

USS Arizona Memorial at Pearl Harbor.

PEARL HARBOR:
Why, How, Fleet Salvage
and Final Appraisal

by
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with a Foreword by
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Foreword

Pearl Harbor will long stand out in men's minds as an example of the results of basic unpreparedness of a peace loving nation, of highly efficient treacherous surprise attack and of the resulting unification of America into a single tidal wave of purpose to victory. Therefore, all will be interested in the unique volume that follows. It is Admiral Wallin's own handicraft, with only minor modifications by this staff.

The Navy has long needed a succinct account of the salvage operations at Pearl Harbor that miraculously resurrected what appeared to be a forever shattered fleet. We were delighted when Admiral Wallin agreed to undertake the job. He was exactly the right man for it—in talent, in perception, and in experience. He had served intimately with Admiral Nimitz and with Admiral Halsey in the South Pacific, has commanded three different Navy Yards, and was a highly successful Chief of the Bureau of Ships.

On 7 December 1941 the then Captain Wallin was serving at Pearl Harbor. He witnessed the events of that shattering and unifying "Day of Infamy." His mind began to race at high speeds at once on the problems and means of getting the broken fleet back into service for its giant task. Unless the United States regained control of the sea, even greater disaster loomed. Without victory at sea, tyranny soon would surely rule all Asia and Europe. In a matter of time it would surely rule the Americas.

Captain Wallin salvaged most of the broken Pearl Harbor fleet that went on to figure prominently in the United States Navy's victory. So the account he masterfully tells covers what he masterfully accomplished. The United States owes him an unpayable debt for this high service among many others in his long career.

Following graduation at the Naval Academy in the Class of 1917, Ensign (and later Lieutenant) Wallin entered into the Navy's then Construction Corps. He intensively studied ship construction in all its intricate facets, then he went on to various efficiently performed duties. At the time of Pearl Harbor Captain Wallin was serving as Battle Force engineer and was charged with overall responsibility for fleet repair and alterations. So he was in the thick of the Pearl Harbor attack from its onset.

When I asked him to write the account of the salvage I expected a well

written one from his experience, his profound mind, his thoroughness, his broad perception, and his skill in expressing himself in writing. What we got, as the reader will note, is not just salvage, but a succinct summary of international aggression during the '30's—the surprise attack that inevitably followed weakness in face of aggression,—and the resurrection and superb service of the fleet that suffered treachery. At first some of us looked upon the three as strange shipmates. But the more we thought about it the more we came to the conclusion that they made a unique team. Someone who had lived through all these, had thought about them at the time, had intimate personal contact in the attack and full responsibility for salvage had told them as the connected story they are—the three acts in a giant drama of world struggle.

Admiral Wallin has written with tireless effort to portray the truth. Whether or not one agrees with all that he says about the events through Pearl Harbor (and I do with all but a few), the reader can know that Admiral Wallin has assiduously sought just the truth. We sent him large cargoes of manuscript material and photographs to add to his own extensive collection. We supplied him with books or titles in numbers for his wide range of reading of published works in addition to the manuscript—he is one of the few people who has seriously read the 39 volumes of the Pearl Harbor Congressional Hearings.

Rear Admiral F. Kent Loomis, Commander C. F. Johnson, Dr. William Morgan, Dr. Dean Allard, and others of us read the manuscript offering suggestions. Commander Victor Robison's assistant in the Curator Section, Mrs. Agnes Hoover, searched far and wide to obtain photographs to supplement the good ones supplied by Admiral Wallin. Dr. Allard, Mr. Bernard Cavalcante, and Miss Sandra Brown ably edited the manuscript for publication and have carried the burden of building a manuscript into a book. Mrs. Robert Winters of Fort Washington, Forest, Maryland, prepared the competent index to this volume. The story, however, is Admiral Wallin's and a significant one it is.

A host of Americans should thank Admiral Wallin for this work. May it help strengthen in the United States our sense of responsibility of service, our readiness to resist tyranny wisely, our integrity and devotion to the cause of liberty and dignity of man under God. May it also help to strengthen in all American minds understanding of the vast role the sea has played in America's destiny and is still to play. In the words of President Kennedy: "The sea means security. It can mean victory. . . ."

E. M. ELLER,

Rear Admiral, USN (Retired),

Director of Naval History.

Preface

Ever since the successful completion of Fleet Salvage at Pearl Harbor in 1942, I have frequently been importuned to write a comprehensive report of that gratifying outcome of the Pearl Harbor disaster. However, in view of other work and avocations, and especially because of the immensity of the task, if it was to be authentic, I was negatively inclined,—at least until a more propitious time.

It was not until the early part of 1965 that the Director of Naval History, Rear Admiral Ernest M. Eller, U.S. Navy, Retired, persuaded me to take the pen in hand. His argument was that the Pearl Harbor Salvage Operation should be made a matter of historical record, and could in addition serve as a ready reference book for any future work of that nature; also that he knew of no other person who could write a reasonably authentic account with the data and information still available. So, in a way, I was "Hobson's Choice" if the work was to be done at all.

Fortunately, I had rather complete files covering the work, inasmuch as through the years I had become some sort of "pack rat" on technical records pertaining to my specialty of ship design, construction, and repair. Although I had turned over most of these files and photographs to the Bureau of Ships of the Navy Department, they were returned to me when I agreed to undertake the writing job.

Despite the fact that nearly a quarter of a century has elapsed since the event a great portion of the impact of my experiences at Pearl Harbor and the salvage work is still quite clear in my memory. At that time I was Material Officer on the staff of Vice Admiral William S. Pye, Commander of the Battle Force of the Pacific Fleet. Therefore the handling of the damage sustained by ships of the fleet immediately became of first concern to me as an existent responsibility. Within a short time I was relieved of all other duties and ordered to full time work as Fleet Salvage Officer.

Ever since those days I have at times pondered the events which occurred before and after the Japanese air raid, and have often wished that the American people might have obtained a more correct understanding of the "Whys and Wherefores." It bothered me greatly when, following the

attack, so many Americans and so much of our news media took a "Who dunnit" attitude toward the disaster and seemed to be more anxious to blame military negligence and inattention to duty rather than to gain a right appraisal of the panorama of events. Perhaps it is an element of human nature to accuse individuals and to find scapegoats whenever distasteful events occur.

Consequently, with the knowledge of one who was on the scene at the time, and of one willing to undertake a vast amount of research from official and other sources, I agreed to proceed with the salvage write-up,—provided I could at the same time pinpoint the situation which pertained in the fleet and in our relations with Japan at that period.

In order to do this with some semblance of authenticity I have reviewed a goodly portion of the testimony given before the Roberts Commission in December 1941 and January 1942, the Hart Investigation in 1944, the Hewitt Inquiry of 1945, the Naval Court of Inquiry of 1944, the Army Investigation in 1944, the Congressional Investigation of 1945, and the State Department releases published in 1953. This latter has been drawn upon freely as it is the official report of the United States' Foreign Policy from 1931 to 1941 inclusive, and is entitled "Peace and War." Also I have read a considerable number of books and reports on the Pearl Harbor attack, some written by Japanese participants. Virtually all of this information has the advantage of hindsight so far as evaluation is concerned and is therefore of inestimable value in piecing together a momentous event which requires retrospection as a primary ingredient.

The Pearl Harbor episode brought forth multitudinous opinions and convictions, some highly emotional and some pertaining to personalities. Others were based on cold logic and technical facts. In the over-all we must all agree that the event which set off a cruel and bloody war is fraught with many lessons and guideposts for the future. I have endeavored to pinpoint a few of these which are particularly worthwhile, and have striven honestly to be fair to all persons who were involved in any way either before, during, or after the event.

The final appraisal of the Pearl Harbor attack is given in Chapter XV. It reveals indisputably that the Japanese government made a great mistake in attacking Pearl Harbor, as it did also in other aspects of the struggle for dominance in the Pacific. There is now no doubt that the attack resulted from the gross unpreparedness of the American military forces, as was

attested by the 1945 statement of President Truman and the 1965 statement of Admiral Nimitz.

I am indebted to the Director of Naval History and his staff for invaluable assistance throughout, and of course for general guidance. That office has furnished much valuable data and information such as official damage reports from the Bureau of Ships, descriptions of rehabilitation work from various naval shipyards, pertinent excerpts from ships' logs, and so forth.

Also, I am most grateful to the Commandant of the Thirteenth Naval District, Rear Admiral William E. Ferrall, U.S. Navy, and his staff for much assistance, including office space and equipment, some secretarial work, and a widespread spirit of cooperation and helpfulness.

HOMER N. WALLIN,
Vice Admiral, USN (Retired).

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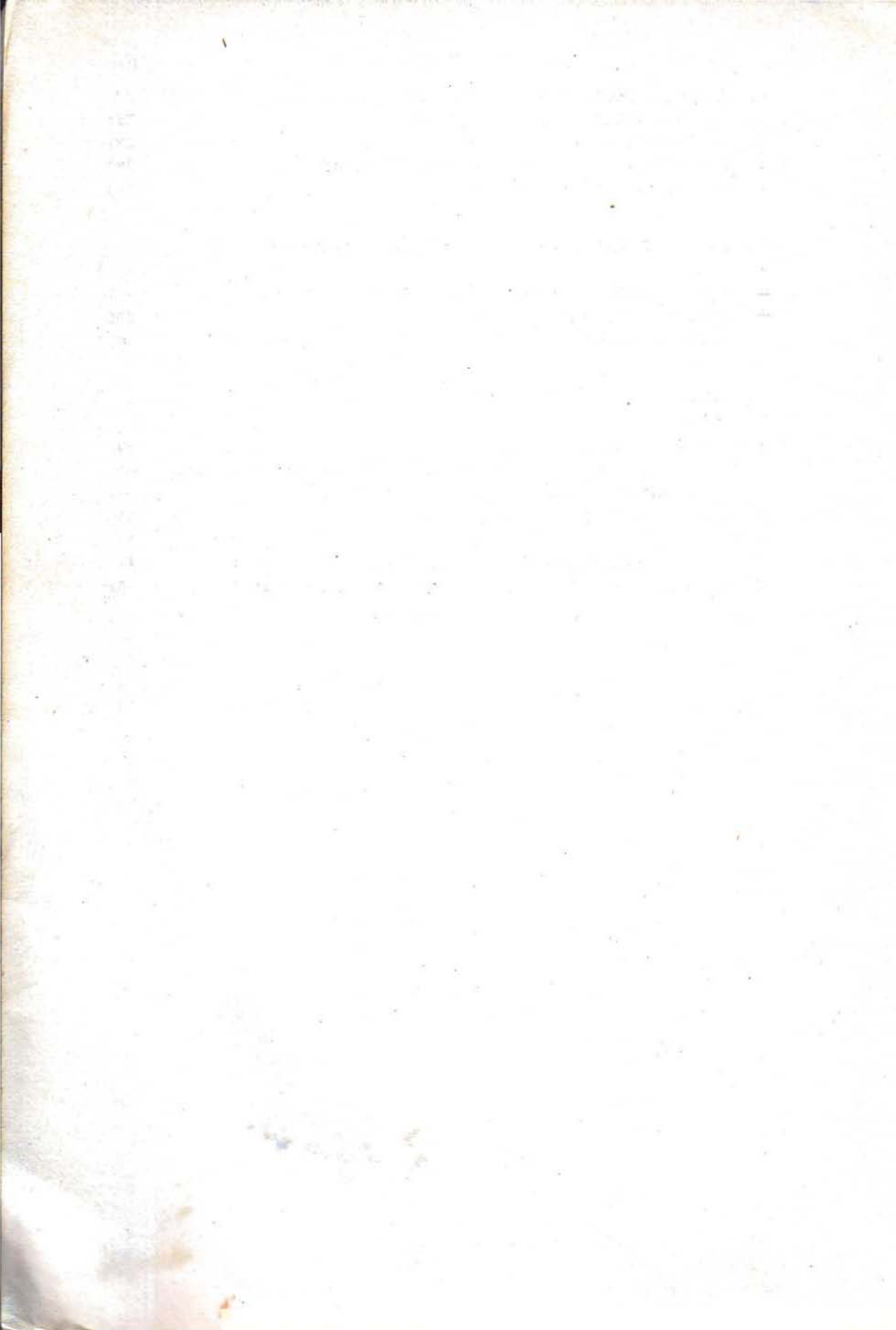
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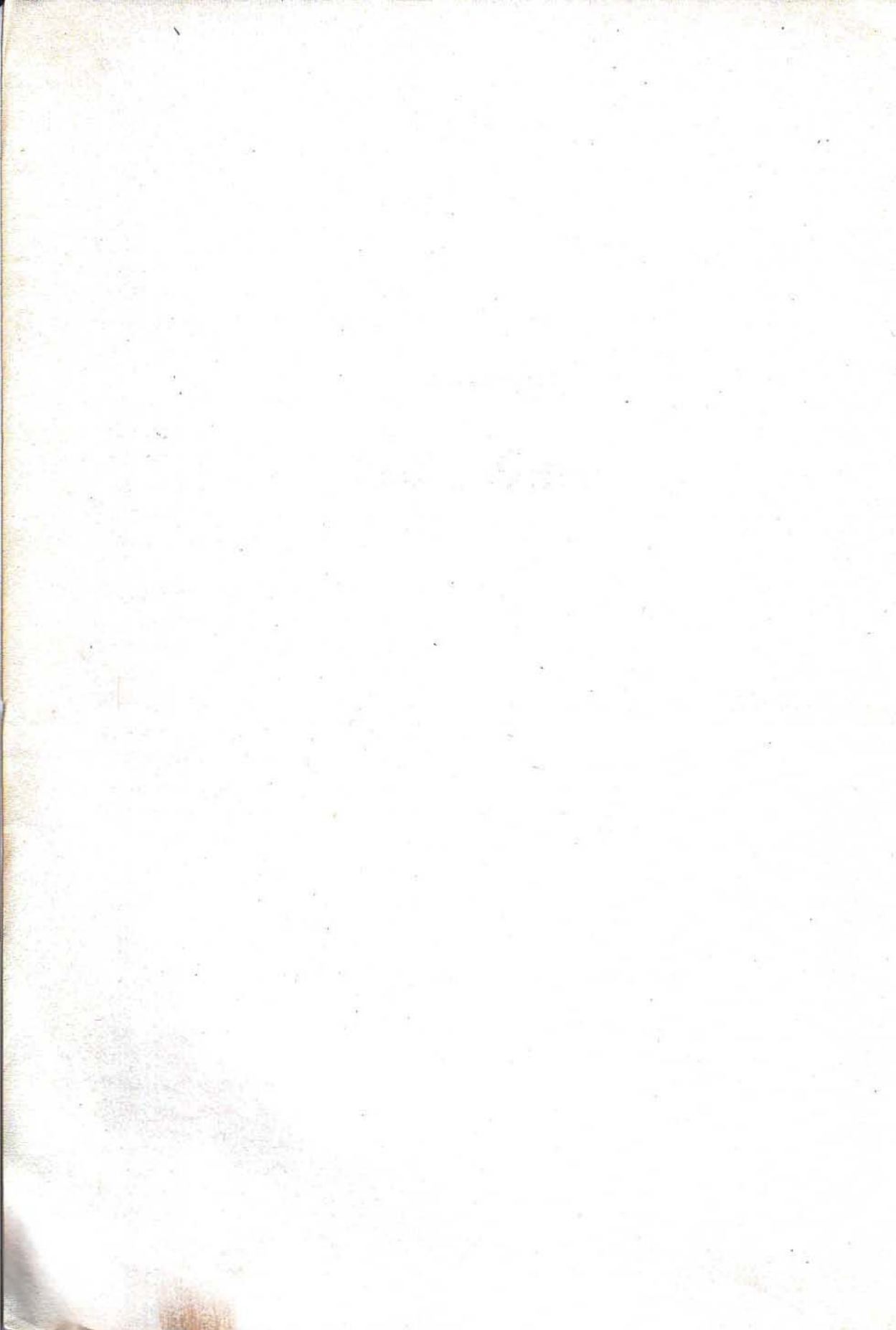
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CHAPTER I

Introduction



CHAPTER I

Introduction

7 DECEMBER 1941 marked an abrupt turning point in world history. The treacherous Japanese air attack on the United States Fleet at Pearl Harbor and the Army Air Forces in Hawaii triggered a World War of unprecedented proportions.

On 8 December 1941 the Congress of the United States declared war on Japan, whereupon Germany and Italy three days later, on 11 December 1941, declared war upon the United States. Their action was in compliance with their mutual assistance treaty with Japan known as the Tripartite Pact of 27 September 1940. It is worthy of note that the United States did not formally enter the European War until after Germany and Italy declared war on the United States.

Thus the Pearl Harbor attack brought the full potential of the United States into the European War which had continued since September 1939 and which up to that time seemed destined to bring victory to the aggressors. But, as a consequence of United States involvement, an all-out war was touched off around the globe. The tide of battle was gradually turned against Hitler's Nazi Germany and Italy's Fascist Mussolini. Their dictatorships, as well as the brutal militarism of Japan, were doomed to ignominious defeat. The war lords of Japan's efficient military machine eventually suffered complete rout, and were doomed to humiliating defeat and unconditional surrender. The defeat of these three powers was accomplished only after a long series of bloody battles, land, sea, and air, which continued at an ever-increasing tempo for nearly four years.

The titanic world struggle not only changed territorial boundaries and governmental framework, but affected basically the whole fabric of civilization, even the manner of living and the peoples' attitudes, standards, and ways of life. Indeed, the consequences of Japan's surprise attack on Pearl Harbor and Hawaii were world-shaking, and they are of a continuing nature which will influence history in all phases for years yet to come.

The immediate result of the Pearl Harbor attack was seeming disaster to the sea power of the United States, but this proved only temporary. The

psychological effect on fleet personnel was to arouse a fighting spirit which turned disasters into victories.

Among the American civilian population too, the attack unified wide diversities of viewpoint and opinion, and solidified the total population in a spirit of willing sacrifice and determined effort which gave unlimited support to the armed forces. The mobilization of moral, mental, physical, and spiritual effort produced a miracle of production such as has never been imagined by man. The output of ships, airplanes, tanks, guns, and landing craft was astronomical. Likewise, the over-all logistic support to the millions of Americans and their Allies who manned these weapons of war, was quite beyond calculation.

Thus, the Japanese militarists who had planned the Pearl Harbor attack over many months of careful and arduous preparation triggered for themselves a disaster quite the opposite of their dreams of conquest. Rather than conquerors they became the supine victims of their own machinations. The Japanese government had been led into violating its solemn agreements signed at The Hague in 1907 not to attack another nation without a declaration of war or an ultimatum. That government was entirely dismantled and reinstated as a democratic government by a generous and compassionate America.

So, in retrospect, the ambitions of the military forces of Japan, which culminated in the treacherous attack on the Fleet and Hawaiian Air Forces, proved calamitous. Its perpetrators failed entirely to understand that unrighteousness, although flourishing for a time, cannot eventually prevail in a world whose major powers stand for peaceful pursuits and fair dealing. The Japanese government failed miserably in underestimating the recuperative power of its newly made enemy and the American potential for all-out combat. The success of the Japanese attack was more than compensated for by the aroused moral and spiritual powers of the American people as they applied themselves to the task before them.

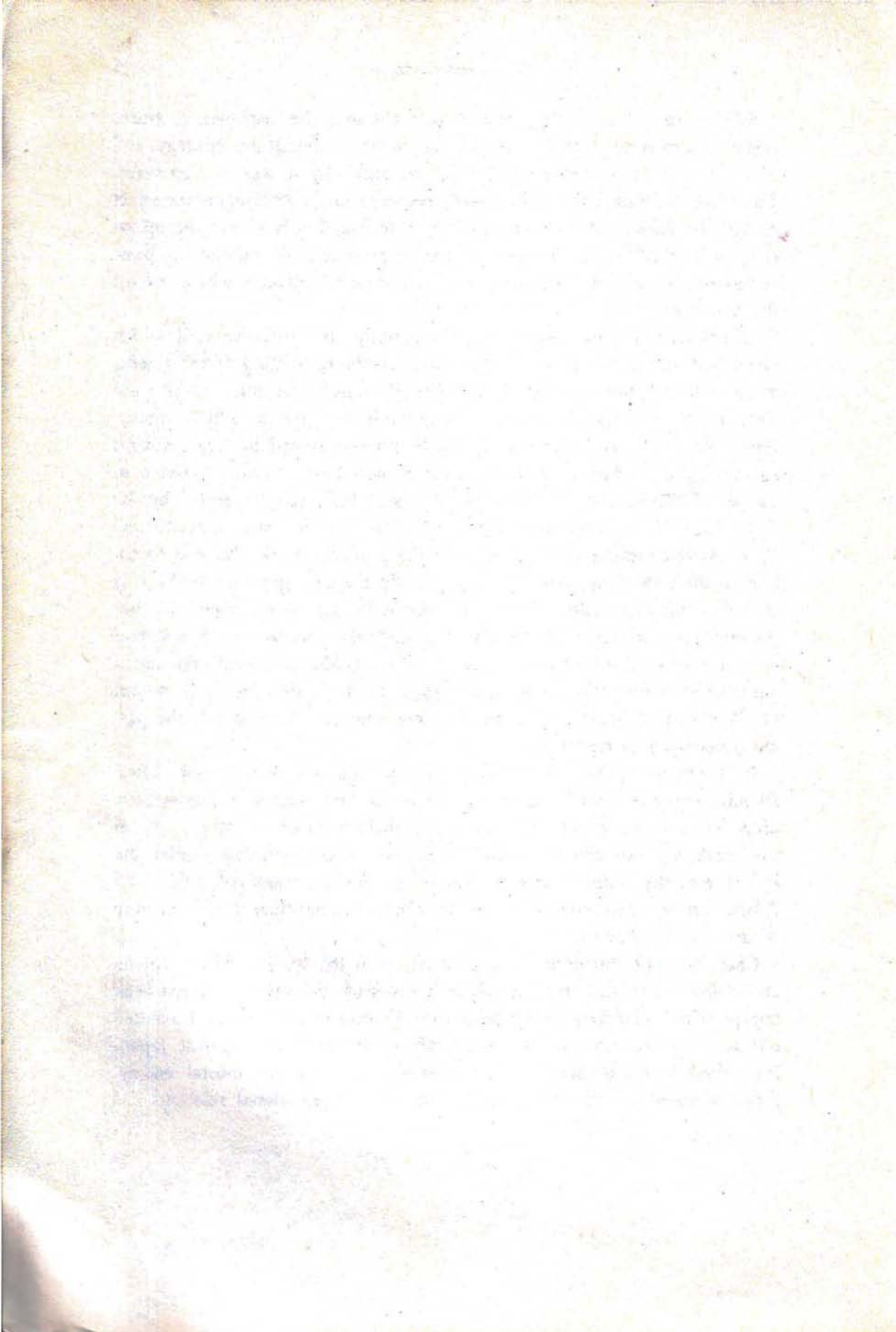
However, it must be recognized that the Japanese performed a masterful job in planning, preparing, practicing, and executing the attack. The efficiency of all aspects was well-nigh unbelievable, especially by people who habitually underestimated the capabilities of the Japanese. It is worthy of note that the weapons employed by Japan were the airplane and the aerial torpedo. Both of these were developed by the United States, but not as efficiently as used by the Japanese. Why? Because the United States was unprepared for war due to a public fetish that preparedness invited international misunderstanding and eventual conflict.

So, before outlining the damage wrought and the remedial measures taken, it seems appropriate to describe in some detail the strategy and tactics employed in delivering the attack, and why it was so successful. Thereafter we might cover the Fleet's response to the onslaught, the effect on specific ships, remedial action taken including details of salvage operations, and so forth. But first it would seem profitable to pinpoint the basic causes underlying and overlying the international situation which set off the holocaust.

Although much has been written regarding the world turmoil which developed during the 1930's, a short and specific recounting of the fateful events which culminated in World War II is necessary. Now it is quite clear that the war was the result of wanton military aggression by Germany, Italy, and Japan, and that the United States was forced to take up arms against these predatory forces if freedom and peace were to survive in the world. These basic facts have never been fully comprehended by the American people; neither have they understood how it was possible for the Pearl Harbor disaster to occur. One of the purposes of this book is to enlighten the public on these points, especially the new generations. Such is a responsibility of historical writings, and it is particularly important that the oncoming personnel of the Navy and the other military services should have a ready reference from which to select guidelines when confronted with comparable problems and circumstances. It is well to take account of the words of George Santayana: "Those who cannot remember the past are condemned to repeat it."

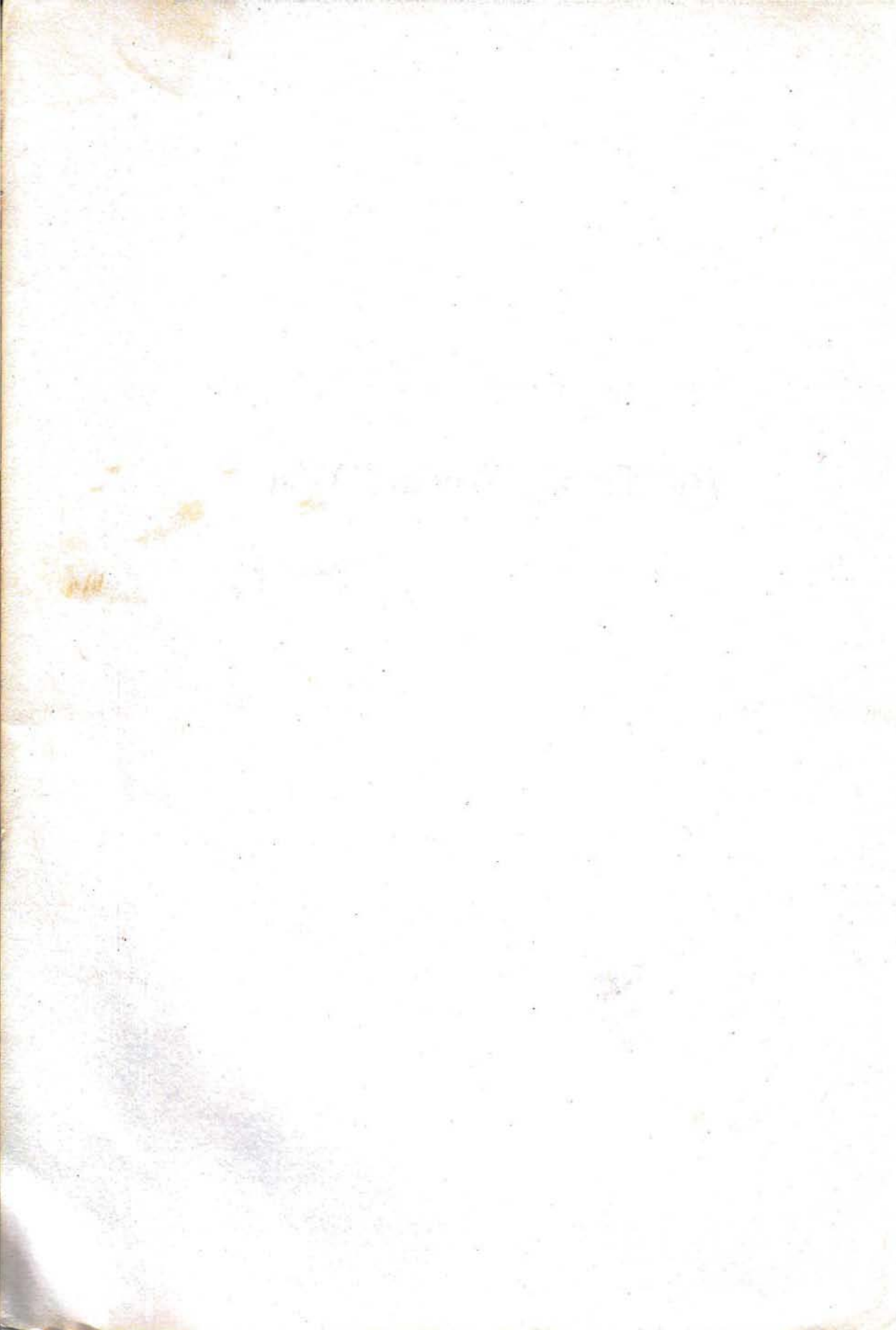
It is interesting to note that our wartime enemies are now our closest friends. Japan, Germany, and Italy enjoy the compassion and generosity of America, and are industrial leaders in their parts of the world. When we speak of Germany we mean, of course, West Germany, under the influence of the United States and her Allies. East Germany is a satellite of Russia and has been subjected to Soviet influence rather than to the influence of the Western World.

Changes have also occurred among Allies in the war, including Russia and China. Russia has been the mother country of communism and has been our principal adversary for at least twenty years while she has fomented unrest throughout the world. China, whom we befriended against Japan, has fallen to communism and has turned out to be our mortal enemy. Strange indeed are the anomalies that occur in international relations.



CHAPTER II

The Trends Toward War



CHAPTER II

The Trends Toward War

1. BASIC CAUSES OF WAR

Warfare with its tremendous sacrifice in lives and treasure is abhorrent to all civilized people. Some wars of the past have been considered justified when waged for religious or idealistic purposes, such as to right the wrongs imposed upon a people. But here we are concerned with warfare based primarily on aggression and greed. History tells us that armed conflict is and always has been a fact of life whenever covetous governments desire their neighbors' property, or whenever thirst for power dictates the purpose and aim of officials in control. In such circumstances the relative weakness of the intended victim is a contributing factor. It has been proved that it is impossible for a nation to run away from a bad situation, to believe that a serious situation does not exist, or that freedom is not involved.

Peace-loving people teach and preach that national aggression and military force do not pay. But that would depend, it seems, whether or not the aggressor is met and repelled by a more powerful force in which hopefully righteousness adds to the power. This fact is true among nations even as among citizens who are menaced by criminals and bandits.

2. GERMANY'S INSATIABLE APPETITE FOR AGGRESSION

One of history's outstanding examples of wanton aggression and thirst for power is Hitler's Germany. Following his coming to power in 1933 Hitler initiated an armament build-up and psychological aggression which were awesome to all peace-loving nations. Even so, the various acts of aggression were gradual and limited, as if to make them somewhat natural and more acceptable to the victims and to onlookers. In effect, Germany pursued the "Nibble Theory" by taking a little here and later a little there, but always professing a fervent desire for peaceful practices and an end to expansive

ventures. Coupled with this were the appeasement policies of the leading world powers interested in world stability, but nonetheless trying desperately to avoid coming to grips with a formidable aggressor.

It is of immense importance to review the germination of the European War because it became a direct threat to American security, and certainly an indirect cause for the Japanese attack on Pearl Harbor. In addition, the experience of European nations with Nazi Germany was in many ways parallel to America's experience with pre-war Japan.

The record shows that Hitler became Chancellor in Germany's government in 1933. In 1934, he took the title of Fuehrer, which means in effect "all-powerful leader," and set out to build up the peoples' desire for expansion and the establishment of a so-called "New Order" in Europe.

Some of the significant steps taken before and after the declaration of the war in Europe were the following:

a. In 1933 Hitler denounced and quit the League of Nations. Violation of several provisions of the Versailles Treaty which ended World War I followed in short order.

b. In 1936 Germany violated the Locarno Treaty of 1925, which guaranteed the status quo in Western Europe, and reoccupied the Rhineland.

c. In 1936 Germany joined Italy in entering the Spanish Civil War.

d. In March 1938 Germany annexed Austria in violation of its pledge made in July 1936.

e. In September 1938 Hitler demanded control of part of Czechoslovakia. This aroused all major nations to the danger of general war, whereupon England's Prime Minister Chamberlain journeyed to Munich to confer with Hitler in order to avoid war in Europe. The result was that Great Britain, France, Germany, and Italy met and agreed to Hitler's demand for taking over that part of Czechoslovakia called Sudetenland.

f. Six months later, in March 1939, Germany took over most of Czechoslovakia in violation of the agreement made at Munich.

g. By this time Hitler had put in high gear the persecution of the Jews in Germany and the annexed territories, such that President Roosevelt "could scarcely believe that such things could occur in a twentieth century civilization."¹

h. At this point the United States appealed to Hitler and Mussolini

¹ *Peace and War, United States Foreign Policy 1931-1941*, Department of State Publication, United States Government Printing Office, Washington, D.C., 1942, p. 58. Hereafter cited as *Peace and War*.

for assurance of no further attacks on independent States of Europe and the Near East. Neither replied directly. The American Secretary of State, Cordell Hull, stated that all other nations were confronted with the "tragic alternatives of surrender or armed defense."²

i. In August 1939 Hitler demanded the return to Germany of Danzig, which was declared a free city in the Versailles Treaty. Following this demand Great Britain and France warned Germany that in compliance with their treaties with Poland, aggression against Poland would mean war.

j. At this point the President of the United States appealed to Germany, Italy, and Poland to agree to settle their differences by direct negotiation or by arbitration. While Poland replied favorably, no direct reply was made by Germany because, the German Ambassador explained, the invasion had already begun due to the uncooperative attitude of Poland.³ Thus with the invasion of Poland on 1 September 1939 the European War began.

k. As the tempo of war developed, Germany asserted its power in every direction, especially its aggression toward neutral and unoffending nations.

l. In April 1940 Germany took over Denmark without opposition, and soon occupied Norway after overcoming Norway's spirited but futile resistance. This was denounced by the United States.

m. Then Belgium and the Netherlands were invaded and subjugated, as well as Luxembourg, in May 1940.

n. Early in 1941 Germany went to the assistance of Italy in its faltering invasion of Greece. By April 1941 the German forces overran both Greece and Yugoslavia and persuaded Rumania, Bulgaria, and Hungary to join the Tripartite Pact.

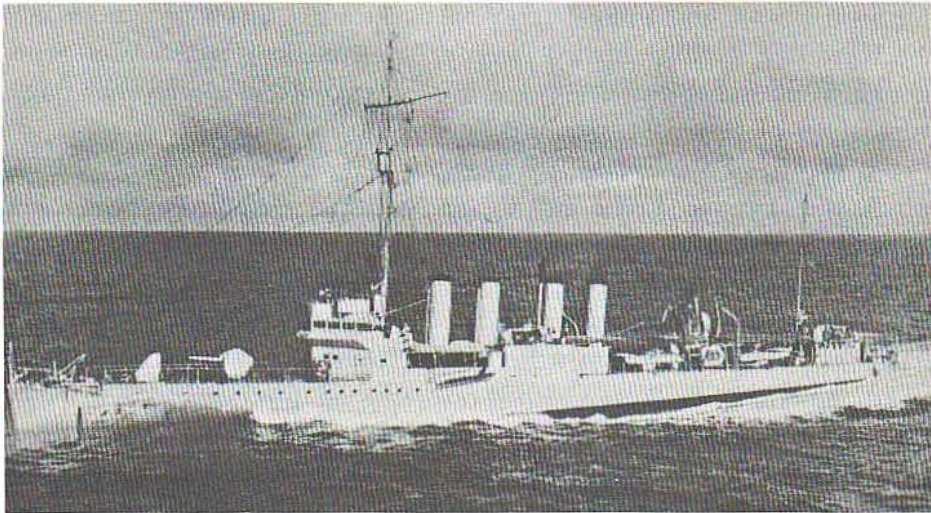
o. In June 1941 Germany attacked Russia in violation of their non-aggression pact.

p. Following its declaration of war in 1939, Germany carried on a vigorous submarine campaign against merchant ships, and gradually expanded its campaign against ships of neutral nations with little or no consideration for the safety of the crews.

q. By September 1941 Germany had sunk numerous American owned merchant ships in the Atlantic, and had attacked *U.S.S. Greer*. The first shots were fired in the Battle of the Atlantic.

² *Ibid.*, p. 63.

³ *Ibid.*, p. 66.



USN 427096

USS Greer was attacked by a German submarine on 4 September 1941.

r. On 17 October 1941 Germany torpedoed *U.S.S. Kearney* in the North Atlantic causing severe damage and killing eleven men. Later in the month, destroyer *Reuben James* was sunk by a U-boat and lost 115 officers and men.

3. THE AGGRESSIONS OF ITALY

Although Germany's aggressions covered a larger field of action, Italy's predatory acts were even more devoid of presumed justification. Whether Mussolini copied Hitler, or vice versa, is not clear, but both came into office originally as purported socialist reformers and developed into absolute dictators in the fateful years between 1934 and 1941. Both exercised emotional leadership over their populations to a degree which bordered on hypnosis, and thus they had full and loyal civilian support in their nefarious ventures.

a. As early as 1934 diplomatic circles were aware that Mussolini was making preparations to take over some territory in Africa. Defenseless Ethiopia was selected as his first victim, and in October 1935 Italian armed forces invaded that country. Emperor Haile Selassie resisted valiantly, but his primitive forces were no match for Italy's army and navy. The conquest of Ethiopia was completed by May 1936.

b. The League of Nations became interested in this aggression and declared that Italy had violated her obligations under the Covenant and recommended commercial and financial sanctions against Italy. The imposition of sanctions by world powers was regarded with some fear and indifference; consequently the limited sanctions that were imposed proved wholly ineffective.

c. The United States held that Italy violated the Kellogg-Briand Pact of 1928 which renounced war as an instrument of national policy.

d. Together with Germany, Italy participated in the Spanish Civil War in 1936, contrary to commitments previously made.

e. Together Germany and Italy formed the Berlin-Rome Axis and Germany and Japan signed the Anti-Comintern Pact against Russia in late 1936.

f. In November 1937 this Pact was expanded to include Italy, the same having been under negotiation among the three powers since 1934-35.

g. In March 1939, when Hitler took Czechoslovakia, Mussolini's Fascist legions occupied Albania on Good Friday, 7 April 1939.

h. When Germany invaded Belgium, The Netherlands, and France in May 1940 the United States appealed to Italy to refrain from participation and thus extending the war. Mussolini replied: "Italy is and intends to remain allied with Germany and that Italy cannot remain absent at a moment in which the fate of Europe is at stake."⁴

i. In September 1940 Germany, Italy, and Japan announced to the world that they had signed a treaty of alliance which provided mutual assistance—political, economic, and military—and recognized the leadership of Germany and Italy in establishing a "New Order" in Europe, and the leadership of Japan in establishing a "New Order" in Greater East Asia.

j. When the German Army was at the gates of Paris in June 1940, Italy declared war on France and Great Britain. Then it was that Winston Churchill called Mussolini "a jackal for plunging a knife into the back of his prostrate neighbor."

k. Italy invaded Greece in October 1940 but was unable to overcome its brave defenders. When the Italian Army was forced to retreat into Albania, Germany came to Italy's assistance. The result was that Greece and Yugoslavia fell to the Axis Powers in April 1941. Then Rumania, Bulgaria, and Hungary joined the Tripartite Pact, thus extending the war.

⁴ *Ibid.*, p. 72.

4. THE BRUTAL AGGRESSIVENESS OF JAPAN

Japan's program of belligerency and expansion had been in operation for nearly ten years prior to signing the treaty of alliance with Germany and Italy. However, Japan made common cause with Hitler and Mussolini as early as 1934. Japan's pattern of expansion, conquest, and terrorism was quite similar to that of Germany, especially with regard to expressing idealistic motives and promises while still moving forward with new invasions and increased demands. Japan's record of treaty violation and aggression exceeds those of either Germany or Italy. This fact should be comprehended and understood by any person interested in the basic causes of the war which was started at Pearl Harbor. Let us therefore list some of the important items:

a. Following World War I Japan was granted a mandate over the islands formerly held by Germany in the Marshalls and Carolines. Contrary to stipulations in the Treaty of Versailles the Japanese proceeded to fortify certain islands and to build military bases in those islands, and to deny entry to the islands by foreigners. It might be noted parenthetically that the later capture of these formidable bases in World War II cost the United States thousands of casualties.

b. In 1931 the Japanese Army invaded Manchuria and set up a puppet government under the name of Manchukuo. The United States protested this action as an act of war in cynical disregard of Japan's obligations under the Kellogg-Briand Pact and the Nine Power Treaty of 1922 regarding the principles and policies to be followed concerning China.⁵ The United States declared that it would not recognize any arrangement which impaired the rights of its citizens in China.⁶

c. For several months in 1932, Japan occupied Shanghai and refused to consider the proposals for peaceful settlement put forth by Great Britain, France, Italy, and the United States.

d. In 1932 Japan developed an internal campaign of public animosity towards foreign nations, especially the United States, even proposing war if necessary. Self-confidence was stimulated by the constant reminder that the Japanese military forces had always proved invincible.

e. In 1933 Japan extended the boundaries of Manchukuo by occupying the province of Jehol in North China.

⁵ *Ibid.*, pp. 4 and 5.

⁶ *Ibid.*, p. 5.

f. When the League of Nations in 1933 adopted a report finding Japan an aggressor in China and acting wrongly in principle, the Japanese delegation walked out and the Japanese government gave notice of withdrawal from the League of Nations.

g. In response to the American protests against aggression and disregard of treaty rights, Japan in early 1934 advised the United States it had no intention of making trouble with any other power, and that no question between Japan and the United States was incapable of amicable solution.⁷ During diplomatic exchanges however, when the United States insisted on adherence to treaties including trade and commercial agreements, Japan gradually put forth a claim of super-sovereignty over parts of Asia on the basis of its special rights and responsibilities.⁸

h. In 1934 Japan gave notice of its refusal to renew the 1922 Treaty for the Limitation of Naval Armament.

i. By 1935 Japan had considerable domination over China and was building up its military strength. Japanese diplomats repeatedly pointed out that Japan was destined to be the leader of oriental civilization and criticized former Japanese government officials for "signing agreements which could not be carried out if Japan wanted to progress in the world."⁹

j. At the London Naval Conference in 1935-1936 Japan asked for naval parity with Great Britain and the United States. When this was not agreed to by the other powers Japan withdrew from the Conference and refused to abide with any limitation on naval armament.

k. During these times the United States emphasized the importance of amicable conferences and such principles as equality in commercial and industrial affairs without resorting to force or threats of force. Japan expressed general agreement, and its diplomats frequently regretted the misunderstanding and misapprehension of the United States as to Japan's intentions, and gave assurance that their armaments were not intended for war against anybody, especially the United States.¹⁰

l. Encouraged by the apparent improvement in the general progress and spirit of the people in Germany and Italy a group of Japanese Army officers fomented a mutiny which was directed toward setting up military control of national policies. The Japanese Army did many things to force the government to pursue a policy of expansionism in China.

⁷ *Ibid.*, pp. 18 and 39. (This viewpoint was expressed many times.)

⁸ *Ibid.*, pp. 38 and 39. (Kurusu, Yoshida, and others put forth this argument.)

⁹ *Ibid.*, p. 38. (Kurusu's statement to the U. S. Embassy in Tokyo, 23 December 1935.)

¹⁰ *Ibid.*, p. 39. (Statement by Yoshida.)

m. On 25 November 1936 Japan and Germany signed their Anti-Comintern Pact, which foreshadowed the similar patterns of aggression which each nation was to follow.

n. In July 1937 the Marco Polo Bridge incident occurred. This was a planned clash between troops of Japan and China, which resulted in Japanese occupation of additional Chinese territory including Peiping in North China. At this point the United States addressed a note to all nations regarding the fundamental principles and international policy toward peaceful existence. The United States offered its good offices to compose differences between China and Japan and to negotiate an agreement. The diplomats of Germany and Italy agreed but Japan refused on the ground that the objectives and principles could only be attained in the far eastern situation by full recognition and realization of the actual particular circumstances of that region.¹¹ As Japan poured more manpower and engines of war into China, the United States warned of the serious consequences to peace, goodwill, and cooperation as compared to the distrust and antipathy being generated among world powers by the brutal policies pursued by the Japanese government.¹²

o. The Assembly of the League of Nations on 6 October 1937 adopted a report stating that Japanese activities in China violated Japan's treaty obligations. The United States, though not a member of the League, proclaimed a similar position.

p. The following month nineteen nations assembled at a conference in Brussels to consider peaceful means for ending the Japan-China conflict. Japan refused to attend on the ground that the dispute applied only to Japan and China and was outside the provisions of the Nine Power Treaty. All members of the conference except Italy went on record opposing Japan's position.¹³

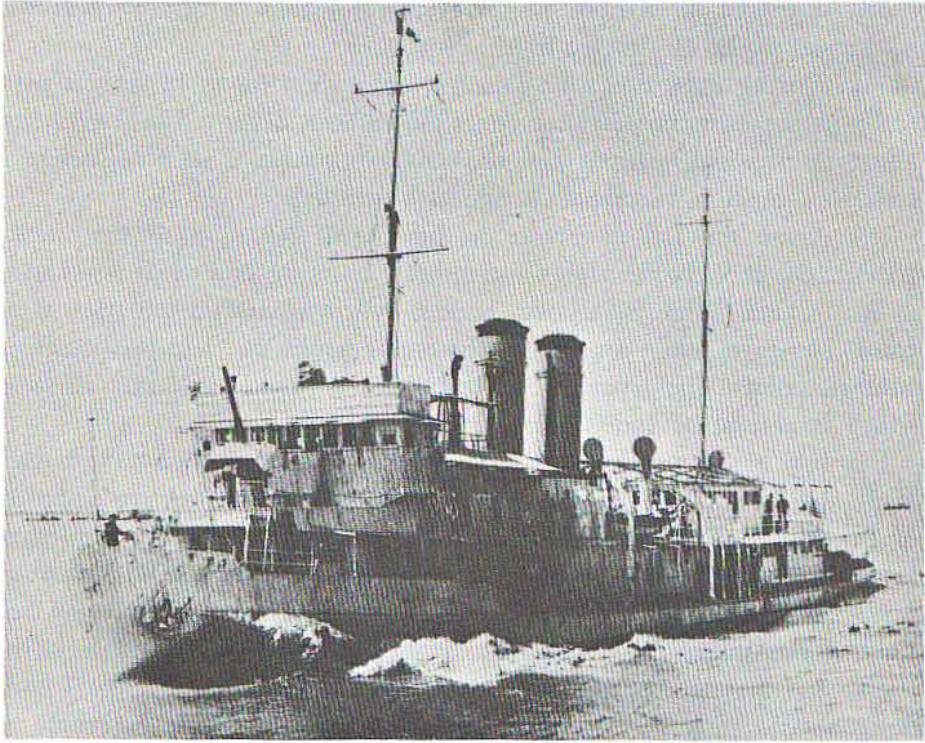
q. On 12 December 1937 the United States was shocked by the air-bombing and destruction of the United States gunboat *Panay* and three United States merchant vessels on the Yangtze River, followed by the machine gunning of crews and passengers. The United States demanded formal apologies, complete indemnification, and assurances against future attacks on American nationals and property in China, or any unlawful interference whatsoever with its legal rights and appropriate business. To this

¹¹ *Ibid.*, pp. 44 and 45.

¹² *Ibid.*, p. 47.

¹³ *Ibid.*, pp. 49 and 50.

strong representation Japan replied favorably, expressed profound regret, and fervently hoped that friendly relations would not be affected by this unfortunate affair.¹⁴



USN NR&L (MOD) 12594

USS Panay was sunk by Japanese aircraft, 12 December 1937.

r. In November 1937 Italy became a partner of Japan in the Anti-Comintern Pact.

s. After Germany's subjugation of the Netherlands in May 1940, Japan expressed some concern as to the status of the Netherlands Indies. The United States informed Japan and the world that any alteration of the status quo would prejudice the cause of stability, peace, and security of the whole Pacific area on account of the importance of the area's rich resources of oil, rubber, tin, and other commodities.¹⁵

¹⁴ *Ibid.*, p. 51.

¹⁵ *Ibid.*, p. 89.

t. Early in June 1940 Japan delivered a full-scale bombing raid on Chungking, endangering American lives and property. The United States' protest was answered by Japan's request for the removal of our nationals. A few days later 113 Japanese aircraft repeated the bombing. Thereafter, Japan requested all nations to remove from China all troops and war equipment which they might have in that area.

u. During these times the Japanese occupation forces in various parts of China harassed and assaulted American citizens, destroyed their property, and even attacked missions and missionary hospitals. This was part of a terrorist campaign to compel foreigners to evacuate.

v. Upon the fall of France in June 1940 Japan asked the French government at Vichy for rights and military bases in the French possessions in Indo-China. This request was backed by an ultimatum and threats of force, but even while awaiting a favorable reply the Japanese occupied strategic points. The Japanese had occupied the island of Hainan in 1939, which is abreast of Indo-China.

w. On 27 September 1940 Japan signed a treaty of alliance with Germany and Italy which provided for mutual assistance in the establishment of Japanese leadership of a "New Order" in Asia, and for German-Italian leadership of a "New Order" in Europe. This was highly important to Japan's objectives, and it was a clever move on the part of Germany and Italy. It was intended to require the United States to defend itself in the Pacific and thus to reduce her strength in the Atlantic. In case the United States should enter the European conflict its military forces, especially its Navy, would be divided between the Atlantic and the Pacific.

x. At about this time the United States announced discontinuance of steel and scrap exportation to Japan. This was in accordance with the Export Control Act of July 1940. Japan immediately protested this action as an "unfriendly act," whereupon Secretary of State Hull stated that it was "amazing" that, after violating American rights and interests, to question this sort of response, especially when in the subjugation of China the United States is called unfriendly unless we sit on the sideline cheerfully and agreeably as these acts go on.¹⁶

y. Many discussions were held between the diplomats of the United States and Japan to improve a deteriorating situation. The United States pointed out Japan's program of expansion by military force, together with

¹⁶ *Ibid.*, p. 94. (The above is a paraphrase of Secretary Hull's reply to Ambassador Horiguchi.)

intensive construction of military and naval armament, and the openly declared intention to achieve and maintain by force of arms a dominant position in the Western Pacific. Secretary of State Hull, cautioned that Japan's "best interests lay in the development of friendly relations with the United States and with other countries which believed in orderly and peaceful international processes." ¹⁷

z. In January 1941 the United States Ambassador to Japan, Joseph C. Grew, reported rumors that Japanese military forces planned a surprise attack on Pearl Harbor in case of trouble with the United States.

aa. Beginning in March 1941 continuous conferences were held in Washington between Japanese Ambassador Nomura and the State Department for the settlement of differences with regard to the Japanese policy which was sloganized as a "New Order in Greater East Asia." As it turned out, this included taking territory by force and violating freedom of trade and freedom of the seas.

bb. In May 1941 Japan proposed a settlement based on recognition by the United States of Manchukuo, recognition of peaceful expansion of Japan to the south, and discontinuance of United States material assistance to China. In return Japan would guarantee the neutrality of the Philippine Islands. The Japanese were not willing to commit themselves unreservedly to a policy of peace, and would not abandon their ties with Hitler and Mussolini.¹⁸ However, the Department of State wrote a comprehensive statement in which important concessions were made to Japanese policy, but with reservations intended to exert a restraining influence.¹⁹

cc. In the summer of 1941 Hitler pressured the French Vichy Government to grant Japan military base rights in Southern Indo-China. These became effective in July 1941 whereupon the President of the United States proposed neutralization of Indo-China so that all nations could carry on trade and commerce. Japan rejected this proposal. Then on 1 August, the United States imposed an oil embargo on Japan.

dd. For several years military control of the Japanese government had been in the ascendancy. Almost full army control had been gained by threat, pressure, and assassination. The conservative elements, even including the Emperor, were shunted aside. Premier Konoye was required to resign in October 1941, and the new premier was Army General Hideki Tojo. Thus

¹⁷ *Ibid.*, p. 113.

¹⁸ *Ibid.*, p. 116.

¹⁹ *Ibid.*, p. 117.

the militaristic element was in full control of Japan and took over the government with the purpose of consolidating their aggressions in China and proceeding with the "Greater East-Asia Co-Prosperty Sphere."

ee. In return for discontinuance of the United States' trade restrictions, Japan offered to cooperate in a development of natural resources and trade in the southwest Pacific. There was a Japanese threat to move into Thailand and to dominate the Indian Ocean while efforts of Germany and Italy were aimed at the Near and Middle East. At the same time the survival of Great Britain was in serious doubt.

ff. Japanese diplomats now proposed a conference between their Premier Konoye and President Roosevelt to reach an overall settlement. But they were unwilling to agree in advance on the basic principles which the United States had consistently championed and which Japan had consistently violated. But, as always, the Japanese stated that they "had no intention of using 'without provocation,' military force against any neighboring nation." ²⁰

gg. On 3 November 1941 Ambassador Grew explained to the United States government that the militaristic government of Japan could not be stopped, and that war could not be averted by the imposition of economic embargoes or sanctions. On 17 November 1941 he suggested that vigilance against sudden Japanese naval or military attack was essential.²¹

hh. In November 1941 Japan's special envoy, Mr. Kurusu, arrived in Washington and endeavored with the help of the Japanese Ambassador to justify Japan's situation, which was really fully understood by our State Department. He had nothing new to offer on the crucial question of Japan's aggressions. The United States promised that if Japan would indicate some peaceful intentions they would be well responded to.²²

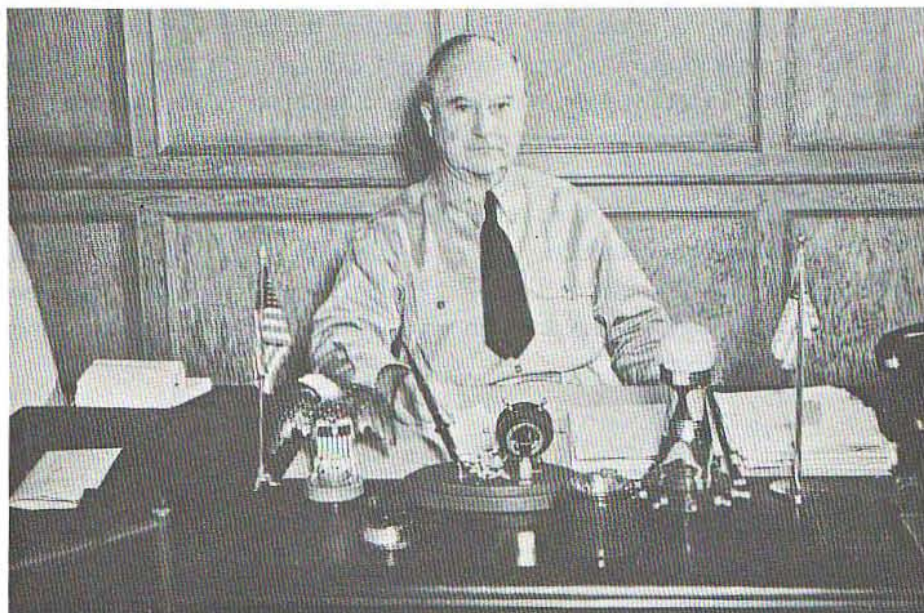
ii. Since Japan's expressions of peaceful intent contained qualifications and restrictions, and did not budge from the fundamental objectives stated by its military leaders, the United States under date of 26 November 1941 made crystal clear its position. The American note was sent when it was fully realized that the long drawn-out negotiations to improve the relations between the two governments were failing.

jj. In early December 1941 there were threatening Japanese troop movements into Southeast Asia. When this was protested by President Roosevelt

²⁰ *Ibid.*, pp. 124 and 125.

²¹ *Ibid.*, pp. 130 and 131.

²² *Ibid.*, pp. 132 and 134.



USN NR&L (MOD) 39730

Rear Admiral William R. Furlong, USN, Commander Mincraft, Battle Force, was in his flagship, USS Oglala, during the Japanese attack. He became Commandant of the Navy Yard, Pearl Harbor, on 25 December 1941.

on 2 December, Kurusu explained that they were for protection against Chinese troops, and that Japan was concerned lest the allied powers should occupy Indo-China.²³

kk. On 6 December 1941 President Roosevelt transmitted a telegram to the Emperor of Japan appealing for cooperation toward eliminating any form of military threat, and for restoring traditional unity.

ll. Under date of 7 December 1941 Japan's reply to the 26 November message was delivered to Secretary Hull. The message was abusive and condemnatory, and ended with breaking off the negotiations. Secretary Hull said to the Japanese diplomats: "I have never seen a document that was more crowded with infamous falsehoods and distortions—infamous falsehoods and distortions on a scale so huge that I never imagined until today that any Government on this planet was capable of uttering them."²⁴

The world now knows that when the Japanese note was written their naval task force was on the way to attack Pearl Harbor, and the attack had

²³ *Ibid.*, pp. 139 and 140.

²⁴ *Ibid.*, p. 142. (Secretary Hull's statement of 7 December 1941 to the Japanese diplomats.)

already been delivered more than an hour before the note was delivered by the Japanese diplomats. This certainly shows bad faith on the part of the Japanese. Their attack force was assembled and underway before the 26 November 1941 note was received by them; their basis for peace was premised upon an unbending attitude regarding Japanese policies in the Pacific; their continued diplomatic efforts were fraudulent because they knew that the United States would not agree to their demands. Even as late as 30 November 1941, General Tojo as Premier stated that the Japanese purpose was to purge East Asia, with a vengeance, of hostile British and United States influences.

CHAPTER III

Problems and Dilemmas of the
United States and Eventual
Preparedness for War

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CHAPTER III

Problems and Dilemmas of the United States and Eventual Preparedness for War

1. AMERICAN ATTITUDES AND POLICIES

The gathering clouds of war in Europe and the Far East became more and more ominous to the United States during each of the half dozen years preceding the attack on Pearl Harbor. Because of our nation's firm commitment to peace there was much sympathy and concern among Americans for the victims of the aggression. In the early stages of unprincipled aggression abroad there seemed little need to worry about what was developing in other countries, or what our own welfare and eventual security might be. Yet as time went on and situations became more critical we found ourselves the only major world power that was not engaged in warfare. Even when our foreign trade and property were jeopardized and our citizens abroad were endangered we were reluctant to take decisive actions which might possibly embroil us in the worldwide conflict. Even while condemning the aggressor nations the large majority of our people demanded peace and neutrality for themselves.

As pressures mounted our diplomatic policy stood firmly for cooperative observance of law and order by all nations. Yet in most cases we found ourselves impotent in negotiating settlements for the benefit of world peace or our own interests. The unremitting efforts made by our country, as well as the efforts made by the victimized nations, proved that talk, discussion, and negotiation were almost futile. Aggressor nations are no more susceptible to logical argument than outlaws bent on plunder. Both operate by force of arms, and it requires force of arms to restrain them.

The major dilemma confronting the United States was whether to tolerate a wholly unsatisfactory world situation, or to resort to forceful intervention. Neither was acceptable nor really possible, but nevertheless the great prob-

lem of the United States was to determine how to restore peace and lawful practices among nations in a disrupted world without going to war. How to strengthen our diplomatic voice in the world without building a sufficient military force to back up adequately that voice was a real dilemma faced by our government.

A specific dilemma in the case of Japan's policy in China, the Secretary of State noted, was to come to amicable agreement with Japan but not at the expense of China.

A related dilemma was how to make preparations against the possibility of armed conflict when public opinion opposed military expenditures and seemed obsessed with the benefits of neutralism and perhaps by self-righteousness. These and other contradictory factors of our national life and well-being are touched upon in this chapter, as are the steps taken to reconcile opposing considerations.

2. RETRENCHMENT IN MILITARY PREPAREDNESS

For a dozen years or more after World War I the United States followed a program of drastic retrenchment in military preparedness. Much of this was quite in order because we had built up a gigantic military machine by the end of World War I, and there were in various stages of completion large naval building programs. The Washington Treaty for the Limitation of Naval Armament, signed in 1922 by the United States, Great Britain, Japan, Italy, and France was in this tradition.

But public opinion demanded much greater military curtailment to demonstrate America's support of the worldwide yearning for peace as exemplified by the various peace-keeping treaties of those years. Also, it is interesting to note that in the mid 1930's the Nye Committee of the United States Senate held numerous hearings to show that war was caused in large part by the manufacturers and vendors of armament and military equipment. It was pointed out that drastic reduction in the purchase of such materials would presumably tend toward peace.

Many peace organizations were active during those times in promoting general disarmament. In the absence of any over-all agreement among the world powers there was a strong feeling for "disarmament by example," the theory being that other nations would probably follow the strongest

nation in the world. Professional propagandists were likewise busy. The result was that throughout the 1920's the military forces of the United States were steadily reduced in effectiveness. Very few new ships were authorized, and manning levels in the military services were greatly curtailed. In short, the military services existed on a starvation diet.

However, when the economic depression began after 1929, the nation was fortunate that a portion of the Congressional appropriations for the National Industrial Recovery Act was assigned to a rehabilitation program in ship construction, but not without opposition from well-meaning organizations devoted to the hope of peace through disarmament. Included in this program of ship construction were a number of major vessels. The design and construction of such ships requires four to five years. But some of these became available and were of inestimable value in the early days of World War II. An important national benefit was the reactivation of the famished American shipbuilding trade which thus was available for the gigantic programs of production in the days ahead.

At this time there was no comprehension of the magnitude of the military needs which shortly would be thrust upon us. Of course, there was very little concern that such needs would require several years of lead time for the design, planning, development, and manufacture, or for the training of personnel for operation. The large portion of our population was determined to avoid war at any cost, and they were quite sure that the best way to avoid war was to avoid preparing for war.

Naturally the Congress reflected the viewpoint of public opinion. Although supporting most of the President's recommendations for national defense, in the late 1930's it acted otherwise repeatedly. For example, in 1938 the House of Representatives barely defeated the proposed Ludlow constitutional amendment which would have required a popular vote as a prerequisite to a declaration of war by the Congress. Except for the strong representations made by the President and the Secretary of State this proposal would probably have been passed.¹

Near the end of 1938 Secretary of War Woodring reported that despite improvements made, the United States stood eighteenth in relative strength among the standing armies of the world. In 1939 Congress refused to

¹ *Peace and War*, p. 52. (President Roosevelt wrote to the Speaker of the House on 6 January 1938, and Secretary Hull warned on 8 January 1938 that this proposal would hamstring the Government.)

modify the prohibition against U.S. merchant ships trading with friendly nations under attack, but did allow these countries to buy our war materials on a cash and carry basis.

Although the Congress approved calling up for active duty the Reserves and the National Guard, in August 1940 it was required that they be used only within the Western Hemisphere or in United States territories. As late as August 1940 Congress passed the first peacetime Selective Service and Training Act in our history by a small margin, but with the same restrictions as for the Reserves and National Guard. At about the same time Congress defeated a bill for improving the defenses of Guam, on the basis that the United States should not do anything to provoke or irritate Japan.

So while some progress was made in building up the national defense forces, public opinion was divided as to the advisability of doing anything which had the appearance of warlike measures. Except for the strong leadership and insistence of the President and Secretary of State, backed by U.S. naval and military leaders, our military structure might well have been quite impotent in late 1941 when World War II broke upon us.

3. DIPLOMACY AT WORK TO PREVENT WAR AND TO IMPROVE PREPAREDNESS FOR WAR

In a world beset with ever-increasing international outlawry, the diplomatic workload of a leading world power committed to peace and legal procedures among nations was enormous. The United States exerted every means to impress upon the offending nations the importance of peaceful processes and the avoidance of violence. Secretary of State Cordell Hull was a patient and reasonable man. He continuously emphasized the inviolability of treaties and agreements among the nations if peace and orderly progress were to be maintained. The logic of his arguments was clear to most people. And let it be said that his work during those critical years bears the stamp of excellence in building a framework of definite action which later could be properly taken. Together with President Roosevelt, the State Department took progressive steps toward exposing international outlawry, and in time toward taking specific action to oppose it. We might list a few of the most important steps which were taken. Many of the specific measures taken pertain primarily to problems in the Atlantic, but of course are clearly related to the problems presented by the Japanese in the Pacific. Many

of the steps taken by government officials were for the purpose of informing the American people of the implications of the world conflict, and alerting them to possible involvement if principles of peace and honor were to be preserved.

a. Freedom of trade and commercial activity as guaranteed by treaties and agreements were the subject of frequent notes and discussions. The situation became crucial when freedom of the seas became involved. Ultimately the United States took decisive action by instituting a naval patrol in the Atlantic in 1941.

b. When public opinion seemed willing to overlook violations of American rights in 1938 Secretary Hull warned that our security would be menaced if we abandoned our legitimate principles because of fear or unwillingness. Only by meeting our responsibilities and making our proper contributions to the firm establishment of a world order based on law "can we keep the problem of our own security in true perspective. . . ." ²

c. When war broke in Europe in 1939 the United States declared its neutrality and also declared a Limited National Emergency. The embargo on the export of arms under the Neutrality Act was repealed in November 1939 so that some aid could be rendered to Great Britain and France.

d. In order to exert a restraining influence on Japan's warlike policies it was decided that the fleet exercises in May of 1940 would be held in the Hawaiian area. The Fleet remained in Hawaii after the maneuvers. This was a diplomatic decision, which was not concurred by all military leaders.

e. On 19 May 1940, President Roosevelt said, "We are shocked and angered" by the over-running of the Lowlands by the Germans and he said that it is a mistaken idea that the American republics are wholly safe from the impact of the attacks on civilization in other parts of the world.³ A month later, on 20 June 1940, the Secretary of State stated that, because of the imminent fall of France, never before has there been such a powerful challenge to freedom, that we could meet it only by retaining an unshakable faith in the worth of freedom and honor, of truth and justice, of intellectual and spiritual integrity, and by determination to give our all for the preservation of our way of life.⁴

f. When the Japanese bombed Chinese civilians the United States declared a "Moral Embargo" against Japan. The American government

² *Ibid.*, p. 55. (Secretary Hull's address in Washington, D.C. on 17 March 1938.)

³ *Ibid.*, p. 73.

⁴ *Ibid.*, p. 78.

appealed to manufacturers and exporters of aircraft parts and armaments not to send these products where they would be used against civilians.

g. In September 1940 American Ambassador Grew reported that Japan felt that she had a "golden opportunity." Japan, he said, was a predatory power and a fully opportunist nation seeking to profit through the weakness of others. She has been deterred from taking great liberties with interests of the United States because she respected our potential power, and she trampled on our rights in exact ratio to the strength of conviction that the United States public would not permit that power to be developed and used.⁵

h. Embargoes and sanctions against Japan were frequently considered and carefully evaluated as to risk of provocation. However, in July 1940 the Export Control Act authorized the President in the interest of national defense to prohibit or curtail the export of certain war materials, including scrap metal and oil.

i. In January 1941 President Roosevelt declared in his State of the Union Message to Congress that American security was threatened, that we supported resolute people resisting aggression, and that our own security would "never permit us to acquiesce in a peace dictated by aggressors or sponsored by appeasers."⁶

j. In March 1941 Congress passed the Lend Lease Act and appropriated seven billion dollars to aid friendly nations. President Roosevelt made a statement that this action ended any compromise with tyranny and the forces of oppression.⁷

k. On 27 May 1941 the President declared an "Unlimited National Emergency." A major objective was to authorize naval action to prevent the aggressors from gaining control of the seas.⁸

l. Following attacks on American merchant and naval ships in September and October 1941 President Roosevelt stated: "History has recorded who fired the first shot." We had sought no shooting war with Hitler, but we were not willing to pay for peace by permitting Hitler to attack our ships when they were on legitimate business.⁹

m. On 21 October 1941 Secretary Hull stated with regard to the Congressional authorization for American merchant vessels to carry cargoes to belligerents that the "paramount principle of national policy is the preserva-

⁵ *Ibid.*, p. 92.

⁶ *Ibid.*, p. 95.

⁷ *Ibid.*, p. 96.

⁸ *Ibid.*, pp. 101 and 102.

⁹ *Ibid.*, pp. 110 and 112.

tion of the safety and security of the nation;" and the "highest right flowing from that principle is the right of self-defense." ¹⁰

n. On 17 August 1941 President Roosevelt and Secretary Hull conferred with Japanese diplomats and delivered a note which contained the statement that the government of the United States "finds it necessary to say to the Government of Japan that if the Japanese Government takes any further steps in pursuance of a policy or program of military domination by force or threat of force of neighboring countries, the Government of the United States will be compelled to take immediately any and all steps which it may deem necessary toward safeguarding the legitimate rights and interests of the United States and the American nationals and toward insuring the safety and security of the United States." ¹¹

o. On 1 December 1941 Secretary Hull stated to Japanese diplomats that the United States would give all the materials Japan requires if the Japanese leaders will show some movement toward peace and discontinue bellicose threats and bluster. ¹²

Thus it is seen that American diplomacy was active throughout the decade preceding Pearl Harbor, in endeavoring to restrain the aggressors on the one hand, and on the other, to educate the American people regarding the issues at stake and the threat to their freedom and security.

4. HARDENING OF PUBLIC OPINION

As the people became informed of the progress of events in Europe and Japan, and were alerted to the effects on American interests and principles, they gradually assumed stronger views against the three aggressor nations. Yet despite the actions of those nations, the clear mandate of the people was to refrain from war or the appearance of war.

There were wide differences of opinion as to the rightness or wrongness of every nation's actions, including our own. Some of these were based on race, nationality, or personal experience. Others were influenced by paid propaganda outputs in this country. But the great majority of the people were sincere and honest in their desire to avoid warfare if at all possible, and were willing to make concessions and even sacrifices to that end. There

¹⁰ *Ibid.*, p. 111.

¹¹ *Ibid.*, pp. 123 and 124.

¹² *Ibid.*, p. 139.



USN NR&L (MOD) 18250

*Rear Admiral Claude C. Bloch, USN, Commandant,
Fourteenth Naval District on 7 December 1941.*

were some who deprecated the mild and patient manner of the State Department over the years, and felt that any nation which violated our legitimate pursuits or hazarded our nationals abroad should be sternly dealt with. Such persons criticized the State Department for writing notes rather than acting forthrightly and forcibly.

The unprovoked bombing of *USS Panay* and three merchant ships in 1937 by the Japanese hardened the American viewpoint, as did the brutal attacks on missionary hospitals in China, and the terror-bombing of the Chinese people.

There was strong opposition to the exportation of scrap metal and oil to Japan before these items were embargoed in 1940 and 1941 especially when these commodities were in short supply in the United States. Yet Ambassador Grew stated that economic sanctions were more likely to cause war than to avoid it. This was one of the dilemmas which the Administration had to face. The Japanese, he explained, could not be bluffed or forced into submission. They would not "back down" as the Oriental psychology would consider this a "loss of face."

By 1941 the great majority of our people were quite aware of Japan's unprincipled behavior, but still regarded the Japanese people with some sympathy and with considerable admiration for their industriousness, objectiveness, and national loyalty. But the ever-increasing tempo of Japan's depredations and the belligerent demands of their government changed attitudes of sympathy and admiration into anxiety and antipathy. When Japan took virtually full control of Indo-China in the summer of 1941 and demanded that Thailand grant special concessions, the American people approved our imposition of an oil embargo. Nevertheless public opinion tried hard to take these aggressions in stride, and it remained for the Japanese to solidify public opinion completely by the surprise attack on the American flag at Pearl Harbor.

5. ASSISTANCE TO FRIENDLY NATIONS

The American public seemed in large part to be naive regarding the full implications of the European War and the Sino-Japanese War. Our high government officials, however, were quite aware of the threats to American interests and eventual security. It soon became crystal clear that the basic contest was between the forces of predatory authoritarianism and the free

nations of the world. Therefore, regardless of personal attachment to one country or another, the effort and influence of the United States were naturally directed toward restraining the predatory powers and assisting the free nations. This diplomatic position became increasingly active and forceful each year as events became more threatening.

Our endeavors to render material support to the beleaguered free nations required some military protection. As the contest widened, the need for defense indicated the importance of greater military potency. Thus the American stance against world aggression gradually developed from the diplomatic stage to the economic, and finally to the military, culminating in the United States becoming, clearly, if not formally, allied with the free nations against the Axis Powers.

We have already mentioned some of the more significant measures of diplomacy; now we might consider a few of the more important steps taken to render assistance to the friendly nations.

a. American trade with China had been of importance to both countries for many years, and was essential to China in resisting Japan's depredations. From the start of the conflict we furnished assistance to China by shipping important materials to meet economic and military requirements. Such assistance to China was characterized by Japan as "an unfriendly act."

b. The Neutrality Acts of 1935 and 1937 placed a rigid embargo on the export of arms to all belligerents, and thus had an injurious effect on friendly nations which were comparatively deficient in military equipment with which to resist the aggressors. At various times President Roosevelt and Secretary Hull endeavored to persuade Congress to amend the Acts favorably to the victimized nations, but to no avail until November 1939 when the Acts were partially repealed. Although the Congress continued to stand firm for military neutrality, the apathy and complacency of the people were challenged and gradually broken down because of the shockingly predatory events abroad.

c. In June 1940 President Roosevelt reported that the United States would provide surplus material resources to Great Britain and France, and pointed out that this was in our self interest. In justifying this action he stated that we as a nation were concerned that "military and naval victory for the gods of force and hate would endanger the institutions of democracy in the western world," and that our sympathies were with these nations that were giving their lifeblood in combat against these forces.¹³

¹³ *Ibid.*, p. 74.

d. In September 1940 the American government agreed with Great Britain to transfer fifty old-type destroyers in exchange for long-term leases of certain bases in the Western Atlantic and Caribbean. These bases would be essential in case of war, which they eventually proved to be.

e. In December 1940 it was plain that the European aggressors intended to dominate all of Europe and ultimately the rest of the world. President Roosevelt proclaimed that the United States would act as the "Arsenal of Democracy," and stated that we must help defend the free world by furnishing needed materials. In January 1941 the President asked Congress to authorize the lending of arms and other assistance to such nations when this was vital to the interests of the United States.

f. Despite the bitter protests of isolationists Congress passed the Lend Lease Act in March 1941 and appropriated seven billion dollars to put it into effect. This Act permitted all direct military aid to Great Britain.

g. By 1941 the loss of British ships to German submarines exceeded the rate of production in the shipyards of both Great Britain and the United States. In order to deliver to Great Britain the material aid required, the United States instituted a naval patrol force to protect British ships in the Western Atlantic.

h. On 30 October 1941 Roosevelt informed Stalin of his decision to grant the Soviet Union up to one billion dollars of Lend Lease Aid to counter Hitler's invasion of Russia.

i. By November 1941 it was clear that the survival of Great Britain was essential to the whole free world, and therefore the United States removed virtually all restrictions on arms shipments to that nation.

j. In spite of continued protests of Japan we had for several years assisted China by furnishing military equipment for shipment over the Burma Road, which by 1941 was the only open route to China as all others had been blockaded by Japan.

6. MILITARY PREPAREDNESS MEASURES

The military capabilities of the United States in the early 1930's were small compared to what might be required to match the powerful forces of the Axis. This fact was fully realized by responsible government officials, but public sentiment was quite fixed in opposition to any warlike gestures, including the buildup of armament. Furthermore, the economic depression

affected expenditures for military preparedness. Yet, paradoxically, it was the depression which permitted significant improvement in preparedness. This was because the National Industrial Recovery Act provided funds for industrial activity which would give jobs to the unemployed. President Roosevelt knew that the building of armaments, particularly ships, made jobs in nearly every phase of industry, and therefore in 1934 he exercised the authority granted by Congress and ordered the construction of thirty-two naval vessels. This was the first significant step in preparing for the needs of World War II, and hindsight proves that it was a fortunate and indispensable step.

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Other steps were taken as the grim events abroad pressed on the national consciousness and brought a change in the public attitude toward military preparedness. Some of the more important were the following:

a. In 1934 the Vinson-Trammell Naval Bill authorized the navy to build up to treaty limitations. This did not provide funds for construction but indicated Congressional opinion as to the need for correcting our naval deficiencies.

b. In 1937 President Roosevelt announced that the Navy was proceeding with the construction of two new battleships, the first since the 1922 treaty. These were *Washington* and *North Carolina* which rendered valiant service in World War II. The Army also received new equipment, and an increase in officers and men from 118,000 to a new limit of 158,000.

c. In his January 1938 message to Congress the President recommended increasing our defenses to insure reasonable security against worldwide pressures and assaults. Congress authorized a twenty percent increase in ships for the Navy and appropriated for two new battleships and two aircraft carriers. Debate in Congress showed that much doubt existed on the need for these increases, and some isolationist groups suspected that the real purpose was to aid Great Britain. Secretary Hull replied that neither extreme internationalism or extreme isolationism was desired, but that inaction meant aiding the lawless nations.¹⁴

d. Again, in his January 1939 message to Congress, the President recommended further strengthening of the national defense, especially in air power, and the mobilization of industry for quantity production.

e. When France sued for an armistice with Germany in June 1940 the United States insisted that the French fleet should not be surrendered to Germany, and received assurances accordingly.

¹⁴ *Ibid.*, pp. 53-55.

f. Just before the surrender of France in June 1940 President Roosevelt asked Congress for authority to build 50,000 military airplanes, and stated to Congress that nations unable to defend themselves were easily subjugated. Old defense systems, he pointed out, were inadequate if American liberties and principles were to be maintained.¹⁵

g. Following the fall of France the President requested Congress to appropriate five billion dollars for further increases in defense. This was granted on 27 August 1940. At the same time Congress authorized calling up the Reserves and National Guard for active duty. In July 1940, forty-five additional warships were ordered for the Navy Department.

h. In the summer of 1940 the President recommended to Congress the authorization for a "Two Ocean Navy," which was approved.

i. The first peacetime Selective Service and Training Act in United States history was passed in September 1940, and in August 1941, when the international situation was very foreboding, Congress extended the period of service to one and one-half years. But this was done by only a one vote margin in the House of Representatives.

In keeping with Congressional authorizations and appropriations for the building up of national defense, many important steps were taken in 1940 and 1941 to improve American power on land, sea, and air. For instance, there were ordered or authorized for the Navy in 1940:

- 6 *Iowa* class battleships of 45,000 tons
- 5 *Montana* class battleships of 56,000 tons (None of the ships were ever finished.)
- 6 battle cruisers of about 27,000 tons (None were completed.)
- 11 aircraft carriers of 27,000 tons
- 40 cruisers
- 115 destroyers
- 67 submarines
- Many auxiliaries and small craft

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With the exception of the larger battleships and the battle cruisers most of these vessels were expedited following the Pearl Harbor attack, and together with other ships which were ordered later, formed the irresistible force which vanquished the Japanese Navy.

¹⁵ *Ibid.*, p. 79.

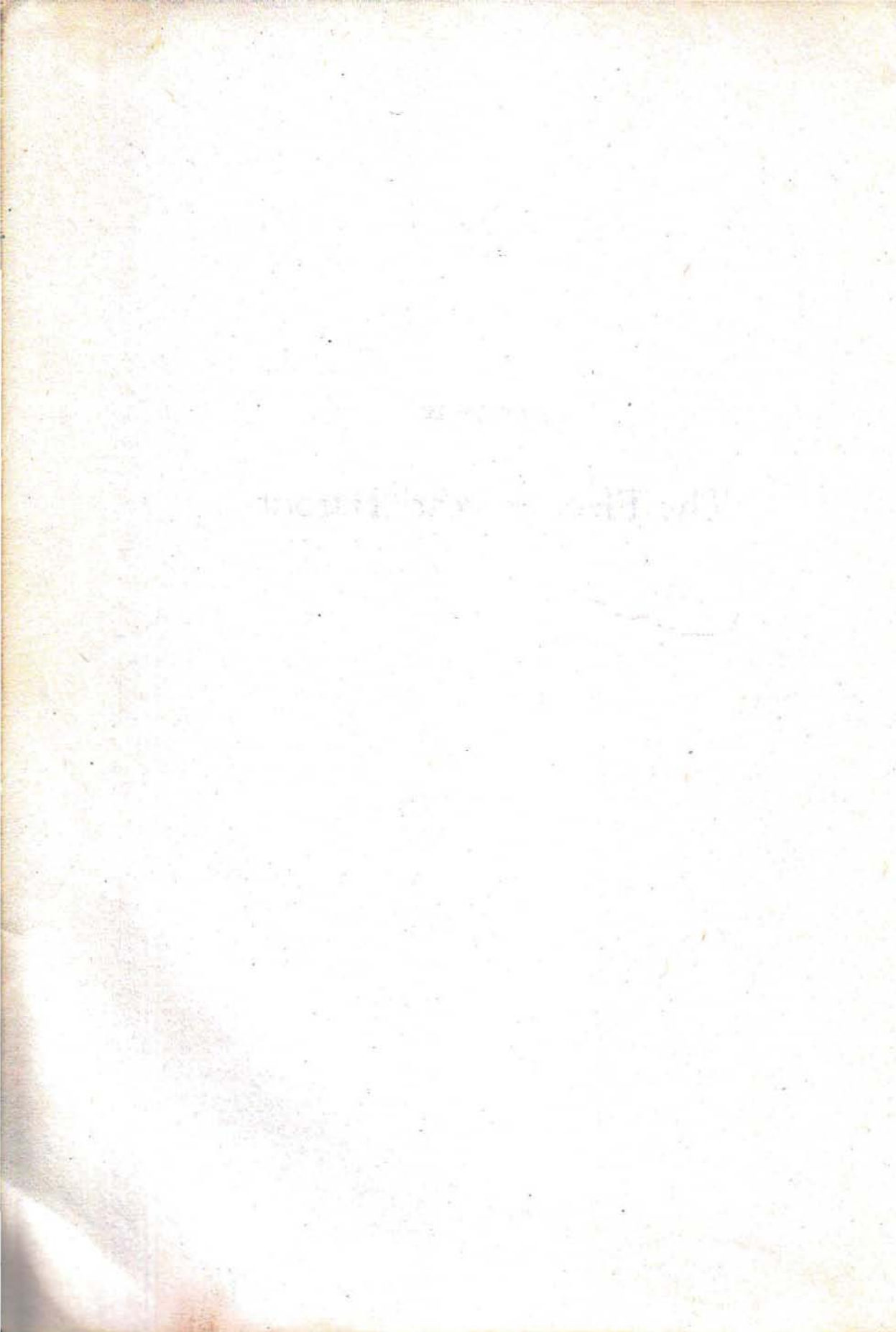
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CHAPTER IV

The Fleet at Pearl Harbor



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The Fleet at Pearl Harbor

1. WHY WAS THE FLEET THERE?

Pearl Harbor had been a relatively minor naval base for many years, and did not become a major base until the early summer of 1940. The decision to base the fleet at Pearl Harbor was a diplomatic decision, and was taken in the hope that it would accentuate our concern over the situation in the Western Pacific, and serve as a restraining influence on Japan's aggression.

From a military viewpoint Pearl Harbor was not a satisfactory fleet base for many reasons, such as:

a. It was restricted in area and had only one access to the open sea. Due to limited area it was necessary for ships to be clustered rather than dispersed.

b. It was far removed from the source of essential supplies, such as oil, food, mechanical materials, technical installations, and industrial capacity.

c. Transportation from the West Coast was slow and inadequate.

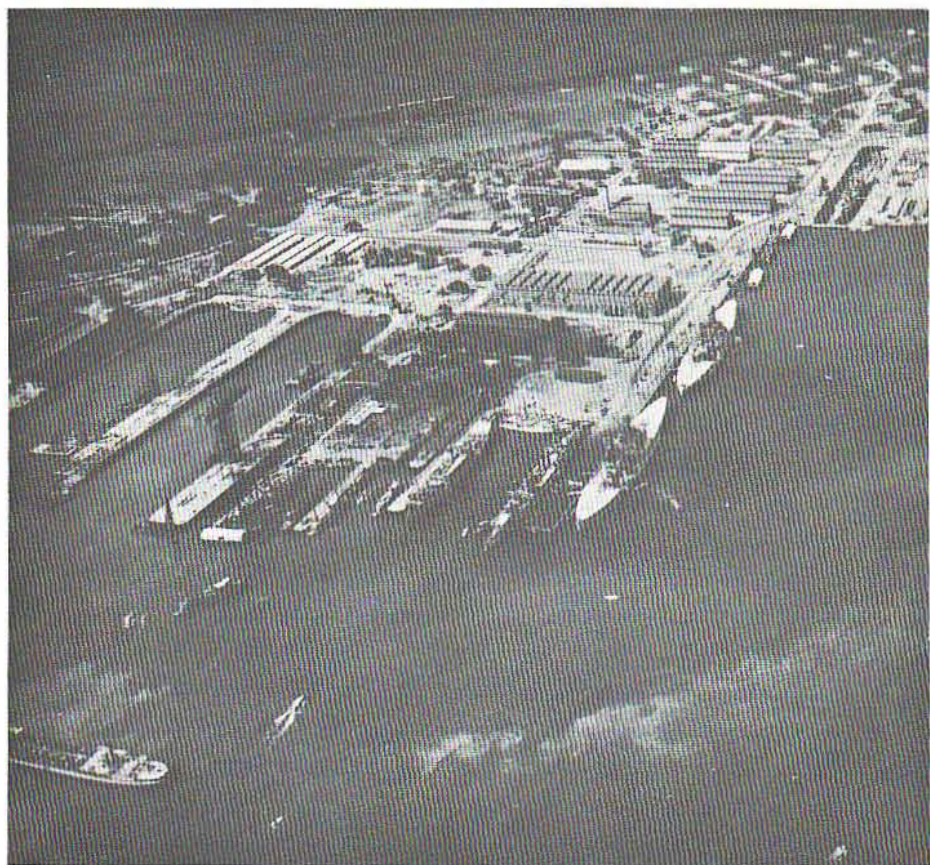
d. Essential services for regular fleet activities and exercises were in short supply. These included tugs, target practice facilities, and a host of other things required by ships of the fleet.

e. Hawaii lacked adequate housing and recreational facilities for military personnel.

f. The great majority of fleet personnel were separated from their families and friends over long periods of time. This was an unsuitable morale situation in peacetime.

g. The defenses of Pearl Harbor were almost non-existent. This was an Army responsibility, but the Army lacked the wherewithal to provide much defense, especially in anti-aircraft batteries and pursuit aircraft.

For these reasons, and others, the Commander-in-Chief of the U.S. Fleet protested strenuously and repeatedly the decision to base the fleet at Pearl Harbor instead of Southern California. He doubted that the presence of the fleet at Pearl Harbor was a deterrent to the Japanese, and pointed out



USN NR&L (MOD) 30731

Ships docked at Ten-Ten Dock.

that it might have the opposite effect. The final result was that he, Admiral Joseph O. Richardson, was relieved of command on 1 February 1941 and was succeeded by Admiral Husband E. Kimmel. At that time the fleet became the U.S. Pacific Fleet, and the separate Atlantic Fleet was established. It might be well to mention here that Admiral Richardson felt that the fleet was not prepared for war and was seriously lacking in logistic support, especially oil tankers.

Despite the inadequacies at Pearl Harbor it is correct to say that during the year or so before the Japanese attack many of the handicaps were partially overcome through persistent and hard work. In retrospect, it appears that even though Pearl Harbor was in many ways an unsatisfactory fleet base, the fact that the Fleet was there prevented the Japanese from initially occupying Hawaii and Midway, thereby using them later as bases to intercept our naval forces. Our Fleet in that case would have had to operate from the West Coast during at least the early part of World War II. Most importantly, after the war started Pearl Harbor became the largest and most efficient naval base in world history. Its value as a springboard for mounting our unparalleled offensive actions against the Japanese was incalculable.

2. ARMY-NAVY DEFENSE OF PEARL HARBOR

As has been indicated, the military defenses of Pearl Harbor were quite meager. The development of a great military base takes years of planning, coordination, copious funds, and continual construction, installation, and support. Such development required close coordination of the various military services. This, of course, can be quite difficult in the face of separate evaluations both in Washington and on the scene. However, it is noteworthy that, contrary to views expressed by much of the news media after the Japanese attack, there was a high degree of cooperation and coordination between the Army and the Navy in the years prior to the Pearl Harbor episode. This was a friendly and hard working joint effort. Here are some of the results of that effort:

a. Hawaii was defended by Army forces including heavy and light artillery, infantry, and air force. The Air Corps was part of the Army at that time.

b. The Army Air Corps operated largely from the three fields at Hickam, Bellows, and Wheeler. The first two were principally bomber fields, while Wheeler operated pursuit planes. All fields were in process of development and were training personnel to operate planes on a combat basis. Hickam Field was busy receiving new B-17's from the West Coast, outfitting and commissioning them, and flying them to bolster the defenses of Wake Island and the Philippines. It is estimated that only about ninety-four Army Air Force planes were ready for combat by 7 December. Many of the planes were under overhaul or having new equipment installed.

c. The Army had 26 fixed three-inch anti-aircraft guns and 60 mobile three-inch guns. None of the latter were emplaced as the assigned locations for wartime emplacements were on private property. Also 140 thirty-seven millimeter guns were assigned, but only 20 were delivered, and these were without ammunition. A large number of 50 caliber machine guns were on order but only 40 percent had been delivered.

d. The Navy and Marine Corps had three airfields: Ford Island in the center of Pearl Harbor, the Marine Corps fighter field at nearby Ewa, and the seaplane field at Kaneohe. The Ford Island field served primarily to receive aircraft carrier planes and to operate them while the carriers were in port. Like the Army airfields, the Navy was busy training men, installing improvements and new equipment, and overhauling wornout parts. The total number of Navy and Marine Corps planes ready for combat was approximately fifty-two.

e. All of these forces were busy every weekday in flight operations, target practice, and training. Citizens of Hawaii were accustomed to hearing planes overhead continuously every day except Sunday. Gunfire incidental to target practice was commonplace.

f. Ships of the active Fleet when in Pearl Harbor were assigned certain sections of arc to defend against possible air attacks. Standing orders of the Commander-in-Chief of the Pacific Fleet required that one-quarter of the anti-aircraft batteries be in a ready state at all times, that gun crews be near at hand, and a supply of ammunition be in ready service boxes near the guns.

g. To defend against prowling submarines the channel entrance to Pearl Harbor was guarded by a double submarine net or gate. It was kept closed at night; it was opened and closed as required by traffic of ships entering or leaving. Patrol vessels were always on duty in the approaches to Pearl Harbor to detect any submarines which might be attempting to enter.

3. RECONNAISSANCE

The need for air reconnaissance was clearly understood by the high command at Pearl Harbor, and strenuous steps were taken to make it effective. As early as January 1941 Rear Admiral P. N. L. Bellinger, Commander of Patrol Wing TWO of the Fleet, and also in command of the Ford Island facilities, reported to the Navy Department that because of deficiencies in

planes, equipment, material, personnel, and facilities "we are operating on a shoestring," and that all efforts to improve the situation had not been effective.¹ Similar correspondence ensued later with but little results. The usual answer from Washington was that "we are doing the best we can."

The Army Air Corps and the Navy Patrol Force cooperated closely in developing a joint operation to insure the best possible reconnaissance with the means then available. Admiral Bellinger, together with Major General F. L. Martin of the Army Air Corps, got out a joint estimate of the situation under date of 31 March 1941 which set up a search and attack group to be used in case of hostilities or in time of emergency. In this document the following statement was made: "The aircraft at present available in Hawaii are inadequate to maintain, for an extended period, from bases on OAHU, a patrol extensive enough to insure that an air attack from an Orange [enemy] carrier cannot arrive over OAHU as a complete surprise." Thus the possibility of surprise air attack was envisioned long before the attack, and plans were developed to detect and defeat such an attack. A surprise attack without a declaration of war or of hostilities was envisioned at an early date, but the words "surprise attack" usually referred to a carrier raid after a proper declaration. Such a raid was in the minds of fleet officers, but as in Washington eyes were turned to Southeast Asia.

The shortage of planes and personnel to carry out a continuous daylight patrol was startling, especially when the need to modify and overhaul these planes is considered. It was estimated that one effective patrol through 360 degrees at a distance of 800 miles required not less than 84 planes on a 16 hour flight. To do this continually with necessary reliefs in planes and personnel would require at least 180 reconnaissance planes. Of course no such number of planes was available, nor was the manpower required to operate them.

With the air forces available, however, a considerable amount of air reconnaissance was conducted by both the Army and the Navy, at times as a joint operation. When aircraft carrier task forces of the Fleet were at sea there were simulated air strikes on Pearl Harbor to improve air reconnaissance and air raid defense. The last such drill was held on 12 November 1941; the next was scheduled for 29 November 1941 but had to be postponed until 13 December because of a task force sortie. As early as the spring of 1941 joint air raid drills were held weekly for a time to familiarize

¹ Commander Patrol Wing TWO letter of 16 January 1941 to the Chief of Naval Operations.

personnel with requirements, but the frequency was gradually reduced because of interference with training as well as wear and tear on equipment. Communications of that time were not equal to the tasks put upon them. This was especially true of the communications with the Army and with outlying stations. Anti-submarine search by both aircraft and destroyers was a regular part of fleet movements. Carrier reconnaissance planes ranged out over wide areas of ocean whenever task forces were leaving or entering Pearl Harbor.

On the morning of 7 December there were a number of reconnaissance planes aloft, and others were in a standby ready status.

a. Three patrol planes were searching the fleet operating areas, and three others standing by on a thirty minute notice.

b. Four other planes from Ford Island were in the air operating with submarines in joint exercises.

c. At Midway five planes were on reconnaissance to a distance of 450 miles, two others were enroute to rendezvous with the *USS Lexington* task force 400 miles to the southeast. Four additional planes were on ready alert.

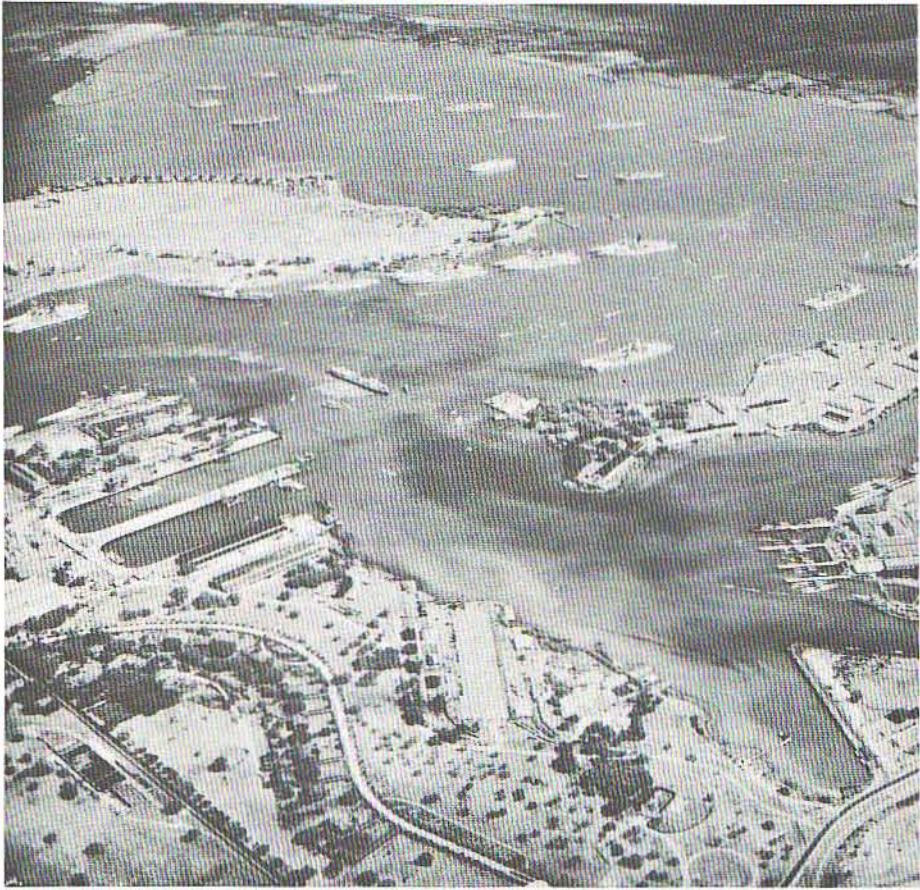
d. Three Marine Scout bombers at Ewa Field were on two hours notice, and fifteen bombers and fifteen utility planes on four hours notice.

e. Some forty Army planes could be called upon for reconnaissance duty by Patrol Wing TWO in emergency but were never called except in connection with air raid drills.

f. In addition, the three task forces at sea were conducting a regular wartime search by aircraft and destroyers, as required by fleet orders.

The advisability of continuous and complete air reconnaissance was always in mind, but this presented a dilemma of the utmost difficulty. First there were insufficient planes and personnel; next was the intensive schedules for training, instruction, maintenance, and improvement. The same principle applied to other elements of our military forces. In the fleet the workday was long and intensive, and reasonable consideration had to be given toward preventing staleness and poor morale among the limited manpower available.

In the days just prior to 7 December we were at peace, although peace was overhung by ominous clouds. The various military forces were preparing for probable hostilities, and it was imprudent to divert our efforts unduly in directions which would wear out planes and pilots in advance of actual needs. When Admiral Richardson was still the Fleet Commander, he took up the question of justification for continuous long range reconnaissance.



USN NRL (MOD) 29782

Ships moored in East Loch, looking northwest.

He addressed the Navy Department as follows under date of 28 November 1940: "I feel that the Fleet must operate on either of two assumptions, that is that we are at peace and no security measures are required; or, that wartime measures of security must be carried out. Heretofore, we have carried out limited security measures largely as a basis for training and on

the assumption that no foreign power would choose to bring on a war by an attack on the Fleet, but that some misdirected or fanatical nationals might undertake individual and irresponsible attack on Fleet units."²

This was answered by the Navy Department under the date of 23 December 1940 as follows: "There will be an advantage in making occasional sweeps by aircraft and surface craft but it is not yet necessary to make these continuous. I agree with you that the wear and tear on equipment, and the detrimental effects on training, of full security measures should be given due weight."³

With these points in mind, and others too, it was a command decision based on calculated risks that reconnaissance as well as other defense matters should be on a moderate scale in peacetime. Thus there was a minimum of air reconnaissance on Sunday, 7 December. Of course the Japanese were fully aware that Sunday was a day of rest and relaxation among the defense forces at Hawaii, and they also knew no doubt that Americans accepted in good faith the Japanese legal commitment not to attack without an ultimatum or declaration of war. On top of this was the general feeling that the Japanese would not be so irrational as to make their initial attack on the stronghold of the Pacific.

4. RADAR

The importance of radar for distant reconnaissance was recognized by the late 1930's. Scientists, engineers, and manufacturers were engaged in important programs of development. Military officials were expediting the purchase and installation of radar equipment to the extent that funds and qualified personnel would permit. The installations in Hawaii at the time of the Pearl Harbor attack were new and quite experimental. There were few military personnel who were trained to operate a radar installation in a reliable manner.

The Navy was installing production sets as fast as they could be obtained and made reliable; but in December 1941, only about a half-dozen ships of the Pacific Fleet had radar installed. The Army was then in the process of installing three large fixed radars on high ground in Hawaii,

² *Hearings before the Joint Committee on the Investigation of the Pearl Harbor Attack*, Part 14, p. 975. Hereafter cited as *Hearings*.

³ *Ibid.*, p. 980.

and six mobile radars on trucks. The effective distance for detection would depend of course upon the height of the installation and the height or elevation of the target. Thus a large ship could be detected by another ship with the radar at a distance of about twenty miles, while an airplane at 10,000 feet could be detected by a fixed land radar at a distance up to 200 miles.

Arrangements had been made between the Army and Navy for joint utilization of radar installations. Since the Navy had more experience in the use of radar, it was agreed that Army personnel would go to sea on four or more of the Navy ships for training and practice in radar operation. This was done in June 1941.

The Army radars were installed by the Corps of Engineers and operated by the Signal Corps. A system was worked out whereby radar information could be forwarded to an "Aircraft Warning Service" for evaluation and action. This came under the Army Air Corps which passed the information to the "Interceptor Command" when defense action was indicated. This system of air raid defense was not fully operative by 7 December although some drills had been held. As will be observed, this was an all-Army set-up since Navy radars were secured in port because of their low elevation on the ships and the interference from the high surrounding land masses and buildings. However, some from the Navy were assigned on an unofficial basis to assist the Army's evaluation system.

The Army radar service was operative every day except Sunday from 0400 to 1600 hours, but on Sunday it was manned from 0400 to 0700 hours. General Short considered these hours the most dangerous time for an air attack. Except for the large installation where one enlisted man had volunteered to continue because of his interest and desire for experience, no radar was operating on the morning of 7 December. This turned out to be a well publicized circumstance, because this man detected on the radar screen a large flight of aircraft bearing north at a distance of about 130 miles. He was perplexed by what he detected, but reported it by telephone to a Lieutenant on duty at the "Aircraft Warning Service." The Lieutenant discounted the information as not being of much moment for several reasons:

- a. They could be planes from our two U.S. aircraft carriers which he knew were at sea.
- b. They could be planes out of Hickam Field.
- c. They could be the twelve B-17's arriving from the West Coast for

transfer to the Philippine Islands. Actually these planes did arrive shortly thereafter and were badly shot up by the Japanese.

d. At that time there was no proper identification system to determine whether planes on the screen were friend or foe, so there was no sure method by which the planes could be identified as other than American.

The important fact of course was that the planes were the Japanese raiding force which arrived an hour later. If the radar information had been fully utilized it is likely that Pearl Harbor and all airfields would have been fully alerted. If our forces had been ready, what would the results have been? No doubt a much greater number of Japanese planes would have been destroyed, and possibly some of their ships damaged or sunk. But our own losses would not have been materially lessened, and the general outcome might well have been about the same. This interesting viewpoint will be covered in later pages.

5. OPERATION OF THE FLEET

During the eighteen months following the basing of the Pacific Fleet at Pearl Harbor great progress was made in training the sea forces for possible hostilities and in improving the facilities of the new base of operations. There were generous appropriations for new ships, equipment, manpower, and for shore installations. The results were beginning to show, but there is always a great time lag between authorizing such things and their integration into the operating forces.

New ships and planes were being delivered but the bulk of these were assigned to the Atlantic where actual war conditions existed and prospects were extremely grave. The new units required trained men, and therefore training had topmost priority. It became the duty of the Pacific Fleet to do a vast amount of on-the-job training of men to be transferred back to the mainland for later assignment by the Navy Department. Many of these, especially officers, were reserves called to active duty. It is worthy to note here that these reserves became a major part of the fleet and fought with great distinction in World War II.

A large proportion of the new air strength was diverted to the Philippines, Midway, and Wake. It was the policy to strengthen these islands. Such a policy originated in Washington, and was part of the war plan which would be followed in case of hostilities with Japan.

In shoreside activities great improvements were made to the shop facilities at the Pearl Harbor Navy Yard. A large new drydock, additional oil stowages, and general expansion of repair capacity were also included. Without these, the wartime performance of the Navy Yard in supporting a greatly enlarged fleet would have been impossible.

In the summer of 1941 the Pearl Harbor Navy Yard was entirely competent to handle a limited number of overhauls of all but the largest ships. The Yard was gradually built up in officers and civilian manpower so that it could do a very creditable job within the limits of its capacity. Although major overhauls of ships such as battleships and aircraft carriers were performed at the West Coast Navy Yards, the Pearl Harbor Navy Yard was able to handle many important items of work on all ships including the installation and testing out of new improvements such as radar, anti-aircraft guns, fire control gear, radios, and so forth. The regular overhauls about once every eighteen months for battleships, aircraft carriers, and most cruisers and submarines were handled at the West Coast Navy Yards. The ships were rotated in the fleet schedules so that a minimum was absent at any one time. The arrangement insured a program of maintenance and improvement, and at the same time gave the ship crews an opportunity to visit the mainland for several months and to be with their families and friends.

The active units of the fleet operated on a strenuous schedule of training. They were engaged in sea maneuvers about 60 percent of the time and were in port at Pearl Harbor the other 40 percent. The submarines based at Pearl Harbor operated on a special schedule, while all other ships were divided into three separate task forces which overlapped each other in their scheduled time at sea and in port. While at sea, major units of the fleet were screened by aircraft and destroyers to be sure that enemy submarines were not in the operating areas. It was assumed that the operating areas were infested with Japanese submarines, and that a surprise attack would be by submarines against major units of the fleet.

6. HOW POWERFUL WAS THE FLEET?

Among most Americans, and even most military personnel, Pearl Harbor was believed to be a mighty bastion of defense. Together with the power of the Pacific Fleet, Hawaii was considered by the public to be impregnable.

The fleet itself was assumed to be invincible as compared to that of any prospective enemy. Even some of the high ranking personnel of the State Department had faith in the supposition that if hostilities occurred, the sea forces of Japan could be vanquished in a few weeks. But as we well know that viewpoint was quite mythical.

Just prior to the Japanese attack the Pacific Fleet had a total of 159 vessels assigned, including some smaller craft such as mine layers, mine sweepers, and patrol vessels. This compared to 224 such vessels assigned to the Atlantic Fleet. If we exclude the smaller vessels, the Pacific Fleet had 111 ships and the Atlantic Fleet 188. The Pacific Fleet had nine of the fifteen battleships and most of the modern submarines, but the Atlantic Fleet excelled in other types. At the time of sending the United States Fleet to base in Hawaii, that fleet was relatively stronger than the fleet based in the Atlantic, but events in Europe and the Atlantic forced Washington to transfer some of the ships from the Pacific where peace still prevailed. In May 1941 the following were detached from the Pacific and sent to the Atlantic for duty: ⁴

- 3 battleships
- 1 aircraft carrier
- 4 cruisers
- 9 destroyers

To show Washington's concern over the Atlantic and the Mediterranean, it was proposed in the summer of 1941 that a like force from the Pacific be transferred to the Atlantic, but this proposal was dropped. These transfers indicate that the Atlantic was deemed to be the scene of needed strength.

The three major task forces comprising the Fleet were organized as follows: ⁵

Task Force I, Vice Admiral W. S. Pye, Commander Battle Force, in *USS California*

- 6 battleships
- 1 aircraft carrier

⁴ *Report of the Joint Committee on the Investigation of the Pearl Harbor Attack, and Additional Views of Mr. Keeffe Together with Minority Views of Mr. Ferguson and Mr. Brewster*, United States Government Printing Office, Washington, D.C., 1946, p. 167. Hereafter cited as *Report of the Joint Committee*.

⁵ *Hearings*, Part 17, p. 2535.

- 5 light cruisers
- 18 destroyers
- 5 mine vessels

Task Force II, Vice Admiral William F. Halsey, Commander Aircraft Battle Force, in *USS Enterprise*

- 3 battleships
- 1 aircraft carrier
- 4 heavy cruisers
- 18 destroyers
- 4 mine vessels

Task Force III, Vice Admiral Wilson Brown, Commander Scouting Force, in *USS Indianapolis*

- 1 aircraft carrier
- 8 heavy cruisers
- 9 destroyers
- 13 mine vessels
- 6 attack transports

At least one of these three task forces was always at sea. Usually two of them were at sea for overlapping periods during tactical operations.

In addition the submarines were organized as a task force for independent operations to provide an efficient Submarine Observation and Attack Force and to conduct patrols as ordered by the Fleet Commander. The operating schedule called for about thirty submarines and their supporting vessels.

The above gives a good approximation of the strength of the Pacific Fleet. However, all the ships were not in Pearl Harbor or not in full operating status. Some were at West Coast Navy Yards for regular overhaul, some at the Pearl Harbor Navy Yard for required material improvement work, and many were operating at sea.

While the strength of the fleet seemed quite formidable, it was realized by "those in the know" that the Japanese fleet was considerably stronger. Definite information, of course, was unavailable, but it was known that Japan had been busy building and training for at least a half-dozen years. The extent of their superiority was demonstrated in the early days of the war, especially in the category of aircraft carriers and aircraft carrier planes.

7. WHERE WERE THE FLEET SHIPS ON 7 DECEMBER?

Contrary to popular belief, many ships of the fleet were not present at Pearl Harbor on 7 December. A rough estimate would show that about one-half of the total force was absent. Fortunately all three of the aircraft carriers assigned to the fleet were elsewhere, but eight of the nine battleships assigned were present and took the brunt of the attack.

Several of the ships were absent in connection with Navy Yard overhauls on the West Coast. But others were on special missions, such as:

a. A special task force under Vice Admiral Halsey in *Enterprise* was about 200 miles west of Hawaii enroute to Pearl Harbor after having delivered Marine Corps fighter planes to beef up the defense of Wake Island. This task force consisted of 1 aircraft carrier, 3 heavy cruisers, and 9 destroyers.

b. Another special task force under Rear Admiral J. H. Newton with *Lexington* was about 400 miles southeast of Midway enroute to that island to deliver Marine Corps scout bombers. This force consisted of 1 aircraft carrier, 3 heavier cruisers, and 5 destroyers.

c. A special task force under Vice Admiral Wilson Brown consisting of 1 heavy cruiser and 5 destroyers together with minesweepers was off Johnston Island to test a new type of landing craft.

d. Two heavy cruisers were on convoy duty in the Samoa and Solomons areas in connection with protection of shipping to Australia.

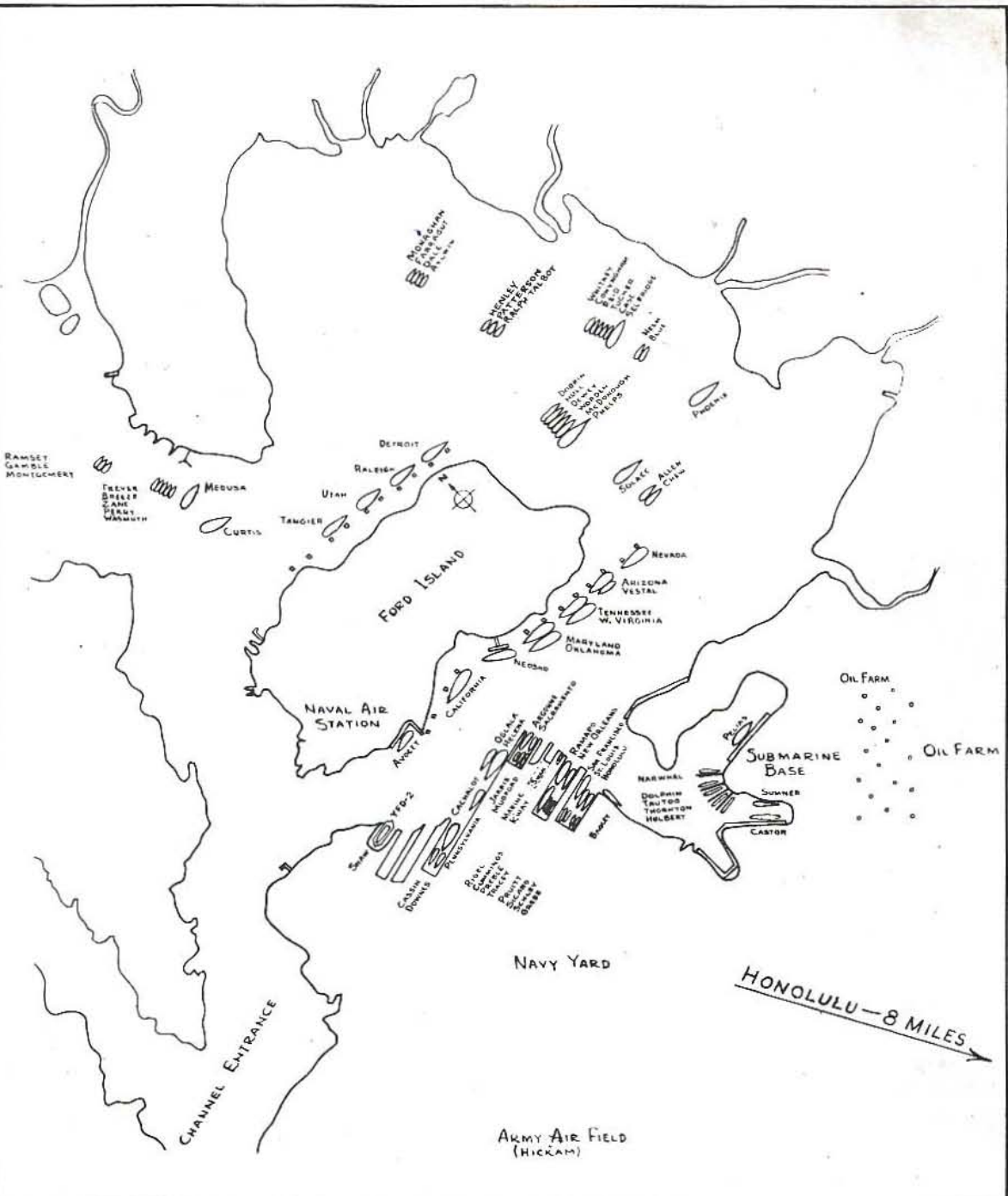
e. One heavy cruiser and four destroyer minesweepers were about twenty-five miles south of Oahu conducting special exercises.

f. Two submarines were in the Midway area, and two others in the Wake Island area.

g. Other ships, such as oil tankers were enroute to Hawaii from the West Coast.

All of these ships at sea were in a status of wartime alert, fully armed, and ready for any emergency. Their absence from Pearl Harbor left the following ships present:

- 8 battleships
- 2 heavy cruisers
- 4-10,000 ton cruisers
- 2-7,000 ton cruisers
- 30 destroyers
- 4 submarines



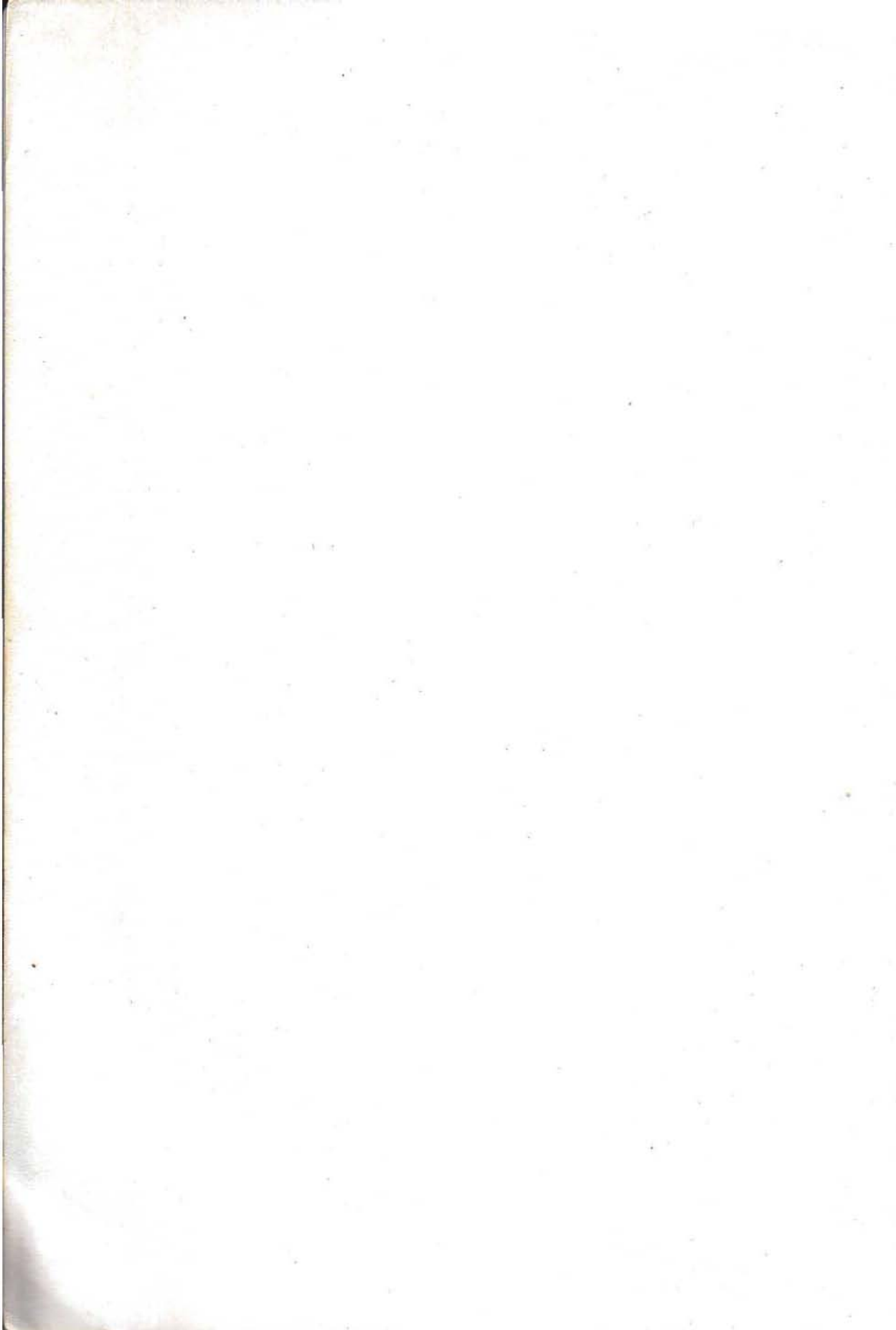
Ships location, 7 December 1941.

- 1 gunboat
- 9 minelayers
- 14 minesweepers
- 27 auxiliaries such as repair ships, tenders, store ships, and tugs.

All of the vessels at Pearl Harbor, except those undergoing overhaul at the Navy Yard, were, in accordance with fleet orders, in readiness condition three, which required about one-quarter of the anti-aircraft batteries and their control stations to be in a ready status with gun crews and ammunition at hand. All fleet vessels had ready for use their full supply of ammunition plus a reserve supply. Also, these vessels were required to be on twelve hours notice for getting underway. Actually, however, none of the ships required twelve hours steaming notice to get underway, as will shortly be seen; the requirement for twelve hours was for a fleet sortie.

CHAPTER V

Imminence of War



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Imminence of War

1. BREAKDOWN OF DIPLOMACY

The numerous diplomatic discussions in Washington, and the many exchanges of diplomatic notes and proposals were not fruitful in lessening the gap between Japan's adamant demands and America's vigorous opposition. Analysts of the facts could readily see that the two countries were on a collision course which could only result in hostilities. However, the American public was far from convinced that the actual situation could be so extreme, and continued to put great faith in the negotiations which had been going on in Washington for eight or nine months. Whether or not these diplomatic efforts were bona fide on the part of Japan might now be doubted. Unquestionably the United States could have delayed the conflict for a time by agreeing to the various demands of the Japanese. These demands were so extreme that Japan did not expect full agreement, but nevertheless pursued the policy of diplomatic exchanges until the last. Even the attacking force had instructions to withhold the attack in case the diplomats came to an agreement.

It is fair to say that the great majority of the people, even in the military services, did not visualize a direct attack by Japan. Rather it was taken for granted that Japan would move toward the south which was rich in oil and other resources. There were some who felt that Japan would take the Russian maritime provinces to the northward. This was especially so since this region was greatly desired by the Japanese Army, but Russia was still unconquered by Germany and Japan did not want that nation to be counted as an enemy at that time.

However, the policies and actions of Japan were dominated by the extreme militarists headed by Premier General Tojo. Their estimate of the situation was so favorable that they were determined that now there had been presented to them a "golden opportunity" to strike and accomplish their purposes. Their treaty of alliance with Germany and Italy gave them full confidence because at that time the Axis Powers were eminently success-

ful. France had fallen, Great Britain was wobbling, Hitler's army was near the gates of Moscow, Rommel's German army was overrunning Egypt, the Near East was threatened, and the United States stood alone in remonstrance without any formal allies.

2. JAPAN'S KNOWLEDGE OF PEARL HARBOR

The information received from the Japanese after the war shows that their methodical observations and espionage kept them well informed of everything concerning the defenses of Hawaii and the activities of the Pacific Fleet. In our open democratic society Japanese agents were free to observe fleet practices, take photographs with their high-powered equipment, and to solicit almost any information desired. Any person could roam the hills around Pearl Harbor or other areas of Hawaii and witness the comings and goings of each and every ship, exactly where they were moored while in port, and what their schedules seemed to be. Also, such persons could readily obtain specific information on the air fields and various defense measures such as anti-aircraft guns, torpedo nets around ships, and barrage balloons. High-powered binoculars were hardly necessary, but they showed particular details which in large measure were unknown even to any single officer of the fleet. In fact, one of the espionage officers in the Japanese Consulate has admitted that he rented a plane at a commercial airport of Honolulu and regularly flew over Hawaii's military air bases. He also stated that he watched fleet sorties from Mount Tantalus or from Aiea.

Testimony before the Roberts Commission and the Congressional Investigation showed that the Japanese Consulate in Honolulu was headquarters for an espionage ring. There was at least one German spy. At that time there were about 37,000 Japanese aliens in Hawaii and some 117,000 American citizens of Japanese ancestry.

The Consulate's spy ring was unbelievably effective. Tokyo asked for and received regular reports from the Consulate at Honolulu and from other Pacific ports regarding the movements of ships, their specific location in port, air reconnaissance, defense measures, troop movements, and other matters. As 7 December drew near, such reports were requested by Tokyo at shorter intervals, and they were furnished as requested. The exchanges were numerous and intensely interesting. Here are excerpts from a few

typical examples. These may be seen in their entirety in Part 12 of the Congressional Investigation of Pearl Harbor.

From Honolulu to Tokyo 16 January 1941:

* * * * *

2. The number of vessels seen in the harbor on the morning of the 16th was as follows: five battleships . . . five light cruisers . . . nineteen destroyers, two destroyer tenders . . . about six small submarines . . . and three transports.

The Yorktown is not in port.

The CinCUS shifted the flag from the New Mexico to the Pennsylvania on 15 January. [Trans. 1/31/41]

From Honolulu to Tokyo 21 February 1941:

1. The capital ships and others departed from Pearl Harbor on the 13th and returned on the 19th. (It is said that they will depart again on the coming Wednesday and return on the following Wednesday). Judging from the statements by various sailors who were on these vessels, the training was apparently held in the vicinities of Kauai, Lahaina and Hilo. [Trans. 2/28/41]

* * * * *

From Tokyo to Honolulu 21 September 1941:

Henceforth, we would like to have you make reports concerning vessels along the following lines insofar as possible: [The message divides Pearl Harbor waters into a number of areas which are delineated.]

2. With regard to war ships and aircraft carriers, we would like to have you report on those at anchor . . . tied up at wharves, buoys and in docks. (Designate types and classes briefly. If possible we would like to have you make mention of the fact when there are two or more vessels alongside the same wharf.) [Trans. 10/9/41]

From Tokyo to Honolulu 15 November 1941:

As relations between Japan and the United States are most critical, make your 'ships in harbor report' irregular, but at a rate of twice a week. Although you already are no doubt aware, please take extra care to maintain secrecy. [Trans. 12/3/41]

From Tokyo to Honolulu 29 November 1941:

We have been receiving reports from you on ship movements, but in future will you also report even when there are no movements. [Trans. 12/5/41]

From Tokyo to Honolulu 2 December 1941:

In view of the present situation, the presence in port of warships, airplane carriers, and cruisers is of utmost importance. Hereafter, to the utmost of your ability, let me know day by day. Wire me in each case whether or not there are any observation balloons above Pearl Harbor or if there are any indications that they will be sent up. Also advise me whether or not the warships are provided with anti-mine nets. [Trans. 12/30/41]

From Honolulu to Tokyo 4 December 1941:

On the afternoon of the 3rd one British gunboat entered Honolulu harbor. She left port early on the morning of the 4th. . . .

Furthermore, immediately after the vessel entered port a sailor took some mail to the British Consular Office and received some mail in return. [Trans. 12/12/41]

From Honolulu to Tokyo 5 December 1941:

1. During Friday morning, the 5th, the three battleships mentioned in my message [previously] arrived here. They had been at sea for eight days.

2. The Lexington and five heavy cruisers left port on the same day.

3. The following ships were in port on the afternoon of the 5th: 8 battleships, 3 light cruisers, 16 destroyers. [Trans. 12/10/41]

* * * * *

From Tokyo to Honolulu 6 December 1941:

Please wire immediately . . . the movements of the fleet subsequent to the fourth. [Trans. 12/12/41]

From Honolulu to Tokyo 6 December 1941:

1. On the American Continent in October the Army began training barrage balloon troops at Camp Davis, North Carolina. Not only have they ordered four or five hundred balloons, but it is understood that they are considering the use of these balloons in the defense of Hawaii and Panama. In so far as Hawaii is concerned, though investigations have been made in the neighborhood of Pearl Harbor, they have not set up mooring equipment, nor have they selected the troops to man them. Furthermore, there is no indication that any training for the maintenance of balloons is being undertaken. At the present time there are no signs of barrage balloon equipment. In addition, it is difficult to imagine that they have actually any. However, even though they have actually made preparations, because they must control the air over the water and land runways of the airports in the vicinity of Pearl Harbor, Hickham, Ford and Ewa, there are limits to the balloon defense of Pearl Harbor. I imagine that in all probability there is consider-

able opportunity left to take advantage for a surprise attack against these places.

2. In my opinion the battleships do not have torpedo nets. . . . [Trans. 12/8/41]

From Honolulu to Tokyo 6 December 1941:

. . . The following ships were observed at anchor on the 6th:

9 battleships, 3 light cruisers, 3 submarine tenders, 17 destroyers, and in addition there were 4 light cruisers, 2 destroyers lying at docks (the heavy cruisers and airplane carriers have all left).

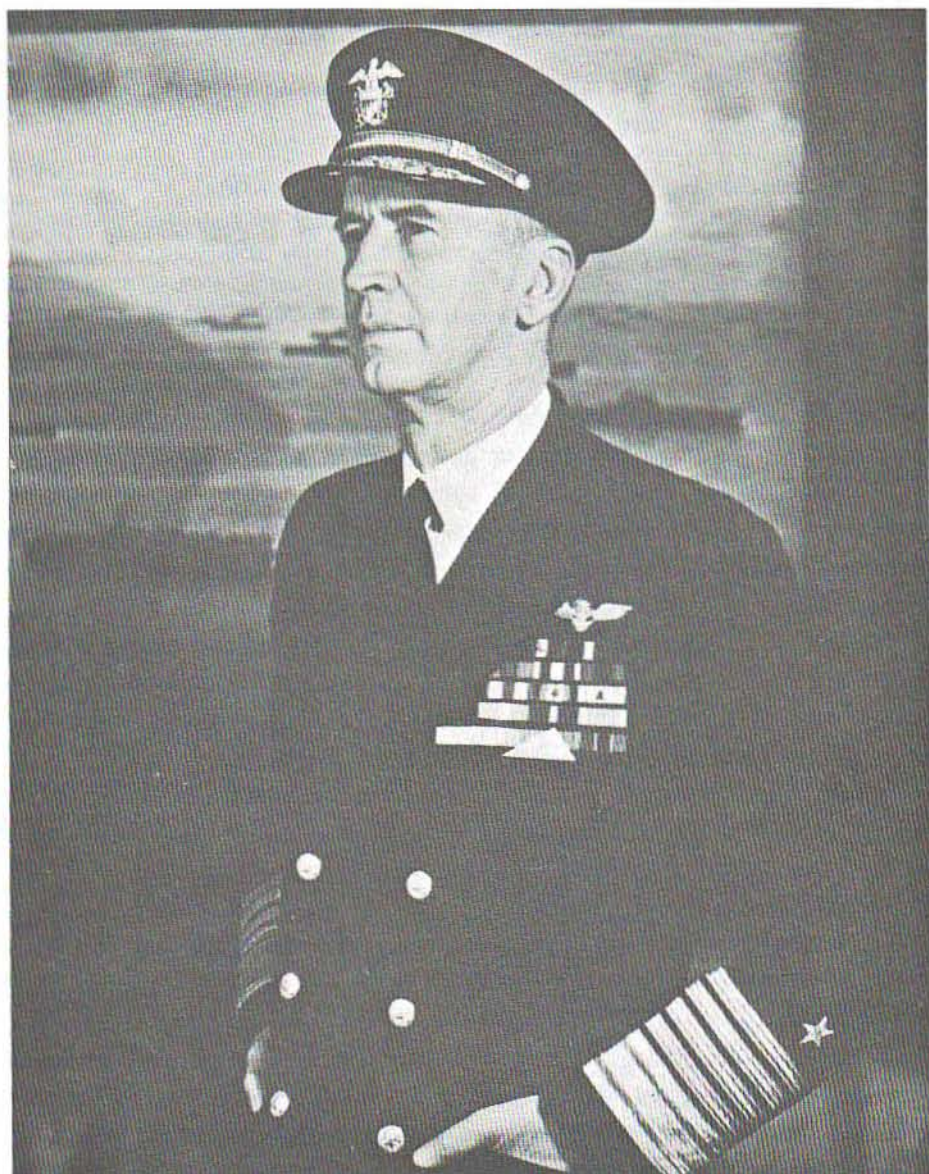
2. It appears that no air reconnaissance is being conducted by the fleet air arm. [Trans. 12/8/41]

The diplomatic codes used by the Japanese in the exchange of communications regarding Pearl Harbor and the fleet became known to us, but at the time of the attack most of their military codes were still secure. Actually they used a number of different codes and changed them occasionally. Also, they devised a system to report movements of fleet ships by the display of lights at night. The lights would be at certain land areas in Hawaii, and these could be observed by Japanese submarines on surveillance patrol off shore. The exact time of display and the number of lights shown would identify the type and number of large vessels which had departed, or were about to depart, from Pearl Harbor.

Another method was to include in regular news broadcasts certain information regarding the breaking off of diplomatic relations. This was known as the "hidden word" method. The intended message was clear when the key was understood and applied.

Tokyo sent out to their embassies throughout the world the key to a weather report message to give advance information to its agents of the impending termination of diplomatic relations with particular countries. This was done by adding a "ringer" in the weather report, and repeating it three or more times. Thus "east wind rain" referred to the United States-Japan relations; "west wind clear" to the British; and "north wind cloudy" to the Russians.

Clearly, the Japanese informational system gave specific knowledge on the American structure of defense. The Pacific Fleet situation prior to the attack was almost an open book to Japan. Their complete information permitted them to provide each attacking plane with a specified target and its exact location in the harbor. Sketches on official Navy charts were



USN 416885

Fleet Admiral Ernest J. King, USN. He was appointed Commander-in-Chief of the United States Fleet on 20 December 1941 and assumed command on 30 December 1941.

recovered from Japanese airplanes and midget submarines which were shot down or captured during the attack.

3. AMERICA'S KNOWLEDGE OF JAPAN'S INTENTIONS

Most Americans have traditionally frowned upon espionage and spying as sources of information pertinent to our security and military defense. Consequently we had but little knowledge comparable to the knowledge Japan had regarding Pearl Harbor and our defenses. The United States' representatives in Japan were greatly restricted in obtaining definite information, as indeed were all foreigners, in the totalitarian atmosphere which prevailed there. Rumors were rife and there was plenty of evidence that Japan was intent on a great program of expansion of military capabilities. Yet we lacked details on how much had been accomplished in augmenting their naval and air power, and the training of operating personnel. We were yet to learn, to our sorrow, how extensive their preparations had been and how proficiently their manpower had been developed and trained.

It was still an American tendency, and indeed a world-wide one, to underrate the Japanese. For instance, we rated them as excellent copyists, but lacking in originality; we smirked at the stories of some of their ships having capsized at launching; some accepted the myth that because of their eye structure the Japanese could never be good combat aviators. Events soon proved that such ignorance of a prospective enemy might be termed the "valor of ignorance" because our misconceptions produced a false sense of security, a feeling of over-confidence, and a presumed inherent superiority.

From many sources, however, we knew beyond question that Japan would strike when the circumstances suited her, but nobody knew when, where, or how. Her plans and the execution of them were closely guarded secrets which were known to only a few within the Japanese government or among her military strategists.

As has been seen, there had been rumors of an attack on Pearl Harbor. But there were also rumors on many other targets and it seemed far-fetched and foolhardy to attack Hawaii, especially without a suitable declaration. Why would Japan attack such a concentration of American power nearly 3,500 miles away while its real objectives in the Far East were near at hand and almost defenseless?

In addition to Southeast Asia and the Dutch East Indies, Japan coveted the maritime provinces of Russia bordering on the Pacific. This fact was widely recognized, and now with Hitler's army near to Moscow, that move seemed quite logical to military analysts, especially as it was known that the Japanese Army was particularly anxious to occupy those areas. And after all, the Army was running the government, which was headed now by General Tojo.

The imminence of hostile action pointed to attacks in the Western Pacific area. There seemed to be little probability that the initial attack could be against Pearl Harbor. This was the current estimate of the situation among American officials. There was no person "in the know" who had forecast an attack on Pearl Harbor. The secret knowledge in possession of the United States in Washington at the time supported the generally-held viewpoint that Japan's first move would be in the Western Pacific.

For over a year many of the Army and Navy radio stations had been able to intercept, and certain ones to decode, most of the Japanese secret diplomatic messages. This was indeed an accomplishment of the highest value. It gave our government the basic information concerning Japanese conversations with Germany and Italy, and even Tokyo's instruction to its diplomats in Washington. Such information was referred to as "magic," and pertained specifically to the diplomatic code which was designated as "purple." Credit for the remarkable achievement of breaking this code goes to both Navy and Army personnel, and was carried to the point of actually being able to manufacture machines for coding and decoding "purple" messages.

The diplomatic messages did not contain specific warning of the attack on Pearl Harbor. Even the Japanese diplomats in Washington were kept entirely uninformed of that military project. They were purposely kept from military secrets so that they would continue their diplomatic efforts without giving an inkling of what the military had in mind.

At that time we had not completely broken the Japanese military codes. Even if they had been in our possession at the time of Pearl Harbor it would not have been of great assistance because the attack was handled in strict secrecy with complete radio silence. Inasmuch as the objectives of Japan with reference to their program in Asia, as well as their relationships to Germany and Italy, were well documented by these many exchanges, let us set down as interesting sidelights a few excerpts from the numerous "purple" messages printed in Part 12 of the comprehensive *Hearings Before the Joint Committee on the Investigation of the Pearl Harbor Attack*.

From Tokyo to Berlin 2 July 1941:

* * * * *

The Policy.

1. Imperial Japan shall adhere to the policy of contributing to world peace by establishing the Great East Asia Sphere of Co-prosperity, regardless of how the world situation may change.

2. The Imperial Government shall continue its endeavor to dispose of the China incident, and shall take measures with a view to advancing southward in order to establish firmly a basis for her self-existence and self-protection. [Trans. 8/8/41] ¹

From Tokyo to All Diplomatic Offices 26 July 1941:

Depending upon how Japanese relations with England and the United States turn out, we may have to consider divesting England and the United States of all their interests in China. If and when things come to the worst, I want all areas concerned to cooperate in either destroying or seizing the considerable mining and other industrial equipment and ships of these countries. Be particularly sure to let nothing be taken away. I want you all to be ready at any moment to take this precautionary step of transferring the property of these two nations to our control. [Trans. 7/28/41] ²

From Nomura in Washington to Tokyo 30 July 1941:

Today I knew from the hard looks on their faces that they meant business and I could see that if we do not answer to suit them that they are going to take some drastic steps.

During my first conversation with Roosevelt after I took office the President, referring to the Panay incident, said that at the time he cooperated with the Secretary of State and succeeded in restraining popular opinion but that in case such a thing happened a second time, it would probably be quite impossible to again calm the storm. The latest incident brought all this back to me and I can see just how gravely they are regarding it. Think of it! Popular demand for the freezing of Japanese funds was subsiding and now this had to happen. I must tell you it certainly occurred at an inopportune moment. [Trans. 8/2/41] ³

From Tokyo to Embassy in Washington 31 July 1941:

We are expanding our best efforts to cooperate with Germany. She knows it and ought to understand our actions.

6. Well, the formula for cooperation between Tokyo and Berlin, in order to realize the fundamental spirit of the Tripartite Pact, should be for each

¹ *Hearings*, Part 12, p. 1.

² *Ibid.*, p. 7.

³ *Ibid.*, p. 8.

country to have a certain flexibility in its conduct. What I mean to say is that each should understand that real cooperation does not necessarily mean complete symmetry of action. In other words, we should trust each other and while striving toward one general objective, each use our own discretion within the bounds of good judgment.

Thus, all measures which our Empire shall take will be based upon a determination to bring about the success of the objectives of the Tripartite Pact. That this is a fact is proven by the promulgation of an Imperial rescript. We are ever working toward the realization of those objectives, and now during this dire emergency is certainly no time to engage in any light unpremeditated or over-speedy action. Please send to Rome. [Trans. 8/4/41] ⁴

From Tokyo to Japanese Embassy in Washington 16 October 1941:

Although I have been requested by both the German and Italian Ambassadors in Tokyo to give them confidential information on the Japanese-American negotiations, I have, in consideration of the nature of the negotiations, been declining to do so. However, early this month, following the German attacks on American merchant ships and the consequent (revival?) of the movement for revision of the Neutrality Act, the German authorities demanded that the Japanese Government submit to the American Government a message to the effect that the Japanese Government observes that if the ROOSEVELT Administration continues to attack the Axis Powers increasingly, a belligerent situation would inevitably arise between Germany and Italy on the one hand and the United States on the other, and this would provide the reasons for the convocation of the duties envisioned in the Three Power agreement and might lead Japan to join immediately the war in opposition to the United States. . . . [Trans. 10/17/41] ⁵

From Tokyo to Washington 22 November 1941:

. . . Stick to our fixed policy and do your very best. Spare no efforts and try to bring about the solution we desire. There are reasons beyond your ability to guess why we wanted to settle Japanese-American relations by the 25th, but if within the next three or four days you can finish your conversations with the Americans; if the signing can be completed by the 29th, (let me write it out for you—twenty ninth); if the pertinent notes can be exchanged; if we can get an understanding with Great Britain and the Netherlands; and in short if everything can be finished, we have decided to wait until that date. This time we mean it, that the deadline absolutely cannot be changed. After that things are automatically going to happen. Please take this into your careful consideration and work harder than you ever have before. This,

⁴ *Ibid.*, p. 10.

⁵ *Ibid.*, p. 71.

for the present, is for the information of you two Ambassadors alone. [Trans. 11/22/41] ⁶

From Washington to Tokyo 27 November 1941:

On the 27th, I, together with Ambassador Kurusu, called on the President. (Secretary Hull was also present.) The résumé of our talks follows:

The President: "In the last Great War, Japan and the United States were together on the side of the Allies. At that time, both Japan and the United States were given ample proof that Germany failed to comprehend the way the people of other countries think.

"Since these conversations were begun, I am aware of the fact that much effort has been made by the Japanese side, too, by those who cherish peace. I am highly appreciative of this fact. It is clear that the majority of the American people are anxious to maintain peaceful relations with Japan. I am one of those who still harbors much hope that Japanese-U.S. relations will be settled peacefully."

I: "Your recent proposal will no doubt be the cause of painful disappointment to the Japanese Government."

The President: "To tell you the truth, I, too, am very disappointed that the situation has developed in the manner that it has. However, during the several months that these conversations were being conducted, cold water was poured on them when Japan occupied southern French Indo-China. According to recent intelligences, there are fears that a second cold water dousing may become an actuality." (He apparently meant the increase in our troops to French Indo-China and our occupation of Thai.) (See my message #1205.) "I fully understand that the general public in Japan who has been living in war conditions for the past year, cannot see a parallel with conditions in the United States, which is living under peaceful conditions.

"During all of the time, however, that Your Excellency and Secretary Hull have been conversing, we have never heard of or seen concrete proof of any peaceful intention by the leading elements of Japan. This has made these talks an exceedingly difficult undertaking." [Trans. 11/29/41] ⁷

* * * * *

From Tokyo to Japanese Ambassador in Berlin 30 November 1941:

4. If when you tell them this, the Germans and Italians question you about our attitude toward the Soviet, say that we have already clarified our attitude toward the Russians in our statement of last July. Say that by our present moves southward we do not mean to relax our pressure against the Soviet and that if Russia joins hands tighter with England and the United States and resists us with hostilities, we are ready to turn upon her with all our

⁶ *Ibid.*, p. 165.

⁷ *Ibid.*, pp. 192 and 193.

might; however, right now, it is to our advantage to stress the south and for the time being we would prefer to refrain from any direct moves in the north.

5. This message is important from a strategic point of view and must under all circumstances be held in the most absolute secrecy. This goes without saying. Therefore, will you please impress upon the Germans and Italians how important secrecy is.

6. As for Italy, after our Ambassador in Berlin has communicated this to the Germans, he will transmit a suitable translation to Premier MUSSOLINI and Foreign Minister CIANO. As soon as a date is set for a conference with the Germans and Italians, please let me know. [Trans. 12/1/41]⁸

* * * * *

From Berlin to Tokyo 29 November 1941:

* * * * *

1. Ribbentrop opened our meeting by again inquiring whether I had received any reports regarding the Japanese-U.S. negotiations. I replied that I had received no official word.

Ribbentrop: "It is essential that Japan effect the New Order in East Asia without losing this opportunity. There never has been and probably never will be a time when closer cooperation under the Tripartite Pact is so important. If Japan hesitates at this time, and Germany goes ahead and establishes her European New Order, all the military might of Britain and the United States will be concentrated against Japan.

"As Fuehrer Hitler said today, there are fundamental differences in the very right to exist between Germany and Japan, and the United States. We have received advice to the effect that there is practically no hope of the Japanese-U.S. negotiations being concluded successfully, because of the fact that the United States is putting up a stiff front.

"If this is indeed the fact of the case, and if Japan reaches a decision to fight Britain and the United States, I am confident that that will not only be to the interest of Germany and Japan jointly, but would bring about favorable results for Japan herself." [Trans. 12/1/41]⁹

* * * * *

From Tokyo to Japanese Ambassador in Berlin 30 November 1941:

3. The proposal presented by the United States on the 26th made this attitude of theirs clearer than ever. In it there is one insulting clause which says that no matter what treaty either party enters into with a third power it will not be interpreted as having any bearing upon the basic object of this treaty, namely the maintenance of peace in the Pacific. This means specifically the

⁸ *Ibid.*, pp. 204 and 205.

⁹ *Ibid.*, p. 200.

Three-Power Pact. It means that in case the United States enters the European war at any time the Japanese Empire will not be allowed to give assistance to Germany and Italy. It is clearly a trick. This clause alone, let alone others, makes it impossible to find any basis in the American proposal for negotiations. What is more, before the United States brought forth this plan, they conferred with England, Australia, the Netherlands, and China—they did so repeatedly. Therefore, it is clear that the United States is now in collusion with these nations and has decided to regard Japan, along with Germany and Italy, as an enemy. [Trans. 12/1/41]¹⁰

From Tokyo to Ambassador in Washington 1 December 1941:

When you are faced with the necessity of destroying codes, get in touch with the Naval Attache's office there and make use of chemicals they have on hand for this purpose. The Attache should have been advised by the Navy Ministry regarding this. [Trans. 12/1/41]¹¹

From Rome to Tokyo 3 December 1941:

On this day, at 11 o'clock in the morning, I, accompanied by Ando, called on Premier Mussolini, (Foreign Minister Ciano was also present). I described the developments in the Japanese-U.S. negotiations in accordance with the contents of your message #986 to Berlin.

Mussolini: "I have been carefully watching the progress of the Japanese-U.S. talks from the very beginning and therefore am not at all surprised to receive your report. As a matter of fact, in view of the utter bull-headedness of the United States and the meddlesome nature of President Roosevelt, I should say that the outcome was nothing but what should have been expected. One of the aims of the United States is to make the Far East her own, from an economic standpoint. I have felt from the beginning that if it was the intention of the United States to separate Japan from the Axis first and then intervene in Europe, the United States was doomed to fail because of Japan's loyal and sincere nature.

"As Your Excellency and Your Excellency's predecessor know, I wholeheartedly endorse Japan's policy of creating a New Order in East Asia. This has been true in the past, is true now and will be so in the future. I am one who is firmly convinced that Japan has every right to be the leader of the Great East Asia area."

I continued by relating to him the contents of your message referred to in the heading, (with regard to paragraph 3 of that message, I said that I had been advised that some arrangements were being made between our Ambassador in Berlin and Ribbentrop). With regard to paragraph 2, Mussolini said that should war break out, Italy would give every military aid

¹⁰ *Ibid.*, p. 206.

¹¹ *Ibid.*, p. 208 and 209.

she had at her disposal, i.e., that she would make every effort to keep the British navy checked in the Mediterranean.

Mussolini: "Recently, the formation of an Italian-German air force bloc was discussed so as to afford closer cooperation between the two to apply further pressure on the British in the Mediterranean. The negotiations on this proposal have progressed to a point where it may be signed any day now."

Regarding paragraph 2 again, should Japan declare war on the United States and Great Britain, I asked, would Italy do likewise immediately? Mussolini replied: "Of course. She is obligated to do so under the terms of the Tripartite Pact. Since Germany would also be obliged to follow suit, we would like to confere with Germany on this point."

With reference to paragraph 3, I submitted the French text of your message #987, as one proposal, and asked him whether he preferred it to be separately or jointly. He replied that as long as it was done simultaneously with Germany it did not make much difference to him, but if it were done jointly he thought it would give the impression of more strength. . . .

Mussolini failed to bring up the subject of Soviet Russia, so the matter was not brought up at all. [Trans. 12/6/41] ¹²

* * * * *

The total group of "purple" messages showed that Japan was unwilling to give up her alliance with Germany and Italy, would not remove troops from Indo-China, and refused to abide by the American demands regarding China and free trade for U.S. nationals as guaranteed by commercial treaties.

The Japanese were quite unaware that the United States was in possession of their diplomatic code, and therefore able to read their communications. However, they fully realized that the various radio stations under the control of the United States were regularly monitoring the radio traffic of the Japanese Fleet. This was a customary practice among nations and furnished valuable information. One of the obvious advantages was the accumulation of sufficient information and data to enable cryptanalysts to eventually break the codes. It is now common knowledge that the military code of the Japanese was broken shortly after the Pearl Harbor attack, and this achievement was an incalculable benefit.

Another purpose of monitoring was to fix the location of the enemy's ships. This could be done quite handily by means of obtaining cross-bearings. For instance, each ship of the Japanese Fleet had a specific call signal. When that ship answered its call one could use a direction finder to ascertain its

¹² *Ibid.*, pp. 228 and 229.



USN 424384

Admiral Harold R. Stark, USN, Chief of Naval Operations from 1 August 1939 to 12 March 1942.

general location, and when several of our radio stations from distant areas did likewise, the cross-bearings on that ship would show its definite location. In many cases it would not even be necessary to get cross-bearings, especially when the habitual operations of the fleet vessels were understood.

For quite some time before 7 December the Pearl Harbor radio stations maintained a fairly accurate record of the location of the major units of the Japanese Fleet. This radio intelligence was reported to the Commander-in-Chief almost daily and was considered quite reliable until just prior to the attack, when its reliability was greatly reduced by counter measures taken by the Japanese. First they changed the call signals of their ships on 1 November, and then again on 1 December. This had been done before, and was confusing for a time but not usually for very long. Then the Japanese used deceptive call signals to give the impression that certain major ships like aircraft carriers were elsewhere than where they actually were. For several weeks in late November our monitoring stations lost contact with the Japanese carriers and some other major vessels. This gave rise to the suspicion that these ships might have taken up stations at the naval bases of the Mandated Islands.

The chief countermeasure to defeat monitoring is radio silence, and that is what the Japanese used so effectively. A certain amount of radio silence by the carriers was observed in the early stages of their preparations for the attack, and absolute radio silence was in effect for all ships of the attacking task force which assembled in northern Japan and sailed for Hawaii on 26 November 1941.

4. WARNING TO THE FLEET

The probability of hostilities between the United States and the Axis Powers was well recognized by a large portion of the American public. But how this might come about, and when, was entirely speculative. The news media featured the growing tensions which existed in both the Atlantic and the Pacific, and even the Mediterranean, but few visualized that a direct attack on the United States was imminent. The general concept seemed to be that if we were drawn into the war it would be by going to the defense of a victimized area, such as Malaya or the Dutch East Indies.

In order to relieve the pressure on Malaya and other areas which were held by our allies, the American plan for a possible war with Japan was for the fleet to attack the Japanese Mandated Islands in the Marshalls and the Carolines and to establish a fleet base at Truk. But because of many problems and shortages, such an expedition was looked upon unfavorably by most naval officials. The American public of that time would not support a war of that nature. Then the Japanese solved this dilemma by making a direct attack on the American flag at Pearl Harbor.

The people of Hawaii, including the military, were accustomed to news reports showing the continuing controversy between opposing powers, but in Hawaii there was little turmoil or tension. Business went on routinely, people pursued their usual activities, and military personnel were carrying out the program of preparedness. There was little suspicion that Japan would launch a direct attack prior to a state of war, or at least an ultimatum, against the strong-hold of the Pacific. Among the military the prevailing talk seemed to be that if war should come it would be somewhere else, probably in the Southwest Pacific.

From official Washington there had come to Hawaii, as to other Pacific outposts, almost a superfluity of alarms and alerts for over a year. These were usually of a general nature as reflecting the new aggressions of Japan, or the widening gap in diplomatic relations. In most cases such warnings were precautionary and were not intended for public information. In fact the Hawaiian commanders were always cautioned to limit the warning information to those who needed to know, and to avoid arousing or irritating Japan by any overt or unfriendly action. The rank and file of the military, as well as the general public, were probably not aware of the serious implications which existed just prior to 7 December. And some of the most important implications were not known to the high commands in Hawaii because Washington had not transmitted them.

The warning signals sent from Washington had value, but were lacking in important essentials. Naturally, in Washington they could not be specific enough to forecast what would happen. There were sometimes differences in the estimates of the situation between the Army and the Navy. Furthermore, the separate signals sent out by the Army and the Navy were received and evaluated separately in Hawaii. There was not unity of command but there was a remarkable degree of discussion and coordination regarding the information which was received.

The first alert came from the War Department to the Hawaiian Army Command and to Panama in June 1940. The date marked the fall of France, indications of possible German aggression in South America, and also the Japanese bombing of Chungking. This alert continued for a month. The Navy was not included in the Washington instructions but was told of the situation locally, and participated by increasing its long-range air patrol and continuing it for some months. Washington cautioned Hawaii to avoid publicity or in any way from provoking curiosity of news media or alien agents.

In February 1941 the Secretary of the Navy advised the Secretary of War of the possibility of air attack on Pearl Harbor. Copies of this communication were received by the Army and by the Navy in Hawaii. In July 1941 Hawaii was warned of the tense situation caused by the Japanese occupation of Southern Indo-China and the United States' imposition of an embargo on trade with Japan.

When the Konoye cabinet fell in Japan and General Tojo took over the government as Premier in October 1941, the Hawaiian commands and other Pacific commands were again advised of the seriousness of the situation in the Pacific. This dispatch from the Chief of Naval Operations in Washington went to all commanders directly concerned.

Admiral Kimmel issued a new security order under date of 14 October 1941 which superseded the security order which was in effect dated 15



USN NR&L (MOD) 27377

Admiral Husband E. Kimmel, USN, Commander-in-Chief Pacific Fleet on 7 December 1941.

February 1941. This delineated actions to be taken in the anti-aircraft defense, anti-submarine defense, Army and Navy coordination, communications plans, drills, and so on. In his order Admiral Kimmel stated: "That no responsible foreign power will provoke war . . . by attack on the Fleet or Base, . . . [but] that a declaration of war may be preceded by; (1) a surprise attack on ships in Pearl Harbor, (2) a surprise submarine attack on ships in the operating areas, (3) a combination of these two."¹³ This eventuality had been mentioned in the letter sent to the Secretary of War by the Secretary of the Navy in January 1941. It had also been covered in great detail by the Martin-Bellinger order for the defense of Pearl Harbor 31 March 1941. In that order it is stated: "In the past Orange [Japan] has never preceded hostile actions by a declaration of war." The Chief-of-Staff of Admiral Kimmel, Rear Admiral W. W. Smith, stated at the Hewitt Inquiry that "they were aware of the possibility of hostile action without a declaration of war, but they expected the Japanese might hit the Philippines, Midway, or Guam, but not Pearl Harbor."¹⁴ This was the thought universally held.

The Navy Department dispatch of 16 October 1941, was essentially as follows:

The resignation of the Japanese Cabinet has created a grave situation. If a new Cabinet is formed it will probably be strongly nationalistic and anti-American. If the Konoye Cabinet remains the effect will be that it will operate under a new mandate which will not include rapprochement with the U.S. In either case hostilities between Japan and Russia are a strong possibility. Since the U.S. and Britain are held responsible by Japan for her present desperate situation there is also a possibility that Japan may attack these two powers. In view of these possibilities you will take due precautions including such preparatory deployments as will not disclose strategic intention nor constitute provocative actions against Japan.¹⁵

On 24 November 1941, a message was received from the Navy Department as follows:

Chances of favorable outcome of negotiations with Japan very doubtful. This situation coupled with statements of Japanese Government and movements of their naval and military forces indicate in our opinion that a surprise aggressive movement in any direction including attack on Philippines or Guam is a possibility. Chief of Staff has seen this dispatch concurs and

¹³ Pacific Fleet Confidential Letter No. 2CL-41 (Revised), 14 October 1941, p. 1.

¹⁴ *Ibid.*, Part 36, p. 442.

¹⁵ *Report of the Joint Committee*, p. 96.

requests action aedes to inform senior Army officers their areas. Utmost secrecy necessary in order not to complicate an already tense situation or precipitate Japanese action. Guam will be informed separately.¹⁶

The final and most important warning was sent from Washington and to other Pacific outposts on 27 November 1941. It was specifically designated as a "war warning." It reads as follows:

This despatch is to be considered a war warning. Negotiations with Japan looking toward stabilization of conditions in the Pacific have ceased and an aggressive move by Japan is expected within the next few days. The number and equipment of Japanese troops and the organization of naval task forces indicates an amphibious expedition against either the Philippines Thai or Kra Peninsula or possibly Borneo. Execute an appropriate defensive deployment preparatory to carrying out the tasks assigned in WPL46. Inform district and Army authorities. A similar warning is being sent by War Department. SPENAVO inform British. Continental districts Guam Samoa directed take appropriate measures against sabotage.¹⁷

It is noted that at no time did Washington indicate any belief of a surprise air attack on Pearl Harbor in advance of a formal declaration of hostilities. On the contrary, the supposition continued to be that Japan's moves would be to the south, and evidence was at hand giving validity to such beliefs. This belief was supported by the fortnightly summary sent out from Washington under date of 1 December 1941 from the Director of Naval Intelligence. On the Japanese naval situation it stated:

Deployment of naval forces to the southward has indicated clearly that extensive preparations are underway for hostilities. At the same time troop transports and freighters are pouring continually down from Japan and northern China coast ports headed south, apparently for French Indo-China and Formosan ports. Present movements to the south appear to be carried out by small individual units, but the organization of an extensive task force, now definitely indicated, will probably take sharper form in the next few days. To date this task force, under the command of the Commander in Chief Second Fleet, appears to be subdivided into two major task groups, one gradually concentrating off the Southeast Asiatic coast, the other in the Mandates. Each constitutes a strong striking force of heavy and light cruisers, units of the Combined Air Force, destroyer and submarine squadrons. Although one division of battleships also may be assigned the major capital ship strength remains in home waters, as well as the greatest portion of the carriers.

¹⁶ *Ibid.*, p. 98.

¹⁷ *Ibid.*, p. 98.

The equipment being carried south is a vast assortment, including landing boats in considerable numbers. Activity in the Mandates, under naval control, consists not only of large reinforcements of personnel, aircraft, munitions but also of construction material with yard workmen, engineers, etc.¹⁸

Washington's acute desire to avoid war in the Pacific should also be noted. In fact both the War and Navy Departments expressed the hope in November 1941 that firm diplomatic attitudes toward Japan not be taken for a period of three months or more, during which time reasonable preparedness would be obtained. It was especially desired to improve defenses in the Philippines as it was recognized that the Japanese coveted this territory. Its location was critical to Japanese expansion. The United States was in process of adding a large number of B-17's to the air power of the Philippine Islands. Under date of 27 November 1941 General Marshall, the Army's Chief of Staff, and Admiral Stark, the Chief of Naval Operations, asked the President and Secretary of State for more time to prepare, stating: "The most essential thing now, from the United States viewpoint, is to gain time. . . . Precipitance of military action on our part should be avoided so long as consistent with national policy."¹⁹

Although the additional time was not to be, the fact was clear that the United States did not commit any overt military action against Japan. The final overt hostile act was Japan's treacherous bombing of Pearl Harbor with a consequent toll of destruction and human lives.

5. WHAT INFORMATION DID HAWAII NOT RECEIVE?

While Washington furnished to Hawaii and elsewhere a great volume of information on the critical relations between Japan and the United States, it is a fact that some very important information was not sent to Hawaii. This was the "purple" information regarding the specific ships in designated locations in Pearl Harbor during the few days prior to 7 December, and the instructions to various places to burn certain codes. However, it should be mentioned here that the work of decoding and translation of the multitude of messages was not completed until after 7 December. The amount

¹⁸ *Fortnightly Summary of Current National Situations*, Navy Department, Serial No. 25, 1 December 1941, p. 9.

¹⁹ *Report of the Joint Committee*, p. 175.

of work over-taxed the section in charge of this specialty and some of it was not completed until after the air attack.

At an earlier time, shortly after "purple" messages became available, the Fleet was an addressee for this information. But this was discontinued about six months before the attack in the interest of security. Obviously the value to our government of intercepting and reading Japanese secret diplomatic messages was so great that it would be foolhardy to risk any compromise of our advantage.

Likewise, the instructions to Japanese Embassies and Consulates to destroy their codes and coding machines were highly significant. Here again, Hawaii was not cut in directly. However, the commands in Hawaii were aware of it through their own surveillance of the Japanese Consulate as American representatives observed the burning of records there.

While we must recognize the possibility that the Pearl Harbor attack should have been blunted to some extent if more of the information available in Washington had been transmitted to Hawaii, there is room for other viewpoints. Harassed by the pressure of events and torrents of information, the responsible officials in Washington were subject to human limitations as to relative urgency, evaluation, and necessary action. Without doubt some officials, using their hindsight, could later see that certain things might have been done differently and better. At the time, however, it would seem that their estimate of the situation indicated that little could be gained by alerting Hawaii beyond what already had been done.

As for the Hawaiian commands, some people observed that they were "fed up" on alarms, alerts, rumors, and an overdose of pressures and cautionary messages. Fleet operations were at times subordinate to alerts and defense drills, and suffered accordingly. The cry of "wolf" had become so customary that it no longer made an impact. And even if the Pacific Fleet had been fully ready, the damage would not have been much less. In fact, it might well have been much more.

CHAPTER VI

Japanese Attack, Strategy,
and Tactics

LETTERS TO THE EDITOR

CHAPTER VI

Japanese Attack, Strategy, and Tactics

1. PREPAREDNESS, WAR GAMES, AND DRILLS

The attack on Pearl Harbor was the brain-child of Admiral Isoroku Yamamoto, the Commander-in-Chief of the Japanese Combined Fleet. He was well schooled in American ways, having had a tour of duty in Washington. Moreover, he was well regarded by American officers, was a sophisticated poker player, giving to successful bluffing.¹ He was regarded as bold and venturesome. But, to some he was head-strong and lacking in prudence.

He had worked his way up in the Japanese Navy, was vice-minister in 1939, but became the Commander-in-Chief of the Combined Fleet in 1941 due to his familiarity with aircraft and carriers. He was a proponent of the attack on Pearl Harbor. The purpose was to sink or cripple large units so as to immobilize the Pacific Fleet while the Japanese invaded the Philippine Islands, the East Indies, and improved the defenses of the Mandates.

Thus a perimeter could be drawn which would discourage the United States, British, and Dutch responses and would in due time destroy the American will to fight an enemy so far from home.

Yamamoto proved an aggressive naval commander. He carried through the attack on Pearl Harbor, as well as the naval operations against other points in the South, proving to an unbelieving world that the Japanese were capable of more than one major offensive at the same time. Fortunately for the Allied Powers, especially the United States, Yamamoto's plane was shot down in April 1943 while on a naval inspection trip to the Solomon Islands.

In January 1941 Rear Admiral Onishi was appointed Chief of Staff of the Japanese Eleventh Air Fleet and ordered to make a study of the Pearl Harbor operation. In early September 1941 Admiral Nagano, Chief of General Staff, and selected members of the Combined Fleet and the First

¹*The Campaigns of the Pacific War*, United States Strategic Bombing Survey, Naval Analysis Division, Washington, D.C., 1946, p. 13. Hereafter cited as *Campaigns*.

Air Fleet commenced work on details of the actual plan of attack. It was then that the attack on Pearl Harbor was played several times on the war game-board and each time it showed a successful attack with a maximum loss of about one-third of the Japanese force, including airplanes.

By August 1941 or earlier aviators were trained to drop torpedoes from very low altitudes; the torpedoes were fitted with wooden fins or stabilizers to prevent diving. To defeat nets around capital ships, the aviators were trained to use bombs from high-level planes and diving planes. Some of these bombs were made over from 14 or 15-inch armor-piercing shells in order to penetrate the armored decks or turret tops of battleships.

The Japanese were fully aware of the U.S. Fleet doctrine to get underway in case of attack and to pass out to sea through Pearl Harbor's narrow entrance channel. To take full advantage of this eventuality the Japanese stationed five fleet submarines near the entrance and had about thirteen more submarines on patrol duty in other areas bordering Hawaii. These submarines left Yokohama on 11 November 1941 and sailed by different routes.

Five of the large submarines carried midget submarines on their decks.



USN NR&L (MOD) 37386

Fleet Admiral Isoroku Yamamoto, IJN, Commander-in-Chief Combined Fleet.

The midgets were to enter Pearl Harbor if they could and fire torpedoes against the capital ships. The midget submarines had only two men aboard, carried only two small torpedoes, and were about seventy-nine feet long. After launching midget submarines from their decks not later than the evening of 6 December, the large submarines were to patrol around Hawaiian waters to intercept enemy ships leaving Pearl Harbor. In no case were submarines to attack prior to the air attack.

2. ASSEMBLING OF ATTACK FORCE

The task force under command of Vice Admiral Nagumo, assembled at Hitokappu Bay on the island of Eretufu in the Aleutian Islands of Japan on 22 November 1941, although some of the vessels had come earlier. The assembling of ships was spread out as utmost secrecy was to be observed. The government knew of the proposed attack on the United States Fleet but this knowledge was withheld from all not directly connected with the project. The Emperor knew of the plan in general, but the attack was not to occur until after the message concluding negotiations with the United States Government was delivered.

Complete radio silence was practiced and some radio deception was engaged in. Careful planning of the route to Pearl Harbor was undertaken and the northern route was chosen despite anticipated bad weather for refueling in order to avoid meeting other ships and to make detection less likely.

Prior to departure the aviators were deemed sufficiently trained, and refueling exercises had proved very successful. The task force sailed for Pearl Harbor on 25 November 1941, United States time.

3. ROUTE OF THE PEARL HARBOR ATTACK FORCE

The Pearl Harbor attack force proceeded along the track shown on page 89. The force operated under certain instructions which should be mentioned. "X" Day² was selected as 7 December (U.S. time) because it was Sunday. A few days later would have been more desirable because of

²"X" Day in military parlance means the day of actual attack or opening of hostilities.

the darkness of the moon. The refueling was undertaken on 3 December (U.S. time) without mishap.

No shipping was encountered, but if the attack force was discovered prior to "X-2" day the force was to return to Japan without executing the attack. If discovered prior to "X-1" day the decision became the responsibility of the attack force commander, but if discovered on "X-1" or "X" day the attack was to continue. If the United States Fleet interfered in any way it was to be attacked and sunk.

On 1 December 1941, (U.S. time) the Japanese Naval General Staff approved the Pearl Harbor attack. This was supplemented by the approval of the Commander-in-Chief of the Combined Fleet, Admiral Yamamoto. The orders issued are given below.³ The times given are Japanese times which are one day later than United States times.

5 November 1941

From: The Chief of Naval General Staff
To: CinC Combined Fleet

1. In view of the fact that it is feared war has become unavoidable with the United States, Great Britain, and the Netherlands, and for the self-preservation and future existence of the Empire, the various preparations for war operations will be completed by the first part of December.

2. The CinC of the Combined Fleet will effect the required preparations for war operations.

3. Execution of details will be as directed by Chief of the Naval General Staff.

7 November 1941

From: CinC Combined Fleet
To: First Air Fleet

The Task Force, keeping its movement strictly secret, shall assemble in Hitokappu Bay by 22 November for refueling.

Note: (Upon arrival at Hitokappu Bay all ships with a limited cruising range were deck loaded with drums of fuel and oil was stowed in all available spaces inside the ships.)

25 November 1941

From: CinC Combined Fleet
To: First Air Fleet
(Pearl Harbor Attack Force)

The task force, keeping its movement strictly secret and maintaining close

³ Paraphrased versions of these orders may be found in *Hearings*, Part 13, pp. 415-417.

guard against submarines and aircraft, shall advance into Hawaiian waters, and upon the very opening of hostilities shall attack the main force of the United States Fleet in Hawaii and deal it a mortal blow. The first air raid is planned for the dawn of X-day (exact date to be given by later order).

Upon completion of the air raid, the task force, keeping close coordination and guarding against the enemy's counterattack, shall speedily leave the enemy waters and then return to Japan.

Should the negotiations with the United States prove successful, the task force shall hold itself in readiness forthwith to return and reassemble.

25 November 1941

From: CinC Combined Fleet
To: First Air Fleet
(Pearl Harbor Attack Force)

The task force, keeping its movement strictly secret, shall leave Hitokappu Bay on the morning of 26th November and advance to 42° N. 170° E. on the afternoon of 3 December and speedily complete refueling.

1 December 1941

From: The Chief of Naval General Staff
To: CinC Combined Fleet

Japan under the necessity of her self-preservation, has reached a decision to declare war on the United States of America, British Empire, and the Netherlands. Time to start action will be announced later. The CinC Combined Fleet shall, at the start of war direct an attack on the enemy fleet in the Hawaiian area and reduce it to impotency using the First Air Fleet as the nucleus of the attack force.

Note: (The above despatch was issued by Admiral Nagano under authority delegated by Imperial Order. The commencement of hostilities was decided upon by Cabinet Council on 1 December.)

2 December 1941

From: The Chief of Naval General Staff
To: CinC Combined Fleet

The hostile action against the United States of America, the British Empire, and the Netherlands shall be commenced on 8 December. Bear in mind that, should it appear certain that Japanese-American negotiations will reach an amicable settlement prior to the commencement of hostile action, all forces of the Combined Fleet are to be ordered to reassemble and return to their bases.

Note that if the American government agreed to the Japanese demands

the attack force would not attack but would return to their bases. The likelihood for this was remote indeed. Yet the Japanese diplomats were kept active in Washington as it was intended that they should not present the final note until one-half hour before the scheduled time of the Pearl Harbor attack. Actually they did not present it until after the attack, due to their own delay.

Of course the diplomatic efforts were not successful and as a result the Japanese attack force continued. It received the signal "Climb Mount Niitaka" on "X-1" day, which was the order to attack. The attack force arrived at its destination, 200 miles north of Oahu at 0730 on 7 December 1941 (U.S. time). The first air attack took off from the carriers at 0600, preceded by two float planes each from two heavy cruisers. These visited Pearl Harbor and Lahaina Roads and reported "all clear."

The strategy of the Japanese was to immobilize the various air bases on the Hawaiian island of Oahu so that fighter planes could not get into the air and offer opposition.

4. THE ATTACK FORCE

The attack force consisted of the following six aircraft carriers: *Akagi*, *Kaga*, *Soryu*, *Zuikaku*, *Hiryu*, *Shokaku*. To these had been added a number of seasoned aviators from carriers not included in the attack force.

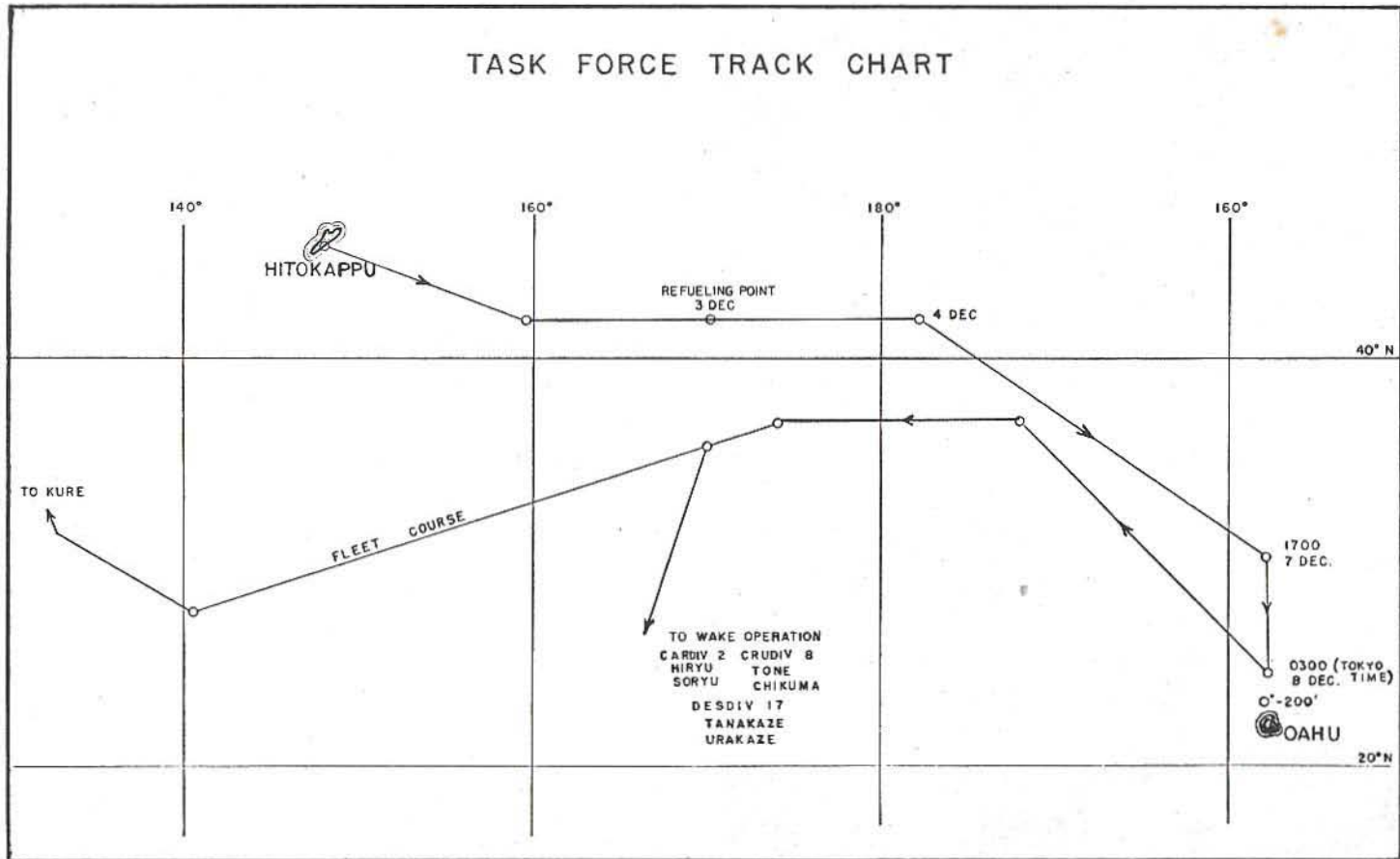
The Screening Unit had the mission of furnishing cover. This unit was composed of one light cruiser and nine destroyers. The Support Force was composed of two battleships and two heavy cruisers.

The Patrol Unit was three "I"-type submarines which preceded the attack force and patrolled the ship lanes. In addition there were eight tankers which returned to Japan following the refueling on 3 December.

5. THE ATTACK

The force launched 360 planes. The first wave of 189 planes took off at 0600 under command of Commander Fuchida. The second wave of 171 planes, under command of Lieutenant Commander Shimazaki, were scheduled to take off one hour and fifteen minutes later. Because these overlapped somewhat, and because the second wave was about fifteen minutes ahead of

TASK FORCE TRACK CHART





USN NR&L (MOD) 37322

Admiral Chuichi Nagumo, IJN, Commander-in-Chief First Air Fleet and Commander Pearl Harbor Striking Force.

schedule, United States observers at Pearl Harbor were unable to state accurately when one wave ended and another began.

In addition to the 360 planes in the attacking wave, the carriers retained 54 type Zero fighters to take turns as combat air patrol. The patrols alternated every two hours and continued from an hour before sunrise until forty-five minutes after sunset.

The first wave consisted of 50 horizontal bombers each carrying an 800 kilogram (1760 pounds) armor-piercing bomb, 40 torpedo planes each carrying an 800 kilogram⁴ aerial torpedo, and 54 dive-bombers each carrying a 250 kilogram land bomb as well as machine guns for strafing. In addition 45 fighters were over these planes for air control and strafing attack as might be required.

The targets of the horizontal bombers, attacking from 10,000 feet, and the low flying torpedo planes were the battleships and carriers. The battle-

⁴ One kilogram is about 2.2 pounds.

UNIT		COMMANDER	TYPE OF AIRPLANE	NUMBER OF AIRPLANES	TYPE OF ATTACK	ARMAMENT EACH AIRPLANE	TARGET							
FIRST ATTACK UNIT	1 GROUP SHUDANO	1 ATTACK UNIT	COMDR. FUCHIDA LT. COJDO, HASHI COJDO LT. ABE LT. COMDR. KUSURI LT. COMDR. KUSATA LT. KITAJIMA LT. HIGAI LT. MATSUMURA	TYPE 99 CARRIER BOMBER	15 15 10 10	HORIZONTAL BOMBING ATTACK	ONE 800-KG ARMOR-PIERCING BOMB	BATTLESHIPS						
		2 ATTACK UNIT												
		3 ATTACK UNIT												
		4 ATTACK UNIT												
	2 GROUP	1 SPECIAL ATTACK UNIT	COMDR. FU- CHIDA	TYPE 99 CARRIER BOMBER	12 12 8 8	TORPEDO ATTACK	ONE 800-KG AERIAL TORPEDO	BATTLESHIPS AIRCRAFT CARRIERS						
		2 SPECIAL ATTACK UNIT												
		3 SPECIAL ATTACK UNIT												
		4 SPECIAL ATTACK UNIT												
	3 GROUP	15 ATTACK UNIT	LT. COMDR. TAKAHASHI LT. SAKAMOTO LT. COMDR. ITAYA LT. SHIDA LT. SUGANAMI LT. OKAJIMA LT. KAKENO LT. SATO	TYPE 99 CARRIER BOMBER TYPE ZERO CARRIER FIGHTER	27 27 9 9 9 6 6 8	DIVE BOMBING ATTACK	250-KG. LAND BOMB	AIR BASES FORD ISLAND WHEELER						
		16 ATTACK UNIT												
		1 FIGHTER STRIKING UNIT												
		2 FIGHTER STRIKING UNIT												
		3 FIGHTER STRIKING UNIT												
		4 FIGHTER STRIKING UNIT												
		5 FIGHTER STRIKING UNIT												
		6 FIGHTER STRIKING UNIT												
1 GROUP		6 ATTACK UNIT							LT. COMDR. SHIMAZAKI LT. ICHIHARA LT. COMDR. FUSA LT. KUBAYASHI LT. OHYAMA LT. MAKINO LT. SHINDO LT. AIKAWA LT. HIOA LT. NANO	TYPE 97 CARRIER ATTACK PLANE TYPE 99 CARRIER BOMBER TYPE ZERO CARRIER FIGHTER	27 27 18 18 18 27 9 9 9 9	HORIZONTAL BOMBING ATTACK	ONE 800-KG. LAND BOMB, SPEEDING ORDNANCE CROSS	AIR BASES HICKAM KANEHO FORD ISLAND EWA
5 ATTACK UNIT														
2 GROUP	13 ATTACK UNIT													
	14 ATTACK UNIT													
	11 ATTACK UNIT													
	12 ATTACK UNIT													
3 GROUP	1 FIGHTER STRIKING UNIT													
	2 FIGHTER STRIKING UNIT													
	3 FIGHTER STRIKING UNIT													
	4 FIGHTER STRIKING UNIT													
SECOND ATTACK UNIT	1 GROUP	8 ATTACK UNIT	COMDR. SHIMAZAKI	TYPE 97 CARRIER ATTACK PLANE	27 27	HORIZONTAL BOMBING ATTACK	ONE 800-KG. LAND BOMB, SPEEDING ORDNANCE CROSS	AIR BASES HICKAM KANEHO FORD ISLAND EWA						
		5 ATTACK UNIT												
	2 GROUP	13 ATTACK UNIT	LT. COMDR. FUCHIDA	TYPE 99 CARRIER BOMBER	18 18 18 27	DIVE BOMBING ATTACK	ONE 800-KG. ORDINARY BOMB	AIRCRAFT CARRIERS CRUISERS						
		14 ATTACK UNIT												
		11 ATTACK UNIT												
		12 ATTACK UNIT												
	3 GROUP	1 FIGHTER STRIKING UNIT	LT. COMDR. SHIMAZAKI	TYPE ZERO CARRIER FIGHTER	9 9 9 9	AIR CONTROL AND STRAFING ATTACK	TWO 20-MM. MGS. TWO 7.7-MM. MGS.	LARGESIZE AIRCRAFT STRAFING OF GROUNDED AIRCRAFT HICKAM FORD ISLAND WHEELER KANEHO						
		2 FIGHTER STRIKING UNIT												
		3 FIGHTER STRIKING UNIT												
		4 FIGHTER STRIKING UNIT												

Japanese Aircraft Attack Organization.

ships were mostly secured in pairs, so that the inboard battleships could not be reached with torpedoes. Therefore the horizontal bombers intended to hit inboard battleships with enough large armor-piercing bombs to put them out of commission. It is well to remember that the ships were entirely stationary while the Japanese airplanes were operating in ideal visibility and wind conditions.

The first objective of the dive-bombers was the air bases at Ford Island and Wheeler Field where the fighters were located. The air patrol was to strafe the air bases if the United States fighters failed to appear. They were also to attack the air bases at Ford Island, Hickam, Wheeler, Ewa, Bellows, and Kaneohe with their 20 millimeter⁵ and 7.7 millimeter machine guns.

The second wave consisted of 54 horizontal bombers each carrying one

⁵ One millimeter equals 1/1000 of a meter. One meter equals 39.37 inches.

250 kilogram bomb and six 60 kilogram bombs. In addition 36 fighters were overhead to meet Hawaiian based fighters or for strafing airfields with their 20 millimeter and 7.7 millimeter machine guns. The mission of the horizontal bombers was the various air bases, while the objectives of the dive-bombers were the major ships of the Pacific Fleet.

The attack started at Wheeler and Ford Island at 0755, while the torpedo planes attacked the battleships at 0757. The grounded aircraft were attacked at 0800 and the horizontal bombers got into action about 0805. It was estimated that although the 250 kilogram bombs would not pierce the armored decks of the battleships they would be effective against cruisers and carriers. But finding no carriers present, these bombs were directed against battleships.

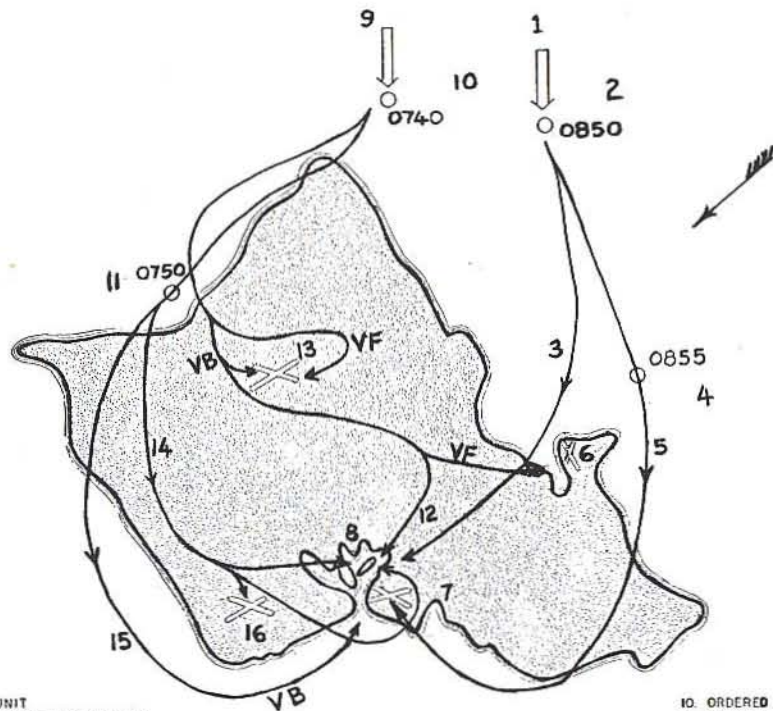
The Japanese torpedoes were especially effective. There were no torpedo nets spread for the protection of battleships, and each battleship was a stationary target which could hardly be missed by the forty torpedo planes flying 50-100 feet above the water. We were to learn that Japanese torpedoes were more lethal than American torpedoes; first, because they had been tested for explosive effect whereas American torpedoes had not been so tested on grounds of economy; secondly, because the Japanese used oxygen, which is highly explosive, instead of air for propulsion of torpedoes; and thirdly, because the torpedoes carried an explosive charge of over 1000 pounds as compared to the American charge of about 500 pounds.

The question was asked why torpedo nets were not used by the fleet, and why captive balloons were not employed. The answers are very simple. Due to the restricted area, and the need for seaplane lanes for taking off and landing, torpedo nets could not be used. Balloon barrages were considered undesirable because they interfered with our own aircraft over the fleet. Probably, the best answer is that these items were not available in sufficient quantity at that time.

6. DIRECTION OF ATTACK

The illustration on page 93 gives the plan of attack, and indicates the reason local observers concluded that the planes came from a southerly direction. It will be noted that the first wave was to leave the northerly rendezvous at 0740 and the second wave at 0850. The torpedo bombers

AIRCRAFT APPROACH TO OAHU



1. SECOND ATTACK UNIT
2. ORDERED TO DEPLOY AT 0850 HOURS
3. DIVE BOMBING UNIT
4. ATTACK RUN ORDERED AT 0855 HOURS
5. HORIZONTAL BOMBING UNIT
6. KANEOHE
7. HICKHAM
8. FORD ISLAND
9. FIRST ATTACK UNIT

10. ORDERED TO DEPLOY AT 0740 HOURS
11. ATTACK RUN ORDERED AT 0750 HOURS
12. DIVE BOMBING UNIT
13. WHEELER
14. TORPEDO BOMBING UNIT
15. HORIZONTAL BOMBING UNIT
16. EWA
17. Note: THE FIGHTER STRIKING UNITS IN EACH ATTACK OPERATED AT WILL AFTER DEPLOYING.

(TIMES ARE IN HAWAIIAN TIME)

were to approach the battleships from the port beam, which they did with disastrous results.

Each aviator had a chart or map showing the exact location of his target. Finding no aircraft carrier in Pearl Harbor, these fliers used some of their ammunition on battleships and some on the old battleship *Utah* which had been converted to an aircraft target ship. She was presumably identified by some aviators as an aircraft carrier.

7. SUBMARINES

The damage caused by the submarines stationed at the entrance to Pearl Harbor was negligible. Of the five midget submarines all were eventually lost without inflicting any damage. No ship was damaged by torpedoes fired from the "I"-type submarines on patrol duty after launching their midget submarines. One "I"-type was lost on 10 December in an attack by *Enterprise* planes. The fleet type submarines were on patrol duty in the Hawaiian area until early January, but caused no damage. Thereafter they were on the West Coast of the United States, accomplishing only minor results.

8. JAPANESE LOSSES

After completing its mission each Japanese aircraft was to return to its carrier. The losses reported from American sources were frequently duplicated and gave an inflated figure. Japanese admissions after the surrender presumably gave a true picture and were as follows:

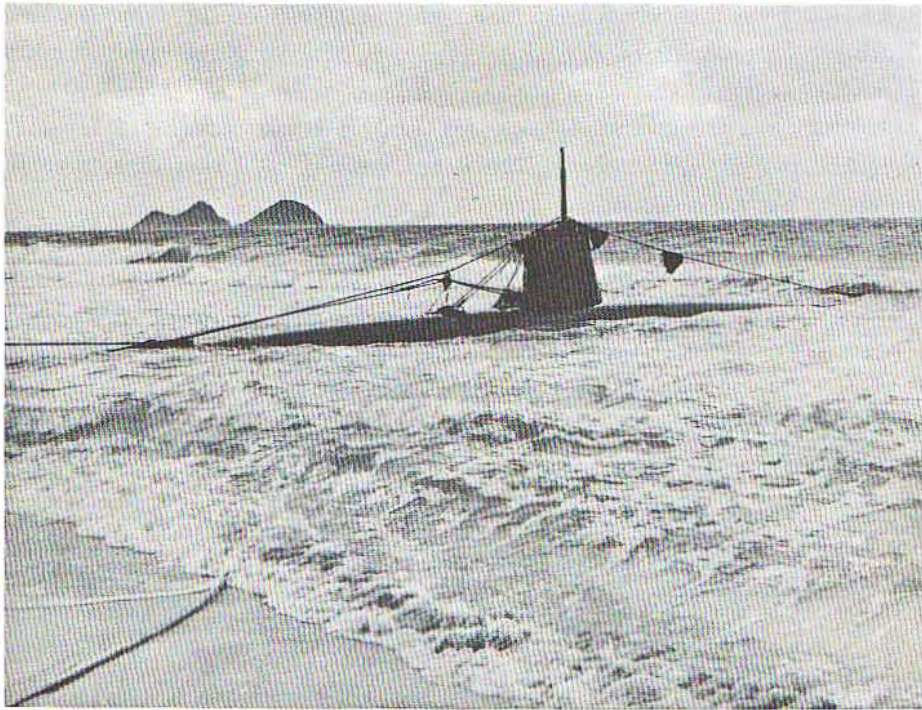
Aircraft in first wave:

Fighter Planes	3
Dive-Bombers	1
Torpedo Bombers	5
Total	9

Aircraft in second wave:

Fighter Planes	6
Dive-Bombers	14
Total	20

Grand total of aircraft lost: 29



USN NR&L (MOD) 39733

Japanese midget submarine No. 19

The losses of the Japanese do not include planes lost or damaged when returning to the carriers.

Submarines lost:

Fleet type "I"	1
Midget type	5
Total	6 ⁶

The airplanes returned to their carriers immediately after rendezvousing with their fighters at a point about 20 miles bearing 340° from Kaena Point. The aircraft carriers were underway for Japan at that time. There was no rearming of airplanes for renewed attacks on Pearl Harbor. Admiral Nagumo felt that the mission was completed and he was intent on getting clear of the area as quickly as possible as had been ordered. He was somewhat afraid of an attack by American carrier planes whose whereabouts

⁶ *Campaigns*, pp. 18 and 19.

were unknown, and from land based pursuit planes of the Army at Pearl Harbor. Nagumo assumed that as many as fifty of these were operable after the attack.

He had one mission yet to perform. On his return voyage to Japan he detached two aircraft carriers, two heavy cruisers, and two destroyers for an attack on Wake Island.

9. JAPANESE ESTIMATES OF DAMAGE TO THE AMERICANS

From pilot reports and photographs taken from attack planes of the second wave the Japanese estimate was:

Ships damaged or sunk:

Sunk—4 battleships, 1 cruiser, 2 tankers

Heavily damaged—4 battleships

Lightly damaged—1 battleship

Aircraft shot down or damaged:

Shot down—10

Destroyed on the ground—250⁷

⁷ *Ibid.*, p. 19.

CHAPTER VII

Results of Japanese Surprise
Air Raid



CHAPTER VII

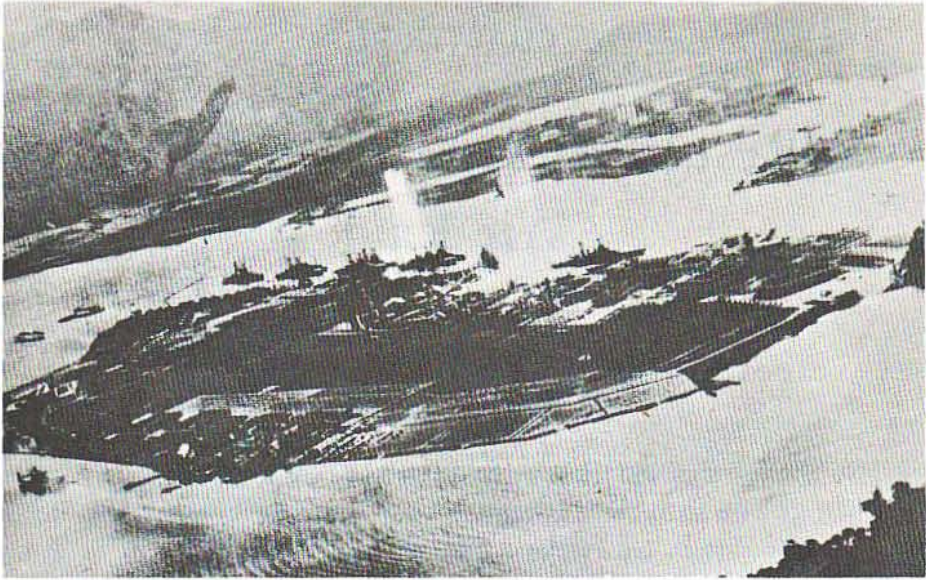
Results of Japanese Surprise Air Raid

1. SUNDAY WAS A DAY OF REST IN HAWAII IN PEACETIME

Sunday, 7 December 1941 was a typical day of rest in Hawaii. The weather was perfect with some cloud cover overhead. The people were taking it easy as was their custom on Sundays. The military was sleeping in or eating breakfast a bit late since this was a day of relaxation and rest. The accounts of battleship survivors, which are included later in this work, give the state of mind general among the military as well as among all Hawaiian residents.

Although Admiral Kimmel in his Fleet Order warned of a surprise air raid on Pearl Harbor as a possibility, few thought "it could happen here." Most people felt the Japanese would not attack without a declaration of hostile intent. The fact that they had attacked China in 1895 and Russia in 1905 without a declaration of war was considered not applicable to modern Japan. The military personnel, however, were not sure of Japan's code of honor in this regard, and made preparations accordingly. Yet, in the various hearings no American military man excused the air raid on the ground that Japan had violated her solemn agreement to the Hague Convention.

There was little real reconnaissance on 7 December. There was none to the north, which proved to be the vulnerable direction. It was taken for granted that if the Japanese attacked, the attack would be from a southerly direction, where the Mandated Islands were. But, the trade winds were northerly and would be helpful to the Japanese in carrying a bomb load over 200 miles of water.



80-G-30554

Japanese planes over Ford Island.

2. SUBMARINES

The first indication of hostile action by Japan was a submarine periscope sighted at 0350 by the minesweeper *Condor*. The destroyer *Ward*, which was on patrol duty at the Pearl Harbor entrance, was notified and opened fire and dropped depth charges. Also a PBY seaplane dropped depth charges which showed a noticeable oil slick after the explosions. It was assumed that the submarine was sunk in about 1,200 feet of water.

A message was sent at 0654 which was delivered to the Duty Officer of the Commander-in-Chief of the United States Fleet at 0715. After requesting confirmation Patrol Wing TWO verified the report at 0732. But a second confirmation of this unbelievable circumstance was requested. Before verification was received the attack on Ford Island dispelled all doubt.

3. WE ARE AT WAR

At 0755 the Navy Yard signal tower telephoned to the Commander-in-Chief at his quarters, "Enemy air raid—not drill." At about the same time the Commander Patrol Wing TWO broadcasted from Ford Island the warn-

ing: "Air Raid, Pearl Harbor—This is Not a Drill." Within a few minutes an identical message came from the Commander-in-Chief of the U.S. Pacific Fleet.

Fleet doctrine required all ships to get underway as soon as possible but some were not able to overcome the damage which the Japanese attack wrought. As it turned out, it was better that ships stayed moored because there was some fear that the planes had dropped mines in the entrance channel; and let us not forget that enemy submarines awaited the ships in the various sea lanes. Most destroyers and a few cruisers did get underway and joined forces to find and confront the Japanese Fleet, but these searched southward instead of northward. Perhaps it was best that they were unable to contact the Japanese forces, for these forces were much superior and had plenty of air power. Sunk at sea, they would have been lost beyond recall—though they would have been far tougher targets.

4. ALL AIR BASES IMMOBILIZED

True to the Japanese plan all air bases were first put out of commission so that air interference with Japanese attacks on the ships of the fleet was minimal. Ford Island was attacked at 0755 and all fighting planes were effectively disposed of prior to torpedo attacks on ships which occurred at 0757. Likewise Ewa, Hickam, Wheeler, Bellows, and Kaneohe were subjected to dive-bomber attacks and machine gun strafing. The Army field at Haleiwa was not attacked because the Japanese knew it had only a few reserve training planes.

The Army was on sabotage alert only, and therefore its planes were grouped together with ten feet or less from wing-tip to wing-tip. Only machine gun ammunition was available to Army personnel until well into the morning. This fact plus the sabotage philosophy resulted in a perfect target for the Japanese dive-bombers and machine gun strafers.

The score board shows that the attackers put all of the air bases virtually out of commission for several hours. The figures given before the Joint Congressional Investigating Committee on 15 November 1945 are as follows:

Ford Island—33 out of 70 totally destroyed or damaged.

Ewa—33 out of 49 totally destroyed.

16 out of the remainder were too damaged to fly. (3 were on patrol.)

Hickam—18 out of 30 combat planes totally destroyed.

Wheeler—42 out of 83 combat planes totally destroyed.

Bellows—3 out of 12 combat planes totally destroyed.

Kaneohe—26 out of 35 seaplanes totally destroyed.

6 were severely damaged. (3 were on patrol.)¹

The true story is that the Japanese put out of commission the half dozen potent air bases in Hawaii. Although the Army Air Force and Naval Air acted heroically when the true nature of the attack was comprehended by the personnel, the fact remains that only a token air force was able to resist the Japanese or follow them to their carriers.

5. SHIPS ATTACKED BY TORPEDO PLANES

Within a very short time after Ford Island and Hickam were struck, the moored ships were attacked by torpedo planes. The forty planes came in



80-G-19948

Wreckage at Naval Air Station, Ford Island, with ships burning in background, 7 December 1941.

¹ *Hearings*, Part 1, pp. 54 and 55.



80-G-32477

Planes and hangars wrecked during the Japanese attack on Naval Air Station, Ford Island.

groups in the early stages of the assault and their targets being stationary, the accuracy of fire was lethal. The torpedoes were let go 50-100 feet above the water only a few hundred yards short of the ships. There were four groups of torpedo bombers in all, the first one on the port beams of the ships. The following ships were hit: *California*, *West Virginia*, *Oklahoma*, *Arizona*. The second group also attacked the port sides. The third was from the west and was directed against ships tied up at the Navy Yard dock. It was then that *Helena* was hit by a torpedo after it had passed under *Oglala*. The force of the explosion opened a hole in the old mine-layer *Oglala* which eventually caused her to capsize. The fourth group came from the northwest and was successful in putting at least two torpedoes in *Utah* and one in *Raleigh*. The old battleship *Utah* was rigged as an aerial target ship and resembled an aircraft carrier; she capsized to port at 0813. It is interesting to note that *Utah* and *Raleigh* occupied berths usually assigned to aircraft carriers. The forty torpedo planes presumably fired forty torpedoes, of which about half found their mark.

A few of the Japanese torpedoes were recovered from the mudbanks in which they ended their runs. All of them were fitted with wooden fins to prevent diving, and they were modified to explode after a very short run. These were new features to the Americans as it had been believed a depth

of at least seventy-five feet was necessary for modern torpedoes, and a run of several hundred yards was required prior to explosion.

6. INBOARD SHIPS HIT BY HIGH-LEVEL BOMBERS

The inboard ships could not be reached by torpedoes, for which reason the Japanese endeavored to immobilize them by armor-piercing projectiles dropped from a height of about 10,000 feet. The following ships were hit by 14 or 15-inch projectiles or later by smaller bombs: *Pennsylvania*, *Nevada*, *Arizona*, *California*, *West Virginia*, *Maryland*, *Tennessee*, *Honolulu*, *Vestal*, *Shaw*, *Floating Dry Dock Number Two*, and *Curtiss*. *Cassin* and *Downes* were in Dry Dock Number One ahead of *Pennsylvania* and



80-G-32438

Japanese planes attacking Pearl Harbor.

were hit by diving planes using the smaller bombs. The extent of the damage caused is covered in a later chapter.

7. LOSSES IN HONOLULU

Honolulu did not escape. Several people were killed on the streets of the city or elsewhere, and several buildings were destroyed, including a Japanese language school. Whether all losses resulted from bombs being jettisoned by planes before their return to their carriers or whether some were 5-inch shells fired by fleet ships at Japanese planes is not clear and probably never will be solved.

A number of private planes, out for flying in balmy Hawaiian skies, were shot down by the Japanese in the early stages of the attack. Such planes were entirely inoffensive and the slaughter of their occupants was wanton murder in the first degree.

8. OFFICERS AND MEN ABOARD SHIP AND FIT FOR DUTY

Some mainland newspapers published stories of a dearth of manpower at air bases and on board ship on Sunday morning, or unfitness for duty on account of drunkenness. The Roberts Commission had as witnesses the President of the Temperance League of Hawaii and its Executive Secretary. Both of them admitted that the letter signed by them to the people of America was exaggerated and slanderous. Although there were about 11,000 soldiers and sailors in Honolulu on the night of 6 December, that figure represents only about ten percent of the total military force, and only a few were drunk or disorderly. In fact the police records indicate that more civilians were arrested for drunkenness on the night of 6 December than were military. It should also be noted that leave or liberty expired at midnight, and the military personnel who imbibed beer at the various service clubs could not obtain beer after midnight on 6 December. No liquor was served on military ships.

Officers and selected enlisted men whose families lived at the time in Honolulu were granted weekend leave over 7 December. Yet the figures were kept within the limits set by the fleet order. The hearings of the Con-

gressional Committee show that the actual number of men on board and available for duty at 0800 on 7 December were:

Admirals	5 or more
Commanding officers of battleships	5 out of 8
Commanding officers of cruisers	6 out of 7
Commanding officers of destroyers	63%
Damage-control officers of battleships	6 out of 8
Average percentage of officers:	
Battleships (approximate)	60-70%
Cruisers, battle force (approximate)	65%
Destroyers, battle force (approximate)	50%
Average percentage of men:	
Battleships	95%
Cruisers, battle force	98%
Destroyers, battle force	85% ²

The Army exceeded these figures somewhat because the Army had quarters available at the duty sites for officers and enlisted men.

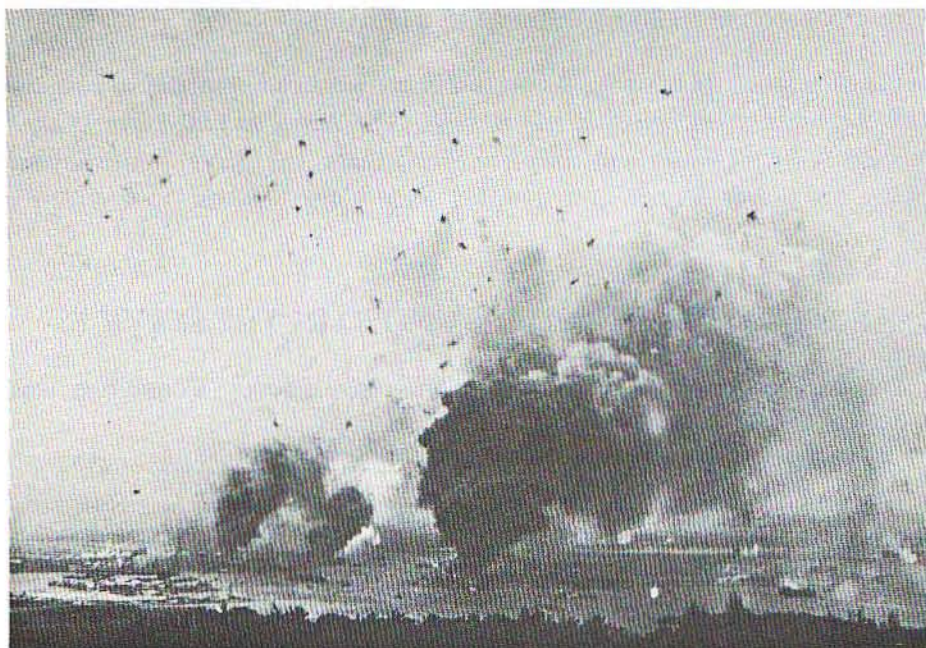
9. ANTI-AIRCRAFT BATTERIES WHICH OPPOSED THE JAPANESE PLANES

As has been seen the fleet order required that about one-fourth of the anti-aircraft batteries be manned, with ammunition near at hand. The batteries selected were in various sectors, with range finders and directors appropriate to those sectors. The 50 caliber machine guns were furnished with 300 rounds of ammunition, and the two 5-inch guns with 15 rounds each in ready service boxes. Additional ammunition was furnished from magazines by personnel regularly assigned to that task and by volunteers. The number of shots fired by various guns was given at the Congressional Investigation as follows:

	Rounds of machine gun ammunition	275,807
3 ¹ 50 →	Rounds of 5-inch 50 caliber	1,741
	Rounds of 5-inch 25 caliber	1,523
	Rounds of 5-inch 38 caliber	1,665 ³

² *Ibid.*, p. 49.

³ *Ibid.*, p. 57.



80-G-32792

Heavy barrage of anti-aircraft fire which the Japanese planes encountered.

The machine guns got into action promptly while the 5-inch guns were firing within four minutes. The destroyers had all anti-aircraft batteries firing in about seven minutes although the machine guns opened fire immediately. As will be seen from survivors' reports printed later, general quarters was sounded on practically all ships promptly. The effectiveness of the Navy fire is evidenced by the fact that five of the torpedo planes which began the attack on the large units of the fleet were shot down.

Mention should be made of the midget submarine which gained entrance to Pearl Harbor. At 0835 on 7 December *Curtiss* sighted a periscope and immediately opened fire. The submarine surfaced and fired one torpedo toward the nested destroyers. *Curtiss* hit the conning tower twice as *Mona-ghan* dropped depth charges. There was never any doubt that the submarine was sunk. It is shown on page 169 as finally recovered several weeks later.

As for the Army, only a limited amount of ammunition was at hand, although machine gun ammunition was available on some of the Army planes. None of the 3-inch mobile batteries were emplaced. There was not at the time any anti-aircraft batteries around airfields or around the Navy compound.

10. DEEDS OF HEROISM

Deeds of heroism in both the Army and Navy were common and in keeping with the highest traditions of the services. The Army awarded five Distinguished Service Crosses and sixty-five Silver Stars; the Navy recommended fifteen Medals of Honor and awarded sixty Navy Crosses.

11. TOTAL DEAD AND WOUNDED IN THE SERVICES

The Army list given at the Congressional Investigating Committee was as follows:

Killed in action or fatally wounded	215
Wounded in action	360
Missing in action	22

The Navy was as follows:

Killed in action or fatally wounded	2,036
Wounded in action	759
Total killed or fatally wounded	2,251
Total wounded in action	1,119

12. SABOTAGE

Let it be recorded that there was no sabotage or insurrection in Honolulu or anywhere in Hawaii. It is true that the Federal Bureau of Investigation immediately took into custody suspected enemy agents, including 370 Japanese, 98 Germans, and 14 Italians.

Contrary to the stories printed in some mainland papers there was no organized glutting of roads to Pearl Harbor. In the early stages of the attack no one had any trouble driving from Honolulu to Pearl Harbor although such roads became crowded in due course.

Here it should be mentioned that staff officers and others received telephone calls at Honolulu "to return to the ship immediately; we are under enemy air attack." Commercial radio assisted in this. All complied promptly, although the great majority thought it was a Sunday drill, and that the "boom boom" which they heard (a customary sound on weekdays) was intended to add realism to the drill. Even when entering the Navy Yard on

the way to the boat dock most officers were unbelieving until seeing the wreckage and the burning oil on the waters, and the bottom of *Oklahoma* in the distance.

The prevalent story of poisoned drinking water was pure fabrication, as was also the story of cutting direction markers in sugar cane fields to indicate the course to Pearl Harbor. Many similar stories were ill-founded.

Martial law was promptly put into force in Honolulu. All except those with military business were off the streets at nine o'clock in the evening. Strict black-out was practiced at night. All women and children except those women holding government jobs were evacuated as soon as ships were available.

13. STATE OF MIND OF MILITARY PERSONNEL

There was now no doubt that the Japanese had scored a great victory. Most of the air bases were a shambles and a large part of the fleet was immobilized. The damage done seemed great indeed, and spirits were at a low ebb. On 10 December came the news that *Prince of Wales* and *Repulse* had been sunk near Singapore. Two days earlier the air bases in the Philippine Islands were successfully attacked. It did not seem possible at the time that the Japanese could be so victorious.

What if another air raid was made on the fleet and its reserve oil supply or its repair base at the Navy Yard—or a landing force of the Japanese hit the beaches? Families in Honolulu were indeed in jeopardy and many took to the hills to escape the danger that seemed to threaten.

For several months the Army was unable to guarantee that the islands of the Hawaiian group were safe against successful Japanese landing attack. This included Midway, from which land-based airplanes could operate. Therefore the Navy was forced to consider Pearl Harbor as a base with limited capabilities. With the possibility of Japanese land-based planes near at hand it was decided that Pearl Harbor should be used by the fleet as little as possible, that task forces should stay at sea a maximum of time, that rest and relaxation were things that had to take second place in wartime.

The first part of the book is devoted to a general history of the United States from its discovery to the present time. It is divided into three volumes. The first volume contains the history of the discovery and settlement of the continent, and the establishment of the first colonies. The second volume contains the history of the growth and development of the colonies, and the struggle for independence. The third volume contains the history of the United States from its independence to the present time.

THE HISTORY OF THE UNITED STATES

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CHAPTER VIII

Washington's Response to the
Japanese Attack



CHAPTER VIII

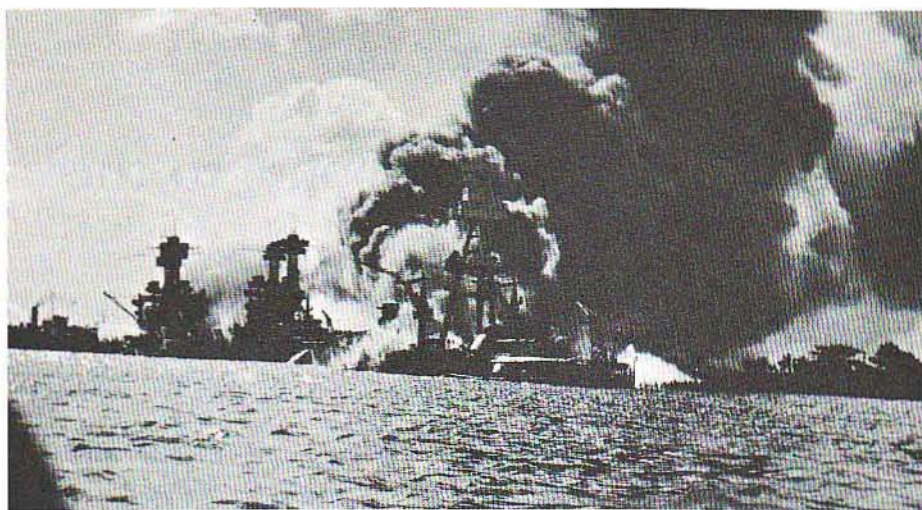
Washington's Response to the Japanese Attack

1. MILITARY AND CIVILIANS TAKEN BY SURPRISE

When President Roosevelt read the intercepted "purple" messages just prior to Pearl Harbor he remarked: "This means war." He did not foresee a Japanese attack on the Pacific Fleet but he knew that the Government of Japan would rather go to war against the United States, Great Britain, and the Netherlands than give up their alliance with Germany and Italy, or recede from their depredations in China. By now it was easy to anticipate that eventually we would have to go to the assistance of Great Britain against Hitler if freedom was to prevail, but it was hoped that peace in the Pacific would continue until the Atlantic peril was satisfactorily met.

Thus war thrust upon us, and hindsight proves that the attack on Pearl Harbor, despite its losses, brought the blessings of a nation unified in spirit and purpose and was for us the easiest way to open hostilities with Japan and the Axis Powers. If the United States had not been attacked, the alternatives were a naval attack on the Mandated Islands or a naval excursion into southern Asia. Either would have been hazardous and the military recoiled from the necessity of fighting a long war against such odds with a divided public opinion at home.

The losses at Pearl Harbor seemed staggering at the time. Washington was as surprised as the personnel at Pearl Harbor that the Japanese had decided somewhat inscrutably to attack the Pacific Fleet. Four years of bloody warfare lay ahead and victory over the fanatical "Sons of Heaven" seemed assured,—at least eventually. The attack on Pearl Harbor proved that the impossible was possible after all.



80-G-33058

USS Arizona *burning after the magazine explosion. The ship forward is USS Tennessee which is playing water over the stern to keep oil fires from Arizona at a distance. USS West Virginia is on the far left.*

2. DECLARATION OF WAR

The President lost no time in taking official action against Japan. On 8 December 1941 the President told Congress: "Yesterday, December 7, 1941—a date which will live in infamy—the United States of America was suddenly and deliberately attacked by naval and air forces of the Empire of Japan." Congress then declared war on Japan. One vote was cast against the measure by a Congresswoman from Montana. Agreeable to their alliance with Japan, Germany and Italy declared war on the United States four days later. So the United States was at war not only with Japan but with the front-runners of the European War, Germany and Italy.

3. SECRETARY OF THE NAVY VISITS PEARL HARBOR

Almost immediately the Secretary of the Navy, Frank Knox, set out for Pearl Harbor to see at first hand what damage the Japanese had wrought. He remained until Friday the 12th. On his return he had a conference with the President, and held a news conference on the following Monday, 15 December 1941. He lauded the heroic action of the fleet in resisting the

enemy, and gave a number of instances of fearless and intrepid action. Secretary Knox admitted that the attack was a surprise to all concerned. Before leaving Washington for Pearl Harbor he sent a message to all Naval ships and stations. It is quoted because it is so appropriate for all times:

The enemy has struck a savage, treacherous blow. We are at war, all of us! There is no time now for disputes or delay of any kind. We must have ships and more ships, guns and more guns, men and more men—faster and faster. There is no time to lose. The Navy must lead the way. Speed up—it is your Navy and your Nation!

Frank Knox
Secretary of the Navy

Although the Japanese took pictures of the damage they had caused, and these pictures were published abroad, Japan was relatively uninformed of the full extent of the damage. As is customary in warfare, the enemy was not told more than he already knows. For that reason Secretary Knox minimized the damage. At that time the fleet in Pearl Harbor felt that the Secretary's report was less than half the truth,—but time proved that his estimates were excessive and that the full extent of the damage was less than at first visualized. This proves the adage that people are prone to see the worst or pessimistic sides of a situation rather than the best or optimistic aspects.

4. THE ROBERTS COMMISSION

Official Washington lost no time in appointing a Commission to investigate Pearl Harbor. This was headed by Associate Justice Owen J. Roberts of the United States Supreme Court, a Republican. Three of the members were retired officers of the Army and the Navy while one member was on active duty with the Army Air Corps.

The Commission met as early as 18 December 1941 in the Munitions Building at Washington. After getting statements from the top officers of the Army and Navy it went to Hawaii where it viewed the wreckage and held hearings at Fort Shafter, at the Submarine Base, and at the Royal Hawaiian Hotel. The Commission received sworn testimony until 10 January 1942. After that it returned to Washington where it received sworn testimony from various Army and Navy officers from 19 January 1942 to 23 January 1942 when the Commission's report was made to the President.

The report to the President disposed of a number of wild rumors, and

included a number of basic facts about the Hawaiian Command. Washington knew the possibility of air raids, and so did Hawaii, but both considered such a circumstance remote. Both were of the firm opinion that collision courses in national interests would result in eventual warfare, but neither considered Japan so desperate or foolhardy as to attack Pearl Harbor.

The Roberts Commission went on record with the following summary and recommendations, among others: "Army preparations were primarily based on fear of sabotage while the Navy's were based on fear of submarine attack. . . . The first surprise attack . . . caught them completely unprepared. It was about four minutes before the first anti-aircraft fire by the Navy began, and as the Army aircraft batteries were not manned nor their mobile units in position it was some time before their anti-aircraft fire became effective. . . . The final results . . . left the Army airfields and the Naval station very badly damaged and resulted in the practical immobilization of the majority of the Navy's battle fleet in the Pacific for months to come, the loss of 75 percent of the Army's air forces on the Islands, and the loss of an even larger percentage of the Navy's air force on Oahu. . . . The loss of life and the number of wounded in this attack is a shocking result of unpreparedness."

The Commission concluded: "This attack has emphasized the completeness of the Naval and Military information in the heads of the Japanese, the meticulous detail of their plans of attack, and their courage, ability and resourcefulness in executing and pressing home their operation. It should serve as a mighty incentive to our defense forces to spare no effort to achieve a final victory."

5. PRESIDENT ROOSEVELT'S FIRESIDE CHAT

On 23 February 1942 the President gave a fireside chat to the nation entitled "We Must Keep on Striking our Enemies Wherever and Whenever We Can Meet Them." This was delivered on the day after Washington's Birthday, and the President drew a parallel between Valley Forge of colonial days and the odds which faced the American people of the present. He discounted wild rumors and called attention to the relatively moderate losses which we suffered at Pearl Harbor. Although we had been compelled to yield ground to the enemy he said, "we will regain it. So spoke Americans in 1776, and so speak Americans today!"

6. ADMIRAL KIMMEL AND GENERAL SHORT RELIEVED

The President did not wait for the Roberts report before taking action with regard to Admiral Husband E. Kimmel and Lieutenant General Walter Short. It was traditional in the services that they should be relieved. Their commands had suffered a tragedy, one which was greatly exaggerated in the mind of the public, but nevertheless one which seemed sizable at the time. There was no air reconnaissance to the north on that fateful Sunday. They left their posts with the good wishes of their subordinates. Admiral Kimmel was affectionately regarded in the fleet as an officer of unqualified loyalty and efficiency. His going was deeply regretted, but the nature of things required that he be relieved. Had he remained as Commander-in-Chief he would undoubtedly have proven himself one of the Navy's greatest heroes of all time.

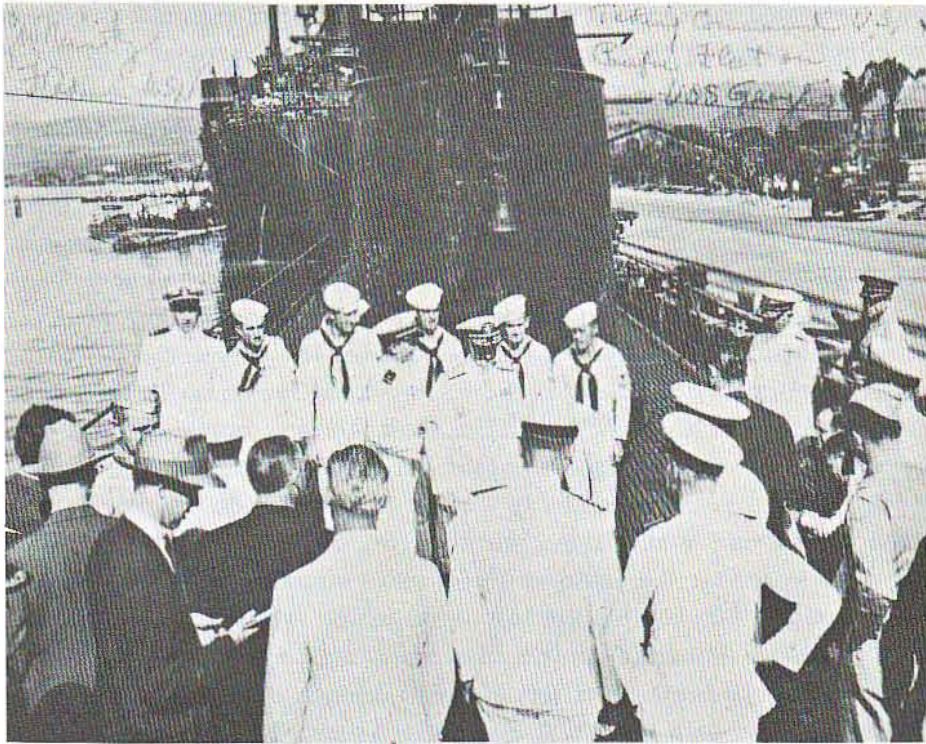
The poisonous rumors that gained credence is illustrated by letters which Mrs. Kimmel received following his departure. The first was from a woman who deprecated the fact that two pregnant women were required to get off the clipper plane to the mainland (planes were very infrequent in those days) to make room for her and her belongings. The nephew of the woman asserted that demands upon the plane's personnel deprived other passengers of the attention which was due them. In the other letter the woman writer said that she had it on good authority that Mrs. Kimmel and Mrs. Short were never invited to the same party because of their conflicting temperaments. To both of these letters Mrs. Kimmel replied that she had never been on a clipper plane and had never been in Hawaii! Too bad that other ill-founded rumors and gossip could not be scotched so easily at the time!

Vice Admiral William S. Pye relieved Admiral Kimmel on 17 December 1941 as temporary Commander of the Fleet. He was number two in the fleet echelon of command and assumed the job as additional duty until a regular relief arrived. Admiral Pye was hard put to decide whether to take action in relieving Wake Island. He had two task forces near enough to the island to subject the Japanese forces to an aircraft carrier raid. But to do so required him to risk the loss of a carrier, which at that stage he could ill afford. Hindsight proves that action even against the land-based planes of the Japanese from the Marshall Islands only about 500 miles away would have been successful. But Wake is nearer to Japan than Hawaii, and holding it would have been impossible without changing the whole complexion of the war which lay ahead. The relief of Wake would have

prevented the capture of military and some 650 civilian personnel which the Japanese took into custody. There were a number of other considerations involved, including the state of the weather, the shortage of fleet oilers, and the lack of loading and unloading facilities at Wake. As it appears now, Admiral Pye acted wisely, about 22 December 1941, in sacrificing the manpower on Wake without risking the loss or crippling of one or more aircraft carriers.

7. ADMIRAL C. W. NIMITZ TAKES COMMAND

Admiral Chester W. Nimitz, formerly Chief of the Bureau of Navigation, took command on 31 December 1941. He was a fortunate choice for the position. Although he was unknown to the public at that time, his appointment restored public confidence in the abilities of the United States Navy.



NR&L (MOD) 27151-A

Admiral Chester W. Nimitz assumes duties as Commander-in-Chief Pacific Fleet, 31 December 1941, on board USS Grayling at Pearl Harbor.

He not only got along with all elements of a unified command but proved a strong commander in his quiet sort of way. He was destined to remain in command throughout the war and to be promoted in due course to Fleet Admiral.

Fleet Admiral Nimitz was a plain man who had no use in wartime for furbelows and ruffles. He was non-argumentative, but used his common sense to arrive at decisions which had to be made. He was a good listener, but used his own judgment in making decisions. Here was a man who in due time gained the confidence of all by the sheer demonstration of ability and good will.

Although originally a pessimist in salvage operations, his interest is well illustrated by the fact that for six months he required the Salvage Officer to see him at an appointed time once a week to talk over the progress of the work. Whenever significant salvage operations occurred, such as the entry into dry dock of a ship that once rested on the bottom of Pearl Harbor, he and others in high command were always present to show their interest and to add their prestige to the work.

8. ADMIRAL ERNEST J. KING BECOMES COMMANDER-IN-CHIEF OF THE U.S. FLEET

In order to coordinate the Atlantic and Pacific theaters, the Commander of the Atlantic Fleet was, on 30 December 1941, assigned as the Commander-in-Chief of the United States Fleet. He became the over-all Commander-in-Chief of the Navy under the general direction of the Secretary of the Navy and the President of the United States. Admiral King later became the Chief of Naval Operations as additional duty, when he relieved Admiral Harold R. Stark as the Chief of Naval Operations in March 1942, and eventually was promoted to Fleet Admiral. For the rest of the war Admiral King wore both hats.

Admiral King sent the following message to the Navy shortly after taking the oath as "Cominch:"

The way to victory is long
The going will be hard
We will do the best we can with what we've got
We must have more planes and ships at once
Then it will be our turn to strike
We will win through in time.

He and Admiral Nimitz made a strong team which operated harmoniously throughout the war. To them island hopping was not new or novel because in their naval warfare they had many islands to contend with and many islands to conquer. These two officers were a portent to our enemies, especially to Japan, that no effort would be spared to bring ultimate unconditional victory.

9. ADMIRAL NIMITZ'S POLICY OF A "LIMITED OFFENSIVE"

Since the days of John Paul Jones the Navy had pursued the policy of using the offensive as the best defense. Nimitz was hard put to find means in the Pacific Fleet to take the offensive without undue risk. Obviously we were far inferior to the Japanese, and undue risk was out of the question until the industrial marvel of American production permitted the fleet to sail for Japan's strongholds. Nimitz was under great pressure from Washington, to take the offensive against Japan's Navy. He refused to move until he had sufficient time to size up the situation which confronted him. Then, about the first of February he solved this riddle by the adoption of the "Limited Offensive" policy in directing fleet operations. This policy was inaugurated for the purpose of restoring morale in the Pacific Fleet, of holding the line against any further expansion of Japanese power in the Pacific, of staging raids against the Pacific enemy, of diverting Japanese strength away from the East Indies if possible, and of safeguarding communications to Hawaii, Midway, and Australia.

10. HALSEY'S EARLY RAIDS

Admiral Nimitz used the intrepid Vice Admiral William F. Halsey to carry out his policy. On 1 February 1942 Halsey bombed the Marshalls with the *Enterprise* force while Rear Admiral Frank Jack Fletcher with the *Yorktown* force bombed the Gilberts. On his way home Halsey struck Wake and Marcus, the latter only about 600 miles from Japan. Then Fletcher joined Vice Admiral Wilson Brown's *Lexington* force which bombed Lae and the Solomons as well as the northern coast of New Guinea. The military effect of these raids was not consequential but they proved to the

Japanese that American forces were on the loose and had to be reckoned with. They proved that aircraft carriers were capable of air raids even when the enemy was fully alert.

As early as mid-April 1942, the Halsey-Doolittle team bombed Tokyo and other Japanese cities. This was accomplished with sixteen medium range B-25's launched from the deck of *Hornet*, commanded by Captain Marc Mitscher. The carrier *Enterprise* carried Admiral Halsey in command of the expedition which besides the two carriers was composed of the cruisers *Nashville* and *Vincennes*, four destroyers, and one oiler. *Enterprise* maintained air patrol over and in advance of the task force.

The air raid was originally conceived by Captain F. S. Low and Captain Donald Duncan of the Staff of Admiral King in Washington. They with the cooperation of General "Hap" Arnold, who was head of the Army Air Corps, modified the Army B-25's for their mission.

The raid had to take off from a distance of about 650 miles to avoid detection by one of the many Japanese patrol vessels. All of the Ameri-



USN NR&L (MOD) 30734

Lieutenant General James H. Doolittle, USA, and Admiral Marc A. Mitscher, USN, on board USS Hornet.

can pilots landed in China or Russia or in waters near China; the few who were captured by the Japanese in China were imprisoned or put to death. Nevertheless, the raid was successful and served notice on the Japanese as early as April 1942 that even Tokyo was not exempt from American sea and air power.

The President referred to the Halsey-Doolittle air raid as having originated from "Shangri-la." This was released for the benefit of the American public, but primarily for the confusion of the enemy.

CHAPTER IX

Observations and Statements
Made By Survivors

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CHAPTER IX

Observations and Statements Made By Survivors

1. CONDITION OF SHIPS AT 0755

On 7 December 1941, all major combatant ships at Pearl Harbor were in condition "X" with two machine guns manned and two 5-inch anti-aircraft guns with ready ammunition and crews near at hand. After the attack began, the ships assumed condition "Y" or "Z" as rapidly as possible. The battleships had been in port for several days and had been refueled. Most of the ships were ninety-five percent full of fuel oil. The degree of closure of water-tight doors and hatches is determined by the conditions named. Condition "X" is the minimum safety condition, while condition "Z" is the battle closure condition. Condition "Y" is between the two. These are usually designated by their alphabetical names, that is "X-ray," "Yoke," and "Zed."

The survivors from the battleships sunk at their berths and the many ships round about furnish ample evidence as to the nature of the various attacks. In summary, many of the battleship survivors considered that a "fire and rescue party" was required because of a disaster at Ford Island before the true nature of events was ascertained. Among the crews, many wondered why a drill was taking place on a Sunday morning.

The cruisers, destroyers, and service vessels some distance away saw the enemy planes earlier and witnessed the torpedo plane attack on the battleships. The impressions held by the various personnel, as well as the actions they took, can best be determined from excerpts of these statements, which are taken from official reports of the engagement. These statements are given here to refute the many irresponsible statements which have been made regarding the behavior of Navy men at Pearl Harbor. The survivors' statements are known to only a few and have not therefore been referred to generally. Some are reproduced here to present a true picture of these important events.



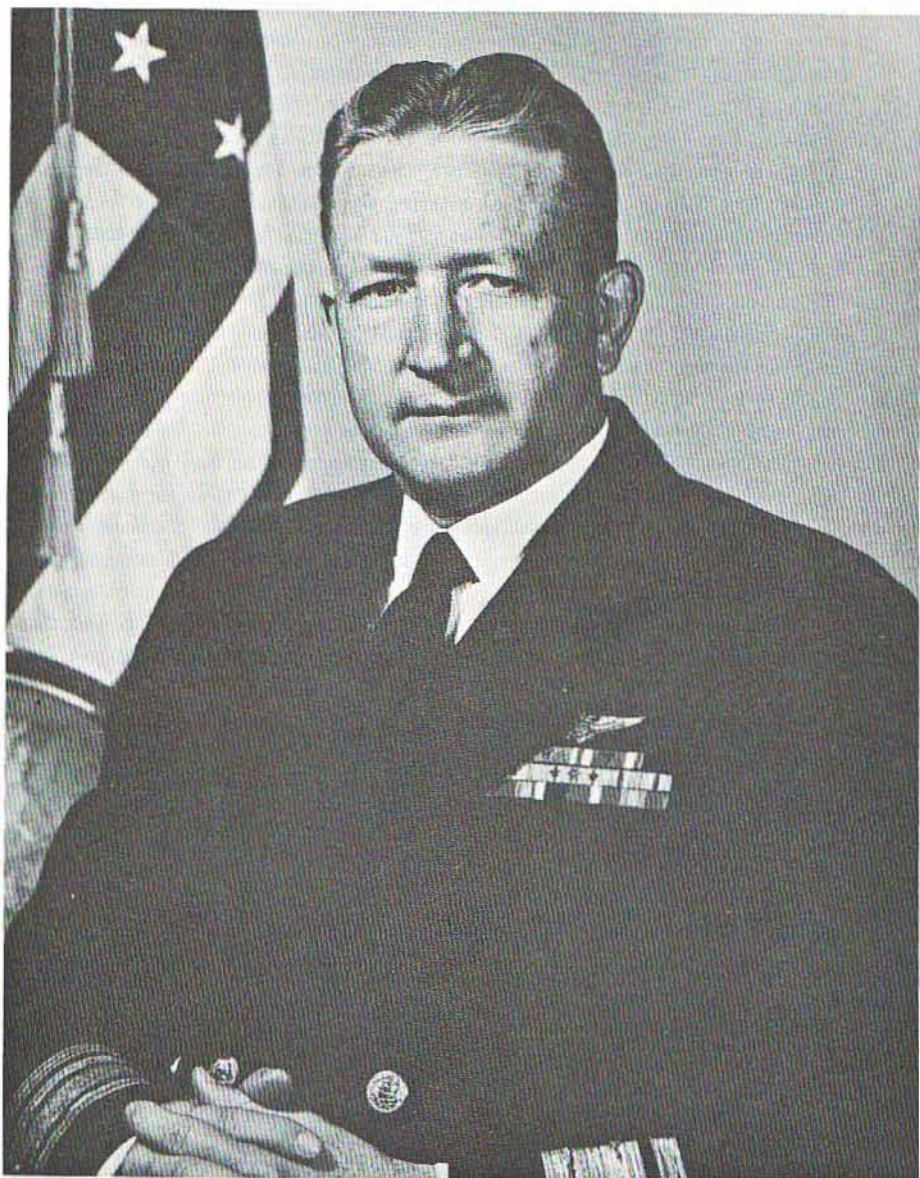
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Aerial view of Battleship Row. From left to right: Arizona, Tennessee (inboard) and West Virginia, Maryland and Oklahoma (capsized).

2. IMPRESSIONS AND ACTIONS ON U.S.S. WEST VIRGINIA

Lieutenant C. V. Ricketts wrote as follows:

At about 0755 on 7 December, 1941, I was sitting at breakfast table in the wardroom when assembly was sounded and the fire and rescue party called away. Almost immediately thereafter, as I was leaving the wardroom, general quarters was sounded. As I went up the ladder to the starboard side of the quarter deck, I heard the word being passed by word of mouth that, "The Japs are attacking." As I reached the quarterdeck I felt the ship being hit. She was shaken some but I was not knocked from my feet. I thought then that instead of actual hits the vibration might be caused by bombs falling close aboard. I went up the starboard side of the boat deck to the anti-aircraft battery which was being manned. Ensign Hunter was present on the starboard battery and I told him to open fire as soon as possible. Ensign Hunter, incidentally, was attached to the five inch anti-aircraft battery and that was his regularly assigned battle station. Ensign Graham, who is also in the anti-aircraft battery, was present during the firing although I do not remember giving him any actual orders or seeing him at that time. I then



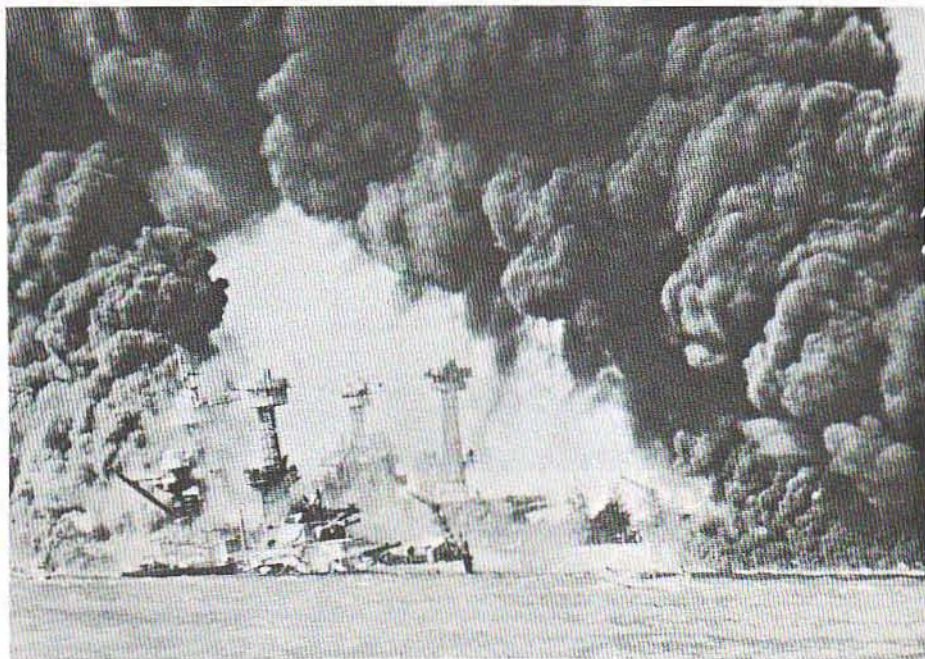
OFFICIAL U.S. NAVY PHOTOGRAPH

Admiral Claude V. Ricketts, USN.

went to the Fire Control tower as I was the senior officer in the gunnery department aboard. The tower was locked so we broke it open. The Captain then appeared and as the ship was listing rapidly to port and I knew probably few C&R officers were aboard I said, "Captain, shall I go below and counterflood?" He replied, "Yes, do that." I went down through times

square where I picked up Billingsley, B.M.1/c, to help. We went to the main deck and aft on the starboard side and down to the second deck through the escape scuttle in the hatch in front of the Executive Officer's Office. The hatches in this vicinity were closed with escape scuttles open. Wounded were being brought up the hatches forward. The ship was now listing so heavily that on the linoleum decks it was impossible to walk without holding on to something. I reached the third deck by the ladder at frame 87 starboard and went forward to the first group of counterflood valves. Billingsley went aft and got a crank for operating the valves. When he came back Rucker and Bobick, shipfitters from Repair III, came with him. Billingsley and I started B-163 counterflooding while the other men assisted at other valves. When I was assured that counterflooding was well underway, I told Rucker to counterflood everything on the starboard side until the ship was on an even keel. It was not long before the excessive list to port began to decrease. Rucker told me later that he had not previously received any orders to counterflood but he and Bobick decided that they should anyway and they actually opened the valves to two voids in Repair III. This action on their part, in my opinion, showed excellent initiative and judgment.

I then went to the anti-aircraft battery on the boat deck and found that all ammunition from the ready boxes had been expended. I went to times



80-G-32414

Dense smoke frames USS West Virginia and USS Tennessee.

square and formed an ammunition train, opening hatches as necessary. However, when the hatch to the third deck A-420 was opened we found it to be flooded. This hatch was again closed and further attempts to obtain ammunition were abandoned. Ensign Ford, who was assisting me in this attempt, then very properly used the ammunition train and other personnel available to evacuate the wounded from the second deck.

When all the men had left and Lieutenant (jg) White was on the line, I went down the fire hose to the crane. From that time on until relief fire fighting parties arrived we fought the fire on the boat deck starboard casemates, and port side of the main deck forward. Ensigns Hine, Hazelton, Lombardi, Graham, and some others did excellent work in this fire fighting.

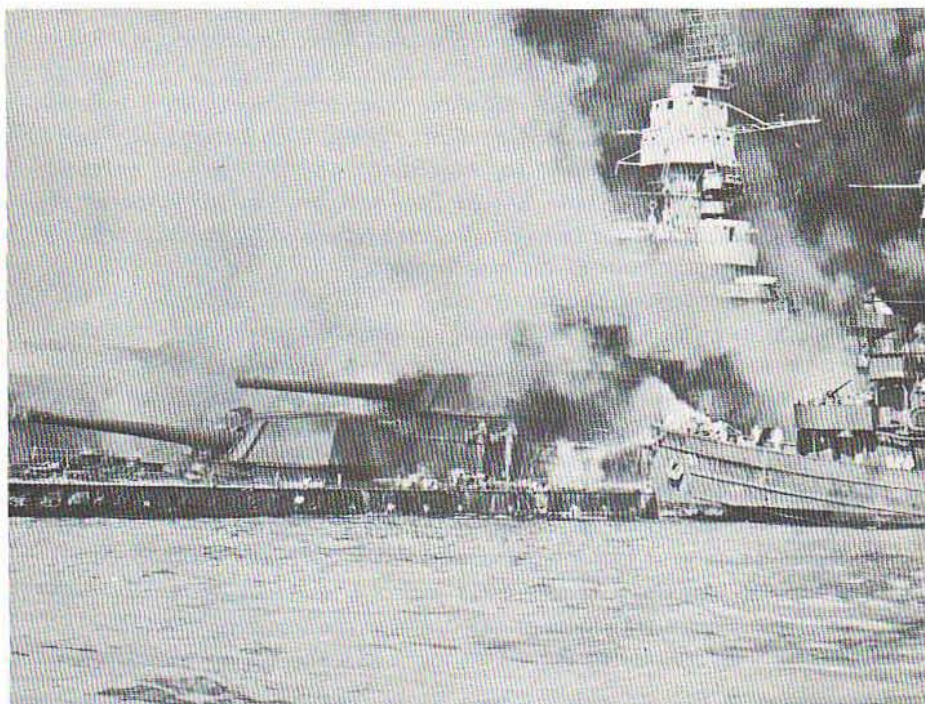
The personnel that worked with me on the bridge I cannot commend too highly. They carried out every order promptly and enthusiastically, even when it meant danger to themselves. They did not attempt to abandon the bridge until ordered to do so. These personnel were: Lieutenant (jg) F. H. White, Ensign V. Delano, Sewart, A. A., C.S.M., Leak, L. N. Cphm., and Miller, D., Matt.2/c. Two or three other men, signalmen I believe, were also present. Lieutenant (jg) F. H. White is to be especially commended for his great help, many suggestions, and disregard of personal danger. Ensign Graham and Ensign Lombardi provided us a means of escape by passing us lines from the starboard crane and by directing the fire fighting on the after side of the mast structure.

The Captain deserves the highest praise for his noble conduct to the last. Although in great pain he kept inquiring about the condition of the ship, whether or not we had any pumps running, etc. He was particularly concerned about the fires on board and the oil on the surface of the water. I assured him that everyone was doing everything possible to fight the fire and control the damage. He did not want to be moved and after the fire started, kept insisting that we leave him and go below. For a short time after he was wounded it would have been possible to lower him down, but his wound was so serious I knew that he would be better off with as little handling as possible. Leak concurred with me in this opinion. However, when the fire broke out around the after part of the bridge structure I moved him regardless because of the suffocating smoke and the approaching fire.

The Executive Officer, Commander R. H. Hillenkoetter, the senior surviving officer of *West Virginia* wrote:

I was in my cabin just commencing to dress, when at 0755 the word was passed "Away Fire and Rescue Party." This was followed about thirty seconds later by "General Quarters"; at the same time, 0755, the marine orderly rushed into the cabin and announced, "The Japanese are attacking us." Also, just at this time two heavy shocks on the hull of the *West Virginia* were felt. It seemed as if these shocks were somewhere forward on the port side.

By this time I had reached the Quarterdeck, and the ship was beginning to list rapidly to port. I proceeded along the starboard side until just forward of Number Three Turret, when there was a third heavy shock felt to port. The planes on top of Turret Three caught on fire, and there were flames all around the Turret Top. The quarterdeck sentry informed me that the Captain had already gone to the bridge, so I remained aft to assist the extinguishing of the fire around Turret Three and on the quarterdeck. There was another heavy explosion at this time, that threw me flat on the deck. During all this time the ship was continuing to list to port, and at the time of this latest shock, I should estimate that the list was about 20° or 25° (this is purely an estimate). I called to the sound power telephone watch to tell Central to counterflood, but do not know whether or not this word got through.



USN NR&L (MOD) 39735

USS Argonne fighting fires on West Virginia.

Immediately following this latest explosion, I saw a flash of flame about fifteen feet high somewhere forward on the ARIZONA and had just gotten to my feet again when there was a terrific flash of flame from the ARIZONA, this second flash being higher than the foretop. Burning debris of sizes from a fraction of an inch up to five inches in diameter rained on the quarterdeck of the WEST VIRGINIA.

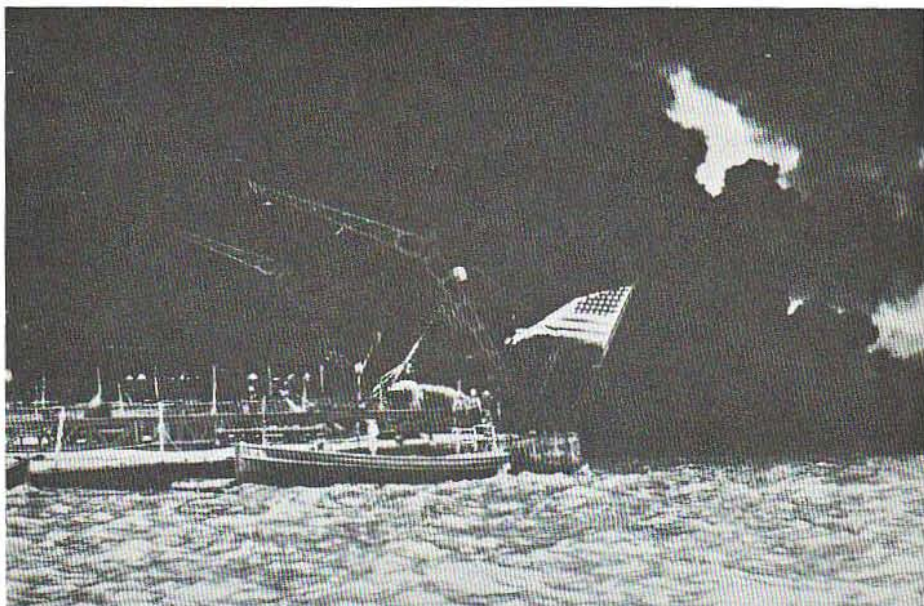
During all of the above the ship's batteries continued firing, and shortly after the ARIZONA explosion, the list on the WEST VIRGINIA stopped and she gradually started to right herself. Meanwhile, efforts to push overboard the burning embers on the quarterdeck and to extinguish the fire on top of Turret Three and in the planes was continued. There was another heavy shock, distinguishable from the shock of the ship's own guns firing, and it was reported that a large fire had broken out amidships. I went into the deck-house and found the repair parties already working against a fire, but without much success, as the fire increased by leaps and bounds. At this time, a Telephone Talker said "Central Station says Abandon Ship." As it was evident the fire fighting party had no chance to extinguish the fire, they were ordered to leave the ship. The fire had by then, from all appearances, from aft, isolated the after and forward parts of the ship. I went out on the port side of the quarterdeck, and seeing no boats on that side went over to the starboard side. By this time the stern of the TENNESSEE was burning, and a wall of flame was advancing toward the WEST VIRGINIA and the TENNESSEE from oil on the water from the ARIZONA. I looked around and saw no one else aft on deck and then I dove overboard and swam to the TENNESSEE. On getting on deck of the TENNESSEE I found about ten WEST VIRGINIA people gathered under the overhang of the TENNESSEE's Number Three Turret. As the TENNESSEE people were busily engaged in fire fighting but in no need of any extra help, I took the WEST VIRGINIA people over the starboard side on to the pipe-line to help in extinguishing the fire that had started in the rubbish and trash and oil covered water between the TENNESSEE and Ford Island. Several of our people that were hurt were loaded into a truck and taken to the dispensary. I then brought the truck back to that part of Ford Island opposite the TENNESSEE and kept on with efforts to distinguish the fires among the trash and oil on the water. More and more WEST VIRGINIA personnel kept arriving at this point, some by swimming, some by hanging on to wreckage, and, I think one whaleboat load.

* * * * *

Lieutenant C. V. Ricketts, the Senior Gunnery Officer aboard, and regular Second Battery Control Officer, who, as his battery was not firing, busied himself with aiding the Damage Control Officer in counter-flooding, in caring for the Captain when wounded, in attempting to get additional ammunition to the Anti-aircraft battery, and was unsparing of himself in his efforts during the action and during the fire-fighting which followed.

Lieutenant F. H. White, D-V(G), U.S.N.R., who, aided by Miller, Doris, Mess Attendant second class, U.S. Navy, was instrumental in hauling people along through oil and water to the quarterdeck, thereby unquestionably saving the lives of a number of people who might otherwise have been lost.

* * * * *



80-G-32422

National ensign flying from stern of USS West Virginia

Because the above named people are particularly mentioned, it must not be construed that the actions and work of their shipmates and associates was any less valuable or less courageous. The entire ship's company is deserving of the highest commendation, both for their work on December 7th and on the days following. All the ship's company, officers and men, ask is another chance at the enemy. Their devotion to duty and their performance of duty have given new meanings to those phrases.

3. IMPRESSIONS AND ACTIONS ON *U.S.S. OKLAHOMA*

Lieutenant Commander William M. Hobby, Jr., wrote as follows:

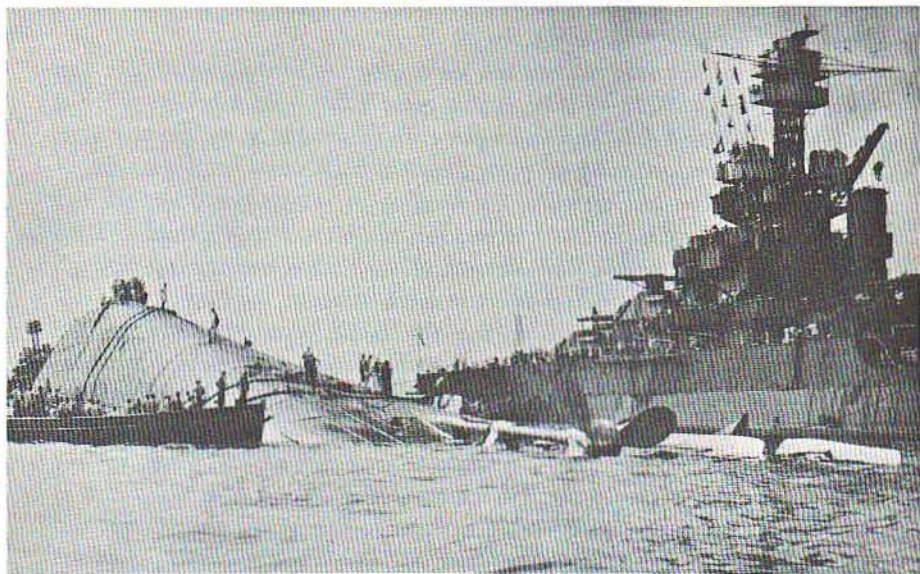
On the morning of Sunday, December 7, 1941, the *OKLAHOMA* was secured at berth F-5, Pearl Harbor, outboard of the *MARYLAND* and starboard side of the *MARYLAND*. Commander J. L. Kenworthy was senior officer on board, and I was second in command. At about 0800 I heard the word over the loud speaker to man the anti-aircraft battery, then shots from an indeterminate direction, then a second time the word to man the anti-aircraft battery for a real attack. As I was going topside the word was passed to man all battle stations. I ran up the starboard side out to the main deck

aft by the break of the deck. Before I reached the main deck aft there was a din of gunfire and explosions from all directions.

I started up the ladder from the main deck aft to the anti-aircraft gun platform on the starboard side; at this point I felt what I believe was the first torpedo hit—a dull thud and a powerful reverberation, on the port side, and the ship began listing to port. I started back down with the idea of getting to Central and directing the flooding of the starboard blisters, but almost immediately there was a second torpedo hit and then a third and the ship listed more; at this time streams of men were pouring up through hatches to the topside. A second or so later, at about the time I was back down to the main deck aft again, came the fourth torpedo hit, and the ship continued to list to port—at least a twenty degree list at this time, I estimate, and still listing. I directed petty officers near me to spread out over the length of the ship and keep the men as orderly and calm as possible. I sighted Commander Kenworthy on the starboard catwalk and made my way to him and told him that I thought the best now was to save as many men as possible, that it was now impossible to make further watertight closures and establish any further watertight integrity. He agreed and we both passed the word to abandon ship. I called to men on main deck aft to attempt to get to work on the loud speaker.

Although there were now hundreds of men on the starboard side, the general conduct of all hands was quiet and calm. There was an explosion around the port side of the forecastle, which I thought was a bomb hit. I worked my way forward and Commander Kenworthy worked his way aft. There was another shock and concussion and vibration and fuel oil splashed in streams over everything topside. This was either another torpedo hit or a large bomb hit close aboard. The ship continued to list over to port, now about 30 degrees, or more, I thought. I entered #1 casemate to see about the escape of men from below to topside. Men were still coming out through casemates, and thence out through gun ports to the catwalk and onto the side. When no more men were to be seen in casemates, I climbed up through a gun port and out over the side; the ship was capsizing and the angle was about 90 degrees. I pulled myself along the side and bottom as the vessel keeled over; the ship finally settled when the mast and stack apparently hit bottom, with an angle of approximately 145 degrees, starboard side uppermost.

I sat on the bottom at about frame 60; hundreds of men were along the hull making their way to the water's edge. Keenum C. W., CBM, joined me and rendered much aid in steadying the men and directing them to swim to the MARYLAND, to the Ford Island Landing, or to a motor launch, depending on the location of the men. The air attack continued and bombs were dropping nearby, but none struck the OKLAHOMA after she capsized. All men who reached the topside were apparently saved, swimming either to the MARYLAND, the shore, or to a motor launch. There were many cases



80-G-33034

USS Oklahoma. *Thirty-one men were rescued by the working force cutting holes through the bottom. USS Maryland is on the right.*

of men aiding others to swim, and in some cases actually towing them to shore or the MARYLAND or a boat. The general conduct of the crew continued to be excellent.

I saw the OKLAHOMA officers and men who boarded the MARYLAND go to the MARYLAND anti-aircraft battery and aid in the anti-aircraft fire on the MARYLAND. I saw Boatswain Bothne acting as coxswain of a motor launch and picking up men and taking them to Ford Island landing. After all others had cleared the hull of the ship, as far as we could see, Keenum and I made our way out to the bow. I discarded shoes and uniform, expecting to swim in, at this juncture Boatswain Bothne approached in a motor launch, having already landed one load of men. There were about fifty men in this second load. Keenum and I entered the motor launch. The boat made the dock and unloaded all but Boatswain Bothne, four men, and myself. OKLAHOMA men on the dock were handling lines of a tanker which was getting underway, and some of them boarded the tanker upon being told that the tanker needed more men to go out on her. Other men on the dock were asking where they could go to aid in anti-aircraft fire; all seemed to be thinking of how to fight rather than seeking safety.

I remained in the motor launch, and with Boatswain Bothne and four men patrolled up and down the line facing the OKLAHOMA, WEST VIRGINIA, and ARIZONA, looking for survivors to pick up from the water. By this time it appeared that all men had reached shore and the water

was clear of men. We patrolled for about twenty minutes (estimated), until it seemed that the attack was over, or at least that no more bombs were being dropped that we could see, and we could see no more enemy planes. Then we took the motor launch across the harbor to the Mine Dock landing. Here were survivors, other boards, and Navy Yard personnel along the dock. A truck driver volunteered to drive those of us without clothes to the Receiving Station for clothes. We drove there, and I obtained dungarees, shoes and a white sailor's hat. Then the truck returned me to the landing. I commandeered a motor boat and returned to the hull of the OKLAHOMA. Others were on the OKLAHOMA and still more were coming aboard as I arrived. With several men I went over the hull discussing possibilities of salvaging those still alive inside. Commander Kranzfelder, Lieutenant Commander Benson, Lieutenant Commander Henderson were now on the hull. Also Boatswain Bothne and twenty or thirty men from the OKLAHOMA who had returned. I believe that all returned at approximately the same time. Thenceforth we concentrated on salvage work for the rescue of survivors trapped inside. I remained on the hull or inside the hull for the next sixty hours as senior OKLAHOMA officer on salvage work. A detailed report of salvage work is submitted as a separate report.

Boatswain A. M. Bothne wrote:

About 0800 December 7, I was on the after end of the superstructure deck. The first indication I had of the attack was when Hilton, BM1/c started to call for the sixth division men to man the anti-aircraft battery. I saw three torpedoes hit the OKLAHOMA, one forward at about frame 35 or 40. The ship started to list immediately when the first torpedo hit. After the third torpedo hit the ship listed to an angle of about 45 degrees. All lines to the MARYLAND were still holding with about 150 or 200 men sitting on the starboard blister ledge. The ship seemed to be stationary in that position for a short interval when another torpedo hit the port side, then the lines to the MARYLAND carried away and the OKLAHOMA rolled on over to about 135 degrees. I swam out to #3 motor launch and started rescuing the men who were left on the edge of the hull.

The fire burned around the CALIFORNIA and was extinguished. With the aid of a water barge and tug #31 the fire around the WEST VIRGINIA was brought under control. I then noticed activity on the bottom of the OKLAHOMA and reported to Lieutenant Commander Hobby to aid in rescue and salvage work.

Chief Machinist, Second Class, W. F. Staff wrote as follows:

Sunday morning at 0750 on 7 December 1941, I was in the Carpenter Shop when the general alarm was sounded. I immediately went along the starboard side of the third deck to my battle station. I felt several explosions

on the way to Repair II. When I got to Repair II I took my phones and went to get a flashlight but they were locked up so I went on down to A-28, the forward air compressor room, and started to set Zed.

There was an electricians mate and a fireman also Centers, J.P., MM2/c and myself in the compartment. When the lights went out the fireman and electricians mate started to go out the zed hatch which had been set by repair II; they were yelling and screaming. Water and fuel oil was coming down the hatch. I tried to stop them from opening the hatch but couldn't.

The next thing we knew we were all under water and oil. Centers and myself were the only ones that came up.

It took us some time in the dark to find out that we were back in A-28 and the ship had capsized.

We then tried to get into the linen storeroom. It was on the starboard side and was out of the water. A-28 was about half full of oil and water. The storeroom was locked and it took several hours to beat the lock off with a wrench that we found on the air compressor. We could not get into the storeroom as gear must have wedged against the door.

We tried to get into a small storeroom which was on the overhead, but it was also locked and we could not get into position to beat the lock off.

About Monday noon we heard tapping and we answered them. After so long they were right overhead and we could hear them talking. When they started to cut into us it let out our air and we were under air pressure; the water came up as our air escaped.

The water came up and ran out the hole they were cutting and they left. But we still had about six inches of air space.

We tried the linen room again and it gave a little. Apparently the water had cleared the gear from the door, we went in and started tapping again.

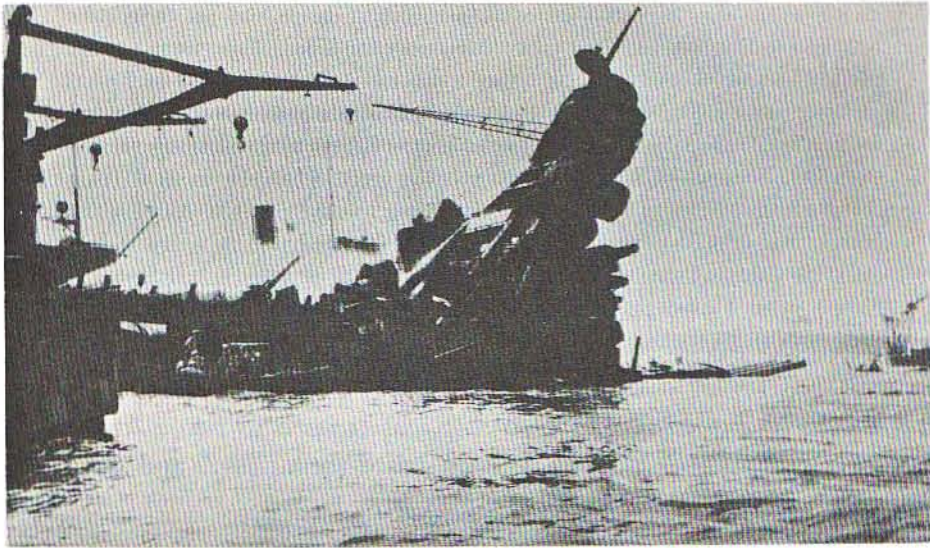
The rescuers soon got out to us again and we left the ship at 0200 Tuesday morning.

I wish to thank these men for their hard work in rescuing us: Keenum, CBM, Thomas, SF1c, and Harris CM2c.

4. IMPRESSIONS AND ACTIONS ON *U.S.S. ARIZONA*

Aviation Machinist's Mate, Third Class M. T. Hurst wrote as follows:

When the attack on Pearl Harbor began on December 7, 1941, I was on the quarter deck smoking a cigarette. The first bit of excitement I noticed was the Officer-of-the-Deck and the Junior O.D. standing near the Admiral's gangway, pointing and looking west toward Ford Island. Out of curiosity I went over to the life line to see what everyone was looking at. I saw a large column of smoke going up into the air. At this time the O.O.D. told the boatswain's mate of the watch to sound general alarm which he did



80-G-32608

Rescue party alongside Arizona.

on the double. At the time I thought there was a fire on one of the ships or the air station so I went up into #5 casemate to see what was going on.

It was now that the first word was said about an air attack and then everyone seemed to think it was the Army having a mock attack. I watched several planes sweep over Ford Island and when one went over our fantail I saw the red spot on the wing. Our guns then opened up and it first struck me that we were being attacked. I then went back on the quarter deck and just as I reached the armor deck, general quarters was sounded. My general quarters station was not down there so I started back up the ladder which was made a little difficult by a marine officer fighting his way below.

When I reached main deck there was a fire in the Executive Officer's office. Lane, an aviation radioman, Burns, our yeoman, and I started to get a hose to fight the fire. At this time a fire broke out on the quarter deck, and we dragged the hose out there. Lane screwed on the nozzle while I went to turn on the water at the plug forward of #3 turret.

A bomb then hit somewhere forward of me and knocked me down. I finished turning on the water and started out to where I was to help Lane, but he was no longer there. I noticed there was no water coming out of the nozzle so I started to go forward and saw many marines and sailors lying about the deck badly burned. I tried to help one but he was pretty well blown up.

Someone yelled, "Get out of here," so I picked up someone and started to carry him off. Someone said to let him go since he was dead. It was pretty hot then and several men were running around badly burned, so with

a couple of other fellows, one of them Burns, I helped to get these men over to the life line and told them to go over the side. I then went over to the blister and jumped into the water. I was near a mooring quay so I went under it and took off my pants and socks. My shoes got separated from me some place. From there I swam to the motor launch tied up along side of the quay. Someone helped me out onto the quay. Then we were all busy for some time helping others out and putting injured into the launch. The launch was going to the SOLACE so when it started pulling away I dove over the side and started to swim to Ford Island. It was the farthest and fastest swim I have ever made. Upon reaching land we were directed to the bomb shelter where I remained until taken over to the Receiving Barracks. I stayed there until coming to Ford Island.

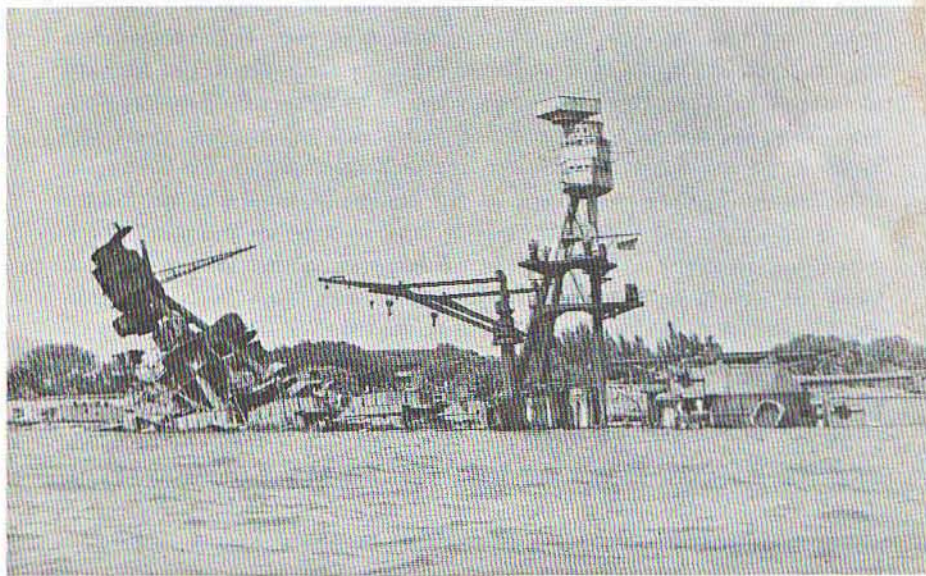
It should be explained that each ship was moored to two quays which were near Ford Island. Most of the men called them "keys" and the statements of survivors often refer to them as keys.

Seaman First Class W. W. Parker wrote as follows:

On December 7, 1941, about 7:50 a.m. I was on the blister top of the USS ARIZONA when a squadron of Japanese dive bombers began to bomb the air-drome on Ford Island. I stood there a few minutes and watched, thinking it was a bombing practice. Air raid sirens began to blow. I went up to the battery on the double time and manned gun one. After one round, the gun captain ordered us to take cover when they began strafing us with machine gun fire. All took cover with the exception of three of us who kept on firing. We still did not understand what was taking place. Then we saw the WEST VIRGINIA toped. Next, we saw a flight of horizontal bombers that began to drop their bombs. One bomb hit in front of the forward turret. We think it went down in the magazine for the whole forward part of the ship blew up and caught fire. One of the other men and I must have been blown over the side of the galley deck. About that time a bomb went down the stack. That's all I remember until I was on the quarter deck and aware that they were taking men from the quay over to Ford Island in whaleboats. About that time all the ships were getting organized and were putting up a heavy barrage of fire. The Japanese planes were not doing so good then for they were being driven off. I saw four or five planes shot down. There were two planes shot down by our machine gunners who were on security watch on the ARIZONA. None of the ammunition we fired exploded in the air; why I do not know unless it was because the fuse was not set. This is all I can actually say that I saw.

Ensign H. D. Davison wrote as follows:

It was just before colors, in fact I had already sent the messenger down to make the 8 o'clock reports to the Captain. Then I heard a dive bomber



USN NR&L (MOD) 39736

Arizona sunk.

attack from overhead. I looked through my spyglass and saw the red dots on the wings. That made me wonder but I still couldn't believe it until I saw some bombs falling. The first one hit up by the air station. I sounded the air raid alarm and notified the Captain. The Captain and Lieutenant Commander Fuqua came on deck, and the Captain went on up to the bridge. Mr. Fuqua told me to sound General Quarters. About that time we took a bomb hit on the starboard side of the quarterdeck, just about abreast of #4 turret. We grabbed the men available and started dropping the hatches and leading out hose on the quarterdeck.

About this time, the planes that had made the initial dive bomb attack strafed the ship. Mr. Fuqua and I told all hands to get in the marine compartment. It was reported to us that we had a bomb in the executive officer's office. Mr. Fuqua told me to call the center engine room and get pressure on the fire mains. Then he went up to the boat deck. I told the boatswain's mate of the watch to do that. Then I went into the O.D.'s booth to do it myself. Just after I stepped in the booth we took another hit which seemed to be on the starboard side of the quarterdeck just about frame 88. The boatswain's mate and I were trapped in the booth by the flames. We started out of the booth, trying to run through the flame aft on the quarter deck. We could not get through so we went over the lifeline into the water. I was conscious of a sweetish sickening smell to the flame.

After I got in the water my first intention was to go to the quay and then onto the quarterdeck or to swim to the gangway and get aboard. But

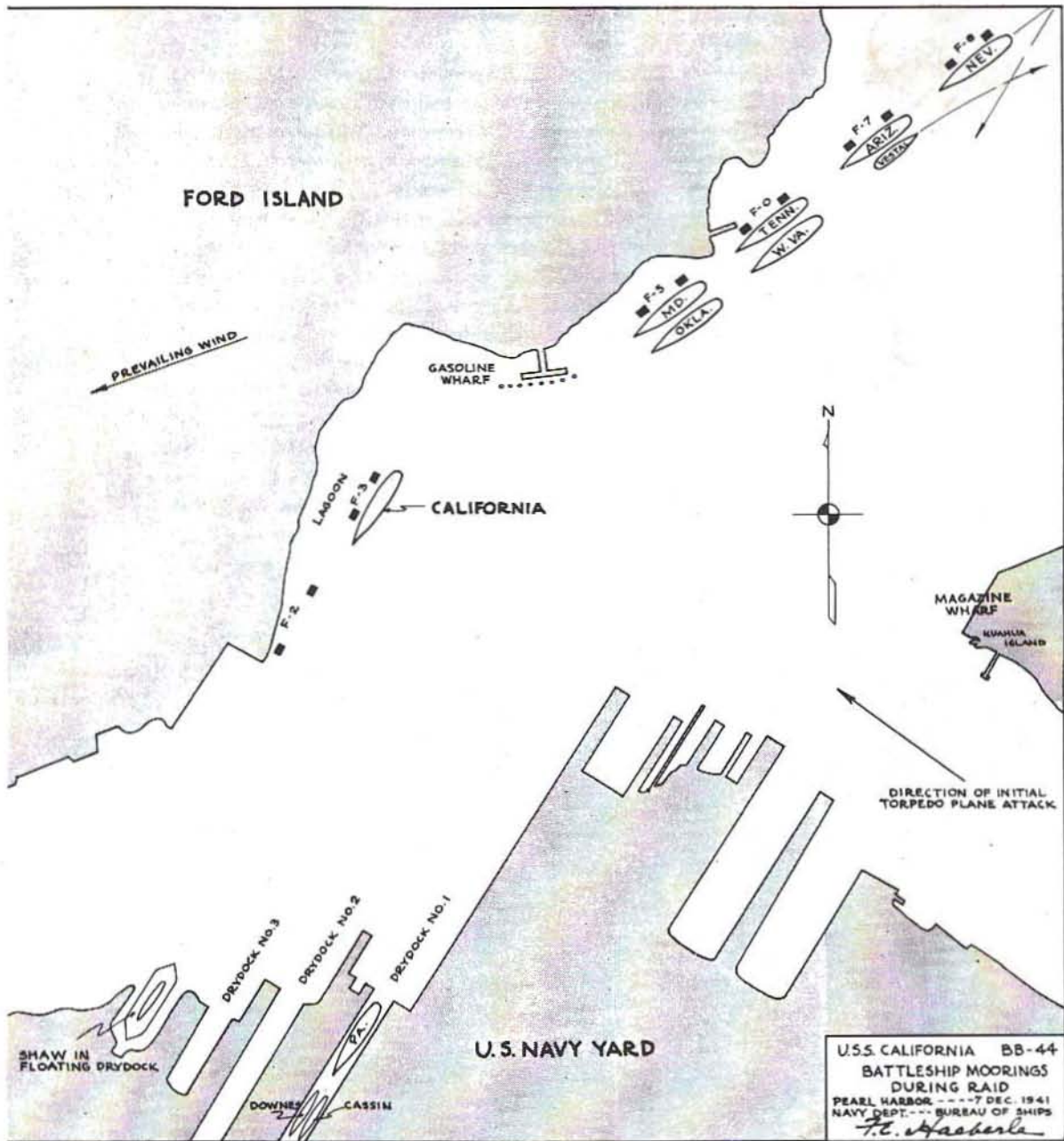
after I took one look at the ship, I decided that it was useless. She had settled down by the bow and appeared broken in two. The foremast was toppled over, she was a mass of flames from the forecandle to just forward of turret #3. I was helped into a motor launch by Ensign Bush and another man. Then we in turn took the motor launch and picked up as many survivors as we could find in the water. We took them over to the landing at Ford Island. There we were met by Air Station Marines who helped us. . . . Ensign Bush and I took the barge which had come up and took it back over alongside the quarterdeck where we gathered another load of injured. Upon our return to Ford Island we noticed three more boats alongside the ARIZONA so we proceeded to the air raid shelter. Then I went up to the dispensary for first aid treatment.

5. IMPRESSIONS AND ACTIONS ON U.S.S. CALIFORNIA

Lieutenant Commander M. N. Little, First Lieutenant and Acting Commanding Officer wrote as follows:

About 0750 or 0755, Sunday, December 7, 1941, I was working in my office when I heard a series of explosions followed by the word passed over the loud speaker system, "Air Raid! Air Raid! Seek Shelter! Seek Shelter!" I rushed from my office and as I reached the door the general alarm was sounded. I paused long enough to order Baldwin, R. M., my Chief Yeoman, to assume command of the Damage Control personnel in Central Station and tell him that I was going to the bridge to take command. I then ran up to the conning tower on the emergency platform. Enroute I noticed several dark gray planes with red wing markings attacking the moored line of battleships. As I reached the emergency platform I heard several heavy explosions and looking aft saw large columns of water arising along the ships moored abaft the CALIFORNIA. I entered the conning tower and found it already partially manned. Lieutenant Fritschmann was in control of the ship's armament. I ordered him to complete the manning of the A.A. Battery as soon as possible, to get up ammunition, and open fire on any enemy planes sighted. I then ordered Main Control to make preparations for getting underway and Central Station to have repair parties set conditions YOKE and ZED throughout the ship.

I next stepped out on the emergency platform and walked around the superstructure in order to see whether I could sight planes attacking from any direction. Within a few minutes I saw a low flying plane approach from the direction of Merry Point, bank steeply and launch a torpedo. The bubble track of the torpedo was clearly visible as it headed for us and struck the ship somewhere slightly abaft the port beam about frame 100. As the torpedo exploded a heavy column of water arose alongside the port side



Battleship Row at the time of attack.

and the ship lurched and began to list to port. I returned to the conning tower where I informed central station that we had been struck by a torpedo on the port quarter in Repair III area and directed Baldwin to counterflood starboard voids as necessary to reduce the list and restrict it to four degrees or less, at the same time cautioning him to watch the draft and not to flood so many voids that he would be in danger of sinking the ship.

I spent the next ten or fifteen minutes alternately in the conning tower checking the progress of counterflooding operations with Central Station and on the emergency platform observing the efforts of the personnel to procure ammunition. There was none available to the A. A. Battery except that in ready boxes on the ready guns and at the time of the first torpedo hit ammunition from the magazines had not been received by the battery. Lieutenant Fritschmann assured me that every effort was being made to get the ammunition supply functioning and I refrained from disturbing him by repeated questioning. After the first torpedo hit it was reported that power was lost on the A.A. hoists and I directed that the ammunition supply be started using hand power. Central Station had reported that counterflooding was in progress and the list had apparently been checked, at least temporarily, when the second torpedo struck.



80-G-32586

Oil fires approaching USS California.

I caught only a glimpse through the conning tower eye port of the track of the second torpedo as it approached but believed that it had struck forward of amidships, about abeam of turret II. I notified Central Station of this second torpedo hit and ordered further counterflooding as necessary to restrict the list of the ship but again cautioned Baldwin not to flood so many voids that he would sink the ship. I also ordered that I be informed of the damage when it was ascertained. The OKLAHOMA which was moored astern of us outboard of the MARYLAND was already listing heavily and was obviously about to capsize. At this time I was more concerned about the possible danger of the ship capsizing than of sinking. I soon received a report from Central Station that further voids were being counterflooded and a report from Lieutenant Fritschmann that the ammunition supply was functioning, although slowly. The list after the second torpedo hit had increased markedly and was about six or seven degrees but apparently checked at that point so I took advantage of the lull to order Lieutenant Commander Eckhoff who was also in the conning tower with me, to assume direction of activities on the Bridge while I took a quick turn about the ship to see personally how matters were going.

I then took a quick turn around the Casemates and Boat Deck. In the course of this round I noted that the personnel on the various stations were on the whole, cool and collected and eager to have ammunition so they could fight back in the event of a recurrence of the attack. After the round of the gun stations I returned to the emergency platform outside of the Conning Tower a few moments before the commencement of the bombing attack.

Just before the bombing attack on this ship Commander Stone, the Executive Officer, appeared on the bridge, having returned to the ship from shore leave at 0845. I informed him of the situation and he thereupon assumed command.

Shortly after Commander Stone's arrival the bombing attack commenced. I was still with him when what appeared to be a whole stick of bombs landed on our starboard side in the water between the ship and the shore. A few seconds later the ship was hit by a bomb amidships on the starboard side. There was a heavy explosion below decks followed by light smoke from the starboard side and later heavy smoke. This bombing was followed by strafing with machine guns. Such guns of our battery as had ammunition and could bear were in action. I informed Central of the bomb hit amidships and ordered Repair I to report to the scene. There appeared to be several recurrent waves of strafing attacks but no further bombing.

I returned to the Captain who was on the Emergency Platform and gave him a brief summary of the damage at that time insofar as I knew it. From there I went to the quarterdeck intending to enter the main deck and reach the scene of the fire which was then raging on the starboard side in the interior of the ship. I undogged the door on the starboard side of the quarter-

deck leading into the main deck but was met by a rush of heavy smoke and heat so intense that it was impossible to enter the compartment. I closed the door and started to enter the Crew's Reception Room hoping to get in that way but found the same conditions existing there. The 2JZ talker of Repair I had left the Crew's Reception Room and was crouched on the platform of the officers' ladder leading from the quarterdeck to the boat deck where his telephone lead would reach. I asked him if he still had Central Station and he said yes that Baldwin wanted to speak with me. Baldwin informed me that he had lost communication with all repair parties save Repair I. I inquired whether Central was intact and personnel safe and he said yes everything was all right there.

I started across to the port side intending to try again to get inside to the main deck but upon my arrival there noted that the fire on the next ship astern had worked down to the oil which formed a heavy coating on the surface of the water and was coming down rapidly toward the CALIFORNIA with the wind which was blowing a fresh breeze from that direction. I returned to the Emergency Platform where I pointed out the approaching fire to the Captain. He left me presumably to confer with Admiral Pye who was aboard by this time and was on the Flag Bridge. Upon his return a few minutes later the Captain directed the Executive Officer to order the crew to abandon ship.

I went immediately to the Conning Tower where I had the JA talker direct Baldwin in Central to order all repair parties to abandon ship and Baldwin himself to evacuate Central Station with the personnel therein via



80-G-10951

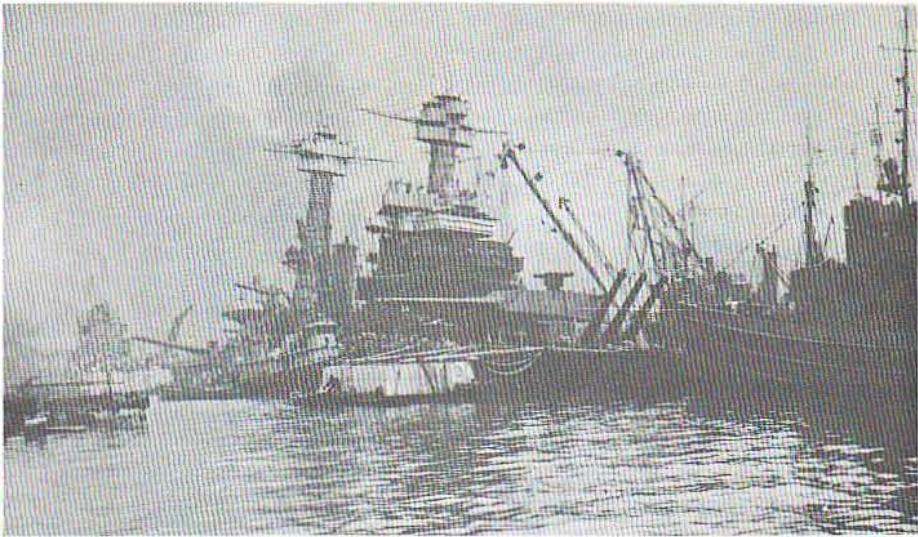
California engulfed by oil fires.

the Conning Tower tube. When I saw that the tube was open and the personnel of Central Station on their way up I left the Conning Tower and went to the forecastle, where I stood by and directed the men to slide down to the Mooring lines to the quay rather than to jump or dive into the water. As the fire came forward on the port side of the CALIFORNIA I slid down one of the mooring lines to the quay where I remained temporarily. Fire passed down the port side setting many fires on the weather decks but the ship as a whole did not catch fire. Seeing that the fire was passing I swam over from the quay to the dredge pontoons and went inshore to where a large group of men were gathered at the water's edge and ordered them to return to the ship in an attempt to salvage her. I myself returned to the quay in a punt and climbed up the mooring lines to the deck where I started to organize the personnel to fight the fires still burning amidships and to prevent the ship from sinking or capsizing.

As I spent most of the time during the actual engagement either on the Emergency Platform or in the Conning Tower I did not witness any acts of extraordinary heroism or bravery because there was no opportunity for such display. On the other hand every man whom I observed was manning his station and performing his duties with coolness and without fear in entire disregard of any danger to which he might be subject. Of the performance of duty of all members of the damage control organization both during the action and in the subsequent rescue work thereto I cannot speak too highly. I cannot single out any one individual from this group for special mention without doing an injustice to all the others. As described by the reports of their leaders the work of all members of the damage control organization was most gratifying and praiseworthy, fully in keeping with the highest traditions of the service.

Private A. E. Senior, U.S. Marine Corps, wrote as follows:

When General Quarters was sounded I went to my battle station, 5 inch/51 Gun #8 in Casemate #8 on the port side. The Battery Officer then asked for volunteers to go below for gas masks. I volunteered, but we could not get down to the storeroom where the masks were stored, so we returned to our gun stations. Again the Battery Officer asked for two volunteers to go below and haul 5 inch/25 A.A. ammunition to the topside because the hoists were out of commission. We went down through the escape hatch in Casemate #6, through the Division Compartment, and finally through the hatch on the starboard side to the 'C-L' Division Compartment. This is where ammunition was being taken out of the hoist which was being operated by hand in the handling room. It was being passed from there to the topside by hand. It was here, at this time that I first saw Ensign H. C. Jones. He was standing on the third deck at the foot of the ladder directing the hand passing of ammunition up the ladder. In passing the ammunition, I was at the top of the ladder from the handling room, and



USN NR&L (MOD) 39737

Tugs assisting in rescue and salvage near California.

only one man was between myself and Ensign Jones. We had been down there about fifteen or twenty minutes when the bomb hit on the starboard side of the ship. The only light we had was blown out when the bomb hit. When it hit, the compartment filled with smoke and I reached for my gas mask, which I had layed on top of a shell box behind me, and put it on. Then someone said, 'Mr. Jones has been hit' so I flashed the flashlight I had on Ensign Jones' face and it was all bloody. His white coat also had blood all over it. Two other men and myself took a hold of Mr. Jones and started up the ladder with him. We got him as far as the M Division Compartment. Then he wouldn't let us carry him any farther. When we tried to he said, 'leave me alone, I'm done for. Get out of here before the magazines go off.' Then there was another shock from below and that's the last I remember until they were pulling me up through the escape hatch in Casemate #3.

6. IMPRESSIONS AND ACTIONS ON U.S.S. UTAH

There are only a few survivor's reports from *Utah*, which was a former battleship converted to a target ship. One of the best was written by the Acting Commanding Officer, Lieutenant Commander S. S. Isquith, which is as follows:

On Sunday, December 7, 1941, while moored at Berth FOX-11, Pearl Harbor, T.H., 3 planes whose identification were not questioned but taken for U.S. planes maneuvering, were observed just as colors were being hoisted at 0800, heading northerly from the harbor entrance. They made a low dive on the southern end of Ford Island and each dropped a bomb.

Immediately thereafter the air was filled with planes clearly distinguished as yellow colored planes with brilliant red Rising Sun insignia on fuselage and red wing tips, flying low at about 100 knots speed and dropping aerial torpedoes and bombs. They appeared to be Henkle 113, or similar type, with very silent engines. The general alarm was immediately rung and word was passed, "All hands to bombing quarters." About this time, 0801, a severe underwater hit, at approximately frame 84, port side, was felt and the ship immediately commenced to list to port. Another underwater hit was felt almost immediately thereafter in about the same general location and the listing of the ship increased immediately to about 15 degrees. At this time I realized that the ship would capsize and word was passed. "All hands on deck and all engine room and fireroom, radio and dynamo watch to lay up on deck and release all prisoners."

All hands were ordered to the starboard side, which was the high side, to escape danger of loose timbers pinning men down. Word was passed for all hands to equip themselves with life jackets but due to the fact that the life jackets were stored in canvas bags in the air castle, it was not practicable for many men to obtain life jackets due to miscellaneous gear stored in the starboard aircastle moving and a bomb explosion in the port aircastle which took place at that time. At about this time the engine room reported that steam had dropped and that they were unable to cut in the drain pumps, that the port engine room was flooded and that the starboard engine room was taking water rapidly, the water at that time being above the high pressure turbine and reduction gear. The lights were still on in the engine room. The engine room watch cleared the starboard engine room. No. 2 fireroom, No. 4 boiler steaming, reported steam dropping rapidly and additional burner cut in to hold steam. The second hit put out all fires. The fireroom watch then abandoned the fireroom, closed the quick closing fuel oil valve, leaving the auxiliary feed pumps operating but slowing down due to lack of steam.

By about 0805, the ship had listed to about 40 degrees to port. Lights were still on. No report had been received from the dynamo room; word was again passed. "All hands on deck and abandon ship over starboard side." The crew commenced getting over the side, the ship continuing to list but somewhat slower. The attacking planes were now returning from a northerly direction flying low and strafing the crew as they abandoned ship. The loose timbers about the decks were moving to port, interfering greatly with the efforts of the crew to abandon ship.

Observing the strafing and the moving of the timbers and loose gear in

the aircastles, I directed that the crew divide into three groups, one group going up the ladder leading from the starboard aircastle to the Captain's cabin, one going up the ladder from the starboard wardroom country to the passage inboard of the Captain's stateroom, and one going up the ladder leading from the starboard wardroom country near the wardroom pantry to the forecastle. A large number of these men escaped through the ports in the Captain's cabin.

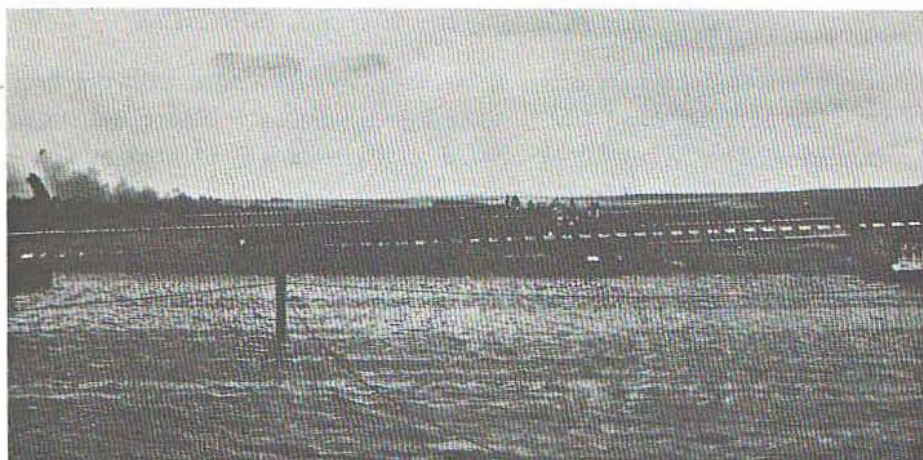
Lieutenant (jg) P. F. Hauck, Machinist S. A. Szymanski, and myself were the last to leave the ship going through the ports in the Captain's cabin. At this time, about 0810, the ship was listing about 80 degrees to port and planes were still strafing the ship. Mooring lines were parting and two motor launches and the motor whale boat were picking up men in the water. Many men were observed swimming to the north and south quays of Pier FOX-11, and as planes were still strafing, the men were ordered to the sides of the quays for some protection.

At about 0812, the last mooring lines had parted and the ship was capsized, the keel plainly showing. All men picked up by ship's boats were taken ashore to Ford Island and boats were ordered to return and pick up any men still swimming about.

On reaching shore on Ford Island, all hands were ordered into the trenches that had been dug there for some Public Works Project, in order to protect themselves from the strafing planes. Noting that many men were injured and wounded, Commander G. H. Larson, (MC), U.S. Navy, with Kerns, Jean W., HS1c, U.S. Naval Reserve, who had brought a first aid kit ashore with him, set up a first aid station in the quarters of Lieutenant Church (CEC), Building No. 118, Ford Island. Commander Larson, Gray, PhM, and two other pharmacist's mates proceeded with the first aid treatment of all men who had been injured and necessary cases were sent to the Naval Air Station Dispensary in Naval Air Station trucks supplied for this purpose.

While in the trenches, a short time later, knocking was heard on the ship's hull. At this time planes were still strafing and dropping bombs. I called for a volunteer crew to return to the UTAH to investigate the knocking heard. Machinist Szymanski and a volunteer crew consisting of MacSelwiney, CMM, and two seamen, names unknown, returned to the ship and located the tapping coming from the void space V-98, under the dynamo room. They answered the knocking with knocks on the outside which in turn were answered by knocking within the ship.

Realizing that there were personnel trapped inside the ship, Machinist Szymanski obtained a cutting torch and equipment from the U.S.S. RALEIGH and cut a hole in the bottom of the ship and rescued Vaessen, John B., F2c V-6, USNR, who reported that he had been the last man in that part of the ship. He was on watch on the forward distribution board when the ship was hit and the voltage commenced dropping. He cut out



80-G-19960

Rescue parties working on openings in the hull of capsized USS Utah.

power forward and then aft in an endeavor to maintain lights in the ship. Finally the lights dimmed and went out and he, then being unable to escape to the deck, proceeded to the dynamo room, entered the starboard dynamo work shop, opened the manhole to compartment V-98 and climbed up to the ship's bottom taking his wrench and flashlight with him.

* * * * *

All officers and enlisted personnel are to be commended for the initiative and prompt execution of all orders during the entire period and I am of the opinion that the coolness and lack of excitement as well as the small loss of life was due to a great extent to the training they had received during the previous nine weeks of duty as a bombing target. The boat crews acted in a manner well worthy of commendation, picking up men from the water during the entire strafing period.

The reports of survivors agree with the report given above. It should be mentioned here that *Utah* did not open fire against the Japanese planes because the guns were all inoperative. By reason of acting as target ship in the current operations all of the anti-aircraft guns were covered with steel housing while the smaller machine guns were dismantled and stowed below decks.

There were 58 men lost on *Utah*. The majority of those lost were killed or injured by 6 x 12 timbers which covered the ship in two layers; the swim to Ford Island was considerable, although shipmates helped each other in getting through the oily water.

7. THE PERFORMANCE OF U.S.S. NEVADA

Nevada was moored just astern of *Arizona*. In accordance with the fleet doctrine she got underway and headed for the entrance before the order was cancelled. The senior officer aboard at the time was Lieutenant Commander Thomas of the Naval Reserve.

The Japanese planes were first seen at 0801 and General Quarters was sounded immediately. The Captain's official report indicates that the machine guns forward and aft opened fire at 0802 and the 5-inch opened fire about 0803 with local control as it was deemed inappropriate to wait for director control personnel to reach their stations in the top of masts.

The machine guns fired effectively at enemy torpedo planes approaching from the portside. One plane was brought down by machine gun fire and fell about 100 yards off the port quarter. Another plane dropped a torpedo which struck *Nevada* on the port bow. The 5-inch guns on the portside downed a torpedo plane before it released its weapon.

About 0830 all guns opened fire again and continued until 0915 when the attack slackened. The official reports differ as to the number of enemy planes shot down, but as many as five were reported. Some of these were dive bombers which attacked *Nevada* while she was underway.

She got underway at 0840 and headed southwest. When abreast Drydock Number One she was heavily attacked by Japanese dive bombers. At this time Admiral Furlong, standing on the deck of his doomed flagship, *Oglala*, ordered the ship to seek refuge in the Middle Loch. He feared that she might block the entrance channel, especially if the enemy had dropped mines in that area as then seemed probable. Accordingly, he ordered two tugs to assist *Nevada*, and she was grounded near the entrance at Waipio Point.

There were no more Japanese attacks. *Nevada* had fought gallantly, and had received one torpedo hit and at least six bomb hits. Her crew was magnificent. The Captain, Captain F. W. Scanland, reported as follows:

The Commanding Officer finds it extremely difficult to single out individual members of the crew as deserving of special praise. Every officer and man aboard, without exception, performed his duties in a most commendable manner and without regard to personal safety. The courage and spirit of the anti-aircraft gun crews, where bomb hits caused most of the casualties, was of the highest order. Every man on the ship carried on in accordance with the best traditions of the service.

It is considered that Lieutenant Commander Francis J. Thomas, U. S.



80-G-177113

USS Nevada beached.

Naval Reserve, the Commanding Officer during the greater part of the attack, is deserving of special commendation. This officer got the ship underway within forty minutes and headed down channel. Although the NEVADA had been torpedoed and had received one or two bomb hits, Lieutenant Commander Thomas correctly decided that it was urgently necessary to get underway to avoid destruction of the ship due to the proximity of the ARIZONA which was surrounded with burning oil and afire from stem to stern. Throughout the action Lieutenant Commander Thomas coolly and calmly fought the ship despite many bomb hits and casualties. After the attack and for two days afterward, Lieutenant Commander Thomas performed damage control duties in a most creditable manner although near the point of exhaustion by his two days of strenuous work.

In addition, the Captain named the following for special recognition:

Chief Boatswain E. J. Hill, who was killed in action.

Ensign J. K. Taussig, Jr., who, although badly wounded, refused to leave his post.

Ensign Taylor, who was in charge of a 5 inch anti-aircraft battery and was outstanding in leadership.

Among others he mentioned Lieutenant L. E. Ruff, Chief Quartermaster R. Sedferry, Boatswain's Mate, First Class A. Solar, and Seaman First Class, W. F. Neudorf, Jr.

He ended with the following:

The Commanding Officer believes that all members of the crew of the NEVADA who were aboard during the attack are deserving of special praise, and the courage and spirit of the crew both during and after the attack cannot be over-emphasized. The performance of duty of the Medical Department under the difficult conditions is most gratifying, and the members of that Department exhibited the same courage and devotion to duty under fire as any other member of the crew. The dead and wounded were quickly and effectively handled.

8. IMPRESSIONS AND ACTIONS ON *U.S.S. MARYLAND*

The Commander Battleships, Rear Admiral W. S. Anderson, wrote as follows:

On the occasion of the treacherous surprise attack on Pearl Harbor on December 7, 1941, battleship ready guns opened fire at once. They were progressively augmented as the rest of the anti-aircraft battery was manned as all battleships went to General Quarters with commendable promptness. This resulted in an early and great volume of anti-aircraft fire. Considering all the circumstances, including the necessity for local control in the early stages of the attack, the control of fire was gratifyingly good as attested by the fifteen to seventeen enemy planes which were brought down. That such an anti-aircraft fire could be inaugurated and sustained in spite of the difficulties resulting from early damage by torpedoes and bombs and great and menacing oil fires is a tribute to the courage, constancy, efficiency and resourcefulness of the officers and men. Not only were they maintaining a sustained and aggressive fire whenever the enemy threatened, but they were engaged in valiant efforts to save the ships, prevent their capsizing and fighting large and menacing oil fires, enveloped in dense clouds of smoke. Severe structural damage and flooded magazines made replenishment of ammunition a serious problem, which in overcoming great courage and ingenuity was exhibited.

* * * * *

When the attack first started, the Chief of Staff, Operations Officer and Assistant Material Officer were on board the flagship, MARYLAND. Other members of the Staff returned to the ship as soon as practicable, all arriving on board either during the action or shortly thereafter. Commander Battleships arrived on board about 0905 and immediately took general charge not only of the salvage and rescue work of the battleships but also assisted in retransmitting messages received from the Commander-in-Chief addressed to various light forces.

* * * * *

Burning oil from the ARIZONA was being carried on the surface of the water surrounding the TENNESSEE-WEST VIRGINIA group and at times on the MARYLAND and capsized OKLAHOMA. The YG17 upon the initiative of her commanding officer, Chief Boatswain's Mate, L. M. Jansen, U.S. Navy, took aggressive action in fighting the fire, taking station at the quarter of the WEST VIRGINIA and maintaining her position there in spite of dense smoke and flame. Commander Battleships directed the TERN to assist and later when the WIDGEON reported to assist in the rescue work on the hull of the capsized OKLAHOMA, directed that vessel to fight the fire. Later, the BOBOLINK was also directed to assist. These vessels kept the fire under control throughout the night and with the assistance of the NAVAJO on December 8 succeeded in extinguishing the fire in the WEST VIRGINIA. These vessels were then directed to fight the fire in the ARIZONA which was gotten under control before dark the night of December 8.

The CALIFORNIA was listing dangerously to port. The NEVADA, which had gotten underway from her berth, and had been bombed in the channel, was beached in order to prevent sinking or capsizing.

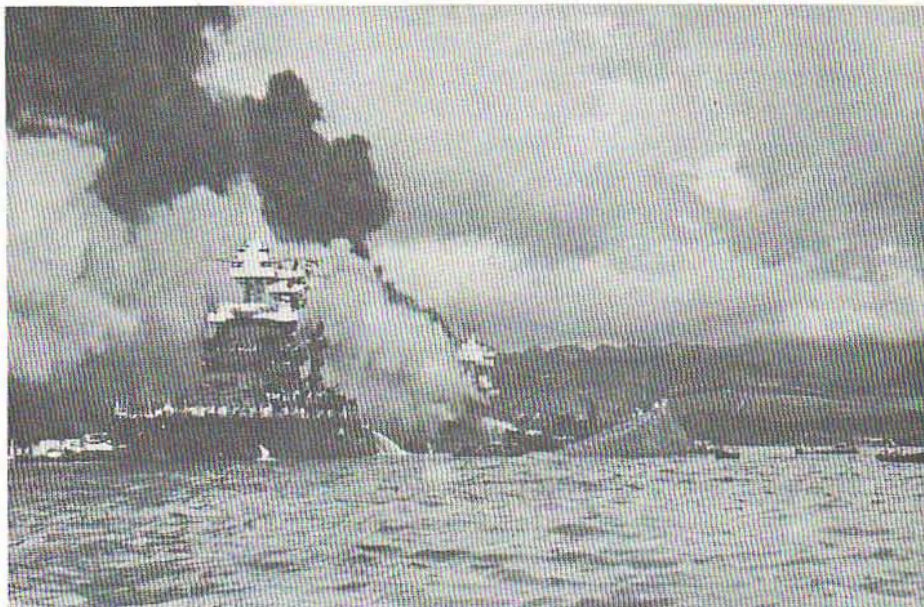
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The TENNESSEE was pinched between the WEST VIRGINIA and the forward interrupted quay. There is no evidence of excessive strain of the ship's structure. Armor bolts have been examined and found tight.

MARYLAND was struck by a light fragmentation bomb on the fore-castle deck forward, which blew a hole about 12 feet by 20 feet in the deck, and caused minor structural damage in the compartments on the main deck below. This has been repaired.

A 15-inch A.P. bomb entered the water on the port bow close aboard, and pierced the shell at the twenty-three foot water line, near frame 11, exploding in compartment A-103-A, sail and awning stowage, causing widespread structural damage and flooding. Repairs are underway to make the ship seaworthy.

The torpedo air compressor rooms were flooded incident to this hit, placing both compressors out of commission. A steam air compressor has been installed in the ship to provide H.P. air until these compressors can



80-G-32706

Maryland and capsized Oklahoma with West Virginia's masts visible in the background.

be repaired. Small arms and .50 caliber machine gun magazine was flooded by the ship.

* * * * *

Information available at present indicates that machinery and fireroom spaces have incurred little or no damage from explosion or fire. On the NEVADA, OKLAHOMA, ARIZONA, CALIFORNIA and WEST VIRGINIA the engineering plants are submerged.

The fires in the forward portions of the WEST VIRGINIA and ARIZONA have caused warping and collapse of a considerable portion of structure.

* * * * *

The need for adequate splinter protection for topside personnel was vividly demonstrated. For example, the protection afforded by the King Board bulkheads provided considerable protection so far as it went. These bulkheads were pitted by many .50 caliber bullets and fragments. In no case were the bulkheads which were inspected holed. However, the protection afforded was inadequate. There should be gun shields, or better still, gun turrets. In the case of the NEVADA, a bomb hit the boat deck and wiped out most of the personnel because no protection was afforded from inboard.

The need for splinter protection with lateral, all around, and overhead

protection has been stressed by Commander Battleships in previous correspondence and the attack on Pearl Harbor served to emphasize its urgent necessity.

* * * * *

Rescue work on the hull of the capsized OKLAHOMA was initiated by Commander Battleships and directed by Commander E. P. Kranzfelder and Lieutenant Mandelkorn of Commander Battleships' staff, assisted by officers and men of the OKLAHOMA, men from the RIGEL and Navy Yard Pearl Harbor and fire and rescue parties from the battleships. As a result of these efforts 32 men were rescued alive from the hull of the OKLAHOMA.

* * * * *

The following named Division Commanders and Commanding Officers were killed:

Rear Admiral I. C. Kidd, U.S. Navy, Commander Battleship Division One.

Captain F. Van Valkenburgh, U.S. Navy, Commanding Officer, U.S.S. ARIZONA.

Captain M. S. Bennion, U.S. Navy, Commanding Officer, U.S.S. WEST VIRGINIA.

Conduct of personnel. In separate correspondence Commander Battleships has submitted to the Commander-in-Chief a report of the distinguished conduct of various individuals, as well as the ships' companies in general. Commander Battleships cannot, however, conclude this report without paying homage to the universal exhibition of courage and magnificent fighting spirit by absolutely all the personnel of the battleships. Their conduct was in accord with the highest traditions of the Service.

The Commanding Officer, Captain D. C. Godwin reported:

All anti-aircraft batteries were promptly manned at the beginning of the attack. The machine gun battery placed torpedo planes under fire immediately, it being believed that the first two such planes approaching this ship and the OKLAHOMA met destructive fire. All A.A. batteries were employed against the dive bombing and strafing attacks which followed the torpedo attack. The approximate amount of ammunition expended is as follows:

5"/25—450 rounds

1".1—4500 rounds

.50 cal. M.G.—2500

9. IMPRESSIONS AND ACTIONS ON U.S.S. TENNESSEE

The Captain of *Tennessee*, Captain C. E. Reardan, wrote:

At about 0755, planes, observed to be Japanese by their markings, were seen dropping bombs on Ford Island. This ship went to General Quarters and started setting condition Zed. Immediately, after the bombing of Ford Island, planes began torpedoing and bombing the battleships and other ships in the Harbor. This ship opened fire with 5" 25 caliber, 3".50 caliber, and .50 caliber machine guns about five minutes after the first attack. Orders for sortie were received but later cancelled for battleships. This ship was ready to get underway with both plants and 6 boilers about 0930. Shortly after the attack began, the OKLAHOMA, WEST VIRGINIA, and CALIFORNIA received torpedo hits. The OKLAHOMA listed over and in about 10 minutes capsized. The WEST VIRGINIA listed heavily but was righted by counter flooding. The CALIFORNIA listed. The ARIZONA received several large bomb hits at least one of which apparently penetrated the magazines. There was a large explosion forward. The foremast fell forward and burning powder, oil, and debris was thrown on the quarterdeck of the TENNESSEE. The ARIZONA settled rapidly by the bow. The NEVADA got underway, but was struck by bombs and torpedoes and grounded in the channel. Large fires were raging around the ARIZONA and WEST VIRGINIA. The ARIZONA was moored to quays about seventy-five feet astern of the TENNESSEE and the WEST VIRGINIA was moored to the TENNESSEE. The burning powder, oil, and debris from the ARIZONA explosion plus the intense heat from the fires started fires in the stern and port quarter of this ship. These fires and the subsequent wetting caused considerable damage to the wardroom and officers' quarters in this vicinity. The fires were brought under control about 1030.

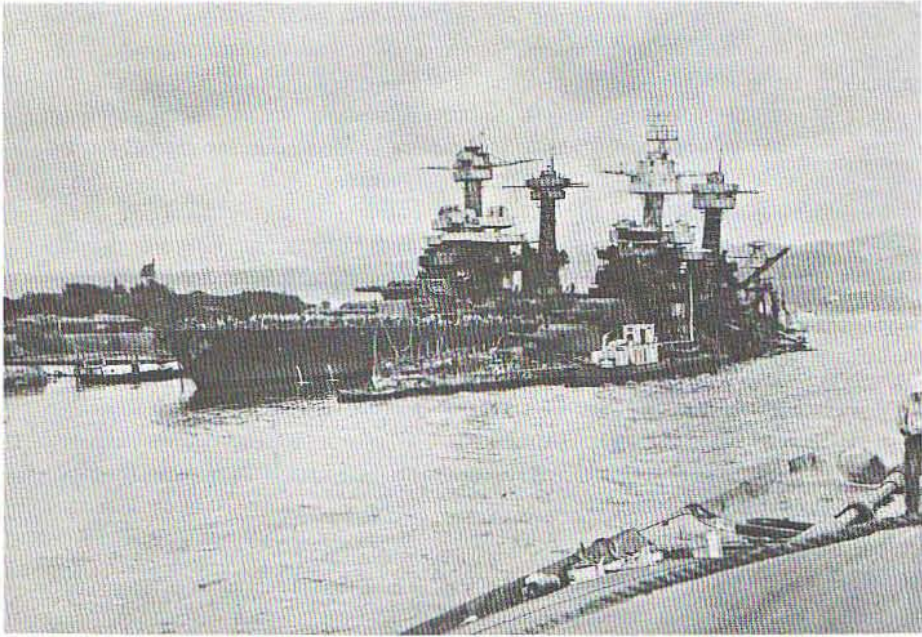
* * * * *

There are 21 blanked off ports in the area which was exposed to great heat. Of these blanked ports the welding pulled apart due to the distortion of the shell plating. The regular ports in this area had the lenses fused, rubber gaskets burned, and the canvas stopwater between the port frame and the side of the ship destroyed. Except in small isolated cases, there was no burning of linoleum. This was probably due to the fact that the heat was above all linoleum rather than under.

* * * * *

The following ammunition was expended during the battle: 760 rounds 5"/25 A.A. common, 180 rounds 3"/50, 4000 rounds 50 caliber machine gun.

* * * * *



80-G-36822

Tennessee and West Virginia with capsized Oklahoma in foreground.

The conduct of the officers and crew of the TENNESSEE was uniformly in accordance with the highest traditions of the Service. Not only did they fight the battle with calmness and deliberation but for the next twenty-four hours they fought the oil fires in the ARIZONA and WEST VIRGINIA which threatened to destroy the TENNESSEE. The ARIZONA was eighty feet to windward and her burning oil was a real menace to this ship; the WEST VIRGINIA was alongside with her forward magazines in danger of explosion; nevertheless, the crew carried out their gunnery and damage control duties as if at drill. The Commanding Officer considers that the conduct of the following officers was especially distinguished:

1. *Lieut-Comdr. John W. Adams, Jr., U.S. Navy:*
As Gunnery Officer and temporary Commanding Officer he fought the ship with a calmness and precision that was an inspiration to the entire ship's company.
2. *Lieutenant Robert R. Moore, U.S. Navy:*
As senior Damage Control Officer aboard he carried on all of his duties in an extremely calm and efficient manner.
3. *Captain Chevey S. White, U.S. Marine Corps:*
Acting as Air Defense Officer, he displayed outstanding coolness and courage during the engagement. While exposed to enemy bombing

and strafing attack at his unprotected battle station he directed the fire of the A.A. battery in a calm and efficient manner.

4. *Ensign William S. Thomas, D-V(G), U.S.N.R:*

As A.A. Group Control Officer, while exposed to enemy bombing and strafing attack in an unprotected battle station, he carried out his duties in a calm and efficient manner.

5. *Ensign Donald M. Kable, U.S. Navy:*

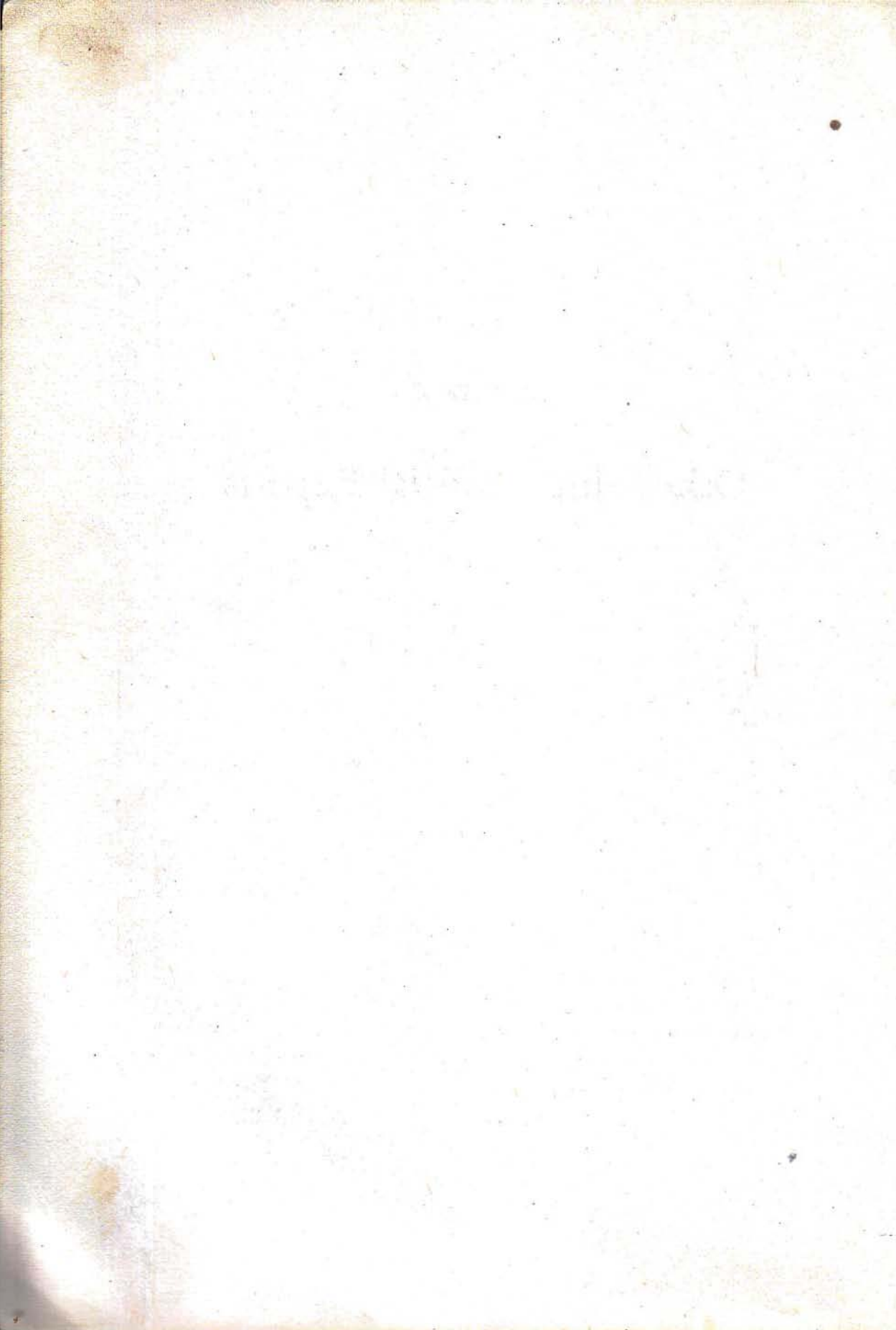
As .50 caliber machine gun Control Officer, he directed the fire of his guns while being strafed by enemy planes until he was so seriously wounded that he was carried below.

6. *Chief Boatswain Lewis W. Adkins, U.S. Navy:*

In charge of the after repair party, his leadership and heroic conduct while fighting the fires contributed much toward saving the ship from destruction. Throughout the attack he was in an exposed position and continued to fight the fires until they were brought under control.

CHAPTER X

Other Ships' Official Reports



CHAPTER X

Other Ships' Official Reports

1. DESTROYERS

Bagley was at the Navy Yard and witnessed the action over Hickam Field, believed at first to be Army bombers. At about 0758 *Bagley* saw torpedo planes attack *Oklahoma* from a height of only 50 or 60 feet. The ship went to general quarters, opened fire at once with forward machine guns, and saw one plane drop and its torpedo land in a mud bank ahead of *Bagley*. *Bagley* shot down, or saw shot down, several Japanese torpedo planes. Although limited by Navy Yard work *Bagley* was able to get underway at 0940 and patrolled at sea near the entrance.

Blue saw *Utah* torpedoed at 0800, and sounded General Quarters. Although undergoing buoy upkeep, she prepared to get underway. At 0805 she opened fire with 50 caliber machine guns, and about two minutes later with 5-inch guns. The ship got underway at 0847 and continued firing at enemy planes while steaming out of the harbor. *Blue* passed the channel entrance buoys at 0910 and proceeded to the patrol station of sector three. Here *Blue* claimed one midget submarine, and possibly two more, due to depth charge attacks. Oil slick and air bubbles were in evidence.

It should be related that the Acting Commanding Officer of *Blue* was Ensign Nathan F. Asher, only two years out of the Naval Academy. The officers aboard were in large part Reserve Officers. The ship got underway promptly, opened fire with its machine guns at once, and got the 5-inch anti-aircraft battery firing within a few minutes. They shot down at least one Japanese plane, probably sank one enemy submarine, and acted as screen for fleet cruisers searching for the Japanese Fleet. When the gun captain of number 1 gun went to repair the ammunition hoist of number 4 gun he got on his knees and prayed, "Oh, Lord! Oh, Lord! Make this ammunition hoist work just this once." While he was praying with tears coming from his eyes, a tall colored man stationed in the handling room looked down and said, "Why, Smith, you got the oil turned off."

Helm was enroute to the deperming area in the West Loch at 0726. Her



80-G-16871

USS Shaw *exploding*.

crew saw the Japanese planes attacking Ford Island at 0759, before going to General Quarters. Although ammunition was at hand the forward machine guns did not open fire on the torpedo planes that passed over the ship because these guns did not bear and were in a state of preservation. However, fire was opened at 0805 by the after machine guns and were followed shortly by the forward guns. This was followed at 0807 by firing from the 5-inch battery. A Japanese torpedo plane was observed to catch on fire and crash-land near Hickam Field.

Helm changed its destination and put out to sea, ultimately to act as a screen for cruisers. In the meantime she sighted a periscope near the entrance. The submarine appeared to be fast on a reef but it escaped and submerged. A torpedo passed close to *Helm* and its plates were sprung due to near misses of light bombs and constant strafing.

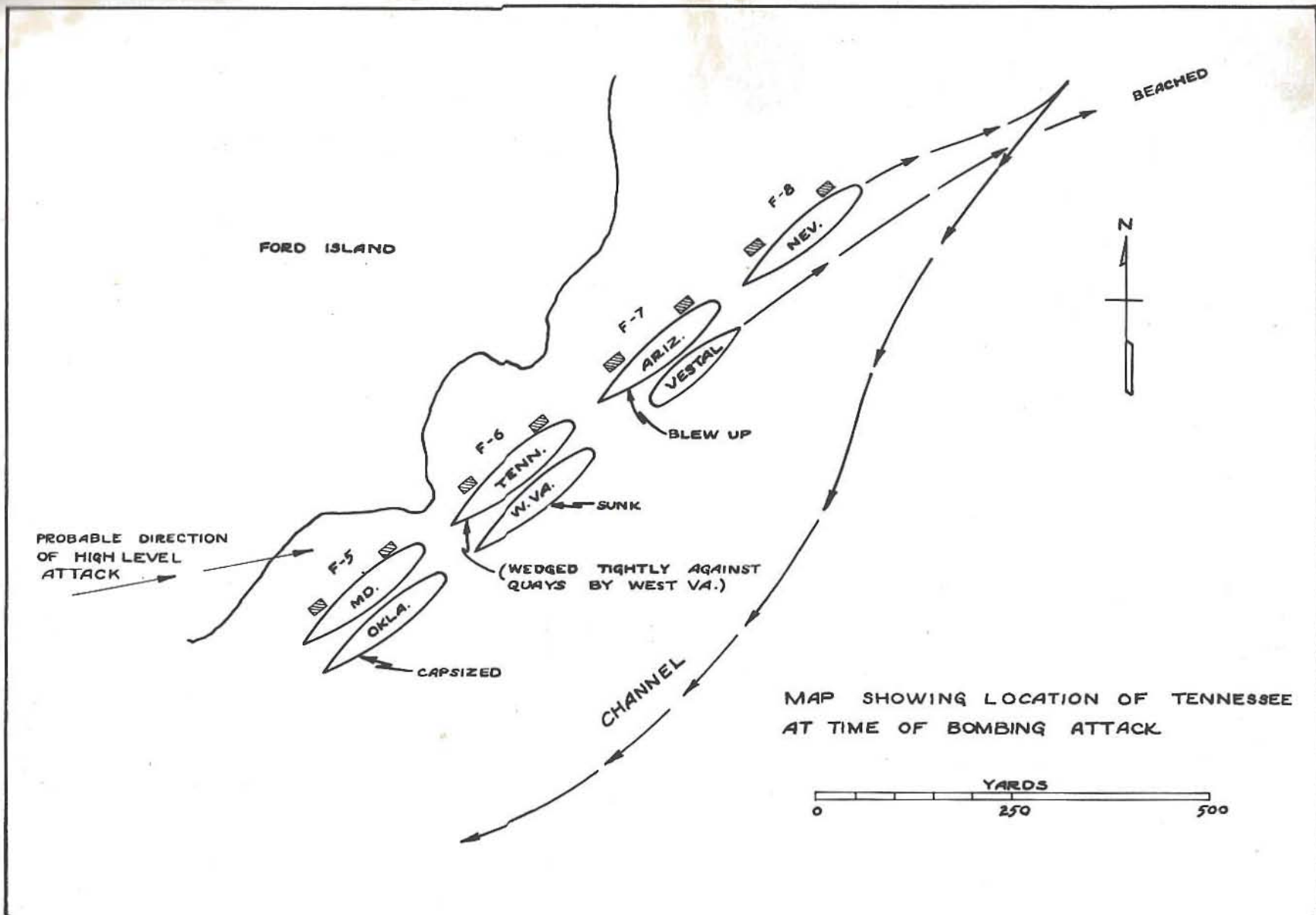
Jarvis was at the Navy Yard and witnessed the torpedo planes attacking the battleships at 0759 and immediately went to General Quarters. Promptly the anti-aircraft batteries were manned and the machine guns opened fire at 0804. At 0805 the number 3 five-inch gun joined the action, and all guns were in use by 0815.

Shaw was in *Floating Drydock Number Two* and eventually came to grief. The vessel saw the planes attack Ford Island but did not open fire because she was in an overhaul status with ammunition stowed below. At 0840 *Shaw* and the floating drydock were heavily bombed by the planes which attacked *Nevada* which was then near. As a result the floating drydock was sunk and *Shaw* heavily damaged due to a magazine explosion forward. The magazine explosion on *Shaw* is shown on page

There were 35 or 40 destroyer types in Pearl Harbor at the time of the Japanese onslaught. Except for three, none suffered serious damage. The great majority showed the mettle which characterized the fleet. Those that did not get underway to patrol for enemy submarines were on the job with their anti-aircraft batteries, were rescuing men from the water and oil, or were sent to the battleships to help fight the fires which were raging. A number were under overhaul at the Navy Yard or alongside repair ships or tenders, and were therefore in an unalert state as far as concerns guns, ammunition, or propulsion. Their efficiency in patrol work is attested by the fact that not a single ship of the American Navy was successfully attacked by the Japanese submarines that lay in wait off the entrance channel or in operating areas.

Space is not available to describe the various destroyers which rendered major service in combatting the enemy or patrolling for enemy submarines, but mention should be made of *Wasmuth*, *Tucker*, *Tracy*, *Breese*, *Dewey*, *Henley*, *Preble*, *Sumner*, *Reid*, *Hull*, *Gamble*, *Cummings*, *Thornton*, *Ramsay*, *Mugford*, *Conyngham*, *Sicard*, *Ralph Talbot*, and others.

Let it be recorded that both mine divisions acquitted themselves well. They were undergoing overhaul at the Navy Yard and were without guns or ammunition. However, they went to General Quarters promptly and were sent to assist nearby ships in manning anti-aircraft batteries, in supplying ammunition, and in fighting fires on *Pennsylvania* and *California*. Machine guns were reassembled and remounted, and with ammunition obtained from *New Orleans* and *San Francisco* were used against the enemy in the late attacks.



2. BATTLESHIPS

As previously explained, *Pennsylvania* was in Drydock Number One together with the destroyers *Cassin* and *Downes* which were forward and inboard. *Cassin* and *Pennsylvania* observed enemy planes attacking Ford Island and Hickam Field. When enemy planes attacked *California*, General Quarters was sounded about 0757 or shortly thereafter. *Pennsylvania*, although in drydock, opened fire on the Japanese planes at 0802. During the second attack *Downes* was hit and set on fire; the drydock service lines were hit and water pressure was interrupted. One bomb passed through *Pennsylvania's* boat deck on the starboard side and put several 5-inch guns out of commission. At 0920 the drydock was flooded to put out raging fires on *Downes*. The result was that *Cassin* rolled over on *Downes*. Both destroyers were severely punctured by fragments from bomb hits on the drydock, and warheads from *Cassin* exploded and fell on *Pennsylvania's* bow.

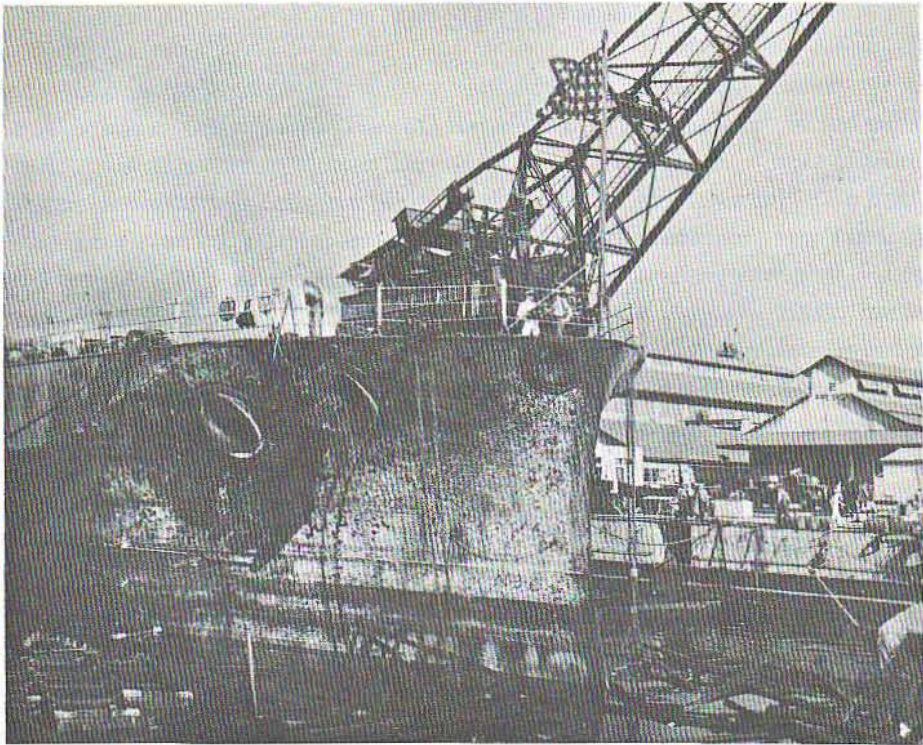
Tennessee was kept busy fighting fires on the oily water as a result of fires on *Arizona* and *West Virginia*. The after part of the ship was gutted by fires. In addition, *Tennessee* was hit twice by bombs, once on the face of turret II and again on the top of turret III. Although capable of getting underway, the ship was held fast due to the pinching of the hull between *West Virginia* and the forward quay. The latter had to be blown up with explosives before *Tennessee* could be extricated.

Maryland was moored inboard of *Oklahoma* and was the least damaged of the battleships. She received one bomb hit on the forecastle, but was moved to the Navy Yard as early as 11 December and was ready for duty a week later.

The twenty-five observation planes of the battleships were hard hit. Only one was fit to fly immediately while nine more were repaired in a few hours. Four required major repairs, and eleven of the planes were stricken as complete wrecks. Their parts were used in repairing others.

3. CRUISERS

There were eight modern cruisers in Pearl Harbor, most of them at the Navy Yard, at the time of the Japanese attack. Many of the other Pacific cruisers were at sea with the various task forces. Only three were damaged: *Helena*, *Honolulu*, and *Raleigh*.



USN NR&L (MOD) 39739

Damage to bow of Pennsylvania in Drydock Number One.

Phoenix saw planes proceeding to Ford Island at 0755. *Honolulu*, from the Navy Yard at 0755 saw planes attacking Hickam Field and shortly thereafter witnessed a wave of torpedo planes moving toward the battleship line. She immediately sounded General Quarters and passed the word "Enemy Air Raid." Machine guns fired at the torpedo planes and the 5-inch went into action immediately. *Honolulu* fired about 2000 rounds of 30 caliber, 4500 of 50 caliber, and 250 of 3-inch. The ship kept firing until the attacks subsided. This ship saw two of the torpedo planes destroyed.

Phoenix got underway at 1010, temporarily returned to its moorage as ordered, but eventually joined other cruisers at sea. The ship fired eighty rounds of 5-inch between 0900 and 0915 on planes dive-bombing Ford Island and the battleships.

Honolulu suffered one near-miss which caused considerable damage and leakage hard to control. One near-miss bomb passed through the Navy Yard concrete pier and exploded near the hull of the ship.

Helena was moored to 10-10 dock and observed planes over Ford Island at 0757. A signalman, with previous duty on the Asiatic Station, identified the planes immediately and arranged for the general alarm to be sounded and service ammunition to be broken out. At 0801 *Helena* opened fire, which caused the Japanese aviators to disperse and shy away from *Helena*. A torpedo exploded against the port engine room after passing under *Oglala* which was tied up alongside and outboard. The hit on *Helena* caused serious flooding of machinery spaces. For temporary repairs before departing for the West Coast, the ship was put in the still incomplected Drydock Number Two, the first vessel to use this drydock.

Raleigh was tied up at the quay customarily used by an aircraft carrier. At 0800 she opened fire with her anti-aircraft battery consisting of 50 caliber, 1.1-inch, and 3-inch guns. She was struck by a torpedo about 0800 and immediately listed to port. The forward engine room and forward fire rooms were completely flooded. All weights on the port side were jettisoned to prevent capsizing. The ship sent help to *Utah*, and the ship's doctor to *Solace*, a hospital ship.

New Orleans sounded General Quarters at 0757, immediately after seeing enemy planes dive-bombing Ford Island. The ship was tied up at the Navy Yard and manned 1.1-inch battery and machine guns aft in time to fire at the Japanese planes launching torpedoes against the battleships. In the meantime, the Japanese were fired at with rifles and pistols from the fantail. By 0810 all guns except the 8-inch were in use and caused the Japanese aviators to turn away or to drop their bombs erratically. The concentrated fire from *New Orleans* and *Honolulu* had a salutary effect, causing the bombs to fall into the water between the ships and *Rigel*.

Saint Louis was at the Navy Yard but lost no time in going to General Quarters and opening fire with the 50 caliber and 1.1-inch batteries. The 5-inch guns and the two boilers which were out of commission because of Navy Yard work were soon put into operating condition. *Saint Louis* got underway at 0931 with boiler power for twenty-nine knots. She cleared the entrance at twenty-five knots and zigzagged after torpedoes were fired at her. She joined other cruisers and destroyers in pursuit of the Japanese forces.

The Commanding Officer, Captain G. S. Rood, gave high praise for the performance of duty of all officers and men attached to the vessel. All hands responded promptly without confusion or delay. He especially commended Lieutenant Charles A. Curtze, on the Staff of Commander Cruisers,

who was a visitor on board at the time General Quarters was sounded. He proceeded at once to Central Station and performed the duties of First Lieutenant and Damage Control Officer.

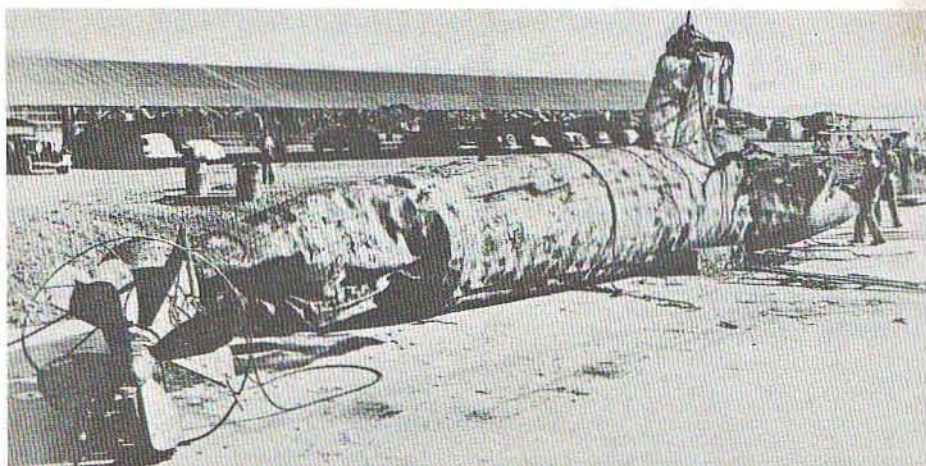
4. MISCELLANEOUS AUXILIARY SHIPS

The auxiliary ships acquitted themselves with distinction. *Avocet* was moored near Ford Island and observed the bombing of hangars and planes at the Naval Air Station. That small seaplane tender fired forty-four rounds of 3-inch and 1750 rounds of 30 caliber. The torpedo planes which attacked *California* were fired upon by *Avocet*.

We should not forget the seaplane tender *Curtiss*. She witnessed the bombing of the Naval Air Station and the torpedoing of *Utah* and *Raleigh*. Immediately the vessel went to General Quarters. She shot down an enemy plane about 1000 yards off the port bow and saw one plane crash in a sugar cane field. The vessel was ready to get underway when at 0835 it sighted a midget submarine periscope on the starboard quarter about 700 yards away. She opened fire at once and scored two hits on the conning tower. The submarine was later depth charged by *Monaghan* and was subsequently recovered. Its picture appears on page 169. At 0905 an enemy plane was hit by *Curtiss* and crashed into the starboard crane. A bomb hit the boat deck and detonated on the main deck, its fragments destroying much gear. At the same time one bomb fell short and another struck the mooring buoy.

Nor should we forget the indomitable repair ship *Vestal* which was moored alongside the ill-fated *Arizona*. She sounded General Quarters at 0755 and shortly thereafter opened fire with 5-inch, 3-inch, and 30 caliber. A blast from *Arizona* caused numerous casualties on *Vestal*. It blew overboard the Captain who returned to his ship by swimming. He was Commander Cassin Young, who was later killed aboard the cruiser *San Francisco* at Guadalcanal. *Vestal* had been hit by two bombs, had a list of over six degrees, and was down by the stern. When burning oil from *Arizona* jeopardized the ship by fire, *Vestal* got underway at 0845 and grounded at 0950 to prevent further list or loss of buoyancy.

Swan, another small seaplane tender, was in the Marine Railway undergoing boiler repairs when at 0755 it observed the enemy assault on Ford Island. It immediately went to General Quarters and opened fire at 0803 with its 3-inch guns.



USN NR&L (MOD) 26697

Stern view of Japanese two-man submarine. Note "washboard" effect caused by depth charges.

Rigel, a repair ship was tied up at the Navy Yard, saw Ford Island attacked by ten dive-bombers at 0758. At 0800 it was bombed and strafed by dive-bombers from a low altitude. The ship had no armament and was therefore unable to take action against the Japanese planes although seeing them attack the battleships with torpedoes. About 100 of her men were sent to *West Virginia* to help fight fires. The blasts from near-misses threw about 100 men into the oily water, and caused about 150 small fragment holes in the port quarter. The men were rescued but one whaleboat was hit by a bomb and disintegrated.

The submarine rescue ship *Widgeon* rendered first aid to whatever ship seemed in need. The ship received from Commander Battle Force a letter of commendation for the work of its intrepid divers and those of the Submarine Base for their work on *Nevada* and *California*.

Various other auxiliary vessels witnessed the early Japanese forays and took offensive action. Among these were *Pelias*, *Antares*, *Whitney*, *Dobbin*, *Ramapo*, *Castor*, and the tugs *Vireo*, *Bobolink*, and *Rail*.

5. SUBMARINES

There were four United States submarines present at the time of the Japanese attack, none of which were damaged.

Tautog at once saw enemy planes approach and drop bombs over Ford Island. She also saw the torpedo planes approach the battleships. The fourth plane in line was shot down by either *Tautog* or *Sumner*.

Dolphin at 0800 used rifles and machine guns against Japanese planes.

Another submarine which should be mentioned is *Cachalot* which was at the Navy Yard at the time. It was in position to observe the attack on Ford Island and the torpedoing of the battleships. Bereft of military equipment due to Navy Yard overhaul it rendered assistance to stricken ships, especially *Oglala*.

6. OGLALA

Special mention should be made of the minelayer *Oglala* because she was the flagship of the minecraft. The Commander of Minecraft, Rear Admiral William R. Furlong, was walking the deck of *Oglala* and was a valuable witness before the Roberts Commission. He saw the bombs dropped on the Naval Air Station and saw the torpedo planes start their torpedoes toward the defenseless battleships across the water from him. As soon as he heard

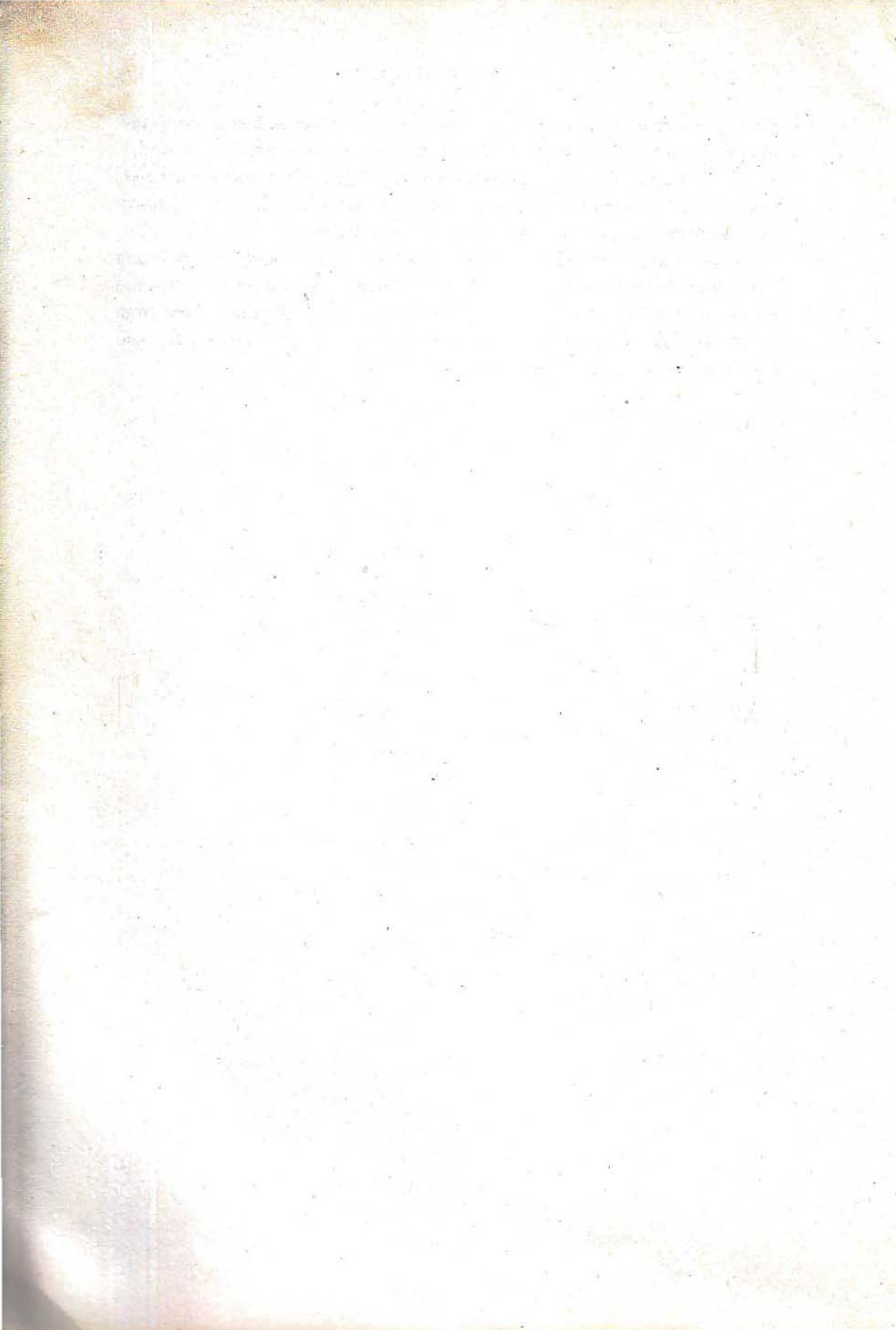


80-G-32537

Starboard side of USS Oglala, looking aft from Ten-Ten Dock.

the explosions he detected that they were enemy planes although up to that time he gave but little attention to planes buzzing about even on a Sunday. He called out: "Japanese. Man your stations." The word was immediately passed to call all men to General Quarters. All watertight doors were closed, guns were manned, and all men went to their stations.

Oglala capsized eventually, about one and one-half hours after suffering a near-miss from the torpedo which struck *Helena*. *Oglala* set up a first aid station on the Navy Yard dock, and mounted guns on the dock. Men from *West Virginia* who were wounded were landed there and received first aid treatment from *Oglala's* crew.



CHAPTER XI

“All Hands” Engaged In
Salvage Work



CHAPTER XI

"All Hands" Engaged In Salvage Work

1. PRIORITY OF WORK

No sooner had the attack been completed than Fleet Commanders got ready for another strike. Many put to sea in search of the enemy. Fortunately a repetition of the attack never came. The Japanese Commander considered that the mission was completed and missed his chance of finishing the job so efficiently begun. He could have set on fire the reserve oil supply of five million barrels, or he could have leveled the Navy Yard's shops and dry-docks, thereby destroying the Navy's industrial capacity. Likewise he could have destroyed the submarine base which contained the headquarters of the Commander-in-Chief and which was of paramount value later in carrying on the submarine offensive against Japan's military and maritime ships.

As has been stated, each ship was under twelve hours notice to get underway in case of attack. Yet, the smaller ships required much less than twelve hours. Some ships at Pearl Harbor did get underway and put to sea, but the larger ships stayed in port due to a wise cancellation of the order. The two task forces then at sea were instructed to search for the Japanese and to intercept them if sighted. Fortunately they were not found; their strength was far greater than any American force that was available at the time. This included air power, of which the Japanese had a great superiority.

Of first importance to Fleet Commanders was the task of readying ships for a full fleet engagement with the Fleet of Japan. At that time no information was at hand on the enemy's location, the strength of his force, or his intentions with regard to landing or seeking a fleet engagement. The situation which confronted the high command was therefore to arrive at a priority of work on the various ships, since those needing a minimum of work should be taken in hand first and made ready for action.

2. HELPING EACH OTHER AND REPELLING ENEMY ATTACKS

We have seen from survivors' reports the spirit which pervaded our men. Both officers and enlisted were busy saving the lives of each other and in repelling the enemy. Cowardice was rare if not unknown. Heroism and bravery were the qualities shown by the military. Taking undue risks was commonplace.

The manning of anti-aircraft batteries and the replenishment of ammunition came first. The removal and comfort of the wounded were of almost equal importance. Fighting fires and watertight integrity were the tasks of many. Men were overcome by fumes from the fuel oil which was everywhere, but a shipmate was usually at hand to carry a person to fresh air, or to rescue drowning persons from the water, or from oil and water mixed. Helping shipmates through portholes was the only means of escape still available in certain ships and was responsible for saving many lives.

3. FREEING TRAPPED MEN

As ships capsized in particular *Oklahoma* and *Utah*, some men were trapped in the ship's lower compartments. They made their presence known by tapping on the structures with wrenches or other tools. These were heard by the men on the hulls of the capsized ships and were answered; the Morse Code was used, and the rescue of the trapped men began. *Oklahoma* showed the maximum promise. The bottom of the ship was all that was visible above water. The ship had capsized through 170 degrees so that its bottom was nearest the surface. By cutting holes through the bottom of the ship the rescue party was able to reach the men who had sought refuge in that part of the ship which was near the open air.

A survivor who had escaped through a hatch at frame 117 stated that men were alive in that locality. At about that time, 0915, Commander Kranzfelder and Lieutenant Mandelkorn from the staff of Commander Battleships, were present, and at 0930 Lieutenant Commander Herbert Pfingstag from the Navy Yard arrived. At first they tried to gain access to the inside of the ship by acetylene torch, using it in locations free of oil and water, but found that the fumes from oil and the cork used for insulation were deadly to the men who were trapped in the locality. Accordingly, they thereafter



80-G-19941

Rescue parties at work on USS Oklahoma. USS Maryland is in the background.

used compressed air and corresponding tools which were furnished by the Navy Yard and various ships, including *Maryland*, *Argonne*, and *Rigel*. The Navy Yard and ships concerned provided submersible pumps, sound powered telephones, and air ducts for ventilating purposes.

Soon the trapped men were located in the vicinity of frames 131, 116, 78, and 22. The men were all near the bottom of the ship, which at that time was partly visible above the water level of the harbor. It was not until 0800 on 8 December that six men were rescued, and at 1100 eleven more were brought out. Five more were released at 1400 and eight at 1600 on that same date. The last man was not rescued from *Oklahoma* until 0230 on 9 December. All were in good condition except for lack of sleep, food, and sufficient oxygen. Some of the thirty-two men were dependent on an air bubble for sufficient air. Of course the air bubble gradually disappeared and water rose as soon as an opening was made in a compartment. A watch was

maintained on the hull of *Oklahoma* until 11 December but no further signs of life were detected.

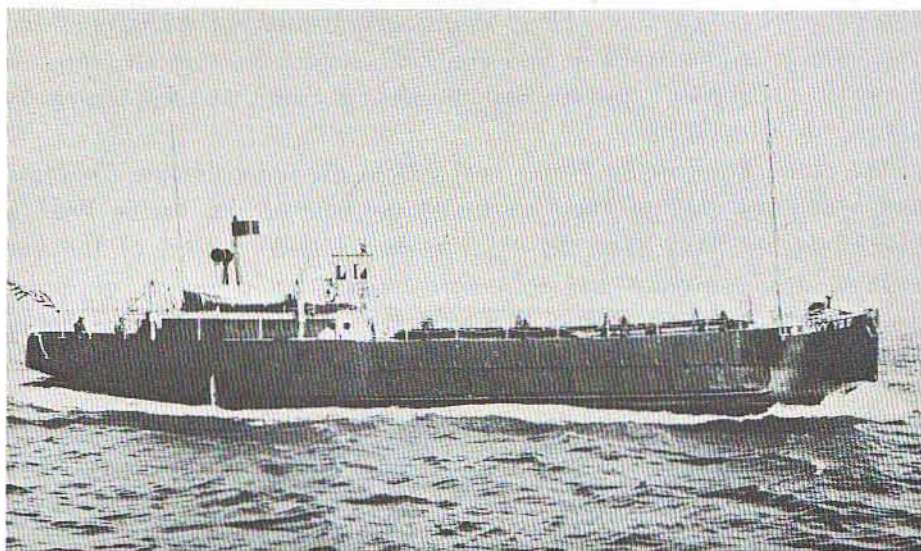
A great part of the credit goes to the Navy Yard. One of its men showed intrepidity of the highest nature by staying on the job and risking his life as leader until all known survivors had been released from the hull of the ship. He was Julio De Castro, Leadingman Caulker and Chipper, who was awarded a Commendation by the Commandant, Fourteenth Naval District.

Utah lost fifty-eight men in the action. Of those saved one man was rescued through the bottom after the ship had capsized. This was John B. Vaessen, Fireman Second Class, who was later lost. Nearly all of the men who had not been killed or wounded were clear of the lower compartments except Vaessen who remained at his post in the forward distribution room in order to keep lights on the ship as long as possible. He was rescued by helpers from *Raleigh* as well as by a volunteer crew from *Utah* consisting of Machinist S. A. Szymanski, Chief Engineman MacSelwiney, and two seamen. They heard tapping on the bottom and after answering, they cut a hole by acetylene torch, obtained from *Raleigh*, near enough to free Vaessen.

4. SALVAGE OPERATIONS FROM ARGONNE

Rear Admiral William L. Calhoun was in charge of salvage operations by virtue of his position as Commander of the Base Force. He was assisted by officers on his staff, especially Commander Rufus G. Thayer and Commander James H. Rodgers. It happened that Lieutenant Commander Lebbeus Curtis was enroute to the Far East for salvage work and, because of his considerable experience was put in charge as Salvage Engineer. He later was retained in the Base Salvage Organization for several months, at which time he was put in charge of all salvage in the Pacific as Mobile Salvage Engineer. He ultimately was promoted to Rear Admiral.

Considerable progress was made in repairing ships which had only minor damage, especially by furnishing small craft to fight fires and supply pumping equipment. A hero of the times was the lowly garbage lighter, *YG-17*, which had a large pumping capacity. She tied up alongside *West Virginia* to fight her many fires and was successful in her work though beset by Japanese aircraft and continuous strafing. This craft, which won commendations from the Commander of Battleships, had a nostalgic effect on the



19-LC-15AA-1

Garbage Lighter YG-17 which performed such heroic duty on 7 December 1941 in fighting fires.

author because her all-welded sister ship, YG-16 (often called *Petunia*) was built under his jurisdiction at Mare Island and won a prize of \$7500 in 1932 for himself and another officer. YG-17 which was commanded by Chief Boatswains Mate L. M. Jansen won a well-merited commendation for brave work following the Japanese surprise air raid.

5. START OF SALVAGE ORGANIZATION

The formal Salvage Organization began on 14 December 1941, an even week after the Japanese attack. It was under the direction of then Commander James M. Steele, who was previously in command of *Utah*. He remained in command of salvage under the Base Force until relieved by the author, Captain Homer N. Wallin, on 9 January, 1942. At that time the Salvage Division became a part of the Navy Yard under the Manager, Captain Claude S. Gillette.

The author is indebted to Vice Admiral William S. Pye and his Chief-of-Staff, then Captain Harold C. Train, for releasing him, first on a part-time basis, from his duties on the Battle Force Staff so that he could take direct

charge of the salvage work. These officers were boosters of the salvage work and were extremely active in showing their support. So were all officers of the Battle Force Staff, especially Captain Allan E. Smith who was Operations Officer for Admiral Pye.

The Staff of the Battle Force moved from the uninhabitable *California* and joined the Staff of the Commander-in-Chief of the Pacific Fleet at the Submarine Base. Thus the three senior material officers of the fleet were in a single office and were called upon for a variety of duties. These were Commander David H. Clark of the Staff of the Commander-in-Chief; the author, Captain Homer N. Wallin, of the Battle Force; and



USN NR&L (MOD) 39741

Insignia for Pearl Harbor Navy Yard.

Commander Ralph S. McDowell of the Scouting Force. Commander Clark and Commander McDowell were very helpful to the author in all aspects of salvage work.

In view of the Navy Yard's industrial importance its Commandant was switched from the Commandant of the District, Rear Admiral Bloch, on a part time basis, to the former Commander of Minecraft whose flagship, *Oglala*, capsized and sank. He was Rear Admiral William R. Furlong who was very interested in all Yard work and gave to salvage operations a great impetus. Formerly he was Chief of the Navy's Bureau of Ordnance.

The headquarters of the Salvage Division was a contractor's shack near the waterfront. It was very unpretentious but served satisfactorily. As the Salvage Division grew, a number of other unpretentious waterfront buildings were added.

The original organization had liaison with the Navy Yard, and project officers in charge of each job. Originally Lieutenant Emile C. Generaux was project officer for *Nevada*, Lieutenant Commander Thayer for *Tennessee*, and Lieutenant Commander Rodgers for *California*. In addition to Lieutenant Commander Curtis, Lieutenant Commander Thayer and Lieutenant Commander Rodgers were general assistants to Commander Steele. Each specialty had an officer in charge. For instance, Boatswain W. A. Mahan under Lieutenant Commander O. L. De Tar was in charge of all diving, Lieutenant Commander E. E. Berthold of ammunition, and Lieutenant Commander F. C. Stelter, Jr. of all other ordnance material. Office work was under Lieutenant Commander Solomon S. Isquith, aided by Lieutenant Hal C. Jones.

Each officer had help from civilian groups. Mr. Dillingham of Honolulu was available with necessary hoisting barges and other waterfront equipment. One of the most helpful organizations was the Pacific Bridge Company. This company was accustomed to underwater concrete and large excavations with proper bulkheading, and therefore proved invaluable.

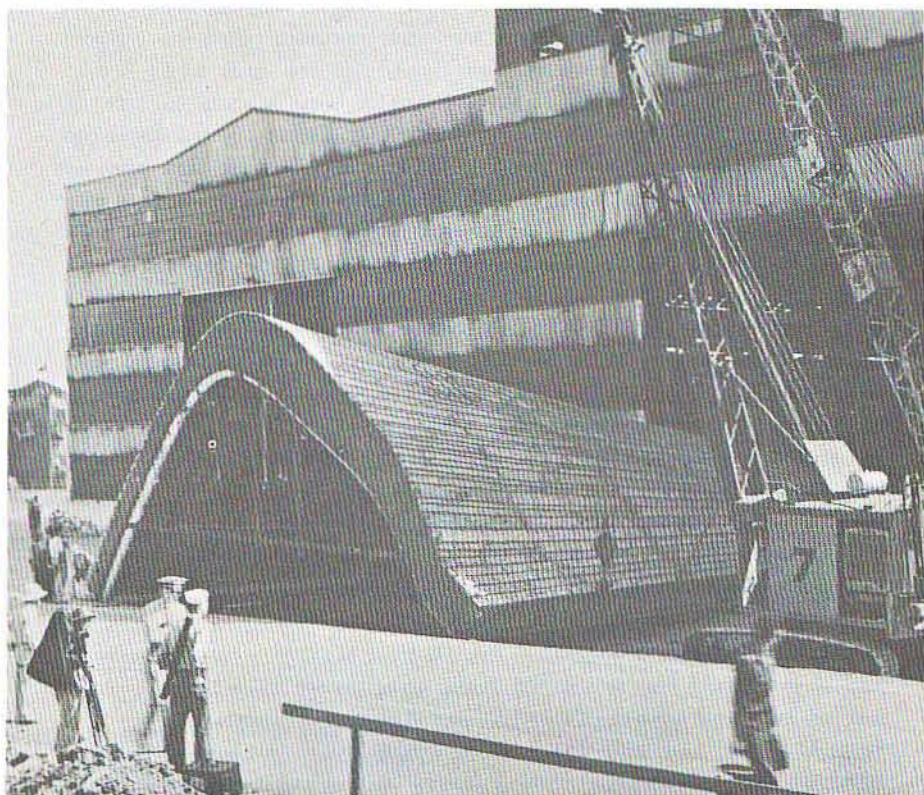
The Pacific Bridge Company recommended underwater concrete in lieu of complete cofferdamming of ships resting on the bottom. An expert from the Navy Department finally agreed to this solution, but not until after Lieutenant Commander Curtis had ordered a large supply of steel sheet piling for cofferdams around *California*. The underwater concrete proved entirely satisfactory, and the cofferdamming material was later used for other purposes in the far reaches of the Pacific.

Sight should not be lost of the part which Navy Yard civilians gave to the salvage work. This is well illustrated by the letter which was written by a Chinese photographer of the Yard named Tai Sing Loo. It follows:

On the 6th of December, Saturday afternoon, I had [made] arrangement with Tech. Sergeant Christen to have all his Guard be at the Main Gate between 8:30 to 9:30 o'clock Sunday morning to have a group of picture taken in front of the new concrete entrance as a setting with the 'Pearl Harbor' for Christmas card to send home to their family.

Sunday morning I left my home for Pearl Harbor after 7:00 o'clock. I was waiting for my bus at corner Wilder Avenue and Metcalf Street. Saw the sky full of anti-aircraft gun firing up in the air, I called my friend to look up in sky, explain them how the Navy used their anti-aircraft gun firing in practising, at that time I didn't realize we were in actual war. Our bus stop at Bishop and King Streets. We heard the alarm ringing from the third story building of the Lewers & Cooke, Ltd. Saw the window shattered. I walk up to Young Hotel corner and cross the street. Stop for a cup of coffee at Swanky and Franky. Suddenly all excitement arouse the Honolulu Fire Engine rush down Bishop Street and all directions. Taxi full of sailor and marine dashing toward Pearl Harbor. I'm very much surprise what's all this excitement. I wave the taxi to stop and get on it to go back to Pearl Harbor. When I approached to Pearl Harbor surprise with great shock. Thought one of our oil tanks caught on fire, showing black velum of thick smoke in the air. I got off at the main gate of Pearl Harbor, met all the guards with arms and Machine Gun in placed. I was great shock with surprise the war are on. Watching many Japanese war planes attacked Pearl Harbor, dropping bombs right and left on dry docks and Ford Island. Suddenly terrific explosion. Fire broke out. I was very calm and waiting for the opportunity to get a ride to the Studio to get my camera. I was at the Main Gates standby with Marines. Guards at the Main Gates were bravery and cool headed to keep the by-standing away for safety and clear traffic. There were the young, fighting marines. We were under fire. The Japanese planes painted in aluminum, Red Ball under each wing, flew very low toward the Main Gates.

I wish my Graflex with me. I would had a wonderful close up shot of the Japanese. Again the Japanese flew around the Navy Housing Area and turn back, head direct to Hickham Field, very low to drop a bomb to the Hangers, with terrific explosion, set fire the buildings. More planes flew direct the dry dock. Suddenly, I saw one plane had a hit. It flew direct toward West Locke Stream of smoke screen. Now this my opportunity to get in the Yard, one of the Leadingman of Machine Shop drove in his automobile. I hop in, he take me to the Studio and pick up my Graflex Camera to take some picture, second thought I change my mind, reason is because first place I didn't had no order, the second place I didn't had



USN NR&L (MOD) 39742

USS Nevada's patch for torpedo hole. Note photographer Tai Sing Loo at lower left.

my famous Trade-Mark helmet on. I had a new English Helmet from Singapore, given by Admiral Murfin a year ago, so I'm afraid some one will make a mistake me as a Jap and shot me down.

I went up to the Administration Building everything OK. I met Mr. Wm. McIlhenny and Mr. W. C. Bohley at the stairway. We talk and both went toward the dry dock. I went to the Supply Dept. and saw many boy had a Steel Helmet on, so I went to see Lt. Cdr. Supply Officer for permission to hat one, the size are too large and heavy for me so I select one smaller size, painted green and white stripe. I went direct to the dry dock to help put out the fire on U.S.S. Cassin had the depth charges on her stern the U.S.S. Pennsylvania bow between Cassin and Downes. I knew it was very dangerous it may explode damage the dry docks and the U.S.S. Pennsylvania. We put our hoses directed the depth charges keeping wet. An Officer came near by and keep up the good work we had out hose right at it all the time, and I turn around and saw Lt. Spear, order all men stand back, some things may happen, so I obey his order and ran back

toward U.S.S. Pennsylvania, suddenly really happen the terrific explosion came from the Destroyer few people were hurt and some fell down. I notice some large pieces of Steel Plates blew over the dry dock when I turn around and look, afterward I notice two extra hoses without nozzles, so I went to the Fire Station and brought back 2 volunteers pointed direct the depth charges, I call for more volunteers to help me clear and straighten up the hose around the First Street to clear for traffic at the same time purpose to gave the fire fighters a chance to extend the hose across over the bow of U.S.S. Pennsylvania to fight the fire at the Downes on Starboard side. Here come another Fire Engine from Submarine Base, I direct them to place their engine and connect this Hydrant #151 and direct them to the depth charges, so everything are well done and successful accomplishment their service. A few words of my appreciation and vote of thanks and successful credit to lieut. Spear, in charge with his gallant spirit to kept his staff and volunteers calms, right at the job to see the depth charges were wet and kept away the fire. The Marines of the Fire Dept. of the Navy Yard, are the Heroes of the Day of Dec. 7, 1941 that save the Cassin and Downes and U.S.S. Pennsylvania in Dry Dock No. 1.

I saw the crew throw out empty 5" shell on the Dock, I gather up in Piles with some sailors so I met Chief LeTendre to help me order some hose from Supply Dept to place in this Hydrant No. 151, corner Avenue D and First Street. I also request Lt. Foster to order me more hoses, with in half an hour and hour the Chief brought back 6 new hoses and other load from Lt. Foster and other Chief which I have about 12 length of hose to stand by. Why I order this hoses for? The Answer—for emergency something may happen I will be there with readiness, reason why, the magazines were taking out from the U.S.S. Pennsylvania, and many casing and empty shell, at the same time were under fired the Jap Airplanes flew over head where up in the clouds. The U.S.S. Pennsylvania Anti-air-craft crews were in full action, I wasn't excited and very calm about Street to protect the 2 new hoses, I were little worry-because I have no nails and lumber to nail between the two planks separated while the heavy traffic going by with Emergency Cases to the Naval Hospital without crushing the hoses. I met Captain Swain passing by I had his permission to have the Carpenter of the Boat Shop to help me nail this planks together. He went to telephone, within few minutes four men marching down with nails and lumber. I were very happy, here comes the Carpenters ready to start nailing suddenly the roaring Anti Air Craft Guns in action, I call my men to dodging for safety, after the Enemy Planes disappear we all returns to our duty, the four men didn't come back at all left the hammers, nails and lumber, so I was very fortunely for two of our local boys passing by and helping me to finish the job, it were very thankful to volunteers their service to stand by with me during the Emergency, I had two men standing by the Hydrant #119 locate Corner Ave E and First Street near the

head of Dry Dock No. 1, four men guarding the two hoses in emergency for readiness in case of fire broke out from the Magazine Casing.

I was self volunteer to be Traffic Police and directing the Traffic during the rushing hours of Emergency, I get a big piece of Maroon cloth to signaling the ambulance to look at those planks easily passing over, to save my hose and other word to give the wounded patients rest easily from rough crossing on the heavy plank I direct all four hours to kept the First Street clear of right away to the Naval Hospital. Many heavy Contractor Trucks passing by with all Defenders and Emergency Call Employee, to report to the Shop for standby. I direct all this group of trucks turn up to Avenue E and unloaded the Employees. Everythings were successfully appreciated to my volunteers friends of their bravery and courageous to their service, during the emergency and Under Fired. Everythings were under control and we all secure and roll up the hoses and returns to the Supply Dept. We were hungry no lunch so I brought each one a Box Ice Cream for lunch and we all dismissed about 3:30 p.m.

One of the Marine Patrol approaching toward me, if I will do the boys a great service of the Marine Guards and Sailor, which their have no lunch and some without breakfast, so I went to the garage to take my Red PutPut to the 3rd Defense Fleet Marine Mess Hall to see my friend Tech. Sergt. Newland for help, I told the story regards the Post Guard have been neglected to release for lunch. Tech-Sergt. Newland were very kind and his Cook to prepared some sandwiches ham and chicken, fruit all I can delivery to the Post. You should hear what were their saying. Charles, you are one life saver. I have been riding round and round the dry dock until every one had a sandwiches on every post except the Fuel Oil Farms. I send 50 chicken and hams sandwiches apples and oranges and buns with ham to the shops supt. office. After I returns the Mess Sergt. report no breads be served and water are being poison. I serving some civilians and the Post and Guards Hot Tacks, apples and orange. The water is poison. At the Dry Dock all the workmen have no lunch and hungry, working on the U.S.S. Downs and U.S.S. Cassin, I ran short of everything about 6:00 p.m. I told the men go to the Mess Hall of the 3rd Defense to have their meal without charges and drink tomatoes juice and fruit. About 7:00 p.m. I went to the garage to have them take me to the Main Gates.

At the last thought I have the driver drove me to the Mess Hall, the Mess Sergt. gave me 3 gals. can iced cold tomatoes juice and 3 dozen oranges and bag full of Hot Tacks, I gave the driver to take back to Garage night force. I left the Navy Yard at 7:30 p.m. at Main Gates. I was very fortunely an automobile pass by. Lady invited me to take me back to town, she just drive off the Ferry boat from Ford Island. She left me off the Hawaiian Electric Co. It was a black out night, I walk across the Army and Navy Y.M.C.A. to the Beretania Street to walk direct to

the Thomas Square and stopped for a rest. I ask the soldier guard on patrol, with appreciated very kindly if he will halt an automobile to take me home, if convenience on their way home. I told him I came back from Pearl Harbor, I'm Chinese. He shake my hand and glad to be of service, to the Chinese friend. An automobile approach and stop, the soldier request the owner if he will help to take me home to the University. Happening the driver knew me very well, he heard my voice, so he invited me in his car and drove me to my home at the front door, I extended my appreciation and thanks him very kindly to see safe home. My wife and four children were happy and thankful I were safely at home.

As the Confucious say, 'Every Kind Deeds its return many, many time Folds.'

6. RECOVERY OF ORDNANCE MATERIAL

One of the most important projects of early salvage was the recovery of anti-aircraft guns and ammunition from sunk or disabled ships. Such guns with their directors and other necessary equipment were then installed around air bases and the Pearl Harbor compound.

Much of this material was recovered by divers. Some of it was underwater and had to be unbolted and manhandled by men using diving gear. Likewise, much of the ammunition recovered was in magazines which had been flooded.

7. MEDICAL HELP FOR WOUNDED OR BURNED

The men of the Medical Department were commended for their efficiency during and following the attack. Many medical officers and their staffs reported to the hospital or dispensaries for duty after their own facilities were no longer usable. They rendered first aid to the injured at the Naval Hospital, at various dispensaries, in the hospital ship *Solace*, or at the Navy Yard. Dispensaries were set up on Ford Island. Medical officers and pharmacist mates won high commendations for staying at their posts giving first aid treatment even though severely wounded or burned themselves.

¹Tai Sing Loo, *Narrative of Experiences of Chinese Photographer Employed by Pearl Harbor Navy Yard during Japanese Raid on 7 December 1941*, no date.

CHAPTER XII

Getting the Less Damaged Ships
Ready For Action



CHAPTER XII

Getting the Less Damaged Ships Ready For Action

As mentioned before the first aim of the high command was to get the less damaged ships ready as soon as possible for action. This work engrossed "all hands" around the clock. The crews themselves did considerable work in getting their ships ready. They were assisted by repair ships, tenders, tugs, and by the Navy Yard.

As yet there was a dire shortage of pumping equipment, lumber, and other materials necessary for efficient salvage work. However, the spirit of the times was "to do our best with what we had." Each echelon of command did everything possible to overcome obstacles which were encountered.

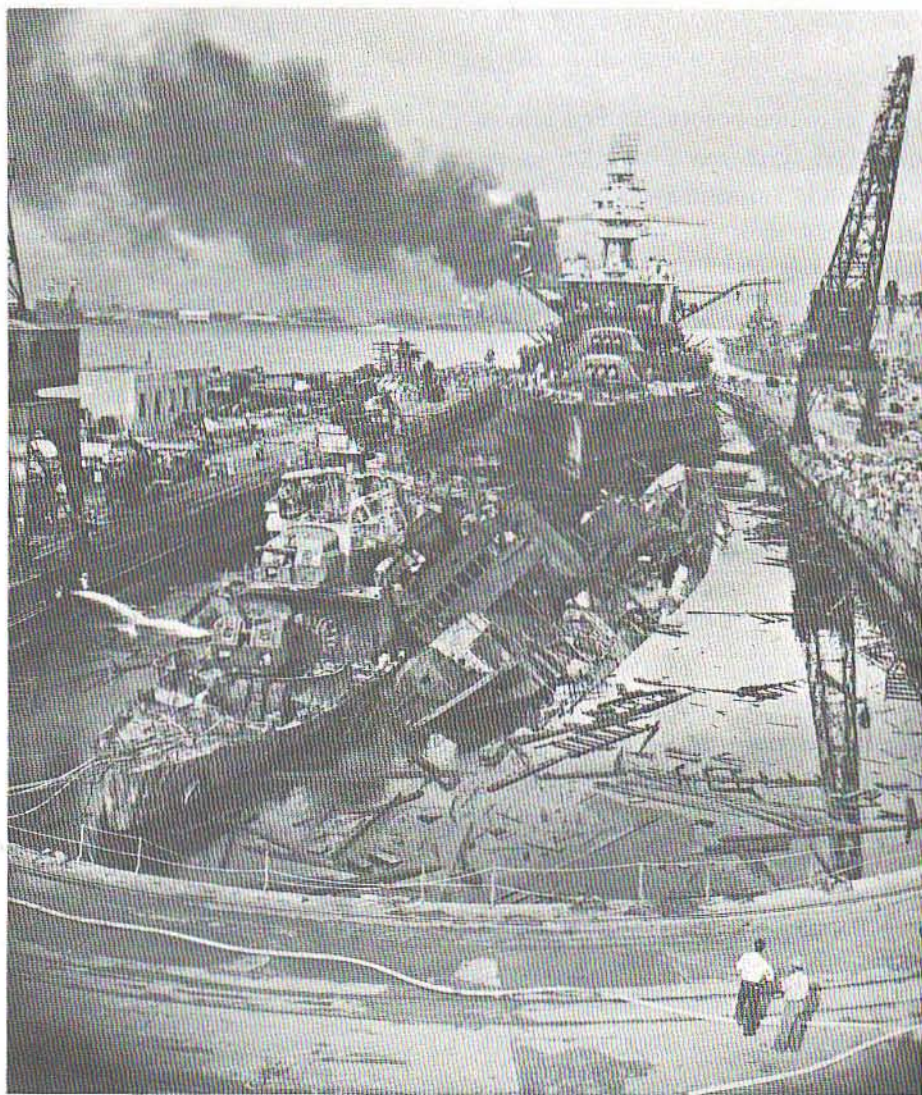
1. U.S.S. PENNSYLVANIA, BATTLESHIP (LAUNCHED IN 1915)

The lightly damaged *Pennsylvania* gave promise of being one of the first ships to be ready for action. The Navy Yard expedited the lining up of her shafts and propellers. One of the 5-inch anti-aircraft guns was put out of commission temporarily and one 5-inch 51 caliber gun was seriously damaged by the same 250 kilogram bomb which exploded two decks below. The latter was replaced by a gun from *West Virginia*. The fragmentation and explosion damage was quickly overcome. The splinter protection, wooden deck, electrical gear, water mains, and structural steel were soon repaired and the ship was ready to leave the drydock by 12 December and the Navy Yard by 20 December.

Pennsylvania's drydock was flooded to within one foot of floatation when it was expected that the Nipponese planes might return. This flooding was precautionary in case a bomb explosion should take out the caisson. When *Pennsylvania* was removed from the drydock on 12 December, *Downes* was

righted and set down on permanent blocks while *Cassin* was left in a toppled state until later.

The hits by Japanese bombs on the ship and on the drydock sidewall resulted in the death of two officers and seventeen enlisted men and the wounding of thirty more.



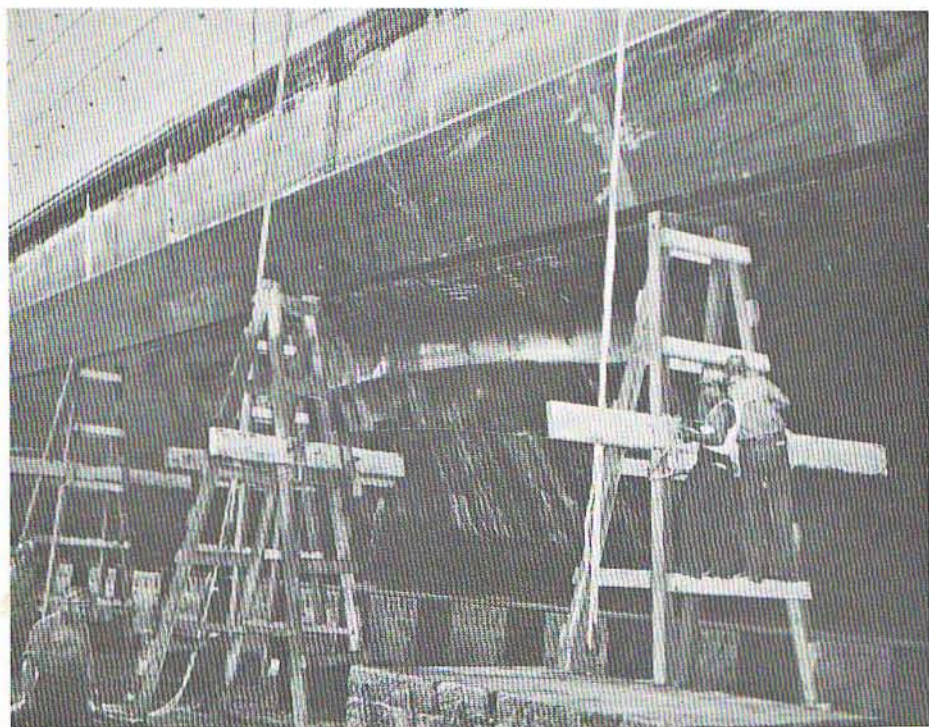
80-G-10943

USS Pennsylvania in Drydock Number One with Cassin and Downes in foreground.

2. U.S.S. HONOLULU, CRUISER (LAUNCHED IN 1936)

Honolulu was at the Navy Yard and suffered severe flooding forward. The ship was not hit, but a near-miss of a 250 kilogram bomb passed through the concrete surface of the pier and exploded about twenty feet from the hull. This resulted in an in-buckle five or six feet deep at about frame 40 and extending fore and aft about forty feet. Although the shell of the vessel was not completely opened, the flooding was extensive and could not be stopped. Due to the rupture of a magazine sea-flood, the flooding included the handling room of turret II and several storerooms and compartments.

Honolulu followed *Pennsylvania* in Drydock Number One, and remained in drydock for permanent repairs from 13 December until 2 January 1942. By 12 January the Yard completed permanent work to the structure, electric wiring, etc.



USN NR&L (MOD) 39743

USS Honolulu, showing damage to port side caused by bomb which penetrated the dock and exploded alongside the ship.

3. U.S.S. HELENA, CRUISER (LAUNCHED IN 1939)

As described, *Helena* was struck on the starboard side by the aerial torpedo which passed under *Oglala* at the 10-10 Navy Yard pier. The starboard side was opened up below the armor belt. Number 1 engine room and Number 2 boiler room flooded and the water percolated slowly into other spaces.

Drydock Number Two was in an unfinished state at that time but the contractor, the Pacific Bridge Company, arranged to use part of the drydock for *Helena* after obtaining suitable bilge blocks from the Navy Yard. The vessel entered drydock on 10 December, the first vessel to occupy Drydock Number Two.

Temporary repairs were made to *Helena*, including various piping systems, electric wiring, etc. On 21 December *Helena* was undocked and on 5 January 1942 she sailed on half power for the Mare Island Navy Yard where permanent repairs were completed.

4. U.S.S. MARYLAND, BATTLESHIP (LAUNCHED IN 1920)

Maryland was berthed inboard of *Oklahoma*. She was struck by two 15-inch armor-piercing bombs. Fortunately both bombs had a low level of detonation. The first struck the forecastle awning and tore a hole about 12 feet by 20 feet and caused some damage in the compartments below. The second entered the hull at the 22 foot water level at frame 10. It exploded within the ship and caused considerable flooding. The bow was down about five feet.

Since a drydock was not available, the Navy Yard assisted, by the forces afloat, made repairs without docking. A small caisson was fitted over the hole on the port side. When sufficient pumping facilities were available to control the flooding, temporary repairs were easy to complete. *Maryland* was fully repaired and ready for action by 20 December.

5. U.S.S. TENNESSEE, BATTLESHIP (LAUNCHED IN 1919)

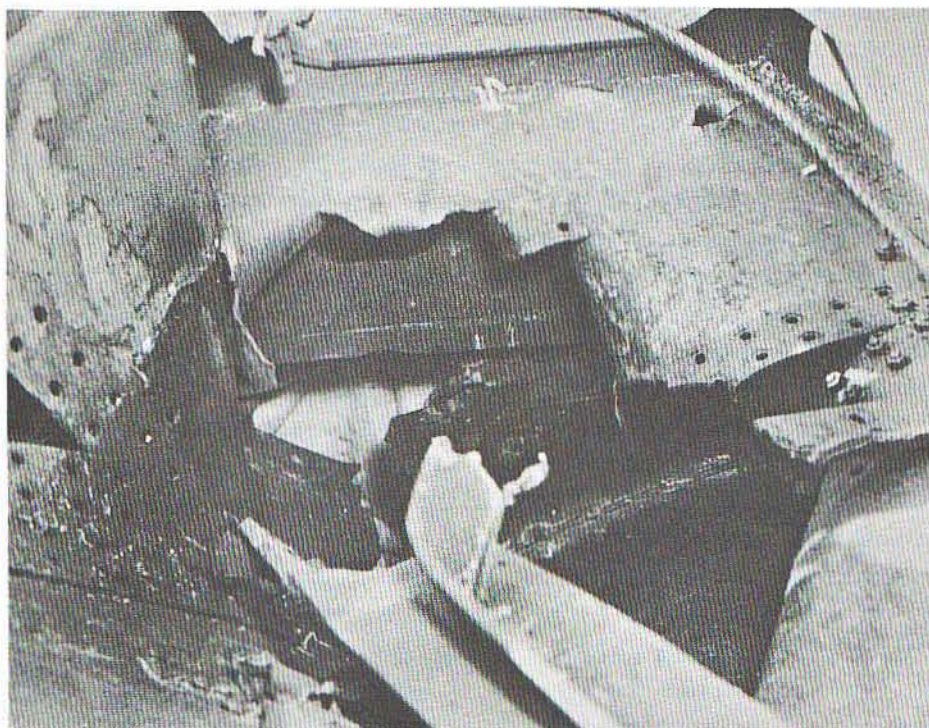
Tennessee was moored inboard of *West Virginia* and became wedged hard against the forward quay as the latter ship settled and finally sank to the

bottom. *Arizona's* oil fire engulfed the stern of the vessel and caused serious fires aft, especially in the officers' quarters on the second deck.

The explosion of the magazines aboard *Arizona* showered *Tennessee* with burning powder and debris. The forward magazines were purposely flooded as a precaution against the many fires on the ship. These fires were ominous for a long period and were so intense as to warp the stern plates and cause some pulling out of hull rivets.

In order to minimize fires the vessel played several water hoses over the stern to keep the burning oil on the water at a distance. Also the engines were turned over to make five knots and the wake was effective in keeping the oil clear of the ship. There was no movement of the ship even when the engines were run at ten knots. This shows how securely the ship was wedged between *West Virginia* and the quay.

The vessel was struck by two bombs of the 15 or 16-inch armor-piercing type from high-level bombers. Both bombs had a low order of detonation, or perhaps did not explode at all.



USN NR&L (MOD) 39744

USS *Tennessee*, showing penetration of bomb through catapult and top of turret III.

The first bomb hit the centerline gun of turret II, causing the barrel to crack. All three guns were rendered inoperable. The second bomb passed through the roof plate of turret III and damaged the structure and the rammer of the left gun.

Several attempts were made to free the ship. About 650,000 gallons of oil were removed by pumping while work progressed on the quay and its buffer. The work proved more onerous than expected and was finished by dynamite blasting about 16 December. In the meantime, repair ship *Medusa* and the Navy Yard patched the warped plates by welding, and blanked off a number of air ports. When *Tennessee* was finally freed she was moved to the Navy Yard where all inside damage was repaired. The ship was ready for service by 20 December.

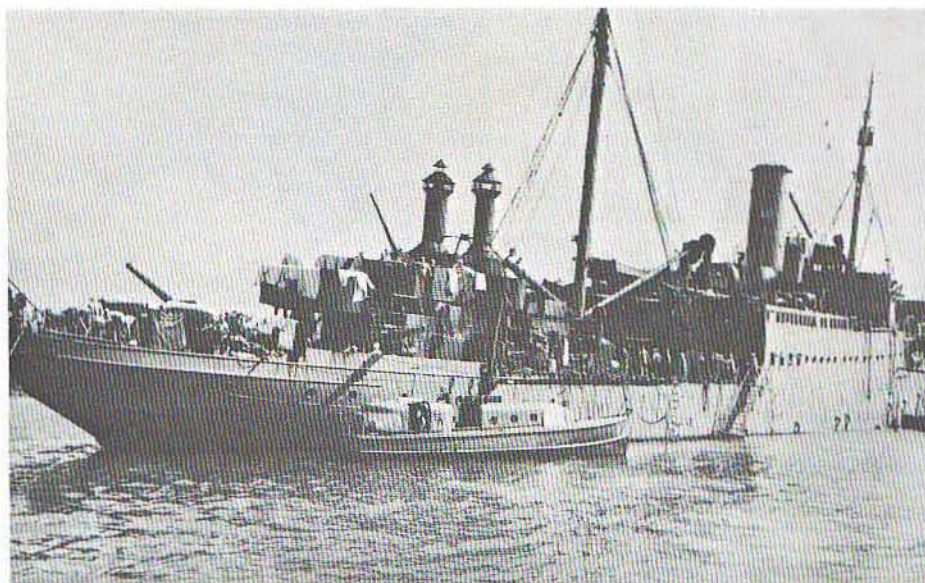
6. U.S.S. VESTAL, REPAIR SHIP (LAUNCHED IN 1908)

Vestal was berthed outboard of the ill-fated *Arizona*. The first torpedo which hit the latter ship probably passed under *Vestal*. That vessel saw many of the torpedoes which hit *Arizona* and some which missed both ships.

Vestal was struck with two bombs which were dropped by dive-bombers early in the attack. They were, from Japanese surrender accounts, the 250 kilogram type although the ship assumed that they were the 15 or 16-inch armor-piercing variety. The first bomb hit the forecastle about 0805 and passed through several decks at about frame 43. This bomb exploded in the metal storeroom where the prevalence of metal products deadened the explosion and prevented the bomb from passing through other decks or the shell. Consequently there was no flooding, but the lower platform deck and other structures were badly ruptured.

The second bomb was dropped from an elevation of about 1000 feet and struck the ship aft. It passed entirely through the vessel before exploding, and caused serious flooding. It lowered the stern about ten feet and produced a port list of about seven degrees.

When the fuel oil between the two ships became ignited the captain of *Vestal* decided to move. The vessel got underway about 0830, aided by two tugs as the ship's steering gear was inoperative. After coming to anchor it was decided that the damage was so extensive as to warrant beaching. Accordingly she got underway again at 0950 and grounded herself on Aiea Shoal.



USN NR&L (MOD) 39745

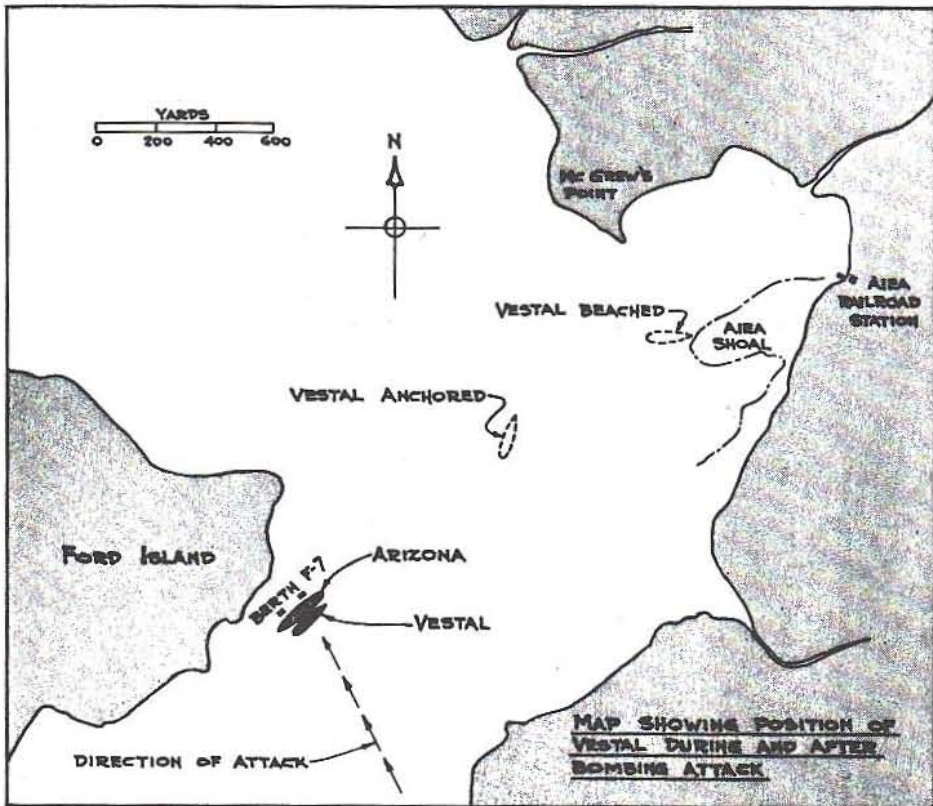
USS Vestal after beaching.

Vestal was a repair ship, and her own artisans undertook the repair work. The temporary work was quite satisfactory but *Vestal* was placed in drydock as soon as one was available at the Navy Yard. The Yard finished permanent repairs on 18 February.

The lesson to be learned from *Vestal's* experience is that water-tight integrity cannot be counted on in the case of older vessels. This ship was about thirty-three years old at the time, and it was found that flooding was progressive through the bulkhead and deck boundaries which supposedly were watertight.

7. U.S.S. RALEIGH, CRUISER (LAUNCHED IN 1922)

Raleigh was struck by a torpedo early in the attack. Like *Utah*, she occupied a berth usually used by an aircraft carrier. At 0756 the two torpedoes were dropped about 300 yards from the ship. One hit the ship below the eighty pound armor belt and another passed about twenty-five yards ahead of the ship. The one which hit the ship caused immediate flooding of the two forward boiler rooms and the forward engine room.

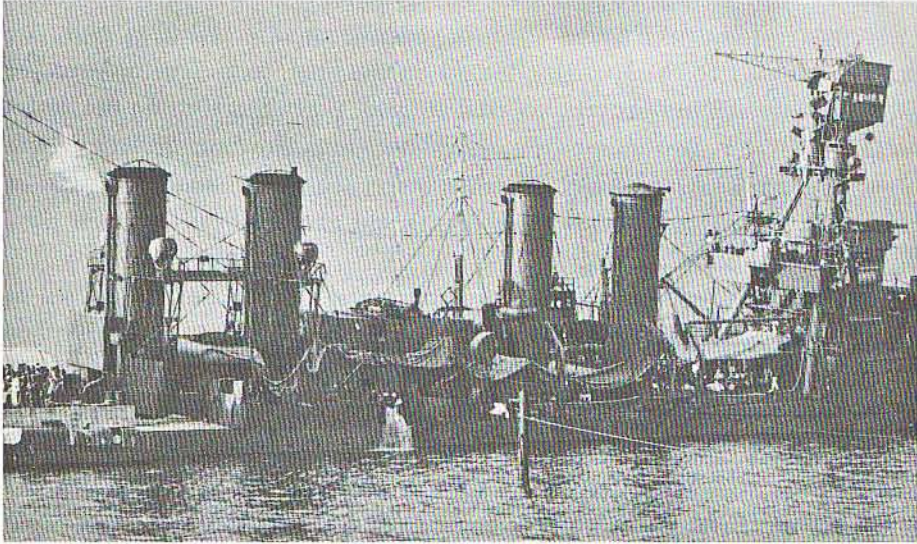


General Quarters was sounded at once, and the anti-aircraft battery went into action promptly. Men not at the guns were ordered to jettison weights on the port side, especially those high up on the ship.

About 0900 the ship received a bomb hit from a dive-bomber. This was dropped from about 800 feet and passed through three decks and out the side of the ship. It exploded clear of the vessel at frame 112 and caused damage typical of a near-miss. Luckily the compartment, which held 3,500 gallons of aviation gasoline, was left intact.

The ship counterflooded, but the construction of the ship was not favorable to a great deal of counterflooding as loss of buoyancy was more important than list. Due to defective hatches the main deck had some free water surface, which, added to that produced by the damage, was almost fatal. The jettisoning of topside weights and the reduction of free surface by pumping water from the main deck saved the ship. It certainly would have

been lost in a seaway, as it developed negative stability. This was gradually overcome, partly by lashing an available barge alongside.



80-C-32448

USS Raleigh after taking one torpedo hit amidships and one bomb hit aft.

Raleigh is an unusual case. The ship was almost lost even with moderate damage. The Commander Battleships commended the captain and crew for saving the ship by remedial actions.

The ship's force and repair ships repaired most of the inside damage to the ship, after removing almost all of the fuel, oil, and water which were aboard. It was not until 3 January that the Navy Yard had Drydock Number One available. Then the Yard completed permanent repairs to the hull and bulkheads until undocking on 14 February. Soon *Raleigh* departed on one engine for Mare Island where new engine parts were provided and electrical repairs made.

8. U.S.S. CURTISS, SEAPLANE TENDER (LAUNCHED IN 1940)

The seaplane-tender *Curtiss* was moored near the Ford Island Air Station. General Quarters was immediately sounded and all guns were in action within five minutes. By 0825 the enemy planes were repulsed. At 0840

Curtiss sighted a submarine periscope at 700 yards and promptly opened fire when the submarine partly surfaced. Two hits were made by 5-inch projectiles from number 3 gun.

Damage to *Curtiss* resulted from an enemy aircraft colliding with the forward crane. The enemy plane burned on the boat deck. This occurred at 0905. Another bombing attack occurred at 0912. One bomb fell on the mooring buoy aft and two bombs fell alongside. Fragment damage from these three bombs was considerable. Another bomb struck the starboard side of the boat deck, passed through three decks, and exploded on the main deck causing considerable damage.

These bombs were about 250 kilograms, measured about 12 inches in diameter, and carried about 130 pounds of T.N.T. They were released by dive-bombers from a height of about 300 to 400 feet.

The widespread damage caused by fragments to the piping, electric wires, steam lines, and ammunition supply, etc. overshadowed entirely the structural damage which they caused. Even the after engine room was affected by fragments from the bomb hit. Many fires were started and these were difficult to extinguish due to smoldering cork insulation and poor lighting.

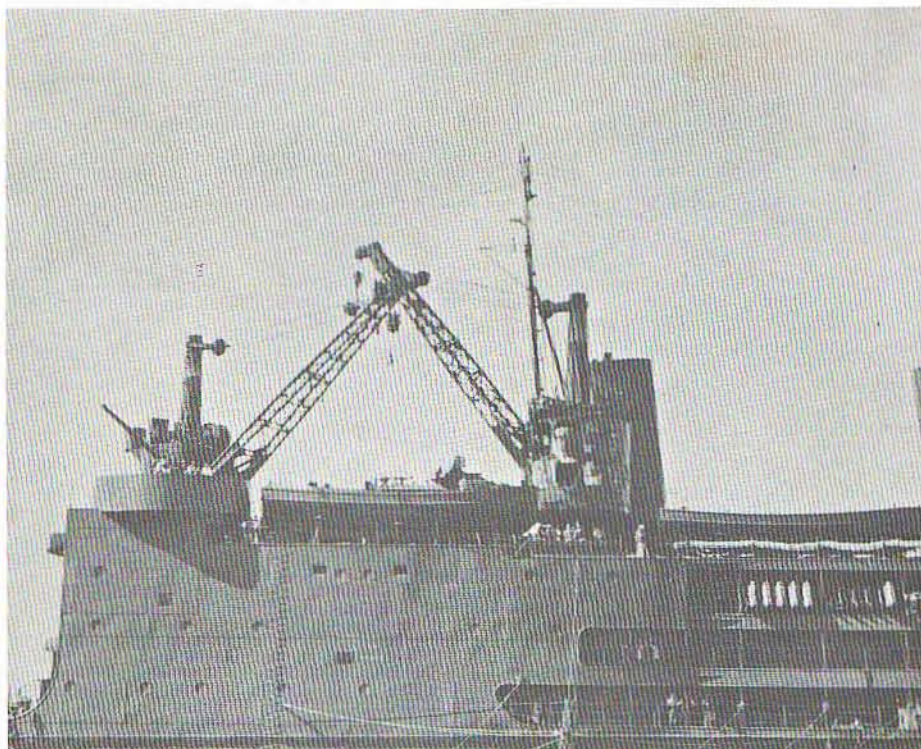
Much of the fragment damage could have been prevented by use of some armor, which was forbidden in auxiliary vessels under the arms limitation treaties. Later designs provided two-inch splinter protection for sixty percent of the length, as well as splinter protection for gun, fire control, and ship control stations.

The Navy Yard undertook repairs to *Curtiss* on two separate availabilities; the first was from 19 to 27 December. When replacement parts were received, *Curtiss* was in the Yard from 26 April to 28 May 1942. At that time final repairs were made.

9. U.S.S. *HELM*, DESTROYER (LAUNCHED IN 1937)

We have seen how *Helm* got underway promptly and patrolled the waters for submarines outside of Pearl Harbor. She was attacked by a dive-bomber at 0915 when about five miles southwest of Aloha Tower. *Helm* reported that the enemy fighter dropped two bombs from a height of about 1000 feet. The first fell about 100 to 150 feet off the port bow, and the other about 30 feet to starboard abreast frame 10.

The second bomb deluged with water the forecastle and the gun director.

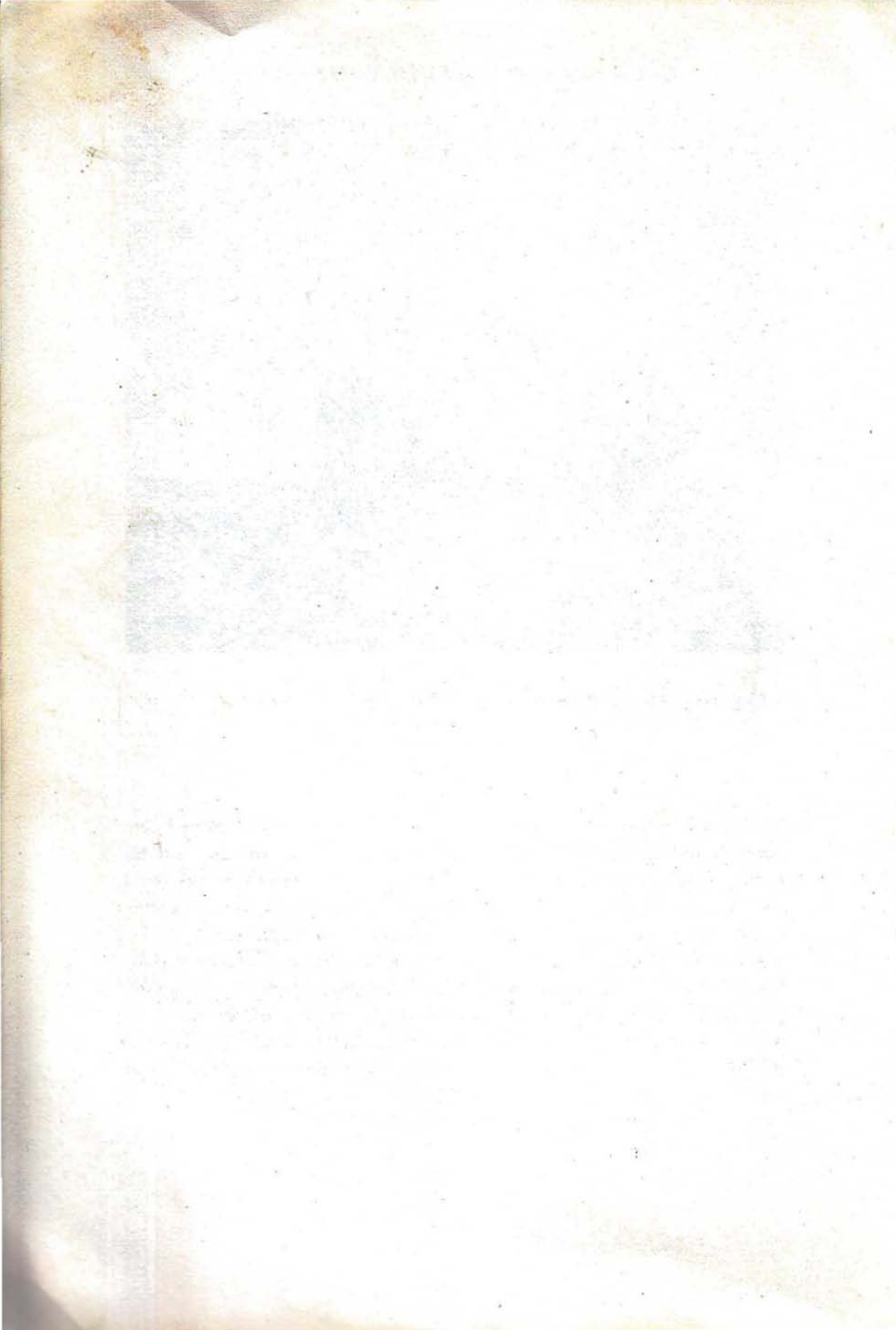


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USS Curtiss, showing starboard crane which was struck by Japanese aircraft out of control.

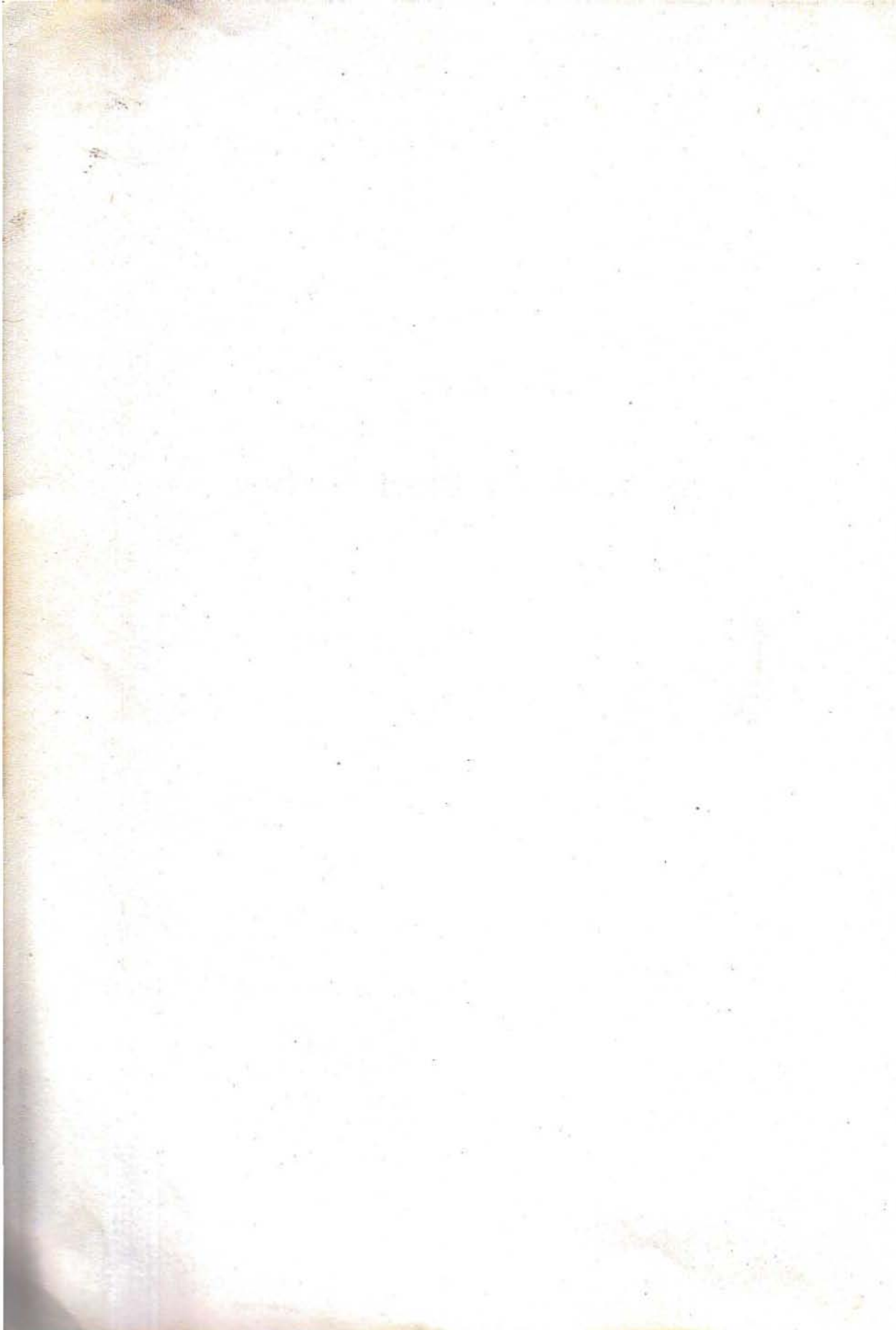
No fragments were observed. The forward part of the ship suffered considerable damage from the near-miss. The foundation of the gun director steadily grew worse, and the flooding forward was severe in the peak tanks and forward compartments. Some damage occurred due to short circuiting and kicking out of circuit breakers in the forward part of the ship.

Helm was drydocked in the Yard's marine railway on 15 January 1942. Here permanent repairs were made to the shell plating, structure forward, gun directors, and electrical lines. The shell plating showed the effects of the near-miss. Shear lines were seen forward of bulkhead 14. The practical effects of the near-miss were in accordance with the naval architectural theory.



CHAPTER XIII

Ships Sunk At Pearl Harbor



CHAPTER XIII

Ships Sunk At Pearl Harbor

There was a general feeling of depression throughout the Pearl Harbor area when it was seen and firmly believed that none of the ships sunk at Pearl Harbor would ever fight again. The scene to the newcomer was foreboding indeed. *Nevada* was near the entrance channel and was a sorry spectacle to greet the eye of the new arrival. Yet she was the best of the lot. It did not seem possible that *Shaw* or *California*, and especially *West Virginia* and *Oglala*, would ever be able to take part in the war. Yet we had embarked on a long war and most of these ships were yet to prove their mettle. In fact, even though *Shaw*, *Cassin*, *Downes*, and *Oglala* were officially reported as lost, they eventually fought against the Japanese.

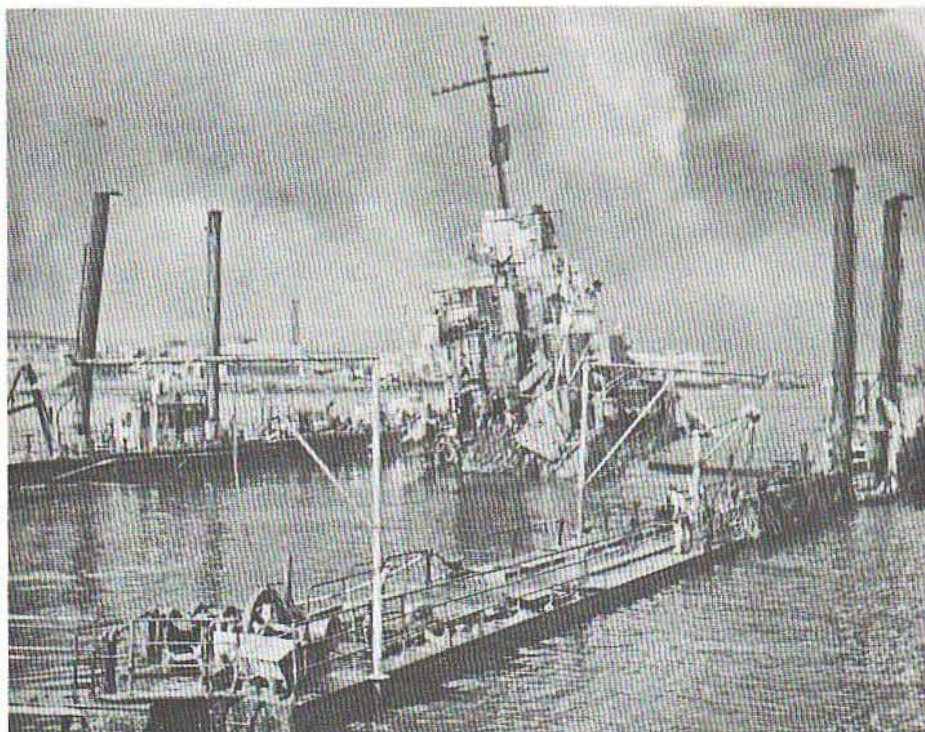
1. U.S.S. SHAW, DESTROYER (LAUNCHED IN 1935)

Shaw was in *Floating Drydock Number Two* when hit by three bombs from the same dive-bombers that attacked *Nevada* about 0850. The first two bombs came from port to starboard and apparently hit just aft of 5-inch gun number 1. They penetrated the forecastle and main decks and exploded with a low order of detonation in the crew's mess on the first platform deck. These bombs, according to Japanese records, were the 250 kilogram type, and were in part responsible for severing the bow forward of the bridge.

The third bomb was of the same type and passed through the bridge. It exploded in the wardroom pantry, and ruptured the fuel oil tanks, scattering burning oil throughout that portion of the ship. The heat from this oil fire caused the forward magazines to blow up. This wrecked the forward part of the ship as far back as frame 65.

When the floating drydock sank, the forward section of the ship went down with it, but the area from frame 60 aft was buoyant and remained afloat. There was considerable flooding of the forward boiler rooms, and the after boiler rooms had 10-15 inches of water. This entered through leaks in

the periphery of bulkhead 106 but was controlled by the portable gasoline pump procured next day from the Navy Yard.



80-G-32760

USS Shaw in Floating Drydock Number Two, showing damage after magazine explosion demolished the ship just forward of the bridge.

Shaw was originally reported as a total loss but its machinery was in good condition. It was only from frame 65 forward that the vessel was severely injured. Accordingly, the forward part was entirely cut off and the portion abaft frame 60 was docked on the Yard's marine railway on 19 December. At that time the Navy Yard took measurements for the fabrication of a false bow. This was installed on *Shaw* on 26 January 1942 when the ship subsequently was docked on *Floating Drydock Number Two*.

The Navy Yard scrapped the bridge area of *Shaw* and installed a temporary mast and ship control station. The vessel was undocked on 4 February, and after a few trials departed for Mare Island on 9 February. She was the first severely damaged vessel to put to sea, and there was great jubilation at Pearl Harbor to see her leave under her own power only two months



USN NR&L (MOD) 39746

USS Shaw *burning in* Floating Drydock Number Two.

after she was given up for lost. She was under command of Commander W. G. Jones.

Soon she became a first-line destroyer and took an active part in World War II. She performed a variety of duties common to a destroyer from the fall of 1942 until the end of the war. These duties ranged from bombardment of enemy islands to picket duty. She ran aground on a reef near Noumea, New Caledonia in January 1943 but was freed and drydocked after six days. Before World War II ended, *Shaw* won eleven battle stars, including those for the Battle of Santa Cruz Islands in 1942, Guadalcanal, Leyte Operation in 1944, and the Southern Philippines in 1945.

2. FLOATING DRYDOCK NUMBER TWO

This floating drydock was subjected to a heavy blitz about 0850. The Japanese planes were dive-bombers dropping 250 kilogram bombs, five of which fell near the floating drydock. She was submerged for protection.

Four of the bombs impaired her watertight integrity. At least 155 holes were welded or plugged by divers before she was raised on 9 January 1942.

She had rested on the bottom of Pearl Harbor for over a month at an angle of over fifteen degrees. Besides the damage from fragments she suffered from the fires which occurred on *Shaw*.

This floating dock was restored to service on 25 January 1942, and the next day she docked *Shaw* as her first customer since the morning of 7 December. For some time she operated on a limited basis because of a large hole which had not yet been repaired. It was not until 15 May that she was considered as good as new.

3. THE TUG *SOTOYOMO*

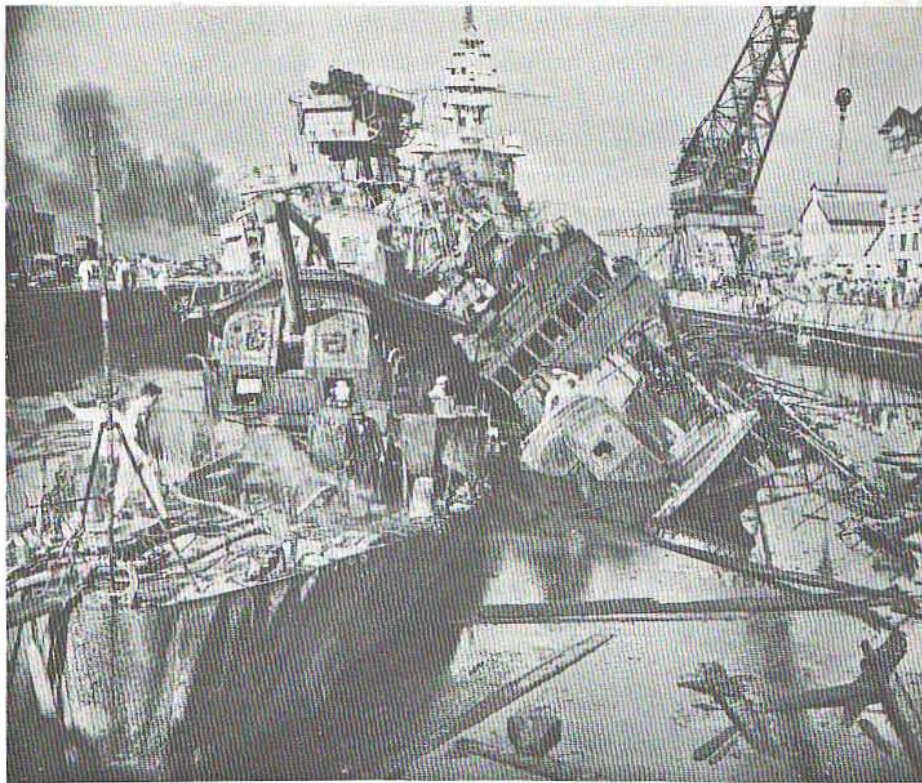
This small tug was in the floating drydock with *Shaw*. It appeared to be a total loss, and little attention was paid to her at first. Her name was against her, as it sounded Japanese. However, *Sotoyomo* commemorates a part of the war-like Sioux tribe of Indians. The tug proved that it was properly named.

It was taken in hand by the recently arrived Pearl Harbor Repair and Salvage Unit, under command of Lieutenant Commander K. F. Horne. The organization's original name was Destroyer Repair Units I and II and was composed of about 6 officers and 60 men, all of whom were specialists. They were housed and messed separately from the rank and file of the Salvage Organization. While *Sotoyomo* was their first assignment, they also proved their worth later in floating the famous *Cassin* and *Downes*. To them was added a group of about seventy other ship salvage experts.

The *Sotoyomo* was totally submerged. She suffered severely from *Shaw's* fires and had some fragmentation damage. The Navy Yard ordered spare parts for the vessel which did not arrive until late in the summer. However, it soon assumed full-time duty as a small much-needed tug at Pearl Harbor.

4. U.S.S. *CASSIN* (LAUNCHED IN 1935) AND U.S.S. *DOWNES* (LAUNCHED IN 1936)

These two vessels were a sorry spectacle indeed, as can be seen from the illustration on page 207. They were docked forward of *Pennsylvania*, and were the victims of serious fires, much fragmentation, and precautionary flooding of the drydock. After the attack *Cassin* and *Downes* were reported as total losses. The big question seemed to be how to get them clear of the



USN NR&L (MOD) 39747

Downes (upright) and Cassin in Drydock Number One.

drydock. They had gone through every kind of ordeal which ships could be subjected to, from bomb hits to severe fires, to explosions, to fragmentation damage, etc. These vessels were the only ones of the Pearl Harbor group that suffered all the kinds of damage enumerated, for which reason they are given special attention.

The bombs which struck or exploded near *Cassin* and *Downes* were the 250 kilogram type and were dropped by both high-level and dive-bombers. Incendiary bombs were not dropped as was reported originally by ship crews.

High-level planes were active in the area at about 0815, but it was not until 0850 that ten or fifteen dive-bombers approached. About ten of these attacked *Nevada* while the remainder covered the ships in Drydock Number One and in the floating drydock. At this time a hit was scored on *Cassin*. It went out through the bottom of the ship at frame 140 and struck the drydock floor between *Cassin* and *Downes*, starting a fire immediately. A few

minutes later a bomb struck the edge of the dock on the starboard side, and another on the port side. These hits cut off the water supply of the Yard and also the electric power. A second bomb struck *Cassin* and passed through the ship in the vicinity of frame 60. The fragments from this bomb penetrated both ships and their fuel oil tanks. By this time the oil fires extended the full length of both ships, and both were being abandoned when the second bomb landed. The third bomb hit *Downes* and demolished the director platform, the bridge, and the charthouse.

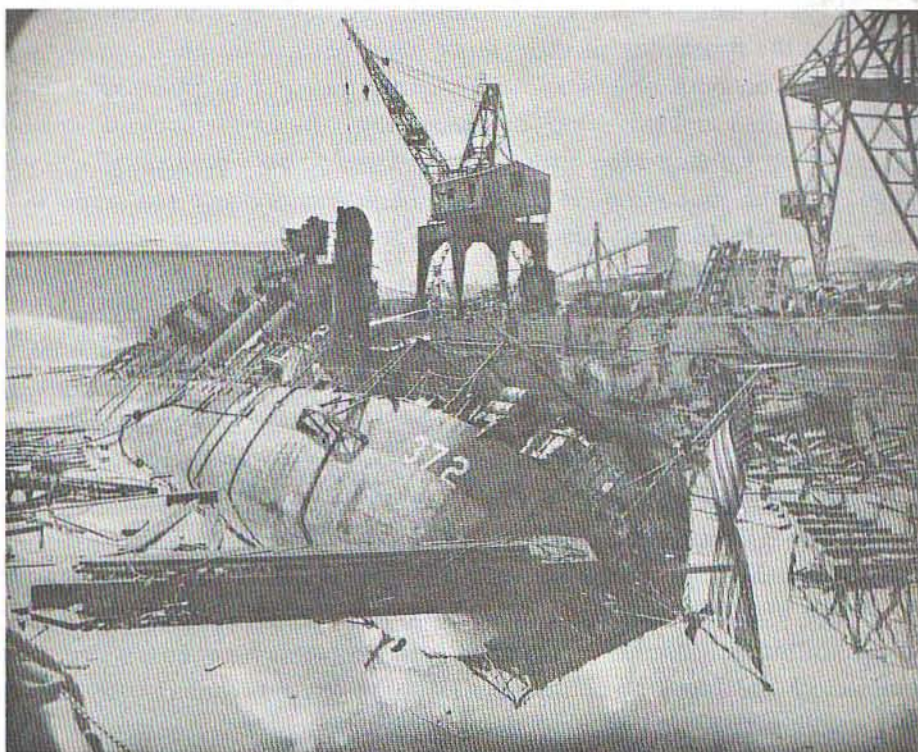
The fuel oil fires eventually reached the depth charges and the torpedoes. Without adequate water the fires raged on both ships and in the drydock. The Yard desired to flood the drydock as early as 0815 but no action was taken for an hour. At that time *Cassin* came afloat astern and pivoted on her forefoot. This, together with the free surface, caused *Cassin* to become unstable. She fell over on *Downes*.

The fuel oil fires caused havoc before the water level was high enough to protect the hulls of the two ships. The fragments from the first bomb penetrated the oil tanks of both vessels and loose oil fed the fires which were started. The thick black smoke, which is characteristic of burning fuel oil, prevented the crews from fighting the fires which engulfed both ships.

Explosions on *Downes* were the cause of much of the damage. The bomb hits were not in themselves of real account. The explosions were caused by fuel oil tanks becoming overheated, by 5-inch ammunition in ready boxes, by the powder in the forward magazine, and either by torpedo air flasks or torpedo warheads. Regardless of which part of the torpedoes was the real culprit, one of the assemblies was found in the yard seventy-five feet from its starting point. The force of the explosions was sufficient to wreck everything in its path. The most severe damage on *Downes* was caused by a torpedo explosion near the after stack. Here a large hole in the deck and side resulted.

The damage to the hulls of the two destroyers from oil fires, the toppling of *Cassin*, and explosions, etc. was extensive. Both vessels were pocked with holes. As for *Cassin*, the flat keel was warped and was about 18 inches above the baseline, the hull was hogged (raised in the middle) from 10 to 17 inches, the bow was about two feet high, and both struts were out of position. The shell plating of *Cassin* was badly wrinkled especially on the starboard side.

Downes was in worse shape as regards longitudinal strength. The bow was nearly 40 inches high, the stern 40 inches low, and the hull twisted and



USS Cassin.

80-G-32431

hogged. The plating was badly wrinkled from fire and strain, and damaged by many fragments.

Both vessels, on later examination, showed that their main propulsive machinery was in relatively good shape, as were the hull fittings and machinery throughout. However, the aluminum plating of *Downes'* deckhouse was completely destroyed and the corrosion-resisting steel panels of the deckhouses of both ships were badly wrinkled.

Lessons learned included the following for vessels in drydock in a war zone:

- a. Portable pumps should be available.
- b. Means should be provided by the Yard to fight oil fires.
- c. Rescue breathing apparatus and flame proof clothing should be near at hand.
- d. Torpedoes, depth charges, and warheads should be removed.
- e. If circumstances dictate that the dock should be flooded, care must be exercised in maintaining correct blocking under the ships.

The newly named Pearl Harbor Repair and Salvage Unit went to work to restore the floatability of these ships. They patched up hundreds of fragment holes on both vessels and on *Downes* they put in place some large sections of deck and side which had been blown out by the explosions. They used electric welding after fitting steel patches to suit the contour. At the same time the unit removed much of the machinery and put some in a state of preservation in suitable Navy Yard storage.

When *Pennsylvania* was taken out of the drydock on 12 December *Downes* was set on correct blocking, but *Cassin* was left in a toppled state until holes could be patched on the port side. *Cassin* was righted on 5 February, at which time patches were electric welded on the starboard side. She was floated and removed to the Navy Yard on 18 February. In the meantime *Downes* was floated and removed from the drydock on 6 February.

There was wide diversity of opinion as to the proper disposition of these ships. The Salvage Officer felt that in view of the dire scarcity of ships *Cassin* and *Downes* could be used for limited escort or patrol duties. Some felt that the machinery and suitable hull fittings should be preserved and installed in new hulls. Eventually the forces afloat agreed with the opinion of the Navy Yard that the hulls be scrapped and the machinery and usable fittings and parts of the vessels be sent to Mare Island. To this the Bureau of Ships and the Navy Department agreed.



USN NR&L (MOD) 37471

USS *Downes* afloat, being removed from drydock, 6 February 1942. Note wrinkled plating.

It was ordered that both ships be scrapped after removing from them all the machinery and parts that would be helpful to Mare Island. It was important that these be properly labelled before the parts were sent in various ships to the building yard. The scrapping of *Downes* was completed in drydock in August 1942 and of *Cassin* in October 1942. Mare Island Navy Yard completed the ships in November 1943 and February 1944 respectively. They then left the West Coast to look for Japanese ships.

Cassin was fortunate in her assignments, as she took part in the campaigns which brought the American flag to Marcus Island, Guam, Saipan, Tinian, Luzon, Iwo Jima, Palau, and the Philippine Islands. *Cassin* won seven battle stars and the Navy Occupation Medal for Asia.

Downes, which went to sea first, won four battle stars. Besides winning the Navy Occupation Medal for Asia, she participated in the taking of Saipan, Marcus Island, and Luzon. Both ships gave a good account of themselves after they were given up as "lost" on 7 December.

5. U.S.S. NEVADA, BATTLESHIP (LAUNCHED IN 1914)

The refloating and drydocking of *Nevada* showed unmistakably that such work should be under the direction of a person familiar with floatability, trim, list, and stability. The availability of a technical group knowing these facts about a particular ship as well as about the strength of various bulkheads is important to a satisfactory outcome. As was clearly shown later, the same applies to all ships which are flooded with water or filled with oil, ammunition, and stores. The close cooperation which existed between the Salvage Officer and the Pearl Harbor Navy Yard was of invaluable assistance in finding a satisfactory solution in the case of all vessels which were sunk at Pearl Harbor.

At this time, the Assistant Salvage Officer was a reserve officer named George M. Ankers. He had had some practical experience in Alaska but was quite unfamiliar with large naval vessels. Through hard work he progressed in the Navy from Junior Lieutenant on the *Nevada* job to Captain in the Bureau of Ships in charge of all salvage work.

In addition to Lieutenant Ankers and Carpenter Mahan, other officers and men became available. Most of these were reserves who, as on regular shipboard duty, were assigned specialty jobs and continued on that specialty. Thus some had charge of cleaning, or of diving work, or of pumps, or of

internal watertightness. These specialty officers progressed from ship to ship under salvage, while the Salvage Officer, himself, covered all projects, but spent most of his time on the ship destined for early drydocking.

Nevada was beached to prevent sinking on 7 December. She was located near the entrance channel with stern up against the shore and bow in deep water. Her draft when flooding of compartments had been completed on the following day was about 48 feet forward and 39½ feet aft at high tide, which was about two feet above zero. This position was maintained by several anchors laid out astern, and she remained in such position until refloated in February. Her list at the time was about two degrees to starboard. This was to prevent any possibility of the ship's sinking in the channel which connected Pearl Harbor to the sea.

The Salvage Officer, Captain Homer N. Wallin, was optimistic with respect to *Nevada* as she had reciprocating engines as compared to the electric-drive battleships *California* and *West Virginia* which were in much worse shape. But, he was taken aback somewhat by the words of the new Commander-in-Chief of the Pacific Fleet, who, when viewing *Nevada* for the first time, remarked that satisfactory salvage seemed impossible and that we should not be over-optimistic. It should be stated here that when Admiral Nimitz arrived on 31 December 1941 he wanted very much to be shown the various "wrecks" in the harbor. Captain Wallin, who was then the Senior Material Officer of the Battle Force, was assigned to him for this purpose. What Admiral Nimitz saw was a ship entirely filled with water, with her bridge and forward controls entirely burned out, and with the forecastle wrecked by the bombs which exploded beneath. No wonder he was pessimistic!

Nevada was struck by a torpedo at frame 41 about 0810 about fourteen feet above the keel. The innermost torpedo bulkhead held but the joints permitted considerable flooding below the first platform. The original list was four to five degrees but this was soon corrected by counterflooding. The ship had started warming up the machinery and was able to get underway at 0840. While underway near the Air Station the signal was received that the ship should not leave the harbor but should continue to the west side of Ford Island.

About 0950 five bombs hit the ship almost simultaneously. Two struck the forecastle near frame 15. One passed out through the side of the second deck and caused near-miss damage. The other exploded within the ship after penetrating the structure near the gasoline tank. This caused

gasoline leakage and vapors in that part of the vessel. This added to the many fires and the difficulty of extinguishing them. Another hit was near number I turret inboard from the port waterway. It blew large holes in the upper and main decks. A fourth bomb struck the port director platform in the foremast and exploded at the base of the stack on the upper deck. The fifth bomb exploded directly over the crew's galley, at about frame 80.

New fires broke out immediately. They were intense around the foremast, the officers' quarters forward, and the crew's galley. The forward magazines were flooded, and by mistake the after group was flooded too. When the fires burned themselves out, the foremast structure containing the bridge was entirely destroyed. Air from the intakes was smokey and caused the boiler rooms to be abandoned.

Flooding was progressive and emanated primarily from the "bull ring" where the main ventilation air intakes were located. By Monday nearly the whole ship was flooded including the machinery spaces. This flooding continued for a month; only a few compartments were found partly dry when the ship was eventually drydocked.

The new Commander-in-Chief of the Pacific Fleet was concerned about the flooding of the after part of the vessel where practically no damage had occurred. He therefore requested a report for the benefit of future operations. *Nevada's* officers pointed out that the progressive flooding was due to the following causes:

- a. Ventilation trunks permitted water to spread from the "bull ring" to various parts of the ship. There were inadequate closures in the ventilation system.
- b. The second deck was not watertight. As water spread on the second deck it reached spaces below through hatches and other openings. The second deck should have a large number of transverse bulkheads to prevent water from traveling forward or aft.
- c. There was leakage around piping and electric leads passing through armored decks and bulkheads.
- d. Although it was found that practically all "X", "Y", or "Z" closures were properly closed during the action, the flooding of the ship converted *Nevada* into a salvage job instead of a repair job.

Salvage work commenced promptly. The bomb holes forward were covered by wooden patches externally as shown in the illustration on page 217. These are known as "window frames" and are held close to the hull plating by hook bolts manipulated by divers. Of course the water pressure assists.

As the water level is lowered the inflow of water was partially stopped by stuffing rubber mats and kapok material in the bomb holes and using shores to tighten them. In one instance a steel patch was welded by divers in way of a serious leak.

Where the torpedo hit, there was one void and two liquid layers of fuel oil. This was minimal protection against torpedoes and exists in major ships only forward and aft of vital spaces. The damage from the torpedo was roughly 48 feet long by 25 feet in depth. Over this it was proposed to fit a large patch, but it was found that internal bulkheads in this area were reliable and would prevent the spread of flooding. Although the seams and butts of the inner bulkhead were opened somewhat as a result of the explosion, the flooding from this torpedo hit was not enough to scuttle the ship or cause serious flooding.

The large patch was made up at the Navy Yard and made to fit the upturned bottom of *Oklahoma*, the sister ship of *Nevada*. It was delivered in early January but it was unwieldy for handling. Immediately dredging was resorted to and part of the docking keel was removed by dynamite charges. Divers were busy for a month to fit the patch but it was finally given up and the intact bulkheads properly shored and backed up with water pressure. The patch would have projected at least two feet below the keel, and therefore presented a docking problem. It was ascertained after docking that the blister had blown outboard about two feet, and, unknown to the divers, prevented the patch from seating properly. The large hole was therefore left open to the sea and the internal bulkheads were depended upon for restricting the flooding.

Gradual reduction of the water level in the flooded ship was accomplished by suction pumps ranging in size from 10 inches to 3 inches. As spaces were unwatered prompt steps were taken to plug holes used for drains or sanitary discharges. The ship's crew also cleaned compartments of oil and refuse as the level receded. Personal property was guarded, classified information was turned over to a central point, and steps were taken to assure proper care and preservation of electrical and other equipment.

Ammunition and stores were removed from the vessel, as was oil and fresh meat which was very smelly by this time. The ammunition was sent to the ammunition depot for reconditioning.

Credit should be given to the Acting Commanding Officer for the efficient work performed by the twenty men of the ship's force who remained to handle the salvage work. His name was Commander H. L. Thompson. The



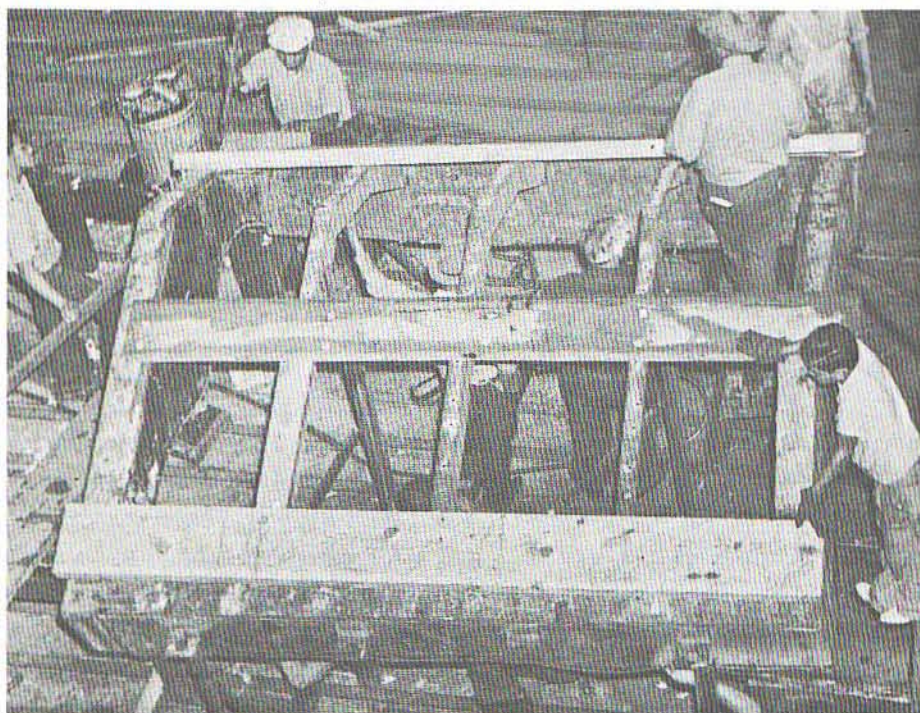
USN NR&L (MOD) 39749

USS Nevada, showing bomb rupture on bow, forward of turret I.

working force, which was recruited from the Receiving Ship and from the Salvage Division, performed valiantly in removing stores and ammunition. Oil was pumped into oil barges by the fuel oil pumps in the machinery spaces. These were operated by compressed air furnished by the compressors on barges alongside. The suction pumps on the oil barges were of considerable help. The valves for fuel oil lines were traced out by sense of feel by the divers.

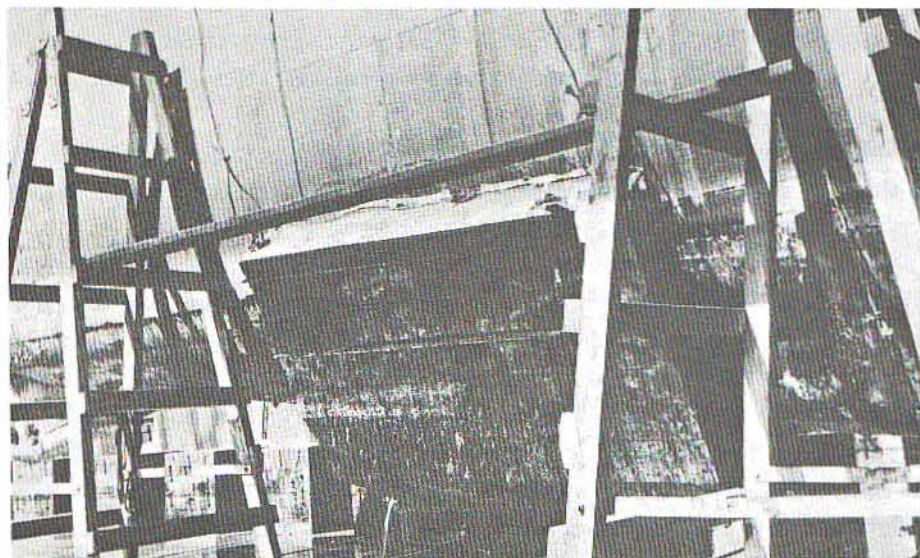
The Engineering Officer should not be overlooked, as he was a true optimist. He predicted that *Nevada* would sail to the West Coast under her own power. It sounded fantastic at the time, but his prediction was correct, not only for his own ship but for all the sunken ships except *Cassin* and *Downes*. His name was Lieutenant Commander George E. Fee.

Naturally the living spaces and other compartments were a real mess. These areas had been under water for two months, and the contents of the compartments were strewn about. The first requirement was general washing down with sea water; thereafter a hot caustic solution was used to cut the oil which had permeated all materials and all spaces which were open.



USN NR&L (MOD) 39750

Window frame patch for Nevada in Shipfitter Shop.



USN NR&L (MOD) 39762

USS Nevada in drydock, showing window frame patch in place.

It was determined early that the proper uniform for men of the salvage crew and ship's crew were rubber boots and a one-piece overall. These permitted the men to wade in oily water and to contact oily objects. Again, care was taken to guard all personal belongings and official papers.

Unwatering was a step by step process, in order to give the salvage crew time to plug leaks and to give the working crew time to clean up the spaces which were unwatered. Care was taken later when the ship was afloat to reduce to a minimum the free water surface. The use of small suction pumps in lower spaces facilitated this purpose.

The electrical gear held up remarkably well. At least ninety-five percent of it was salvaged, at least for temporary or limited duty. As the machinery spaces became free of water the motors were removed and sent to the Navy Yard for drying out and reconditioning. On account of the number involved, a Honolulu firm was requisitioned to assist with the work. Even the delicate electrical instruments like ammeters and wattmeters were found to be satisfactory and capable of salvage if prompt steps were taken for their proper preservation following unwatering. About this time "tectyl" was "discovered" by the salvage crew although the Bureau of Ships had become familiar with it before. Generous quantities of "tectyl" were used by all ships beginning with *Nevada*.

"Tectyl" is the trade name of a liquid substance which does wonders for machinery submerged in salt water. It not only absorbs what water remains, but furnishes a thin protective film over all parts. The treatment should be given before the air is allowed to cause corrosion after the removal of salt water.

The electrical wires or leads were found in relatively good shape. They could be dried out and used satisfactorily. The vital leads were finally replaced by the Navy Yard when the ship was sent to the Yard.

At about this time two fatalities occurred on *Nevada* due to poisonous gas. On 7 February Lieutenant James S. Clarkson removed a cap from the air test fitting of the steering engine room. He was in a trunk which had limited space and air volume. Several men went to his rescue, but too late as escaping gas killed him. Machinist Mate DeVries who reached him first, later died at the hospital. In all, six men were overcome by the gas. At once a Board of Investigation was called, and the Navy Yard chemist ascertained that the gas was hydrogen sulphide. It is odorless in high concentrations and acts without warning; it originates in stagnant water which has a quantity of paper products in the pressured space. Thereafter frequent

samples of air were taken for analysis, and temporary ventilation was greatly increased on all ships under salvage. Confined spaces were not entered without wearing rescue breathing apparatus.

Besides the temporary ventilation which was provided as spaces were unwatered, temporary lighting lines were run. Both were essential for the efficient performance of the work.

As weights were removed and water was pumped out, *Nevada* gradually came afloat. She floated on 12 February and was drydocked in Drydock Number Two on 18 February. It had been the original intention to drydock the vessel in Drydock Number One which is a smaller dock and has less clearance over the sill. This was given up gradually as trouble was encountered with fitting the large patch over the torpedo hole forward. As recounted, the patch was finally discarded and the magazine bulkheads were depended on for relative watertightness. The holding bulkheads were backed up by water introduced in the magazines. This water was pumped out as the vessel took up on the blocks of the drydock.

The operating forces, especially Admiral Nimitz were concerned lest *Nevada* sink in the channel when jostled by the tugs which conveyed her to drydock. To forestall this, gasoline pumps were kept running and there was no re-sinking. Accordingly, on 18 February Admiral Nimitz and Admiral Furlong stood at the head of the drydock to show their support of salvage work. A commendation was received from Admiral Nimitz for all hands whose hard work and persistence made possible the satisfactory outcome of the operations.

The work of the divers is worthy of mention. Much of the diving forward could be done with shallow water diving outfits, which were widely used until it was discovered that the water was polluted. *Nevada* divers were helpful in finding the valves in machinery spaces and operating the right ones to permit the transfer of fuel oil from the ship's tanks to the oil barges. All of this work was done underwater and without lights. The ship had only two divers but they made 80 dives. *Widgeon* and *Ortolan* had over a dozen divers each and together they made over 150 dives. Even the Destroyer Repair Unit had a few divers who participated in the salvage work. Of major importance were the four civilian divers of the Pacific Bridge Company who made 160 dives for over 950 diving hours. In all over 400 dives were made on *Nevada* totalling over 1500 diving hours. The divers performed all manner of work from underwater cutting with oxygen and electric torches to hydraulic and syphon excavating, to using



USN NR&L (MOD) 39780

Nevada, showing torpedo damage to port side.

dynamite to remove sections of the docking keel, to the use of hand and pneumatic tools for drilling and setting patches. They also did much interior work for pumping operations, adjusting watertight closures, etc. The successful accomplishment of all assigned diving tasks without casualty or injury was the result of excellent supervision on the part of Lieutenant Commander H. E. Haynes, who was in general charge of all diving, plus Gunner Duckworth of *Widgeon*, Gunner Arnold Larson of *Ortolan*, and Carpenter Mahan of the Salvage Division.

The Pearl Harbor Navy Yard took *Nevada* in hand once she was in dry-dock. The torpedo hole was temporarily made watertight. The bomb damage was also repaired, although it was necessary to build a new structure and new decks in various locations. The galley was made suitable for limited service. The damaged starboard shaft and propellers, and the rudder, were put in temporary good condition. These were damaged as the ship backed into the shore at Waipio Point. The six boilers were all rebricked, re-insulated, and properly tested.

The Navy Yard worked assiduously on *Nevada* and the vessel was undocked on 15 March 1942. The main and auxiliary machinery was thoroughly overhauled and tested. All Navy Yard work was completed on 22 April 1942. On that date *Nevada* joined a convoy for the West Coast and set sail for Bremerton, Washington. She traveled on her own power with both screws in use, arriving at the Puget Sound Navy Yard on 1 May 1942.

There the ship was thoroughly overhauled and modernized. She left Bremerton before the end of the year with a bristling array of modern anti-aircraft guns. She participated in the Aleutian Campaign in December 1942, and later took an important part in the landings in France. Thereafter she joined forces in the Pacific and took part in the campaigns which brought victory at Iwo Jima, Okinawa, and Japan itself. Here was a ship which at one time looked like a total wreck but now was a formidable foe of the Axis Powers.

Nevada won seven stars in World War II as follows: one star for Pearl Harbor-Midway, one star for the Aleutian operations, one for the Invasion of Normandy (including bombardment of Cherbourg), one star for the Invasion of Southern France, one star for the Iwo Jima Operation, one star for the Okinawa Gunto Operation, and one star for the Third Fleet Operations against Japan. She also received the Navy Occupation Service Medal (Asia clasp).

Nevada was noted for the accuracy of her main battery of 14-inch guns.

These were used in bombardment in France and in the island campaigns against Japan.

6. U.S.S. CALIFORNIA, BATTLESHIP (LAUNCHED IN 1919)

The Salvage Organization studied all jobs which lay ahead and came to some conclusions regarding the salvage of each particular ship. As a result there was little difference of opinion as the work progressed. The officers and men of the Salvage Division, the Navy Yard, and the Pacific Bridge Company were all included.

While work was proceeding on *Nevada*, the wooden cofferdams for *California* were well underway, and the patches for *West Virginia* were being put in place. Moreover, personnel were transferred from a ship which had been completed to the next ship scheduled for drydocking. Thus Lieutenant Ankers and Chief Carpenter Mahan were transferred, among others, from *Nevada* to *California*. The Salvage Officer, Captain H. N. Wallin, divided his time among all ships and concentrated on the one that seemed most in need of his services. Part of the officers of the Salvage Division are shown in the picture on page 224. This picture was taken on *California* during the planning for that ship's salvage.

The crew of *California* affectionately referred to her as "The Prune Barge," because that state produced a large quantity of prunes for export. It did not seem possible that the old "Prune Barge" was helpless on the bottom of Pearl Harbor. The salvage of *California* was studied by many interested persons.

The salvage of *California* was somewhat similar to the work on *Nevada*, but the first ship was damaged much more severely and recovery of human bodies was involved. It was the recommendation of experts from Washington that a sheet steel bulkhead be driven entirely around the ship. But because of the nature of the bottom of the harbor, it was decided that the first work should be to close the torpedo holes with concrete patches. Before that could be done, it was necessary to wall off the water by driving steel sheet piling around the torpedo holes. But, as work progressed it was decided to reduce leaks through these holes from the inside and to eliminate entirely the patches on the outside.

While *Nevada* lost some men, none of the bodies were in the ship. All

men had been blown overboard or killed near the impacts of the bomb hits. In the case of *California*, however, it was assumed that about fifty bodies remained in the ship.

Another important difference was that the whole quarterdeck and a part of the forecastle of *California* were underwater. While *Nevada* was driven by reciprocating engines, *California* was electric-driven. The experts at hand figured that the salvage of electric-drive battleships would require at least four years. All in all, then, the salvage of *California* was a much more difficult job than the salvage of *Nevada*.

California was struck by two torpedoes and one bomb. Serious damage was done by a bomb near-miss and minor damage resulted from bombs which exploded at a distance. A bad fire resulted from the bomb which struck the ship before it was stopped by the armored second deck. The vessel sank over a period of three days. This fact indicated that the torpedo bulkheads were reasonably intact.

Flooding of the ship was progressive due to open manholes, ventilation systems, and ruptured pipelines. Water and oil permeated the ship and caused abandonment of fire rooms and engine rooms. Unfortunately a serious oil fire from *Arizona* swept down upon *California* at 1000 on the day of the attack. This caused temporary abandonment of the ship and interfered with the steps being taken to keep the ship afloat. Except for this, *California* would no doubt have been saved from sinking.

The list of the vessel was to port, and at one time was nearly sixteen degrees. There was considerable concern lest the ship turn turtle as *Oklahoma* had done, or that she slide into deeper water on the port side. In order to reduce the list, counterflooding was resorted to, and two boiler rooms on the starboard side were purposely flooded. The Commanding Officer, Captain Joel W. Bunkley, asked the Material Officer of the Battle Force, Captain Wallin, if flooding by hose of the outboard starboard blisters would not be helpful, and this step was taken. The result was that the list to port was greatly reduced. It was about five and a half degrees eventually.

Unlike *Nevada*, *California* was not in battle condition at the time of maximum damage. Although attempts were made to assume condition Zed after the surprise attack was begun it must be realized that passing from X-ray to Zed at breakfast time on a Sunday morning was no easy task. The fact that unwatering showed many Zed closures open substantiates the fact that the ship never attained the proper closure.

A number of the manholes of the port blisters were off or were loose,



USN NR&L (MOD) 39751

Part of salvage crew discussing salvage of USS California. From left to right they are: J. M. Ephland, CSF, Master Diver; LT W. L. Painter, USNR, Officer in Charge of Work; CDR J. F. Warris, USN, Temporary Commanding Officer; CAPT H. N. Wallin, USN, Salvage Officer; LT G. W. Greely, USNR, Assistant Salvage Officer; LT W. M. Bjork, USNR, Assistant Salvage Officer; and LT J. W. Darroch, USNR, Assistant Salvage Officer.

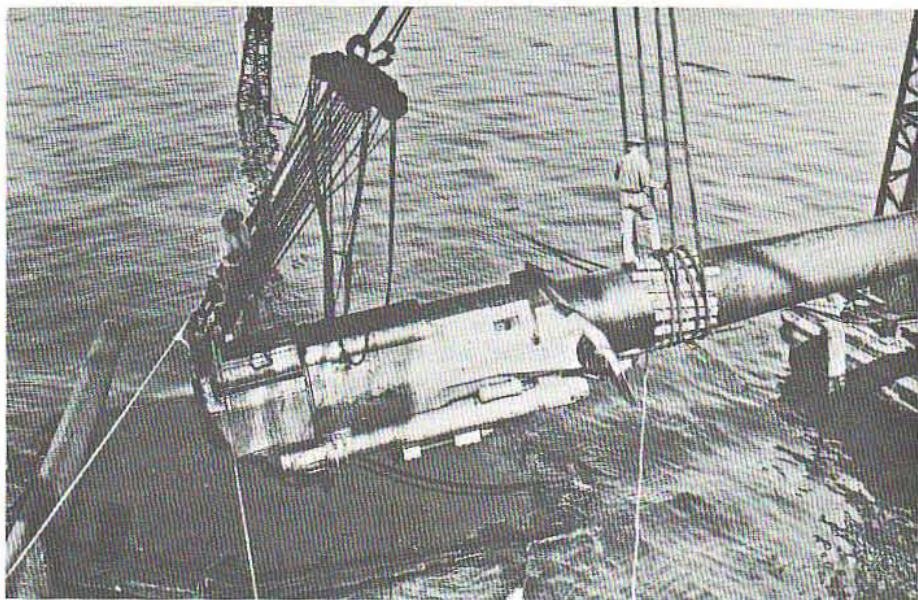
which contributed to the loss of the ship. This permitted fuel oil to flow up from the fuel tanks near the torpedo hits and eventually to find its way to the lower parts of the vessel. This together with non-closure of 8-inch fuel lines and ventilation ducts, permitted gradual seeping of fuel oil and water to vital parts of the ship.

California was well designed. The holding bulkhead near the torpedo holes was adequate to its task. Except for a few discrepancies in the location of fuel oil lines and water lines the ship was entirely able to withstand the punishment received on 7 December. Staying afloat for three days and drydocking without a single patch attests to the toughness and ability of the ship. Adequate pumping, if it could have been supplied at the time, would have kept the vessel afloat.

The two torpedo hits at frames 46-60 and frames 95-100 respectively were the most serious damage sustained. The torpedo protection at these areas is approximately 17½ feet deep consisting of five bulkheads. In each case the inboard bulkhead was practically intact. The torpedo hits were below the armor belts.

The near-miss forward was a serious threat because of the 3000 gallons of gasoline carried in this area for the seaplanes and for the motorboats. The gasoline lines were not ruptured although some leaks occurred. Most of this gasoline was drained out during salvage operations. Flooding was general in this part of the ship, and that put the bow down several feet. A "window frame" patch was installed over the hole blown by the near-miss on the level of the first platform deck. This was effective but was blown off a few days before docking by the explosion of gasoline vapor in the area. The explosion was severe and did additional damage to the structure. Fortunately all hatches and doors were tightly closed and dogged at the time of the explosion. It is likely that a naked light, possibly with defective wiring insulation, caused the explosion. Later, additional ventilation was provided to prevent such explosions. Some additional areas were opened to the sea, but it was possible to isolate the damage and to proceed without attempting further patching. By this time it was ascertained that the pumps in use were more than enough to keep up with the water which found its way into the ship.

A 250 kilogram bomb did considerable damage at about 0845 on the day of attack. Although it killed a large number of people, it did not directly affect the ship's stability or floatability. It entered at the starboard upper deck level at frame 60, passed through the main deck, and exploded on the



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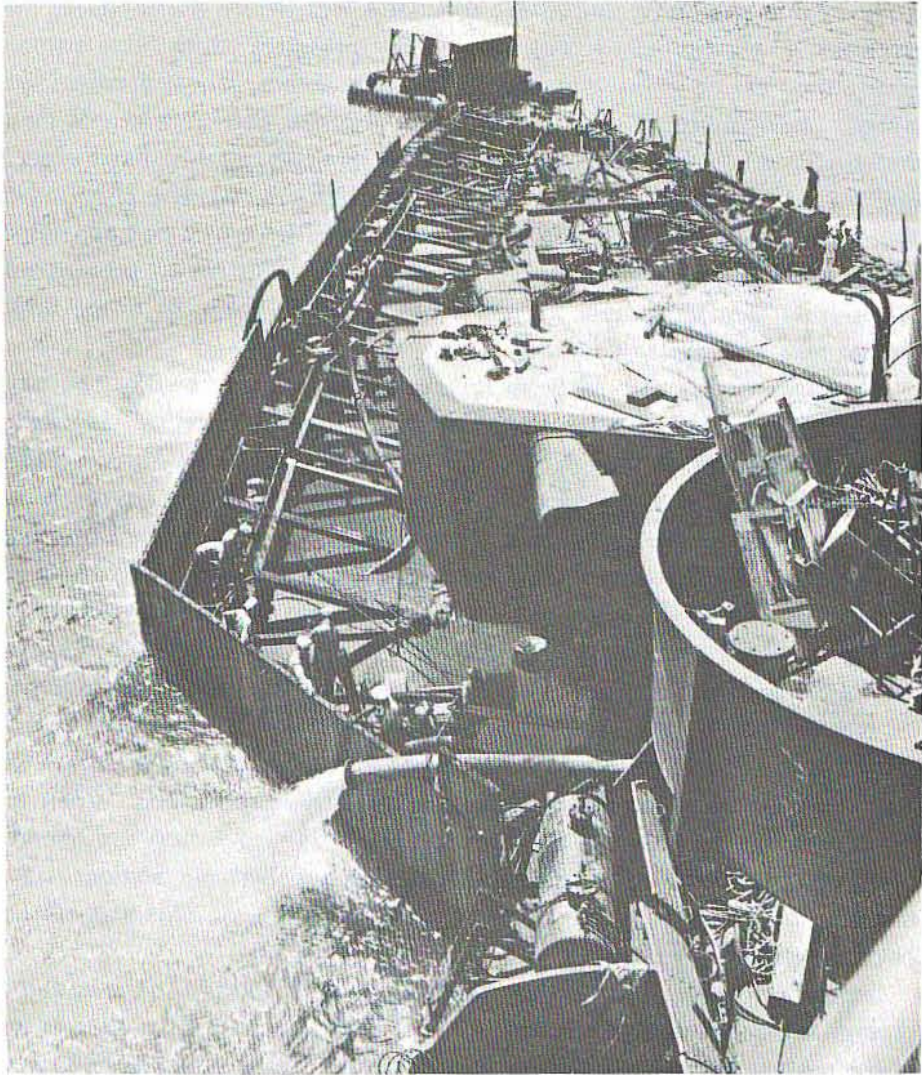
Removal of one of the 14-inch guns from USS California.

armored second deck. It caused a great deal of structural damage and a fire which was difficult to extinguish on account of the failure of water pressure at that time. The smoke from this fire, which was fought with carbon dioxide extinguishers by men using old type rescue breathing apparatus, infiltrated the second and third decks. The smoke found its way into the forward engine room through the ventilation system. By causing the abandonment of the engine room it had a bad effect on the fortunes of the ship. The fire was finally put out by three minesweepers which came alongside.

A few high-level bombs were dropped on the starboard side, but these had little effect on the ship aside from slight damage from near-misses and some fragmentation damage to smoke stacks and starboard anti-aircraft guns.

After three days the ship came to rest with a list to port of about $5\frac{1}{2}$ degrees with a draft of about 43 feet forward and 57 feet aft. This put sea water over the port side forward and over turret IV on the quarterdeck. The ship was settled deeper in the mud than anticipated.

The first requirement was to unload the ship. This was partly accomplished by the removal of all guns from the turrets except turret IV which



80-G-36812

Salvage operations on California showing removal of water from forecastle.

was below the water level. Eventually the ship and flag conning towers were taken off, the broadside guns removed, and the mainmast, which had previously been recommended for removal, was cut off at the base and taken off the ship. Plans were made to remove all safes aboard, the catapults, the boats, the cranes, and the anchors and many shots of anchor chain.

While this was being done a wooden fence-like cofferdam was erected

around the quarterdeck, and in the forecastle area, which was flooded. The thickness of the timbers depended upon the pressures which were encountered; they varied from four inches to eight inches. The cofferdam was usually installed from barges in thirty foot sections. Each section was made watertight at the deck coaming, was braced by divers against fixed objects, and was fitted with bins for sand bags to overcome the positive buoyancy of the lumber. The weight of the sections was taken by a fore and aft timber which rested in the waterway. The heights were sufficient to prevent seawater from entering in case a greater list was experienced or if the vessel should take a starboard list when afloat.

About this time, material from the mainland began to arrive. The most important were the electric deep-well centrifugal pumps up to twelve inches in diameter. Although the ship received power from Ford Island it was self-sufficient with generators, air compressors, and drying out machines. These were set on the upper deck or some other dry spot on the ship.

The Navy Yard received some mechanics from the mainland who were extremely useful in the heavy workload ahead. Among these were carpenters to fabricate the cofferdams and make them tight against water pressure.

Most of the work was done by divers at this and later stages. A large part of it was done by the Pacific Bridge Company, which fabricated and installed the wooden cofferdams. Their six divers were kept busy bracing and making watertight the cofferdam around the quarterdeck. When the water level inside was below that outside, the flow of water was checked by stopping small leaks. At the deck coaming and between sections a soft material, or pudding, was used to attain watertightness. This was usually oakum enclosed in canvas.

Other divers were busy below decks plugging sanitary drains, ruptured piping, sea scuppers, and ventilation lines. The closing of all ports was one of the most important tasks. They also closed off the leakage resulting from open or loose manhole covers. This was done by driving shores or wooden wedges in ruptures admitting seawater or oil.

One big job efficiently performed by divers was the closure of gun ports on the port side. The Navy Yard made strongbacks which permitted the closures to be drawn up tight. After removal of guns it was hard to make the closures watertight except by strongbacks and wedges.

When the electric and the gasoline-driven centrifugal pumps were placed in the various trunks and compartments the water was circulated to overcome stagnation. This was kept up everyday. It was then discovered that the out-

flow of the pumps was greater than the inflow of water, and it was decided that with additional plugging it would be possible to float the vessel without patches over the torpedo damage.

The lowering of the water level was kept in step with the removal of stores and oil, the care and preservation of the equipment which was uncovered, the removal of human bodies, and the cleaning of the compartments which were unwatered. A definite schedule controlled this work. As soon as turret IV was above water, inspection was made of turret rollers. It was found that aside from slight corrosion and discoloration the rollers and their paths were perfectly all right.

The Salvage Division never did get enough men to do a satisfactory cleaning job although men from the Receiving Station were added from time to time to augment the ship's force available. The amount of cleaning which is necessary in a sunken battleship is well-nigh incalculable. The maximum number required was about 500 men; at first only 6 officers and 48 men were available.

As the ship was pumped down in accordance with the schedule, divers plugged leaks in the structure and steps were taken to preserve machinery. A hot caustic solution was applied to machinery equipment as well as to all surfaces immediately after original washdown with seawater. This was followed by fresh water, and machinery items were treated to a bath of "tectyl" to prevent corrosion. Many items were put on a barge and sent to the Navy Yard. They were tagged for identification under the able direction of Lieutenant Commander J. A. McNalley who was in charge of preservation and identification. Eventually these items were sent to the Navy Yards at Puget Sound and Mare Island, but those needed for the homeward voyage were retained at Pearl Harbor. Because of the large number of electric motors on *California* all those not needed for the voyage to the mainland were preserved in place aboard ship. Lieutenant J. W. Darroch was in charge under Commander McNalley, and did a good job of preserving and drying out these electric motors.

On the second and third decks of *California* a number of human bodies were encountered. It was the practice to stop the pumping in time to leave about two feet of water above the deck. The bodies were then floated into large canvas bags. These were securely tied and transported to the Naval Hospital at Aiea for correct identification and burial.

The removal of oil, ammunition, and stores went on continually. About 200,000 gallons of free oil were collected from various compartments. The

free oil had a good effect in protecting machinery items from the seawater although, of course, it was also responsible for causing loss of life and the abandonment of certain battle stations. Stores were easy to remove when the water level permitted. The refrigerator spaces containing fresh meat were a notable exception. Ammunition was a valuable factor in reducing weight, especially the 14-inch shells and powder.

Mention should be made of the oil-skimming operation, which was followed in all ships. This was a part of the free oil recovered, and was used at all times particularly before final pumping at any deck level. All classified information and personal effects were turned over to the Commanding Officer for proper handling and disposal.

The experience aboard *Nevada* warned of the danger of toxic gases. Great care was taken to avoid subjecting the men to this danger. Before any compartment was entered the air was analyzed by the Yard expert, Lieutenant Commander C. M. Parker (Medical Corps) of the Industrial Department. He was available at all times and was a frequent visitor to the ships under salvage. Lieutenant Ankers and Carpenter Mahan were charged with watching for gas hazards. One of these officers was aboard at all times. Temporary ventilation was furnished for all spaces and temporary electric lights were installed in all compartments. All men were outfitted with boots and coveralls.

As the machinery spaces were emptied, great care was taken to preserve the electric-drive alternators and motors. It was hoped they would be usable for the voyage to the mainland. The mechanical parts were washed out with fresh water and "tectyl." The electrical parts were cleaned and dried. The instruments in the control room were sent to the Navy Yard as quickly as possible following removal from the instrument board.

Shortly after docking Commander Hyman G. Rickover arrived from the Bureau of Ships. He had a plan for reconditioning the electric-drive machinery and had consulted with General Electric and Westinghouse Companies as well as with the Puget Sound Navy Yard. He held a conference on 11 April. He had with him a representative of the Puget Sound Navy Yard, Mr. McConnell, and Mr. C. E. Wilson of the General Electric Company. It was decided that electric motors which were subjected to high voltages could not safely be dried out and re-impregnated. This method was only suitable for low voltages especially in a ship which was twenty years of age at that time.

It was not long before General Electric had fifty-three men working on

one alternator and two motors. It was their estimate that the electric machinery necessary for a trip to Puget Sound could be completed in about four months. It was decided that one set, consisting of one alternator and two motors, would be cleaned in place and dried out for the voyage, and finished while other work was being performed at Puget Sound. All vital wiring and instruments were replaced at Pearl Harbor. The machinists, electricians, and riggers from the Puget Sound Navy Yard were partly responsible for the fine record made.

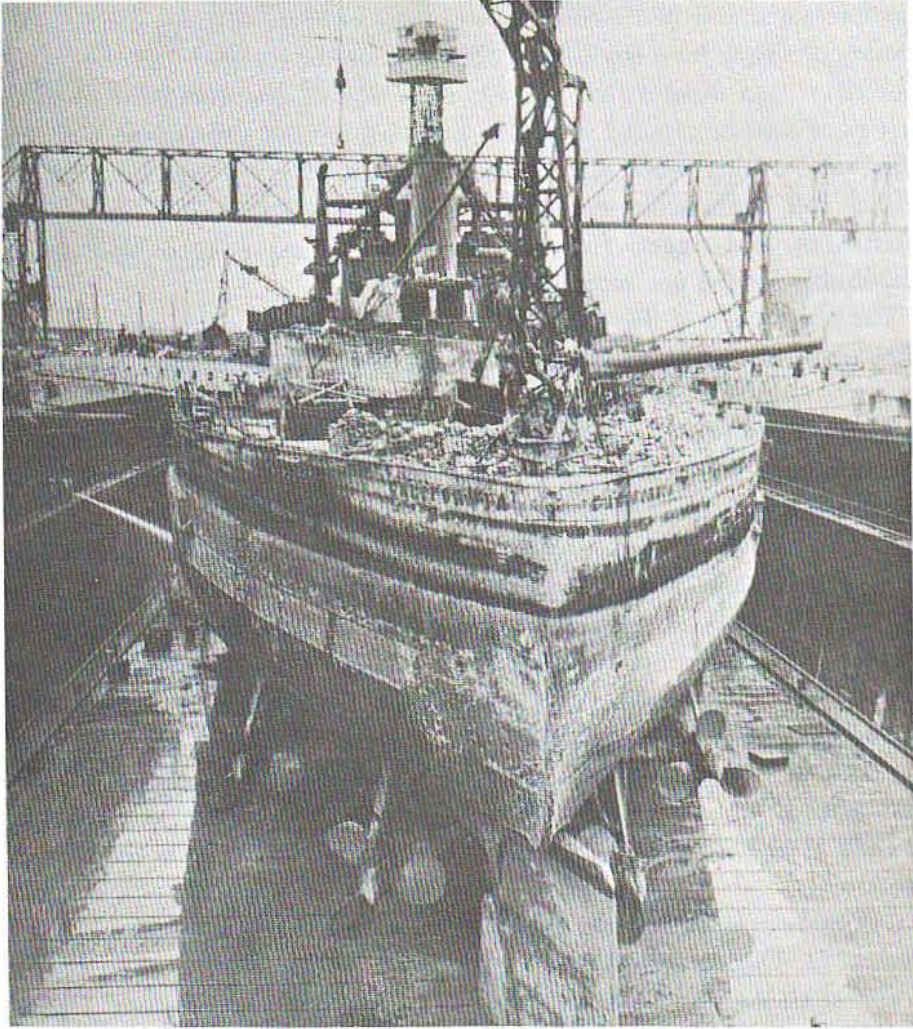
The turbine end of the electric-drive machinery gave no important trouble although it required the usual attention due to corrosion in some degree and the presence of fuel oil.

As for the boilers which had been submerged for four months, they were found to be in good condition although, as done on *Nevada*, it seemed best to rebrick and test them.

California came afloat on practically an even keel or a slight list to port on 24 March 1942 and was placed in Drydock Number Two on 9 April 1942. At that time her mean draft was about forty feet. Before docking, the wooden cofferdam around the quarterdeck and on the forecastle were removed from the vessel. As customary, the Commander-in-Chief of the Pacific Fleet and the Commandant of the Navy Yard were at the head of the dock to welcome *California*. In the spring of 1942 the office of Fleet Maintenance was established under Rear Admiral C. A. Dunn; after arriving at Pearl Harbor he was never absent from significant events in the salvage operations.

California remained in dock, subject to seventy-two hours notice, until 7 June 1942. During this time the Yard made permanent structural repairs to almost all the ship's damage. After a few trial trips she left Pearl Harbor under her own power on 10 October 1942 and arrived at the Puget Sound Navy Yard on 20 October 1942. There she was modernized and fitted out with forty 40-millimeter Bofors in quadruple mounts and forty-eight 20-millimeter Oerlikons in single mounts. The ship was entirely new with greater beam, greater stability, greater protection, and 154 miles of new electric cable.

Credit for the successful salvage of *California* has to go to the Navy Yard personnel as well as to the Salvage Division. Of the former we must not overlook the Planning Officer, Captain Fred M. Earle, and his able assistants. In the Salvage Division, by far the hardest worker and the one who set the pace for all others was Lieutenant Wilfred L. Painter. His



USN NR&L (MOD) 30748

California just as the drydock emptied, 9 April 1942.

assistants were Generaux, Bjork, Greely, Walker, Ankers, and Mahan. The Manager of the Navy Yard, Captain Claude S. Gillette, was helpful at all times, especially in reconditioning the electric-drive machinery, with which he was intimately familiar since he had served as Engineering Officer in one of these ships. We must not forget Lieutenant Commander J. A. McNalley who did so much in preserving and reconditioning all machinery parts and electric motors. He was a real optimist! The Pearl Harbor Repair and Salvage Unit under Commander Horne was on the job during most of

California's salvage and did much good work in cleaning and preserving electric equipment as well as stringing temporary lighting cables.

California remained at the Puget Sound Navy Yard somewhat less than one year. After that she joined the Fleet and participated in the Marianas Campaign, bombarded Saipan under Rear Admiral J. B. Oldendorf, and bombarded Guam under Rear Admiral Richard L. Conolly. She was a part of the American forces at the famous Battle of Surigao Strait in which she, on 25 October 1944, pumped over sixty 1500-pound projectiles into a Japanese battleship of the *Fuso* class.

Thus, U.S.S. *California* came out of a watery grave and won seven battle stars against the forces of Japan before World War II ended. They were for Pearl Harbor-Midway, the Marianas Operation (Saipan, Tinian, Guam), the Leyte Operation, the Luzon Operation, the Okinawa Gunto Operation, and for Third Fleet's Operation against Japan.

7. U.S.S. WEST VIRGINIA, BATTLESHIP (LAUNCHED IN 1921)

Here was a ship much more severely damaged than *California* or *Nevada*. Salvage was getting harder as the work progressed. Few there were in the early days after the Japanese attack who believed that *West Virginia* would ever float again, much less be a formidable ship against Japanese sea power. Yet, so it turned out to be!

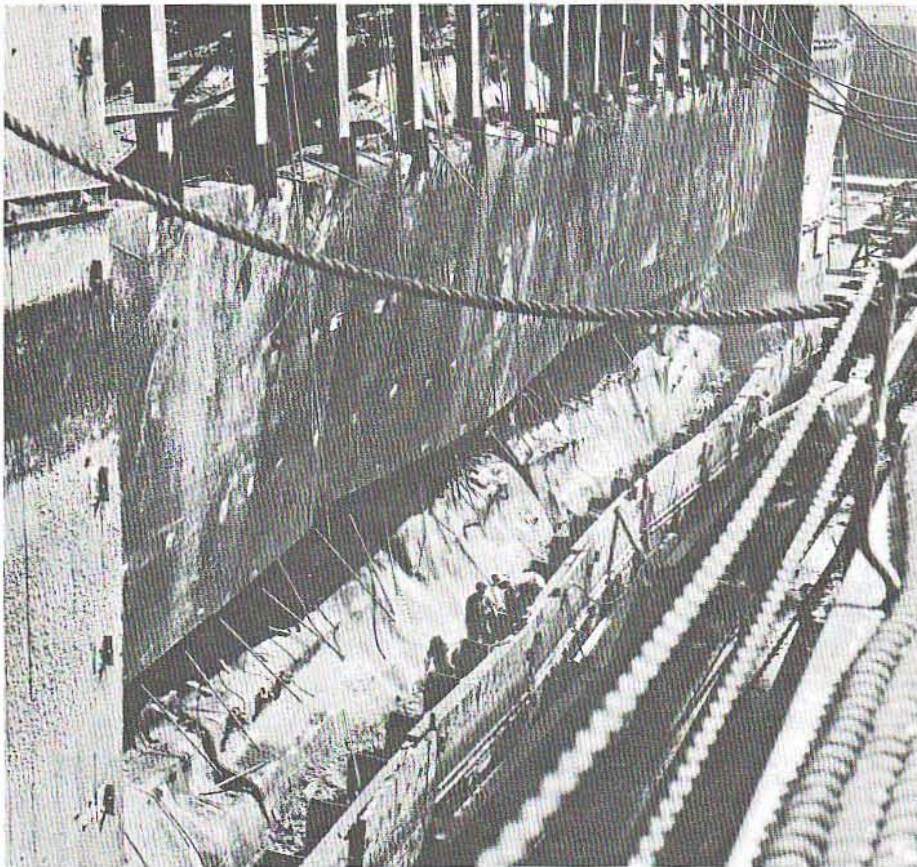
The pet name for this formidable ship was the "Weevie." Most of the crew and officers were transferred to other ships and only a skeleton crew remained on board. The high command was hard pressed for experienced men to man the ships of the fleet, and after all, it did not seem reasonable to assume that "Weevie" would ever fight again.

The vessel was hit by as many as seven torpedoes; the exact number is questionable because of the extent of damage on her port side. At least three torpedoes struck below the armor belt and one or more hit the armor belt knocking it askew. Seven armor plates and their keys were ordered by the Puget Sound Navy Yard. One or possibly two torpedoes entered the ship through the holes made by the first torpedoes when the vessel was listed about 20 to 30 degrees. These exploded on the armored second deck; and one hit the steering gear and wrecked the area aft, besides knocking off the rudder. Two bombs struck the ship but fortunately they were both duds.

The torpedoes virtually opened up the whole port side. It was the composite opinion that a patch was required over the two major holes extending from the waterline to the turn of the bilge. One such concrete patch was needed at frames 43 to 52, and another of ample proportions from frames 61½ to 97½. The steering area could be isolated, and the rudder picked up from the bottom of the harbor in due course.

The torpedo bulkheads were severely damaged. The holding bulkhead was ruptured far more than in the case of *California*, and the intervening transverse members were badly accordionized.

The bombs which struck 16-inch turret III and the foretop respectively did little damage. Both were the armor-piercing type of 15-inch projectiles.



USN NR&L (MOD) 30753

USS West Virginia, showing distortion in armor belt and damage above and below on port side looking aft.

The first passed through turret III's top but failed to explode within the turret. The other passed through the foretop and was found later unexploded in the debris on the second deck.

Serious damage occurred due to an oil fire which was not extinguished for thirty hours. Part of the oil was washed in from *Arizona* and part of it came from the ship itself which was about 70 percent loaded with fuel oil. This fire caused warping of a large area of deck and bulkhead plating amidships. A peculiar aspect of the fire was that when it was put out in one area it broke out in another.

West Virginia suffered some damage from being pinched by *Tennessee* when that ship wedged against the forward quay. Some damage to the bilge amidships was caused. But this may have prevented *West Virginia* from capsizing in the early stages of the attack before counterflooding was effective. In any event it reduced the amount of heel.

Salvage work began while similar work was underway on *Nevada* and *California*. The experience which the salvage crew gained on those two ships was useful for the *West Virginia* job.

One significant aspect of the work was the use of underwater concrete. By this time, too, the electric driven deep well pumps of up to a ten-inch discharge, were available. Also, the gas hazard was recognized and steps were taken to consult Commander Parker of the Medical Corps frequently. In fact, regular tests were run in various parts of the ship, especially those recently unwatered, to assure that the air was safe before men entered without gas masks. By this time, too, the men had regular "tank" suits, as coveralls were now called, which were laundered continuously by a contractor in Honolulu. Men engaged in particularly dirty work were furnished knee-length rubber boots which were readily cleanable. A picture of the Acting Commanding Officer, Lieutenant Commander White, and the Salvage Officer is shown on page 240 in the garb which was regularly used.

The underwater concrete was a great success. It extended from above the waterline to below the turn of the bilge. This material was used to seal the ends of the large patches as well as the bottoms of each individual patch. Its efficacy was proved by the fact that in drydock it stuck so well to the hull of the ship that small dynamite charges were required to break the concrete loose. We were extremely fortunate that the Pacific Bridge Company was present and available to handle the design and installation of these patches, and to make the large number of dives which was necessary to make the patches watertight.

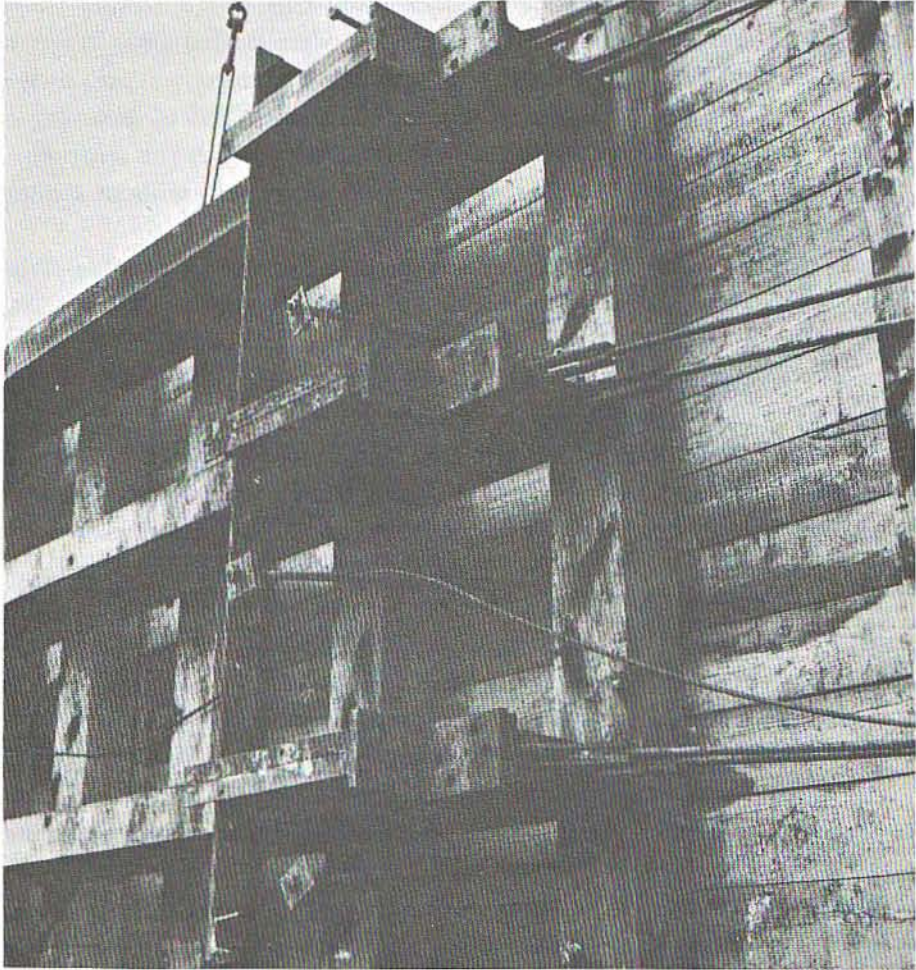
It is not practicable to give a complete description of the concrete-sealed patches, but some information should be included. In the first place, the patches were usually in thirteen and a half foot sections. Each section was about fifty feet long or deep. The bottom portion followed the contour of the ship, and the patch was pulled up snugly by means of hook bolts spaced horizontally every twelve feet or so. The hook bolts were spaced by divers and hooked into the side plating through holes burned by an underwater gas or electric torch. These bolts passed through the patches and were fitted with butterfly nuts. The mud which covered the bilge was washed away by waterjets. The bilge keel was cut away where it fouled the patch, but in most instances the patch fitted over it.

The joints between patches were made watertight by using old rubber hose for gaskets, and drawing one patch to another by lug bolts.

The patches were made of four-inch planking. The 4-inch steel "I" beams and the 10-inch steel "H" beams were set vertically. This ingenious structure took the inward thrust of the patch as shown in the illustration on page 237. Fore and aft wales of 12" x 14" timbers were spaced about four and a half feet apart. These members were shored directly to the armor belt. Negative buoyancy at the time of placement was obtained by a lead weight placed on an angle iron shelf on the outside of each patch. The clearance between the armor and the inside of each patch was about eighteen inches. This gave sufficient room for a person to work between the armor and the patch. The forward patch had one door and the after patch three doors for divers to pass from the outside to the inside of each patch. After concrete was poured these doors were secured.

The final operation was the pouring of the underwater concrete to seal the bottoms of all sections and the sides of end sections. All were poured in succession from a steel barge on which had been placed a mixing machine. The concrete was a rich mixture consisting of one part cement to three and one-half parts of aggregate. The contractor utilized the Tremie process which he used in drydock construction. Ten-inch Tremie pipes were about ten feet apart. Care was taken, as is usually the case, that the concrete mixture did not disintegrate in the water. The concrete was installed about four feet deep along the bottom of each patch and at each end. In all 325 cubic yards, or about 650 tons of concrete were used.

As soon as the concrete patches were finished the deep-well pumps were started to reveal large leaks in the patches, or elsewhere. It was easy to exceed the inflow when the leaks were rectified by the divers. Soon the



USN NR&L (MOD) 39754

West Virginia, showing lower portion of patch. Projecting steel beam was fitted under the armor belt.

salvage crew was in command, and it only remained to reduce draft by removing weights still in the ship.

These weights consisted of free oil which was skimmed from the surface of each level by use of a skimmer operated by an electric motor. Fuel oil, which totaled about 800,000 gallons, was also removed. About 40,000 gallons of free oil was picked up by the skimmers. This was only half of the free oil in *California*. However, *West Virginia* had only 70 percent of its fuel oil aboard whereas *California* had 100 percent. The fuel oil was taken out by ship's pumps operated by air, as in *California*. All of the

16-inch shells and powder were sent ashore. This was a sizable weight. Many of the regular stores and canteen stores were landed also. Experience proved that the removal of fresh meat and dairy products was an unwholesome job, but a new method was devised. This consisted of pumping sea water into the compartments for several days, after which the meat was in shredded form and could be removed in its original bags without a noticeable stench.

The hazard of capsizing was always present because of possible failure of the concrete patch due to an enemy air attack or structural failure. Steps were taken to prevent this, especially when the ship was enroute to the drydock. Temporary patches, similar to a collision mat, were made to draw over any damage which might be sustained.

We asked to drydock in Number One instead of Number Two Drydock, if possible, because of the long time that *West Virginia* would require to make even temporary repairs. It should be understood that Number Two was a much larger dock with a greater depth over the sill and blocks. Therefore it had to be available for damaged ships returning from a fray with the Japanese. The use of Number One Drydock established our goal for a draft of approximately thirty-three feet, which was hard to attain for this severely damaged ship. But it was reached by removing the fresh water from the double bottoms and all unattached weights on board.

Air pressure was used extensively in *West Virginia*. It was tried out successfully in the area near the steering mechanism, and elsewhere wherever isolation of damage was possible.

Human bodies were handled as in *California* and were taken out almost unknown to the working parties. Sixty-six bodies were found throughout the ship. Several bodies were found lying on top of steam pipes which were in the air bubble existing in the flooded areas.

Three bodies were on a lower shelf of a storeroom near a fresh water supply. These men were clad in blues and jerseys. They presumably died from lack of oxygen. A calendar indicated that they had lived from 7 December to 23 December. They had consumed the emergency rations which were available at the battle station, which apparently was the fresh water pump. This area had not been flooded.

Great care was taken with the main propulsion plant. Little oil was allowed to percolate into the main units, and as they were unwatered prompt steps were taken toward preservation. The General Electric Company and Puget Sound working parties on *California* became available and

went to work promptly on *West Virginia*. They reconditioned the steam end without much trouble, and were able to start at once on the alternators and motors. As a result *West Virginia* had all her electric-drive machinery restacked and rewound before the voyage to the mainland. This was the biggest job ever undertaken on a ship afloat.

West Virginia came afloat on 17 May and was received in Drydock Number One with blocks cut down to thirty-three inches on 9 June 1942. At that time she was practically on an even keel although she had been heeled to a maximum of twenty-eight degrees. When the salvage crew started working on her the draft was 50½ feet forward and nearly 41 feet aft, with a list to port of about three degrees.

It might be observed that the smaller pumps were used to reduce the water level in storerooms and smaller compartments. Even the Barnes three-inch suction pumps were put to work, as were the four-inch and the six-inch suction pumps. The 440 volt Pomona and the Peerless ten-inch deep-well pumps were extremely effective in reducing the ship's water level.

Adequate ventilation was a must in *West Virginia* in order to reduce the gas hazard. Temporary lines were run by the Pearl Harbor Repair and Salvage Unit and hooked up to the ship's ventilation system. Temporary lights were rigged by the same crew, as lower compartments were unwatered.

Nearly all electric motors and auxiliary machinery were saved. This was due to the care exercised by Commander McNalley's crew. Preservation was the watchword. All vital items were reconditioned at the yard; all others were retained on the ship for delivery at a West Coast Navy Yard.

As usual, personal effects and classified material were turned over to the ship superintendent by order of the Commanding Officer. Great care was exercised, especially when personal lockers were emptied of their contents.

The enthusiasm and spirit of the crew deserves high praise. The Commanding Officer, Lieutenant Commander W. White, and his first assistant, Lieutenant Commander Levi Knight, were fine leaders and performed through the months most admirably. They, with less than 500 men at any time, tackled almost a hopeless job. Yet they were able to clean up the ship, remove the dead, take off every weight that could be moved, set up and man an anti-aircraft battery of nine machine guns, and reduce the draft to permit docking in Drydock Number One. At the same time they established temporary living quarters on Ford Island, built a walkway to the ship, recommissioned the officers' and crews' galleys aboard ship, and from 27 April served three meals a day to all hands.



USN NR&L (MOD) 39755

Salvage Officer, Captain Homer N. Wallin, USN, and Commanding Officer of West Virginia, Lieutenant Commander W. White, USN.

The Navy Yard's design and planning specialties were important to the success of salvaging *West Virginia*. Various shops also applied their talents to the work. Without them the operation of air compressors and ventilation blowers would have been greatly handicapped.

The Navy was fortunate indeed to once again have the personnel and the experience of the Pacific Bridge Company. Their abilities in diving work and in design and installation of the patches was an achievement which excited the admiration of all. Without them the work could not have been done. Gratitude was expressed to Messrs. Graham, Ginella, Freeman, and Rice who handled the outside work and to Messrs. Crocker and Foster who did so magnificently in design.

The Salvage Division itself was on the job constantly. No harder worker or more devoted man could be found than Lieutenant Painter who had been in charge of the *California* work, and who relieved Lieutenant Generaux so he could take the *Plunger* job. Lieutenant Painter was everywhere and spread enthusiasm and initiative. He was a Civil Engineer rather than a ship man. He was killed in Greece after the war by an explosion aboard a private yacht. His loss was a real one to his profession.

Other Salvage Division officers who stood out were Lieutenant Commander Charles W. Rhodes, a machinery and electrical expert; Darroch, Liedstrand, Bjork, and Beauchamp-Nobbs, acting as Lieutenant Painter desired, especially in the installation of patches, the setting of pumps, opening of drain lines, and ventilation. During this time Commander McNalley spent only a small portion of his time aboard ship, but he was always active in reconditioning mechanical and electrical machinery.

Some reference has been made to the work of divers. Without them it would have been impossible to salvage *West Virginia*. They performed hazardous work, both inside and outside, without a casualty. These men came from the Salvage Division, *West Virginia*, *Widgeon*, the Submarine Base, the contractor, and the Navy Yard. In all from January to June, 527 dives were made totaling nearly 1400 hours. Nearly half of the hours underwater were done by the contractor. Credit for the fine record achieved goes to the meticulous officer in charge of all diving, Lieutenant Commander Haynes and his assistants who were Calhoun, Ephland, and Suggs.

In drydock *West Virginia* received the attention of the Navy Yard. It was agreed that the ship could be undocked to make way for any battle casualty, but none appeared. The electric-drive machinery was the governing job, so final repairs in lieu of temporary repairs were possible in most cases.

The Navy Yard did a great deal of work on *West Virginia* before her departure for the Puget Sound Navy Yard.

She sailed under her own power, as was the habit of Pearl Harbor's sunken ships. She was modernized by the Puget Sound Navy Yard with greater torpedo protection, increased stability and floatability, and a vastly improved anti-aircraft battery.



USN NR&L (MOD) 39756

USS *West Virginia* approaching drydock, 8 June 1942.

Because of the unusual features of the salvage of *West Virginia* the full account is included as Appendix E for those who desire to read it.

West Virginia left the Puget Sound Navy Yard on 4 July 1944 and took up the fight with the Japanese at the famous Battle of Surigao Strait where she poured ninety-three 16-inch projectiles into the Japanese Fleet. Before this she helped the landings at Leyte by bombardment. Later she took part as flagship in the Mindoro Operation, and still later she participated at Luzon, Iwo Jima, and Okinawa. She was present on 2 September 1945 when the Japanese surrendered formally on board *Missouri*. *West Virginia* was

the first of the "old" battleships to steam into Tokyo Bay and to anchor off the Japanese capital. Such is the history of the ship which was "lost" on 7 December at Pearl Harbor. She had won five battle stars.

8. U.S.S. OGLALA (LAUNCHED IN 1907)

After *California* and *West Virginia*, *Oglala*, ("Lalie" for short) was indeed a small ship, but she presented to her salvors new problems. She was on her side and almost submerged, she was an old ship designed in 1906, her construction permitted a maximum of free water, and her stability during salvage was of the worst. Because of the uniqueness of *Oglala's* damage she became a historic ship in salvage operations.



80-G-177097

USS Oglala, preparing to sink pontoons, 5 April 1942.

In the previous thirty-five years she had a checkered career. She was built by the Cramp's Shipyard in Philadelphia as a coastal passenger vessel between Boston and New York with the name of *Massachusetts*. She displaced about 4,200 tons and made twenty knots which made her very popular on the "Old Fall River Line" in those days of limited transportation.

In World War I she was taken over by the Navy and converted to a

minelayer with the name of *U.S.S. Shawmut*. She rendered heroic service in helping to lay the North Sea mine barrage. At the end of that war she was reconverted into a seaplane tender, as aviation was regarded as the weapon of the future and the Navy was about to make the three historic seaplane flights to Europe. This assignment continued until 1928 when she was again converted into a minelayer with a new name. She was given the name of *Oglala*, which is derived from a formidable tribe of the Sioux Indians.

On the morning of 7 December *Oglala* was moored outboard of *Helena* at "Ten-Ten" dock of the Pearl Harbor Navy Yard, an eight foot camel separating the two ships. An airplane torpedo, fired from 500 yards, passed under the shallow draft *Oglala* and exploded against the starboard side of *Helena* causing great damage in her machinery spaces. The pressure wave from the explosion ruptured the lower port shell plating abreast of *Oglala's* fireroom. Although watertight closures had been rather well secured, the crew of this old vessel was unable to isolate the flooding. The ship gradually took aboard large quantities of water and finally capsized to port about two hours after the explosion.

The Commander of the Mine Force, Rear Admiral William R. Furlong, was aboard *Oglala* at the time and saw that the sinking of his flagship alongside *Helena* would foul the cruiser and prevent her removal from the dock. He therefore commandeered several tugs to pull *Oglala* clear and alongside the dock. In that position every effort was made to save *Oglala* but she finally capsized with her masts and top hamper resting on the dock. As she rested on the bottom only the middle area of her starboard side was above water at the two foot tide which was the maximum at Pearl Harbor. Fortunately the crew suffered no loss of life nor serious injury.

Oglala was initially written off as a total loss. Any planning for her future pertained to getting her clear of "Ten-Ten" dock by fair means or foul. For the next several months manpower and material were made available only for salvage and repair work of the highest priority. The only work done on *Oglala* during these days was to remove her masts and topside structure, with the thought of preparing her for beaching or for burial at sea. The purpose was to free the urgently needed dock site.

To accomplish this worthy objective, much thought and discussion was involved. A logical and simple method was to unwater the flooded areas by means of compressed air, at least sufficiently to float the vessel on her side, and then tow her to the beach, to drydock for further handling, or out to

sea for sinking. But tests soon proved that the ship's hull would not hold enough air pressure to utilize this method.



USN NR&L (MOD) 29757

Pontoons surfacing near bow of Oglala, 11 April 1942.

The next proposal was to rig four large lifting barges with multiple steel cables. It was found that this would require many alterations to the barges for proper subdivision of compartments, suitable piping for flooding and pumping, and very special arrangements to protect the barges when they were subjected to a heavy and eccentric lift. Because all this would divert manpower and material from urgent work, this method died aborning.

Then, it was proposed that the easiest solution was to blow the ship up with dynamite, and with the help of underwater divers and cutters to pick up the pieces for urgently needed scrap. While this method sounded within the realm of reason, it had serious drawbacks. The required crane service was more valuable elsewhere, and divers who were experienced in underwater cutting were at a premium. Of importance too was the possibility of serious damage to the dock from this drastic treatment.

Finally after three or four months it was determined that all of the methods which seemed to promise an easy way out were unworkable or impracticable. So somewhat in desperation the decision was made to undertake the orthodox procedures of first righting the ship, refloating her, and then drydocking her for repairs. All of this was accomplished within a period of about three months but not without many problems and interesting episodes.

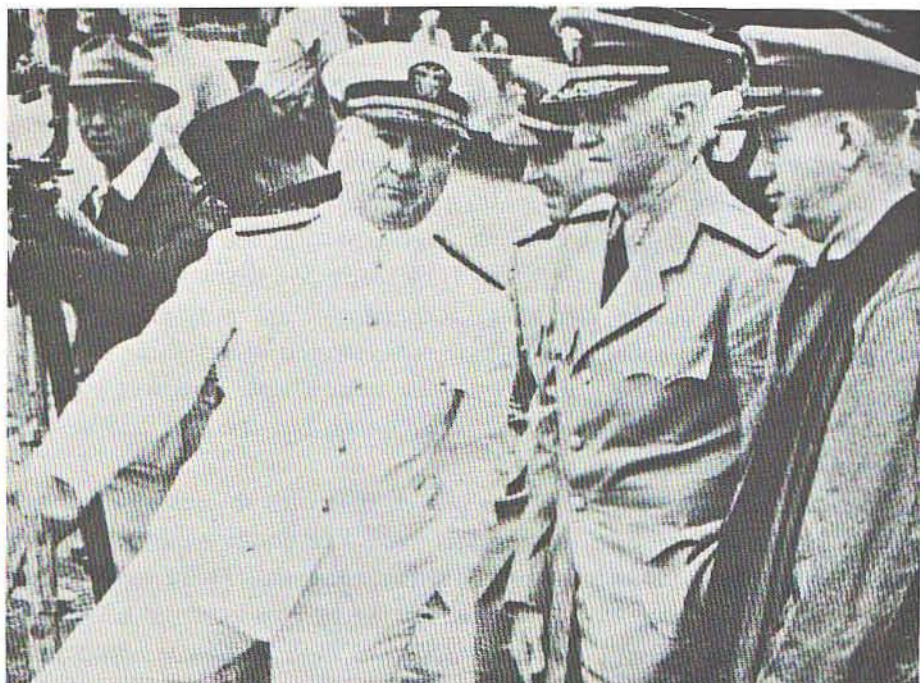
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A large number of interested observers were present, including Admiral Nimitz and the Navy Yard Commandant, Rear Admiral Furlong, as usual consistently supporting and encouraging the salvage tempo by being present at every significant event. In spite of an enthusiastic audience the righting operation was a failure, the first of several mishaps in the *Oglala* job.

The cause of the failure was that several of the pontoons broke loose and rose to the surface when their chain bridles parted at the welds. However, it was observed that plenty of power was available to do the job. So the defective bridles were discarded and the pontoons re-rigged more securely for a second try on 23 April. This was entirely successful, although the initial list was about twenty degrees to port. Various steps were taken to reduce the list, including dredging, and new hitches by the pontoons. In a few days the list was less than seven degrees. This was considered acceptable for the next step, which was refloating.

At this point the ship was sitting on the bottom in about forty-five feet of water, so very little of its remaining structure was visible. The wooden deckhouses had been removed, so only a few feet of the bow and a bit of the superstructure amidships were above water.

The method of refloating was the same used successfully on *California*



USN NR&L (MOD) 38594

Rear Admiral William R. Furlong, Admiral Chester W. Nimitz, and Captain Homer N. Wallin inspecting the salvage operations in USS Oglala.

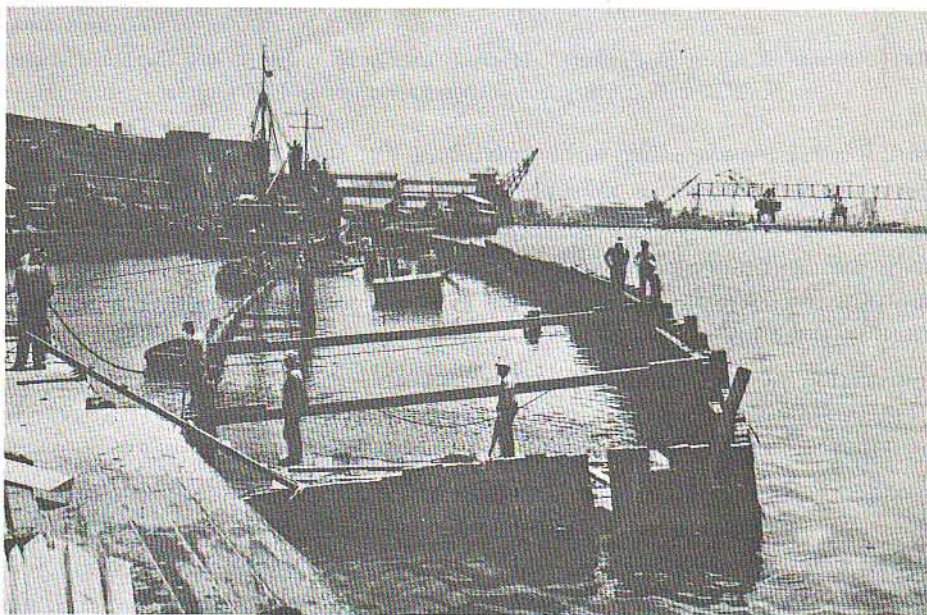
and *West Virginia*—that is by extending the shell of the vessel upward from the deck edge to a point above high water. This was accomplished by the wooden fence-type cofferdam which was secured to her gunwale. Then with sufficient pumping capacity and gradual control of the inflow of water the ship is sure to float in obedience to Archimedes' Principle. The salvage crew had definitely learned that successful salvage work follows the proper application of the immutable laws of nature.

Extending the shell upward is basically a simple operation although usually beset by obstacles and design complications. A fence type caisson of wooden vertical sections was bolted to the waterway coaming. In this case they ranged in height from six feet to twenty-six feet, and the thickness varied from four inches to ten inches to withstand the maximum computed water pressures. These high pressures necessitated a great amount of shoring from the inside to insure no failure at critical periods. A point of interest, too, is that for the floating cranes to properly position the thirty foot sections of heavy lumber in deep water required negative buoyancy. This was

attained by placing a large number of sand bags in boxes built into each section.

While the caisson sections were being installed the diving detail was busy securing an 18 by 20 foot wooden patch over the ruptured shell area. Also they were active in closing all hull openings and calking cofferdam sections. A tremendous amount of first class diving work was performed under excellent supervision. During the *Oglala* salvage some 15 to 18 divers were available, mostly from *Ortolan*. They made 542 dives totaling nearly 2,000 hours under water. The divers experienced not a single injury or casualty in this work. The water level was lowered about three feet per hour, and at 1000 on 23 April 1942 *Oglala* came afloat. This was a proud moment for the salvage workers and for *Oglala*, but she still had several ordeals to withstand.

Calculations had been made which proved that with the vessel afloat her stability, both transverse and longitudinal, would be questionable and would soon become negative as the draft was further decreased. There were several reasons for this. An important one was that we had added over 1,300 tons of cofferdam, sand ballast, shoring, and pumps high above the ship's deck



USN NR&L (MOD) 39757

Oglala's cofferdam completed, 8 June 1942.

edge. Another was the large area of free water surface, especially on the open mine deck.

In order to improve transverse stability it was decided to remove the anchors, some 350 tons of sand bags, a few of the higher shores, and considerable loose water which was trapped in various locations. But improvement was meager because it required the removal of 150 tons of main deck weight to gain one inch of righting arm. Under existing conditions *Oglala* was certain to be cantankerous regardless of mathematical manipulation. This fact became clear as the pumping continued. The ship kept on an even keel until the draft was reduced to forty feet at which time she took a port list of eight degrees.

Additional topside weights could have been removed but it was decided that this should await further developments, and it was fortunate that we did. On the night of 25-26 June the Salvage Officer was awakened by the mess boy on watch at a Makalapa bachelor domicile with the dolorous announcement that "the Og-la-la, she is sinking again." What had happened was primarily a lesson in longitudinal stability. First a forward pump stopped when its gasoline line became clogged. This permitted the inflow of water to exceed the outgo at the bow because the other pump in that location took suction several feet higher. As the bow went down a bit some of the water surged forward. This further increased the draft forward and caused still more water to surge toward the bow. The surging water carried some clothing and debris which clogged the strainers of both pumps, thus compounding the situation. Within a half hour the cumulative effect was that the bow reached the bottom in forty-eight feet of water, and the rest of the ship soon followed, ending up with a starboard list of 8 degrees.

After strenuous work in tightening up the shoring and stopping leaks for three days the ship came afloat again on an even keel. But still another chapter of *Oglala's* ordeals was near at hand. On 29 June while the writer was walking on the top of the cofferdam's stern section he felt a movement of the timbers, and within moments the whole section tilted sufficiently to let in large volumes of water, and again to sink the ship. Removal of the stern section disclosed another "practical" departure from design specifications, in that steel tie-rods between the ship's structure and the bottom of the cofferdam had been omitted. Somebody in the field assembly gang guessed that the two 10 by 12 timbers, inside and out, would be adequate.

Within two days the vessel was afloat again and scheduled for the trip to the drydock two days later, namely 3 July. Except for some very efficient

fire fighting this would not have occurred, for in the early evening of 2 July a spectacular fire raged on the interior water surface fed by oil and gasoline. The oil-soaked timbers of the cofferdam were soon aflame. The picture was ominous, but several fire brigades were soon on the scene and extinguished the flames within a half hour without serious damage. Another sinking of *Oglala* was avoided, and next day she was in the drydock starting a new career. The fire started from a splash of gasoline on a hot exhaust pipe during refueling.

Again, the machinery was entirely reconditionable, especially the reciprocating main propulsion drive of *Oglala*. The electric motors were treated to proper care and preservation by the people in charge of this specialty. It had been learned that electric motors and modern wiring subjected to submergence could be preserved and dried out without too much difficulty. Deep submergence, on the other hand, might show satisfactory characteristics in a non-humid atmosphere, but high potential lines were sure to break down ultimately in sea service. All important wiring was renewed by the Navy Yard before the trip to Mare Island.

Oglala had a mean draft of about sixteen feet prior to sinking whereas it was over 39 feet when drydocked. Except for inherent instability the draft could have been further reduced. Great care was taken to avoid damage to the deck edge caissons which had dried out considerably and required constant tightening of shores. Such damage could come from tugs or their lines on the way to the drydock. Stability could be affected by accelerated movement in any direction due to the large amount of free surface in the ship. All hazards were guarded against, and the trip to the drydock was made in fair weather with a minimum of difficulty.

The interesting details of getting a delicate and potentially unstable ship into drydock must for brevity's sake be omitted here, as must also a multitude of details concerning the righting, refloating, and repair. For those especially interested most of the story can be found in the files of the Navy's Ship Systems Command. Suffice it to say that as far as salvage operations were concerned the challenge presented by *Oglala* covered the whole gamut of technology and experience and its successful outcome gave to all personnel involved a sense of great satisfaction.

After temporary repairs at Pearl Harbor she soon sailed away unescorted, under her own power, for reconditioning at Mare Island. However, it was decided that the Los Angeles Shipbuilding Company would do the job and refit her as a repair vessel for diesel propelled craft which by that time

The Navy Yard's design and planning specialties were important to the success of salvaging *West Virginia*. Various shops also applied their talents to the work. Without them the operation of air compressors and ventilation blowers would have been greatly handicapped.

The Navy was fortunate indeed to once again have the personnel and the experience of the Pacific Bridge Company. Their abilities in diving work and in design and installation of the patches was an achievement which excited the admiration of all. Without them the work could not have been done. Gratitude was expressed to Messrs. Graham, Ginella, Freeman, and Rice who handled the outside work and to Messrs. Crocker and Foster who did so magnificently in design.

The Salvage Division itself was on the job constantly. No harder worker or more devoted man could be found than Lieutenant Painter who had been in charge of the *California* work, and who relieved Lieutenant Generaux so he could take the *Plunger* job. Lieutenant Painter was everywhere and spread enthusiasm and initiative. He was a Civil Engineer rather than a ship man. He was killed in Greece after the war by an explosion aboard a private yacht. His loss was a real one to his profession.

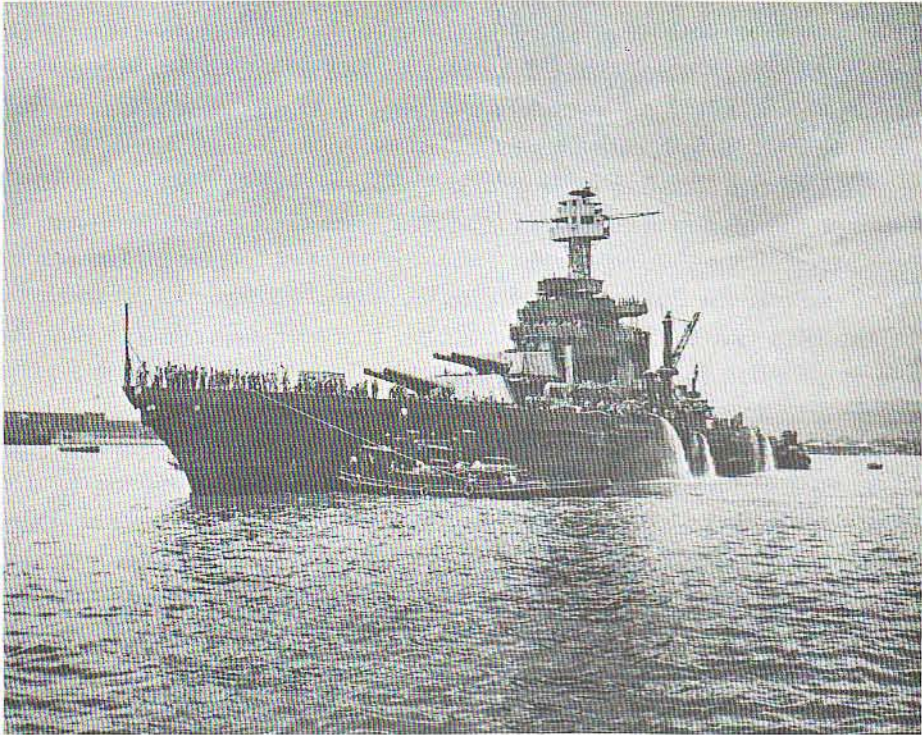
Other Salvage Division officers who stood out were Lieutenant Commander Charles W. Rhodes, a machinery and electrical expert; Darroch, Liedstrand, Bjork, and Beauchamp-Nobbs, acting as Lieutenant Painter desired, especially in the installation of patches, the setting of pumps, opening of drain lines, and ventilation. During this time Commander McNalley spent only a small portion of his time aboard ship, but he was always active in reconditioning mechanical and electrical machinery.

Some reference has been made to the work of divers. Without them it would have been impossible to salvage *West Virginia*. They performed hazardous work, both inside and outside, without a casualty. These men came from the Salvage Division, *West Virginia*, *Widgeon*, the Submarine Base, the contractor, and the Navy Yard. In all from January to June, 527 dives were made totaling nearly 1400 hours. Nearly half of the hours underwater were done by the contractor. Credit for the fine record achieved goes to the meticulous officer in charge of all diving, Lieutenant Commander Haynes and his assistants who were Calhoun, Ephland, and Suggs.

In drydock *West Virginia* received the attention of the Navy Yard. It was agreed that the ship could be undocked to make way for any battle casualty, but none appeared. The electric-drive machinery was the governing job, so final repairs in lieu of temporary repairs were possible in most cases.

The Navy Yard did a great deal of work on *West Virginia* before her departure for the Puget Sound Navy Yard.

She sailed under her own power, as was the habit of Pearl Harbor's sunken ships. She was modernized by the Puget Sound Navy Yard with greater torpedo protection, increased stability and floatability, and a vastly improved anti-aircraft battery.



USN NR&L (MOD) 39756

USS West Virginia approaching drydock, 8 June 1942.

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80-G-177007

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USN NR&L (MOD) 39757

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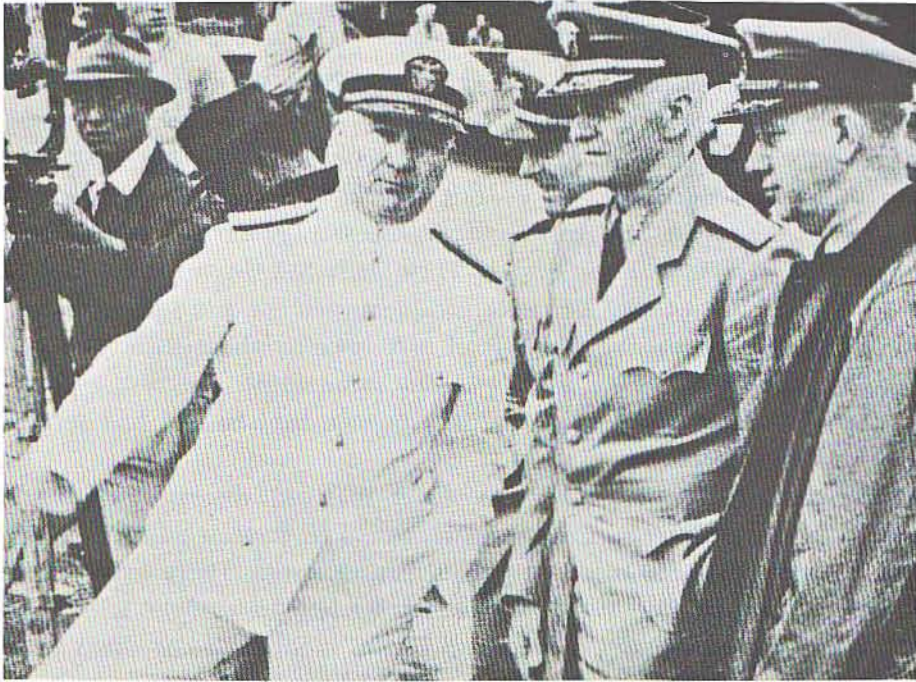
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The cause of the failure was that several of the pontoons broke loose and rose to the surface when their chain bridles parted at the welds. However, it was observed that plenty of power was available to do the job. So the defective bridles were discarded and the pontoons re-rigged more securely for a second try on 23 April. This was entirely successful, although the initial list was about twenty degrees to port. Various steps were taken to reduce the list, including dredging, and new hitches by the pontoons. In a few days the list was less than seven degrees. This was considered acceptable for the next step, which was refloating.

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The method of refloating was the same used successfully on *California*



USN NR&L (MOD) 38594

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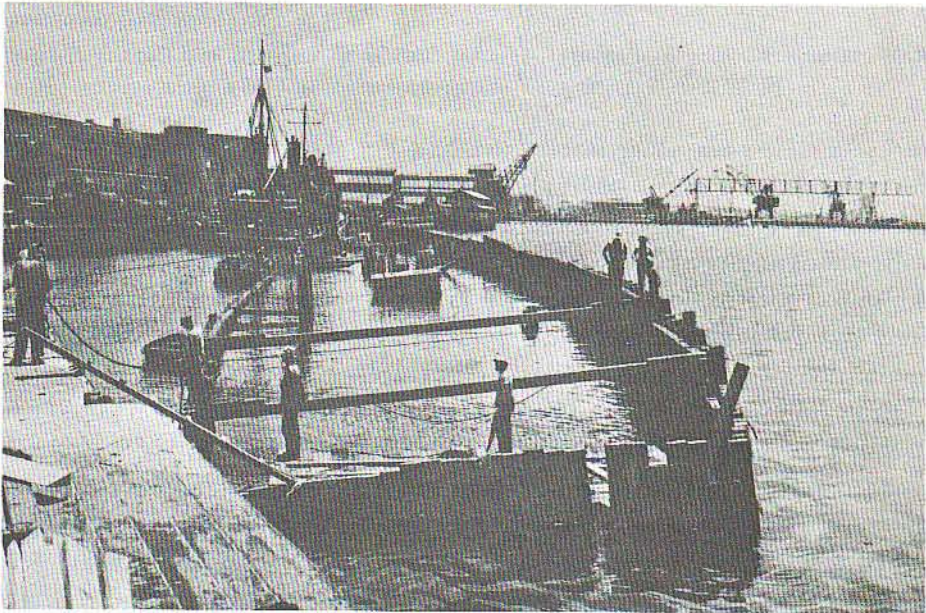
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USN NR&L (MOD) 39757

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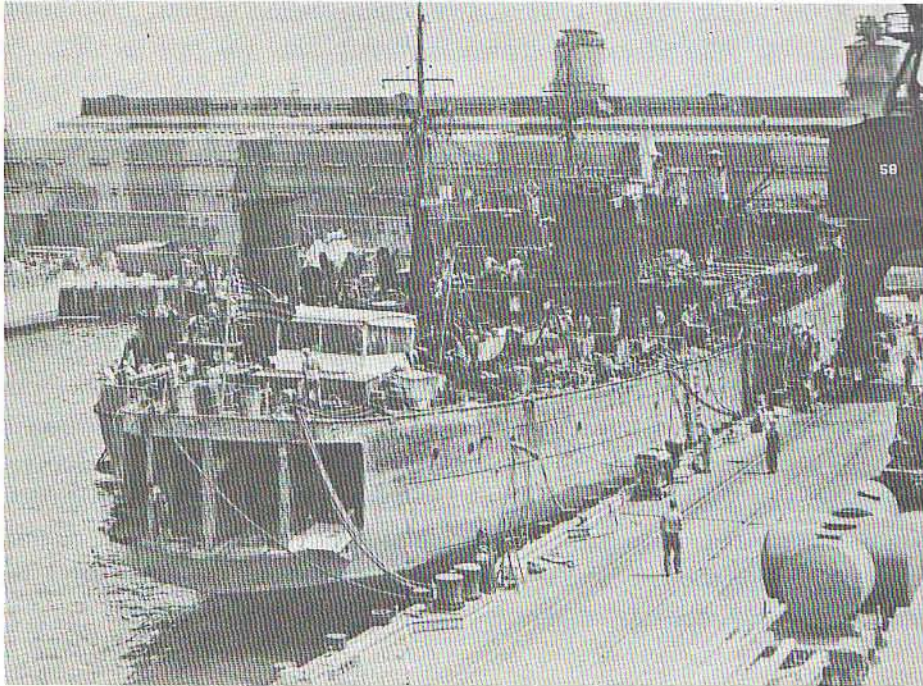
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Again, the machinery was entirely reconditionable, especially the reciprocating main propulsion drive of *Oglala*. The electric motors were treated to proper care and preservation by the people in charge of this specialty. It had been learned that electric motors and modern wiring subjected to submergence could be preserved and dried out without too much difficulty. Deep submergence, on the other hand, might show satisfactory characteristics in a non-humid atmosphere, but high potential lines were sure to break down ultimately in sea service. All important wiring was renewed by the Navy Yard before the trip to Mare Island.

Oglala had a mean draft of about sixteen feet prior to sinking whereas it was over 39 feet when drydocked. Except for inherent instability the draft could have been further reduced. Great care was taken to avoid damage to the deck edge caissons which had dried out considerably and required constant tightening of shores. Such damage could come from tugs or their lines on the way to the drydock. Stability could be affected by accelerated movement in any direction due to the large amount of free surface in the ship. All hazards were guarded against, and the trip to the drydock was made in fair weather with a minimum of difficulty.

The interesting details of getting a delicate and potentially unstable ship into drydock must for brevity's sake be omitted here, as must also a multitude of details concerning the righting, refloating, and repair. For those especially interested most of the story can be found in the files of the Navy's Ship Systems Command. Suffice it to say that as far as salvage operations were concerned the challenge presented by *Oglala* covered the whole gamut of technology and experience and its successful outcome gave to all personnel involved a sense of great satisfaction.

After temporary repairs at Pearl Harbor she soon sailed away unescorted, under her own power, for reconditioning at Mare Island. However, it was decided that the Los Angeles Shipbuilding Company would do the job and refit her as a repair vessel for diesel propelled craft which by that time



USS Oglala raised.

USN NR&L (MOD) 39758

abounded in great numbers in the far reaches of the Pacific.

The Board of Inspection and Survey had been called in to check *Oglala's* physical condition, especially because of the over-age and the wear and tear of hardy service and the debilitating ordeals of salvage operations. After a rigid inspection the Board reported favorably on her general strength and capability for further service. In February 1944 a fine and almost new repair ship, named *Oglala*, sailed for the South Pacific for duty, and in due time moved with the fleet to Hollandia and Leyte. She was an important unit of our sea forces, rendering essential services to her sister vessels and their crews on their steady approach to Japan.

At present *Oglala* is a part of the Maritime Reserve Fleet at Suisun, California. She is standing by awaiting a call to service.

The Navy Yard was active in furnishing a large number of studies on *Oglala*, especially those pertaining to floatability versus stability. Mr. Hastrup of the Navy Yard was especially valuable in this regard.

The successful outcome of salvage operations was due as usual to the assistance rendered by the Pacific Bridge Company, and to the constant

effort of the rescue ship *Ortolan* and its Commanding Officer, Lieutenant Latta. He was relieved by Lieutenant Holland, who was just as efficient. Gunner Arnold Larson was always on the job, assisted by his friend, Boat-swain Walsh. All three of these men were active later with their ship in the Guadalcanal area.

The Salvage Division was fortunate in having Lieutenant M. L. McClung in direct charge. Lieutenant Commander Rhodes took charge of the machinery preservation on *Oglala*. At various times, especially after *West Virginia* was placed in dock, a number of officers were available for other salvage work in the Pacific, including Greely, Liedstrand, Bjork, and Brady.

Oglala became a valuable vessel to the fleet, but at one time she was written off as a total loss. The lesson to be learned is that in time of disaster or adversity human nature is impressed by all that is wrong or baneful, and not by the good still remaining. The old ship *Oglala*, when drydocked, was ninety percent repairable. All the other ships rescued from the waters of Pearl Harbor showed similar percentages, and all of them proved it by helping defeat the enemy responsible for the 7 December attack.

9. U.S.S. *PLUNGER* (LAUNCHED IN 1936)

This submarine was not present at Pearl Harbor when the surprise Japanese attack occurred, but the Salvage Division inherited a job when *Plunger* was docked on the Marine Railway and fell over to port on 17 February 1942. The blocking of the Marine Railway was repeatedly immersed in oily water and had therefore gathered a coating of oil which made the blocks unstable. The result was that *Plunger* came to rest on the floor of the dock at a list of only a few degrees. The Marine Railway was knocked off its tracks. It was assumed that severe damage had occurred to the tracks or to the wheels. In any event, the dock was immobilized.

The Commandant of the Navy Yard finally asked the Salvage Division to take over the job. Reference has been made to the fact that Lieutenant Emile Generaux was taken off *California* and assigned to *Plunger*. He was reputed to be a rigger of more than ordinary capabilities, and he proved this on the submarine job.

Fortunately a finger pier paralleled the Marine Railway, and this gave almost a straight pull for the purchases which Generaux rigged to *Plunger*. The rigging for the pull was of large proportions as about 2000 tons had

to be skidded along the floor of the dock, or the floor itself had to move. Before lightening the ship several test pulls were made to insure that the rigging and the motive power were sufficient.

To reduce the pull required, the lead ballast and the water were removed from the submarine. With this weight removed it was found that upon movement of the ship into deep water, the rigging at hand was quite sufficient. As the vessel entered the water the movement became easier as is naturally the case. Of course, it was well that the concrete cross member had been removed, and that a sliding shoe had been placed on the port side to ease the vessel outboard when leaving the cradle. To facilitate this, a buoyancy tank with about 30,000 pounds lift was installed over the shoe as it was assumed that the track or wheels on that side were collapsed.

In the meantime the Navy Yard made calculations on floatability and stability. These were used to good purpose. When *Plunger* was almost afloat the lead ballast and ballast water were replaced in the ship to insure positive stability when freely afloat. In addition about fifty tons of pig iron were loaded into the vessel. *Plunger* had been pulled about forty feet before the ballasting material was added. Then the pull was resumed, and *Plunger* floated off the drydock apron into deep water after the vessel was pulled about thirty feet.

The work on *Plunger* was of little account. The apron of the Marine Railway was put back into the position which it would have when retracted. While considerable work was originally expected, it was found that work by the divers in positioning the rails and some minor repairs were all that was required. The Marine Railway went back into regular use on 3 August and *U.S.S. Barker* was docked on schedule.

10. U.S.S. OKLAHOMA, BATTLESHIP (LAUNCHED IN 1914)

The Japanese planes which passed over the officers' boat landing at Merry Point seemed to concentrate their torpedoes on the battleships which were moored outboard near the northern end of the line. *West Virginia* was hit by as many as seven torpedoes, *Arizona* was sunk at her berth, and *Oklahoma* received from five to seven hits. Early in the onslaught she was put out of action and capsized at her berth.

It was realized that the salvage of this ship would require a combination of the steps taken on *West Virginia* and *Oglala*. The size of *Oklahoma* and

her general condition made salvage questionable, although it was deemed important to rid the harbor of a derelict and to make the berth available for other ships. Accordingly, plans were made by the Salvage Division to right her and to refloat her for further disposition.

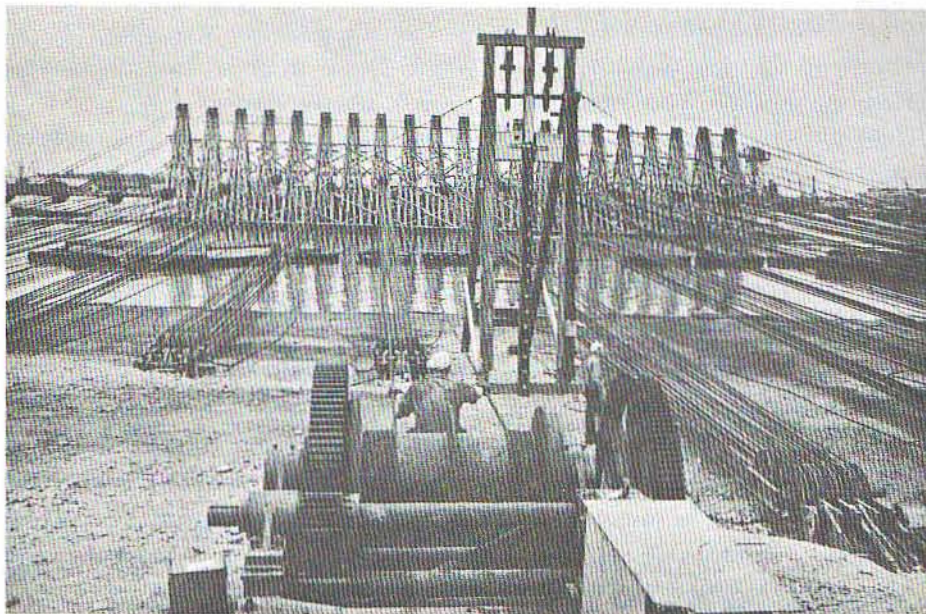
As early as May 1942 the Navy Department indicated a desire that *Oklahoma* be salvaged. Contractual arrangements were therefore made with the Pacific Bridge Company so that the company could get suitable priorities on required material, and at the same time could hire the right men for the job. A scheme of salvage was therefore drawn up which divided the responsibilities between the Navy and the company. In short, the scheme provided that the ship should first be righted and then floated to a drydock for repairs.

RIGHTING

The righting of a ship weighing about 35,000 tons was no easy task. It was accomplished by various means. The important element was, of course, the installation of shore winches on Ford Island. These twenty-one electric winches were anchored in concrete foundations and operated in unison. Each electric winch was capable of about a twenty ton pull through a flexible one-inch wire cable operated through a block system which gave an advantage of seventeen. The three-inch cable, in order to increase the leverage, passed over a wooden strut arrangement which stood on the bottom of the ship about 40 feet high. Then the cable divided into four "cat tails" which were secured to lugs welded to the shell of the ship at frame stations. Calculations indicated that the hull strength was adequate. To assist the twenty-one winches it was at first proposed that submarine salvage pontoons be used on the port side. This was given up because of the difficulty of proper attachment, and the presence of mud. The air pressure proposed inside the hull seemed ample.

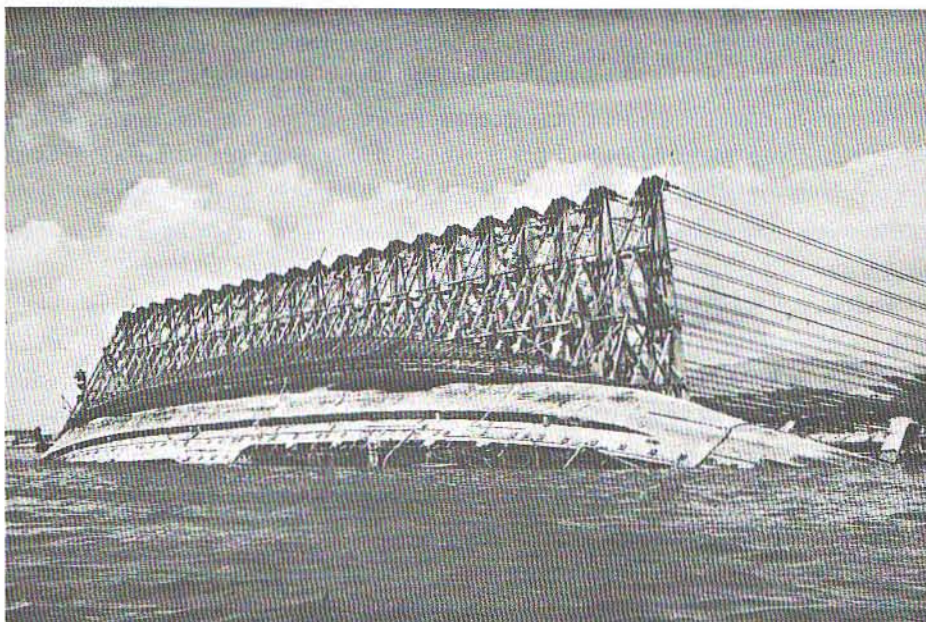
The air bubble method accounted for almost 20,000 tons of weight initially and was highly effective. It was used on the starboard side after the oil had been removed through the bottom. This totalled about 350,000 gallons of the 1,000,000 gallons originally in the ship. It was placed in oil barges as it was pumped out by three-inch steam reciprocating pumps and air-driven pumps. A steam blanket was used to prevent explosions from oil vapors. This was provided for by having *ex-Navajo* moor alongside and furnish steam and electric power.

The air bubble was divided into five parts to prevent loss of air pressure



USN NR&L (MOD) 39759

Start of righting operations of Oklahoma, 8 March 1943.



USN NR&L (MOD) 39760

Righting of Oklahoma in 130° position, 8 March 1943.

for the whole ship at a crucial time. The air pressure was about 11-12 pounds, so that the water level was blown down to about twenty-five feet below the surface. This lightened the ship's weight considerably.

There was a large amount of weight in the ship which could have been removed prior to righting or refloating, but difficulty of access made this impracticable. About one-third of the ammunition was taken off but none of the 14-inch projectiles. Some of the machinery was removed from the dry evaporator pump room. The blades of the two propellers were taken off, more to avoid damage to them than to reduce weight.

The above methods assumed that *Oklahoma* would roll instead of slide. Tests, including soil tests, were made to check whether restraining forces should be used to prevent sliding toward Ford Island. It was indicated that the soil of the after two-thirds of the ship facilitated rolling; but the bow section rested in soupy mud which surely permitted sliding. To prevent this about 2200 tons of coral soil were deposited near the bow section, and anchorages along the port side were given up as not necessary.

Consideration was given to some dredging and removal of mud on the starboard side prior to righting, but this was deferred to assure that the vessel would rotate rather than slide. When *Oklahoma* was righted with a list of about fifteen degrees to port the excess soil under the starboard side was washed away by high pressure water jets operated by divers.

During and prior to the righting operation, care was taken that all purchases were equalized. This was accomplished by the use of strain gauges on the hauling wires at each bent or strut. The one-inch flexible cable was speeded up or slowed down to equalize these strain gauges. Observation posts were established on barges to note the effect of righting movements, and especially to note whether the ship was rotating or sliding.

The wooden bents became less effective as their leverage decreased when the ship gradually assumed a position approaching ninety degrees. When the list was about sixty-eight degrees to port the bents or head frames were cast off and floated clear. From then until the ship reached thirty degrees to port the pull was directly on the lugs welded to the port shell. Then the hauling cables were secured to the ship's topsides, especially to strong portions such as barbettes and the starboard crane foundation.

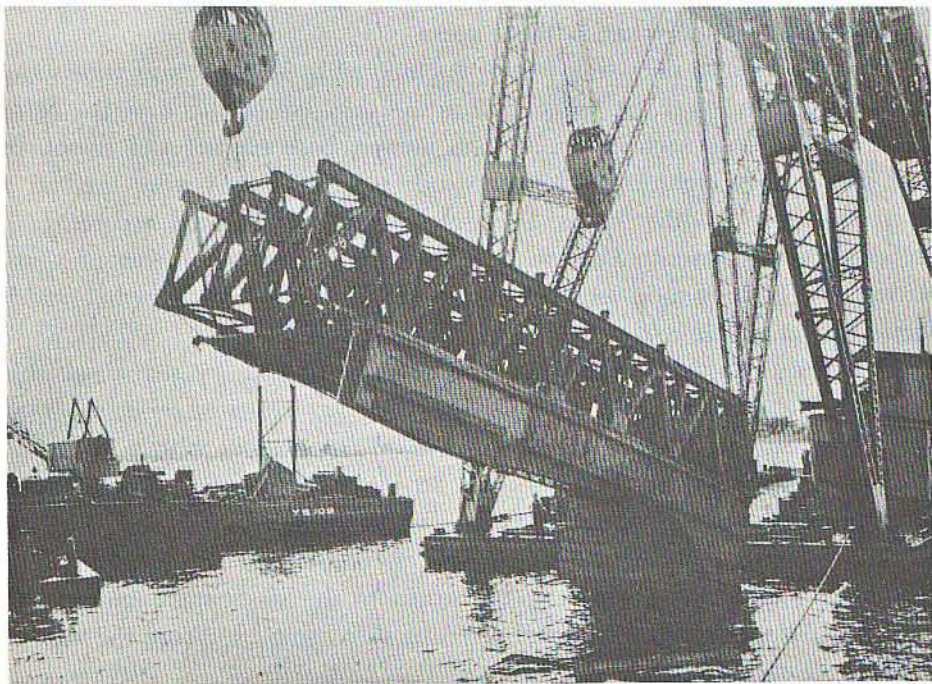
The ship rolled as desired. The stern section traveled a greater distance than the bow section toward the quays. This was because of the greater area of the stern. In any event, the vessel came to rest with a mean draft of 49½ feet at high tide (high tide is something less than 2½ feet above mean low

water). The list to port was only 2 degrees and 10 minutes. The behavior of the ship was in strict accord with the models which were constructed and tested before salvage operations were begun. *Oklahoma* was right side up by 16 June 1943, the work having started 8 March 1943.

FLOATING

When *Oklahoma* was nearly upright, divers investigated the damage on her port side. They found that the port side was pretty well opened up from torpedo explosions which occurred before and during capsizing. They cut away structural wreckage and took necessary measurements for temporary patches. The topside damage was apparent; contact with the bottom had broken off the masts and most other superstructure.

The divers found that a large patch was required from frames 43 to 75. This patch was 130 feet long and 57½ feet high as it extended well under the turn of the bilge. In addition, several patches were installed, usually of



USN NR&L

Lifting of Section I of the five-section main cofferdam patch for Oklahoma.

wood and sealed with Tremie underwater concrete. For instance, one went between frames 31 and 43, another between frames 74 and 96.

The large patch was in five parts and was primarily steel and wood as shown on page 257. It was sealed by underwater concrete at the ends as well as at the bottom. The sections were made watertight by puddings between the sections. Again, underwater concrete was essential. In all over 1000 tons of concrete were poured. Hook bolts were used by the divers in drawing up the patches to the hull of the ship.

The main deck aft was underwater, but not enough to prevent refloating. However, in order to increase the waterplane area and in order to improve the stability during refloating a wooden cofferdam like *Oglala* and *California* cofferdams was installed from frames 85 to 115.

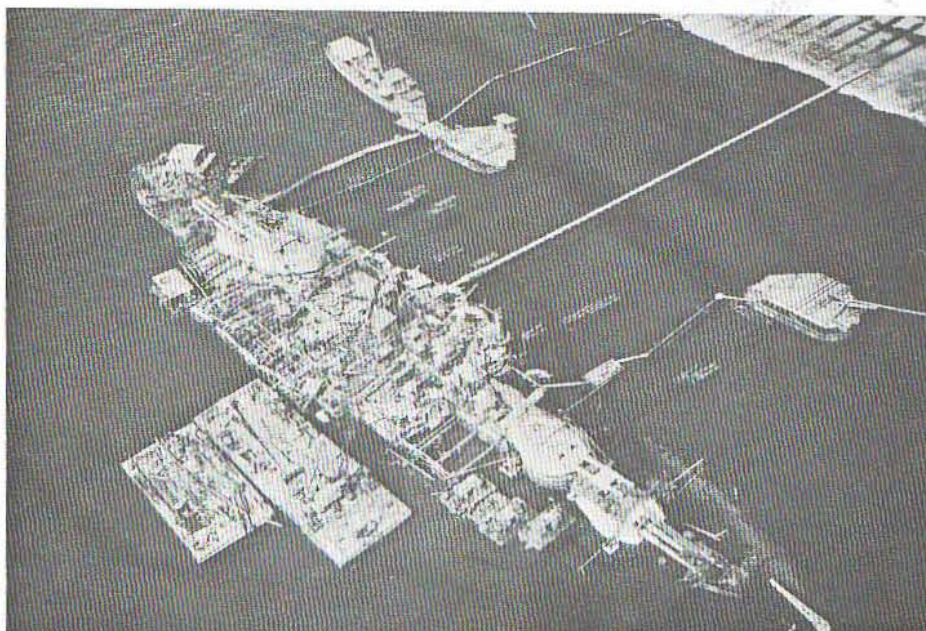
In the meantime the divers were busy jetting out mud, closing drains and sanitary outlets, cutting sluicing holes, closing watertight doors and hatches, etc. In due time they followed the reduction of the water level and closed off the main leaks in the hull and the patches.

During the last period of righting the weight of the ship was reduced by about 3500 tons through using the buoyancy forward of frame 30 and aft of frame 115. This was done primarily by deep-well pumps which quickly removed the water in those areas.

Then 10 ten-inch deep-well pumps augmented by lesser pumps were more than enough to lower the water level in the ship, but by this time the Navy Yard was in possession of twelve-inch pumps, both electric and diesel. In the main patch eighteen and twenty-inch electric pumps were used at a later date. As in other ships, the water level was reduced according to schedule which permitted adequate testing for toxic gases, plenty of ventilation and lighting, and removal of the 400 or more human bodies which were in *Oklahoma*.

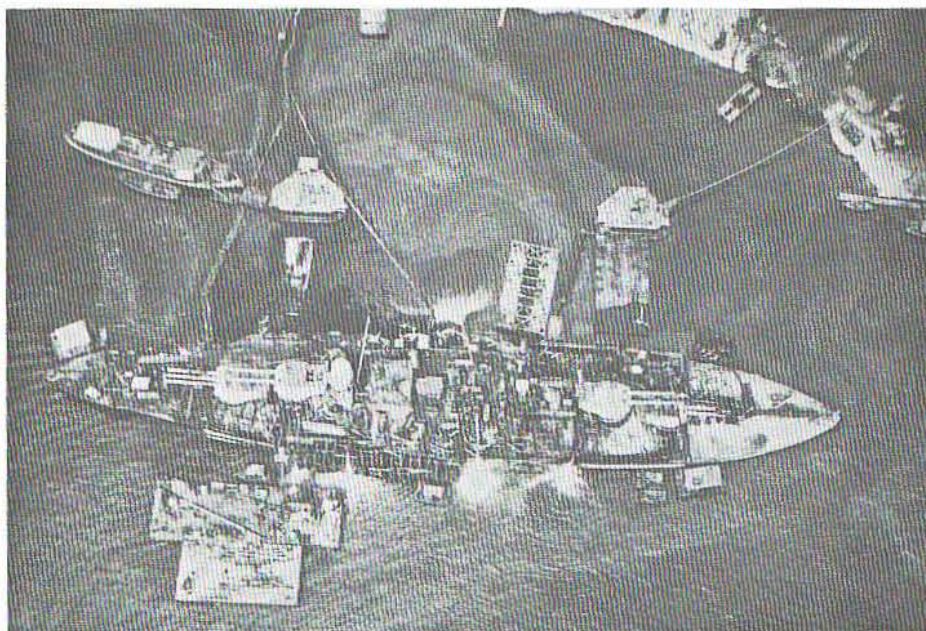
In order to insure positive stability, some ballasting by sea water was scheduled in the machinery spaces. Great care was exercised by the Salvage Superintendent to insure that the ship would come afloat with a minimum of list. Actually she came afloat on 3 November 1943 with a mean draft of about forty-six feet and a starboard list of twenty-six minutes. The list was increased to about one degree to starboard and so maintained by pumping water from the port engine room to the starboard engine room. The hauling tackles were removed after the ship came afloat and the various leaks were well in hand.

Thought was given to the damage caused by teredo worms on patches



USN NR&L (MOD) 39763

Oklahoma salvage operations, 20 September 1943. View looking forward on port side.



USN NR&L (MOD) 39764

USS Oklahoma after refloating, 3 November 1943.

after long submergence. This was found to be negligible, as was the teredo damage to the teak decking of the ship.

For the purpose of refloating very little weight was removed. However, prior to drydocking, attention was given to this important consideration. It was not practicable to remove stores, but anchors, chain, remaining oil, and so on were taken ashore. Mud in the ship was jettied to electric pumps by water jets in the hands of divers.

DRYDOCKING

The ship was placed in Drydock Number Two on 28 December 1943 with a mean draft of thirty-six and a half feet and a list to starboard of nearly three degrees. The list was purposely put on the vessel in order to favor the port side and its patches. In order not to lose buoyancy the introduction of water to attain the desired list was not permitted; instead four submarine salvage pontoons, each having a lift capacity of eighty tons, were used on the outside of the main patch.

The total draft of *Oklahoma* was nearly thirty-nine feet because the main patch extended several feet below the keel. During the trip to the drydock the electric-driven pumps were replaced by diesel-driven. The list was taken off in drydock and the ship settled on the blocks provided without undue



USN NR&L (MOD) 39765

Port side view of Oklahoma four days before entering drydock.

incident. The pontoons were removed, and the patches were likewise taken off to expose the damage which the ship had sustained. This is seen in the illustrations on page 262. A strict fire watch was maintained on board.

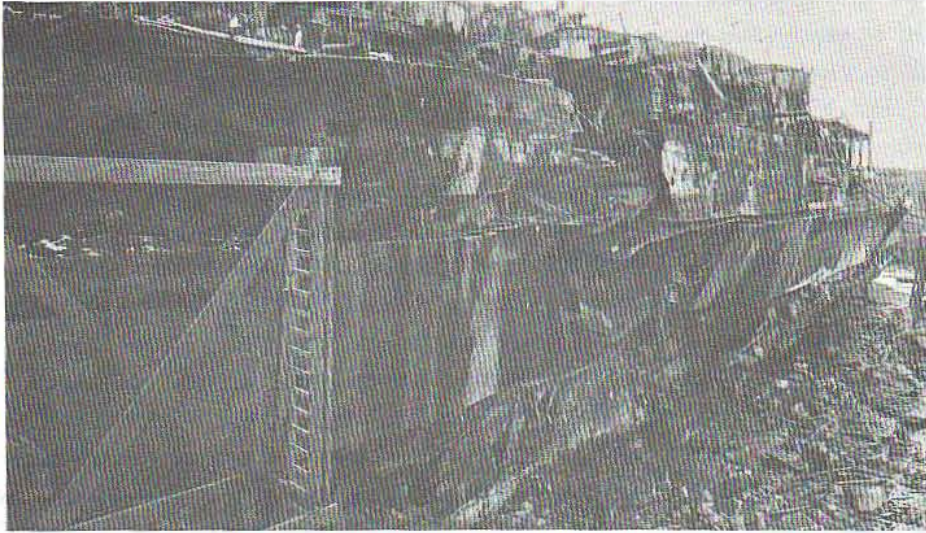
The Navy Yard employees were quick to start with temporary repairs. They worked from inboard to obtain watertightness of the hull inasmuch as the drydock was available for emergency dockings of damaged major ships of the fleet. Thus the drydock had to be vacated on seventy-two hours notice. However, no emergency developed, and *Oklahoma* remained there for several months. During her time at the Navy Yard she was stripped of guns and some of the auxiliary machinery. The ship was unloaded of ammunition and stores. She was decommissioned on 1 September 1944 and sold for scrap for \$46,000 on 5 December 1946 to the Moore Drydock Company. On 10 May 1947 she left Pearl Harbor under tow of two tugs but was lost in a storm at sea about 500 miles northeast of Hawaii on 17 May 1947.

Much of the early salvage work was performed by divers under Lieutenant Haynes. This work was difficult and hazardous, but no serious casualty occurred to the naval divers or to the civilian Navy Yard divers. Only one casualty marred a perfect record of the contractor's divers.

Exterior steel work by divers was done with oxy-hydrogen torches; interior work with the oxygen-carbon arc. Precautions were taken to avoid explosions from fuel oil and gases. No serious explosions occurred although several small ones were experienced without serious injury. In all about 1850 dives were made with a total of 10,300 man-hours underwater.

Credit for a great job must go to the Salvage Superintendent, Captain F. H. Whitaker and his corps of assistants. The Navy Yard should be included as should the Pacific Bridge Company which had shown their proficiency in previous salvage jobs. The work of this company in setting up the winches, in making the soil tests, and in designing and installing the various patches is beyond calculation. The feats performed could not have been done without the cooperation of such men as Messrs. Graham, Ginella, Crocker, Davenport, Freeman, and Bisordi. Also, we should include the old Salvage Organization. It was they who made detailed plans of *Oklahoma's* righting and refloating.

In addition to Captain Whitaker, we should give credit to naval officers who spent time and energy in the long and arduous project. Among these who should be mentioned are the following: Greely, Liedstrand, Lindstrom, Tell, Baker, Leech, Morris, Calhoun, Chase, Keenum, Minor, Nordquist,



USN NR&L (MOD) 39766

Damage to port side of Oklahoma after removal of patches in drydock. View looking aft from about frame 35.

Smith, Urbaniak, Hendon, Snow, Arbogast, Hall, McDonald, and Smith.

To these must be added the enlisted personnel who assisted with the work, and also the Commandant and the Manager of the Navy Yard, Admiral Furlong, and Captain Paine, who were an inspiration to those entrusted with the project.

Captain Whitaker's complete story of the salvage of *U.S.S. Oklahoma* may be found in the *Transactions of The Society of Naval Architects and Marine Engineers*, Volume 52 (1944). The original estimate dated 18 July 1942 may be found as Appendix F of this book. This is the estimate prepared by the Salvage Division while *West Virginia* and *Oglala* were being salvaged.

11. *U.S.S. UTAH*, FORMER BATTLESHIP (LAUNCHED IN 1909)

This ship presented about the same problems of salvage as *Oklahoma*. However, she was a much older ship and was used only for aircraft target practice. She did not occupy a berth essential to the fleet. Some thought was given to using an air bubble to float the hull to the drydock for scrapping, but this idea was abandoned when it was revealed that *Utah* would not

hold enough compressed air to make a safe trip to the drydock across the channel.

It was originally intended that the ship should be salvaged immediately after *Oklahoma*, but there was considerable doubt whether the time, energy, material, and cost warranted the operation. The ordnance gang under Lieutenant Commander Stelter and Gunner Manthei had already removed from this ship, and other disabled ships, considerable ordnance material. This

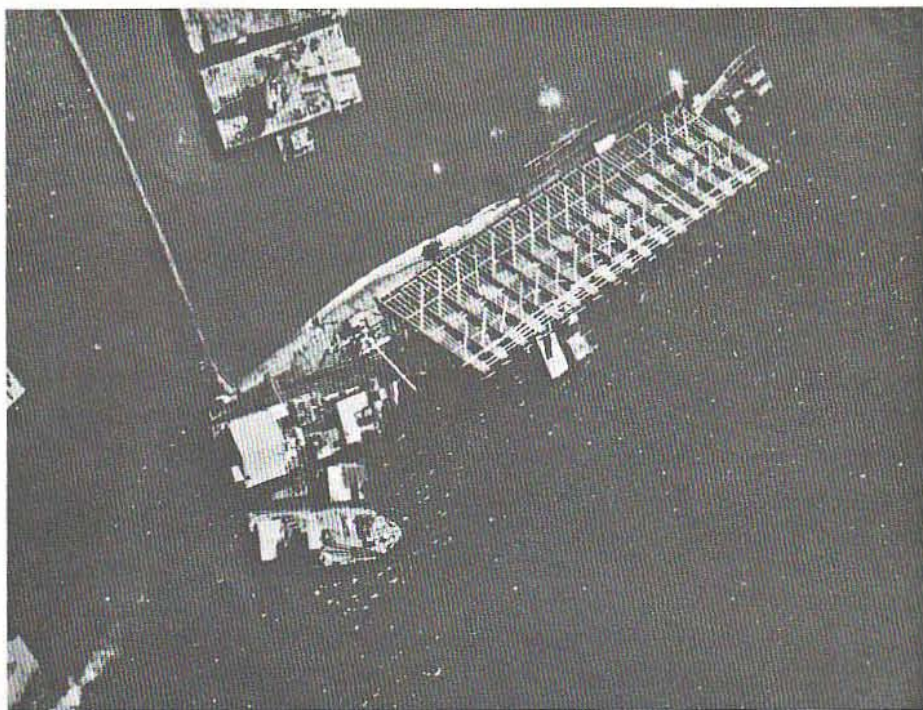


USN NR&I (MOD) 39767

Bow of Utah.

consisted of anti-aircraft guns, ammunition, small arms, etc. Most of the fuel oil had already been pumped out through the bottom.

The decision was made by the Navy Department to forego salvage work on *Utah* as the space was not needed and economy did not warrant further work. The matter was taken up anew in 1956 when the Commandant of the Fourteenth Naval District pointed out that carriers of the *Essex* class had insufficient space in which to transfer ammunition, special weapons, and guided missile components. The removal of *Utah* would facilitate such essential transfers. The cost of salvage would be about \$4,000,000 whereas



USN NR&L (MOD) 39768

Utah with righting headframes in place, 15 November 1943.

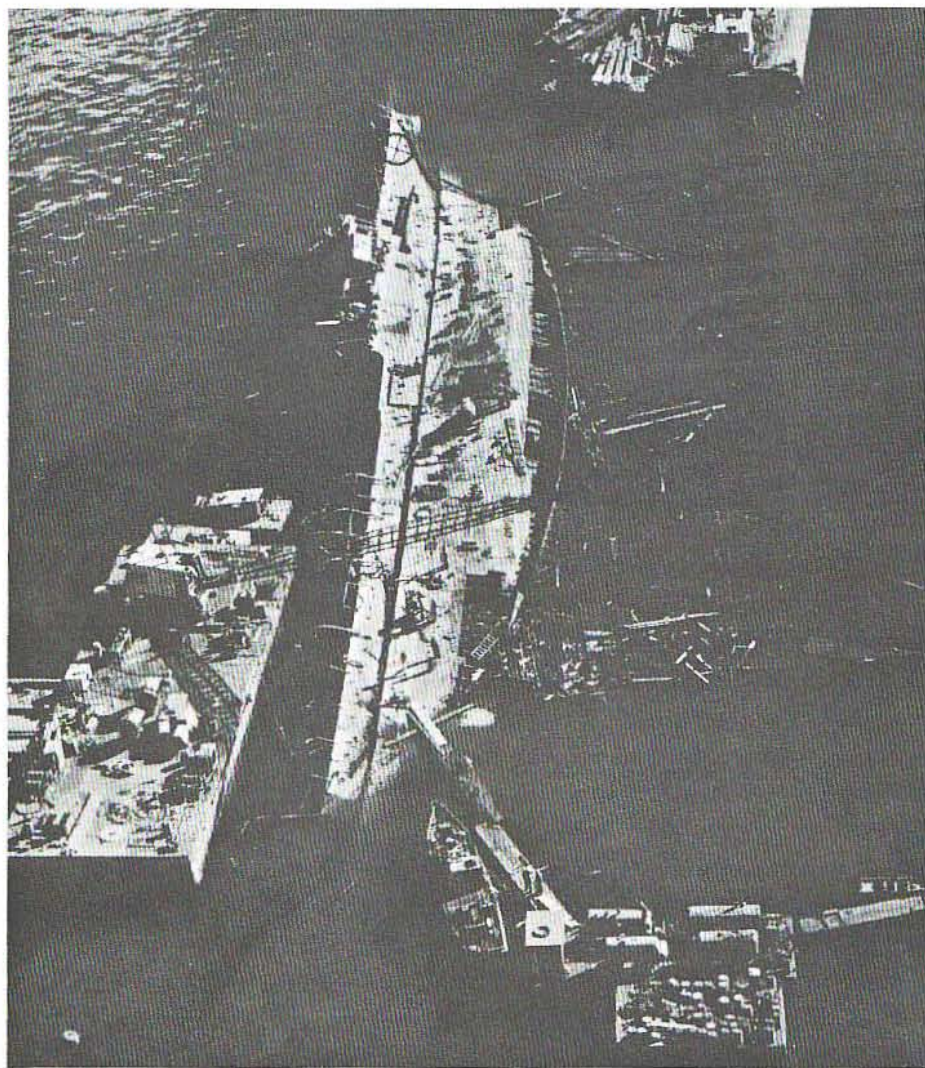


USN NR&L (MOD) 39769

Utah during first pulling period, 8 February 1944.

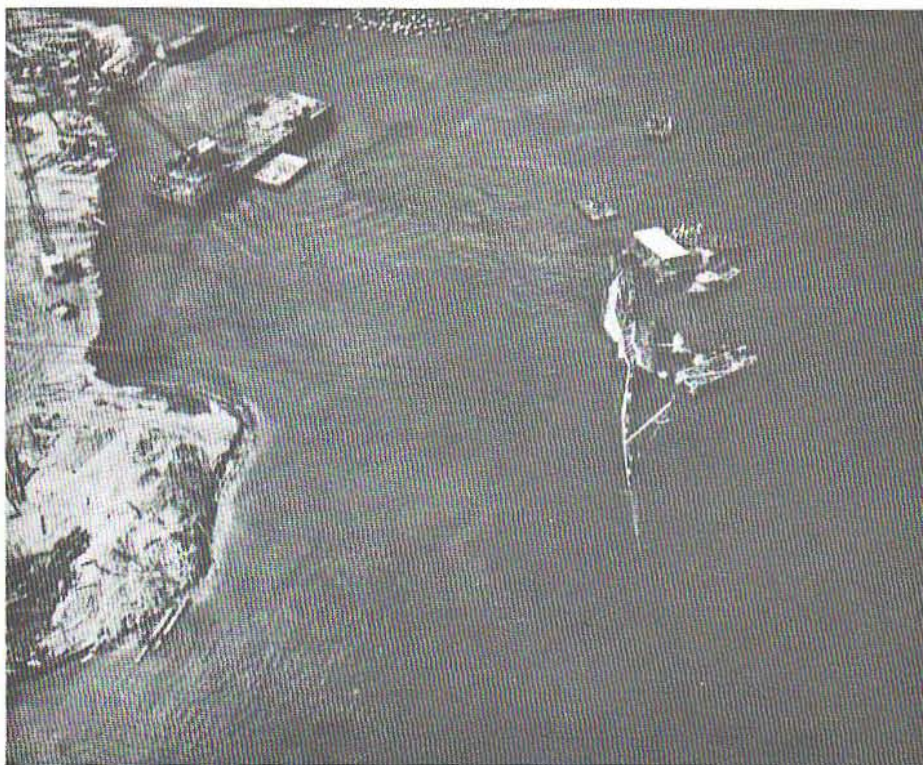
the 7,000 tons of recovered steel would bring only about \$30-\$40 per ton. The Commandant showed, however, that the salvage of *Utah* would remove an obstruction from the channel and would obviate the necessity of building a new berth for the aircraft carriers.

This view was concurred in by the Service Force, the Fleet Maintenance Officer, and by the Pacific Fleet. The plan was to use the refloating of



USN NR&L (MOD) 39770

Utah at the completion of first pulling period showing blister cut away to provide fairlead to hitch pads. Ship is in about 68° position.



USN NR&L (MOD) 39771

Utah in final position, 37° 45' to port, 13 March 1944.

Utah as a training project for harbor clearance. The ship had already been partially righted. The list to port had been reduced to about thirty-eight degrees, but she sat in water which nearly covered her hull.

The Bureau of Ships stated that since the decision of 1944, by the Chief of Naval Operations, the material required for righting the ship had been disposed of by sale, that the divers were no longer available, and that the project would consume one and a half to two years. Further, funds were not available and if the work was to proceed it should be under funds appropriated for the purpose.

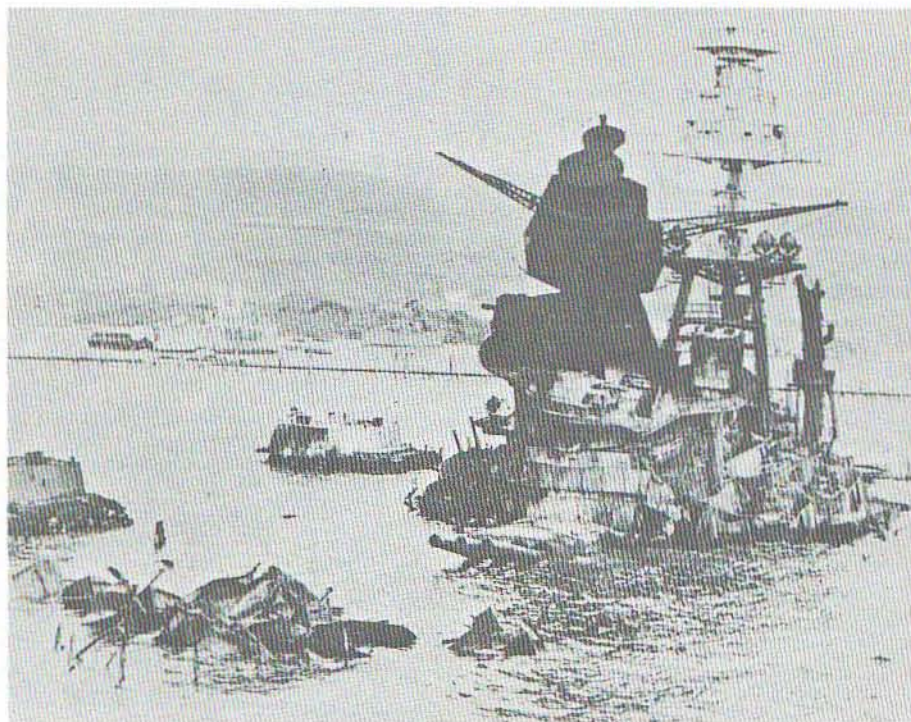
The Chief of Naval Operations did not favor further work on *Utah* but had no objection to using the ship for training of divers and harbor clearance. He saw no emergency requirement which would warrant the project. He was probably influenced by the argument advanced a few years earlier that the final resting place of some fifty-eight men should not be disturbed. It was proposed that a survey be made to determine whether a new pier

tangent to *Utah* could not be built for mooring and servicing aircraft carriers.

In any event *Utah* still remains at Pearl Harbor. She rests on the bottom although in a slightly different position than the bottom-up position she originally assumed. The Chief of Naval Operations has been consistent in his decision of April 1942 that because of the minor military value of *Utah* any salvage work should be directed toward her ultimate use as scrap.

12. U.S.S. ARIZONA, BATTLESHIP (LAUNCHED IN 1913)

There was no thought of raising *Arizona* because of her military value, but the divers and other salvors spent a lot of time investigating the wreckage. At one time it was believed that the after part of the ship was reasonably intact and that it could be raised if the underwater cutters could satisfactorily disconnect this portion from the rest of the ship.

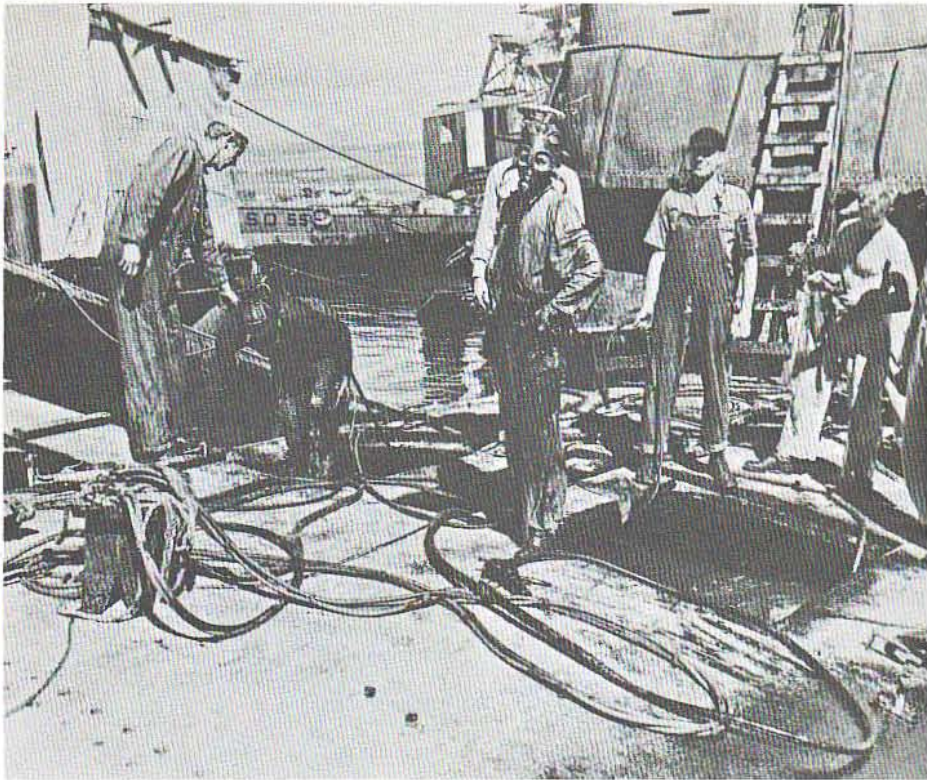


USN NR&L (MOD) 30772

USS Arizona, 10 December 1941.

The Ordnance Section was successful in removing from *Arizona* in the early days a great deal of the anti-aircraft battery with its ammunition. Much other ordnance material was recovered from the ship even as late as November 1942. The oil which fouled the harbor was gradually removed as it was released from the ship's opened tanks.

Practically all of the survey conducted in the summer of 1942 had to be performed by divers, mostly from the inside of the ship. It was found that the bow portion was buoyant, the after portion relatively intact, but the central portion of the ship was badly wrecked. Lieutenant Ankers, assisted by Ensign Beauchamp-Nobbs and Carpenter Urbaniak make a thorough survey. Gunner Manthei recovered considerable ammunition from turrets III and IV. The 14-inch guns, except from turret II, were removed and offered to the Army.



USN NR&L (MOD) 39773

Members of the diving crew emerge from water-filled compartments of Arizona.

It was decided that nothing further should be done toward salvaging *Arizona*, but that the ship should remain as a memorial to the men who lost their lives at Pearl Harbor. The hull of the ship is the final resting place of about 1100 men, including Rear Admiral Isaac C. Kidd.

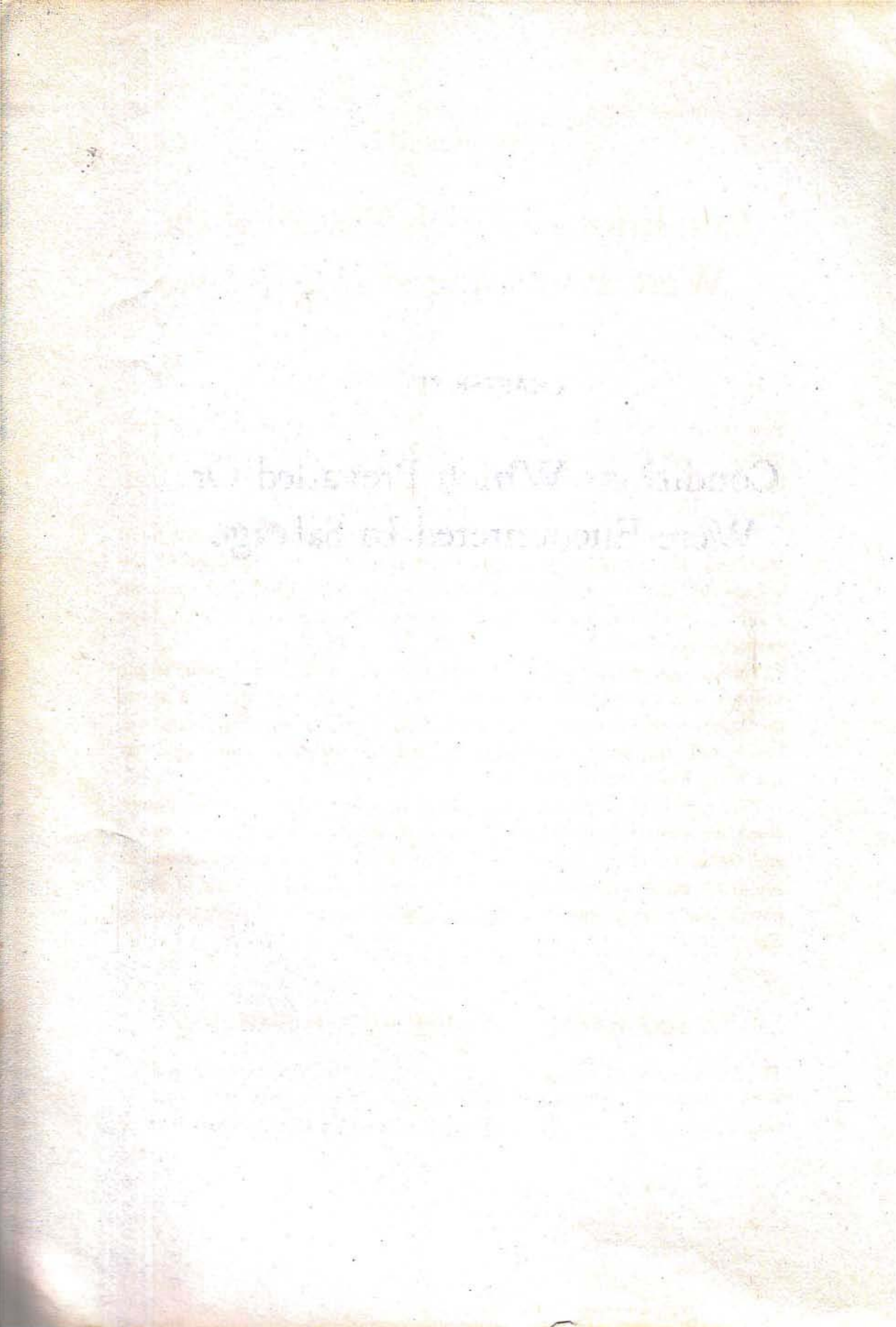
In due time the topsides of *Arizona* were removed, and all projections from the hull were cut off by divers. A memorial structure was built transversely over the hull of the ship. It is supported by two concrete girders which weigh 250 tons each. This rests on concrete piling. The structure is 185 feet long with a width of 27 and 36 feet respectively at the ends to 14 feet at the center. The assembly area accommodates 200 people.

The memorial is reached by a boat landing, and access is gained by formal stairs at the harbor end. Included is a carillon and a shrine. The shrine has a marble wall on which are inscribed the names of the men who were lost on *Arizona* on 7 December 1941.

This structure is a fitting memorial to the 2335 service men who were lost and the 1143 who were wounded on 7 December. It is painted white and is surmounted by the American Flag which flies day and night. The memorial is visited by many Americans and foreigners visiting Pearl Harbor.

CHAPTER XIV

Conditions Which Prevailed Or
Were Encountered In Salvage



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Conditions Which Prevailed Or Were Encountered In Salvage

1. LACK OF MATERIAL

Pearl Harbor was noted for shortages. This was a fact of life in a comparatively new fleet base 2000 miles from home. It has already been pointed out that there was a great shortage of oil, of oil tankers, of service craft, and countless other things to support a fleet which was ever growing.

The treacherous Japanese attack on a Sunday morning accentuated these shortages. If adequate pumping facilities had been at hand some of the ships would not have been sunk. If better fire protection had been available many of the fires which caused so much damage could have been extinguished.

The salvage effort would have been made much easier with ample supplies near at hand. The shortage of lumber and fastenings was acute; the shortage of manpower, especially electric welders and carpenters was keenly felt. All civilian mechanics and engineers were in short supply at the Navy Yard and in Honolulu.

The right kind of pumps arrived late. These were the deep-well pumps which were used effectively on the later battleships, especially *West Virginia* and *Oklahoma*. They varied in size up to 10 inches, and for *Oklahoma* as big as 18 inches and even 20 inches. They were driven by electric or diesel power, and were essential in ridding a badly wounded ship of incoming water.

2. FIRE HAZARDS ON THE SHIPS THEMSELVES

The European War taught the fleet much regarding fire hazards and floatability. Before the surprise air attack many fire hazards had been removed from combat ships. There is a tendency on the part of all personnel to be

"pack rats," to have at hand anything that may sometime be required. This inclination of human nature resulted in stowing away an excess of rubber sheeting, paints, canvas, oakum, linoleum, and so on. These were removed and greatly reduced the fire hazard and improved the floatability.

During the war all linoleum was taken off the ships and all oil paints were put ashore. Paint was chipped off down to bare metal and later was replaced with latex or water paints. These have satisfactory preservative qualities and are better than oil paints in resisting fire and high temperature.

3. SALVAGE OF ORDNANCE MATERIAL

Of all shortages, limited ordnance material presented the worst problem. Except for anti-aircraft guns on ships there was little defense of Pearl Harbor and the various airfields. No temporary batteries were installed, and 30 caliber machine guns were the main ones ready at the air bases. The



USN NR&L (MOD) 30774

Adjusting discharge hose from submersible pump in 14-inch magazine spaces during refloating operations in Oklahoma.

batteries of ships were restricted in their zones of action, and Sunday morning at "colors" was a time of maximum unreadiness.

Thus it was that one of the prime jobs was to build up the anti-aircraft defense. This was done quickly by transferring the batteries and their ammunition from disabled ships to points of vantage around the Navy Yard and air stations. Much of the removal work from ships was done by divers, and though this slowed up the transfer it was not long before Pearl Harbor had a tolerable anti-aircraft defense.

The Ordnance Section gave attention to other salvage as well as anti-aircraft batteries and ammunition. They worked assiduously in saving range finders, directors, small arms, and fine ordnance instruments from various sunken ships. This material required care and preservation in most cases, and the material was soon ready for use against the enemy.

4. ELECTRICAL EQUIPMENT

When it was ascertained from the experience on *Nevada* that total submergence in sea water permitted electrical equipment to be used again, there was much surprise in the fleet. Of course, proper steps for care and preservation had to be taken. Even the most delicate instruments, such as ammeters and wattmeters, were usable if properly cleaned and preserved before exposure to the air. The same pertained to cables and motors. If properly dried out and cleaned thoroughly they were usable. However, vital electric cables and motors were replaced.

It was learned that low humidity helped re-use. The humidity near the ocean meant that the equipment would ultimately fail. To avoid this, some of it was sent as far away as Denver. There it stood every test but proved questionable when returned to the seacoast. It should be clearly understood that here we are dealing with electric gear that has been submerged in sea water only a comparatively short time and has not been subjected to the tidal currents of the sea.

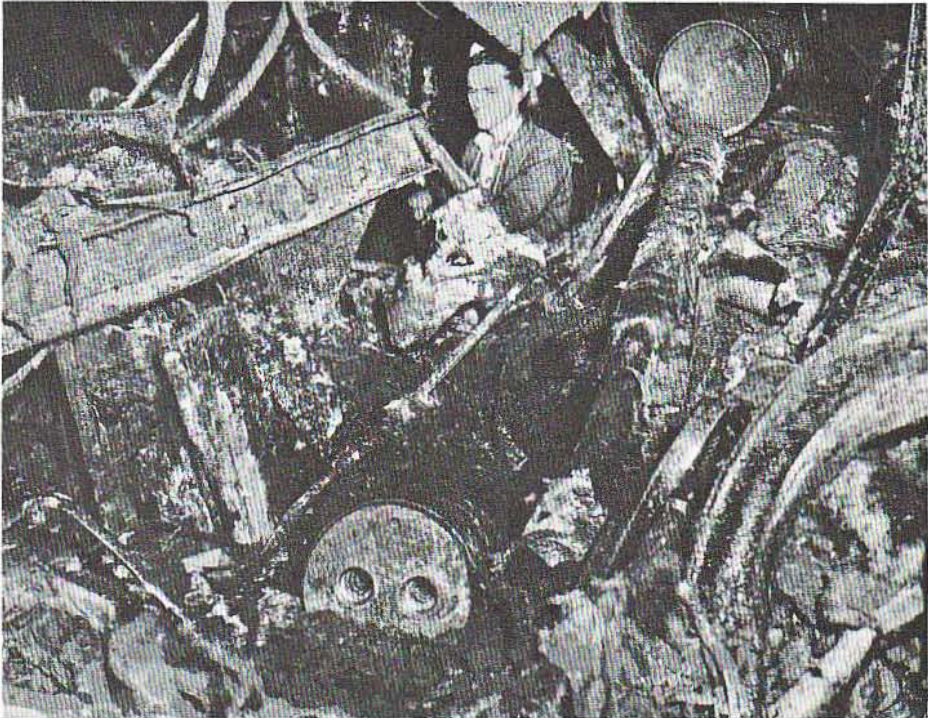
It was realized that no chance should be taken with respect to high potential lines and equipment. Accordingly, all such electrical gear was replaced as work progressed. No difficulty was experienced with either high potential or ordinary electrical equipment later in the war.

Due to the importance of this subject, additional detail is included in Appendix B.

5. JAPANESE TORPEDOES AND BOMBS

Salvage experience proved that a fair proportion of Japanese bombs and torpedoes failed to explode. This was especially true of the 800 kilogram bombs dropped from about 10,000 feet. These were made over from armor-piercing shells of 14 or 15-inch size, and were intended to pierce the armored decks of battleships, aircraft carriers, or cruisers. They had an explosive charge of about 430 pounds. On the other hand, the 250 kilogram bombs used by dive-bombers were very effective and were frequently mistaken for incendiary bombs by our forces. The explosive charge of these bombs was about 135 pounds.

The torpedoes used by the Japanese seem to cover a variety of explosive charges. According to the Japanese story given after the surrender, they all were of the "Long Tom" variety which were so effective in the Guadalcanal Campaign. These use oxygen in lieu of air which is safer, and carry



USN NR&L (MOD) 39775

Removal of dud bomb found in West Virginia.

an explosive charge of about 1000 to 1200 pounds. The American counterpart has an explosive charge of only 500 to 600 pounds.

It is worth noting that American torpedoes fired by our submarines early in the war sometimes failed to explode although they could be heard making contact with enemy ships. This deficiency was rectified after we developed a more reliable exploder.

Likewise, our close range anti-aircraft batteries had limitations. The American 1.1 inch in quadruple mounts seemed to be effective but frequent jamming curtailed efficiency. Our Bureau of Ordnance was in the process of getting from Sweden the 40-millimeter Bofors gun which could be mounted in twos or fours, and the 20-millimeter Oerlikon gun from Switzerland. These were used in great numbers on our ships from 1942 on.

There was much strafing by Japanese airplanes. Aside from causing a few casualties, this was ineffective. It has a value when it deters personnel from doing what should be done, but the evidence is clear that such things were done despite the strafing. So far as the ships were concerned, it is evident that strafing causes no real damage. At times, however, strafing is highly effective against personnel.

6. DIVING EXPERIENCE

Without competent divers the salvage work would have been impossible. Credit has been given to the various divers in each operation, but their outstanding efficiency deserves mention again. The supervision of the divers was excellent. Lieutenant Haynes was a stickler for safety, as were his assistants. The divers from the Salvage Division, the Navy Yard, *Ortolan*, *Widgeon*, and elsewhere made about 4,000 dives totaling some 16,000 hours underwater without a single serious casualty. The contractor had one casualty. The total of the contractor and the Navy was about 5,000 dives with about 20,000 hours underwater. Considering the difficulty, hazard, and importance of the work, this is a remarkable record.

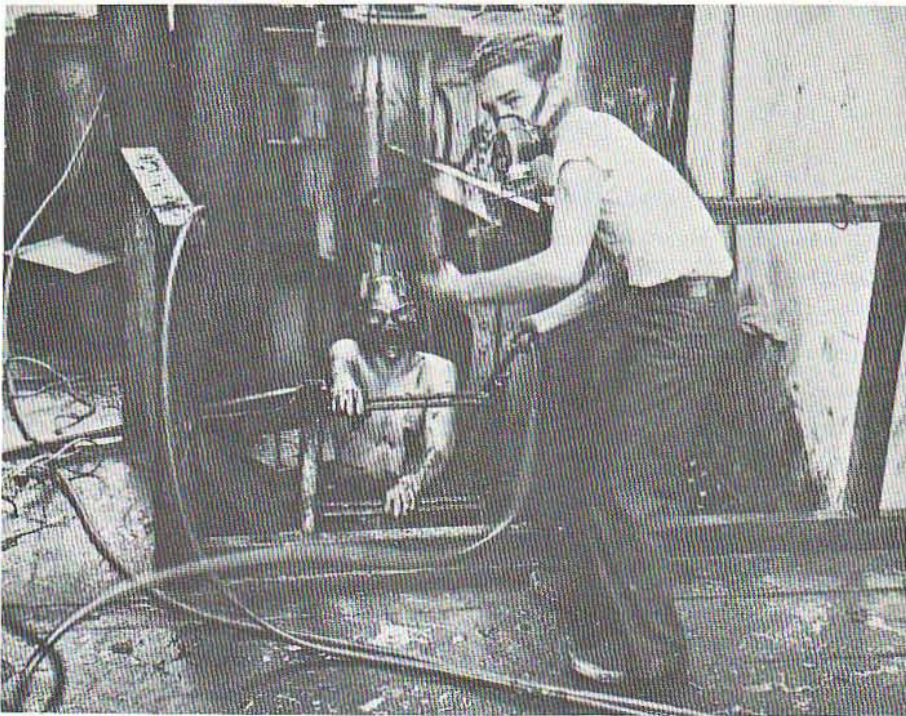
7. DEADLY GAS ENCOUNTERED ON MOST SHIPS

The prevalence of hydrogen sulphide in *Nevada* and other ships was indeed a new phenomenon. While we usually think this gas has the smell of rotten

eggs, the gas when absorbed in water at high pressure has no smell at all. At higher concentrations it is undetectable because it tends to paralyze the sense of smell. There were other gases encountered but none so deadly and widespread. Lack of oxygen in the spaces unwatered was commonplace.

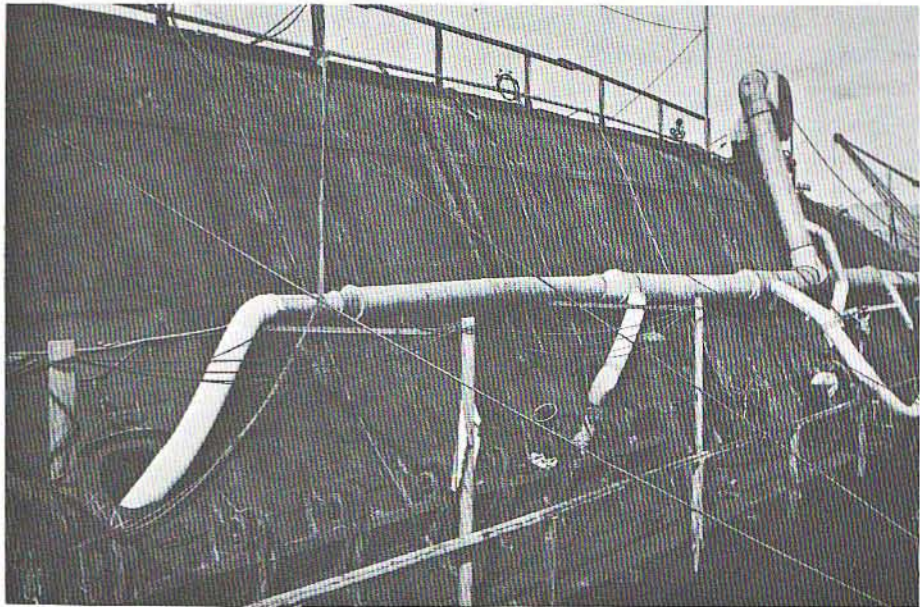
Hydrogen sulphide is formed by polluted water working on paper products. It was found in compartments of every large ship, sometimes in lethal doses. After the *Nevada* incident, in which two men were lost, great care was taken with regard to sending men into spaces recently unwatered. Tests were taken of the air and frequent inspections made by experts of this industrial hazard. Each man wore some litmus paper on his tank suit to reveal the presence of gas.

Ample ventilation put fresh air into each compartment to insure the dilution of deadly gases and to provide oxygen into spaces which were deficient. When necessary to send men into untested areas they were equipped with gas masks or rescue breathing apparatus. Divers were prevented from using only face masks in waters which showed heavy pollution.



USN NR&L (MOD) 39776

Divers emerging from gas-filled compartments.



USN NR&L (MOD) 30771

Ventilation for work in Oklahoma blister.

In view of the importance of this subject, Appendix C is added for the information of those engaged in such work.

8. GASOLINE EXPLOSIONS

The gasoline vapor explosion on *California* taught an important lesson. Despite ventilation which was deemed adequate, the accident occurred. It was a serious explosion too, and would have caused casualties to anyone in the vicinity at the time. As it was, the structure was ruptured and an efficient hull patch rendered useless near the time for drydocking. Luckily it happened in a location which permitted isolation of the flooded spaces. This allowed drydocking on schedule.

Advantage was taken of this lesson in future salvage work. On *West Virginia* and other ships, the gasoline tanks were thoroughly emptied and gasoline vapors eliminated.

When a steam blanket cannot be used over oil, it is mandatory that divers engaged in welding or cutting drill holes somewhat higher than where they are working to allow oil vapors to escape. This method was

used on *Oklahoma*, and though some small explosions occurred none were serious.

9. ELECTRIC-DRIVE BATTLESHIPS

When two electric-drive battleships were among the casualties of the air raid, it was at first assumed that four or five years would be required to rehabilitate the propulsion machinery of *California* and *West Virginia*. But necessity is the mother of invention and the mainspring of action.

Details are given in the account of *California* salvage of the rewinding of alternators and motors and the restocking of their iron elements. Suffice it to say here that *California* was on her way to Bremerton on 10 October 1942 and *West Virginia* followed shortly after. Both travelled under their own power and emerged from the Bremerton Navy Yard as modern ships to participate fully in the war against Japan. For more information on reconditioning these electric-drive ships see Appendix D.

10. CLASSIFIED CORRESPONDENCE AND PERSONAL PROPERTY

Great care was always used to insure the proper handling of classified correspondence and papers. This included personal property which was retrieved from lockers of men who were lost or who had departed on other ships. Ordinarily these papers or valuables were delivered to the Commanding Officer or to whomever he might designate as the proper officer to receive them. Personal property removed from lockers was tagged for identification and delivered in due course to owners or relatives.

11. REMOVAL OF HUMAN BODIES

Some of the ships had large numbers of human bodies in various compartments. A scheme was developed for handling these without the knowledge of the men who comprised the working parties. Two or three feet of water were left in each compartment so that the bodies could be floated into canvas bags. The bags were tightly tied and transported to the Naval

Hospital for proper identification and burial. The method was very effective and was undisturbing to the salvage crew.

12. CLEANING OF COMPARTMENTS

The cleaning of compartments of unwatered ships was a beggarly job. There was always a shortage of manpower, as the original crews had largely gone to other duty. Trained men for the fleet were in short supply; even recruits were in great demand, as were naval reservists who had some training in their specialties. The men for salvage work came mostly from the Receiving Ship or from vessels in ordinary. These men had numerous assignments and it was only near drydocking time that the total reached as many as 400 to 500 men. The Salvage Officer requested 800 men near the end of a job, but this figure was never reached.

Each man of the cleaning crew had a tank suit and knee-high rubber boots for especially dirty work. The suits which became oil soaked were turned in for a freshly laundered suit. Boots were cleaned by the wearer. Only selected men were given gas masks for entering spaces that had not yet been adequately ventilated and lighted. They had litmus paper attached to their suits to show presence of toxic gases.

The cleaning crew found material and equipment of all sorts strewn about, and oil everywhere. Their first job was the removal of wreckage. The next was washing down by a high pressure hose. Both sea water and fresh water were tried, but fresh water did a better job. This was followed by a caustic solution which cut the oil coating. Then fresh water would do a clean and finished job.

One of the chores of the cleaning gang was to remove ammunition from turrets and magazines, and to take off cases of canned goods and other stores. All of the latter was scrapped in accordance with the recommendation of the representative from the Department of Agriculture. In a region of food shortage it was hard to see unbulged canned food dumped at sea, but that was the order of competent authority.

13. WORK PERFORMED BY THE NAVY YARD

Too much credit cannot be given to the Navy Yard, Pearl Harbor, for its part in ship salvage and rehabilitation. There was a close tie between the Salvage Division and the Navy Yard. Consequently the Salvage Division

was given up-to-date information from Design and Planning with respect to stability and floatability of any ship under varying conditions. True enough there was difference of opinion at times, but these differences were always worked out between the parties involved.

The performance of the Navy Yard when the raised ships entered dry-dock left nothing to be desired. In spite of the heavy workload of supporting a fleet at war, the Navy Yard was always available to repair, on a permanent or temporary basis, the ships presented to it. This was done despite a growing shortage of manpower in several of the engineering and mechanical ratings. In due time this shortage was overcome by importing workers from the mainland Navy Yards and shipbuilding companies. It might be mentioned that all of these men were not desirable, and a keen eye was necessary to detect professional gamblers and other similar characters.

Special mention should be made of the Navy Yard's work in rehabilitating electric motors and electric-drive battleships. Through the Yard various contracts were made for handling motors and other electrical gear. These contracts ranged from Honolulu to Oakland. Full cooperation with the General Electric men and the Navy Yard brought the electric-drive battleships to the point where they could go to Bremerton under their own power and later join the fleet which defeated Japan.

The services rendered by the Navy Yard are too numerous to mention. Among others, it furnished scarce scrap materials to manufacturers on the mainland. It gained the thanks of government officials in Washington who oversaw such work. The Navy Yard prided itself in sending large amounts of steel, rubber, electric cables, brass, and aluminum to the mainland.

The Japanese could not stop the flow of scrap materials to the mainland throughout the war. Neither were the Japanese effective in intercepting ships carrying personnel or other material to or from Pearl Harbor; nor were they effective against the crippled ships which regularly crossed the ocean on the way to Bremerton or to Mare Island or other California ports. Japanese submarines proved to be a complete loss.

14. USE OF SUNKEN OR DAMAGED SHIPS IN THE WAR EFFORT

The enemy achieved much of his goal in the perfidious air raid of 7 December 1941. Although only 19 ships of the almost 100 that occupied berths

at Pearl Harbor were sunk or damaged, an important part of the fleet was immobilized for many months.

The shortage of ships prevented decisive action against a superior foe. It was only after new ships joined the fleet from building yards or the Atlantic that offensive warfare could be pursued in earnest.

In a war which lasted nearly four years all nineteen of the Pearl Harbor victims, except *Oklahoma*, *Arizona*, and *Utah*, saw action against the Japanese Navy. This included vessels which had been given up by the Secretary of the Navy as lost, or enumerated by the Japanese as destroyed at Pearl Harbor. The marvel of salvage surprised not only the Japanese but also our own forces.

As described, many of the salvaged ships performed wonders during the war. Their strength augmented the fleet, and it was this overall strength that ultimately won the unconditional surrender of Japan. We learned that sunken or damaged ships can be put to work again and with greatly increased potential.

It should be mentioned that the battleships at Pearl Harbor were ill prepared for survival. They were not in a battle condition. As a comparison, consider the German battleship *Bismarck*, or the two new Japanese 64,000 ton battleships which were put into service in 1941 and 1942. The metacentric height of each ship was about ten feet or more. These ships were in action with all closures made, and with excellent damage repair facilities. They were finally sunk, but not until each of them had taken approximately 10 torpedoes and from 10 to 20 bombs.

15. SPIRIT OF THE SALVAGE CREW

Enough cannot be said in praise of the salvage crew. They worked hard and earnestly. They soon saw that the results of their efforts exceeded the fondest hopes of their supporters and they were urged on by their successive achievements.

Much has been said of the men who contributed most to the salvage of each ship. Praise has been given to the Navy Yard and to the Pacific Bridge Company, but little has been said of the men in the Central Office. They consistently did much to keep the gears meshed and turning. Without them the Salvage Organization would not have functioned smoothly.

All projects were pursued to a happy conclusion. There was no bickering

or an "I told you so" attitude. There was a meeting of the minds in all the jobs in which the Salvage Division was engaged. There was never a lack of confidence. Instead, there was a feeling of assurance in the outcome of each job. This consistent oneness of purpose can best be explained by the operation of the One Mind which governs all things well.



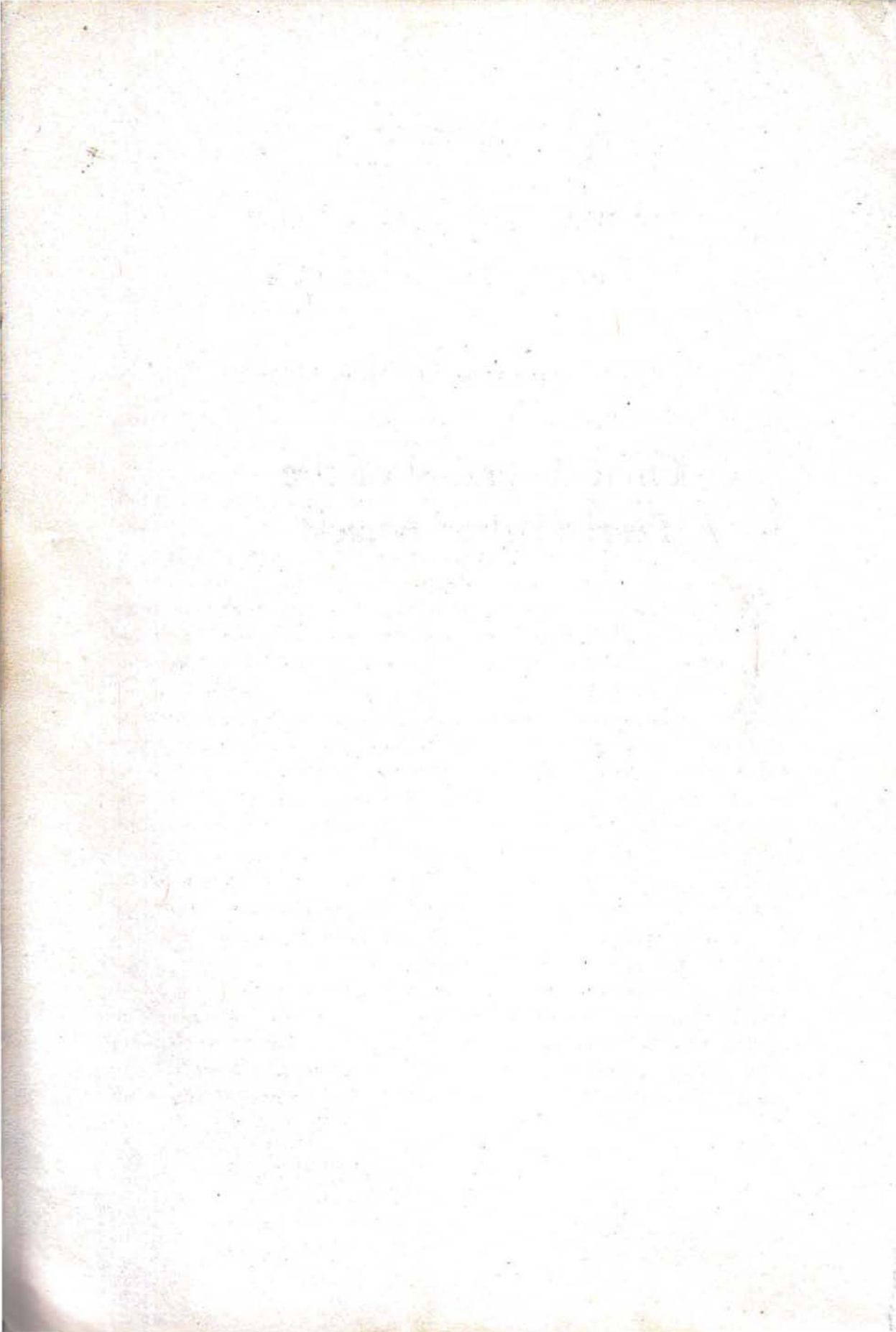
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Divers standing in front of decompression chamber.

I made recommendations to the Commandant of the Navy Yard regarding the medals which a grateful Nation should bestow upon its benefactors engaged in salvage work. Before departing for the South Pacific I was recommended for the Navy's Distinguished Service Medal by the Forces Afloat, and this was presented to me by Admiral Nimitz on the deck of the aircraft carrier *Enterprise*. At that time about a dozen other medals were presented for deeds of valor. Admiral Nimitz read the citation for the work performed by the Salvage Organization and ended by adding, "for being an undying optimist". The Medal was accepted by me in the name of the organization which I had the honor to head.

Final Appraisal of the
Pearl Harbor Attack

CHAPTER XV



Final Appraisal of the Pearl Harbor Attack

1. JAPAN'S MISTAKE IN ATTACKING PEARL HARBOR

In retrospect, the Japanese attack on Pearl Harbor was a blessing for both nations, if not for the world. The "Day of Infamy" will long be remembered, because at the time it seemed real and portentous. Since that time, a quarter century ago, the results of that attack appear insignificant compared to the events which have since transpired. What seemed a great disaster at the time of Pearl Harbor has turned out to be a blessing in disguise. Tragically, it was the cheapest way in which a nation such as the United States could become unified and could thereafter go forth as the champion of liberty throughout the world. The results of the war put an end to many of the non-democratic governments in the world and at the same time led the United States to take decisive action and world leadership.

True enough, General Tojo and Admiral Yamamoto were bad news for a peace-loving nation like the United States. The Japanese people became willing victims of a despotic militaristic regime which had never known defeat, and which had attacked without warning in the Chinese War of 1895 and the Russian War of 1905. In later years they signed an agreement at The Hague which prohibited such uncivilized practice. Yet in 1941 they attacked Pearl Harbor in peacetime without warning. Through a miscalculation by their diplomats in Washington, the half-hour's interval between the attack and the final note ending further negotiations turned out to be a warning which was received more than an hour after the event.

The militaristic faction in Japan had been successful in their program of territorial and economic expansion. They had occupied a portion of Manchuria, Hankow, Shanghai, the island of Hainan, and Indo-China, and they had driven many foreigners out of China. Their expressed concern for international amity and goodwill was not sincere. They yearned for the riches

of Southeast Asia and their golden opportunity for further expansion arrived in 1941 when the Axis Powers, Germany and Italy, were apparently successful in their programs of expansion. It was Tojo who declared to a willing people that "Japan's destiny is to return Asia to Asians." Though certain elements in Japan, including the Emperor, cautioned peace, the country had gone so far that it could not draw back without a loss of face. This was impossible, especially when Japan's military power was fully poised, trained, and ready.

The Japanese Fleet attacked Pearl Harbor in force, and the results seemed calamitous then. The military purpose was to immobilize the American Fleet so that the American forces could not interfere with depredations in China or in Southeast Asia. The Japanese leaders accomplished their purpose, but the purpose was wholly illusory when viewed in the context of later events. The question now arises: What mistakes did Japan make in the attack on Pearl Harbor?

In the first place, the Japanese Commander of the attacking force felt that his mission was completed, and that he should return to Japan as ordered. It apparently did not occur to him that his planes could have destroyed the thirty-eight cruisers and destroyers that remained afloat at Pearl Harbor, or the reserve fuel oil supply of the fleet that would have immobilized the fleet for months or even years. His planes could have destroyed the mechanical shops and drydocks which were indispensable to a fleet at war. These important adjuncts of military power were left intact. Possibly they were left to serve Japan at a later date in case they occupied Pearl Harbor.

In the second place, the American Fleet was inferior to the Fleet of Japan, especially in aircraft carriers and aviators. If the Americans did intervene, where could they strike without undue risk from submarines and land-based aircraft? The Rainbow Plan called for the fleet to attack the Marshall and Caroline Islands and to establish a fleet base there. Could this be done without great risk to the American Fleet? Even if successful, what impact would it have had upon the Japanese in their invasion of China, Indo-China, Malaya, or Indonesia?

If the Japanese had warned the Americans of the intended attack even a few days in advance, would the situation have been any better? Perhaps our land-based Army planes could have given a good account of themselves. The losses to the Japanese would undoubtedly have increased, but the losses of our side in terms of ships and aviation manpower could have



Ships of the Fleet anchored in Pearl Harbor near the end of the war.

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been much greater. A fleet action would hardly have been in our favor, for we would have only two carriers in the Central Pacific against six Japanese carriers. Some of our battleships and cruisers would certainly have been deep water victims. The losses could easily have exceeded those suffered at Pearl Harbor, and would have been final in most cases.

On 3 April 1965 Fleet Admiral Nimitz wrote to the Chief of Naval Operations, Admiral David L. McDonald, as follows:

Several times in recent weeks I have been quoted—*correctly*—that “as bad as our losses were at Pearl Harbor on 7 December 1941—they could have been devastatingly worse”—had the Japanese returned for more strikes against our naval installations, surface oil storage and our submarine base installations. Such attacks could have been made with impunity as we had little left to oppose them. Furthermore—I have been correctly quoted in saying that it was God’s divine will that Kimmel did not have his fleet at sea to intercept the Japanese Carrier Task Force that attacked P.H. on 7 Dec 1941. That task force had a fleet speed at least 2 knots superior to our speed—and Kimmel could not have brought the Japanese to a gun action *unless* they wanted it. We might have had one carrier but I doubt if the *Lexington* could have joined in time. Picture if you can—6 Japanese carriers working on our old ships which would be without air cover—or—had the Japanese wanted to avoid American air attacks from shore—they could have delayed the action until out of range of shore based air. Instead of having our ships sunk in the shallow protected waters of P.H. they could have been sunk in deep water—and we could have lost all of our trained men instead of the 3800—approx. lost at P.H. There would have been few trained men to form the nucleus of the crews for the new ships nearing completion. Not only were the ships of the enemy task force faster—they were more modern—and the Japanese main fleet under Yamamoto was in the rear—in support—if needed. Nagumo—the Commander of the P.H. Attack Force—missed a great chance by not following up his attack . . .

The greatest mistake was purely psychological. The attack on Pearl Harbor solidified a people against Japan and her allies and brought about the greatest miracle of production that the world has seen. Before that happened, the people were divided in their feelings toward Japan and toward the Axis Powers. There was some sympathy for Japan. Going to war to interfere with her exploits in China and Southeast Asia would have failed to arouse a patriotic spirit among Americans. But the unprincipled attack on Pearl Harbor changed the people entirely; they were now committed to an all-out war with “unconditional surrender” as the objective.

2. OTHER MISTAKES MADE BY THE JAPANESE

For a military government to make the mistakes made by Japan is almost inconceivable. In addition, Japan did not use well the superiority which she possessed. Besides underestimating the power of an aroused America, the military leaders of the Japanese failed to gauge the potential of a great country at war. They assumed that the Americans would grow tired of the struggle and be content to let Japan keep her ill-gotten gains. No greater mistake could be conceived with regard to the true character of the American people, in that age or any age.

Overexpansion was without doubt the greatest error of Japan. The first steps of the war were so easy that the leaders departed from the original plan and included parts of Alaska, Midway, and Australia in their projected empire. The result was that when the real tests came they were unable to defend the expanded perimeter against their newly-made enemy.

They assumed that they had insured security of their codes. Yet before Pearl Harbor we had broken the diplomatic code, which was of inestimable value to Americans and their allies.

The military leaders of Japan failed to protect their shipping adequately. Our submarines were able to make intolerable inroads on Japanese merchant ships. In contrast, we lost very few ships to Japanese submarines in the Eastern Pacific or elsewhere. This all points to the fact that they failed to use properly their large fleet of submarines.

We give the Japanese credit for the early-day efficiency which they displayed. At Guadalcanal their destroyers were adept in the use of the "Long Tom" torpedo which had a far greater explosive force than our weapons. They also excelled at first in night action. True, the Japanese were on the offensive and could select the time and place for the sea battles which ensued.

Yet, at Guadalcanal the real caliber of American sea power and American character were shown. As we see it now, the Japanese were eventually turned back at Guadalcanal, as they were at Midway. The turning point of that great war occurred at Midway in June 1942 and at Guadalcanal after August 1942. They retreated from Alaska in the fall of 1942.

The Japanese were not lacking in patriotism or willingness to die for their Emperor. If the atomic bombs had not been dropped on Hiroshima and Nagasaki it is possible that millions of Americans would have been lost in their effort to take the homeland from a relentless and fanatical foe.

An amphibious assault on the Japanese homeland would have been very costly to the Japanese as well as to the Americans.

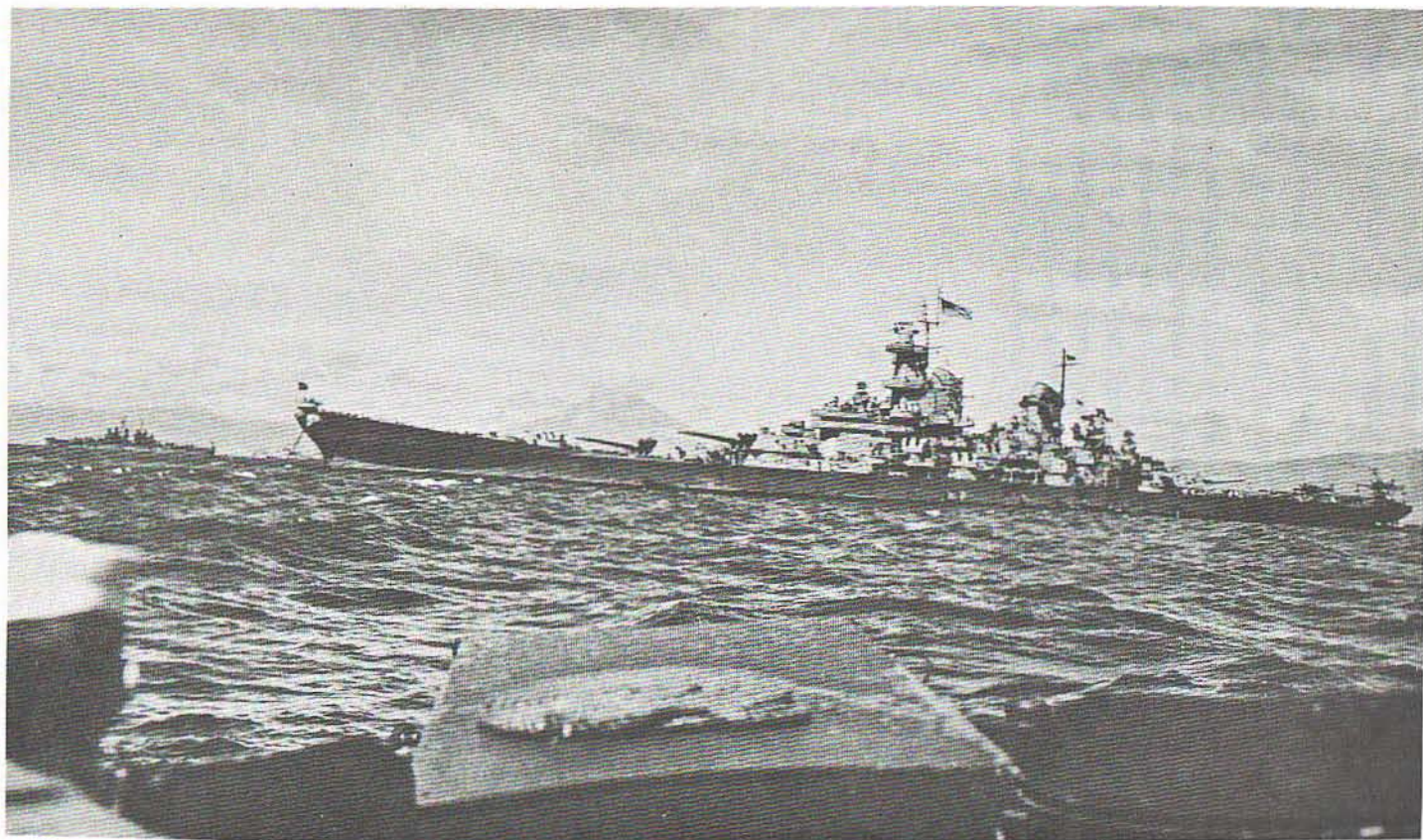
In retrospect, we are thankful that America was with God during the ordeal which tried men's souls. In many ways, He showed that the right prevails over the wrong, provided that the right side perseveres. Truly it has been said that right motives give pinions to thought, and strength and freedom to speech and action. This is especially true of those who strive to perform the right. The final surrender of the hordes represented by Hitler, Mussolini, and the Japanese militarists, proved unmistakably that the power of God is on the side which is nearest right.

3. UNITED STATES' AVERSION TO WAR

Through the years of 1920-1940 the people of the United States were strongly opposed to war. Isolationism was rampant. World War I was a great victory for America and the western democracies as a whole, but at a fearful cost. It was only when England was near collapse and Japan was taking over China and Southeast Asia that the people of America awoke to the real facts of international life. The American people gradually came to the realization that it was impossible to withdraw from the world or avoid its problems. Such is the way of a leading democratic society. Such is an inherent responsibility of a great world power. Even with this realization there were divisive forces in the body politic.

In the 1920's and early 1930's the people had elected representatives in Congress who believed as they believed. The result was that disarmament was popular and preparedness was anathema. Consequently there was a minimum of money for the armed forces. The Army and Marine Corps were on a starvation diet and few new ships were ordered for the Navy prior to Roosevelt's Presidency. Even when the situation became ominous in 1940, and it was apparent that the world was about to be taken over by predatory forces, it was impossible to make up for the years of neglect. The forces of 'peace at any price' were still powerful in Congress, and the majority of people was adamant in their aversion to war.

That state of mind did not persist among our citizens after the bombing of Pearl Harbor. The isolationists in our populace became patriotic Americans. Even the Japanese who were American citizens gave an outstanding account of themselves. The sons and daughters of all Americans went to war in the



USS Missouri anchored in Tokyo Bay for the formal surrender ceremonies on 2 September 1945.

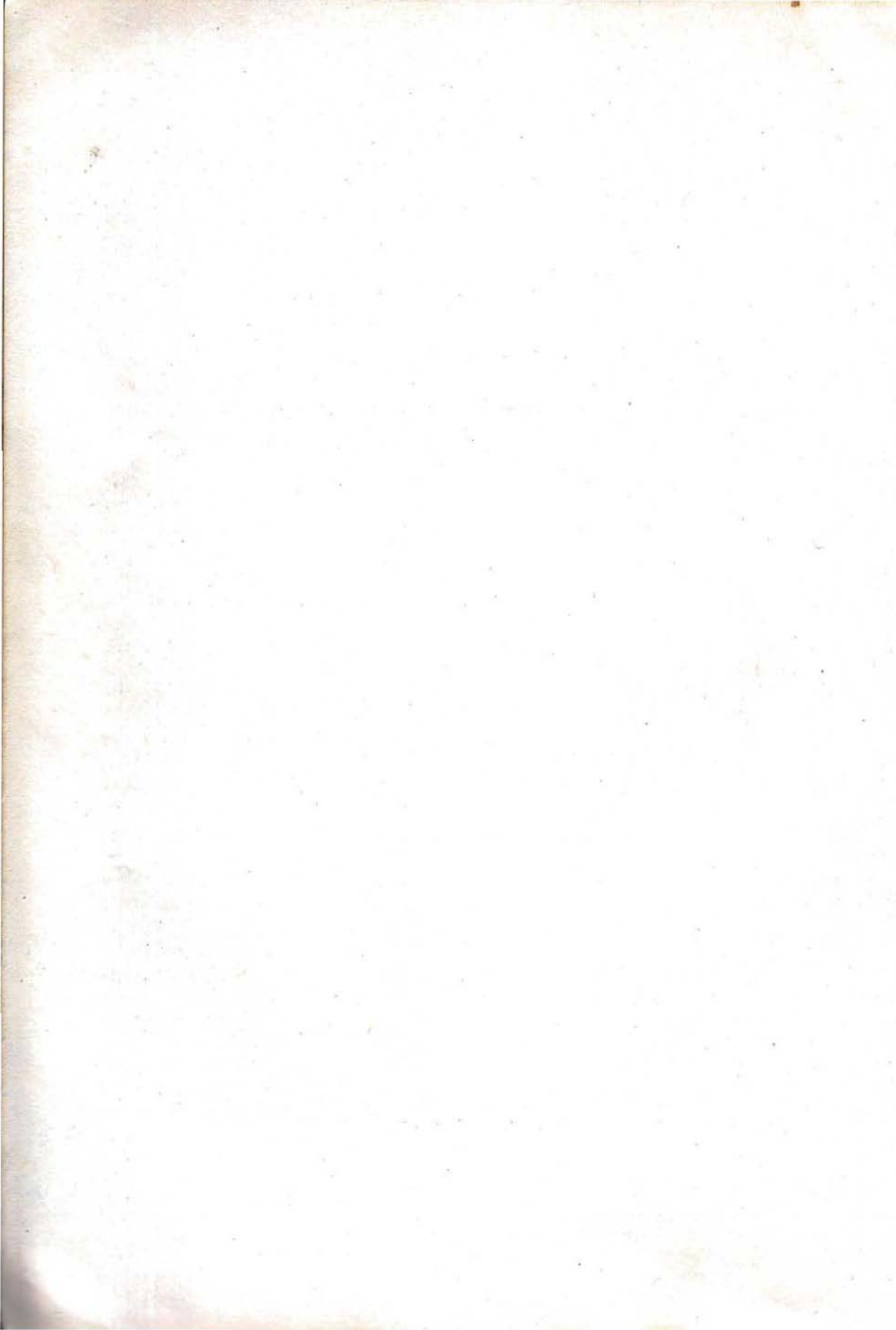
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global conflict which ensued. Those who remained at home put their shoulders to the wheel and the world witnessed the marvel of wartime productions.

A few years later, when approving the 1945 Navy Court of Inquiry on the Pearl Harbor attack, President Truman made the following statement:

I have read it very carefully, and I came to the conclusion that the whole thing is the result of the policy which the country itself pursued. The country was not ready for preparedness. Every time the President made an effort to get a preparedness program through the Congress, it was stifled. Whenever the President made a statement about the necessity of preparedness he was vilified for doing it. I think the country is as much to blame as any individual in this final situation that developed in Pearl Harbor.

Appendices



APPENDIX A

This appendix contains additional selections from survivor reports.

1. U.S.S. WEST VIRGINIA

Lieutenant Commander T. T. Beattie wrote as follows:

About five minutes to eight I was in the wardroom just finishing breakfast, when word came over the loud speaker from the officer-of-the-deck, "away fire and rescue party." This was followed immediately by a second announcement over the loud speaker, "Japanese are attacking, all hands General Quarters," and the general alarm was rung.

I heard several dull explosions coming from other battleships. Immediately I left the wardroom and ran up the starboard passageway to the bridge. The Captain was just ahead of me and proceeding in the same direction.

At this time the ship listed at least five or six degrees and was steadily listing more to port. The Captain and I went to the conning tower, our battle stations, and at this time dive bombing attacks started to take place and numerous explosions were felt throughout the ship. Upon testing our communications with central station and to the guns we found they were disrupted. I suggested to the Captain as long as no communications were in the battle conning tower that we leave there and attempt to establish messenger communication and try to save the ship. We went out on the starboard side of the bridge discussing what to do. During all this time extremely heavy bombing and strafing attacks occurred. The ship was constantly shaken by bomb hits.

The Captain doubled up with a groan and stated that he had been wounded. I saw that he had been hit in the stomach probably by a large piece of shrapnel and was very seriously wounded. He then sank to the deck and I loosened his collar. I then sent a messenger for a pharmacist's mate to assist the Captain.

Just then the U.S.S. ARIZONA's forward magazines blew up with a tremendous explosion and large sheets of flame shot skyward, and I began to wonder about our own magazines and whether they were being flooded. I posted a man with the Captain and went down to the forecabin where a number of the crew and officers had gathered. I got hold of a chief turret captain to check immediately on the magazines and to flood them if they were not flooded at this time. Large sheets of flame and several fires started aft. Burning fuel oil from the U.S.S. ARIZONA floated down on the stern of

the ship. Just then the gunnery officer, Lieutenant Commander Berthold, came aboard and I asked him to try to flood the forward magazines. Shortly thereafter I was informed that the after magazines were completely flooded but that they were unable to flood the forward magazines as the water was now almost to the main deck.

At about this time a large oil fire swept from the U.S.S. ARIZONA down the port side of the U.S.S. WEST VIRGINIA. We had no water on board as the fire mains and machinery were out of commission and we were unable to do any fire fighting at all. I got into a motor launch to go to the stern of the ship to investigate the fire. The smoke was so heavy that I could not see aft of the bridge. As I got into the boat, a sheet of flame swept on top of us and we barely managed to get free of the fire. I then had the boat take me aft. The burning oil on the water swept by the ship and I managed to return to the quarterdeck. I realized then that the ship was lost.

The attack lasted approximately thirty minutes. We were able to fire all our ready ammunition on the anti-aircraft batteries, but were unable to replenish it as the ship was flooded. I then told the men on the quarterdeck, with the exception of a small working party, to leave the ship. I believe at this time that all the wounded had been taken off the ship and it was extremely dangerous for anyone to remain aboard; that nothing could be done to save the ship and shells from the secondary batteries were constantly exploding due to the intensive heat of the fire midships.

The conduct of the crew and officers was outstanding. There was no confusion and every man and officer did his duty as well as he was able under the conditions.

Lieutenant (jg) H. B. Stark wrote as follows:

Shortly before eight o'clock on Sunday morning, I was in my room double george on the half deck. Double george is the third stateroom counting from aft on the starboard side of the half deck, in the third watertight compartment from aft. As I was getting up from my bunk I heard the call "Away Fire and Rescue Party," followed immediately by General Quarters. This was followed almost immediately by two or three violent explosion in quick succession. The ship started listing to port right away. Grabbing an armload of clothes, I ran forward and found only one man on the half deck manning the repair phone. Between us we started closing watertight doors working from aft, although we did not check the after door leading to the airplane crane room, which normally should be shut. As I dogged down the door forward of my room I heard something let go in the compartment, some leak starting violently. By that time there were a few more men in the compartment above. The large watertight hatch over that space was dropped and I crawled out through the escape scuttle.

As I did I skidded over to port and landed in about four feet of water with a scum of fuel oil. I decided to work my way along the starboard side of the third deck to see if counter-flooding was being accomplished. To my mind there was no danger of sinking in that shallow water but there was great danger of turning over on the port side, as the port list was getting greater. As I dropped down into the trunk to the steering motor room, fire and grains of burning powder showered around me. With the help of a marine sentry the slight fire was extinguished but we could not completely shut the hatch leading down to the steering motor room; it seemed jammed although almost shut. I sent the marine up to shut the hatch over me as I undogged the starboard door. When I stepped into the mess attendants' compartment someone helped me to shut the door. At that time I first noticed that it was completely dark except for a glimmer of a flashlight forward. I groped my way along the deck to the next compartment through the open door and found the damage control gear locker. Puccio, S.F., 3c, I think, had broken into the locker and was hunting for counterflood cranks. He found one and I found one; also a flashlight. I told him to flood forward while I did aft. I ran back into the after compartment and started cranking. We worked for some time on three voids, I believe, but were unable to build up any pressure before the men started falling to the deck. The valve settings were on open, we could not lift any, and the men were all passing out. I grabbed someone and told everyone to haul somebody out the starboard hatch on the quarterdeck just aft of the break of the deck. Then, again I remember nothing until I was under the overhang of turret two, my turret. My head ached terrifically, I could not breathe, and all my extremities tingled as if they had been asleep and were just being awakened. Finding out from my CTC., Crawford, that no one was in control, I started for that station with the starboard anti-aircraft guns firing in my face, it seemed to me. That was the first time I realized the anti-aircraft guns were firing. I ran into Lieutenant Ricketts on the boat deck by a number three anti-aircraft gun and asked him if he needed men. He said, "Yes, on the anti-aircraft ammunition supply." I noticed several anti-aircraft officers on the battery and it was functioning wonderfully. I got back under the overhang of the turret, but the hatches were closed. I passed out in the exertion of opening the right tail hatch, but was able to tell Crawford to get men on the anti-aircraft ammunition train. How long I lay there trying to breathe I do not know until Crawford returned, told me that the ammunition train was flooded, that all boat deck ammunition was exhausted, and that the Captain had ordered "Abandon Ship." I made sure that my turret was evacuated, then remember hitting the water from the forecabin. I tried to swim but was too weak. Glover, E.E., G.M. 2 c, and Bircher, H.C., Sea. 1c, of my division held me up and dumped me into a life raft. The next I definitely remember I was on Ford Island at the dispensary.

2. U.S.S. OKLAHOMA

Pay Clerk D. L. Westfall wrote as follows:

At the time of the attack I was in my room shaving. The word was passed "Away Fire and Rescue Party;" just as I was leaving my room the second word was passed for all hands to man their General Quarters Stations closely followed by a shock of a hit. I glanced at my clock as I was leaving my room and noticed the time was a few minutes before 8:00 A.M.

I started for my station in Radio Central; as I was passing along the third deck up a port ammunition passageway, I felt two more hits. The lights went out in the passageway except for one battle light and two panel lights in the boat crane machinery space.

By the time I reached the compartment abreast the armory the ship had picked up a 10-15° list to port; there were a couple of battle lights on in this compartment. Water and oil were bubbling up along the junction of the bulkhead and deck of the electrical work shop, port side. Repair personnel were busy closing watertight doors.

When I reached Radio Central, personnel there had just started evacuating on the orders of the Communication Watch Officer. Radio equipment apparently was out of commission as I noticed many pieces of equipment knocked over or dangling by wires. Back up on the third deck all lights were out and only a few flashlights were available. About this time the word came along from man to man to "Abandon Ship." I helped a partially incapacitated man to the second deck and then joined in a line passing injured men along to the ladder by the dental office. I lost all knowledge of time while here, but after some minutes, Ensign McClelland, who was beside me in the line, said he was feeling faint and then collapsed. I noticed other men dropping around me. I stooped over to pick up Mr. McClelland but when I stooped over I got dizzy and fell. I seemed to be paralyzed from the waist down, had great difficulty breathing, but had enough strength in my arms to drag myself to the ladder and up a couple of steps before collapsing completely.

After passing out I had only flashes of consciousness until mid-afternoon. When I recovered I was at the Naval Air Dispensary on Ford Island. Shortly thereafter I joined a bunch of men going over to BOQ at the Air Station and started a check on survivors from the supply department.

The action of everyone I observed was cool and purposeful as soon as they fully realized we were actually under attack. The only confusion was occasioned by lack of lighting. My life itself is proof of the courage and disregard of personal danger on the part of unknown shipmates.

Second Lieutenant William G. Muller, Jr., wrote as follows:

I had just returned aboard ship on the 0745 motor boat; the boat came

alongside the gangway at approximately 0750. On reaching the Junior Officers' mess the word came over the loud speaker system, "Air attack, all unengaged personnel seek cover, these are real Japanese bombers." I could hardly believe that this was a real attack but the excitement and reality of the voice convinced me to move. I left the mess and started aft, first stopping off at my room to get my pistol. My room is on the starboard side, just aft of the Junior Officers' mess. I left my room and went over to the port side to enter the third deck via the hatch just adjacent to the Warrant Officers' mess. A line had formed by this time and men were pouring down into the third deck. I finally found an opening in the line and started down the ladder. I had just reached the third deck and was almost opposite the ladder when the first torpedo hit. The explosion came from the vicinity of the Wardroom and was not a violent one. The line was still moving down into the third deck and I was opposite the Communication office when the second torpedo hit. This explosion caused violent repercussions and the whole ship seemed to tremble. I figured the hit was almost adjacent to where I was standing.

By this time I decided to leave as water was beginning to flood into the third deck and the ship started listing to port. I assume there were a couple hundred personnel in that third deck and only a few of us were able to reach a hatchway in time. Two more torpedo hits were sustained by the time I was able to work my way back to the hatch I had entered and to get up to the second deck. The ship was about 35° to port by this time and the decks were too slippery and steep to walk on. I worked my way to starboard by use of dogs and fittings on the bulkhead. During this time I heard the last two explosions which were somewhere amidship or aft. There were six torpedo hits that I heard in all.

With difficulty I made the starboard side and climbed into my room which I knew had an open port. The porthole was almost overhead and I climbed through it, slid down the side which inclined about 50° and jumped into the water.

Ensign H. F. Rommel wrote as follows:

The first bombs were from dive-bombers on the hangars at Ford Island. Then a torpedo plane, coming in from over Ford Island, dropped a torpedo at a ship at 10-10 dock. The ship was hit about mid-ships and the explosion seemed upward with many splinters.

I ran aft and passed the word 'A cruiser has just been sunk. These are real bombs and real torpedoes. Man the anti-aircraft battery.'

The ship listed slowly but steadily. No word was received over the speaker to abandon ship. I escaped via the overhang hatch and was picked up by a battleship motor launch. We continued pulling men out of the water. It was difficult due to the oil making everyone slippery. Men

with undershirts could be pulled into boats by grabbing the shoulder piece and sleeve on each side while men who had stripped were very slippery. It is recommended that men be instructed not to remove undershirts when abandoning ship.

Ensign J. M. Doherty wrote as follows:

When the word was passed to man battle stations I left the J.O. Mess for the third deck. On the way down the ladder, the first bomb or torpedo hit. Before I ever got to the Communications Office, oil was pouring into the compartment A-122-P from a hole near frame 60. We had no time to set Zed and I guess there were four or five hits in about five minutes. The ship listed to port and oil was knee deep on the third deck after the first five to seven minutes.

Bunks and bedding interfered considerably with people trying to get around. They were all over the deck at all angles and in everyone's way. The ladder to the second deck was bent and twisted and the lights went out after approximately the fourth hit.

I got out a port on the second deck. I think that ports should not be sealed up but left open for personnel to escape. Ladders should be fastened at the lower end and not be allowed to hang loose as when the ship turns over the ladders jam up the hatches. There should be more hatches in more compartments. Ships should not be overcrowded with people "training" if ships are in dangerous areas. Let the people train in peaceful waters on ships not likely to be hit.

Shipfitter, First Class, W. T. Link wrote as follows:

Time was short and in such time word was passed, "Japanese Airplane Attack—All unengaged personnel seek cover on the third deck—Set condition Zed—Man your Battle Stations."

By sending the men to seek cover on the third deck, jammed ladders prevented quick access to repair stations and also crowded repair stations.

Repair One was never fully manned and three men were dropping large hatches. Oil made it necessary to turn nuts with wrenches.

Chain stanchions secured with nuts could not be removed in the short time we had and hatches were not closed at all. Countless parts were not closed because of the necessity of using a wrench to turn the slick oily nuts.

I never did hear "Abandon ship" and Repair One did not all escape.

I escaped through a port in the A Division living space, had no trouble, and ran around or up to the bottom of the ship. I obtained a life jacket out of the water along side of the ship and put it on. I helped another sailor back on the ship and was pulled on the ship again myself by Birnel SF2/c. Then I swam to the rescue boat. I did not dive off the ship,

only shoved off into the water. I was never excited but was covered with oil.

Chief Water Tender, L. C. Bickley wrote as follows:

On or about 0800, 7 December 1941, the word was passed to man all battle stations. I went to #2 Fireroom Pumproom and was starting pumps until the water came in through the air ducts and flooded the pumprooms. The hatch to #2 Pumproom was down and I couldn't get it up, so I dived and swam into #1 Pumproom and out. The lights were out and I couldn't see where the two men went that were with me. I got to B Division living compartment and water started coming in so I went out through a port hole in the wash room after the ship rolled over, and was picked up by a motor launch and put ashore in the Navy Yard. The only word I got over the phone was to get ready to get underway.

Many men were lost in the lower handling rooms of turrets. Falling 14-inch shells killed and injured a great many. About 125 men remained in an air pocket in the shipfitters shop, but when the space was opened, water rushed in as air rushed out. Only one man of this group saved himself by swimming to the C.P.O. pantry on the third deck and out through an open porthole. His story is as follows as gained from excerpts of statement given by Chief Machinist, Second Class I. M. Hull:

The lights were out. I went to the shipfitter shop and tried to get up the hatch leading to the C.P.O. quarters but water washed me back. The ship had listed 90° to port so I tried to swim out through the same hatch but was washed back again and landed in the C100s along the conveyor. I dogged the door down to the shipfitter shop. The ship listed another 90° thus being all the way over. We had about 125 men in the C100s. After 4 hours, the men tore the door off the shipfitter shop. Water and oil came into the C100s and rose to waist level. I swam to the C.P.O. pantry and out a port hole. None came with me. I left the ship about 1300, 5 hours after the ship sank.

The story of D. Weissman, Seaman, First Class is as follows:

I was in the lower handling room of Turret IV. After the first hit, I went to the shell deck. The lights went out and the ship started to turn over. I went to the lower handling room and followed a man with a flashlight. I entered the trunk just outside of handling room on the starboard side. The lower handling room flooded completely. Water entered the trunk. I dove and swam to the bottom of the trunk and left the ship through the hatch at the main deck and swam to the surface.

Eleven men in the lower handling room of turret IV escaped through the lucky bag. When the rescue party cut a hole in the lucky bag, the

water rose rapidly but all men were removed before the water flooded the lucky bag completely.

Five men were in the five inch twenty-five caliber handling room preparatory to sending up anti-aircraft ammunition. They escaped to the five inch handling room and reduced flooding through ventilation ducts by stuffing rags in the lines. They were eventually saved by the rescue party by way of the shaft alley.

Eight men with water up to their necks were rescued from the steering compartment after these men, who had set condition "Z," were enabled to enter the steering room through the hole made for them. Three holes were made in all; pumps were in use constantly to keep the level of the water and oil below the danger point.

3. U.S.S. ARIZONA

Lieutenant Commander S. G. Fuqua wrote as follows:

I was in the ward room eating breakfast about 0755 when a short signal on the ship's air raid alarm was made. I immediately went to the phone and called the Officer-of-the-Deck to sound general quarters and then shortly thereafter ran up to the starboard side of the quarter deck to see if he had received word. On coming out of the ward room hatch on the port side, I saw a Japanese plane go by, the machine guns firing, at an altitude of about 100 feet. As I was running forward on the starboard side of the quarter deck, approximately by the starboard gangway, I was apparently knocked out by the blast of a bomb which I learned later had struck the face plate of #4 turret on the starboard side and had glanced off and gone through the deck just forward of the captain's hatch, penetrating the decks and exploding on the third deck. When I came to and got up off the deck, the ship was a mass of flames amidships on the boat deck and the deck aft was awash to about frame 90. The anti-aircraft battery and machine guns apparently were still firing at this time. Some of the ARIZONA boats had pulled clear of the oil and were lying off the stern.

At this time I attempted, with the assistance of the crews of #2 and #4 turrets to put out the fire which was coming from the boat deck and which had extended to the quarter deck. There was no water on the fire mains. However, about 14 CO₂'s were obtained that were stowed on the port side and held the flames back from the quarter deck enabling us to pick up wounded who were running down the boat deck out of the flames. I placed about 70 wounded and injured in the boats which had been picked up off the deck aft and landed them at the Ford Island landing.

This was completed about 0900 or 0930. Not knowing whether the Captain or the Admiral had ever reached the bridge, I had the Captain's hatch opened up, immediately after I came to, and sent officers Ensign G. B. Lennig, U.S.N.R. and Ensign J. D. Miller, U.S.N. down to search the Captain's and Admiral's cabins to see if they were there. By this time the Captain's cabin and Admiral's cabin were about waist deep in water. A search of the two cabins revealed that the Admiral and Captain were not there. Knowing that they were on board I assume that they had proceeded to the bridge. All personnel but 3 or 4 men, turrets #3 and #4, were saved.

About 0900, seeing that all guns of the anti-aircraft and secondary battery were out of action and that the ship could not possibly be saved, I ordered all hands to abandon ship.

From information received from other personnel on board, a bomb had struck the forecastle, just about the time the air raid siren sounded at 0755. A short interval thereafter, there was a terrific explosion on the forecastle, apparently from the bomb penetrating the magazine. Approximately 30 seconds later a bomb hit the boat deck, apparently just forward of the stack, one went down the stack, and one hit the face plate of #4 turret indirectly. The commanding officer of the U.S.S. VESTAL stated that 2 torpedoes passed under his vessel which was secured alongside the ARIZONA, and struck the ARIZONA.

The first attack occurred about 0755. I saw approximately 15 torpedo planes which had come in to the attack from the direction of the Navy Yard. These planes also strafed the ship after releasing their torpedoes. Shortly thereafter there was a dive bomber and strafing attack of about 30 planes. This attack was very determined, planes diving within 500 feet before releasing bombs, about 0900. There were about twelve planes in flight that I saw.

The personnel of the anti-aircraft and machine gun batteries on the ARIZONA lived up to the best traditions of the Navy. I could hear guns firing on the ship long after the boat deck was a mass of flames. I can not single out one individual who stood out in acts of heroism above the others as all of the personnel under my supervision conducted themselves with the greatest heroism and bravery.

Radioman's Mate Third Class, G. H. Lane wrote as follows:

When the attack started on December 7, 1941, it was just before 0800 and I was on the forecastle of the U.S.S. ARIZONA. I saw torpedo planes, with the rising sun insignia under their wings, attacking ships ahead of us. General alarm was then sounded and we were all told to seek cover. I went aft to the aviation workshop and helped wake men who were still sleeping there and closed battle ports in the optical shop. The order came for all hands not assigned to anti-aircraft batteries to go to the third deck.

I started for the third deck but just then General Quarters was sounded. I came back and started for my General Quarters station which is a repair station (patrol five). We were hit aft and also in one or two other places on the ship. Word came, "Fire in the Executive Officer's Office." Hurst, Bruns, Wentzlaff, and I manned a fire hose and went on the quarterdeck to connect it and fight the fire aft on the quarterdeck where the bomb had hit us. Lieutenant Commander Fuqua was at his post on the quarterdeck where the bomb had hit us. I was on the nozzle end of the hose and told Hurst and Bruns to turn on the water. They did, but no water came. I turned around to see if the hose had any kinks in it and at that time there was an explosion which knocked me off the ship. I was taken aboard the NEVADA where I was brought to my senses in a casemate (no. 3). I had been in the water because I was soaked with oil. The NEVADA was underway and I helped handle powder for the 5 inch gun. When the NEVADA was hit in the dry dock channel, the gun was put out and the ship was afire. I helped get wounded aft and fought fire until I was choked by smoke and fumes. They sent me from the NEVADA to the SOLACE where I was put to bed and cuts and bruises treated. I couldn't see either until my eyes were washed out and treated. I was released from the SOLACE December 10, and was sent to Receiving Barracks where Mr. Fuqua told me to rejoin the aviation unit at Ford Island. I saw no signs of fear on the ship. Everyone was surprised and pretty mad.

Corporal E. C. Nightingale of the U.S. Marine Corps wrote as follows:

At approximately eight o'clock on the morning of December 7, 1941, I was leaving the breakfast table when the ship's siren for air defense sounded. Having no anti-aircraft battle station, I paid little attention to it. Suddenly I heard an explosion. I ran to the port door leading to the quarterdeck and saw a bomb strike a barge of some sort alongside the NEVADA, or in that vicinity. The marine color guard came in at this point saying we were being attacked. I could distinctly hear machine gun fire. I believe at this point our anti-aircraft battery opened up. We stood around awaiting orders of some kind. General Quarters sounded and I started for my battle station in secondary aft. As I passed through casement nine I noted the gun was manned and being trained out. The men seemed extremely calm and collected. I reached the boat deck and our anti-aircraft guns were in full action, firing very rapidly. I was about three quarters of the way to the first platform on the mast when it seemed as though a bomb struck our quarterdeck. I could hear shrapnel or fragments whistling past me. As soon as I reached the first platform, I saw Second Lieutenant Simonsen lying on his back with blood on his shirt front. I bent over him and taking him by the shoulders asked if there was anything I could do. He was dead, or so nearly so that speech was impossible. Seeing there was nothing I could do for the Lieutenant, I continued to my battle station.

When I arrived in secondary aft I reported to Major Shapley that Mr. Simonson had been hit and there was nothing to be done for him. There was a lot of talking going on and I shouted for silence which came immediately. I had only been there a short time when a terrible explosion caused the ship to shake violently. I looked at the boat deck and everything seemed aflame forward of the mainmast. I reported to the Major that the ship was aflame, which was rather needless, and after looking about, the Major ordered us to leave. I was the last man to leave secondary aft because I looked around and there was no one left. I followed the Major down the port side of the tripod mast. The railings, as we ascended, were very hot and as we reached the boat deck I noted that it was torn up and burned. The bodies of the dead were thick, and badly burned men were heading for the quarterdeck, only to fall apparently dead or badly wounded. The Major and I went between No. 3 and No. 4 turret to the starboard side and found Lieutenant Commander Fuqua ordering the men over the side and assisting the wounded. He seemed exceptionally calm and the Major stopped and they talked for a moment. Charred bodies were everywhere.

I made my way to the quay and started to remove my shoes when I suddenly found myself in the water. I think the concussion of a bomb threw me in. I started swimming for the pipe line which was about one hundred and fifty feet away. I was about half way when my strength gave out entirely. My clothes and shocked condition sapped my strength, and I was about to go under when Major Shapley started to swim by, and seeing my distress, grasped my shirt and told me to hang to his shoulders while he swam in. We were perhaps twenty-five feet from the pipe line when the Major's strength gave out and I saw he was floundering, so I loosened my grip on him and told him to make it alone. He stopped and grabbed me by the shirt and refused to let go. I would have drowned but for the Major. We finally reached the beach where a marine directed us to a bomb shelter, where I was given dry clothes and a place to rest.

Aviation Machinist's Mate, First Class D. A. Graham wrote as follows:

On hearing the explosions and gun reports, Wentzlaff, E., A.O.M.2/c, came in saying we were being attacked and bombed by Jap planes. The air raid siren sounded, followed by the General Quarters alarm. I stepped outside the shop and started to my general quarters station on the quarterdeck, shouting "Let's go."

It seemed as though the magazines forward blew up while we were hooking up the fire hose, as the noise was followed by an awful "swish" and hot air blew out of the compartments. There had been bomb hits at the first start and yellowish smoke was pouring out of the hatches from below decks. There were lots of men coming out on the quarterdeck with every stitch of clothing and shoes blown off, painfully burned and

shocked. Mr. Fuqua was the senior officer on deck and set an example for the men by being unperturbed, calm, cool, and collected, exemplifying the courage and traditions of an officer under fire. It seemed like the men painfully burned, shocked, and dazed, became inspired and took things in stride, seeing Mr. Fuqua, so unconcerned about the bombing and strafing, standing on the quarterdeck. There was no "going to pieces" or "growing panicky" noticeable, and he directed the moving of the wounded and burned men who were on the quarterdeck to the motor launches and boats. He gave orders to get the life rafts on #3 barrette down, supervised the loading of the wounded and burned casualties, assisted by Ensign J. D. Miller who set a very good example for a younger officer by being cool, calm, and collected.

The signal gang, quartermasters, and all hands on the bridge went up—as the signal men were trying to put out a fire in the signal rack and grabbing signal flags out to hoist a signal, the whole bridge went up, flames enveloping and obscuring them from view as the flames shot upward twice as high as the tops. A bomb hit on the starboard side of the after 5 inch guns and anti-aircraft gun, and got most of the marine crew and anti-aircraft crews. It seemed as though one bomb hit the port after the anti-aircraft crew and came down through the casemate and Executive Officer's office.

After the big explosion and "swish," the men painfully burned and wounded, dazed beyond comprehension, came out on the quarterdeck. I had to stop some of them from entering the flames later on and directed them over to the starboard side of the deck to the gangway for embarking, encouraging them to be calm.

The VESTAL, tied up alongside the port side, did not seem to get hit hard and started to get underway, so I stood by to cast off lines on the quarterdeck portside and cast off their bow lines as the Lieutenant Commander on her wanted to save the line to tie up to one of the buoys. Assisted by a seaman from #4 turret, we rendered the bow line around and cast her off. Then getting the small life raft on #3 turret barrette port side off and over the port stern, the water and oil being on deck, and the ship settling fast, we got orders to embark on the motor boat at the starboard stern quarter, Lieutenant Commander Fuqua and a few others still being aboard. We landed at B.O.Q. landing, Ford Island. Smith, B.M.2c, USN, boat coxswain, made many trips for wounded and burned men being delivered by Lieutenant Commander Fuqua, still on board.

Courage and performance of all hands was of the highest order imaginable, especially being handicapped by adverse conditions and shipmates being blown up alongside them. There was no disorder nor tendency to run around in confusion. The coolness and calm manner of Lieutenant Com-

mander Fuqua and Ensign J. D. Miller installed confidence in the surviving crew.

4. U.S.S. CALIFORNIA

Chief Yeoman, S. R. Miller wrote as follows:

At about 1030, December 7, 1941, after the U.S.S. CALIFORNIA had been struck with torpedoes and bombs, a man reported to me on the Flag Bridge that he had just escaped from Central Station by the trunk leading into Flag Conn. This was reported to Ensign McGrath on the signal bridge. Stover, C.E., C.Q.M., Campbell (initials unknown), C.E.M., and I with Ensign McGrath entered Flag Conn to investigate. We obtained a line and lowered Ensign McGrath through the trunk to Central Station, which was then being flooded with fuel oil coming from vents and various other places. The oil fumes were so strong that we feared Ensign McGrath would be overcome with the fumes before the trapped men could be rescued. At this time the ship was burning fiercely and there was also danger of the ship turning over as it was listing badly. Ensign McGrath completed his investigation and returned up the trunk to Flag Conn and reported that these men were in a compartment under Central Station and might be rescued by cutting a hole through the deck of Central Station. He reported that the deck of Central Station would soon be flooded with oil and that when this occurred, it would be too late to cut the hole through the deck.

A cutting torch was quickly obtained and volunteers called for. The response of volunteers was so great among various men on the boat deck that most of them had to be returned to their stations fighting fires. Ensign McGrath, Campbell and the volunteer rescue party entered Central Station through the trunk and proceeded to cut an escape hole in the deck. Ensign McGrath and Campbell were both nearly overcome by fumes before the job was completed. The first who worked with the cutting torch was overcome by fumes and had to be replaced with another experienced man. During the time this hole was being cut, there was great danger of fire as the fuel oil was gradually working its way close to where the hole was being cut. In addition to this danger, there was danger of the ship turning over as it was straining the mooring lines badly. The hole in the deck was just cut in time before fuel oil flooded Central Station.

It is considered that Ensign McGrath, Campbell, and the several other men who assisted, accomplished saving the lives of these trapped men at great risk of their own, and therefore distinguished themselves in bravery and gallantry above and beyond the call of duty.

Under the strain and shock of the attack, it is regretted that the names

of the other enlisted men were not obtained. They acquitted themselves equally as well to the best traditions of the Naval Service.

Lieutenant Commander H. E. Bernstein wrote as follows:

I was aboard ship with the Head of Department duty sitting in my room half dressed, when the General Alarm was sounded. I ran immediately to the quarterdeck and observed two torpedo planes approaching the ship perpendicular to it at an altitude of less than one hundred feet and as I moved aft, saw two torpedoes dropped by these planes. I immediately gave orders that all ammunition be broken out and upon receiving the report that some ready boxes were locked, I gave orders that they be broken open.

The work of Commander Skillman in obtaining all available fire fighting equipment ashore was most commendable, as a very large supply including new extinguishers which were filled on the landing, arrived.

There was no sign of panic or fear displayed by any of the men on shore even when bombing planes were overhead and all continued in their work of supplying fire fighting equipment.

Electrician Linn wrote as follows:

At 0750 I left my room and went to the Warrant Officer's mess room for breakfast. I had just sat down when the word was passed "All hands to General Quarters." I heard a distant rumble, glanced out the port hole on the port side of the ship, and saw a black airplane with rising sun insignias. I immediately went to the main control room. Word was passed to set condition Zed, and about ten minutes later a torpedo hit. We started lighting off both engine rooms to get underway. About five minutes after the torpedo hit, the steam pressure slowly dropped to zero. We received report that there was water in the fuel oil. Everything possible was being done to clear lines of salt water and get fuel oil. About 0830 we received another torpedo hit and shortly after a report came in that a bomb hit had set a large fire forward. The fire main pressure was boosted to well over 100 pounds.

Shortly after bomb hit we had steam pressure on one boiler and furnished ship with light and power from after engine room. Forward engine room had to abandon. After engine room reported main set ready to come in on line. Steam pressure again dropped to about 100 pounds. We held off putting an after main set because of low steam pressure. Orders came over J.V. phones to abandon ship. Abandon ship orders belayed. Report that hatch or port thrust buckling. Informed personnel to check logs and see that it was secure, before abandoning that area. About 1000 ordered to abandon ship which we did after dogging down all hatches. I checked motor rooms for personnel and found them clear of personnel and after dogging all hatches reported to topside.

The wounded were being taken off the ship and others were being brought to top side from third deck passage where they were overcome with fuel oil fumes. All hands returned back aboard to fight fire with aid of tugs from Navy Yard. Our attention was called to the fact that five men were trapped in the center shaft alley. The only possible way to save them was cutting through bulkhead in center motor room. The water was running in center motor room from vent trunk which leaked terribly. Water was up to main motor bearings when five men from center thrust were pulled out. These men were hurt in no way and required no medical attention. We started putting pumps in various holds and commenced pumping but the ship slowly settled at all times until it finally settled on bottom.

Ensign E. R. Blair, Jr. had these comments on machine gun ammunition:

I was in an undressed state in the forward bunk room when General Quarters sounded. The first torpedo struck as I left the bunkroom, quickly followed by the second. Zed was already set on the main deck hatches so that in order to get topside I opened the escape hatch. In the boat deck Ensign Canfield was acting as starboard battery officer and Ensign C. H. Hall as port battery officer so I rushed up to sky control to man a director. Both directors were inoperative. On the way to sky control I had noticed that machine guns number 1 and number 2 were firing but were short of ammunition. The ammunition that they were using was the 400 rounds of ready ammunition on that station.

I gathered a working party of about 10 men from the vicinity of 5 inch 51 caliber gun number 1 to bring up machine gun ammunition. We opened the amidships forecabin hatch which led to the shaft leading to the forward torpedo hold. We were under attack at the time but the men paid no heed to the enemy planes and worked quickly and eagerly. It was necessary to open five zed hatches including the armored deck hatch to get to the .50 caliber ammunition, but I believed that the need for the ammunition warranted the risk involved.

Because of the previous torpedo hits I knew that it would be impossible to get to the .50 caliber magazine via the third deck and the opening of a similar number of zed hatches would be involved. I broke out the belted ammunition, about 1600 rounds, distributed it among eight men, 200 rounds to a ready box, one ready box to a man. To each man I designated a station to which he was to take his ammunition. It was exceedingly hard going for these men to chink up the shaft with the ammunition. The ship was listing badly and they could use only one hand to chink the vertical ladders in the shaft. Every one of the men made it to the main deck. With the remaining men I commenced belting up new ammunition.

Shortly, however, we were hit again. It felt exactly as the concussion of a 5 inch/51 caliber feels when you are sitting in the pointer's seat. Two glass gauges broke and diesel oil ran out on the deck. I closed the valves and

thought that glass gauges on a battleship should be done away with. There was a leak forward and we could hear water running close at hand. I was determined to get as much ammunition out as was possible and belt it above decks. Accordingly, including two men who were on watch there, each man went topside with all he could carry. A Gunner's Mate remained with the men and I instructed him to bring the clipping machine with him. He had it half unfastened when I left. The clipping machine never reached topside. When I went back for it thirty minutes later the torpedo hole was completely flooded.

From the magazine I headed for the main top, noting as I went that the main deck starboard side was a wreck; men were crawling out of the starboard forecandle hatch in a dazed condition, some badly burned. There was a neat bomb hole near 5 inch/51 caliber gun three with smoke trickling out. There was no ammunition in the maintop. I retraced my steps. On the main deck near the forecandle hatch amidst smoke and debris was the ammunition scattered over the deck with a dead man beside each ready box. Two ready boxes that could be gotten to (there was fire all around) I sent to guns numbered 1 and 2. I returned to the maintop hoping to find the clipping machine and the boxes of loose ammunition brought out last from the magazine. Two boxes were brought up by exhausted seamen, one of which was Shelton, S1c, 6-S Div. We turned to belting the ammunition by hand. After belting about 100 rounds "Abandon Ship" was given. Reluctantly Ensign B. C. Hall and I left without firing our belt.

Machine guns #1 and #2 were manned immediately after the enemy dropped her first bombs on Ford Island. They fired at the first planes which attacked this ship. Gun number 2, however, which could bear on the torpedo planes attacking this ship, would fire only one round without being given "immediate action" or reloading by hand. This was due to a faulty setting of the oil buffer. Gun number 1 with Price, S2c, 6-Div. firing, is credited by all men at the guns, including Lieutenant (jg) Jakeman, with the feat of bringing down the plane which attacked immediately behind the plane which scored the bomb hit to starboard. The task of getting ammunition to the .50 caliber machine guns was one for the machine gunners themselves. That they didn't carry out their job was due principally to the fact that they were stopped by officers and put in the 5 inch/25 and 3 inch/50 ammunition supply lines where they did heroic work. Another reason was that Montgomery A.F., GM1c, who was in charge of the .50 caliber machine gun ammunition supply, had been temporarily detached for patrol duty ashore. The man next in charge after Montgomery, a GM3c did not have the experience to cope with the situation.

Machine Gunners who should be mentioned for their heroic work in ammunition supply line below decks and later in saving lives at the risk of their own were Bell, GM3c, Doran, S1c, Nix, S1c, and Cleveland, S1c, all of 6-P Division.

Ensign W. A. J. Lewis wrote as follows:

General Quarters was sounded and I proceeded at once to the Forward Engine Room. The room was fully manned within a few minutes and I gave the order to set all condition on the Damage Control Fittings. We had just shifted F.O. suction to the starboard battle tanker when we got the word from the oil king to make the shift. I checked the light and power machines and found them operating properly. I instructed the watch to watch all trips closely and if anything tripped out to reset it and hold it in if necessary. The first torpedo hit came just as I was reaching the engine room. It knocked out about one half of the lights in the machine ship and about one fourth of the lights in the engine room. No machinery was tripped or put out of commission by this hit. An inspection of the engine room showed that we had suffered no visible damage. I ordered a main feed pump put on the line along with both main fuel oil pumps. We had just started warming up the main plant when we got reports that #1 boiler was getting water in its fuel oil. Steam pressure dropped rapidly so we secured from warming up main set, secured main circulator, and steam fuel oil pumps.

After the second torpedo hit, we began to get large quantities of smoke down the ventilator blowers so we secured the ventilators. Smoke still came down and word was received that gas was present. We could detect nothing but powder gases so did not put on gas masks. Later on the smoke became thicker so I directed some of the men to put on their masks. They found a certain amount of relief by doing so; mainly I think because it took certain irritating particles out of the air and also because it protected the eyes. The smoke seemed to be coming now from burning paint rather than powder. The smoke began to take effect on the crew so I ordered all hands except the talker on the upper level to go down to the lower level where the air was somewhat better. The forward part of the engine room had become very hot and the metal in some places was too hot to touch. This accounted for some of the paint fumes as the paint had begun to blister.

When the order came to abandon ship, (we did not receive the first order) I directed the men to leave these stations and go up after hatch. They did so but for some reason they could not get the watertight door above the hatch open. We then tried to open the forward hatch but the metal in that area was so hot that it led us to believe that there was a big fire just above us. We got all the fire extinguishers in the engine room and all the extra clothes we could find to wrap around ourselves and began to try to force the forward hatch. At about this time we were assisted from above and the hatch was opened. The fire was just forward of us so we proceeded aft and came up on deck. By this time the ship had been abandoned but the crew was rapidly returning to fight the fire in the midships section.

The conduct of the crew was excellent. There was no confusion and each man manned his station and obeyed orders without question or delay. Even at the time when all hands began to feel that we were going to be trapped below there was no hysteria or excitement.

The Acting Engineer Officer, Lieutenant C. A. Peterson wrote as follows:

I went to Main Control immediately when General Quarters was sounded. As soon as communications were manned I ordered the after steam lines warmed up, all boilers lighted off, and both main sets warmed up and made ready for getting underway. Reports that General Quarters was set were received from all engineering stations. Shortly thereafter a heavy shock was felt and a report was received that a torpedo had hit the ship. (These events all happened in very rapid succession, and I am not sure of the sequence. I believe that the torpedo hit before the reports of all stations had been received.) About ten minutes after the torpedo hit the steam pressure started dropping. Number 1 fireroom (which had been steaming for auxiliary) reported water in the fuel oil. The forward fuel oil suction was at this time, and had been for 10 or 15 minutes, on the starboard battle tanks. I ordered a shift to the starboard loop and called the oil king by phone for consultation. He informed me that he had tried the starboard battle tanks, starboard loop, and engine room bottoms, but had been unable to get any good oil. I ordered the forward auxiliary fuel oil pump stopped and the fuel oil loop opened all the way around in order to get fuel from an after suction to #1 fireroom. I ordered all forward firerooms to run the water from their burner connections to the bilges in order to clear the line of water. I also ordered all after firerooms to light off under natural draft using as many burners as possible. The after boilers reported that the oil was too cold to burn. I ordered them to keep trying and told Emergency Boiler Control to get a blow torch to heat the oil in the burner line to one of the after boilers. The forward light and power machines had been tripped out and the steam pressure rapidly dropped to zero. About this time a second torpedo hit the ship. A report was received from port thrust block room that it was filling with water rapidly. Orders were given to abandon the station. After gyro reported a short time later that the hatch from port thrust was bulging and leaking and that station (after gyro) was ordered abandoned and secured. Prior to this it had been necessary to allow the Forward Torpedo Air Compressor crew and the Forward S. E. Air Compressor crew to abandon their stations due to heavy leakage of fuel oil into those spaces. Not long after the second torpedo hit, a bomb hit was reported in the machinery passageway. This turned out later to have been the bomb that exploded in A611s. The forward engine room reported that they were getting a great deal of smoke and had stopped their blowers, also that the bulkheads and overhead were getting hot. Fuel not having been regained on #1 fireroom, and since the fires had been suc-

cessfully lighted in #6 boiler, I ordered the main steam cut outs in the after engine room closed to keep all the steam that we were about to get for the after main set and after light and power machines. The fuel oil loop had previously been isolated between the forward and after engineering spaces, as the large amount of water being forced out of the forward lines dropped the pressure aft. The forward auxiliary fuel oil pump was started again and continued effort was made to find good oil for the forward boilers. This had still not been accomplished when the engine room was abandoned. Number 6 boiler came in on the line and about five minutes later number 5 boiler came in on the line. The after light and power machines were started as soon as one boiler was on the line, and light and power were restored to the ship. Numbers 3 and 4 bilge pumps were put on the firemain. Shortly after this I got a call via ship's service telephone from emergency boiler control and was asked, 'Did you get the word in Main Control to abandon ship?' By this time the after engine room and some of the firerooms had gotten this word and started to abandon. I ordered them stopped while I verified this order. Conn said that no such order had been given. The men were ordered to return to their stations, and they did so with such speed that none of the operations which they had been engaged in were interfered with. That is, the boilers centered to steam and the light and power machines to run. Shortly after this the Chief Engineer came down to Main Control and assumed charge. The after main set was ready to roll and word was requested from Conn if it were intended to get underway. As I recall it the answer was in the negative. A short time later word was received from Conn to abandon ship. It was stated to be on the authority of Commander Battle Force. Orders were accordingly given to all stations which were abandoned in an orderly manner. Fires were cut in the steaming boilers and the light and power machines slowed down and stopped. All spaces leading from the engineering passageway were checked and found to be abandoned. All watertight doors were closed securely, and with the space abandoned the Chief Engineer and I came topside. When we got to the quay Captain Smith was directing everyone to go back and fight the fire. After a slight confusion due to this conflicting order, the crew started fighting the fire in the casemates with buckets and portable fire extinguishers. From the time that #6 boiler came on the line until the engineering spaces were abandoned, the firemain pressure had been kept at 75 pounds or more continuously. The rapid stroke of the two pumps on the line (I could hear them) indicated that they were pumping large quantities of water.

Chief Electrician, R. W. Miller wrote as follows:

The morning of December 7, 1941, about 0750, while seated in the W.O. mess room at breakfast, I heard an unusual rattle of machine gun fire and an explosion from the vicinity of the Navy Yard Dry Dock. The General

Alarm sounded and I seemed to know without further thought that we had been attacked and that it was not just another drill. A quick glance out the port in the mess room verified this. There in full view and an easy target was a gray plane on an opposite course paralleling our heading at the mooring.

I ran to my room for my gas mask, etc. and then for the Central Station, my battle station. On reaching the ladder to the Central Station an explosion occurred seeming to come from forward; this I took to be a torpedo. Condition Zed was immediately set around the Central Station and plotting room area. Officers present in plot were Lieutenant Purdy, Ensign Relley and Ensign Joys and in Central Station Ensign Walker and myself. In short order we had communications established with what was available. Some excitement existed at the start but things soon quieted down to almost routine.

Upon arriving at Central I had the compasses started, made preparations to live up telegraphs, etc. for getting underway, and called the forward and after distribution switch boards to see how they were getting along and if everyone had reached his station. We seemed to be well manned and all had responded to the G.A. instantly. About this time, 0810 or 0815, the ship had a port list. Chief Yeoman Baldwin acted as D.C.O. and ordered starboard voids to be flooded to counter our list. In about 10 more minutes there was a terrific explosion almost under our feet; we knew this to be a torpedo. The list increased and Baldwin continued to counter flood.

Word came into Central for power for the hoists to get up ammunition. I was asked if there wasn't some auxiliary power and told the ammunition the only auxiliary power was to use the hand hoisting gear. All lights were off but the auxiliary lights came on nicely. About this time word came in that the port lower 5 inch handling room was flooding. I left Central and went down to check to see if any more ammunition could be sent up before the boys abandoned this station. The water was about knee deep and pouring down the hoist. I ordered the handling room abandoned and had hoist flaps and the watertight door secured. The crew to this station went up to Plot and we secured the trunk to the forward distribution room. Mr. Walker and myself were quite concerned with the list which by now was 8°, checked with Baldwin frequently to see that all starboard voids were being flooded, and we were assured that they were. This concern was amplified by the fact that we had received a report that the OKLAHOMA was bottom side up.

Explosions were felt at intervals but no damage reports came in. The fire alarm annunciator dropped from the magazines and started dropping, indicating them to be either on fire or flooded and the bell rang incessantly. I ordered the fire alarm bell to be cut out to stop the noise. I called up the forward board and pleaded with Ensign Gavin to see if he could get us power and was informed that there was water in the fuel oil. I then

called main control to find out if they couldn't use the steering batteries for power on the after distribution board. I called Ensign Gavin again to contact the engine room for power and was informed it would be on in a short while. About this time, 0830 or 0840, a crashing explosion just overhead and to the starboard side led me to believe that a 5 inch magazine had gone since the fire alarm drops had indicated them on fire or flooded.

All equipment seemed to hang together nicely especially the ship's service telephones. Anything that was secured held fine; only a few loose things flew around a bit.

The telephone cabinet doors jumped out a little and we were all jolted but no harm was done below. The overhead of Central Stations started to drip fuel oil and water and we knew that the deck above us was flooded. We put buckets under the leaks. Price, Chief Electrician's Mate, called me in the room to look at the leaks. I found the bulkhead between Main Radio and the IC Room buckled and the frames bent with some water squirting through but it looked as though it would hold for awhile. Sweavey, CM 1C, at the after gyro called up and said the hatch to the port thrust was bulging and so I ordered him out and told him to secure the hatch to the third deck. Sweavey is missing and a fine boy he was. The list had decreased some to about 6½ degrees and then increased again. Word was received in Central that they were dropping thermite bombs. Lights and power came on in Central again around 0840 approximately. When the word to abandon ship came we left through the Conning Tower tube. Things on top were a mess. I got a life jacket and after reaching the float promptly, fell in the oil being temporarily blinded. A truck picked me up and carried me to the new BOQ where I received treatment for my eyes and some dry clothes.

Gunner's Mate, Third Class, V. O. Jensen wrote as follows:

During the air raid Sunday morning, December 7, 1941, Robert Scott of the 'A' Division was in waist deep water and fuel oil and refused to leave his station after we had gotten word to abandon our compartment. I called to him and told him everyone else had abandoned the compartment but he insisted on staying; 'As long as I can give these people air, I'm sticking.' His station was on the Forward Air Compressor by Main G.S.K. Things were blacking out for me so I was forced to leave the compartment and I never saw him afterwards.

Ensign Champion wrote of a rescue party which freed five men from the Center Thrust Block Room.

After the engagement Sunday I was standing on the quarterdeck organizing a party to rescue five men trapped in Center thrust. Campbell CEM, ran up to the men and said Ensign Gavin and several other men were trapped in the forward distribution board and could be rescued by cutting

through the plotting room deck. Taking the men I had with me, we went to the foundry and removed the acetylene cutting outfit. We then proceeded to the conning tower. Ensign McGrath was there and asked me to keep everybody out of Central Station except a group of picked men. He then went down to Central Station with several men including Campbell, CEM, and Rountree, F1c. We lowered the cutting outfit down to them and then procured a sledge hammer and some chisels which we also lowered to them. Ensign McGrath shouted up that the fuel oil fumes were very bad. We tried to rig a blower in the conning tower tube, but no power was available. The trapped men were rescued just before Central Station was flooded with fuel oil.

5. U.S.S. MARYLAND

Ensign W. O. Beach of Commander Battleships Staff wrote as follows:

Having the Communication Staff Duty, I was on board during the subject action and had just finished eating breakfast a minute or two before the first alarm. I was still sitting in the wardroom when I heard a short burst of machine gun fire which was immediately followed by the sounding of General Quarters. When General Quarters was sounded I walked to one of the open Ward Room ports and looked out, seeing a plane swoop up over the OKLAHOMA and MARYLAND, the plane having evidently just dropped a torpedo. I then walked aft to the Flag Office, finding Ensign Bradway there, getting what information he could from Radio Central and telephoning it to Flag Plot. Leaving the Flag Office, I went up the ladder to the port side of the quarterdeck and saw numerous Japanese aircraft were bombing us and that the OKLAHOMA was already listing to port. Returning to Ward Room country, I sent the mess boys to close the Ward Room ports and saw that Ensign Bradway was having the ports in the Flag Office closed.

* * * * *

A group of men from the OKLAHOMA, standing near number three turret on the starboard side, asked for orders; I directed them to dog down the hatch leading to Officers' Country, forward on the starboard side, which was still open and then get below the protective deck. On returning to the Flag Bridge, I found there was nothing in particular that I could do in Flag Radio so stayed out on the bridge to take Lt. Comdr. Horne's place as best I could until he returned to the ship.

* * * * *

I did not note very carefully the type or number of planes attacking although there must have been fifty or more all told. Most of them seemed

to be a low wing dive bomber type and their markings (the rising sun on the wings and fuselage), were very distinct. They seemed to attack in three or four waves, bombing and dropping torpedoes, the first and main attack being a torpedo attack. Our anti-aircraft guns were relatively slow coming into action but it was amazing to me how fast they did get into action considering the circumstances. The attacks were centered on the heavy ships with other attacks being made on Hickam Field and the Naval Air Station. I saw only one plane shot down during the action. This plane was hit squarely and blown to pieces as it dived on the Naval Air Station. I observed another plane apparently disabled and headed for a crash. This plane was going from Pearl toward Hickam Field when last seen.

Commander E. Kranzfelder of the Staff of Commander Battleships wrote as follows:

Commander Sabin and I were at the Moana Hotel in Honolulu when, at approximately 0820 on the morning of December 7th, we received a call from the telephone operator telling us that an emergency existed at Pearl Harbor and that we should return to our ships as soon as possible. We proceeded to Pearl Harbor as expeditiously as possible and arrived on board the MARYLAND at about 0925.

Upon boarding the MARYLAND I proceeded immediately to the bridge. While on the bridge a man from the OKLAHOMA contacted me and stated that assistance was required on the OKLAHOMA and that there was urgent need for cutting equipment. At this time Lieutenant Mandelkorn proceeded to the OKLAHOMA to assist in the rescue work. A short time later I informed the Admiral that I believed I could be of assistance in connection with the rescue work on the OKLAHOMA and he directed me to do all I could to release any entrapped personnel. Before leaving the MARYLAND I obtained a copy of the OKLAHOMA booklet of plans for use in connection with the cutting of holes in the OKLAHOMA's hull.

With the energetic assistance of Lieutenant Mandelkorn the efforts of the rescue group were organized. Lines were rigged from the bilge keel at intervals along the bottom, telephone communication was established with the MARYLAND, an air supply line was quickly rigged from the MARYLAND to the OKLAHOMA, strainers were removed from main injections and over board discharge in an attempt to gain access to the engine room. Contact was established with two men entrapped in the evaporator pump room through a small overboard discharge connection in the hull. Food and water was passed down to these men. From information obtained from these men as to their location in the ship and with the aid of the booklet of plans it was possible to determine the best locations to cut access holes in the ship's bottom. Since, with the exception of the reserve feed bottoms, practically the entire bottom of the OKLAHOMA

consists of oil tanks, considerable care had to be exercised in cutting holes with an oxyacetylene torch in order not to open holes in the bottom which would permit the egress of oil with the attendant fire hazard. Fortunately the information obtained from the entrapped men was correct and entrance holes were out in a cofferdam. In the meantime Lieutenant Commander W. L. Benson had arrived on the OKLAHOMA and since I considered that Lieutenant Mandelkorn's and my services would be required in connection with the remaining battleships in distress, we returned to the MARYLAND and I reported to the Admiral that the rescue work had been placed in charge of Lieutenant Commander Benson who would keep me advised of the progress and of any additional assistance or equipment he needed for the rescue work.

During the remainder of the day and until after midnight Lieutenant Mandelkorn and I made numerous trips to the other battleships in distress. I considered that we could be of most use in coordinating the delivery of essential salvage equipment such as submersible pumps, diving equipment and arranging for tug service for the CALIFORNIA and NEVADA. At about 1930 the list on the CALIFORNIA had increased to about 9° and recommendations were made to the Commanding Officer to counter flood two of the starboard firerooms to prevent the ship from capsizing. Likewise, arrangements were made with Commander Base Force to carry out two anchors from the bow of the NEVADA to prevent her from slipping further into the channel.

At about 2100 Lieutenant Mandelkorn and I were aboard the tug VIREO when all batteries in the harbor opened fire on approaching planes. A short time after firing subsided, a man was rescued from the water over the stern of the VIREO. The man was placed in a stretcher and taken on board the CALIFORNIA. From conversations with personnel of the VIREO it was learned that he had been in an ENTERPRISE plane.

Of the observations as to conduct of personnel that came to my notice during the day, I consider that of Lieutenant Commander W. L. Benson, Engineer Officer of the OKLAHOMA as outstanding. His vigorous efforts in connection with the work of rescuing his entrapped shipmates on the OKLAHOMA deserves recognition.

Commander W. F. Fitzgerald, Jr., Operations Officer, Staff of Commander Battleships wrote as follows:

I was the regularly assigned Staff Duty Officer on the morning of 7 December 1941 . . . Shortly before 8 o'clock I was undressed and ready to take a bath when I became conscious of intermittent explosions. I quickly jumped into my trousers and grabbed a hat and blouse and started for the top-side. I was hardly out of my room when General Quarters were sounded. I proceeded immediately to the Flag Bridge, telling all men I encoun-

tered enroute to the bridge to man their battle stations and to be calm. Upon arrival on topside, which I estimate to be about 8 o'clock, I noticed smoke, flame and many explosions throughout the harbor. I believe I heard machine gun fire from the MARYLAND at this time but I am not positive. I am conscious of having seen the OKLAHOMA upright but with a perceptible list to port. My first glance did not indicate to me that she was rolling over. Heavy explosions continued. Upon arrival on the Flag Bridge I immediately checked with Captain Godwin to see if he was making all preparations for getting underway. He said that he was. Shortly after my arrival on the Flag Bridge, Captain W. R. Carter, Chief of Staff, said, "We can't do much good up here. Let's go down to the guns and give them a hand." We both proceeded to the 5" AA batteries and split up, each one doing what he could to assist in organizing the gun crews, ammunition parties, and assigning to stations men who were not otherwise engaged. During all this time the flame, smoke and noise were terrific. My memory indicates that there was some 5" gunfire on the MARYLAND upon my arrival at the guns but of this I am not certain since it was impossible to tell just who was firing, and the fact that I concentrated on getting in action guns which had not yet opened fire. I judge this time to be about 0810. At about this time I noticed Lieutenant Mandelkorn and gave him various directives such as organizing a party to obtain steel helmets for all men topside, getting air to the batteries, getting spare tools for the guns, etc. I judge that about 0815 there was sufficient air pressure to use the power rammers on the starboard battery. It was not until an appreciable interval afterwards that the port battery obtained sufficient air. However, in the meantime the port battery fired by hand power. During the ensuing 10 or 20 minutes I was greatly assisted by the cool headed actions of Anderson, Charles G., Coxswain and Heiteman, Raymond A., GM3c of the MARYLAND. The actions of these two men were outstanding in every respect. They got not only their own gun into action but also assisted other guns. It may be doing an injustice to any number of other excellent men who performed their duties in an equally outstanding manner but who, due to their location, did not come particularly under my observation.

Shortly after my arrival at the guns the OKLAHOMA rolled over. Numerous men from the OKLAHOMA swam to the MARYLAND and upon coming aboard I immediately assigned them gun stations or details in the ammunition party. After the gun crews were organized and in action, and under command of their own battery officers, I returned to the Flag Bridge. Upon arrival on the Flag Bridge I noted that a great number of bombs were still falling. A terrific explosion took place on what I thought was the stern of the TENNESSEE but which I have since learned was on the ARIZONA. A large fire was in progress on the WEST VIRGINIA. I believe it was about this time that I noted that the NEVADA was under-

way and standing down the channel. She seemed to be in good shape until about the time she arrived abreast of 10-10 dock at which time she was heavily bombed. I noted that she later turned around in the channel and was apparently aground. Up until this time I cannot definitely state that I saw any formation of enemy planes. However, I did see numerous planes which seemed to be conducting single dive bombing attacks. While on the starboard side of the Flag Bridge I felt the MARYLAND shudder from what was apparently a near miss off the port bow. Within a second or two I saw a bomb land on the forecastle of the MARYLAND and shortly thereafter (a matter of a few seconds) a large geyser of water sprung up on the starboard bow of the MARYLAND apparently from another near miss.

Within a few minutes a dive bombing attack was noted coming in from the port side across the forecastle of the MARYLAND at an altitude which appeared to be at the lowest point not over 200-250 feet. There were about six or seven planes in this particular attack. One of the planes burst into flames and crashed from what I believe was a direct hit from the 1.1" starboard battery of the MARYLAND. This was followed in a few moments by another plane which was shot down over Ford Island but which apparently was not in flames. About this time I noticed a bombing attack over the ships in the North Channel. One of the planes in flame apparently landed directly on the CURTISS. By this time the guns of both the port and starboard batteries were firing continuously at the enemy planes. The ships seemed to be recovering from the shock of the original surprise and were performing excellently. The fires on the ARIZONA and WEST VIRGINIA seemed to be increasing and frequently the MARYLAND was entirely covered with heavy black smoke. In the meantime various officers of the staff had reported back on board and had immediately taken their stations. As near as I can remember I saw Commander Battleships on the Flag Bridge for the first time about 0905.

I cannot speak too highly of the conduct of the men during the entire action. There was no panic whatever. As I went from gun to gun and ammunition party to ammunition party I noted that even though there might have been surprise and fear present every man was willing and anxious to do his bit and after only a word or two of encouragement turned to his task with zest and efficiency.

During the entire action broken clouds covered the entire sky. There were many patches of blue but in general the clouds and smoke made a low ceiling.

Various tugs, lighters, and small boats were directed by Commander Battleships to proceed to the WEST VIRGINIA and ARIZONA to assist in putting out the fire. In addition rescue parties were sent to the OKLAHOMA, which by now had rolled over about 150 degrees, in order to cut holes in the bottom and rescue the men who were trapped inside.

In regards to extinguishing the fires, two incidents stand out prominently in my mind. One was the action of Garbage Lighter YG17 which, without hesitation, went alongside the WEST VIRGINIA and for over 24 hours poured water on the flames both on the ship and on the edge of the burning fuel on the water. The other was the outstanding action of a motor whaleboat from the HONOLULU which made repeated trips directly along the edge of the burning fuel oil on the water in order to extinguish it and prevent its spreading. This boat repeatedly caught fire itself but as soon as the flames were extinguished would return to its task of extinguishing the dangerous fire on the water. Incidentally, this fire on the water was a real menace to all the ships at the interrupted quay wall. Extraordinary efforts were made by all concerned to keep the flames away from the TENNESSEE and the MARYLAND.

At some time during the morning I saw an explosion in the vicinity of the PENNSYLVANIA and at another time saw a destroyer in dry-dock being blown up. It was not until later in the morning that I realized the CALIFORNIA had been badly damaged. I had noticed that she was hit but at first did not appreciate the heavy list which I subsequently noticed.

Lieutenant Commander D. H. Johnston of Commander Battleships Staff wrote as follows:

About 0825, December 7, I received information via phone regarding the attack on Pearl Harbor. At this time I was at my home, Apt. 29, Edgewater Beach.

I proceeded to Pearl Harbor with Comdr. Curts, CincPac Staff and Ens. Tyng, U.S.S. HELENA. Enroute we observed heavy smoke over Pearl Harbor and Hickam Field. At the Fleet Landing I embarked in a MARYLAND motor launch in company with Commander Haines, Lt.Comdr. Horne and several other officers attached to the MARYLAND. At this time the second attack began. Planes plainly marked as JAPANESE were dive bombing on the vessels in the harbor. Heavy AA fire was being maintained by all vessels in the Yard and harbor.

Upon arrival on board about 0915 I proceeded directly to my station in Flag Plot, supervising the recording of information and plotting such contacts as were received.

At 1030 Captain Bode (OKLAHOMA) was directed to go to the Naval Air Station to take charge of survivors from the disabled ships and to arrange for delivery of ammunition.

By this time oil from the ARIZONA burning on the surface of the harbor was being blown down on the TENNESSEE, WEST VIRGINIA and the MARYLAND. The Yard garbage lighter YG17 took position on the port quarter of the WEST VIRGINIA and rendered invaluable service in fighting the fire. She maintained her position in spite of repeated ex-

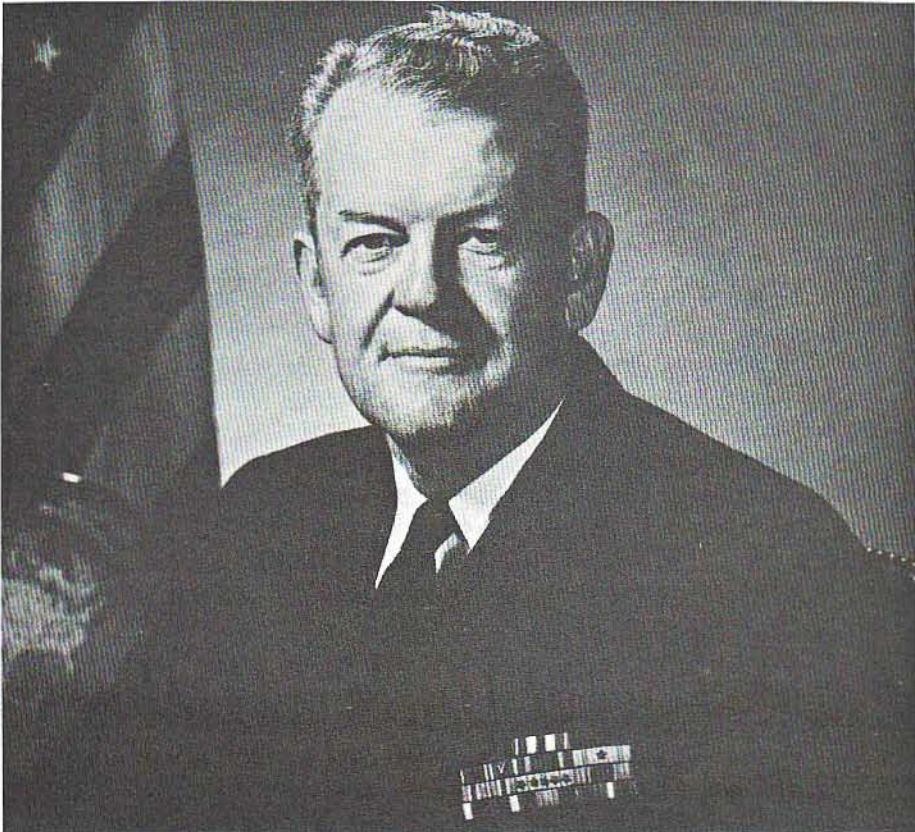
plosions of ammunition in the WEST VIRGINIA's ready boxes. Several ships' boats assisted by cutting in close to the flames and using CO2 extinguishers. At 1142 the U.S.S. TERN was directed to assist.

About 1300 divers reported on board and under the direction of Commander Kranzfelder and Lieutenant Mandelkorn proceeded with rescue operations on the hull of the U.S.S. OKLAHOMA.

I had no opportunity to observe the conduct of the men during the actual engagement except for the crews of small boats which continued returning personnel to their ships in spite of the bombing attacks. The conduct and spirit of the men after the engagement I considered excellent.

Lieutenant E. P. Holmes, Staff of Commander Battleships, wrote as follows:

Early in the morning of December 7, 1941, I was proceeding with Lieut. Comdr. (MC) A. C. Hohn enroute to Fort Shafter. We observed



OFFICIAL U.S. NAVY PHOTOGRAPH

Admiral Ephraim P. Holmes, USN.

the sky in the general location of Pearl Harbor to be filled with bursts and heard heavy firing.

We decided to proceed to Pearl Harbor and to go to our ship. Enroute we observed the firing to continue and at one point saw a great explosion in or near Pearl Harbor which we thought to be an oil tank explosion, but which we have come subsequently to believe to have been the explosion of the ARIZONA.

I saw numerous groups of airplanes in the sky, but have no knowledge of their identity or number. I noted at this time that there was considerable cloud-cover over most of Pearl; otherwise clear.

When we arrived in the Yard the first attack was over. I ran to the Officers' Club Landing; Lieut. Comdr. Hohn stopped near the Fleet Landing to attend to some injured men who were just beginning to get ashore. At the Landing I saw the OKLAHOMA had turned over. Great fires on the surface of the water were burning near the WEST VIRGINIA and ARIZONA, completely obscuring the latter. The WEST VIRGINIA was already settling low in the water. I jumped in the first boat available, ComDesRon One gig, with a junior officer from the CALIFORNIA; left him at the CALIFORNIA (he stepped from the boat to the Main Deck of the CALIFORNIA); and proceeded to the MARYLAND, arriving at about 0840-0850. A lull in the attack occurred at this time and when I boarded the MARYLAND. I went to my room to put on some shoes and get binoculars, Signal Book and revolver. While there another attack started. As soon as I could get out (Main Deck hatches were closed at this time), I proceeded to the Signal Bridge, passing over the Boat Deck. Somewhere enroute I felt a considerable shock which I thought a near miss. In passing across the Boat Deck I noted a large number of empty cartridge cases. All hands at the guns seemed to be very tense but collected and determined.

I remained on the Signal Bridge the rest of the day. Much intermittent firing occurred and several groups of Japanese planes were sighted and fired at. The planes observed were single-wing, single-motored types of moderate speed, probably not over 200 m.p.h. at the most. I saw but one that gave evidence of being hit in the air. It was over the location of Hickam Field; broke into smoke and appeared to be in difficulty but I did not see it crash.

When the Commander-in-Chief, Pacific Fleet order was received not to sortie our bridge passed it by visual to the PHOENIX, RALEIGH, and DETROIT who were underway. When later the order was intercepted for all cruisers and destroyers to sortie we made a hoist to all cruisers and destroyers to sortie indicating the originator as the Commander-in-Chief, Pacific Fleet.

When the fire was raging in and alongside the WEST VIRGINIA, YG17 promptly and without orders put its bow into the fire and pumped

water onto it for hours. The TERN and WIDGEON were ordered by Commander Battleships to assist. Their able work eventually checked the fire. At one point in this fire fighting episode a motor whale boat from the HONOLULU expended CO2 extinguishers in the fire by the WEST VIRGINIA by making repeated runs along the edge of the fire. Each time this was done the sides of the boat broke into flames, which had to be put out before the next run. The heat was so intense that the men in the boat had to lean way over the unexposed side to protect themselves.

The MARYLAND delivered a heavy AA fire from all AA batteries on each occasion of opening up. The 1.1 mounts near the Signal Bridge functioned very well. It is believed, however, that both these guns and the .50 cal. machine guns had a tendency to open fire at too great ranges. *This was caused, no doubt, by eagerness to engage the enemy but should be guarded against in the future.*

After the WEST VIRGINIA fire had been brought under control, YG17 and the TERN were directed to shift their efforts to the fire burning in the ARIZONA. This was done in the forenoon of December 8. During that same day the NAVAJO reported to Commander Battleships for orders. After determining that the CALIFORNIA did not need her services she was likewise ordered to assist in fighting the fire in the ARIZONA.

The Executive Officer of *U.S.S. Tennessee*, Commander Colin Campbell, wrote as follows:

At 0800 Sunday morning, December 7, 1941, I was at my residence in Waikiki, Honolulu, T. H., on authorized liberty. At about that time I heard what appeared to be gun fire, and which I first thought to be target practice of some kind. Shortly after, word came over the radio that Pearl Harbor was being attacked by Japanese planes, and all service personnel should proceed at once to their stations. I started immediately by automobile to Pearl Harbor, but the traffic congestion was such that I did not arrive until about 0915. I went to the Officer's Club Landing. Bombing planes were still attacking. I was finally able to commandeer a boat. The TENNESSEE was moored inboard of the WEST VIRGINIA at berth F-6. The WEST VIRGINIA had been sunk and was on fire. The ARIZONA, about 75 feet astern of the TENNESSEE had been sunk and was on fire, and oil was burning on the water. I landed on Ford Island and about 0940 was able to get aboard over a pipe line. I went to the signal bridge and assumed command until the arrival of the Captain about 1000. Lieutenant Commander J. W. Adams, Jr., who had the head of Department duty, had been in command and was on the signal bridge. The stern of the TENNESSEE was on fire, and fires were raging on the ARIZONA and WEST VIRGINIA, threatening destruction of this ship. The officers on the bridge of the WEST VIRGINIA informed me that her after magazines had

been flooded, but that efforts had been made to flood the forward magazines, but as the second deck was under water they were not sure that they had succeeded. I told them that their magazines must be flooded at all costs, as this ship was relatively undamaged and must be saved. When the Captain came aboard he directed me to go aft and take charge on the quarterdeck, where I remained practically continuously supervising the fire fighting on this ship and against the oil fires on the water coming from the ARIZONA, until about sundown Tuesday the 9th, by which time the oil fires on the ARIZONA had been extinguished by this ship and yard tugs. The fires aft on this ship were under control by about 1030 Sunday morning, but continued to break out sporadically for the next couple of days due to the intense heat from the ARIZONA oil fires. During this time our main engines were run ahead and the wash from the propellers very successfully helped wash the burning oil astern, assisted by hoses from this ship. The TENNESSEE was wedged between the sunken WEST VIRGINIA and the forward quay, preventing any movement ahead. As long as the intense fires raged on the ARIZONA, the TENNESSEE was constantly in danger.

For me to mention the especially distinguished conduct of any particular individual would detract from the bravery, calmness, and efficiency of all officers and men. The conduct of all hands was superb, and I am proud of every one of them. I cannot help, however, mentioning at this time the distinguished conduct of Lieutenant Commander J. W. Adams, Jr., the gunnery officer; and that of Chief Boatswain L. W. Adkins, who had charge of the repair party fighting the fires aft, and whose leadership and heroic conduct helped to save the ship by keeping the fires under control.

APPENDIX B

Restoration of Unwatered Compartments and Machinery of Sunken Ships

U.S. NAVY YARD
Pearl Harbor, T.H.

March 14, 1942

Salvage Bulletin #14A

Subject: Restoration of Unwatered Compartments, Damaged Machinery and Disposition of Recovered Material, Scrap and Trash

Please substitute this Salvage Bulletin (#14A) for Salvage Bulletin #14, dated February 13, 1942, which has been revised as a result of further experience and the development of additional cleaning equipment, improved technique, etc.

The following is published for the information and guidance of all personnel engaged in salvage operations, especially for the ships' personnel. It is hoped that a better understanding of the problems and procedures involved in such operations will be gained thereby. Part I will concern itself with general cleaning operations around the ship and Part II with reconditioning of machinery.

PART I

1. Generally speaking, the very minimum amount of material will be removed from a ship. Prior to decision to remove material, careful consideration

should be given to leaving the material in place for necessary cleaning, preservation, etc. If it is not considered practicable to carry out these operations with the material in place, consideration should be given to retaining the material on board and the utilizing of the portable cleaning and preserving units which are being made available.

2. The material which may be removed falls into the following categories and disposition thereof will be made as indicated:

a. *Trash* may be defined as material unfit for any further use. It may be separated into two types, burnable and unburnable, the former including clothing, wood, etc. and the latter brickwork, etc. All trash should be thus separated and deposited at the Hickam Field dump. Ship superintendents will make arrangements regarding shipment of trash as per Salvage Bulletin #3.

b. *Scrap* denotes all metal fit only for remelting. It will be stripped of all fittings, separated into ferrous and non-ferrous piles and placed in the dump at Richardson Recreation Center.

c. *Material* damaged and unfit for further use should not be brought to the Navy Yard for decision regarding ultimate disposition. Ships' personnel will

decide if the material is to be regarded as trash or scrap and make the proper disposition thereof.

d. *Material*, the removal of which to the Yard will *expedite repairs* will only be sent to the Yard on job orders. Such material will ultimately be returned to the ship. This is to be taken to mean electrical equipment, damaged machinery, instruments and gauges, etc., repair facilities for which obviously do not exist on board. Not to be included in this category is material which is merely water soaked or oil coated. Provision has been made for cleaning by Yard forces of material that is to be placed in stores and reissued to various activities. The arrival in the Yard of such equipment oil coated or water soaked as bunk springs, lockers, chairs, etc. is assumed to mean that the ship from which this equipment was sent has no further use for same. Ships will, therefore, make provision for cleaning and reclamation of such material either on board or on the beach. Salvage Bulletin #6 is suggested as a reference in this matter.

e. *Delicate instruments* that require temporary safe storage or routine care not available aboard ship.

f. *Material*, the removal of which will *reduce weight* in accordance with a definite salvage plan or which, by its removal will remove a hazard to salvage operations.

g. *Material* duly authorized for temporary or permanent *use elsewhere*.

3. Before a lower compartment is pumped down, oil, if it is present, should whenever possible, be skimmed off the water. A technique has been developed to accomplish this. Otherwise, as the water lowers, much unnecessary work must be done in order to remove the oil which

will coat itself as a fine film over all interior surfaces.

4. Emergency lights and ventilation must be provided in good quantity at an early date in order to facilitate work. The importance of providing these services cannot be too highly stressed. (See Salvage Bulletin #21). *Before entering unwatered compartments air tests must be made to determine the presence of toxic gases and adequate ventilation must be supplied while work is being carried on in such spaces.* Lives have been lost and more will be unless all safety precautions are taken before attempting to enter or work in unwatered compartments.

5. The most effective means of removing any fuel oil that may be present appears to be by use of a hot salt water wash-down, with a Wheeler unit removing the sludge from a low point in the compartment. A hot fresh water wash-down is then used to follow the salt water wash-down, until compartment is cleaned to a workable condition. Cleaning operation should start as near midship as possible and carried out board to prevent excessive tracking through clean compartments. In the event there is no oil or only light oil present, only hot fresh water is to be used. After and during the wash-down adequate ventilation must be provided, warm dry air being the best. The lagging and the wiring absorbs large quantities of oil and water and after the space is clean personnel are continually annoyed by drops. After the wires are dry they should be scrubbed their entire length with a brush and fresh water. Then about a day later this operation should be repeated to wash off any salt crystals that tend to form. See Bulletin #24, paragraph (2h) on procedure to handle junction boxes. Evaporation and

plenty of wiping by rags will eventually cure this. In connection with the use of rags, reference should be made to Manager's Bulletin #26/42. Receptacles should be provided on board for soiled rags and such rags brought ashore daily for laundering.

6. "Tectyl" is the trade name of a substance called thin film polar compound. It does wonders for machinery submerged in salt water if the treatment is given very soon after the water has been lowered. It must not be used on electrical installation and wiring since it will make them soft and gummy. It can be used on any metal surface. Its action is two-fold. First it absorbs the water and then covers with a thin protective film. It is primarily for bearing surfaces and internal parts of machines like reduction gears, blowers, turbines, pumps, etc. Detailed instructions will be furnished by the Salvage Planning Officer on request since they are too voluminous to be covered here in any but a general manner. For large surfaces like boiler or turbine casings or firesides of boilers it is recommended that consol light grade be sprayed. All hands are again cautioned that this can be overdone and some day someone will have to remove it. It is recommended that galvanized iron containers of tectyl in which to dunk gauges and small fittings, be provided. This is all that need be done, let them dry, no breakdown is required. If they were not mechanically damaged they will be as good as new.

PART II

1. It is recommended to Commanding Officers that the enlisted personnel engaged in these operations be organized

into groups of 10 to 12 firemen and machinist mates ratings from both the fire-room and engineroom supervised by a Chief Petty Officer or a first class P.O.

2. The machinery to be reconditioned comprises the main propelling and auxiliary machinery and the operations pertaining to the reconditioning thereof will be indicated under separate headings.

3. Pumps, reciprocating, in both engine and fire rooms:

a. With a Kerrick Kleener, blast off all the fuel oil.

b. Clean the pump up externally as nearly as possible.

c. Break the drain on the steam cylinder and remove the throttle bonnet.

d. With the steam hose and hot water, wash out steam cylinder and valve chest, draining thru the drains.

e. Hook up the drain and fill the steam cylinder with the necessary amount of tectyl—1 to 2 gallons, depending on the size of the cylinder.

f. Replace the throttle bonnet, close up the valves; and commence pumping operations using compressed air, exhausting at the drains or thru the exhaust valves, after removing the bonnet. Before operating pump, clean rods and slack off on packing to avoid scoring rods. Run the pump thus about 1/2 hour. All tectyl must be drained from the cylinder prior to this operation.

g. While the pump is running, swab the rod and open the water end of the pump with discharge into engine or fire room.

h. After running the pump, remove valve chest from water end and wash out thoroughly.

i. Close up pump and put in standby condition, either drying it out each day or put it in its regular duties.

j. These operations completed, begin testing suction and discharge lines to these pumps making sure that everything is tight. Renew gaskets and repair lines where necessary.

This procedure is to be carried out on all pumps. In the case of main circulating pumps driven by reciprocating engines, the procedure is as outlined above. Where lubricators are fitted to such engines, fill them with tectyl and lubricate the bearings first with tectyl and then, after having rinsed out the tectyl, lubricate with regular lube oil. All pumps should be run at least 15 to 20 minutes daily after having been thus reconditioned.

4. Pumps, Turbine Driven

a. External cleaning operations are the same as for the reciprocating pumps. The water end is to be very thoroughly washed with hot water and lube oil replaced by tectyl.

b. Open the turbine throttle, removing the throttle bonnet, and wash the casing out thoroughly with hot water.

c. While the turbine casing is full of hot water, jack the turbine over by hand and rinse out thoroughly.

d. Drain the turbine and fill with about 2 gallons of tectyl and jack by hand for 10 to 15 minutes.

e. Connect an air hose to the unit and run the turbine and pump assembly for about one hour with tectyl in the bearings and turbine casing.

f. Drain the tectyl from the bearings and replace with lube oil.

g. Drain the tectyl from the turbine casing into a bucket and save for reclamation or for further use.

The packing in all pumps should be removed at the earliest opportunity.

Note: In cases where turbines are fitted

with jacking gear driven by an electric motor, remove the motor immediately and send to the electrical shop for repairs. Temporarily replace electric driven jacking motor with compressed air jacking motor.

5. Turbines, Main Propelling

a. Remove electric motors from jacking gear and send to the electrical shop for reconditioning as soon as possible. If the motors are in such a condition that they cannot readily be repaired and replaced, replace with compressed air driven motors.

b. Clean out lube system and drain tank, pump out all salt water.

c. Clean out sump tank and after removing all salt water, wipe clean with kerosene.

d. Open the complete system including the lube oil coolers and all by-passes and fill the sump tank with fresh hot water in which soda has been dissolved to the proportion of 10 pounds of soda ash to about 500 gallons of hot water. Using the regular circulating pump, circulate this thru the system for 6 to 8 hours. In the meantime jack the main turbines over slowly.

e. After the procedure in Paragraph d above has been carried out, all water will be drained from the system. Using an air hose, blast and dry out all water that remains.

f. Have personnel clean out sump tank and put enough tectyl in the sump tank so that the circulating pump will take and hold a suction. Circulate tectyl to all bearings thru the entire lubrication system and the reduction gears.

g. All spring bearings and external thrust bearings, if fitted, should be flushed out as outlined above, first with

water, then with tectyl, then refilled with new lube oil.

h. Spray all reduction gears and inside reduction gear casings with tectyl.

i. In treating main turbine casings and rotors the procedure is as outlined for smaller units.

1. Fill up casing with hot fresh water to top of shaft and jack rotor for 2 to 3 hours.

2. Drain casing and using a spray outfit, spray tectyl into the casing. The recommended procedure for spraying tectyl is as follows:

a. Remove a valve near the first inlet to the turbine (usually the warming-up valve).

b. Remove the bonnet of this valve, put in a blank flange drilled and tapped to receive a pipe.

c. Introduce a pipe into the turbine thru this hole. By means of this pipe blast 10 to 15 gallons of tectyl into the turbine, thus creating a vapor which circulates thru the diaphragms and casing. By introducing enough tectyl while the turbine is slowly jacked all parts are thoroughly covered with tectyl. When this operation is completed, drain all tectyl from the turbine casing.

j. After all tectyl has been removed from the lube system, wipe down the sump tank with kerosene and put in enough lube oil so that the lube oil pump will take and hold a suction while circulating thru the entire engine room lube system for approximately 2 to 3 hours. Jack the main turbine while circulating lube oil thru the system.

k. While jacking the main turbine, two men familiar with the plant or two experts should go over all turbine and reduction gear casings, carefully scrutinizing the entire plant for cracks,

ruptures or misalignments, listening for any drones or unusual noises and noting if the whole unit turns over as easily as usual. Men should be stationed at various points to note any unusual conditions found. This can best be accomplished by the Engineer Officer's Assistant or men who are familiar with the operation of the plant.

l. Upon completion of the above operations the plant should be in a state of operation and regular operating routine established and request for Dock Trial be made as soon as practicable.

m. Reclamation of tectyl.

1. Put all tectyl used in the operations detailed above into one of the ship's lube oil treating tanks that has been cleaned beforehand.

2. Heat the tectyl up to about 150° and pass thru a De Laval Separator. By this operation approximately 60% of the tectyl used in cleaning the main lubrication system can be reclaimed.

6. Instruments, Gauges, etc., in
Engineroom

a. All gauges in the engineroom should be removed, immediately submerged and rinsed thoroughly in a tank of hot fresh water.

b. Dip them in a tank of tectyl, allow to drain, then assemble them in boxes and send to the instrument shop.

c. All electrical instruments in the engineroom such as electrically operated telegraphs should be removed by electricians and sent at once to the electrical shop. Do *not* treat with tectyl. This will be taken care of in the electrical shop. Do not disassemble units, send to shop complete.

7. Piping, Valves, Condensers, etc.

a. All steam lines should be gone over carefully to discover the presence

of ruptures and damage. A hydrostatic test to working pressure should be put on the lines using only cold water. *Do not* remove lagging at this time.

b. All lubricating oil lines, fire-mains, etc. in the engineroom should be hydrostatically tested to working pressure.

c. All main condenser connections and the condensers themselves should be scrutinized for drainage. If the condenser is undamaged it will not be necessary to wash it out immediately but as soon as possible a 15 pound test should be given to the fresh water side and the salt water side filled to determine the presence of any cracks, leaks or broken gaskets. Washing will be done when directed.

d. All relief valves and other large valves should be thoroughly inspected and those found damaged should be removed and sent to the shop.

e. All valves in place should be treated with "consol." All working parts such as valve stems should be sprayed with "consol." All valve stem packing should be removed as soon as possible in the event the system is not to be put in operation for some time.

8. Bright Work and Finished Surfaces

a. All bright work and finished metal surfaces in the engineroom should be thoroughly washed down and cleaned with tectyl.

9. Boilers

a. A description of the procedures used on one damaged destroyer will, it is believed, be of value in the reconditioning of boilers damaged by submergence. It is presented herewith. This destroyer had been on fire for about three days and then had been submerged for some time. After raising the ship the forward fire-

room was found to contain a large amount of buckled machinery, soot and a great deal of burned cork, etc. All bulk-heads, boiler casings, etc., were for the first cleaning washed down and cleaned with hot fresh water and air hoses. The boilers were washed thoroughly inside and out, including the tubes. All fuel oil and debris was removed from the furnaces, tubes and top casings of the boilers. The water in the boiler drums was tested and found fresh, obviating the necessity for immediate worry about the internal condition of the boilers. All casings were wiped down with kerosene and all registers, soot blowers and external machinery sprayed with "consol" and worked until it moved freely. All boiler stops, safety valves and other external fittings were impregnated with "consol" and put in a state of preservation. After the firesides had been thoroughly cleaned with fresh water, a wood fire was built under the boilers and kept going for 24 hours. Steam was formed and the air cock opened, permitting steam to blow freely thru the drum. An examination of the brickwork showed that it would not be necessary to withdraw any bricks. The brickwork was found sound enough to permit the ship to proceed under her own power to the states. The first consideration in the case of boilers is getting them immediately in a state of preservation by cleaning the firesides and spraying them with "consol." If it is, later deemed necessary to remove or repair brickwork, this can be done after the fireroom is cleared of other work. The boiler having been cleaned up and dried out, all blowers, fuel oil pumps, feed pumps and all other auxiliary machinery in the fireroom were tested. All instruments in the fireroom, most of which had been damaged

by fire were removed and a list made of those which would have to be temporarily or permanently replaced. Boilers were then given a hydrostatic test in accordance with M.E.I. The boiler stops were then opened and the main steam line to the engine bulkhead was tested at working pressure only, because of possible damaged gaskets and cold water. This test will show up any gaskets that have been carried away or any ruptures to the pipe. In view of the fact that the ship was going back to the states for repairs it was not deemed necessary to remove lagging from steam lines or boiler drums. It is believed that general procedure should concern itself with getting the machinery in a state of operation and getting the ship ready to move. Any removal of lagging found necessary can be done at a later date. When other matters have been attended to the lagging may if necessary be removed and the piping wire brushed and put in a state of preservation. Where boilers or other machinery units have been severely damaged, remove all lagging as soon as possible so that the extent of damage can be ascertained and the unit lightened for removal. The forced draft blowers in the forward fireroom had been damaged by fire and it was found necessary to remove them and take them apart and clean them. This is especially true in the case of the ball thrust bearings which had become gummed up. No parts had to be replaced but the assembly had to be taken down and cleaned. #2 fireroom had not undergone such intense heat as #1 and thus it was found necessary only to clean the machinery up generally with tectyl. The blowers were run by air for several hours and found to be in satisfactory condition. Governors and overspeed trips worked perfectly. One

boiler at a time was lit off and steam raised with boiler stops open to the main and auxiliary steam lines. When steam pressure was about 100 lbs. the machinery was tried out. It was discovered that in certain cases relief valve springs had lost their tension and also that the operation by steam of certain machinery uncovered conditions that had to be rectified. This required two to three days. The safety valves were lifted by steam and were found to be in perfect order without need of resetting. The main engine room had not been seriously affected by water, but had sustained considerable heat. A small amount of damage was repaired.

The most important points to be noted in the foregoing are these:

1. The fact that a boiler has been submerged is not prima facie evidence that the brickwork has been irreparably damaged and must be torn down. The immediate need of a boiler is a thorough cleaning and drying out and being placed in a state of preservation.

2. An immediate cleaning up and testing of all boilers and fireroom machinery is the primary consideration on unwatering a fireroom.

3. Lagging and other insulation should not be immediately stripped off unless it is believed that it hides damage.

10. Electrical Equipment

General Information

- a. The electric wiring necessary for most jobs now in sight appears to be limited to that required to re-establish vital circuits. In many cases this involves jumping past damaged areas. A word of caution is again necessary against blanket renewals and unnecessary work. Consult wiring diagrams, dry out the wiring and bring up megger readings. Wiring always appears to be in worse condition

than it really is. Discretion must be used in cutting cable in damage areas. Never make the mistake of chopping off cable too short to prevent later splicing with a junction box thereby necessitating costly renewals. As soon as possible submit a list to the Salvage Planning Officer giving the approximate runs in feet, sizes and types required. This is needed in order to check available stock and in many cases to locate equivalent substitutes.

b. *Electrical Equipment*

c. Main Drive—See Salvage Bulletin #24.

d. *Motors and Generators*.—It is requested that in handling electrical Planning Officer, Lt. (jg) Darrock, telephone 4255, be contacted as soon as a space is unwatered. He will visit the ship and make detailed arrangements on how each lot of equipment is to be handled. Do not dump this equipment on the yard if it is desired to have the job run smoothly. Ships can aid considerably in the task if they will compile in advance a list of units prior to removal from the ship with the following information.

1. Ships item Number (E-1, E-2, etc.)

2. Name of motor or use (#1 Deck Wind)

3. Location of motor (Frame 46-S on Forecastle Deck or #8-46-1 Deck #8-Frame 46—Starboard side.)

4. Motor Serial No. and name plate data. Mark all equipment with metal tags, giving the above information. Ships are requested not to undertake removal of oil from motors, but rather to leave this to be done by the electrical shop.

e. Instruments—See paragraph 6c.

f. Switchboards—See Salvage Bulletin #24, paragraph #5. It is planned

to disconnect, remove intact and recondition in the shop all switch board and control panels that can be more expeditiously repaired by this method. No wires are to be cut, put all nuts back on the studs and carefully mark all leads. There will be no general removal of these items and each item will be individually inspected and scheduled for removal by the Salvage Machinery Superintendent, Lt. Comdr. C. W. Rhodes.

g. *Wiring*

1. *Power Leads*—Give as thorough fresh water wash as is possible. Dry by wiping and by drying compartment, and by drying compartments the intention is to *dry* the compartment as *dry* as is possible. No puddles or drippings can be permitted. Then all wires will be scrubbed with fresh water individually. Continue this process until no more salt forms on the wires or is divested. Do no work on the ends of the cable until specifically directed. The first step will be to clean ends. Then test with low voltage test and submit result to officer in charge of work who will direct procedure from there on.

2. *Lighting*—The cable and spaces will be given the same treatment as for power cable. See Salvage Bulletin #24, paragraph 2b.

3. *I.C. Circuits and F.C. Circuits*—Establish a priority on what circuits will be required. Rewiring of circuits will be done in general as for lighting. All telephones (Ship's service, battle and sound power) will be carefully removed, tagged and delivered to the instrument shop as each compartment is unwatered. There must be no delay in this respect.

11. Comments and Suggestions

a. It has been observed that the

tendency is to tear down too much machinery. It is believed that the minimum amount of machinery should be torn down and the maximum use made of the tectyl treatment. Machinery proven to be out of line or ruptured may have to be torn down for repairs. Machinery that shows no signs of damage other than submergence can readily be reclaimed with tectyl and made to continue in service indefinitely. It may be necessary at some future date to replace packing or do minor repairs.

b. Plans should be made well in advance to procure a plentiful supply of steam. It may be necessary to install a stationary or portable boiler on board or alongside the ship to give a steam supply at about #130; 10 to 15 portable water heaters such as have been built up by the pipe shop at the Navy Yard should also be secured.

c. For mixing operations preparatory to washing down bulkheads, use steam and hot water in a 50-50 proportion and get close to the bulkhead and remove all mud and fuel oil. For washing out machinery and boilers an ample supply of hot fresh water is necessary. Final cleaning is best done using steam cleaners. These should be assembled ahead of time and also obtain sufficient cleaning compound.

d. Numerous air hoses should be provided, 2 to 3 for each engineroom, especially the larger size in order to secure the necessary volume of air to jack over and operate all pumps and machinery.

e. Battleships should have a supply of about 1,000 gals. of tectyl and 300 gals. of "consol" on board. Provision should be made for reclaiming tectyl. Lube oil treating tanks should be cleaned out and De Laval Separators secured as soon as possible and a place to run the oil separated from the tectyl; 60 to 70% of the tectyl used can thus be reclaimed. Since this compound is hard to secure in this area and costs about \$3.00 per gallon it is advisable to reclaim as much as possible. No amount of tectyl no matter how small should be discarded without some attempt at reclaiming part of it. In using tectyl the presence of open flames should be avoided and adequate ventilation in compartments where tectyl is being used should be supplied.

f. In organizing the personnel, it is recommended that they be given a lecture on the procedure, explaining the advantage of tectyl in getting machinery again in operation without tearing it down.

H. N. WALLIN.

cc: Comdt.

Mgr.

Plan. Off.

Prod. Off.

PubWksOff.

Hull Supt.

Mach. Supt.

C.O.Ships

Ship Supts.

Lt-Comdr. Rodgers

Conf. Files

All Salv. Officers

PHR&S Unit (25)

APPENDIX C

Gas Hazard and Protection Against Gas

February 14, 1942

Salvage Bulletin #15

Subject: Hazard from Gas on Ships Under Salvage—Protection Against

1. Lethal concentrations of gas have been found on the NEVADA, CALIFORNIA, and UTAH and fatalities have resulted on the first ship named. A very careful inspection, study and analysis has been made in the case of the NEVADA by Lieut.-Comdr. C. M. Parker, (M.C.) USN, who has submitted the following memorandum to the Salvage Officer:

The following observations were made on the U.S.S. NEVADA on the 7th of February, 1942 and subsequent days. They are quoted together with opinion for your consideration.

On boarding the ship the odor of Hydrogen Sulfide was detected and on going below decks concentration appeared to be heavier. On analysis the gas on the first three decks was in a range from 40 to about 100 parts per million.

In the trunk (where a disaster took place) at the level of the third deck a sample of the gas showed the following: Hydrogen Sulfide 400 parts per million, and a trace of Carbon Dioxide.

About the 10th of February a sam-

ple of air taken from the compartment forward opening into the trunk, below the third deck was taken and the analysis showed in excess of 1000 parts per million. At this time no carbon dioxide was found in any compartment of the ship.

Sampling with lead acetate paper as an indicator was continued. Only when the compartments were considered safe, were men allowed to go in them.

The method used to free spaces of Hydrogen Sulfide was: suction blowers as near water level as possible, which pulled the gas from the compartments and deposited it over the side within a few inches of the water. This method of ventilation is being continued.

The properties of Hydrogen Sulfide are relatively as follows: colorless, heavier than air, and at a low concentration it has the odor of a rotten egg, while at a high concentration it has a sweetish odor. However, at the higher concentration the nerves of smell in the nose are paralyzed rather quickly so that usually no odor is perceptible.

The maximum quantity of gas in the air considered safe for people to work in is 20 parts per million. The latest authorities state the concentration of 700 parts per million is sufficient to cause death in a short time, where as,

a concentration of 1000 parts per million may cause death instantaneously. Between these two concentrations varying effects may be noted, depending upon the concentration.

The symptoms are: irritation of the mucous membrane, of the eyes, nose, and the respiratory track, burning of the throat, and the general signs of a cold or a bronchitis, headaches and dizziness, gastro intestinal disturbances, easy fatigability, a slow pulse, irritability, certain physic disorders as temporary inability to concentrate, and that, all in feeling.

My conclusions at the early point in the study make it seem advisable to take the following precautions. Men going into a ship with water in the compartments for the purpose of opening hatches, and other necessary work in conjunction with salvage should only enter with oxygen rescue apparatus or a face plate receiving its air from outside the ship. Divers of course are well protected. After these compartments are freed of water, suction ventilation should be instituted. Tests then must be made, before men are allowed to enter these compartments. This process must be continued for each compartment, on each deck. Tests should be supervised by someone familiar with this gas and possibly other gases is advised.

2. On 13 February 1942, COM-TRAINRON SIX arranged for Lieut.-Comdr. Parker to give a lecture on this subject to as many of the officers attached

to Ships in Ordinary as could be spared. This lecture was of great interest and caused everyone present to appreciate the seriousness of the hazard which is certain to be encountered on all ships where salvage operations are being conducted. It was decided that the Ship Superintendent of each ship would be responsible for seeing that proper procedure and protection is carried out in connection with the gas hazard, and that he would cooperate closely with the personnel to be trained to make tests, etc., by Lieut. Comdr. Parker.

3. All officers of the Salvage Division are being furnished a copy of this Bulletin and are instructed to take special care with respect to the gas hazard as discussed in Dr. Parker's memorandum. They will take such steps as are necessary to assure themselves that they send no men unprotected into compartments except those known to be safe. The nature of the hazard and the precautions to be taken should be made clear to all civilian workers who are assisting with salvage operations, whether they be Navy Yard workmen or Contractor's men.

4. Arrangements are being made for Dr. Parker to lecture to officers of the Salvage Division at an early date.

cc: Comdt.

Mgr.

Safety Eng.

COMTRAINRON SIX

All Salv. Off.

Lt.-Comdr. Parker

H. N. WALLIN

Captain, U.S. Navy

APPENDIX D

Electric-Drive Machinery of Battleships

U.S. NAVY YARD
Pearl Harbor, T.H.

March 4, 1942

Salvage Bulletin #24

Subject: Outline of Reconditioning Procedure for Main Electric-Drive Machinery—U.S.S. CALIFORNIA

1. There follows an outline of procedure for reconditioning of main electric units on the CALIFORNIA. This procedure has been worked up by Lieutenant Commander McNally, Salvage Planning Officer, who has discussed the problem with numerous persons including some connected with the General Electric Company and the Westinghouse Company. Also, the procedure is based on actual experience and results in the case of electric motors, wiring and instruments heretofore salvaged and reconditioned. As further experience is obtained, this procedure will be modified to insure better results and to improve faulty practices. Suggestions for improvement will be welcomed, and should be turned in direct to Lieutenant Commander McNally.

2. General Procedures for Main Motor Spaces, Main Engine Room, Boiler Room, Control Room.

a. Before any uncovering is done, skim all oil from surface of the water.

b. Rig exhaust ventilation.

c. Immediately on unwatering, wash down with hot fresh water.

d. Sufficient working force must be on hand to wipe and dry down thoroughly. This is far more important than on a steam drive installation. No puddles can be allowed since this will keep the air saturated and prevent drying of electrical equipment.

e. Rig temporary lighting. Do not attempt to bring back ship's circuit at this time. To do so will slow down work. Remove all electric meters carefully; do not cut wires; save securing nuts. After proper tagging, immediately deliver them to the instrument shop of the Navy Yard. Segregate meters from the same board or same piece of machinery in wooden boxes as this will tend to keep records straight and avoid damage in transportation.

f. Remove all steam gauges, flush out with fresh water and then flush out with "tectyl." Then after proper tagging deliver to the instrument shop in wooden boxes similar to the ones used for the electrical instruments.

g. Remove all electric motors as fast as they are uncovered, flush them out with fresh water and deliver to electric shop in accordance with procedure already established by the Electric Salvage Planning Officer, Lieutenant (jg) J. W. Darroch.

h. When compartments and wires have been thoroughly dried, start reviving circuits. Do not remove junction boxes, fittings, etc. unless directed. First wash junction boxes and switches out thoroughly with hot fresh water in place and then dry by air blast; use alcohol or carbon tetrachloride in small amounts taking necessary precautions when using. Inside fittings of boxes will require removal. After cleaning prior to replacement of the fittings the inside of the box should be given a coat of air drying insulating varnish. As soon as you are ready, run temporary electric power source to the nearest feeder or distribution box and work out from there, cleaning and ringing out and relamping circuits as you go.

3. Main Motors.

a. Immediately remove ventilation motors and disconnect panels and send to the electric shop for reconditioning as they will be required just as soon as they can be restored.

b. Connect fresh water up to the fire extinguishing spray and thoroughly wash motors with fresh water for approximately four hours, rotating motors if it can be done; detailed instructions in this respect will be given as work progresses.

c. Connect steam up to motor steam heating service.

d. Make or use blanks for end bells if available aboard so that motor casings can be used as its own leaching tank. Work into design at least one electric motor driven outboard motor propeller and arrange leads for maximum circulation of warm fresh water. During first 24 hours use "Aerosal" in the water. Salvage Planning will specify the amount. Take salinity readings of the raw flushing

water and the discharge. When these readings have equalized at about the eighth day, continue flushing for one more day.

e. Then remove water and heat motor by steam coils and dry by ventilation. Install cargocaire units in each motor room and maintain rooms in as dry a condition as possible, segregating from the rest of the ship.

f. When satisfied that motors are sufficiently dry, ring out circuits and watch megger readings. If readings do not come up it will be necessary to pull rotors and use alcohol for cleaning and use glyptol where necessary for patching. In order to prevent local short circuit currents every stay bolt that holds the laminations will have to be rung and insulation tubes and washers renewed as necessary. Detailed instructions at this point will be given by Salvage Planning. At this point also additional drying might be gained by use of the generator wiring itself by blocking the rotor or use of windings themselves. Detailed instructions will be issued by Planning. Dielectric test will be made, specific instructions will be issued by Planning.

4. *Main Generators*—The same general principles will be applied to these as for the motors. The generators should be uncoupled in order to permit the reconditioning of the turbine end at the same time. It will probably be more difficult to make the generators their own leaching tank but it can be done and templates should be taken for preliminary work prepared from drawings in order not to delay operation on unwatering.

5. *Control Room and Switchboards*—It cannot be too strongly emphasized that after the first fresh water wash-down these spaces and equipment must be thor-

oughly dried down and cargocaire units installed. Open all switches and ring through all circuits and record. This will provide the record of the worst condition. Then proceed to strip boards completely and thoroughly clean the board and fixtures and reassemble board. At the same time ring through again all cable when clear of the board and record. This is done in order to determine what percentage of the ground was at the board itself. Then clean all cable ends, carefully drying ends. When thoroughly dry paint with glyptol to seal ends. At this stage do not be impatient since all air in the compartments must be dry before the cables start to dry and glyptol should not be used until absolutely dry. Ring through and if not clear, report to Planning for detailed instructions. Dielectric test will be specified by Planning on cables when specifically ordered by Planning after study of readings and results.

6. Experience in reconditioning of steam and smaller electrical machinery procedure has already been developed to

a point that detailed discussion is not necessary in this Bulletin. Attention is invited to Salvage Bulletin No. 14 which has much valuable information.

7. Experience has already shown that a very high percentage of electric motors and electric instruments can be reconditioned and put back into service if:

a. Instruments are handled *quickly* after being uncovered, so that fine parts are not subjected to progressive corrosion.

b. Motors and generators are handled quickly. Note that no windings should be subjected to megger tests until they are *dried out*,—otherwise the insulation may be destroyed *by the test*.

H. N. WALLIN

Captain, USN.

cc: Comdt.

Capt. Yard

Mgr.

Prod. Off. (5)

Salv. Plan. Off. (5)

C.O. CALIFORNIA (10)

All Salv. Off.

File

APPENDIX E

The Salvage of *U.S.S. West Virginia*

U.S. NAVY YARD
Pearl Harbor, T.H.

C-L11-1/BB48/Ser.01161

June 15, 1942.

From: The Salvage Officer.
To: The Commandant, Navy
Yard, Pearl Harbor, T.H.
Subject: USS WEST VIRGINIA, Re-
port of Salvage of.
Reference: a. Salvaging of the USS
WEST VIRGINIA—
Report of progress, March
16, 1942.
b. Salvage Bulletin #38, May
26, 1942.
c. Salvage Bulletin #40, May
30, 1942.
d. Salvage Bulletin #42,
June 5, 1942.

1. The USS WEST VIRGINIA was floated on May 17, 1942, and placed in Drydock #1 on 9 June 1942. The draft was 33 feet forward and 33 feet 5 inches aft, and the ship was approximately on an even keel. In order to clear the docking blocks in Drydock #1 at least one foot it was necessary to cut their height down to 33 inches.

2. *Original Condition of the Ship:* The WEST VIRGINIA was sunk and rested on the hard bottom in the outboard berth of F6, with a list of about three degrees to port. The draft was 50 feet 6 inches

forward and 40 feet 10 inches aft. Exploratory work by divers had revealed very extensive damage in the midship area, port side. In addition, divers had found that the rudder had been knocked off and was lying on the bottom, and that the steering engine room was considerably damaged. A serious oil fire had burned on the WEST VIRGINIA for about thirty hours following the December 7th attack, and had caused extensive damage throughout the ship. For about three quarters of the length of the ship all of the deck plating above the second deck and some of the bulkheading was seriously buckled from the heat. At the time of the attack on December 7th, the ship had on board approximately seventy percent of its capacity of fuel oil and was fully loaded with fresh provisions and meat. The records of the WEST VIRGINIA indicated that there were approximately seventy bodies on board the vessel.

3. *Scheme of Salvage:* In view of the divers' findings that at least three torpedoes had struck the ship in the midship area alone it was deemed likely that the torpedo protection had been seriously ruptured. Further, it was found that the hull structure above the armor belt in this area was very extensively damaged. The ship had reported that torpedoes struck in this area after the vessel was listed 20-30 degrees to port.

4. In view of the nature and extent of

the damage to the WEST VIRGINIA it was apparent that the ship could not be raised without the use of patches to shut off the inflow of water. It was therefore decided to install one large cofferdam-type of patch in the midship area, frame 61½-97½. This completely covered the damage resulting from torpedoes and bombs striking in this area both below and above the armor belt. Also, a similar patch, it was decided, would be installed over the forward torpedo hit, at frame 43-52. In the case of the torpedo hit in way of the rudder and steering gear room it was decided to isolate this area by watertight doors and to utilize air pressure if necessary to reduce the amount of flooding. The salvage scheme adopted and carried through was therefore as follows:

a. Install a cofferdam patch over torpedo damage on the port side at frame 43-52.

b. Install a cofferdam patch over the damage to midship area, port side, frame 61½-97½.

c. Isolate steering engine room area by watertight doors.

d. Pump out the vessel, using about ten large pumps (10") to gain control of the inflow of the water.

e. After gaining control, stop off leaks into the hull and improve tightness of patches, watertight doors, watertight covers, etc.

f. Apply air pressure to tanks and voids on the port side to empty or partially empty those that were ruptured.

g. Pump out all intact tanks and voids on the port side and empty starboard tanks and voids correspondingly.

h. Apply air pressure to flooded areas aft in order to reduce the amount of water in those areas.

i. Remove all weight possible, such as water, oil, stores, provisions, meat, ammunition, personal belongings, furniture, trash, wreckage, etc.

5. The above scheme of salvage was carried out as planned, but somewhat further than contemplated in the matter of weight removals in order to reduce the draft sufficiently to get the vessel in Drydock #1. The original intent was to place the vessel in Drydock #2 (which has 42 feet of water over the blocks at mean low water) as soon as the dock was vacated by the CALIFORNIA. However, the military situation required that Drydock #2 be kept available, except for very short intervals, in order that major vessels damaged in action could be expeditiously handled. For this reason the progress of salvage operations in the later stages called for every possible means to reduce the draft to permit drydocking in #1,—even contemplating, if necessary, some delay in docking in order to attain a suitable draft to accomplish this end. This decision was made despite the fact that it was fully recognized that the WEST VIRGINIA was very vulnerable to sinking or even to capsizing in case of reflooding because of failure of the large patch due either to injury from collision, air attack by the enemy, or even from weakening due to Tereido attack.

6. *Design of Cofferdam Patch:* The Navy was very fortunate to have had available at Pearl Harbor the personnel and equipment of the Pacific Bridge Company, contractors for new drydocks, new bomb-proof powerhouse, etc. This company is very experienced in cofferdam work and has been quick to adapt their practices and experience to ship salvage requirements. With the co-operation of various officers of the Salvage Division of

the Navy Yard, the Pacific Bridge Company worked up the detailed design of the cofferdam patches for the WEST VIRGINIA. A print showing the general design will be forwarded to the Department by the Commandant of the Navy Yard together with progress photographs of the installation of the patches. Suffice it to state here that the patch is made up in sections of about $13\frac{1}{2}$ feet long. Each section is about 50 feet in height and is made up of steel, wood and concrete. The patch extends down from above the existing water line to below the turn of the bilge. At the bottom point it takes a right-angled turn so that it extends under the bottom and is pulled up snugly against the bottom. The end sections of each patch are shaped to fit in snugly against the damaged shell. The patch is planked vertically with four inch material. The net clearance between the armor and the inside of the patch is about eighteen inches.

7. In order to eliminate shoring below the armor belt each section has three steel vertical strength members. These are twenty-four inch "I" beams running vertically about twenty feet to a point just above the lower edge of the armor belt. On each beam a bracket is welded and this bracket takes up on the underside of the armor belt to take the upward thrust. There are ten wooden strength members (wales) running fore and aft; these are 12" X 14" timbers. These members are shored directly to the armor on four foot six inch centers and above the armor to special steel members resting on the armor belt.

8. *Installation of Sections of Patches:* The thirteen and one half foot sections of the cofferdam patches were installed one at a time on a schedule calling for

one to be installed each day. Slight negative bouyancy was obtained by placing a lead weight in an angle bar frame attached to the outside near the bottom of each section. This lead weight was removed when the section was in place and used for the next section. All of the installation work was handled with the assistance of the Pacific Bridge Company divers, who did a masterful job of properly securing the sections and subsequently making them relatively water-tight.

9. The sections were secured to the hull by means of four horizontal rows of steel hook bolts. Holes were burned into the hull with an underwater gas torch for insertion of the bolts. The outer end was passed through the patch structure and was drawn up snug against the side by large butterfly nuts on the threaded outer ends of the bolts. Proper distancing of each section from the hull was maintained by the required structural shoring between the hull and the wales of the section. Many of these shores (about 18 to 24 inches long) took up against the armor belt. These shores varied inasmuch as the armor belt had been displaced as much as fourteen inches from the original molded lines. Installing the patch in relatively narrow sections (eleven joints in the large patch) allowed the patch to follow both the lines of the ship and curvature due to damage.

10. The armor belt was found to be badly askew but nevertheless furnished excellent backing for shores. The chief difficulty in shoring was to find suitable structure above the armor belt in the midship area to shore against,—this for the reason that all of the hull plating in the midship area above the armor belt was missing or badly wrecked. Shell plat-

ing that had been blown out was removed previously by underwater cutting. An ingenious scheme for shoring in this area was devised by setting ten inch "H" beams vertically on end on top of the armor with the lower end of the beam kept flush with the outer edge of the armor by means of heavy angle bars which were welded to the "H" beams but not to the armor. A hook bolt was fastened by divers back of the armor. Above the water's edge the "H" beams were backed by steel shapes which acted as struts between the "H" beams and the structure of the ship. These vertical members were tied together fore and aft by welded angles and channels. When thus secured and spaced about every eight feet they furnished a very substantial means against which to shore sections of the patch to take the pressure as the water was pumped down.

11. The joints between the patches were made tight by using old rubber hoses for gaskets and by drawing up the adjoining sections by means of threaded bolts run through lugs on each section. These were spaced vertically about every three feet.

12. *Use of Concrete in the Patches:* The forward patch consisted of three sections and the after patch of eleven sections. After these sections were all installed, the next operation was the pouring of concrete, which was required to seal off the patch along the bottom and take the bottom reaction of the steel structural members and at each end. The concrete was of a rich mixture (about one cement to three and one half aggregate) and was mixed on a barge on which had been installed a contractor's cement mixing plant. The crawler crane which was also on the barge handled the

two yard buckets to transfer the concrete from the mixer to the hopper feeding down into the patch. Concrete was poured, of course, underwater by the Tremie process used by the contractor in drydock construction; ten inch Tremie pipes were placed at about ten foot intervals. The concrete was installed about four feet deep along the bottom of the patch for its whole length and the ends of the patch had a fore and aft thickness of four feet. The total amount of concrete used in both patches was 325 cubic yards or about 650 tons.

13. In order to take the weight of the sections in drydock after the water had been pumped down there were two 1- $\frac{1}{4}$ " steel rods running vertically from each twenty-four inch "I" beam (six rods for each section) at the bottom of the patch to an angle iron welded between the vertical "H" beams or to the ship's plating where it was intact. In order to provide access for divers into the patch, doors were fitted,—one on the three section patch and four on the eleven section patch. After concrete was poured and all shoring completed the doors were secured.

14. *Unwatering of the Ship:* As in the case of the CALIFORNIA, the pump capacity which was installed was more than adequate for the estimated inflow of water. The 440 volt electric Pomona and Peerless deep-well pumps (10") and several Jaeger 10" gasoline pumps were used, a total of nine. Two deep-well pumps were installed in the large patch and one in the small patch. In the later stages these were changed from electric to diesel driven in order to have them operative on the trip to the drydock.

15. Before the patches were installed considerable pumping was done to circu-

late water through the ship for the purpose of removing water long stagnant,—together with gas (H_2S) contained therein. All main watertight doors and hatches were opened in order to insure free flow of water throughout the main spaces of the ship. Also, a number of the pump suction lines were set at low levels, in trunks and other areas to which various compartments could be drained. For instance, one deep-well suction was set in D-117 through a hole burned through the first platform deck with an underwater cutting torch. Drainage holes were burned through the shaft alley bulkheads so that water from boiler rooms and other spaces could drain to the pump through the main drain manifolds.

16. Two stages of pumping were considered; first to unwater the third deck by mass pumping and second to unwater individual compartments either by direct pumping or through the ship's drainage systems. Due to extensive damage to the third deck bulkheads in way of the patches there was little if any watertight integrity down to the third deck and the water in the patch had to be lowered to this level before the third deck could be made dry.

17. As soon as the patches were considered reasonably tight the unwatering of the ship was commenced,—May 12, 1942. The water level within the ship and patches was rapidly reduced four or five feet, but at this point the inflow almost equalled the pumping capacity. This difference in head, however, showed up at points of inflow, and it was a matter of a day or two for the divers to find the larger leaks in the patches, through open ports, etc., and to remedy them. Continuous effort was devoted to improving the watertightness of the patches and of stop-

ping off leaks through holes in the ship. Much of the leakage was not in the patch itself but through damage in the areas contiguous to the patches, open seams, shrapnel holes, loose rivets, scuppers, etc. As the points of inflow were taken care of the water level within the ship was reduced rapidly and the ship came afloat on 17 May 1942.

18. After the third deck was uncovered a number of small Barns (3") pumps were connected up to the various storerooms and small compartments. Pumping out of the lower compartments continued unabated until the ship was ready for drydock. The unwatering of these lower spaces has proved most difficult and slows the unwatering of the ship, principally for the reason that the spaces cannot be drained to other areas, and small pump suction must be brought to each individual compartment.

19. *Removal of Oil:* There was a very large quantity of free oil within the WEST VIRGINIA and early steps were taken to remove the same prior to reducing the water level. A floating Wheeler System took suction in various places throughout the upper decks and spaces on the WEST VIRGINIA and was operated continuously for four or five weeks before the ship pumping was commenced. This resulted in removal of most of the fuel oil in the ship as a result of which there was considerably less oil nuisance on the decks and bulkheads as the ship was pumped down. In the later stages of pumping an additional Wheeler System was installed on the quarter deck to assist in the removal of oil from lower spaces such as engine room bilges, boiler rooms, etc. About 40,000 gallons of loose oil were removed by the Wheeler System.

20. During salvage work about 800,-

000 gallons of oil were removed from the oil tanks of the ship. The oil from the tanks was pumped into fuel oil barges by use of the WEST VIRGINIA'S fuel oil transfer pumps operated by air. In many cases air pressure was applied to the tops of the tanks in order to assist the pumps. In order to keep the ship approximately on an even keel no oil or water was removed from the starboard tanks or voids unless a corresponding amount had been taken from the port side, in the emptying of tanks and voids. When it became necessary to lessen the draft of the ship to a point permitting the docking in Drydock #1 it was necessary to reduce the amount of oil or water in damaged areas to the very minimum. The pumping arrangement was such that spaces on the port side which were open to the sea through side damage were drained outboard into the patches and picked up by the pumps which took suction from near the bottom of the patches. In order to reduce the water level in such spaces the pump suctions were finally set down to within about four inches of the concrete in the bottom of the patches. Inasmuch as some flooding of tanks and voids was through the bottom of the ship or through holes in bulkheads near the tops of these spaces it was apparent that such areas would not drain. In order to reduce their water level a combination of air pressure and individual pumps was utilized. The air pressure was used to force the water out of the holes which permitted flooding through the bottom of the ship. Pump suctions (3") were used to remove water which would not drain into the patches; air pressure was oftentimes used to assist the pumps.

21. *Hazard of Capsizing:* Due to the

fact that no drydock was available when the ship was fully afloat there came to exist a hazard that certain events might cause resinking of the ship and possible capsizing. The possibility of capsizing in the case of failure of the large patch (which might occur in case of an air attack) was clearly recognized. As the ship rose higher and higher this condition was accentuated, due primarily to the fact that the whole midship area of the port side above the armor belt was entirely open, and the decks down to and including the second deck were collapsed. Watertight doors and hatches in this area were useless, and fore and aft of this area most of them were required to be open for the passage of suction hoses, air hoses, light leads, steam leads, etc. However, an air-raid bill was worked up to insure that as many watertight doors and hatches as possible would be closed in the event of such an emergency. Several other precautions were taken, such as: (a) construction of two seam patches and one section patch to be available on the crane barge for placing over ruptures in the cofferdam patches, and (b) having available for counterflooding eight to ten voids on the starboard side with men assigned for the quick operation of sea valves. Fortunately the air raid which might have occurred was stopped off at Midway and none of the precautions were actually necessary.

22. *Emptying of Double Bottom Tanks, etc.:* Fresh water tanks, innerbottom tanks, etc., were emptied by use of ship's pumps operated by air. It was the general rule to operate ship's pumps and ship's facilities to the maximum possible extent with air in lieu of steam.

23. *Removal of Ammunition:* All ammunition was removed from the ship and

most of the ordnance stores. The ship's force handled the removal of ammunition unusually well. Sixteen-inch shells were hoisted by the barge crane through the top of the turrets in the case of the upper stowages; the shells from the handling rooms were hoisted through the ammunition handling hatches. The five-inch shells were brought up by the regular ammunition hoists operated by air drills (corner type); in the later stages 5"/25 shells were passed by hand. Powder and ordnance gear were hoisted through the various hatches by means of small air driven winches (tuggers) installed on the topside.

24. *Removal of Meat:* Considerable apprehension was felt over handling approximately 70 tons of meat which was assumed to be in a bad state of decomposition. Some thought was given to pumping water at high pressure through the meat rooms so that the meat would be taken up by the water and discharged through a 10" pipe over the side. A modified arrangement of this kind was tried and although it did not prove wholly effective it reduced the odor (a disagreeable part of the task) to a point which was quite acceptable. The meat itself after being flushed with water had the appearance of ashes and its texture shreddy. This was shoveled up and placed in ten gallon cans (gas mask containers) and hoisted by air winches to the quarter deck and dumped into the garbage lighter alongside. All in all the removal of decayed meat and dairy products was not really so disagreeable as was anticipated.

25. *Removal of Stores:* Small air driven winches were used to hoist canned goods, flour, etc., to the weather decks.

These materials were then loaded on wheel barrows and dumped into the lighters alongside. The canteen stores and flour were most unpleasant to handle and it was necessary for the men working in the storerooms involved to wear protective masks. The canned goods were generally in a bad state due to the corrosion of the cans which in many instances permitted deterioration of the contents and the generation of gas and disagreeable odors.

26. *Toxic Gases:* As in the case of the CALIFORNIA and the NEVADA there existed a considerable hazard due to the presence of toxic gases. The principal offender was hydrogen sulphide, H₂S (sewer gas), which was generated in the contaminated stagnant water. It was found that the most serious gas concentrations occurred in storerooms containing a large amount of paper or where there was a large quantity of cardboard containers. Numerous cases of oxygen deficiency were found and some cases of carbon monoxide.

27. *Precautions Taken Against Toxic Gases:* A systematic procedure for testing for toxic gas was employed, and was in charge of Lieutenant Commander C. M. Parker (MC), USN, who is a specialist in industrial gas hazards. A large bulletin board was kept marked up to indicate to personnel which compartments were safe and which should not be entered without proper mask protection. Although extraordinarily high concentrations of gases were found on the WEST VIRGINIA (two hundred thousand parts to one million) there were no persons overcome by gas. If the concentration reached the point of 20 parts in a million, as shown by detectors, the space was considered

unsafe except with a rescue breathing apparatus or suitable face plate with air lead.

28. *Ventilation:* In order to combat the gas hazard and to permit work to go on with the least possible delay there were installed a large number of exhaust ventilation units. As the water was pumped down these were connected up to the ship's ventilation pipes so that all parts of the ship could be reached and the toxic gases withdrawn.

29. *Recovery of Bodies:* During the salvage operations sixty-six bodies were recovered from the WEST VIRGINIA. These were found widely scattered throughout the ship. In most cases they were in an advanced state of decomposition, and considerably dismembered. As in the case of the CALIFORNIA the bodies were handled in heavy canvas bags made for the purpose; when drawn tight at the top for closing the odors emitted were negligible. By this means the bodies were removed from the ship at various times almost unnoticed by the working parties on board.

30. There were evidences that some of the men had lived for considerable periods and finally succumbed due to lack of oxygen. In the after engine room, several bodies were found lying on top of the steam pipes, which areas were probably within the air bubble existing in that flooded space.

31. Three bodies were found on the lower shelf of storeroom A-111 clad in blues and jerseys. This storeroom was open to fresh water pump room, A-109, which presumably was the battle station assigned to these men. The emergency rations at this station had been consumed and a manhole to the fresh water tanks

below the pumps had been removed. A calendar which was found in this compartment had an "X" marked on each date from December 7, 1941 to December 23, 1941 inclusive.

32. *Removal of Personal Effects and Trash:* All personal effects, furniture, etc., were thoroughly soaked with fuel oil and in some cases had been burned. As in previous salvage jobs it was necessary to remove all such material either as scrap or for reconditioning. The WEST VIRGINIA force handled the removal of trash in a very expeditious manner by using wheel barrows on the lower decks. They attached shackles to four points on the barrows so that hooks from the hoist line could pick up the wheel barrows and raise same to the weather deck through open hatches. From this point the barrows could be wheeled on to trash lighters and dumped.

33. *Condition of Main and Auxiliary Machinery:* The condition of the main propulsion plant and the auxiliary machinery throughout the ship was approximately the same as in the case of the CALIFORNIA. There was more free oil removed from the WEST VIRGINIA than from other salvaged vessels and as a result there was less deposited on the decks, bulkheads, electrical machinery, etc. The program of removing the electric motors and sending same to the Navy Yard for reconditioning locally or elsewhere was proceeded with as the water level was reduced. Yard workmen were available in large numbers to assist in the removal and reconditioning of mechanical machinery, machine tools, instruments, etc. This fact insures that a larger percentage of the instruments and delicate installations such as gyros, fire

control equipment in plot, etc., have been subjected to less corrosion than in the case of the CALIFORNIA. "Tectyl" was used freely as a preventative agent on mechanical parts of the fire control instruments, pumps, turbines, etc.

34. The main machinery spaces were well cleaned down before the vessel was docked and preliminary steps were underway to disassemble main generators and main motors. It appears certain that the job of rewinding these units will get started very soon and will proceed at a good rate.

35. All in all, the condition of all mechanical machinery is good to excellent, and it is anticipated that it can be reconditioned 100%. All electrical machinery requires rehabilitation and the present decision is to rewind all vital items. It is expected that the rewinding work will be done in part at the Navy Yard here but mostly under contract on the West Coast.

36. *Structural Damage:* Pumping down of the drydock revealed the full extent of the damage to the hull on the WEST VIRGINIA. The damage on the port side amidships from the turn of the bilge to the boat deck, is so extensive as to beggar description. All of the ship's structure in this area, including a number of the armor plates, requires renewal. A detailed damage report will, of course, be submitted by the Navy Yard, Pearl Harbor, but a general listing of the damage appears pertinent to this Salvage Report. The general damage is as follows:

1. *One Torpedo Hit at Frame 46:*

This torpedo struck the armor belt about three feet above its lower edge and burned into the armor a circular groove 18"-20" in diameter for about 270 de-

grees. The pressure wave from this torpedo blew in the hull structure below the armor belt some eight to ten feet, but did not disintegrate the material as is usual in the vicinity of a torpedo warhead detonation. The armor belt itself is pushed in some six to eight inches. The third deck is buckled up and ruptured, and indicates an inward movement of about two feet. One armor plate is cracked.

2. *Torpedo Hit at Frame 70:* This torpedo also struck the armor belt, about four and one half feet above the lower edge. Circular grooves indicate that the torpedo struck a joint and caused the lower edge of the after plate to move inboard about ten inches more than the forward plate. Four armor plates in this vicinity show cracks. It appears that the armor belt at this point has moved inward in the neighborhood of two feet. The damage below the armor belt shows that the hull down to the bilge keel has been blown in and collapsed, but all of the shell material seems to be present. This would indicate that the detonation of the torpedo warhead did not occur in contact with this structure.

3. *Torpedo Hit or Bomb Near-Miss at Frame 81:* Another torpedo struck at frame 80. Although there was no clear markings to show that the torpedo struck the armor belt it seems likely that such was the case. The damage below the armor belt was not believed to be sufficient for close proximity to torpedo detonation; in fact it is considerably less than the corresponding damage of (a) and (b) above. However, the shell above the armor belt at frame 81 is ruptured and opened inward. This would indicate that the torpedo struck rather high up on

the armor belt, or detonated before striking.

Prior to drydocking it was considered that the damage above the armor belt at frame 81 was caused by a bomb near-miss. However, this could have been caused by a pressure wave from a torpedo explosion or from a large bomb near the lower edge of the armor. There is evidence that a bomb struck the top edge of the armor belt,—and probably exploded ten or twelve feet below that point. The armor at this point has been pushed in six inches or more.

4. *Torpedo Hit or Bomb Near-Miss at Frame 94:* The damage here is very similar to that at frame 80, except that the damage above the armor belt extends further fore and aft. It is my present opinion that this torpedo (or large bomb) detonated well up on the armor belt. The lower edge of the armor belt has been pushed in at least ten inches.

5. *Torpedo Hit Above the Armor Belt at Frame 68:* At frame 68 the armored second deck has been blown downward on to the third deck and the main and upper decks are collapsed. Before the ship was unwatered the extensive damage in this area was attributed to a large bomb which passed through the foretop and entered this area. However, when the second deck was unwatered and the full damage revealed it did not seem possible that a bomb could have caused such serious damage to heavy armored structure. It was therefore concluded that a torpedo must have entered above the armor belt at this point. This conclusion was confirmed during the removal of wreckage when a torpedo air flask, fully intact, was discovered in this area.

6. *Torpedo Hit in Steering Gear Room:* This torpedo apparently struck the rudder at its midheight and knocked it off the ship. The rudder has been recovered in two parts, the line of rupture being at the midheight. The bottom of the steering gear room, just over the rudder, was blown open and considerable damage was sustained by the ram levers, cross head, rams, etc. The rudder stock is still missing but search by divers is being continued. The stern post is badly broken and a new steel casting is required. The trimming tank area on both sides is opened up, particularly on the port side. There was no apparent damage to propellers or shafting.

While the damage to the steering gear is severe and will require considerable replacement of materials and work, it would seem that the damage is less than is ordinarily expected from a first order detonation of a torpedo warhead. However, inasmuch as the after portion and the engine compartment of the torpedo was found on the bottom it is certain that the damage resulted from a torpedo hit.

7. *Bomb Hit Through Foretop:* A large bomb passed through the foretop, down through the flag bag, boat deck, etc., and presumably exploded on the main deck or second deck, port side. It was originally believed that the explosion of this bomb caused the very extensive damage suffered by the ship on the port side. However, now that it has been proved that a torpedo explosion occurred on the second deck, might permit the conclusion that this bomb was of little or no consequence. As a matter of fact, an unexploded 15" shell-type bomb was found on the second deck in this area. It

is therefore my opinion that the bomb which passed through the foretop was a dud and that the terrific damage sustained was caused by the torpedo hit over the armor belt at frame 68.

8. *Bomb Hit on Turret III:* One of the 15" shell-type bombs struck the top of Turret III, aft towards the starboard side. This bomb passed entirely through the top plate and into the turret but failed to explode. It was badly broken up. I believe that the parts of this bomb were packed and sent to the Navy Department.

9. *Damage on the Starboard Side Due to Contact With the TENNESSEE:* Upon drydocking it was found that some damage had been sustained at the point of contact with the TENNESSEE, when that vessel was squeezed against the quay as the WEST VIRGINIA settled in the water after pivoting on the port bilge. This damage is comparatively slight, although voids were opened to the sea by a dozen or more pulled rivets.

37. I think that the causes and effects of the various aspects of damage in the midship area of the WEST VIRGINIA is a matter for careful study, and any conclusions are pretty much a matter of individual opinion. Based on the above it is my present opinion that the WEST VIRGINIA was struck by six torpedoes and two large bombs, or by four torpedoes and four large bombs. The torpedoes, it would appear were shallow running torpedoes,—although some of them may have struck when the ship was well listed over. The maximum list attained by the ship was about twenty-eight degrees.

38. *Damage From Fire:* Very extensive damage was suffered from fires which burned for nearly thirty hours.

Most of the fire was from oil floating on the surface of the water, both inside and outside of the ship. The water level on the inside was three or four feet below the main deck on the starboard side and the fires on the surface of the water there caused serious buckling of main deck plating. In large part this will require renewal or/and straightening.

39. The direct contact of torpedo and/or bomb explosions against the armor belt caused the third deck to absorb considerably more energy than is usually the case in way of torpedo explosions. As a result the damage to and on the third deck in the midship area is very extensive. This damage extended to #5 torpedo bulkhead which is pushed in as much as two feet in boiler rooms two and four. Also, there is considerable buckling and failure of bulkhead stiffeners, bracket, etc.

40. *Extent of Structural Damage and Time to Repair:* The time required to make good the structural damage to the WEST VIRGINIA depends upon numerous considerations such as, availability of material, number of structural trades available, handling of armor, etc. Obviously the armor belt in way of the damage must be removed and the whole structure from the shell to torpedo bulkhead #5 inclusive must be replaced in large part. It seems that five armor plates are cracked and all or most of these may require renewal; also, it may be found that some of the armor keyways of others are broken open so as to require replacement of the armor plate. The bottom of the ship under the turn of the bilge is rumped considerably and is pulled up in way of torpedo bulkhead #5. The docking keel is pulled up six to eight inches. It is not blown out at any place

and is damaged comparatively less than in the case of the CALIFORNIA.

41. With material and men available it would seem that the structural job on the WEST VIRGINIA would require some four to six months. A large part of this work can be deferred until the vessel reaches a mainland yard, especially most of the renewal and straightening of main and upper decks. The time required for the steering gear job is anybody's guess at this stage and depends primarily on the delivery of new parts such as stern post, rudder stock, crosshead, etc.

42. The Yard is being pressed to have the WEST VIRGINIA in condition to vacate the dock if emergency requires. It is likely that the inner bulkheads can be made tight to permit refloating of the vessel after a period of about three weeks in dock. Although structural repairs can best be done in dock, it would be possible to handle the work so that only the outer layers need be done in dock and the inside layers completed thereafter. While this would not be the most efficient way of doing the job it would cut down the total drydock period to approximately ten to twelve weeks.

43. *Temporary Quarters on Ford Island:* In order to house the WEST VIRGINIA's crew near their work and to avoid loss of considerable time in boat transportation, a temporary barracks was constructed on Ford Island. A walkway from the WEST VIRGINIA to Ford Island was carried on floats on the water. This arrangement paid high dividends and permitted a very satisfactory arrangement for handling the crew of the ship and added considerably to the morale of the working organization.

44. *Electrical Power—Compressed Air—Steam:* The electric power was fur-

nished to the ship through leads from Ford Island. Steam was furnished by the tug EX-NAVAJO and piped through the ship in temporary piping. Compressed air was generated by about six large air compressors on the boat deck and on the main deck, and distributed from an accumulator.

45. *Personnel Assigned to the WEST VIRGINIA:* The officer assigned as the principal assistant to the Salvage Officer was Lieutenant Wilfred L. Painter, CEC-V(S), USNR, who had direct charge of all aspects of the work including coordination with the ship's complement. Prior to completion of the CALIFORNIA salvage Lieutenant Emile C. Genereaux Jr., D-V(S), USNR, was in direct charge of the WEST VIRGINIA work but due to his assignment to the PLUNGER job he was relieved by Lieutenant Painter. Other officers assigned were as follows:

A. Lieutenant Commander Charles W. Rhodes, USNR, was in charge of facilities such as steam, air, portable lights, etc., of all electrical and mechanical machinery. In general, he assisted the Salvage Officer as Machinery Assistant.

B. Lieutenant (jg) James W. Darroch, D-V(G), USNR, and Lieutenant (jg) Earl H. Liedstrand CC-V(S), USNR, were assistants to Lieutenant Painter in charge of certain details of installation of patches, setting of pumps, furnishing ventilation, operation of pumps, drain lines, etc.

C. Also, Lieutenant (jg) Wilbert M. Bjork, D-V(G), USNR, and Ensign Edgar S. Beauchamp-Nobbs, CC-V(S), USNR, assisted part of the time with the above-mentioned officers in performing similar duties.

D. Lieutenant Commander James A.

McNally, USN, although not specifically assigned to the WEST VIRGINIA he was of assistance to the Salvage Officer in planning machinery work and the reconditioning of electrical and mechanical units.

46. The performances of the above officers in all aspects of the work from design of the cofferdam patches to installation of same, operation of pumps, removal of wreckage, removal of oil and water, etc., was of the highest order. They carried on the work with outstanding devotion to duty, enthusiasm, and high courage in the face of unusual hazard from toxic gases, dangerous wreckage, etc. I have recommended letters of commendation for Lieutenant W. L. Painter, Lieutenant (jg) J. W. Darroch and Lieutenant (jg) E. H. Liedstrand in view of their excellent work throughout the whole period of actual salvage operations.

47. The great success attained in salvaging the badly damaged WEST VIRGINIA is in great part due to the personnel, experience and excellent cooperation of the Pacific Bridge Company, contractor for the new drydocks at this Navy Yard. Their work on design, installation, and upkeep of the cofferdam patches was of inestimable value. The underwater work performed by their divers in the fitting, attaching, and securing of the cofferdam patches was an outstanding achievement in underwater work. Officers who viewed the work after docking expressed astonishment and marveled at the immensity of the achievement. I am preparing for the signature of the Commandant a letter to the Pacific Bridge Company expressing the appreciation of the Navy Yard for their fine work. This letter will make special mention of those

representatives of the company who were outstanding in the WEST VIRGINIA work, such as; the local manager Mr. Jack Graham, the supervisor in direct charge of the WEST VIRGINIA work, Mr. Les Freeman, the rigging supervisor, Mr. Bert Rice, the design superintendent Mr. Fred Crocker, and design assistant Mr. James Foster.

48. The Pearl Harbor Repair and Salvage Unit rendered valuable assistance in operation of pumps and in removing and reconditioning certain auxiliary machinery. Due to the transfer of many of the officers and a considerable number of the men from this area it was not possible for this unit to assist in the same degree as they did on the CALIFORNIA.

49. The various shops of the Navy Yard assisted in their specialties in the salvage work, especially in the operation of air compressors and ventilation blowers. The work on the ship would not have been possible without the installation of a tremendous ventilation system for the removal of toxic gases. Most of this work was performed by Navy Yard workmen and coordinated by the Shop Superintendent's office.

50. The officers and crew of the WEST VIRGINIA turned out a record of work and accomplishment which will probably never be equalled. The Commanding Officer, Lieutenant Commander W. White, USN, and the Ship's Superintendent, Lieutenant Commander L. J. Knight Jr., USN, and many other officers were on the job at all hours to do the part of the salvage work assigned to them and to render any assistance which might be required for any purpose. Unfortunately the shortage of enlisted men which has recently prevailed here, prevented the building up of the crew of

the WEST VIRGINIA. The maximum number in the crew did not exceed three hundred and seventy. Sixty of these were Marines, who assisted in their traditional spirit and were always willing to do nothing less than their share of the work, and then some. With the small crew available the WEST VIRGINIA work was carried along rapidly so that before drydocking the removal of the larger part of the wreckage and trash, all of the ammunition, and much of the stores and provisions had been accomplished. I should mention also, that the initiative and spirit of the WEST VIRGINIA resulted in the recommissioning of the officers' galley which was operated continuously from April 27, 1942, to feed on board the ship three meals a day to all of the ship's officers and crew.

I have prepared a letter for the Commandant's signature expressing appreciation of the excellent co-operation and assistance rendered by the officers and crew of the WEST VIRGINIA in the salvage of that ship.

51. The above is in general the story of the salvage of the WEST VIRGINIA, which may well be designated as a most difficult salvage job successfully completed. All hands assigned to the work performed their part intelligently, cooperatively and effectively. A successful outcome was never in doubt.

cc: Comserfor.

Mgr.

Prod. Off.

Plann. Off.

Shop Supt.

H. N. WALLIN.

APPENDIX F

The Plan for the Salvage of *U.S.S. Oklahoma*

U.S. NAVY YARD
Pearl Harbor, T.H.

C-L11-1/BB/NY10
Ser. Y-01347

July 18, 1942

From: The Salvage Officer
To : The Commandant, Navy Yard,
Pearl Harbor, T.H.
Subject: USS OKLAHOMA—Progress
Report on Salvage of.

1. Complying with your oral instructions I am submitting below a report of the progress of the salvage operations on the USS OKLAHOMA. In view of the termination of my assignment as Salvage Officer, I am including considerable detail and opinion in this report.

2. Under date of 15 March 1942, the Bureau of Ships was advised regarding the situation existing on the ARIZONA, OKLAHOMA and UTAH and the Yard recommended that the salvage of these vessels, except for recoverable material, be not undertaken at this time.

3. Under date of 22 April 1942, the Vice Chief of Naval Operations expressed the desire that the condition of the ARIZONA and OKLAHOMA be carefully surveyed and recommendations made based on the time and cost of salvage. This desire of the Department, it was stated, was based on the excellent

work which had been accomplished in the salvaging of Naval vessels.

4. Under date of 24 May 1942, the Commandant furnished the Vice Chief of Naval Operations a detailed estimate of the salvage of the OKLAHOMA and stated that the Yard was in position to proceed with the work if ordered. Subsequently the Yard was directed to proceed with work on the OKLAHOMA and contractual arrangements have been made with the Pacific Bridge Company to handle a portion of the work; also, arrangements are being made by the Bureau of Ships for suitable priorities for the material required. At the present time the local Manager and local Design Superintendent of the Pacific Bridge Company are at their home offices in San Francisco to review with their company certain aspects of the OKLAHOMA project, including lay-out of righting forces, procurement of essential materials, recruitment of specialized man power, etc.

5. The OKLAHOMA was berthed outboard of the MARYLAND at Berth F-5 and capsized outboard (to port). The vessel rotated through an angle of about 150 degrees and came to rest on a fairly solid bottom. The starboard half of the ship's bottom is above water as is also the lower part of the starboard side, including the starboard propeller. The

topmost point of the OKLAHOMA hull is now about twenty-six feet above mean low water. Soundings have been taken all around the OKLAHOMA and these show that the turrets, superstructure, and masts are entirely submerged in mud. In view of the fairly solid bottom it is likely that the masts and lighter superstructure have been torn clear of the ship or badly bent. It is not practicable for divers to determine the facts on this point without some dredging, and dredging should not proceed in this outboard area until hauling winches are rigged.

6. *Damage to Underwater Hull:* In order to determine the underwater damage of the OKLAHOMA careful inspection of the hull has been made by divers, but most of the damage sustained is partially covered by mud. This has not been dredged out because of higher priorities of other work. However, the divers' inspections indicate four large holes, in the port side as follows:

- a. At about frame 38 there is a hole which appears to be a bomb near-miss. This hole may be found to be considerably larger when mud is cleared away, and may be a torpedo hole.
- b. At about frame 48, one torpedo hit.
- c. At about frame 64, one torpedo hit.
- d. At about frame 94, one torpedo hit.

There appears to be no important damage to the bottom of the ship or to the port side below the bilge keel.

7. *Scheme of Righting:* Considerable study has been applied to the development of a suitable scheme for righting the OKLAHOMA. This has been handled jointly by the Salvage Division, Design Section, and the Pacific Bridge

Company. The final details of the scheme are yet to be worked out but it consists essentially of the following:

a. *Shore Winches:* At present plans call for the installation of twenty-one electric hydraulic hauling winches on Ford Island, each winch having a pulling capacity of about twenty tons. The number of winches is based on an estimated maximum pull of about 345,000 foot tons.

In order to install these winches on Ford Island, two or three of the enlisted men's quarters will have to be temporarily moved clear of their present sites to allow sufficient space for the installation of concrete deadmen as winch anchorages.

Each winch will haul on a 1" (about) flexible steel wire cable rove through blocks which will give a seventeen part purchase. The moving end will be attached to a 3" wire cable which will pass over the bottom of the ship and will be attached to the starboard shell plating through four "cat tails" from each 3" line. These "cat tails" will be shackled to pads or lugs welded to the shell at each frame. Preliminary strength calculations indicate that the hull structure is adequate.

In order to increase the leverage, the 3" pulling wire will pass over a strut arrangement about forty-eight feet above the mean low water level, which will probably be of wood and built on the bottom of the ship with the load taken on the docking keels.

b. *Lift pontoons:* In order to provide adequate assistance to start the ship rolling, especially in view of the fact that most of the superstructure is buried in mud, it is intended that a number of large lifting pontoons be attached to

parts of the superstructure in such a way as to give large righting moments. It is likely that these pontoons can be attached by chains to masts, cranes, turrets, guns, etc. It is not likely that there is room for more than about twenty such pontoons. In the later stages of righting it may be necessary to rig some chains around the ship in order to obtain satisfactory righting moments from the pontoons.

It has been intended that the submarine salvage pontoons at Pearl Harbor, each having a capacity of eighty tons lift, be utilized. Inquiry was made as to whether the Department would authorize the transportation of ten similar pontoons from the West Coast for this project. A negative response has been received, so that it now appears that it may be necessary to manufacture ten additional pontoons if later detailed calculations show the necessity for same.

Some informal conversations have been had with the Army engineers regarding the loan of large gasoline tanks which could be adapted for lift pontoons of about eighty ton capacity each. The Army has indicated a willingness to cooperate, but this would depend of course on whether the gasoline tanks are still available at the time we are ready to put them to use. No official action has yet been taken with the Army on this point.

c. *Air Bubble*: In order to lighten the OKLAHOMA, especially in such a way as to reduce the righting moment required it is intended to use compressed air to blow out some of the water-filled compartments on the starboard side. Calculations have been based on blowing the water down about twenty-five feet, thus requiring an air pressure of eleven or twelve pounds per square inch. The

idea is to divide the air bubble up by transverse bulkheads so that there will in effect be about five air bubbles in the hull along the whole length of the ship. This division will guard against the possibility of losing all of the air bubble at a critical period of the righting operations.

In connection with the air bubble, some of the liquid to be removed is oil, and steps are now underway to remove all of the fuel oil from the starboard tanks by pumping. Test holes are being drilled and access holes are being cut through the bottom of the ship for the purpose of getting hose and men into the oil tanks. Two three inch reciprocating simplex steam pumps will be used to remove the oil from the ship and place it into the oil barge INTREPID. There is some danger of oil vapor explosions in this work and steps are being taken to guard against this hazard, principally by arranging for the EX-NAVAJO to moor alongside the OKLAHOMA and to furnish steam and electric power. Thereafter all oil tanks will be steam-blanketed (or suitable air venting) before access holes are cut. Lieutenant Greely has direct charge of oil removal.

The ship's tanks are practically full of fuel oil, about 1,000,000 gallons. The access holes are eighteen inches square, and fifteen or more of them will be required through the starboard bottom; other holes will have to be cut in longitudinal bulkheads later to sluice oil from other tanks into the wing tanks to be picked up by the pump suction.

d. *Need For Outboard Restrainer To Prevent Sliding*: Considerable thought has been given to the need for a suitable anchorage out in the channel to prevent sliding of the OKLAHOMA instead of

rotating when the righting forces are applied. A study of the soil strength has been made by the Pacific Bridge Company in connection with this matter and it now appears that no anchorages are required, except for one forward. These calculations, however, should be carefully checked as the work proceeds.

e. *Dredging*: In order to permit the OKLAHOMA to rotate without undue restraint, some dredging must be done just inboard of the ship. If too much is done it will increase the possibility of sliding so that the amount of dredging to be performed must be based on the strength of the soil. Also, if too much dredging is done the vessel will be unnecessarily low in the water when righted and this will greatly increase the problem of floating her. Thus from both view points a minimum amount of inboard dredging should be performed, only enough to permit the vessel to rotate without undue obstruction.

8. *Method of Raising*: It is expected that the OKLAHOMA after righting will still have 8-12 degrees list to port, and the main deck (possibly the upper deck) will be under water. The scheme for raising the OKLAHOMA is to utilize the fence-type cofferdam as in the case of the OGLALA. That cofferdam is being stowed on Waipio Point and will be available for adaptation to the OKLAHOMA. Based on present knowledge it is likely that the OKLAHOMA can be raised without installing exterior patches over the holes in the port side, as in the case of the CALIFORNIA. However, final decision on that point should wait for a more accurate determination of the damage.

9. *Division of Duties*: There has been considerable discussion as to whether the

Pacific Bridge Company could not be charged with the complete job of righting and floating the OKLAHOMA. My consistent opinion has been that the work can be handled satisfactorily only on the basis of the Navy assuming responsibility for the job as a whole, but to contract with the Pacific Bridge Company to perform certain parts of the work. As I understand it, their desire is not to take over the job in its entirety but merely to have a definite contractual arrangement under which they could purchase large quantities of materials required and hire specialized men for the work; in other respects the working arrangements used on ships already salvaged would apply.

10. I have discussed the general divisions of the work with the local Manager and local Design Superintendent of the Pacific Bridge Company, and we have agreed that the division shown below appears most favorable:

a. Design, installation, rigging, attaching, and operation of hauling winches—to be handled in its entirety by the Pacific Bridge Company, but subject to Navy inspection and assistance.

b. Lift pontoons to be attached and operated by the Navy, but assistance as necessary to be rendered by the Pacific Bridge Company. The detailed work could best be done by the ORTOLAN or the WIDGEON; the necessary dredging primarily for the attachment of pontoons could be done either by the Navy or by arrangements through the Pacific Bridge Company.

c. Diving work, primarily to close watertight doors, hatches, valves, etc.,—(and to see that certain others are left open) requires familiarity with ships and with naval design and is essentially a Navy part of the job. The Pacific Bridge

Company desires that this be handled entirely by the Navy. The Diving Section of the Salvage Division has been studying this problem for some time and is organized and ready to proceed with the work.

d. Decision as to the amount of dredging inboard seems to be a joint matter for study and agreement. When the decision is reached the dredging itself can be performed by the Yard or by arrangement through the Pacific Bridge Company.

e. In regard to raising the ship, the design, construction and installation of the fence-type cofferdam should be a primary function of the Pacific Bridge Company. Decision as to the need for exterior patches should be made jointly but primarily by the Navy. All interior work and pumping arrangements should be joint, but a Navy responsibility.

f. *Removal of Oil, Ammunition, Wreckage, Debris, etc:* This should be a Navy responsibility, as should also fire protection, hazards to life from toxic gases, explosion hazards, etc. There are supposed to be about 400 bodies in the OKLAHOMA which should be handled by Naval personnel. Also, there is a large amount of personal property and confidential matter which must be safeguarded in accordance with instructions of the Commander-in-Chief of the Pacific Fleet.

11. *Time Required To Do The Work:* The time required to do the work is problematic and depends upon whether unforeseen difficulties develop and cannot be readily overcome. On the assumption that the materials to be procured by the Pacific Bridge Company are given sufficiently high priority the job can be started almost immediately. If the ma-

terials are delivered piece-meal and so scheduled as to be ready for installation when required I think that the OKLAHOMA can be righted within four or five months, and possibly within three months. The time required for raising her after she is righted depends upon how deep she remains in the water and at what angle of inclination. If the depth of the water over the quarter deck does not exceed 20-22 feet it ought to be practicable to raise her within three months.

12. *Possible Difficulties:* The salvage scheme has not yet been developed in such detail as to insure that all difficulties which may arise during the salvage operations have been taken into consideration. However, a few of them presented themselves and are as follows:

a. Strength of the soil of the bottom is a critical aspect of the job. As the righting moment is applied to the vessel the pivoting point will tend to dig in and/or to slide. If the soil is hard enough to prevent sliding but still soft enough to permit the bilge to dig in, the vessel will tend to sink deeper into the mud. This will have several effects, one of which is to increase the moment required for rotation.

b. When the vessel has rotated through about 60 degrees it will be on its port side, and thereafter the pivoting point will be the port bilge. If the mud is relatively soft the port bilge will dig in and cause the ship to sink deeper into the mud. This will also require an increased righting moment, and this at a point when the leverage and the effect of pontoons have been reduced. Thus the winch capacity required for the job should be based upon this consideration. At this point it may be necessary to con-

struct new leverage struts in order to insure adequate righting moment.

c. When the vessel is lying on its side a decision can be made as to how much dredging need be done to facilitate rolling of the ship and to permit the vessel to come upright without too much residual list. By this time the actual strength of the soil will have been pretty well determined so that this decision can be made having in mind the depth of the water in which the ship will be sitting when righted. It will probably be found that enough righting moment can be applied to lift the vessel's center of gravity some in this last part of the righting operation. In that case dredging should be minimized.

13. *Personnel Now Assigned:* A sufficient number of officers and enlisted men have been retained in the salvage organization to carry out the details of the OKLAHOMA work as outlined above. The officers assigned to the salvage aspect of the project are as follows:

a. Lieutenant Haynes, in charge of all diving activities, especially those in connection with a suitable air bubble. Lieutenant Haynes has organized the Diving Section for the great amount of interior work required and has adequate officer supervision for this work. In this connection the Navy Yard civilian divers could be utilized and the Officer-in-Charge (Boatswain Nordquist) might well be assigned to the OKLAHOMA project.

b. Lieutenant Lindstrom, has spent six or eight weeks in design calculations

with the Pacific Bridge Company. He has worked primarily on the air bubble requirements, somewhat on the lift pontoons, etc. Some of these matters should be referred to the Design Section in due course for final review and pertinent recommendations. However, Lieutenant Lindstrom and Pacific Bridge Company have discussed design matters informally with personnel of the Design Section.

c. Lieutenant Greely, in charge of practical work on the ship. He has instituted action for removal of fuel oil from the starboard side, and is making necessary arrangements for other work to proceed.

14. *Equipment Available:* I believe plenty of equipment is available for the OKLAHOMA work. The contractor has the barges and crawler cranes used on the CALIFORNIA and the WEST VIRGINIA and these will be available when needed. Steps have been taken to have the EX-NAVAJO alongside to furnish steam and power as required.

H. N. WALLIN.

cc: Comserfor
 Capt. Yard
 Prod. Off.
 Plan. Off.
 C.O. OKLAHOMA
 Salv. Plan. Off.
 Capt. Hull
 Lt. Comdr. Isquith
 Lt. Comdr. Altland
 Lt. Lindstrom
 Lt. Greely
 Mr. J. Graham, Pacific Bridge Co.
 (2)

APPENDIX G

Ships Present at Pearl Harbor and Vicinity, 7 December 1941

Ships¹ Present at Pearl Harbor² and Vicinity,³ 0800 (Local Time)
7 December 1941

BB	38 Pennsylvania (In drydock)	66 Allen
	43 Tennessee	103 Schley
	44 California ⁴	106 Chew
	48 West Virginia ⁴	357 Selfridge
	39 Arizona ⁴ (1103 officers and men killed)	350 Hull
	36 Nevada	352 Worden
	37 Oklahoma ⁴	353 Dale
	46 Maryland	391 Henley
CL	48 Honolulu	388 Helm
	46 Phoenix	387 Blue
	8 Detroit	386 Bagley
	49 St. Louis	389 Mugford
	50 Helena	390 Ralph Talbot
	7 Raleigh	393 Jarvis
CA	32 New Orleans	392 Patterson
	38 San Francisco	374 Tucker
DD	360 Phelps	139 Ward ³ (Patrolling chan- nel entrance to P.H.)
	349 Dewey	SS 167 Narwhal
	351 MacDonough	169 Dolphin
	355 Aylwin	199 Tautog
	348 Farragut	170 Cachalot
	354 Monaghan	CM 4 Oglala ⁴
	372 Cassin (In drydock)	AM 20 Bobolink
	371 Conyngham	52 Vireo
	375 Downes (In drydock)	31 Tern
	369 Reid	43 Grebe
	370 Case	26 Rail
	373 Shaw (In floating drydock)	13 Turkey
	365 Cummings	DM 22 Pruitt

	21 Sicard	ASR	1 Widgeon
	15 Gamble	AG	16 Utah ⁴
	17 Montgomery		31 Argonne
	20 Preble		32 Sumner
	19 Tracy	AH	5 Solace
	18 Breese	AK	17 Vega ³ (At Honolulu)
	16 Ramsay	AKS	1 Castor
DMS	17 Perry		3 Antares ³ (At P.H. entrance)
	14 Zane		
	15 Wasmuth	AT	13 Ontario
	16 Trever		64 Navajo ³ (12 miles outside P.H. entrance)
PG	19 Sacramento		28 Sunnadin
AD	3 Dobbin		38 Keosanqua ³ (At P.H. entrance)
	4 Whitney		
AV	4 Curtiss		
	8 Tangier	AE	1 Pyro
AVP	4 Avocet	AO	12 Ramapo (Had 4 MTB's on deck & 2 more on dock alongside waiting to be put aboard)
	7 Swan (On marine railway)		
AVD	6 Hulbert		23 Neosho
	11 Thornton		
AR	11 Rigel	AMc	8 Cockatoo
	1 Medusa		9 Crossbill
	4 Vestal		14 Condor
AS	14 Pelias		30 Reedbird

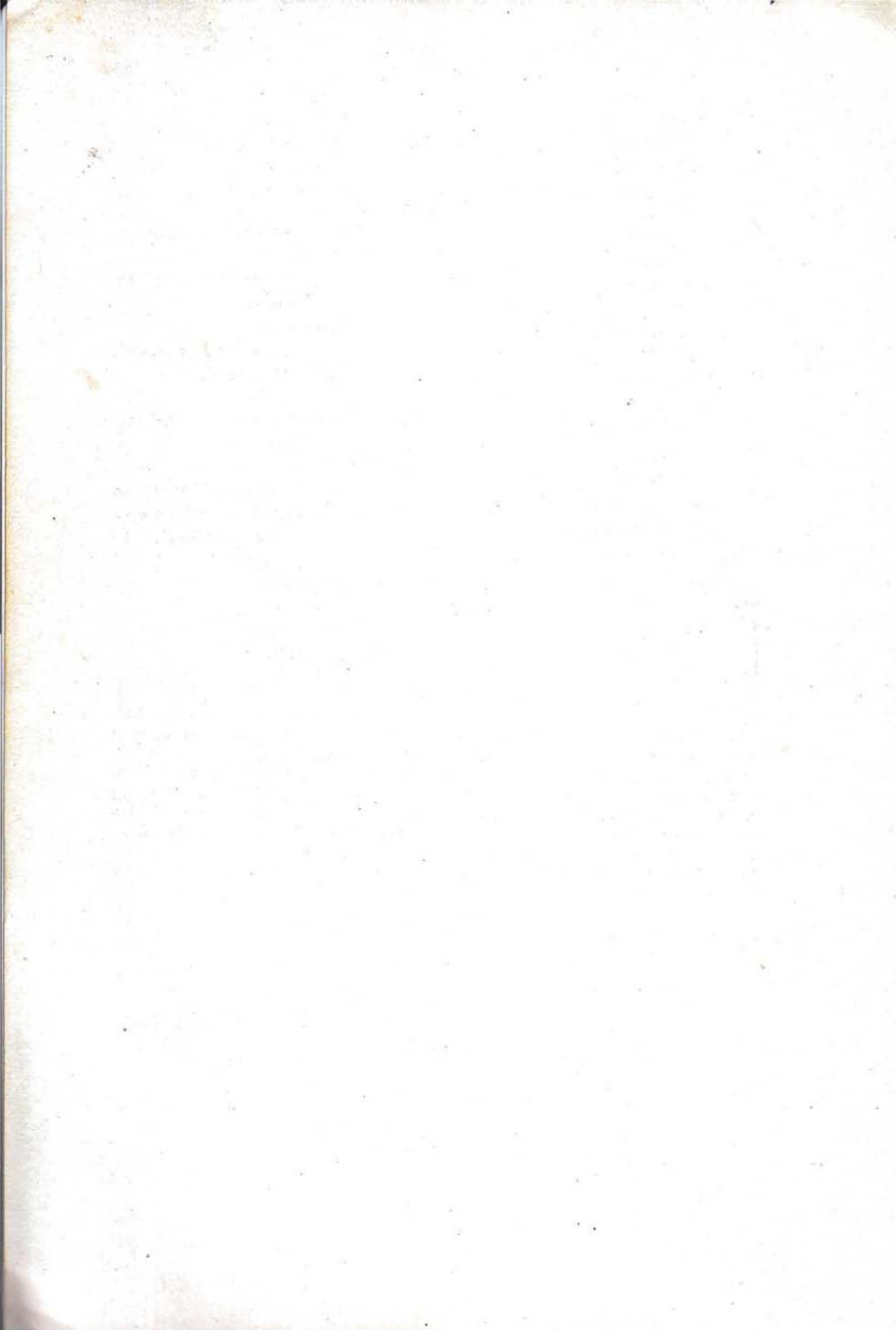
¹ Yard craft assigned to the Fourteenth Naval District, and other small non-commissioned craft, are not included.

² For the purpose of this list, Pearl Harbor is defined as the area *inside* of the nets guarding the harbor entrance.

³ Includes ships within twelve miles of the island of Oahu that were *not* actually within

Pearl Harbor as defined above. Locations of these ships are indicated.

⁴ Indicates ships sunk or destroyed in the Pearl Harbor attack. All of these were later raised and rebuilt except for ARIZONA and UTAH. OKLAHOMA was raised but was not rebuilt.



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