From Luxury Liners to Aircraft Carriers: USS *Wolverine* and USS *Sable*

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This thesis details the complex conversions of two Great Lakes passenger ships into flattop aircraft carriers in 1942 and 1943, and the subsequent training of thousands of pilots aboard the carriers. The entire US naval fleet in 1942 consisted of eight carriers—all of which were desperately needed to fight the Axis powers on the open oceans. To save time and materials, the Navy elected to convert existing ships rather than build new carriers. Lake carriers did not need massive hulls, armaments, elevators and cabins below deck for plane storage and personnel, but they did need realistic carrier operating conditions.

The Great Lakes, especially Lake Michigan, offered wind and wave conditions resembling those found on the open oceans. Navy Pier, in Chicago, provided ideal docking, because it was close to Glenview Naval Air base by air and to Glenview's satellite airfields where the planes were fielded, and pilots were bunked and fed. Hence, the carriers, Navy Pier, and Glenview had a symbiotic relationship; they each needed the other to allow the group to achieve its fullest potential.

In 1942, the Navy requisitioned two of the largest passenger ships on the Lakes, SS *Seeandbee* and SS *Greater Buffalo*. American Shipbuilding Company retrofitted the two ships at their firm's docks at Cleveland and Buffalo. SS *Seeandbee*'s conversion into USS *Wolverine* was completed in four months, but retrofitting SS *Greater Buffalo* into USS *Sable* took five months longer because the Navy decided to experiment with steel, instead of wood, decking.

Converting these ships was challenging. Meeting the Navy's tight schedules proved difficult due to the wartime scarcity of skilled tradesmen, shortages of steel and other raw materials, and safety and security issues. Technical problems, such as designing steel decking, and meeting the Navy's high standards of workmanship governing electrical, lighting, and other fittings also caused delays.

The United States Navy commissioned USS *Wolverine* on August 12, 1942, and USS *Sable* on May 8, 1943. From then until the Navy decommissioned the ships in September 1945, the twin flattops serviced over 136,000 landings and trained over 15,000 pilots. The ships played a vital part in winning the war.

From Luxury Liners to Aircraft Carriers: USS *Wolverine* and USS *Sable*

A Thesis

Presented To the Faculty of the Department of History

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In Partial Fulfillment of the Requirements for the Degree

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by

Sydney M. Swierenga

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Dedication

I want to dedicate this thesis to Sarah Swierenga, Toni Dennis, Kiah Webster, and Robert P. Swierenga who have provided their unwavering support and assistance in encouraging me to complete this labor of love. I wouldn't have finished this crazy rollercoaster ride without them.

I love you all!

"A ship in port is safe, but that's not what ships are built for." – Admiral Grace Hopper

Acknowledgements

First, I want to thank my family for supporting me during this endeavor. This thesis would not have happened without their constant support. My mothers, Dr. Sarah Swierenga and Toni Dennis, were undoubtedly my biggest cheerleaders throughout this entire process from picking a topic to finishing final edits. My maternal grandfather, Robert P. Swierenga, Professor of History Emeritus, Kent State University, Ohio, encouraged me from the outset as well. He helped frame and reorder my material and also lent his keen eye for editing. A Chicago native, he is well acquainted with Navy Pier and had visited Glenview Naval Air Station and Great Lakes Naval Training Center, where his brother, Navy Chaplain Raymond C. Swierenga, completed a tour of duty in the 1960s.

Many specialists guided me in my research on this thesis, including archivists at the National Archives and Naval Archives in Washington, DC, and the Regional National Archives in Chicago. Dr. Wayne Lusardi, state maritime archaeologist with the State of Michigan Department of Natural Resources, was instrumental in helping me explore potential thesis topics about the Great Lakes' role in World War II. I was immediately intrigued by his description of the Lake Michigan paddlewheel aircraft training carriers. Bob Ellis, former president and CEO of the Kalamazoo Air Zoo, and Stephanie Staley, director of the Grand Traverse Lighthouse Museum, shared their vast knowledge of naval aviation was invaluable in the early stages of my research. Later, Christy Kincaid from the Air Zoo and Ashley Deming from the Lake Michigan Maritime Museum in South Haven, MI, assisted me in photographing the scale model of USS *Wolverine* while sharing their knowledge of *Wolverine* and their connections with the Michigan maritime community. Martin Tuohy, archivist/collections manager for the National Museum of the American Sailor at Great Lakes Naval Training Center in Lake Bluff, Illinois, explained the

processes of acquiring and restoring artifacts from World War II. Finally, I learned a great deal about naval aircraft wrecks, bases, and ships during my internship at the Navy History and Heritage Command in Washington, DC, under the direction of Agustin Ortiz, historic preservation & outreach coordinator of the Underwater Archaeology Branch, and Dr. Alexis Catsambis, maritime archaeologist and cultural resource manager. My internship gave me key insights about my own thesis research.

I want to acknowledge and thank Dr. Bradley A. Rodgers, maritime studies professor emeritus at ECU, who served as my original thesis advisor and mentor. He encouraged me to pursue this topic, and I appreciated that he shared his expertise in Great Lakes shipping history, Professor M. Todd Bennett graciously stepped in to provide essential direction and advice that enabled me to complete the thesis. His extensive knowledge of the Second World War era nudged me to place this particular subject in its broader context. I also want to thank my committee members, Dr. Lynn Harris and Dr. Wade Dudley, for their willingness to jump on board a thesis with a topic with which they might not have been familiar.

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Abbreviations

ACV	Aircraft Carrier, Escort; Auxiliary Aircraft Carrier or Tender
BB	Battleship
Btu/lb	BTUs per pound
BuNo	Bureau Number
CQTU	Carrier Qualification Training Unit
C&B	Cleveland & Buffalo Transit Company
Cmdr.	Commander
CV	Aircraft Carrier
CVE	Aircraft Carrier, Escort
D&C	Detroit & Cleveland Navigation Company
D-V(S)	United States Navy Reserve designation for deck officers, commissioned and warrant
F4F/FM-2	"Wildcat," single-engine Navy fighter (VF), manufactured by Grumman/General Motors
F4U	"Corsair," single-engine Navy fighter (VF), manufactured by Chance Vought
F6F	"Hellcat," single-engine Navy fighter (VF), manufactured by Grumman
FBI	Federal Bureau of Investigation
gpm	Gallons per minute
GI Bill	Government Insurance Bill
IX	Miscellaneous Unclassified (for any unclassified ships in the Navy)
LSO	Landing Signal Officer
Lt.	Lieutenant

MBES	Multibeam Echosounder
NARA	National Archives and Records Administration
NOAA	National Oceanic and Atmospheric Administration
NAS	Naval Air Station
NASTC	Naval Air Station Traverse City
NHHC	Naval History and Heritage Command
NRAB	Naval Reserve Air Base
NSTC	Naval Service Training Command
NS	Naval Station
NTC	Naval Training Center
NTS	Naval Training Station
PBM	“Mariner,” twin-engine Navy patrol-bomber (VPB), manufactured by Martin
psi	Pounds per inch
RADAR	Radio Detection and Ranging
RAF	Royal Air Force
RAAF	Royal Australian Air Force
SB2U	“Vindicator,” single-engine Navy scout-bomber (VSB), manufactured by Vought-Sikorsky
SBD	“Dauntless,” single-engine Navy scout-bomber (VSB), manufactured by Douglas
Sgt.	Sergeant
SNJ	“Texan,” Navy training plane (VN), manufactured by North American
STAG-1	Special Task Air Group One
SS	Steamship

SupShips	Supervisor of Shipbuilding
TBF/TBM	“Avenger,” single-engine Navy torpedo-bomber (VTB), manufactured by Grumman/General Motors
TDN	Twin-engine Navy drone manufactured by Brunswick-Balke
TDR	Twin-engine Navy assault drone, (VTD) manufactured by Interstate
U-boat	German submarine used in World War I or World War II.
USAAF	United States Army Air Forces
USN	United States Navy
USS	United States Ship
VC	Composite Aircraft Squadron
VF	Fixed Wing Fighter Squadron
VP	Fixed Wing Patrol Squadron
WASP	Women Airforce Service Pilots
WAVES	Women Accepted for Volunteer Emergency Service (United States Navy Women’s Reserve)
WWII	World War II
WTTW	Chicago TV Station, Channel 11

Introduction

As Chicago River Boat Tours pass by Navy Pier, docents take the opportunity to talk about long-forgotten, jerry-rigged carriers with postage-stamp-sized flight decks that enabled World War II-era pilots to practice takeoffs and landings at "sea." Mistakes and accidents sent many planes into the water, and wrecks still dot the lakebed. The Navy has located some of them in their watery graves, and they have recovered and restored or displayed a few of them, but the full story of this creative training program for naval pilots has not been told.

My thesis will describe the important role these two jerry-rigged carriers played in WWII. USS *Wolverine* and USS *Sable* underwent extensive transformations in order to become training carriers to help support the war effort from the home front. Unfortunately, the Navy scrapped both ships and left them long forgotten. Recently, though, the general public and the historical community have become interested in these remarkable ships again. Primary documentation is scarce, consisting mostly of photographs, a few films, and old newspaper articles, along with some declassified military documents. Secondary analysis is limited as well. Several books, including Paul Somers's, *Lake Michigan's Aircraft Carriers*[1], and the *Dictionary of American Naval Fighting Ships*[2] mention the two carriers and reprint valuable photographs housed in the Naval and Marine Records in the National Archives in Washington, D.C., and the National Oceanic and Atmospheric Administration (NOAA) archives in Alpena, Michigan. However, the information is general and can also be found online. Intended for casual readers, the books and websites lack detail about the conversion process and the activities of the carriers.

[1] Paul M. Somers, *Lake Michigan's Aircraft Carriers* (Charleston, SC: Arcadia, 2003).

[2] United States Navy, *Dictionary of American Naval Fighting Ships* (Naval History Division, Washington, DC, 1976), 6:217; 8:443.

While the books and online sources make the topic more interesting to the general reader, they only have moderate value in terms of citable research. The books, particularly Somers's, provide brief histories of the ships that highlight some interesting facts about each ship. However, they fail to delve beneath the surface to fully examine the incredibly rich and unique history of these two vessels. There is no in-depth scholarly research on the conversion of the two paddle-wheel training carriers, which is why this thesis is important. I have located the original source materials from several archives, and have woven together a detailed historical analysis of the process the Navy underwent to work with several stakeholders—e.g., government officials, engineers, contractors, local authorities, etc.—in order to get the ships retrofitted as quickly and inexpensively as possible. My analysis extends the current historiography by providing the underlying details that the general references describe only at an overview level, including the actual conversion timelines, the dynamic communication environment between all of the stakeholders, and the complex conversion environment (e.g., weather, security).

This thesis on the conversions of USS *Wolverine* and USS *Sable* training carriers makes a significant contribution to the maritime history on this important topic. Given the secrecy of the conversion work, newspapers did not report on the details. Naval archival documents are the main source of information. My work will show, for the first time, the complexities of the retrofitting process completed under the pressing wartime exigencies of material and labor shortages, engineering difficulties, and logistical challenges. It notes ways in which these carriers contributed to the American war effort by improving pilot training. It also shows the impact these training carriers had on the war effort by situating the ships' conversion efforts within the context of the then-active battles occurring in the Pacific theater. And, importantly, it discusses the effects the ship conversions had on Chicago area landscapes and communities—e.g., Naval

Air Station Glenview, Naval Training Station Great Lakes, Navy Pier, and so on—providing a view that effectively extends the existing research beyond the traditional focus on pilot training initiatives and training aircraft.

Research Questions

Two primary research questions guide this work. First, how were SS *Seeandbee* and SS *Great Buffalo* converted into make-shift aircraft carriers and recommissioned as USS *Wolverine* and USS *Sable*? And, second, what contribution did these training carriers make to the war effort? Tertiary questions are what impact did the training carriers have on the Carrier Qualification Training Unit (CQTU) program? What effect did the training carriers and associated CQTU program have on the Chicago-area naval air stations and landscape? And, how did the US Navy aircraft carrier research program, which included comparison testing of the two training carriers, affect future aircraft carrier design and construction?

Research Methods and Sources

The research methodology is typically historical, relying on military documents, postcards, film reels, and other primary and secondary sources to document the step-by-step process used to convert SS *Seeandbee* and SS *Great Buffalo* into USS *Wolverine* and USS *Sable*, respectively. The painstaking process involved removing wooden cabins on passenger steamers and relocating smokestacks from the center of the deck to the side, all to create space for an improvised flight deck that resembled a sea-going carrier.

Chicago's Navy Pier has a museum with artifacts from the vessels and the reconstruction of the pier itself to accommodate the ships. The US National Archives and Records Administration in Washington, DC, and the Chicago Regional National Archive house some two thousand pages of deck logs and operational accounts. These records include ship lines and

blueprints, photographs, accident reports, and communications between naval officials and contractors concerning operations of the vessels.

A&T Recovery, Inc., a salvage company contracted by the Navy, has recovered some of the downed aircraft, many of which have been restored and placed in museums and airports around the county. A few of the restored planes, such as a Wildcat, are currently undergoing restoration at the Kalamazoo (Michigan) Air Zoo, where I met with the director (now former director Bill Ellis). The Air Zoo also holds a model of USS *Wolverine*, which I photographed in order to attempt to create a 3-D photogrammetry model for online viewing. Grand Traverse Lighthouse Museum, located in Michigan's Leelanau State Park, also has an exhibit on the carriers, along with a Lego® replica of USS *Wolverine*. The museum houses a few artifacts from the vessels, such as Tim Clagett's logbook as a naval aviator, an aircraft parking block, and scraps of metal from downed planes. The exhibit is mostly focused on the TND-1 drone testing program conducted off USS *Sable* near the point of the Leelanau Peninsula in 1943. Director Stephanie Staley was very helpful, explaining the collection and her research related to the exhibit. Finally, I obtained copies of the original pre-conversion images of both vessels from the library in Alpena, Michigan.

Private collections and public museums house the majority of artifacts and aircraft related to the wartime training carriers. Lake Michigan's icy cold water holds the many remaining aircraft. The Navy has recovered several of the planes over the years. However, I have been unsuccessful in obtaining copies of site reports for recovered planes from the Navy and A&T Recovery. A&T Recovery, the most significant source of knowledge regarding the precise location of some of the wrecks, reportedly considers its data to be commercially privileged.

Thankfully, the Navy has recently conducted their own surveys of the assemblage of aircraft in the lake, which will help address this issue.

The Chicago Marine Heritage Society produced a film about the aircraft carriers that includes multiple pilot interviews and behind-the-scenes looks at aircraft recovery efforts in Lake Michigan.[3] I have also been in communication with Martin Tuohy, the Archivist/Interim Collections Manager of the National Museum of the American Sailor, Naval History and Heritage Command. Tuohy has also worked at the National Archives in both Washington, DC, and Chicago, and he is currently leading a collections restoration of many artifacts from the time period around World War II. These may or may not be related to the carriers because much of the acquisition documentation and information about these artifacts have been lost or misplaced. As of the date of publishing, Tuohy and I have yet to find any artifacts directly linked to the two carriers in the collection under his care.

Thesis Layout

Organized chronologically, this thesis traces the conversion process and its impact on the American World War II effort. Chapter 1 discusses the background history of naval flight operations, the evolution of aircraft carriers, and why the Navy chose the Great Lakes for the training site. Chapter 2 goes into greater detail, following the timeline of the conversion of SS *Seeandbee* to USS *Wolverine*. Chapter 3 highlights the differences between USS *Wolverine* and USS *Sable* via a closer look at the conversion of SS *Greater Buffalo* to USS *Sable*. Chapter 4 discusses how the Navy used the vessels, the types of planes the Navy used, the typical routes the ships sailed, and the impact the two vessels had on the Chicago area and war in the South

[3] *Heroes on Deck: World War II on Lake Michigan*. Directed by John Davies. Chicago, IL: John Davies Productions, and Moshman Productions, 2016. DVD.

Pacific. The conclusion brings the story to a close, discussing how the public remembers the ships today and suggesting areas of future research.

Chapter 1: Naval Aircraft Pioneers

When the Wright Brothers proved in 1903 that aircraft could fly, they anticipated that planes would be used mainly for air transportation. Prevailing military minds quickly adapted planes for warfare, which prompted the Second International Peace Conference, held in 1907 in The Hague, Netherlands, to add a proviso to the laws of war and war crimes adopted at the first Hague Convention in 1899, that banned the "discharge of projectiles and explosives from balloons or by other new methods of a similar nature,"[4] including the new-fangled aircraft. Signatory nations adopted the 1907 Convention in the form of a treaty. The US Senate ratified the treaty on March 18, 1907, and President Theodore Roosevelt signed the document on March 10, 1909. The Hague conventions were designed to limit civilian casualties and prompt combatants to fight humanely, e.g., avoiding bombing undefended cities without warning, except in cases of assault, and avoiding hospitals, buildings dedicated to religion, art, science, or charity, historic monuments, etc.[5]

Germany violated many of the rules agreed upon at the Hague Conventions in World War I. Kaiser Wilhelm II specifically rejected the ban on military aircraft and employed Zeppelins in reconnaissance and planes in combat, invading Belgium and Luxembourg in August 1914. Japan, a non-signatory nation to the Hague Conventions, lent the converted freighter, *Wakamiya*, to assist the German siege of the Chinese city of Tsingtao. The freighter successfully launched a seaplane from its deck that dropped small bombs on the city on September 6, 1914.[6] All the

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[4] James B Scott, *The Hague Conventions and Declarations of 1899 and 1907* (New York: Oxford Press, 1915), 220.

[5] Scott, *Hague Conventions*, 220; Percy Bordwell, *The Law of War between Belligerents: A History and Commentary* (Littleton, CO: F. B. Rothman, 1994), 287; Javier Guisández Gómez, "The Law of Air Warfare," *International Review of the Red Cross*, 38, no. 323 (June 30, 1998), 348.

[6] Edwin Bickford Hooper, *United States Naval Power in a Changing World* (New York: Praeger Publishing, 1988), 123; Barrett Tillman, *On Wave and Wing: The 100-Year Quest to Perfect the Aircraft Carrier* (Washington, DC: Regnery History, 2017), 7.

major belligerents similarly ignored the rules in the heat of war due to the realities of war. Warring nations, whether they signed the convention or not, chose which parts of the treaty to honor.

Aircraft played an important role in the war, first as "eyes in the sky" and then as bombers and attack fighters. At the beginning of World War I, Lt. Watteau and Sgt. Breguet used aircraft for reconnaissance. This helped French forces win the Battle of the Marne, because they were able to warn their ground command of German troop movements. Soon after that, Sgt. Frantz and his mechanic, Quenault, mounted a machine gun on their Voisin aircraft, which is considered to be the first victory for aerial fire.[7] Military engineers and pilots soon developed fighters and bombers. Aerial dogfights between American and German "Aces" are legendary. While airplane forays were more tactical than strategic in the Great War, they foreshadowed future wars. In World War I, airplanes were critical in controlling the skies and hence the battlefields (fig 1.1).

[7] Gómez, "Law of Air Warfare," 348.

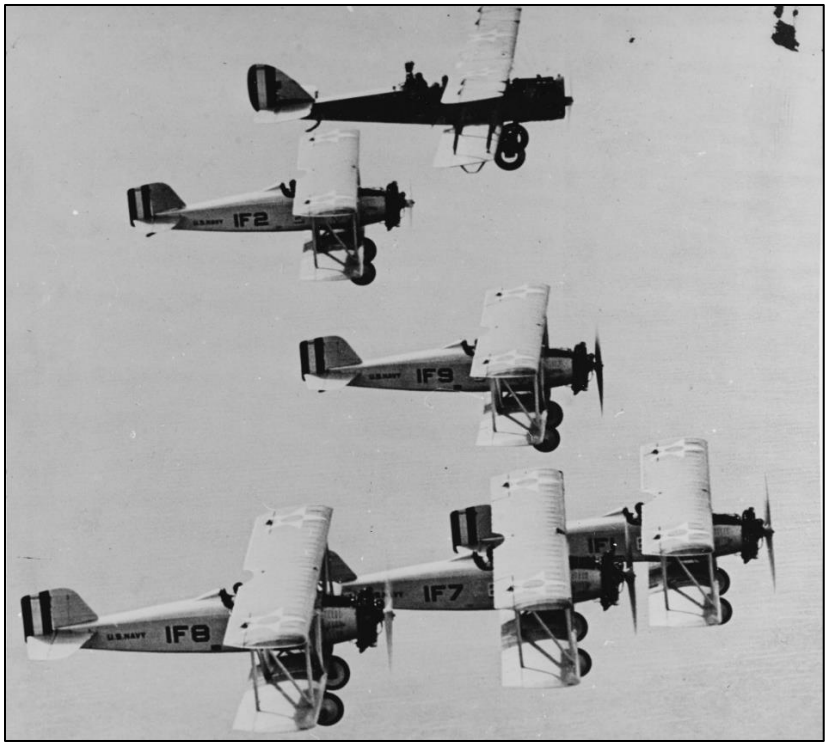

Figure 1.1. The single aircraft at the top of this photograph is one of the DE HAVILLAND DH-4 type aircraft used by the US Navy during the 1920s. The other aircraft are naval aircraft factory TS-1 fighter planes (Courtesy, Naval History and Heritage Command).

After the war, military planners, convinced that the future of warfare was in the air rather than on the seas, focused on developing airplanes and boosting their firepower. Soon they conceived of combining planes and ships with aircraft carriers. Admiral Henry T. Mayo, Commander-in-Chief of the US Atlantic Fleet in 1918, first recommended to Navy brass the necessity of airplanes for reconnaissance, antisubmarine patrols, and escort duties.[8]

The General Board, an advisory body of senior admirals similar to the general staff that Congress had recognized in 1916, studied Mayo's recommendation. This advisory body was reliable to "deliberate selflessly and objectively on matters ranging from strategy to ship characteristics."[9] The Board agreed with Admiral Mayo that aviation must become an essential

[8] Samuel E. Morison, *History of United States Naval Operations in World War II* (Boston: Little, Brown, 1954), Vol. 1:xlvii-xlviii.

[9] Richard Frank, *Guadalcanal: A Definitive Account of a Landmark Battle* (New York: Random House, 1990), 4.

part of the fleet, capable of operating all over the globe. A fleet aviation arm would ensure air supremacy and enable the US Navy to meet "on at least equal terms" any possible enemy, and would put the United States in its "proper place as a naval power."[10] The Board sought to counter a belief among the public and in Congress that the military budget should be cut. After all, the Great War "to end all wars" would obviate more military spending.

Naval Disarmament

The world's major naval powers—led by Britain, United States, and Japan—had other ideas. They began a naval arms race, which induced the United States to convene nine naval powers at the Washington Naval Conference of 1921-1922, in hopes of slowing the naval buildup and forestalling another world war. The conference participants drafted several major and minor treaty agreements. While they placed no limits on land forces, the five signatories (Great Britain, United States, and Japan, plus France and Italy) agreed to limit total tonnage of capital ships—battleships and aircraft carriers. But they did not place limits on submarines, destroyers, and cruisers. Some signatory nations agreed to dismantle existing ships to meet the limits. Germany and Russia did not participate in the conference.[11]

The naval disarmament treaty was the first in a series of conferences that curtailed United States construction programs in various types of warships. At the same time, Japan, in violation of the treaty, and Germany increased their naval force by building ships with advanced designs. Meanwhile, the US Congress, conscious of public opinion, failed to fund new ships, even ones the treaty allowed, such as destroyers, cruisers, and submarines.[12]

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[10] Morison, *Naval Operations*, xlviii.

[11] Hooper, *Naval Power*, 137-39; Tillman, *On Wave and Wing*, 21-22.

[12] David Hobbs, *A Century of Carrier Aviation: The Evolution of Ships and Shipborne Aircraft* (Annapolis, MD: Naval Institute Press, 2009), 99; Morison. *Naval Operations*, xlvii-xlviii; Hooper, *Naval Power*, 137-39.

The US Joint Army-Navy Board Aircraft did not limit the development of air power, and they continued to increase that capacity. The joint board directed the Army Air Service and Department of the Navy to test the effectiveness of aerial weapons by bombing obsolete battleships and ex-German vessels off the Virginia capes. The board concluded that it was imperative for national defense to fully integrate naval aviation and the fleet. The board also recommended building aircraft carriers to the maximum size and speed allowed by the 1921 Washington Treaty.[13]

Another conference at The Hague sought to limit the use of aircraft in wartime by drafting the Hague Rules of Air Warfare (1923). The draft agreement, which was never legally binding, distinguished private from military aircraft, and allowed the latter to bomb "military forces; military works; military establishments or depots; factories constituting important and well-known centres engaged in the manufacture of arms, ammunition, or distinctively military supplies; lines of communication or transportation used for military purposes."[14] The agreement also allowed the bombardment of cities, towns, villages, dwellings, or buildings in direct support of land operations, but the pilots had to have regard for "the danger thus caused to the civilian population" (Article XXIV, paragraphs 2 and 4). The US Navy, which participated in this conference, agreed to the protocols and implemented the rules.[15]

Military Mindset: The Evolution of the Role of Carriers

Given the use of aircraft in World War I, it was clear that they would have a significant role in future conflicts because of their attack range and maneuverability. The military began

[13] Alfred W. Johnson, *The Naval Bombing Experiments Off the Virginia Capes: June and July 1921, Their Technological and Psychological Aspects* (Washington, DC: Naval Historical Foundation, 1959), 22; Hooper, *Naval Power*, 136.

[14] "The Hague Rules of Air Warfare: The Hague, December 1922-February, 1923", in *The Law of War: A Documentary History*, ed. Leon Friedman, 1:437-49 (New York: Random House, 1972), 1:440.

[15] "Hague Rules," 1:440-41; Hooper, *Naval Power*, 136.

experimenting with ship-based aircraft in earnest as early as 1910, when Eugene Ely flew a Curtiss bi-plane off the deck of USS *Birmingham* in Norfolk, Virginia.[16] The wooden ramp was only eighty-three feet long and sloped slightly downward to enable aircraft to reach takeoff speed. A year later in San Francisco Bay, Ely successfully landed an airplane on USS *Pennsylvania* on a wooden platform on the stern. The platform had fifteen ropes to snag the plane's tail hooks. The plane bounced over the first ten ropes before it finally snagged a few and was dragged to a stop.[17]

The Navy did not acquire its first aircraft carrier until 1922, when USS *Jupiter,* the Navy's first surface ship with an electrical propulsion system, was converted into USS *Langley* (CV-1). Equipped with the world's first arresting gear system, USS *Langley* enabled aircraft to land on the deck after flight. It was the only carrier in the fleet until 1927, when the Navy launched USS *Lexington* (CV-2) and USS *Saratoga* (CV-3). The Navy modified USS *Langley* in 1936 into a seaplane tender, while retaining its original capabilities to train and ferry airplanes and pilots. USS *Langle*y saw extensive action in the Pacific theater until early 1942, when Japanese bombers crippled it and the captain ordered it scuttled.[18]

At the onset of World War II, the United States only had seven commissioned aircraft carriers—four in the Atlantic (USS *Ranger,* USS *Yorktown*, USS *Hornet,* and USS *Wasp*), and three in the Pacific (USS *Lexington*, USS *Saratoga,* and USS *Enterprise*). After Pearl Harbor, the Navy assigned all carriers, except USS *Ranger,* to the Pacific theater. Less than a year later, Japanese forces had sunk four of these carriers—USS *Lexington* at the Battle of the Coral Sea, USS *Yorktown* at the Battle of Midway, USS *Wasp* at the Battle of Guadalcanal, and USS *Hornet*

[16] Paul M. Somers, *Lake Michigan's Aircraft Carriers* (Charleston, SC: Arcadia Publishing Co., 2003), 9; Tillman, *On Wave and Wing,* 2-3.
[17] Tillman, *On Wave and Wing*, 4.
[18] Hooper, *Naval Power*, 134; Tillman, *On Wave and Wing*, 21.

at the Battle of Santa Cruz in the Solomon Islands. The Japanese severely damaged USS *Saratoga* and USS *Enterprise* causing the Navy to send the two ships into dry dock for repairs (fig 1.2).[19] Due to these significant losses, the United States faced the challenges of repairing the damaged ships, building additional carriers and aircraft, and training pilots and sailors.[20] The American people were up to the challenge of building more carriers and aircraft, but it fell to the Navy to train pilots and crew in order to use the complicated machines effectively.

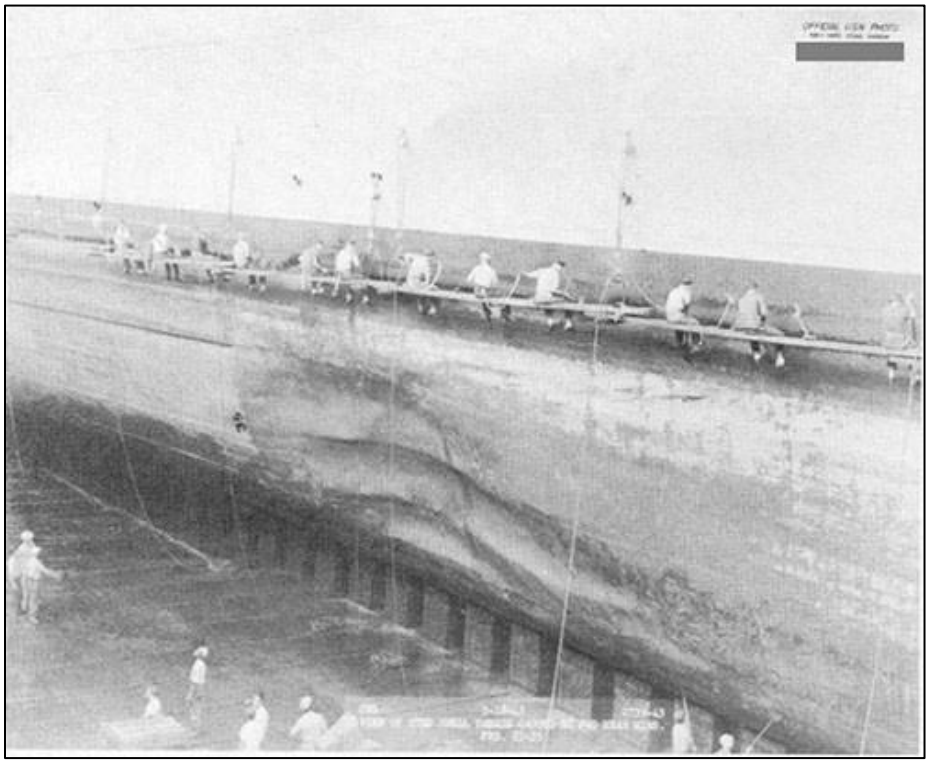

Figure 1.2. Second near-miss. View of damage to shell frames 23-35 starboard of USS *Enterprise* (CV-6) (Courtesy, Naval History and Heritage Command).

Why the Great Lakes?

With the war heating up in Europe in 1939 and 1940, many US officials, especially the Naval High Command, grew concerned that growing conflict would draw the United States into the war. This time, the conflict would be a two-front war on both oceans, with Japanese forces

[19] Clark G. Reynolds, *The Fast Carriers: The Forging of an Air Navy* (New York: McGraw-Hill, 1968), 20-21.

[20] "Plane Carriers," *Chicago Tribune*, March 16, 1942, 10.

mobilized in the Pacific and German U-boats hunting merchant vessels in the Atlantic. The attack on Pearl Harbor by Japanese naval and air forces on December 7, 1941, shocked the United States. The very next day the United States of America declared war on Japan and Germany and officially entered World War II.

Before Pearl Harbor, the naval high command began brainstorming ideas to provide training for aircraft carrier crew and pilots. With Japanese ships a potential threat to the West Coast, the Navy searched for safe waters to harbor aircraft carriers that they could use as training vessels. After Pearl Harbor, volunteers, particularly from the midwestern states, were flooding recruiting stations to enlist. These factors induced the Navy to place the headquarters of the Carrier Qualification Training Unit (CQTU) program at Lake Michigan.

Naval Training Station Great Lakes

Well before World War I, military recruiters noticed that a surprising number of naval recruits were Midwesterners who had fought in the Spanish-American War. In the 1890s, Illinois Congressman George Foss suggested setting up a naval training station somewhere in the Midwest, so recruits did not have to travel to the coast to train. President Theodore Roosevelt conceived the Great Lakes station, and the citizens of Chicago and Illinois wholeheartedly supported it. After much debate and the examination of various sites, the Navy chose Lake Bluff, Illinois, a port on Lake Michigan north of Chicago, to host the training base (fig.1.3).[21]

Naval Training Station Great Lakes officially opened on July 1, 1911 and the Navy soon expanded it. By 1916, the Navy offered recruit training in four specialized schools—radio, signal, band, and hospital corpsman. Before the nation entered World War I in April 1917, NTS

[21] Therese Gonzalez, *Great Lake Naval Training Station* (Charleston, SC: Arcadia Publishing, 2008), 7.

Great Lakes was receiving an average of 220 recruits per month, which number jumped to 9,000 per month after joining the war effort. While the pre-war station had only 39 buildings, it had 775 by the end of the war and personal on the base reached 45,000.[22]

Figure 1.3. Camp tents. Camp Paul Jones is seen here around 1917 from the administration building. The Navy Relief Society, Building 55, is under construction in the foreground. The background shows the hundreds of tents erected on a plot of land immediately north of the main station. The public works building has yet to be constructed on the vacant plot of land immediately east of Building 55 and west of Quarters J, which is barely visible at the far right of the photograph (Courtesy of the Illinois State Historical Library, via Gonzales, 2008).

Before WWII, Navy brass remained less than enthusiastic about the idea of ship-based aircraft, but Rear Admiral William A. Moffett was an exception. During World War I, he commanded NTS Great Lakes and oversaw the pilot training program.[23] After the Armistice in 1919, Moffett was promoted to commander of USS *Mississippi* (BB-41), a battleship in the

[22] Gonzalez, *Great Lakes*, 71; "Naval Station Great Lakes: Your Navy in the Midwest," Commander, Navy Region Mid-Atlantic, Naval Station Great Lakes, https://www.cnic.navy.mil/regions/cnrma/installations/ns_great_lakes.html.

[23] Gonzalez, *Great Lakes*, 21.

Atlantic fleet. He took this opportunity to design airplane fly-off platforms atop the ship's twelve-inch gun turrets. Moffett was a key figure in the administrative battle among the armed forces to keep naval aviation separate from army aviation, which remained a highly contested issue up to World War II. Moffett also developed relationships between the Navy and rising aircraft companies—Boeing, Vought, and Douglas, among others.[24]

The rapid expansion at the Great Lakes base put Capt. William Moffett in a tight spot; he had more recruits than he could house. Using the main station as a model, he divided his men into self-contained units, each with 1,726 men, along with an administration building, instructional building, drill hall, galley, barracks, dispensary, and heating plant. In addition to hiring construction firms to build new barracks, Moffett recruited sailors with construction experience to drill at night and do construction work during the day. These sailors became the 12th Regiment (Public Works). The first of the new schools at the station trained company commanders to lead the flood of new enlistees. Other schools trained specialties, such as coxswains, quartermasters, gunners' mates, merchant marine police, aviation quartermasters, machinists' mates, armorers, and aviation officers.[25]

After the war, between 1918 and 1927, the US government drastically cut military spending. The Navy shrank the NTS Great Lakes from 1,200 to 495 acres and razed several temporary buildings. They retained only sixty-three permanent buildings, including quarters for officers and petty officers. In the Warren G. Harding administration (1921-25), Congress increased military funding, which allowed the Great Lakes station to reestablish recruit training

[24] Gonzalez, *Great Lakes*, 71.
[25] Gonzalez, *Great Lakes*, 21.

for 1,500 sailors. This expansion was mostly focused on general training, but one special school was for training aviation mechanics.[26]

Great Lakes operations continued through 1932, when the Great Depression led President Herbert Hoover (1929-1933), in a cost-saving step, to rotate one-third of the fleet into reserve status annually. For further savings, the Navy moved the Great Lakes Aviation Mechanics School to Norfolk, Virginia, which left only a Marine Corps detachment to guard the Great Lakes station. The locals again pushed the government to reopen the station and, in 1935, they succeeded. The station flourished when President Franklin Roosevelt (1933-1945) began preparing the United States for entering another world war.[27]

Naval Reserve Aviation Base Great Lakes

In September 1923, the US Naval Reserve Aviation Base Great Lakes (NRAB Great Lakes) was established at the Great Lakes Naval Station under the command of Lt. Richard Byrd. The training program primarily used seaplanes and, later, several land-based aircraft. This program would not have survived the Great Depression without support from local Chicagoans, notably Philip K. Wrigley, son of Wrigley Company founder William Wrigley Jr., a company world-famous for its chewing-gum, and owner of the Chicago Cubs baseball team. Men who served in the reserve were mostly from the Chicago area with most of the pilots flying for commercial airlines.[28]

As the planes became heavier and faster, the short runway at NRAB Great Lakes became obsolete. In late 1936, after an extensive search, the Navy department decided to lease the Curtiss Reynolds Wright Airport in Glenview, Illinois, which lay ten miles inland (fig. 1.4).

[26] Gonzalez, *Great Lakes*, 51.
[27] Gonzalez, *Great Lakes*, 51.
[28] Beverly Roberts Dawson, *Glenview Naval Air Station* (Charleston, SC: Arcadia Publishing, 2007), Ch. 1.

Initially, the lease included only the northern three-fifths of the single hanger, nicknamed Hanger One. Workers modified the hanger to add storerooms and carpenter and engine repair shops. When the Great Lakes aviation program was transferred to Glenview in May of 1937, Lt. Comdr. G. A. T. Washburn assumed command of the new facility, named NRAB Chicago.[29]

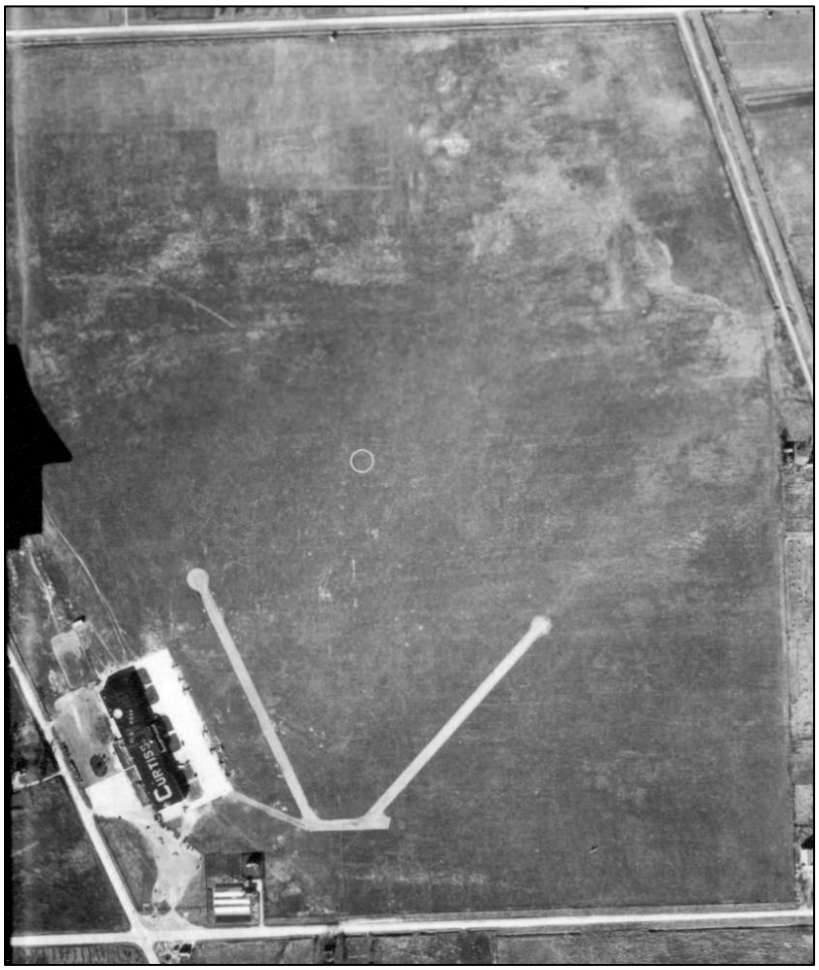

Figure 1.4. An 11/15/38 aerial view of Curtiss-Reynolds Field (Courtesy, Access IL Historical Aerial Photography collection, via Chris Kennedy).

NRAB Chicago/NAS Glenview

The Navy classified NRAB Chicago as an "E," or elimination base. Recruits for this pilot cadet program were advanced students from ages twenty to twenty-eight, with at least two years of college and able to pass a rigorous physical exam. The Navy swore in eligible recruits as

[29] Dawson, *Glenview Naval Air Station*, 25.

seaman second class. If a cadet could successfully fly solo after ten hours of ground school and dual instruction, he was then eligible to advance to the base at Pensacola, Florida, where he could earn his Navy Wings of Gold. Some cadets who failed fight training could apply for training as mechanics or radio signal operators.

Glenview becomes "Another Pensacola"

After the Japanese attack on Pearl Harbor and America's swift declaration of war against the Axis powers, enlistments swelled at NRAB Chicago and the Navy decided to buy the private Glenview airfield and convert it into the largest inland air base in the country. In April 1942, the Navy formally announced its plan to create the biggest inland naval training camp on a 1,000-acre site ten mile from Lake Michigan. The location was the small town of Glenview, Illinois.[30]

The Navy dubbed the base "another Pensacola," because it would take over a job previously done at the great Florida air base, that is, to give cadet recruits their initial training and then carrier flight operations training. Pensacola would then provide final training before deployment. Congress allocated $8 million to construct hangers, barracks, and runways, and expected it to be completed by September, a mere five months away. Upon completion, the Glenview field would have the equivalent of 125 miles of paved runways.[31]

By June 1942, the Navy was training hundreds of young airmen. The ranks of air cadets swelled because the air force lowered enlistment requirements to any eighteen-year-old with a high school diploma, with or without any flying experience. Before coming on base, new recruits studied three months at a university induction center, followed by 85 to 100 hours of instructions over another three months on the base, before they could actually get into cockpits.[32]

[30] "Biggest Naval Training Camp is Far Island," *Columbus Telegram* (Columbus, NE), June 1, 1942, 2.
[31] "Biggest Naval Training Camp."
[32] "Biggest Naval Training Camp."

In late September, three naval admirals came to inspect the new base. The Chicago *Daily Herald* described the Naval brass entourage as "more Navy rank, gold braid, and decorations than have ever previously been seen at Glenview."[33] They performed a white glove inspection prior to the big announcement. On October 1, 1942, the Navy designated the base as headquarters of the Naval Air Primary Training Command. On New Years' Day 1943, the Glenview base "grew up," so to speak, as a full-fledged station, when Comdr. Washburn, commanding officer at Glenview, announced that Navy Secretary Frank Knox had designated the base as Naval Air Station Glenview (NAS Glenview). The designation "Naval Air Station" signified that Glenview had acquired full stature among the Navy's regular aviation training centers, such as at Norfolk, Jacksonville, and San Diego. They deleted the word Chicago to avoid confusion with the new Navy installation on Navy Pier in downtown Chicago.[34]

NAS Glenview, given its location in the Midwest, served as the central source for materials for the entire country, and it had access to any repair and maintenance items needed by its pilots and training vessels. Nearby Navy Pier hosted the new Naval Aviation Mechanics School, where trainee mechanics could service the training planes. Within months of opening Glenview, the Navy purchased another 1,100-acre tract in nearby Arlington Heights, Illinois, for a second airfield, to operate in conjunction with Glenview (fig. 1.5). Again, they constructed a hanger, runways, barracks, and a mess hall post haste. One of the station's training squadrons was based at Arlington Heights.[35]

[33] "Admirals Tour Glenview NAS," *Chicago Daily Herald*, September 29, 1943, 6.

[34] "Glenview Air Base Grows Up; It's Now Full-Fledged Station," *Chicago Tribune*, January 1, 1943, 7; "Glenview Base Now Full-Fledged Naval Air Station," *Chicago Daily Herald*, January 8, 1943, 4.

[35] "Authorized New Navy Air Field on 1,000 Acres," *Chicago Tribune*, January 12, 1943, 4; "To Build Hanger, Barracks at Arlington Navy Airport," *Chicago Daily Herald*, January 25, 1943, 1.

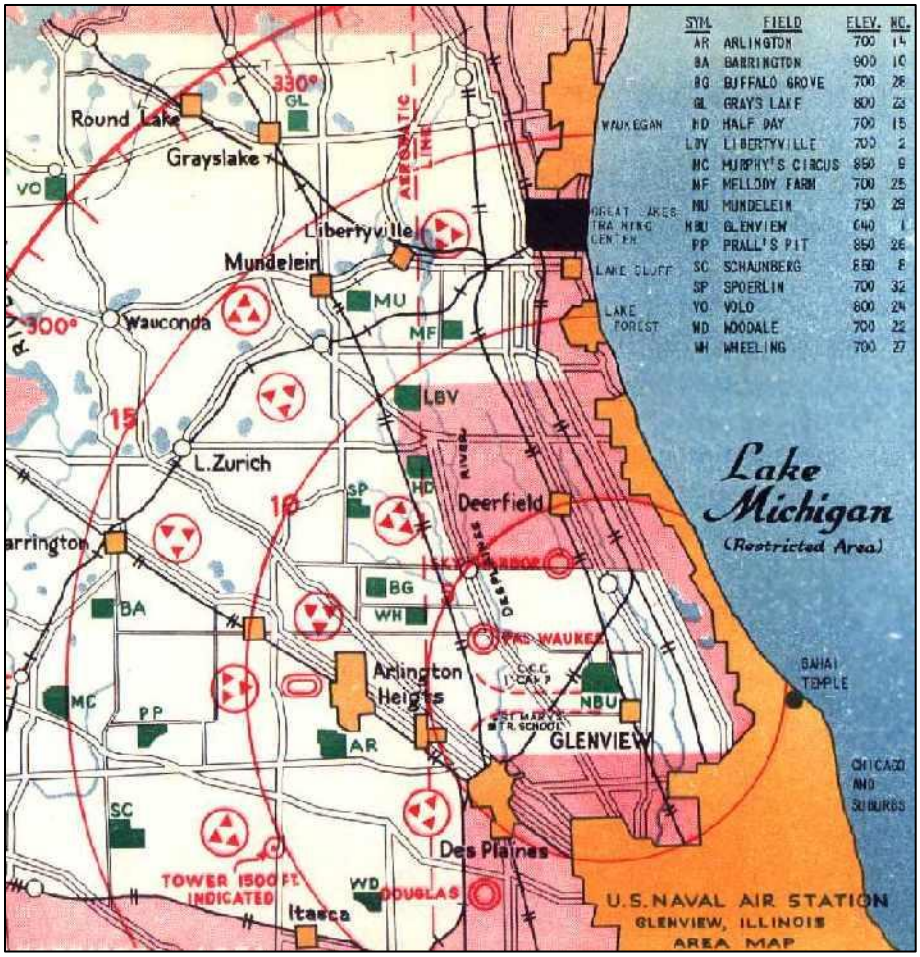

Figure 1.5. A 1945 map of NAS Glenview and its 15 satellite airfields (Courtesy, Dick Ferron via Paul Freeman, 2020).

Navy Pier

The city of Chicago built Navy Pier, originally named Municipal Pier, as one of five harbor structures on Lake Michigan. Chicago architect Charles Frost designed the pier to function as a multi-use facility. In December 1927, the Chicago city council renamed the pier as Navy Pier to honor the Chicagoans and Midwesterners who served in the US Navy during World War I. Ironically, the Navy would take over the pier in August 1941, and turn it into a naval aviation ground training school for mechanics during World War II (fig. 1.6).[36]

[36] Douglas Bukowski, *Navy Pier: A Chicago Landmark* (Chicago, IL: Metropolitan Pier and Exposition Authority, 1996), 15, 35; "Machines Hum Trade School's Song of Battle," *Chicago Tribune* (Chicago, IL), 1 February 1942, 39.

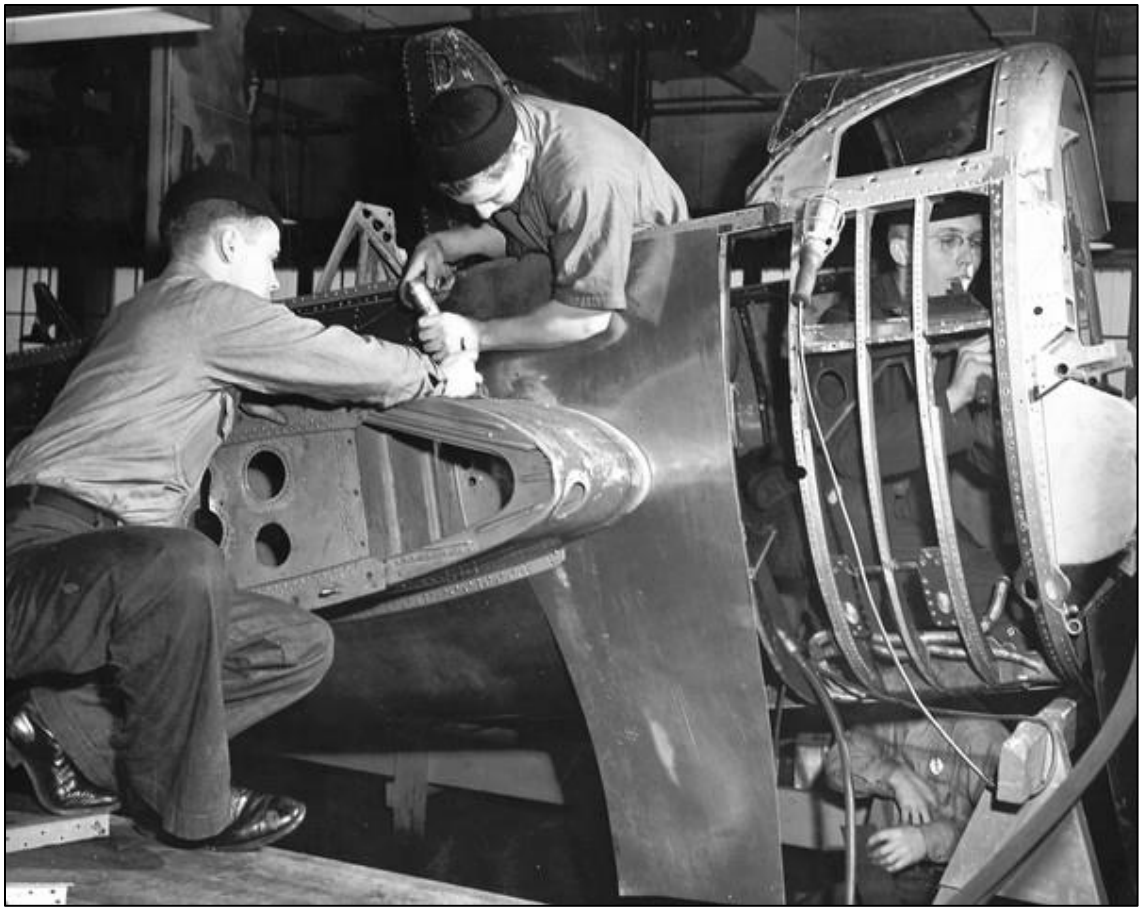

Figure 1.6. Airplane assembly at Navy Pier (Courtesy, Chicago Tribune, via http://www.connectingthewindycity.com/2012/07/navy-pier-at-war.html).

At the onset of the war, the re-purposed pier required a great deal of modification, including a drill hall, hanger, mess hall, and galley. The galley replaced an open-air shelter on the pier. The passenger sheds housed recruits on the upper level and trained them on the lower level.[37] A small part of the pier was reserved for a tugboat and barge, which the Navy assigned to recover crashed planes from the lake.

Navy Pier, NTS Great Lakes, and NAS Glenview were also the home for a number of WAVES (Women Accepted for Volunteer Emergency Service), which was a military unit within

[37] Bukowski, *Navy Pier*, 37.

the US Navy.[38] The NTS Great Lakes first assigned WAVES on November 10, 1942, and NAS Glenview followed in May 1943.[39] As World War II progressed, they not only performed essential clerical duties, such as handling the Navy's mail and supporting communications networks, but also became instructors in chemical warfare techniques, aviation gunnery, and instrument flying. WAVES held jobs that varied from yeoman to mechanic to ground school instructor to training male pilots, depending on their skills and the Navy's needs.[40] Great Lakes also hosted a medical training program for any WAVE who needed advanced medical training.[41]

Birth of the Carrier Qualification Training Unit (CQTU)

As the war heated up in Europe, naval commanders, led by Comdr. Richard F. Whitehead, proposed to US Naval Command to train naval carrier pilots on the Great Lakes. They ignored his idea until after Pearl Harbor, when Rear Admiral John Downes, Commandant of the Ninth Naval District, forwarded Comdr. Whitehead's recommendation to the Chief of Naval Operations, where they seriously considered the proposal.[42]

Comdr. Whitehead argued strongly in favor of the Great Lakes as ideal for training naval pilots. The lakes were landlocked, except for a few locks and channels that made them easy to defend against invaders, and weather conditions, especially on Lake Michigan, resembled oceanic weather patterns and conditions surprisingly well for a freshwater lake. Lake Michigan turbulence would mimic the rolling and pitching of ocean carrier decks. Since the lakes were

[38] The WAVES military unit was established on July 30, 1942, under Public Law 689, which was an amendment of the Naval Reserve Act of 1938. "WAVES: United States Naval Organization," *Encyclopedia Britannica*, https://www.britannica.com/topic/WAVES-United-States-naval-organization

[39] Dawson, *Glenview Naval Air Station*, Ch. 4.

[40] Gonzalez, *Great Lakes*, Ch. 5; San Dee Wallace, "Wave Recalls U.S. Navy Service," *The Herald-Palladium* (Saint Joseph, MI), October 26, 1989, 4; "Wave Pioneer: Local Woman Not A Molly Pitcher," *The Edwardsville Intelligencer* (Edwardsville, IL), July 3, 1944, 2; "WAVES: United States Naval Organization."

[41] "Three South Side Waves Serving at Great Lakes," *Suburbanite Economist* (Chicago, IL), June 27, 1943, 12.

[42] Wayne H. Heiser, *US Naval and Marine Corps Reserve Aviation*, 2nd ed. (McHenry, IL: Dihedral Press, 2006), 1:146; Somers, *Lake Michigan's Aircraft Carriers*, 10.

well protected from U-boat threats, the ships stationed there would not need heavy armament or battleship protection. An additional advantage was the Glenview Naval Air base with its full complement of air cadets already conducting primary flight training.[43]

The Great Lakes being secure from enemy attack had many advantages. Since ships did not see active combat, they did not need the armor plating essential in ocean-going military ships. The weight reduction translated into speedier ships and less fuel consumption. They also did not need armed escort ships, which saved more money. These advantages meant that operations at Great Lakes were cheaper than at any training base in coastal waters.[44] Apart from the occasional icebreaker and Coast Guard support vessels, the training carriers required minimal assistance from other vessels.[45]

Comdr. Whitehead's plans for Great Lakes had a major disadvantage, though, as there were no aircraft carriers on the lakes and no carriers on the high seas could fit through the lock-system required to travel into the lakes. This ruled out all ocean-going vessels that would otherwise qualify to be converted into aircraft carriers. The entry of the United States into World War II eliminated the thought of pulling already existing carriers from combat patrol and dedicating them to training pilots. A number of carriers, including USS *Ranger* and USS *Langley,* did help to qualify pilots, but this was a relatively rare event, as the Navy needed these ships in active combat against both Germany and Japan. Despite these complications, US naval command signed off on the idea and the Carrier Qualification Training Unit officially began operations on August 1, 1942.[46]

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[43] Gonzalez, *Great Lakes*, 71; Somers, *Lake Michigan's Aircraft Carriers*, 10.
[44] Somers, *Lake Michigan's Aircraft Carriers*, 10.
[45] "Plane Carriers," *Press and Sun-Bulletin* (Binghamton, NY), March 26, 1942, 6.
[46] Somers, *Lake Michigan's Aircraft Carriers*, 81; "U.S. Naval Air Station Glenview: The Final Salute, 1937- 1995," *GNAS Base Closure Magazine*, 1995, 10.

Conversion vs. Construction

After deciding that the Great Lakes was the best place to carry out training for naval carrier pilots, the Navy had to decide whether to build new carriers in the lakes or convert ships already on the lakes that could fit the parameters of an aircraft carrier. With existing carriers ruled out as viable options, the Navy was left with two options: They could build from scratch, which would have tied up shipbuilding facilities, or they could convert already existing vessels. The Navy deemed conversion to be the cheaper option and the fastest, given the pressing need for training carrier pilots.[47]

Choosing the Training Carriers

The Navy had certain requirements for potential ships to be considered for conversion. The vessel had to be able to support a flight deck with a minimum length of 500 ft., and still be capable of reaching a speed of 18 knots to assist planes on takeoff. Despite the sheer number of ships already sailing on the lakes, there were surprisingly few ships that could meet these criteria. Comdr. Whitehead's 1941 survey of possible ships narrowed the options to two: SS *City of Midland*, a car ferry owned by Pere Marquette Railroad, and SS *Seeandbee*, a luxury passenger steamer owned by the Cleveland & Buffalo Transit Company. Since SS *City of Midland* was already contributing to the war effort by ferrying railroad cars and goods around and was also the slower and smaller of the two ships, the Navy chose SS *Seeandbee*. The steamship was the third largest passenger liner to ply the Great Lakes and it surpassed many ocean-going vessels in tonnage.[48]

Later, after seeing the impact that aircraft carriers and aircraft were having on the Pacific front, the Navy determined they needed another ship to expand the carrier training program. A

[47] Somers, *Lake Michigan's Aircraft Carriers*, 19.
[48] Somers, *Lake Michigan's Aircraft Carriers*, 19.

search for a second conversion vessel began. Comdr. Whitehead set his eyes on SS *Greater Buffalo* for many of the same reasons he had chosen SS *Seeandbee*. SS *Greater Buffalo* was an aging passenger steamer with a steel hull and wooden super structures. Since Detroit & Cleveland Navigation Company, the company that owned SS *Greater Buffalo,* was financially sound, the ship was not considered in the first search. However, because of the increasing demand for trained pilots, they decided to find another ship similar to SS *Seeandbee*. SS *Greater Buffalo* was slightly larger than SS *Seeandbee*, and in mid-1942, the Navy chose SS *Greater Buffalo* as its second ship for the Great Lakes carrier training program.[49]

SS Seeandbee

The Detroit Shipbuilding Company of Wyandotte, Michigan, launched SS *Seeandbee* in 1912 for the Cleveland & Buffalo Transit Company (C&B). Stephen Kirby, a respected shipbuilder, owned Detroit Shipbuilding in partnership with his father, Frank E. Kirby, who was famous worldwide and the premier naval architect on the Great Lakes. Frank Kirby had designed Detroit's floating palaces since 1871, when at age 21 he launched his first ship, *Queen of the Lakes*. Kirby was famed for his innovative designs and solid vessels (fig. 1.7).[50]

[49] Somers, *Lake Michigan's Aircraft Carriers*, 43.

[50] Chris Engle, "Frank E. Kirby: Architect of Detroit's Floating Palaces," *Michigan History*, 103 (September-October, 2019), 23-27; "Kirby, Frank E.," *Encyclopedia of Detroit* (Detroit, MI: Detroit Historical Society), https://detroithistorical.org/learn/encyclopedia-of-detroit/kirby-frank-e; Nick Robins, *The Coming of the Comet: The Rise and Fall of the Paddle Steamer* (Barnsley, Great Britain: Seaforth Publishing, 2012), 106-7.

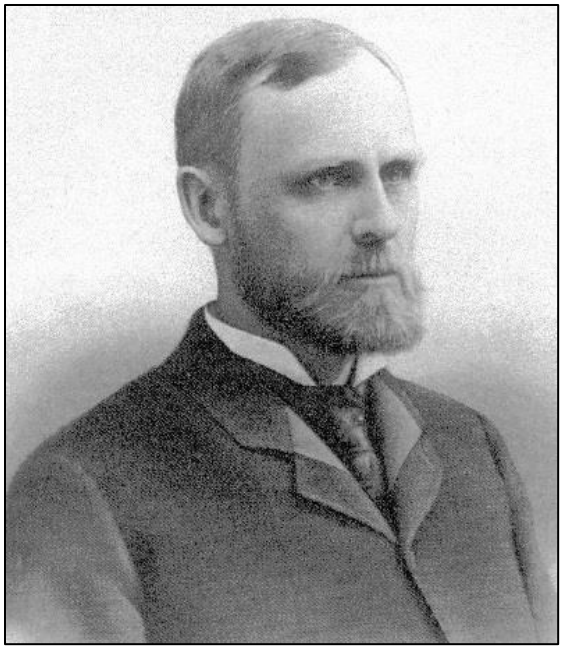

Figure 1.7. Frank E. Kirby, naval architect.[51]

At the time SS *Seeandbee* was built, it was the largest side-wheel passenger steamer in the world. It carried 1,500 passengers, mostly honeymooners and conventioneers, with 510 rooms; its stately ballroom was the highlight of the trip for many of the passengers.[52] The ship was the pride of the C&B fleet, as it plied the Cleveland-Buffalo route daily and overnight for thirty years (fig. 1.8).

SS *Seeandbee* measured 500 ft. in length, with a beam of 96.5 ft., making it wider than the ocean liner SS *Leviathan* of World War I fame. This made SS *Seeandbee* ideal for a flight deck in terms of its length and width. The vessel had a steel hull strong enough to support a flight deck once the Navy removed the upper deck and superstructure. It was both fast and elegant, with a top speed of 22 knots and a 12,000-horsepower, inclined-compound steam engine.[53]

[51] *Cyclopedia of Michigan: Historical and Biographical Synopsis of General History of the State* (New York and Detroit: Western Publishing & Engraving Company, 1900), 128.

[52] Case Western Reserve, "Seeandbee," *Encyclopedia of Cleveland History* (Cleveland, OH: Case Western Reserve), https://case.edu/ech/articles/s/seeandbee.

[53] Somers, *Lake Michigan's Aircraft Carriers*, 43; Engle, "Frank E. Kirby," 103:27.

Figure 1.8. Postcard of SS *Seeandbee* (Courtesy, Thunder Bay Sanctuary Research Collection).

SS *Seeandbee* engines were unique in marine design. No other Frank Kirby-designed ship carried this special engine.

> "The combination with poppet gears on high-pressure and the Corliss [steam engine] on the low-pressure, typically only seen in locomotives, made the engine different from any other on the Great Lakes. The valve gears on the engine were attached to the high-pressure cylinder fitted with poppet valves and Sickles cut-off gear, while the low-pressure cylinders had Corliss valves and gear. All the valves were operated by Walschaerts gear."[54]

The Great Depression hit the shipping business hard and strained the finances of C&B and other carriers. Train and truck transportation also took their toll on lake shipping. Losing a ship to fire was the last straw. C&B filed for bankruptcy in 1939, and the owners liquidated the branch. The Chicago branch of C&B was able to operate SS *Seeandbee* until 1941, when the Navy acquired the vessel.[55]

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[54] Frederick Haynes Newell and C. E. Drayer, *Engineering as a Career; a Series of Papers by Eminent Engineers* (New York: D. Van Nostrand Co., 1916), 63. Walschaerts valve gear is a type of valve gear, invented by Belgian railway mechanical engineer Egide Walschaerts in 1844, used to regulate the flow of steam to the pistons in steam locomotives.

[55] Robins, *Coming of the Comet*, 112.

SS Greater Buffalo

The American Shipbuilding Company constructed SS *Greater Buffalo*, another Frank Kirby-designed ship, and its twin, SS *Greater Detroit*, in 1924, for Detroit & Cleveland Navigation Company (D&C) (fig. 1.9). These vessels with a length of 550 ft. and a beam of 100 ft. were the largest paddle-wheelers ever built and surpassed ocean liners of the era in size and speed. Both operated on the company's longest overnight route between Detroit and Buffalo. With a total of 650 rooms and the capacity to carry 2,127 passengers and 275 crew each, the two steamers were truly massive. Both sister ships operated at a profit until the Great Depression hit the industry in 1930, causing a steady decline in revenue of 25 percent per year until 1932, when revenues plateaued.[56] D&C turned SS *Greater Buffalo* into a summer cruise ship for the next eight years, and it doubled as a floating hotel for large conventions, as in 1936 when the ship housed delegates to the Democratic National Convention in Cleveland.[57] D&C docked SS *Greater Buffalo* from late 1932 to early 1939, and then it returned to service until 1942, when the Navy purchased the ship for its Carrier Qualification Training Program.[58]

[56] "Peak of Luxury in Great Lakes Travel Provided by Two New Leviathans Costing $7,000,000," *Daily Herald* (Medina OH), May 2, 1925; Robins, *Coming of the Comet*, 110-12.

[57] "Many Grosse Pointers Attended the Republican Convention at Cleveland," *Grosse Point News* (Grosse Pointe, MI), June 18, 1936, 10; "Seeandbee Converted by Navy," *Daily Press* (Newport News, VA), March 14, 1942, 5.

[58] Robins, *Coming of the Comet*, 115.

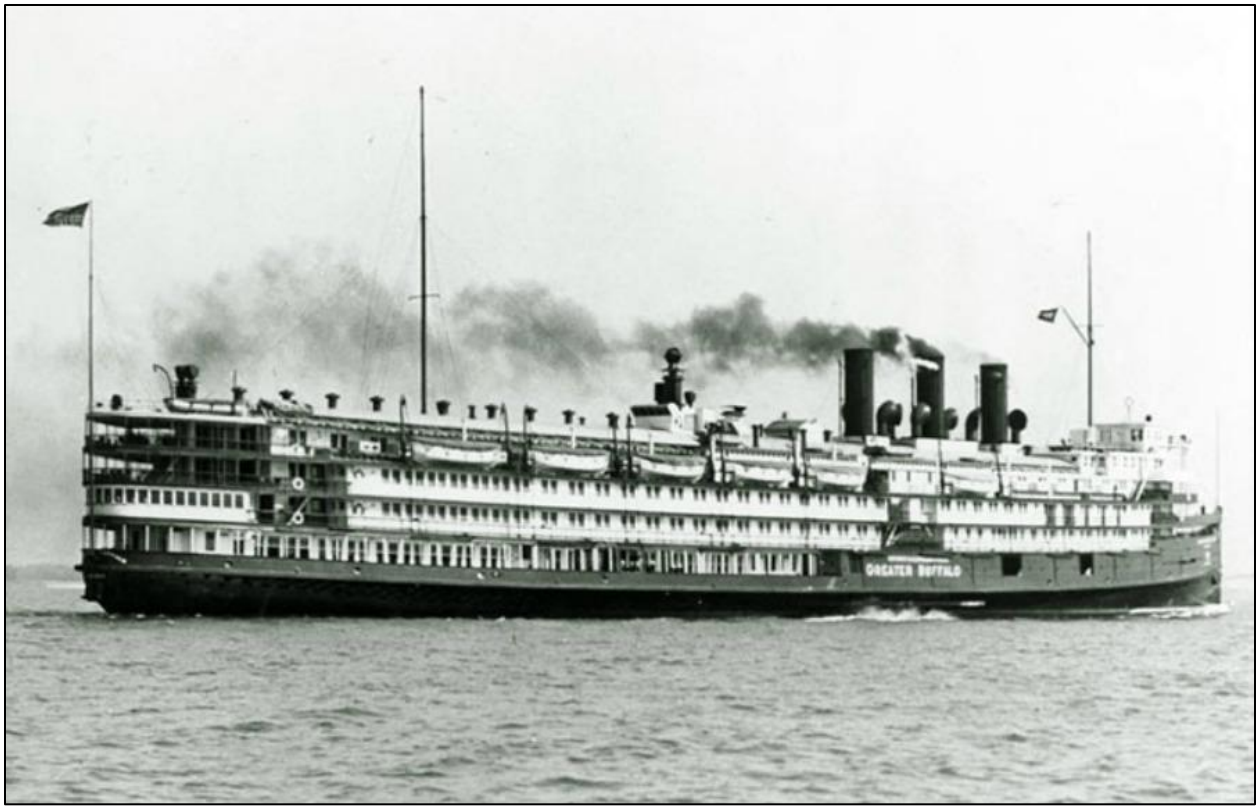

Figure 1.9. SS *Greater Buffalo* arrives in Buffalo, N.Y., on August 6, 1942, to be converted into aircraft carrier USS *Sable* (IX-81) (Courtesy, Naval History and Heritage Command).

In summary, a number of factors aligned to create the environment for establishing the Carrier Qualification Training Unit on the Great Lakes. Most importantly, any training site had to be safe from enemy attacks. The Atlantic and the Gulf of Mexico were hunting grounds for German U-boats and many Americans feared that the Japanese would invade the west coast, making those ports risky. This also meant that training carriers in Lake Michigan did not need to operate under radio silence, allowing pilots to locate carriers easily. SS *Seeandbee* and SS *Greater Buffalo* did not need to have heavy armor or armed escorts, which would cost a substantial amount of money to outfit and fuel. The ships also could run at the speed required to get planes airborne. In short, the two vessels met the minimum qualifications required for aircraft carriers.[59]

[59] Somers, *Lake Michigan's Aircraft Carriers*, 81-82.

The Great Lakes had another advantage. Planes require headwind to take off and land, and weather scientists found that Lake Michigan, in particular, has headwind patterns similar to west coast ports like San Diego and Los Angeles. Naval command decided that Great Lakes operations provided more positive attributes than negative, and was also more economically feasible than having the training unit on the coastline.[60] All of these factors contributed to the birth of this program that provided a critical resource for training Navy pilots for combat.

[60] Somers, *Lake Michigan's Aircraft Carriers*, 82.

Chapter 2: Conversion of SS *Seeandbee* to USS *Wolverine*

The refitting of SS *Seeandbee,* and later SS *Greater Buffalo,* from tourist palaces to flattop carriers took place on a "need to know" basis. The Navy disclosed that the American Shipbuilding Company would undertake the alterations at its shipyards in Cleveland and Buffalo. Navy officials did not announce the ultimate port stationing of the carriers, although speculation centered on Lake Michigan or Lake Erie, which had only three months before icing conditions would hamper operations.[1] The project was hush, hush, in the interests of national security.

This chapter details the process of converting the ship for naval usage. The account rests on detailed naval documents and photographs, because newspaper reports are sketchy at best, given the shroud of secrecy covering the conversion process. On a wider front, the urgent conversion work took place while dismayed Americans read newspaper accounts of the disastrous Allied back-peddling before Japanese forces in the Pacific theatre. The Japanese gained control of airfields across the western Pacific, which they used to provide air cover for further conquests. The only answer was aircraft carriers, with their planes and pilots, to drive enemy planes from the skies and protect the US's warships and transports, cover landings, and support our troops. Allied ships were doomed without air fighter protection.

March 1942 – Planning stage

The Navy requisitioned SS *Seeandbee* on March 12, 1942, immediately after the Allied Pacific campaign began with the battles of Bataan, Java Sea, Sundra Strait, and Badung Strait.[2] General Douglas MacArthur and his family fled Corregidor on March 11, 1942 as the Japanese

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[1] "*Seeandbee* Converted by Navy," *Daily Press* (Newport News, VA), March 24, 1942; "Navy to Make Plane Carrier of Lake Liner," *Chicago Tribune*, March 14, 1942; "Lake Liner Takes Form as Navy Plane Carrier," *Buffalo Courier Express*, July 31, 1942.

[2] Naval Correspondence, SS *Seeandbee* Inventory Index, From the Cleveland and Buffalo Transit Company to the War Shipping Administration, March 12, 1942, Folder C-IX64, Box 414, Section A1 1266-F, Record Group 19, National Archives Records Administration II. (hereinafter C-IX64/414/A1 1266-F/RG 19/NARAII).

threatened to advance on the island of Java.[3] The Navy was dealing with its own internal struggle to admit that airpower was the new frontline attack strategy, instead of mighty battleships that had carried the US through the First World War. The Japanese started a steady march across Southeast Asia with little resistance and the Navy knew it was their job to stop the enemy from reaching any island close enough to launch planes directly at the US mainland. Training carrier pilots was priority No. 1 for winning the war.

The Navy had planned for months to buy SS *Seeandbee* if needed, but the rapid Japanese takeover of Southeast Asia and the Philippines told naval command that time was running out to stop Japanese advances.[4] Japan's sneak attack on Pearl Harbor had destroyed the American Pacific fleet. The Navy had to get its planes in the air as soon as possible to counteract Japanese supremacy of the sky. While the American war machine was starting to produce both ships and aircraft in high numbers, the Navy needed the men who would fly the planes and crew the ships to be trained as fast and safely as possible.

The Navy selected American Shipbuilding Company to perform the conversion. In the early 1940s, American Shipbuilding, headquartered in Lorain, Ohio, had become the largest shipbuilding company on the Great Lakes. American Ship Building had numerous contracts during World War II with the Navy, the US Maritime Commission, and the Defense Plant Corporation (i.e., War Shipping Administration) for building minesweepers, patrol frigates, and tugboats. The Buffalo shipyard mainly focused on retrofitting, repairing, and converting existing ships.[5] They had the experience and capacity to convert SS *Seeandbee*.

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[3] "MacArthur Deserts 'The Battling Bastards of Bataan' and Escapes to Australia," https://www.pacificwar.org.au/Philippines/Macescapes.html.

[4] C. Peter Chen, ed., "World War II Database, 1942," (website), Lava Development, LLC, https://ww2db.com/event/timeline/1942/.

[5] Case Western Reserve, "American Shipbuilding Company," *Encyclopedia of Cleveland History* (Cleveland, OH: Case Western Reserve), https://case.edu/ech/articles/a/american-ship-building-co.

A theme of urgency emerged as the conversion process progressed. As of March 1942, the public still had not caught the desperation the Navy felt on the need for pilot training.[6] This was evident in a notation on Bureau of Ships memorandum dated April 4, 1942, which stated:

> "Contractor [American Shipbuilding Company] delayed starting work until actual receipt of letter of award, despite oral agreement to go ahead. Contractor also refused to start work because he doubts that the Navy needs ship. Although Com 9 [Command District 9] reported by dispatch [its] acceptance of [the] vessel on March 12th, he never let SupShips [Supervisor of Ships] in on the secret."[7]

American Shipbuilding also stated that the conversion would take up to five months, with a completion date of September 1, 1942 (fig. 2.1). The Navy declared this was too long, and instructed them to complete the job by the end of July, a month earlier.[8] The Battle of the Coral Sea in early May 1942, which involved aircraft carriers, confirmed the urgent need for a training carrier. This battle was unique in that no ship fired a shot, and no ship even saw an enemy ship.[9]

[6] "Plane Carriers," *Chicago Tribune*, March 16, 1942.

[7] Naval Correspondence, handwritten note by Murrell attached to letter from the Chief of the Bureau of Ships to the Supervisor of Shipbuilding, Cleveland, OH, April 24, 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

[8] Naval Correspondence, handwritten note on Memorandum, April 4, 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

[9] "Battle of the Coral Sea, 29 April–8 May 1942," Naval History and Heritage Command (website), https://www.history.navy.mil/browse-by-topic/wars-conflicts-and-operations/world-war-ii/1942/battle-of-coral-sea.html.

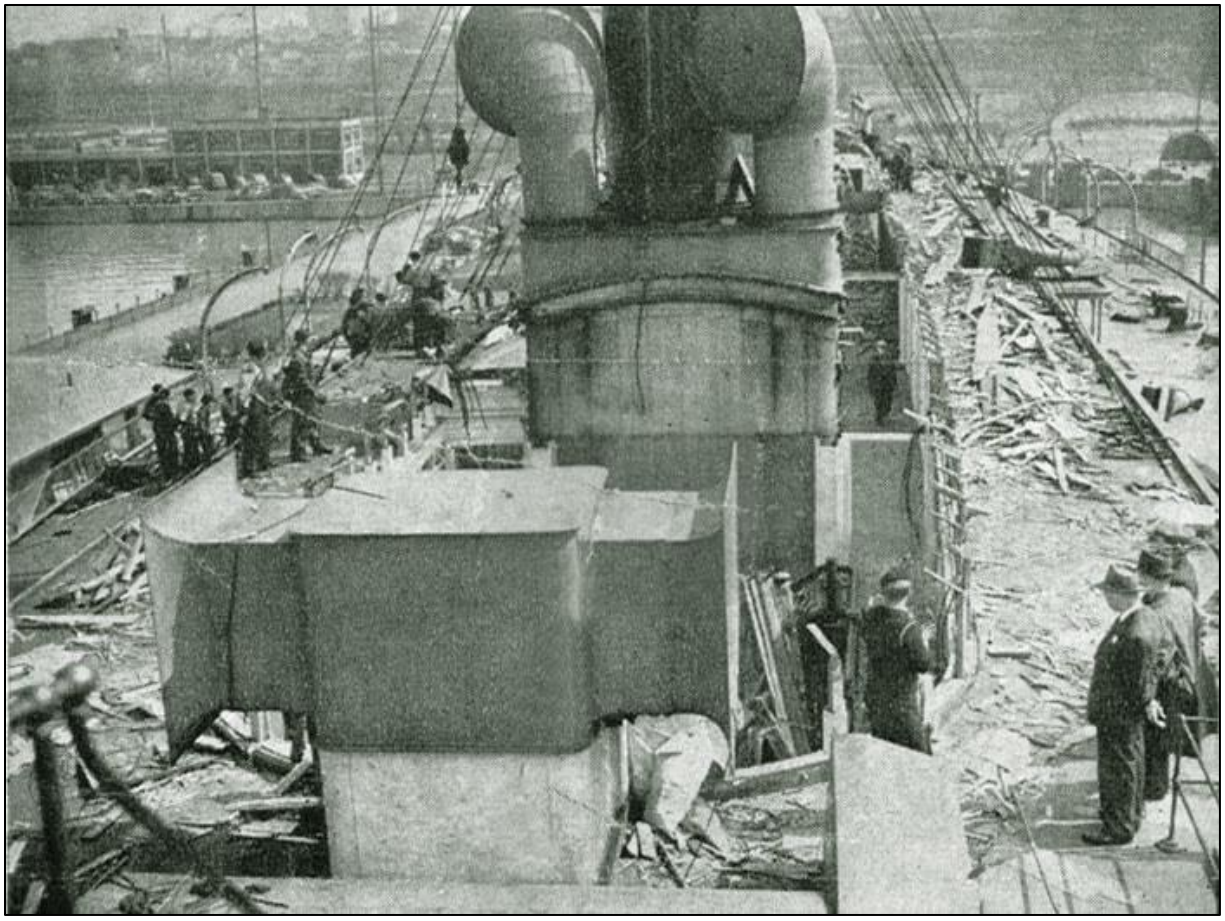

Figure 2.1. Workers from the American Shipbuilding Company strip the top decks of SS *Seeandbee* during April 1942 in Cleveland, OH, (Courtesy, Vintage Wings).

SS *Seeandbee* arrived in Buffalo on May 10, 1942, but the Navy kept the location secret from the general public. The *Daily Press* of Newport News, Virginia noted that it was "tied up at an undisclosed Great Lakes port."[10] American Shipbuilding started to work on it immediately to move the smokestacks to the starboard side of the ship. By the time the conversion project hit its peak in June and July, 1,250 men were working around the clock.[11]

[10] "*Seeandbee* Converted by Navy."

[11] *Buffalo Courier Express*, July 31, 1942; Bill O'Brien, "Marker Plays Tribute to Secret WWII Work," *Record-Eagle* (Traverse City, MI), December 8, 2011, 24.

Conversion planning

After the Navy purchased SS *Seeandbee* on March 12, 1942, it berthed the vessel at Municipal Pier in Cleveland, located at the foot of East 9th Street. While the American Shipbuilding Company did not start deconstruction work until early April, C&B Transit Co. prepared an accurate inventory report in March, to document items that were sellable and estimate their value, which ranged from washers and bolts to toilet paper and soap. The Navy requisitioned materials for retrofitting the ship, including radar when it should become available, and steel plating and wood for the flight deck.[12]

The Navy conducted an extensive security and safety analysis of the ship and surrounding pier. It produced a detailed report on March 27, 1942 (see below). Navy engineers also finalized blueprints and retrofitting plans finalized and sent them to the numerous parties involved with the conversion process, including the Navy's Bureau of Ships, Supervisor of Shipbuilding, Bureau of Aeronautics, and the American Shipbuilding Company.

Japanese and German Espionage

Early in the war Japan and Germany engaged in spying and acts of sabotage on coastal areas of the country, but they did not carry out any attacks in the Midwest. A small contingent of Japanese submarines patrolling the California coast after Pearl Harbor in February 1942, shelled the Ellwood oil refinery near Santa Barbara.[13] Although the damage was minor, this first direct attack on the mainland sparked panic among a jittery populace. The following day reports of enemy aircraft in the area led to the so-called Battle of Los Angeles, in which American artillery

[12] Naval Correspondence, March 12, 1942.

[13] Evan Andrews, "5 Attacks on U.S. Soil during World War II," *A&E Television Networks*, October 23, 2012, www.history.com/news/5-attacks-on-u-s-soil-during-world-war-ii.

fired shells offshore over Los Angeles for several hours, in the mistaken belief that the Japanese were invading.[14]

In June, another Japanese submarine made its way up the Columbia River and shelled Fort Stevens, Washington. In September a Japanese seaplane twice dropped incendiary bombs on wooded areas near Brookings, Oregon, with the intent to set off an inferno. Although this effort failed, the Japanese in 1944 launched 9,000 high-altitude, hydrogen balloons from the homeland 5,000 miles away, each loaded with nearly fifty pounds of anti-personnel and incendiary explosives, with the intent to burn out cities and forests. Without electronic targeting, most fell harmlessly, but they did cause widespread panic.

The largest invasion of American soil during the war came in June 1942, when a German U-boat dropped two saboteurs each at Amagansett, New York, and Ponte Vedra Beach, Florida, with explosives and wads of cash, to attack transport hubs, hydroelectric power plants, and industrial facilities. The doomed mission, known as Operation Pastorius, failed to demoralize the populace; instead it aroused greater vigilance, with evening blackouts of homes and the stationing of guards at strategic points across the country.[15]

Security

Converting ships into training carriers was a first for the Navy and vital to the war effort. Given the recent attacks by Japanese and German saboteurs, the Navy was taking no chances. Officials implemented tight security around the Cleveland pier and American Shipbuilding's Buffalo shipyard to keep the conversion work secret from the public.[16] Security personnel had to submit a detailed assessment on March 24 of Cleveland's Municipal Pier, where the contractors

[14] Andrews, "5 Attacks on U.S. Soil."
[15] Andrews, "5 Attacks on U.S. Soil."
[16] "*Seeandbee* Converted by Navy; "Navy to Make Plane Carrier of Lake Liner," *Chicago Tribune*, March 14, 1942; *Buffalo Courier Express*, July 31, 1942.

were stripping SS *Seeandbee*. The report emphasized the threat of potential Japanese or German espionage or sabotage, and ways to mitigate it with bomb removal experts, pier patrols, and an identification pass system for workers.[17]

The Navy had already instituted night clock watchers from the beginning of the conversion effort, but officials determined that deck patrols were also necessary around the clock. Guards patrolled the port side of SS *Seeandbee*, as well as the dockside, and assisted with increased traffic at the main gate. Specifically, one sentry was required to patrol the pier, paying close attention to the one-story wooden building at the center of the dock. The Navy was especially concerned about foreign espionage and sabotage, even though the conversion sites were in central locations that were nearly impossible to reach via the water or land. Knowing that most of the contracted workers were short-timers, the Navy decided that FBI and Coast Guard background security checks and photographic identification would be too time-consuming. So, the Navy decided to provide non-naval personnel with Coast Guard Waterfront passes and not leave them unattended while near or on the ship.[18]

Fire prevention measures, on the other hand, were prudent and necessary. Naval personnel were well aware of the dangers of ship fires. The first section of the report dealt with containing fires.[19] Given the numerous welding torches onboard, the threat of fire was a hot topic in several communications. They assigned one fire watcher for every four welders doing demolition with cutting torches. After all, a fire onboard SS *City of Buffalo*, a semi-sister ship to SS *Seeandbee*, in 1938 destroyed the vessel. The Navy trained a contingent of enlistees to handle fires that might break out onboard. The goal was to avoid having all the workers drawn away

[17] H.G. Coulton, Lt USNR, and R. P. Morris, Lt USNR, "Internal Security Survey," March 27, 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

[18] "Internal Security Survey," March 27, 1942. C-IX64/414/A1 1266-F/RG 19/NARAII.

[19] "Internal Security Survey."

from their posts during emergencies, leaving the rest of the ship and pier unsecured.[20] As will be noted below, fire did break out in mid-April.

Anchoring policy

Engineers originally fitted SS *Seeandbee* with ground tackle and a windlass that was inadequate in size, weight, power, and handiness for normal anchoring. During its thirty years on the Great Lakes, the ship needed a bow rudder to maneuver in tight quarters.[21] The ship's owners had used permanent moorings at points where the Navy would otherwise use an anchor because anchoring for any length of time would damage the bow rudder.

The Navy did not plan on providing new anchor gear to SS *Seeandbee*, since anchoring would only be done in an emergency. Also, the bow rudder could only be removed in a dry dock, which was in high demand by sea-going combat and support ships. Moreover, the whole point of converting SS *Seeandbee* was that the Navy did not need to modify the hull below the waterline.[22]

While the Supervisor of Shipbuilding and the ship's commanding officers discussed sending the ship to dry dock during the winter months to remove the bow rudder for mooring, dry docking would take considerable time. They would need to remove large parts of the paddle wheels to fit the ship in any existing dry dock. Ultimately, the Navy decided it was not essential to remove the bow rudder.[23]

[20] "Internal Security Survey."

[21] Naval Correspondence from the Chief of the Bureau of Ships to the Supervisor of Shipbuilding, Cleveland, OH, March 21, 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

[22] Naval Correspondence, 21 March 21, 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

[23] Naval Correspondence, March 21, 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

Piers

The Navy was not used to working with paddle-wheel steered vessels and they were concerned about where and how to moor the ship between cruises. The Navy did not know of any existing piers or wharves which could house USS *Wolverine*, due to the ship's unique shape. During a conference, the Navy's Supervisor of Shipbuilding; Captain Stratham, the former SS *Seeandbee* commanding officer; and Lt. Manly, the current commanding officer, decided that a desirable pier arrangement would be "a straight pier at right angles to the shoreline of such length that the vessel can lay alongside and of such width that the landing can be made at the end."[24] The group was worried that such a pier did not currently exist.

The pier head height was also a cause for concern. It needed to be adjusted very carefully because "if it is too low it will cause damage to the bracing under the main deck at the side of it and if it is too high it will interfere with bracing and other obstructions under flight deck." The flight deck structure also dictated that vertical fenders be banned, in favor of using only piers that lay perpendicular to the shoreline and were long enough that vessels could berth alongside and wide enough that they could land it the end of the pier. Since SS *Seeandbee* had such an odd shape, with both the main deck and flight deck extending past the width of the hull, the Supervisor of Shipbuilding and Navy officials decided to add extra fender pilings at all docks where the ship might berth.[25]

On April 26, 1942, the Bureau of Ships chief reported that adequate Navy piers were already available in the Chicago area at Navy Pier, which solved both pier accommodations and the need for a modified anchor (fig 5.1). Navy Pier did not need modification other than properly

[24] Naval Correspondence from the Supervisor of Shipbuilding, Cleveland, OH, to the Chief of the Bureau of Ships, April 2, 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

[25] Naval Correspondence, April 2, 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

placed buoys along the area where the ship would be berthed. The dock was low enough that it did not hit or compromise the flight deck supports and high enough that it did not compromise the lower deck supports.[26]

April-May 1942 – Deconstruction Began

The deconstruction effort began in early April 1942, starting with removing the upper decks and top hampers (fig. 2.2).[27] The Navy compiled an itemized list of objects that it considered essential to the conversion effort, which they furnished. Officials also discussed pier accommodations and other special accommodations (see below).

Figure 2.2. SS *Seeandbee*'s fancy staterooms and atrium being stripped down. (Scharch, Ed L., "USS *Wolverine* (IX-64) WWII Training Carrier 1942-45," http://www.scharch.org/Ed_Scharch/23-uss-wolvering-ix64.htm).

[26] Naval Correspondence from the Chief of the Bureau of Ships to the Vice Chief of Naval Operations, 26 April 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

[27] "Convert Steamer to Carrier," *Advocate-Messenger* (Danville, KY), 27 April 1942.

The Navy's first mention of the urgency of the project was stated quite clearly on April 4, 1942, when American Shipbuilding estimated conversion would take five months. The Navy quickly rejected the proposed timeline, stating it would take "too much time." Navy personnel at this time also noted the need for training on the use of radar on the vessel, which would be essential for pilots in basic flight training, to prepare them for combat.[28]

Fire on SS Seeandbee

Despite fire safely protocols the Navy implemented at the shipyard, hazard abounded, and on April 16, 1942, sparks from a welder's acetylene cutting torch ignited grease in a gallery ventilator shaft on SS *Seeandbee*. Thankfully, they were able to contain the fire quickly and it caused little damage, due to safety measures detailed in the March 27 security and safety report discussed above. However, newspapers reported the story about the fire to the dismay of the Navy, which viewed the incident as a small issue not worthy of a press release. But Cleveland Assistant Fire Chief James Nimmo declared that the fire "might have been a catastrophe."[29] The Security Force Supervisor at the shipyard intoned in typical military fashion said, "As far as I am able to ascertain, no permission was given for this publicity."[30]

Privately, Navy brass did take the fire seriously, given the urgency of the conversion. They had a fire alarm box and portable siren installed on the pier, and the Cleveland Fire Department instructed Chief Boatswain Mate O'Brien to install portable fire alarm boxes and sirens on board the vessel. The Navy increased the number of men monitoring the ship and pier

[28] Naval Correspondence, Memorandum, April 4, 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

[29] "Fire Hits *Seeandbee*," *Sandusky Register* (Sandusky, OH), April 17, 1942; "Extinguish Fire on Steamer *Seeandbee*," *Times Herald* (Port Huron, MI), April 17, 1942.

[30] Naval Correspondence, From the Security Force Supervisor, Cleveland, OH to the District Security Officer, April 16, 1942, C-IX64/414/Al 1266-F/RG 19/NARAII.

for fire outbreaks, and they assigned an enlisted man to watch each person with a welding torch.[31]

American Shipbuilding also removed all combustible furnishings from the ship. They classified the materials according to their combustibility (A-D), moved all A and B materials to a warehouse on the Central Viaduct in Cleveland, and sent the rest of the materials to scrap yards. The Navy posted a guard at the warehouse and insured the materials for $10,000. Naval security personnel interviewed ship workers and examined their birth certificates before issuing passes to ensure that only personnel with access to the ship could work on the ship.[32]

Material shortages

During the war, the military's need of metals for ships, planes, jeeps, guns, and even ration tins and helmets, grew rapidly and soon the essential materials were in very short supply. President Roosevelt established the War Production Board on January 6, 1942, to regulate the industrial production and allocation of war materiel and fuel.[33] It included coordinating heavy manufacturing, and the rationing of vital materials, such as all kinds of steel, galvanized plate, tin, copper, rubber, and oil.

American Shipbuilding keenly felt the shortages in the early stages of the conversion process. On April 29, 1942, the Supervisor of Shipbuilding notified the Bureau of Ships chief that the "determining feature in the completion of the vessel will be material."[34] The needed material was steel, which the contractor was having difficulty obtaining, to the point where the

[31] Naval Correspondence, April 16, 1942, C-IX64/414/Al 1266-F/RG 19/NARAII.

[32] Naval Correspondence, From the Security Force Supervisor, Cleveland, OH to the District Security Officer, April 16, 1942, C-IX64/414/Al 1266-F/RG 19/NARAII.

[33] Franklin D. Roosevelt, "Executive Order 9024 Establishing the War Production Board," US Government, January 16, 1942. Online by Gerhard Peters and John T. Woolley, The American Presidency Project, https://www.presidency.ucsb.edu/node/210828.

[34] Naval Correspondence, From the Supervisor of Shipbuilding, Cleveland, OH, to the Chief of the Bureau of Ships, April 29, 1942, C-IX64/414/Al 1266-F/RG 19/NARAII.

Supervisor of Shipbuilding permitted them to use "warehouse material for shapers where proper material can be obtained" and also "galvanized plate…even though the latter involves a slight excess in cost."[35]

Despite shortages, they continued deconstruction work on SS *Seeandbee*. According to the *Buffalo Courier Express*, American Shipbuilding towed the stripped vessel hull from Cleveland to their dock (formerly the Buffalo Dry Dock) at the foot of Michigan Avenue in Buffalo, New York, in May.[36] The *Altoona Tribune* printed a picture of the partially stripped vessel on May 5, 1942 (fig. 2.3). On May 10, 1942, 125 men continued stripping the vessel in Buffalo, and the company rapidly ramped up the workforce tenfold, to 1,250, drawing workers from the Buffalo area and as far away as Chicago and New York City (fig 2.4). Shifts worked around the clock to finish the hull stripping as swiftly as possible.[37]

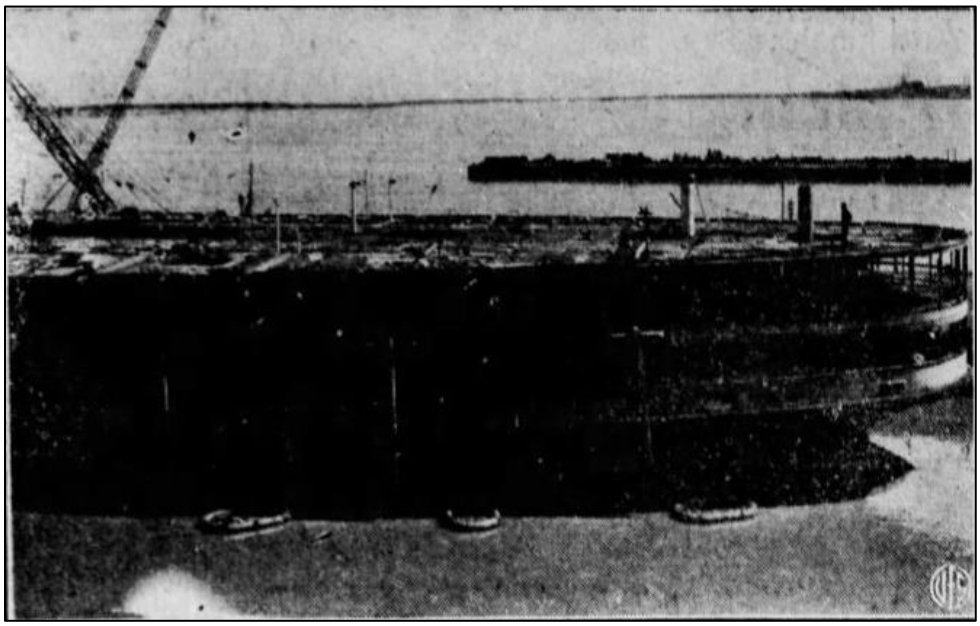

Figure 2.3. Partially stripped SS *Seeandbee* at Buffalo, New York. Note the holes where the superstructure and smokestacks have been removed (Altoona Tribune (Altoona, PA), May 5, 1942).

[35] Naval Correspondence, April 29, 1942, C-IX64/414/Al 1266-F/RG 19/NARAII.

[36] Jack O'Brian, "Plane Carrier Wolverine Taken Over by Navy Crew," *Buffalo Courier Express*, August 13, 1942.

[37] O'Brian, "Plane Carrier *Wolverine*."

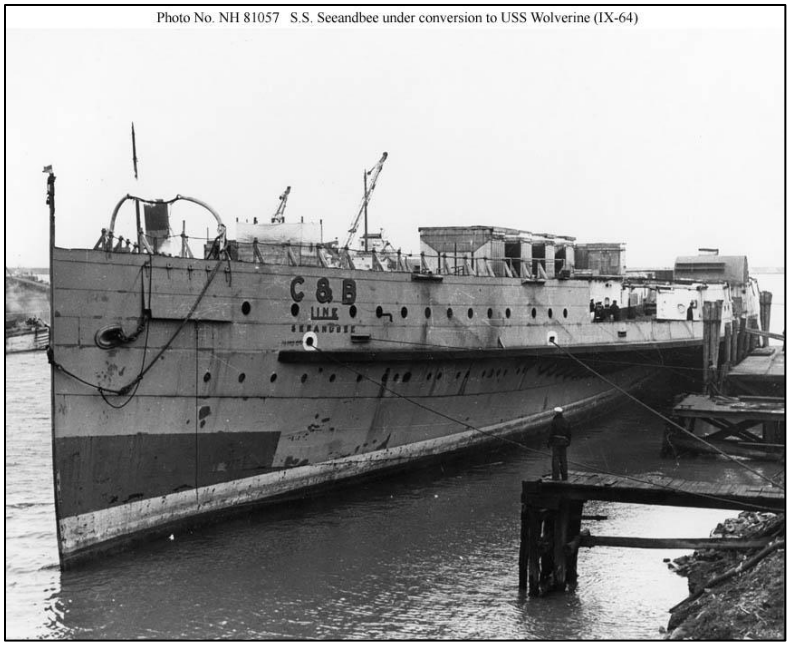

Figure 2.4. SS *Seeandbee* at Buffalo, May 1942, after workers removed the massive wooden superstructure, which only left four boiler uptakes, a structure over the engine room, and the paddle boxes above the forecastle deck level. (Courtesy, Naval History and Heritage Command).

June 1942 – Retrofitting

With the majority of the demolition work completed on SS *Seeandbee*, the workers started on the retrofitting effort. The first priority was to get the deck reconfigured to be an aircraft carrier flight deck. Work continued on SS *Seeandbee* as the workers rerouted the stacks to the starboard side to imitate the island structure of a combat carrier. The laborers completely installed the steel supports for the flight deck and started to work on the wooden deck (fig. 2.5). The sheer scale of the effort was newsworthy: "Forty-five miles of welding went into the job. The amazing total of 57,000 bolts went into her, and a like number each of washers and grommets—packing which makes the bolts watertight."[38]

[38] O'Brian, "Plane Carrier *Wolverine*," 24.

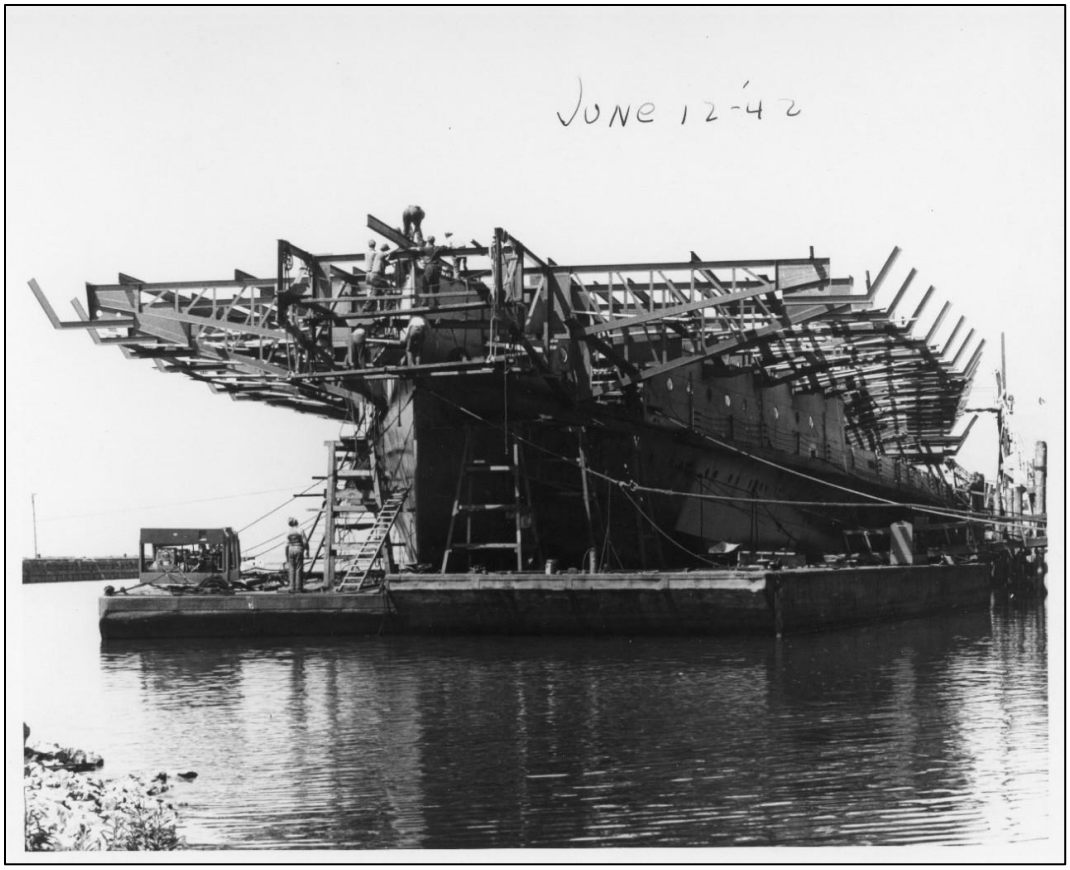

Figure 2.5. SS *Seeandbee* being retrofitted, June 12, 1942. (Courtesy, Naval History and Heritage Command).

July 1942 – Progress Report

The first progress report in mid-July provided details about the status of the conversion process, which was nearly 85 percent complete. However, due to the amount of work left and delays in delivering materials, the Navy set the new estimated commissioning date back a month.[39] All the heavy steel work on the flight deck was completed by mid-July, except for the chain locker and casings around boiler room fans on the main deck, and some side panels along the main deck. Wood planking was nearly 90 percent complete, and the task would be finished by July 20, including caulking. Most of the forward and aft bracing was also finished, and

[39] Naval Correspondence, From the Assistant Supervisor of Shipbuilding, USN, and the American Shipbuilding Company, Buffalo, NY to the Supervisor of Shipbuilding, Cleveland, OH, July 16, 1942, Folder "IX64 Vol. 1-2," Box 412, Section A1 1266-F/ Record Group 19, National Archives Records Administration II.

American Shipbuilding officials anticipated completion by July 22. They expected to finish building a new island structure to house the command and control operation by the end of the month.[40]

Electrical work throughout the ship proceeded rapidly and was 75 percent complete, but obtaining the landing lights for the flight deck turned out to be a major delay. The design called for forty-two lights and installing them was labor-intensive. American Shipbuilding officials repeatedly pleaded for delivery of this crucial item, but the lights were not expected before mid-July. The other major electrical project involved installing the radio apparatus. Thankfully, a radio expert from the Bureau was able to install the radio parts and receiving apparatus, without having access to the original wiring schematics.[41]

Workers installed some 80 percent of the airplane arresting gear by mid-July, including the majority of the sheaves. The remaining work involved installing valve controlling cable and smaller apparatus, including reeving five units, which they anticipated finishing by the end of the month. E. S. Kroner of the Naval Aircraft Factory in Philadelphia performed a detailed inspection report on the arresting gear, and he found that the work met exacting standards in mechanical operation and quality of workmanship. Additionally, the aft ventilating system needed considerable work. American Shipbuilding was able to secure additional workers to install the ductwork, which was being fabricated elsewhere, and expected to finish by the end of the month.[42]

Meanwhile, the interior retrofitting was also well underway by mid-July. The steel structural buildout of the officers' state rooms was 90 percent complete, and fiberglass

[40] Naval Correspondence, July 16, 1942, IX64 Vol.1-2/412/A1 1266-F/RG 19/NARAII.
[41] Naval Correspondence, July 16, 1942.
[42] Naval Correspondence, July 16, 1942.

installations was 50 percent complete and would be ready at the time of the monthly status report. The next step in completing the officer's quarters involved adding access doorways and stairwell, as well as the catwalk. Officials expected that to be completed by the end of the month. On July 26, 1942, American Shipbuilding informed the Naval Command that the conversion of SS *Seeandbee* would not be finished until the end of July, which was much too late for the Navy's desired commissioning date. The delay was due to the difficulty of obtaining skilled laborers, especially electricians, and to obtain flight deck lights. The new commissioning date was set for August 15, 1942.[43]

Electricians, sheet metal workers, and welders were all in short supply due to the high concentration of defense work near the conversion site in Buffalo. Another company, Bison Shipbuilding Company, a landing craft tank (LCT) factory during World War II, was expanding its workforce of welders, which forced American Shipbuilding to obtain welders from vocational schools or train men in the shipyard, so they could pass the qualification test. With the workforce swelling to more than one thousand, finding Navy supervisors was also a problem.[44]

One of the final aspects of the conversion process was finding a way to transfer aviation fuel to SS *Seeandbee* from gasoline boats or lighters. The Bureau and officials from American Shipbuilding needed to create a system to transfer fuel for all the ships they planned to convert to aircraft carriers. After deliberations, Bureau engineers decided to supply one water turbine-driven centrifugal gasoline pump for each ship. They calculated that the pumps would deliver 60 gallons per minute (gpm) against a pressure of 35 psi, as long as it was supplied with 225 gpm of

[43] Naval Correspondence, From the American Shipbuilding Company, Buffalo, NY, to the Chief of the Bureau of Ships, July 26, 1942, IX64 Vol.1-2/412/A1 1266-F/RG 19/NARAII.

[44] Naval Correspondence, From the Supervisor of Shipbuilding, Cleveland, OH, to the Chief of the Bureau of Ships, USN, DC, July 16, 1942, IX64 Vol.1-2/412/A1 1266-F/RG 19/NARAII.

water at 35-40 pounds per inch (psi) at the turbine inlet. They also had to ensure that back pressure on the turbine did not exceed 15 psi.[45]

Due to the high volatility of 100-octane aviation gasoline, the Bureau knew that it would not be possible to load gasoline with the pump on SS *Seeandbee*. Furthermore, the pump was relatively light, so it would have to be either permanently installed on the gasoline boat or transferred to the boat or lighter during the loading process. In either case, the pump required as solid foundation to withstand the strain of the gasoline hose. Also, if the gasoline boat did not have a source of water suitable for running the turbine, they would need to install a 2" or 2-1/2" fire hose between the carrier and the gasoline boat, and the pump would need to be installed low enough to provide suction during flooding. The pump had to be primed by one of the gasoline dispensing pumps since centrifugal pumps were not self-priming.[46]

Toward the end of the month, the engineers who had conducted the inclining experiment on May 5, 1942 submitted their report. They stated that the ship was more stable after the conversion than it was before and that the Navy did not need to conduct further incline testing. Since the overall conversion effort was proceeding satisfactorily, the water trials were set to start on August 7. Several an entourage of naval brass planned to witness this first carrier of its kind being tested and expectations were high.[47]

August 1-11, 1942 – Last Minute Details

As of August 1, 1942, the forty-two landing lights requested on July 16 still had not arrived and the commissioning date was looming. Officials at American Shipbuilding requested

[45] Naval Correspondence, From the Chief of the Bureau of Ships to the Supervisor of Shipbuilding, Cleveland, OH, July 24, 1942, IX64 Vol.1-2/412/A1 1266-F/RG 19/NARAII.

[46] Naval Correspondence, July 24, 1942, IX64 Vol.1-2/412/A1 1266-F/RG 19/NARAII.

[47] Naval Correspondence, From the American Shipbuilding Company, Cleveland, OH, to the Supervisor of Shipbuilding, Cleveland, OH, July 30, 1942, IX64 Vol.1-2/412/A1 1266-F/RG 19/NARAII.

updates multiple times as the days went by. The vessel as of August 5 was still missing basic navigational gear, such as sounding leads, binoculars, and sextants, even though the items had been shipped from Norfolk to the Ninth Naval District on July 22. Without these items, the ship would not be able to steam from Buffalo to Chicago, although lake trials were doable since the vessel would stay within sight of land.[48]

The American Shipbuilding Company completed the conversion process so fast the Bureau of Ships did not have time to complete radio wiring drawings, and instead, they sent a radio installation specialist to assist in placing the components of the radio and receiving apparatus. American Shipbuilding had difficulty acquiring microphones and receivers because priority went to ships for active combat. After numerous phone calls and letters to various Navy yards, including New York City and Norfolk, microphones and homing equipment were delivered to Buffalo by August 5, 1942.

On August 10, the Bureau of Ships was notified by the Supervisor of Shipbuilding of a rather unconventional test the engineers completed on the deck of the vessel. A loaded truck was run across the deck while inclining measurements were taken with a single pendulum to test the stability of the nearly completed vessel. According to the naval document, the test was conducted this way to avoid causing a delay in the delivery of the ship.[49] Based on this test and calculations completed by the engineers earlier in the process, the Navy decided that the converted vessel did not need ballast for stability or steadiness.[50] Sea trials started on August 7 and were completed by August 11, 1942.

[48] Naval Correspondence, Memorandum for Captain N. L. Rawlings, USN, August 13, 1942, Folder "Vol. 2," Box 413, Section A1 1266-F, Record Group 19 National Archives Records Administration II.

[49] Naval Correspondence, From the Supervisor of Shipbuilding, USN, Cleveland, OH, to the Chief of the Bureau of Ships, DC, August 10, 1942, IX64 Vol. 2/413/A1 1266-F/RG 19/NARAII.

[50] Naval Correspondence, August 10, 1942, IX64 Vol. 2/413/A1 1266-F/RG 19/NARAII.

The results of SS *Seeandbee* lake trials were encouraging. The Trail Board discovered only a relatively small number of minor issues. In fact, Commander Henry A. "Packy" Schade, a naval architect and head of the Carrier Desk for the Navy's Bureau of Ships, was very pleased with the small number of items submitted to the Board, especially since the contractors completed the conversion work in such a short amount of time. The Board praised the performance of the workers and the overall condition of the ship.[51]

Best of all, the ship reached 17.8 knots over the measured course in eight to ten fathom water. An additional knot might be achievable under normal operating conditions in deeper water on Lake Michigan. Speed was essential because carriers must have wind to launch planes unless they have catapults, which SS *Seeandbee* lacked.[52]

August 12, 1942 – First Commissioning in Buffalo

At last, after the flurry of conversion activity on multiple fronts, SS *Seeandbee* made its final trial runs at Buffalo in early August. Navy officials made no public comments on the performance, pending the completion of several small tasks (fig. 2.6). As of August 1, 1942, only days before the scheduled trials, landing lights had still not arrived, although they had been promised by July 20. The lights were not installed until August 20, 1942, almost a month behind schedule. Material shortages also delayed the delivery of critical deck landing lights.[53]

Before steaming to Chicago, the Navy commissioned SS *Seeandbee* as USS *Wolverine* (IX-64) at Buffalo on August 12. The Navy was still tight-lipped about where the flattop would

[51] Naval Correspondence, Memorandum for Captain N. L. Rawlings, USN, August 13, 1942, IX64 Vol. 2/413/A1 1266-F/RG 19/NARAII.

[52] Naval Correspondence, August 13, 1942, IX64 Vol. 2/413/A1 1266-F/RG 19/NARAII.

[53] "Lake Ship *Seeandbee* Given Trial as Carrier," *Detroit Free Press*, August 10, 1942; "Great Lakes Carrier Goes into Navy Service," *Press and Sun-Bulletin* (Binghamton, NY), August 12, 1942.

be stationed, saying only that it would operate "somewhere in the Great Lakes."[54] That it was headed to Chicago, however, signaled that Navy Pier might be that station.

The Fort Niagara band accompanied the commissioning by Capt. Ross Schlaback, USN, of Cleveland, the Great Lakes Supervisor of Shipbuilding. Lt. Comdr. Frederick Bolton suggested the name, Wolverine, not because it was the state animal of Michigan, but because for one hundred years, until the 1920s, the original USS *Wolverine* had plied the Great Lakes as a proud training ship for naval reservists. The old vessel, the first steel ship in the nation's navy, lay rusting in Misery Bay at Erie, Pennsylvania, destined for the scrap heap.[55]

As USS *Wolverin*e sailed down the St. Clair River in route to Chicago on August 18, scores of spectators at Port Huron "waved gaily in reply to the salute of three long and two short whistle blasts" from the captain. Seeing the first and only aircraft carrier to ply the Great Lakes was a thrill of a lifetime for many. The captain proudly obliged.[56]

[54] "Lake Ship *Seeandbee*."

[55] Bradley A. Rodgers, *Guardian of the Great Lakes: The U.S. Paddle Frigate Michigan*, (Ann Arbor, MI: University of Michigan Regional, 1996). "Ex-Lake Liner Put in Service as a Carrier," *Detroit Free Press,* August 13, 1942; "For a Hundred Years, 'Wolverine' has been a Proud Navy Name," *Detroit Free Press*, October 25, 1942; "Old Naval Relic at Erie to be Scrapped," *News Herald* (Franklin, PA), August 14, 1942.

[56] "Only Aircraft Carrier on Lakes Passes City," *Times Herald* (Port Huron, MI), August 20, 1942.

Figure 2.6. Finishing conversion of USS *Wolverine*, August 1942. SS *Greater Buffalo*, left, is ready for conversion into USS *Sable*. (Courtesy, National Museum of Naval Aviation).

August 22, 1942 – Second Commissioning in Chicago

As of 20 August 1942, the newly-minted USS *Wolverine* was in route to Chicago, where a second commissioning ceremony took place on the 22nd at the Grant Park outer harbor. It was far more elaborate than the Buffalo ceremony. Officials of the Naval Aviation Selection board, high ranking naval officers, city officials, and cadets from Glenview Naval Air Base took part in the ceremony. Naval air tactics delighted tens of thousands of curious Chicagoans who gathered at the lakefront ceremony to get a close-up look at the grim, gray flattop that had once been a luxury cruiser. The vessel was unique being the only aircraft carrier on the Great Lakes. It was

also the only coal-burner ship in the US Navy at the time. The ceremonies were particularly designed to spur the enlistment of naval aviation cadets.[57]

Post Commissioning Repairs

A few small tasks still had to be completed before pilots could begin training. Some tasks were the responsibility of American Shipbuilding, and others fell on navy personnel. Contractors were responsible for a variety of engineering tasks on the hull and machinery. They needed to install lagging on the auxiliary steam stop value on boilers, jacking gear for main engine, four air gauges to determine draft pressure, and lifting pads above the turbo generators.[58]

The electrical work included installing nameplates on the main switchboards, installing a handrail in front, installing an expanded metal door on the forward end of the main switchboard, and a solid door on the back end. Workers still needed to install the flight deck landing lights along with direct lighting on steam gauges atop the main engine room and a warning signal from the main steam line trap to the operating platform. Importantly, USS *Wolverine* needed a radio directional finder, and the crew had to test and calibrate the radio and sound. Initially, the installation of a RADAR system on the converted ship was not considered urgent, although it was deemed useful in training the pilots to receive directions from flight direction personnel. Since radar was being furnished by the Bureau of Aeronautics, and its installation was not considered to be urgent by the Navy, a space was reserved for the RADAR system on the bridge of the ship. As of September 5, 1942, it had not yet been installed on USS *Wolverine*, because the Navy had placed all available radars in active combat ships.[59]

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[57] "Lake Aircraft Carrier to be Here Saturday," *Chicago Tribune*, August 18, 1942; "'S*eeandbee*' Transformed into Aircraft Carrier," *Times* (Munster, IL), August 18, 1942; "Great Lakes' First Aircraft Carrier is Placed in Service," *Daily Times* (Davenport, IA), August 22, 1942; "First Plane Carrier on Great Lakes Ready," *Argus-Leader* (Sioux Falls, SD), August 23, 1942.

[58] Naval Correspondence, From the Chief of the Bureau of Shipbuilding to the Supervisor of Shipbuilding, Cleveland, OH, August 20, 1942, IX64 Vol. 2/413/A1 1266-F/RG 19/NARAII.

[59] Naval Correspondence, August 20, 1942, IX64 Vol. 2/413/A1 1266-F/RG 19/NARAII.

Minor hull work involved erecting additional shelving and workbenches in the electrical shop and installing a paint locker, generator platform, repair locker, battery charging room, arresting gear shop, boatswain's locker, flight deck repair shop, and lamp room. The workers also had to complete the installation of the Life Buoy equipment, stencil compartment numbers on bulkheads above all access doors, provide runnels or lips for pouring foamite thermal insulation powder into the hoppers. The funnels had to be installed near the hoppers, and they had to move the foamite generator from the port side of the island.[60]

Other tasks included providing locks for drain valves of the gasoline tanks, testing the outrigger for damaged airplanes with a 1000 lb. test load with outriggers in the extended position, applying "Ferrox," or grating, on the walkway around the pilothouse, replacing rubber gaskets in the air ports as needed, providing quick-release hooks for the life-boats, providing netting across the flight deck between the aft end of the island and after the gallery walkway, and providing and installing ladders and grab rods to provide adequate access to the anchor chain lockers. The Trial Board also wanted workers to create a larger manhole and handholes or grab rods if the full scope of the anchor chain was not self-tiering. Additionally, workers were ordered to install gear guards on all bevel gears in the steering gear shafting from the pilot house to the steering engine room and figure out a way to dispose of ashes from the coal in port. The tackle would be installed in the boiler room uptake so that the crew could hoist ashes to the main deck.[61]

Ventilation tasks included ensuring that the radio motor generators had adequate ventilation, and improving ventilation in turbo generator room. The Trial Board also recommended changing the existing exhaust system to a supply vent system, as well as providing

[60] Naval Correspondence, August 20, 1942.
[61] Naval Correspondence, August 20, 1942.

ducts for new exhaust openings in the overhead. The Navy also needed to improve the ventilation in the flight deck lightroom, radar control room, radar plot room, and air plot room. Finally, workers were tasked with making it easier to access the water piping overboard discharge from the gasoline tank by relocating it outside of the tank enclosure.[62]

Navy Tasks

The Navy deliberated about several other items and tasks that were outside the scope of SS *Seeandbee* conversion contract with the American Shipbuilding Company, such as providing new chains for the steering engines at the next availability period. The Trail Board recommended conducting a proof test of the existing chains the next time the ship was available, and then make the decision on whether to replace them. Other recommendations for alterations included installing locally-operated dogged watertight doors between the engine room and after the fireroom and improving watertight closures on the hold and orlop deck levels, since the existing remote-operated doors did not provide adequate water tightness.[63]

While the American Shipbuilding Company officials requested adding rubber matting on the airplane signal platform, the Trial Board did not recommend it. Also, the testing revealed the bow rudder steering gear was not working properly and was too stiff. However, the existing stern rudder steering gear was considered sufficient for the intended service. On the engineering front, the contractor was requested to provide and install label plates on all valves in the engine room, according to list from the naval engineering officer. The contractor was also asked to add pyrometers to analyze the stack gases.[64]

[62] Naval Correspondence, August 20, 1942.
[63] Naval Correspondence, August 20, 1942.
[64] Naval Correspondence, August 20, 1942.

Recommended electrical work included installing a warning signal system between the ash ejector pump in the engine room and the ash hoppers in the boiler rooms, providing a new dial for the ammeter on the Interior Communications Switchboard to determine low scale readings with accuracy. The Navy required two wind direction and intensity indicators for the pilothouse, the flight control area, and the landing signal station. They decided against a recommendation to add anchor lights along the flight deck, viewing them as "superfluous," since they thought lights illuminating the catwalk were adequate. Finally, the Bureau memo documented that they did not need ordinance as part of USS *Wolverine*'s pilot training program.[65]

Navigational Lighting

The Navy knew it would need a number of special accommodations for this experimental conversion. They needed to get permission to modify Great Lakes standard running light rules for the vessel because its unique shape prevented the usual placement of running lights.[66]

Standard operating procedures in the Great Lakes required masthead and range lights to be "a minimum of 20 feet and 40 feet, respectively, above the hull and in line with the keel."[67] However, to meet these rules of navigation lights on USS *Wolverine*, the masthead and range lights had to be rigged at mid-flight deck. The ship's hull was also not of a sufficient depth to use a one-piece housing mast and the height was too great to place an unsecured mast. The raising and lowering of these masts would be slow and would hinder operations since they would need

[65] Naval Correspondence, August 20, 1942.

[66] Naval Correspondence, From the Chief of the Bureau of Ships to the Secretary of the Navy, April 10, 1942, C-IX64/414/A1 1266-F/RG 19/NARAII.

[67] Naval Correspondence, From the Chief of the Bureau of Ships to the Secretary of the Navy, April 10, 1942, IX64 Vol.1-2/412/A1 1266-F/RG 19/NARAII.

to be lowered before and during all flight operations, which "would constitute a very real hazard if they were to become inoperative" when planes needed to land on the deck.[68]

The Navy defined the hull of an aircraft carrier (to located masthead and range lights) as the flight deck, but permitted anchor lights to be located in relation to the forecastle deck, if available. The Navy had to modify this policy for USS *Wolverine*, because of the relatively small size of the vessel compared to ocean-going carriers, which had multiple decks and hangers. The Navy determined that "effective navigational masthead and range lights, fulfilling all the requirements of the rules…can be installed on or adjacent to the starboard side control and smokestack island."[69]

The anchor lights also presented a problem, since Great Lakes regulations required the forward lights to be at least twenty feet above the hull and the aft lights not less than fifteen feet lower than the forward anchor lights. However, the flight deck itself was not even twenty feet above the hull. Aft anchor lights were recommended to be placed below the level of the flight deck on support brackets that would be visible, as required, to avoid the possibility of damage to the airplanes while landing, if the crew forgot to remove the aft anchor light staffs. The documents show that the Bureau of Ships chief concluded that "it would be desirable and safer in airplane operations to allow the installation of portable anchor light staffs forward also, but decision will wait on a direction from the Secretary of Navy."[70]

Based on photographic evidence of the ship during flight operation, it appears that the Secretary of the Navy approved of the request for removable forward anchor light staffs as they appear in some photographs but not all of them, as shown in figures 2.7 and 2.8.

[68] Naval Correspondence, April 10, 1942, IX64 Vol.1-2/412/A1 1266-F/RG 19/NARAII.
[69] Naval Correspondence, April 10, 1942.
[70] Naval Correspondence, April 10, 1942.

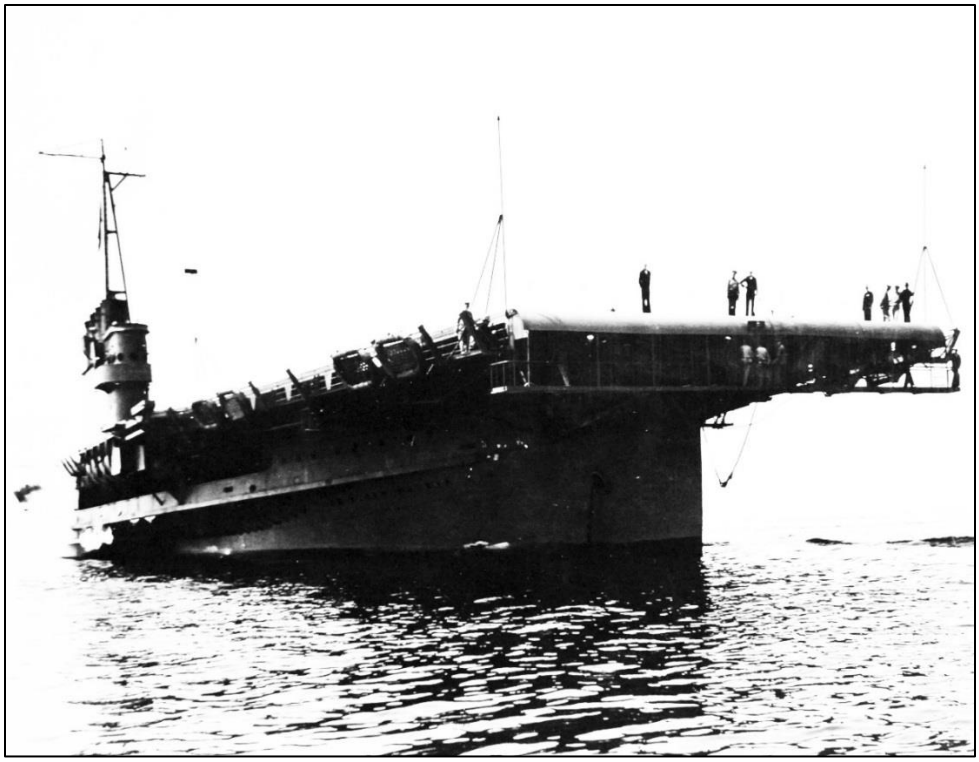

Figure 2.7. USS *Wolverine* with forward anchor light staffs, 1942 (Courtesy, Naval History and Heritage Command).

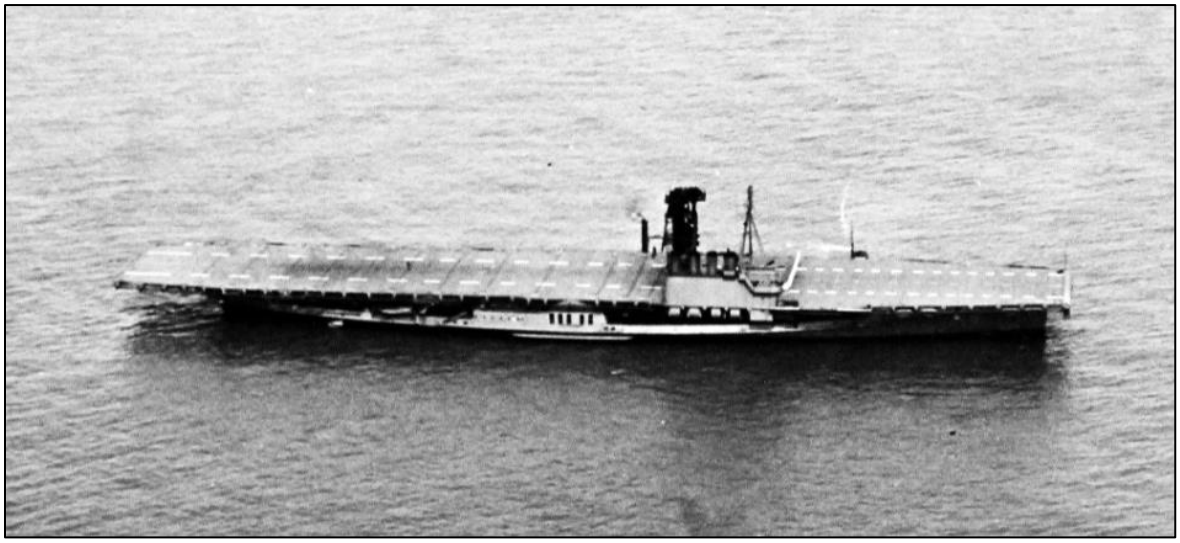

Figure 2.8. USS *Wolverine* on Lake Michigan, with no forward anchor staffs visible, April 6, 1943 (Courtesy, Naval History and Heritage Command).

Major Repairs Over the Winter

Operations on USS *Wolverine* in the fall months under Capt. Roscoe L. Bowman, a "'flying mariner,' almost a pioneer in naval aviation,"[71] revealed major problems the Navy had to fix over the winter months of 1942-43. The Navy realized in August that the ship was not quite up to snuff but needed to put into service anyway. The *News Journal* at distant Wilmington, Delaware, dared to report on the "major operation at [Navy] pier in Lake Michigan at Chicago" that the Navy "refuses to discuss…. Her innards are being given a 'going over.'"[72] The report gave no further details, but the vessel was certainly ready for full operations when the ice broke. In February 1943, Captain Bowman gave reporters the first press party aboard the vessel, so they could "see for themselves the tremendous size of the job of conversion."[73] Doubtless, the reporters were duly impressed by the new training carrier.

Thus, while the details of these final installations were not intricately recorded, they nonetheless illustrate the military's high standards of workmanship and regard for armed forces safety. Although the conversion of a passenger steamer to an aircraft training carrier took more time than the Navy wanted, it still took less time that the contractor thought possible—only fifty-nine days after the superstructure was removed, despite material and personnel shortages. The Navy had no cause for complaint.

Indeed, five months after USS *Wolverine* went into service, the Navy awarded American Shipbuilding Company its Army-Navy "E Award." Rear Admiral W. T. Cluverius, US Navy retired, in making the presentation, said the award "is for the accomplishment of a unique task…. For the first time in history, the nation now has a vessel on the lakes training pilots for the far-

[71] "Great Lakes Plane Carrier Trains Flyers," *News Journal* (Wilmington, DE), 12 February 1943.
[72] "Great Lakes Plane Carrier Trains Flyers."
[73] "Great Lakes Plane Carrier Trains Flyers."

flung battlefronts."[74] The Army-Navy "E" Award was an honor presented to companies during World War II whose production facilities achieved "Excellence in Production" of war equipment.

[74] "Plant Gets Award on Ship Rebuilding," *Democrat and Chronicle* (Rochester, NY), January 20, 1943.

Chapter 3: Conversion of SS *Greater Buffalo* to USS *Sable*

The second phase of making the Great Lakes into a naval training base for carrier-borne fliers started on 1 August 1942. The Navy announced it would requisition SS *Greater Buffalo,* a Great Lakes luxury excursion vessel owned by Detroit & Cleveland Navigation Company, to convert it into USS *Sable* as a semi-sister ship to USS *Wolverine*.[1] SS *Greater Buffalo,* built in 1924 by the American Ship Building Co. of Lorain, Ohio, was ideal because it was one of the world's largest freshwater side-wheelers, weighing 7,739 gross tonnage and 3,330 net tonnage.[2]

SS *Greater Buffalo* and its semi-sister ship SS *Seeandbee,* each cost $3.5 million to build, and the company estimated replacement costs at $6 million, even if the material could be obtained. But the government purchase price was not disclosed to the public, presumably as wartime policy.[3] As large as many ocean liners, the vessel was powered by nine Scotch boilers and an inclined, compound steam engine with three pistons. With a deck crew of thirty, an engine crew of thirty-nine, a total crew total of three hundred, and sleeping accommodations for 1,750 passengers, SS *Greater Buffalo* commanded Lake Erie for two decades and was still in good condition when the Navy purchased it, according to the condition survey the Naval Department of Maintenance and Repair Division conducted upon purchase of the vessel.[4]

The news release by Comdr. Edward A. Eisele, US Navy, Supervisor of Shipbuilding in Buffalo, about the purchase stated that the vessel was "vitally needed in the war program.... With the *Lexington* and the *Yorktown* badly damaged, the need for an aircraft training ship becomes

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[1] "Navy to Take Second Vessel as Carrier," *Detroit Free Press,* August 2, 1942; "Convert Second Lake Boat into Plane Carrier," *Chicago Tribune,* August 14, 1942; "Greater Buffalo will be Converted into Training Ship," *Times Herald* (Port Huron, MI), August 2, 1942; "Navy to Convert Great Lakes Ship," *Akron Beacon Journal,* August 2, 1942.

[2] Paul M. Somers, *Lake Michigan's Aircraft Carriers* (Charleston, SC: Arcadia, 2003), 46.

[3] "Navy Changes Lake Cruises," *Escanaba Daily Press,* August 21, 1942.

[4] Naval Correspondence: Department of Maintenance and Repair Division to the Secretary of the Navy. 10-August 13, 1942, Folder "IX-81 Vol. 1," Box 417, Section A1 1266-F, Record Group 19, National Archives Records Administration II (hereafter IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII).

apparent."[5] The announcement had an unexpected effect. It sparked a rumor that the Navy would buy more of the company's passenger liners for conversion. Overnight, the price of shares of Detroit & Cleveland Navigation Company soared to new heights on the strength of speculation. Within hours of the Saturday announcement, D&C shares traded on the Detroit Stock Exchange had risen in price by 300 percent, from $1 to $3, adding $1 million to the company's valuation. When stock exchanges opened on Monday, the price rose another 25 percent, from $3 to $3.75 per share. More than 18,000 shares changed hands that day, three times the number of shares on company books. One group invested $20,000 in the enterprise.[6] The speculation soured when it became clear over the next weeks that the Navy would not need any more training aircraft carriers.

Implications of Design Changes

The Navy hired American Shipbuilding Company of Cleveland to convert SS *Greater Buffalo* to USS *Sable*. The decision was straightforward. It was the same company that had successfully converted SS *Seeandbee*. Moreover, American Shipbuilding had recently won the coveted Army-Navy "E Award" for excellence in workmanship, giving the firm a solid reputation for reliability.[7] This fact helped shield the company from criticism when the conversion process, through no fault of its own, took longer than expected, and certainly longer than refitting SS S*eeandbee*.

The reason for the lengthier conversion process was that the Navy decided to experiment with steel decking on USS *Wolverine*. As a result, instead of the anticipated four-month

[5] "Navy Converts Sidewheeler into Carrier," *Shamokin News-Dispatch* (Shamokin, PA), August 22, 1942; "Navy Converts a Sidewheeler into Carrier," *Times* (Munster, IN), August 9, 1942.

[6] "Navy Changes Lake Cruises," August 21, 1942; "D&C Stock Hits 3-3/4 on 'Street Talk,'" *Detroit Free Press*, August 28, 1942.

[7] "Plant Gets Award on Ship Rebuilding," *Democrat and Chronicle* (Rochester, NY), January 20, 1943.

conversion schedule, it took nine months. Planners had assumed the shorter schedule, on the assumption that workers could apply lessons learned in the first conversion. This was a correct assumption. Project engineers were able to correct some deficiencies that cropped up during the conversion of the SS *Seeandbee*. However, Navy brass wanted to replace oak flight decks, and the conversion of SS *Greater Buffalo* provided the opportunity to test the advantages and disadvantages of a steel flight deck.[8]

American Shipbuilding Company

American Shipbuilding Company has a long history as a major designer and builder of vessels for the Great Lakes. The firm began in 1899 in Cleveland as a consolidation of local boat works—Cleveland Ship Building Company (fig. 3.1), Ship Owner's Dry Dock Company, Globe Iron Works, and five other Great Lakes companies. Globe Iron Works began even earlier, in 1869, and entered the shipbuilding industry by purchasing an interest in a Cleveland dry dock at the mouth of the Cuyahoga River. In 1886, Globe organized their shipbuilding interests into Cleveland Ship Building Co., and in 1897, Globe took over the Ship Owner's Dry Dock Company, which had two docks in Cleveland. American Ship Building Company prospered in the early 1900s with the steel industry's increased demand for new ore carriers.[9]

[8] Somers, *Lake Michigan's Aircraft Carriers*, 61.

[9] *Encyclopedia of Cleveland History* (Cleveland, OH: Case Western Reserve), https://case.edu/ech/articles/a/american-ship-building-co.

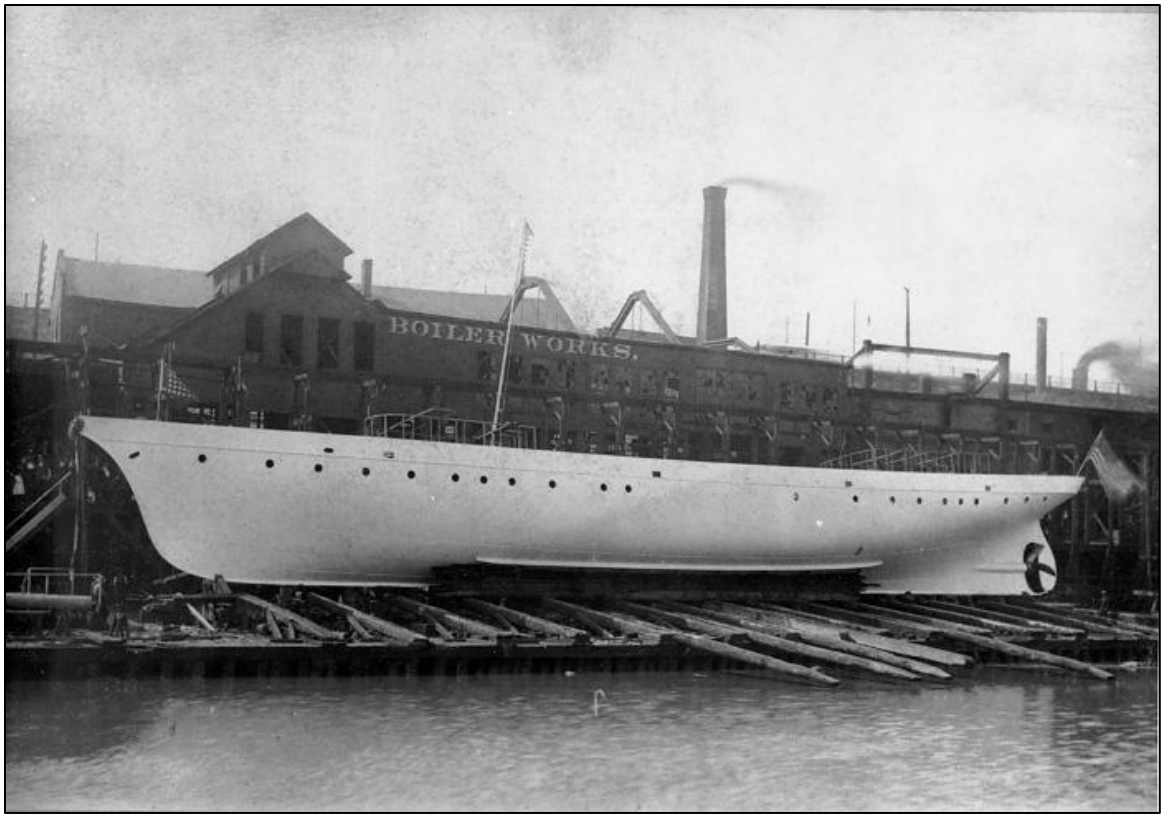

Figure 3.1. Cleveland Ship Building Company, forerunner of the American Ship Building Co. (Courtesy, Western Reserve Historical Society, Case Western University).

Conversion Planning

Special ceremonies marked the final passenger sailing of SS *Greater Buffalo*, one of the queens of the C&B Transit company fleet, from Detroit to Buffalo on 2 August. River craft saluted the vessel as it set sail (fig. 3.2). Passengers promenaded the vessel's decks. And the usual *bon voyage* crowd watched from the dock. After carrying an estimated 25,000 honeymooners to Niagara Falls over sixteen years, the "honeymoon steamer" was on its way to a war job.[10]

[10] "Navy to Take Second Vessel," *Detroit Free Press*, August 2, 1942; "Honeymoon Steamer, 'Buffalo,' on War Job," *Lansing State Journal* (Lansing, MI), August 3, 1942; "Liner Buffalo Taken by Navy," "Navy Changes Lake Cruises," August 2, 1942.

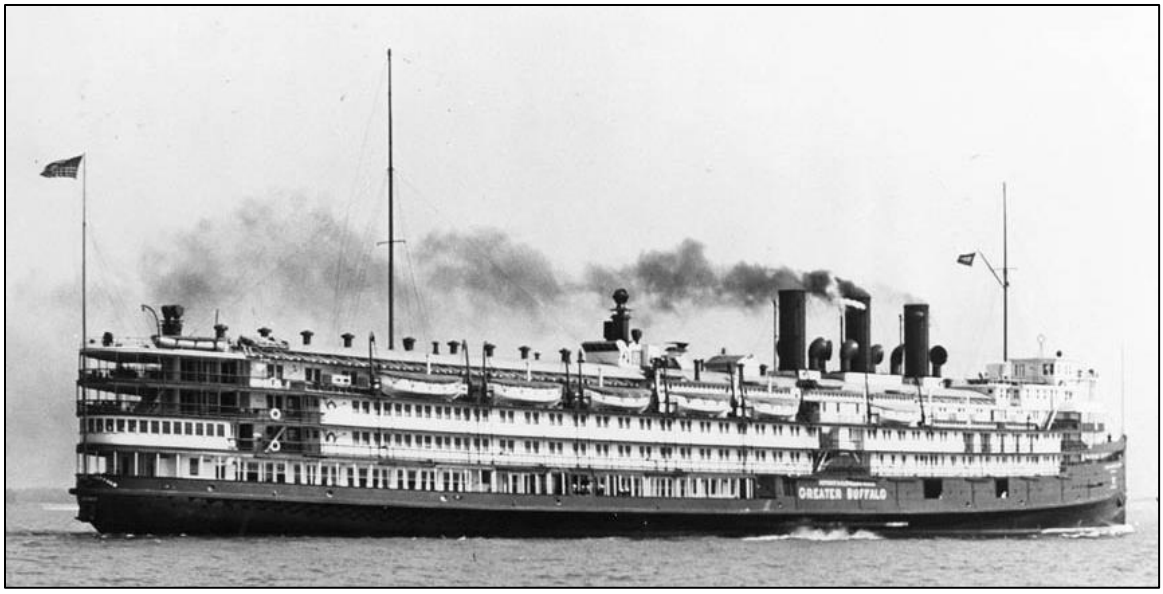

Figure 3.2. SS *Greater Buffalo* arriving at Buffalo for conversion, August 8, 1942 (Courtesy, Thunder Bay Sanctuary Research Collection).

The conversion process was on a very tight timeline. SS *Greater Buffalo* was scheduled to begin its conversion to an aircraft training ship on the 7th of August and be completed by the 31st of October, 1942. American Shipbuilding requested that the Bureau of Ships deliver needed materials as soon as possible. Meanwhile, the bureau requested a detailed inventory of everything on board that could be repurposed, especially the existing gyro-compass equipment. Other desired items included telegraph equipment, the rudder angle indicator, sound motion picture projector, and the like, all to avoid the need to purchase such equipment.[11]

The Chief of the Bureau of Ships asked the Navy's Supervisor of Shipbuilding, in Cleveland, Ohio, to list materials still on hand from USS *Wolverine*'s conversion in hopes of cutting costs and avoiding shipping delays that plagued that project.[12] A team sent from New

[11] Naval Correspondence: Department of Maintenance and Repair Division to the Secretary of the Navy, August 10-13, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[12] Naval Correspondence: Chief of Bureau of Ships to Supervisor of Shipbuilding, USN, Cleveland, OH, August 15, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII. From 1842 through 1966, bureau chiefs were largely autonomous, reporting directly to the Secretary of the Navy and managing their respective organizations without the influence of other bureaus.

York City created a detailed inventory of all materials and supplies in the deck, engine, and steward departments. In addition to the inventory process, the Navy decided to strip everything down to the "B" deck, and then determine what else they might need that was not already available.[13]

September Design Changes

Engineers addressed a major design issue in September regarding the location of the air plot, radar plot, and flight deck light rooms. The only access to these areas was through the radar control room. The proposed solution was to provide a four-foot passageway on the forward side of bulkhead number 55, from the starboard outboard bulkhead to the flight deck light room. To create the space for this passage, the contractors moved a six-foot door off the centerline to port between the flight deck lightroom and the air plot room, and they built an arch between the two rooms. The Bureau of Ships engineers also proposed adding a door from the rear control room to the passageway, as well as adding a door from the radio room to the passage. The downside of the reconfiguration was that the size of the radio room had to be reduced, although it was still adequate to house all the necessary radio equipment.[14]

The schedule called for the installation of arresting units, accumulators, yielding elements, and spares for the end of September. However, by the third week, the contractors realized that this delivery date was unrealistic. The shipment of critical items was deferred, except for five arresting units, which were kept in a dry, confidential location until needed.[15]

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[13] Naval Correspondence: Chief of Bureau of Ships to Supervisor of Shipbuilding, USN, Cleveland, OH, August 15, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[14] Naval Correspondence: Chief of Bureau of Ships to Supervisor of Shipbuilding, USN, Cleveland, OH, September 24, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[15] Naval Correspondence: Chief of the Bureau of Aeronautics to the Supervisor of Shipbuilding, USN., c/o American Shipbuilding Company, Buffalo, NY, and Supply Officer, Norfolk Navy Yard, Norfolk, VA. September 8, 1942, Folder “IX-81 Restricted,” Box 418, Section A1 1266-F, Record Group 19, National Archives Records Administration II.

The Navy renamed SS *Greater Buffalo* on September 19, 1942, as USS *Sable*.[16] On September 30, team leaders met in a conference aboard the ship to discuss their operating experience and lessons learned in the conversion process. The group included the commanding officer and his staff: Capt. Ross P. Schlabach, Navy Supervisor of Shipbuilding, Mr. D. Kruit Sr., Naval Architect in the supervisor's office, and Mr. L. Ylvisaker, operating manager of American Shipbuilding Company.[17]

The meeting resulted in many helpful recommendations. One was to boost the capacity of the flight deck davit to hoist weights of 1,000 lbs. Another was to provide adequate compartment drainage in all of the workshops since that had been a significant problem on USS *Wolverine*. A third was to make sturdier and wider side ladders. Finally, lifeboats were suspended from the flight deck, so that they could be launched while the ship was underway.[18]

Flight deck improvements of lesser import included erecting the sounding platform just forward of the pilothouse, adding a portable turbine ribbon gasoline pump for pumping fuel from planes to storage tanks, installing 42” safety rails on the starboard side forward and aft the pilothouse and on the forward and aft ends of the flight deck. They also moved the flag control platform on the pilothouse further forward, as designed by naval architect Kruit. Other additions to the craft were two dozen portable CO_2 bottles, radiators on top the pilot hour, double-bottom tanks to increase freshwater capacity, and a single-face type telegraph in pilot house engine room.[19]

[16] Naval Correspondence: The Vice Chief of Naval Operations to the Secretary of the Navy, September 19, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[17] Naval Correspondence: Supervisor of Shipbuilding, USN, Cleveland, OH to the American Ship Building Company, October 3, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[18] Naval Correspondence, October 3, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[19] Naval Correspondence, October 3, 1942

Crew's quarters received extra attention. Scheduled additions included a larger washroom, steel clothes lockers, and a clothes-drying room located in the forward crew's quarters to contain wash tubs and washboards. Designers incorporated the lockers and the drying room. The larger washroom was deleted as a cost-saving measure, though, to the detriment of future crew members.[20]

Navy requirements included several machinery and electrical components, including piping the showers from the sanitary system, a public announcement system with a transmitter at the deck office, and instruments to analyze flue gas. To prevent freezing, the Bureau of Ships recommended extending the height of the overflow pipe in the gasoline system and adding a heating system. The bureau also proposed adding lubricating oil tanks between the flight deck trusses of the engine room, insulating fire and freshwater piping, running freshwater piping into the hull structures as much as possible, ensuring that fire piping had proper drainage, adding drainage in workshop compartments and radiators atop the pilothouse, enclosing the flight control platform, and providing for boat storage under the flight deck.[21]

The engineering officer reported that the vessel lacked a strainer/filter system. As a result, sand and mud had seeped into the freshwater tanks and boilers. They recommended strainers and/or filters in these tanks. The final set of recommendations focused on lighting, based on experiences on USS *Wolverine*, included adding breakdown lights and a control panel in the steering gear room, a windlass room, and lights on the main deck from within those spaces, rather than from the pilothouse.[22]

[20] Naval Correspondence, October 3, 1942
[21] Naval Correspondence, October 3, 1942.
[22] Naval Correspondence, October 3, 1942.

On October 3, 1942, the Supervisor of Shipbuilding sent out an extensive list of engineering recommendations and a summary of the September 30 conference. Based on these recommendations, the Bureau of Ships laid out its decisions on November 1, 1942. The bureau rejected many of the recommended improvements because of cost considerations. It also decided not to design a way to launch service boats while underway, because the ship would usually be escorted by US Coast Guard and other vessels, which could perform this function (fig. 3.3). These support vessels rescued downed pilots and sometimes even recovered floating aircraft. They also ferried new crew members and flight cadets to and from USS *Sable* and USS *Wolverine*, refueled both the ships and the aircraft onboard the ships as seen in figure 3.3, and transported damaged aircraft back to Navy Pier for repair.[23]

Figure 3.3. Collier alongside to refuel the training carrier, on Lake Michigan, December 1942. Note coal hoisting gear on the collier and conveyer belt system and coal hatches on the carrier's flight deck (Photo, Lieutenant Wayne Miller, USNR. Courtesy of Naval History and Heritage Command).

[23] Naval Correspondence, October 3, 1942.

Engineers discovered a serious design flaw in October concerning the main engine installation. Steam piping to the engine ran directly from the boiler stop valve to the complicated main throttle valves gear. In case of an emergency involving that valve gear, the valve at each of the main boiler stop valves would have to be closed. These time-consuming steps constituted a major safety hazard. The proposed solution was to install a satisfactory main stop valve in the main steam line that could be operated in the engine room. The Bureau of Ships considered the lack of a main stop valve to be urgent, requiring the contractor's immediate attention.[24]

The bureau staff rejected the request to provide a portable air-driven gas pump for siphoning fuel from planes on the flight deck and reiterated that announcing systems should be built in accordance with the Circular of Requirements. They also agreed to extend the height of the overflow pipe in the gasoline system into the mast and add a heating system. One recommendation that warranted further investigation involved running pipes from the shower space straight overboard since the bureau was not familiar with the sanitary restrictions in the Great Lakes.[25]

On November 2, 1942, the Bureau of Aeronautics gave guidance on the arresting gear arrangement. They specifically recommended lengthening the landing area on the flight deck without increasing the length of the flight deck itself. The contractors addressed the recommendation by adding eight arresting units, eleven arresting wires, and three barriers.[26]

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[24] Naval Correspondence: Supervisor of Shipbuilding, USN, Cleveland, OH to the American Ship Building Company, October 3, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[24] Naval Correspondence: Chief of the Bureau of Ships to the Supervisor of Shipbuilding, USN, Cleveland, OH, November 1, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[25] Naval Correspondence: Chief of the Bureau of Ships to the Supervisor of Shipbuilding, USN, Cleveland, OH, November 1, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[26] Naval Correspondence: The Chief of the Bureau of Aeronautics to the Chief of the Bureau of Ships, November 2, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

Steel Decking

The most significant design decision for USS *Sable* was to switch from the traditional wood deck used on USS *Wolverine* to an experimental steel flight deck. Navy documents do not discuss why they decided to experiment with steel decking. As with the shift from wooden-hulled to metal-hulled ships, though, steel in place of wood was a natural technological advance to service heavier and faster aircraft. On November 16, 1942, the Bureau of Ships held a very important conference to discuss how to experiment with steel decking to find the ideal "specs" and applications for flight decks. The meeting included two staff from the Bureau of Aeronautics, four from the Bureau of Ships, one from the Supervisor of Shipbuilding's Office, one from the American Shipbuilding Company, and three from the H.H. Robertson Company, a Pittsburgh-based company that specialized in protected sheet metal for industrial roofing and siding.[27]

The Bureau of Ships faced several considerations changing from wooden to steel flight decks. One was whether non-skid surfaces could stand up to the intense training and winter weather conditions on the Great Lakes. They were concerned that chipping or scraping ice off the flight deck could cause damage to the runway. Another question was the increased likelihood of non-repairable propeller damage on the training vessel, due to the hard surface that the plane's nose gear would hit on landing. With the softer wooden deck, the propellers could be straightened if bent due to contact with the deck.[28]

The Supervisor of Shipbuilding personnel acknowledged the points made but ordered the construction to continue, as the Navy was committed to the experiment. The consensus was to

[27] Navy Department Bureau of Ships: Memorandum for File, November 16, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[28] Memorandum for File, November 16, 1942.

swap wood decking for five-pound steel decking. The bureau accepted the original designs of flight deck fittings for lights, sheaves, yielding elements, and securing tracks, but the bureau asked American Shipbuilding designers to figure out how to combine the fittings with the two decks. The Robertson Company agreed to provide an engineer, if necessary, to work with American Shipbuilding engineers on installing their deck.[29] After the conference concluded on November 19, 1942, the Bureau of Ships officially authorized the modification of the flight decking from wood to steel. With this official change, the Navy estimated the earliest practical completion date would be March 1, 1943, a troubling six months later that the original October 31, 1942 target date.[30]

Since the results of this experimental installation would be fed into other ocean-going ship designs, the Bureau of Ships decided to use galvanized steel on the forward most of the three sections of the so-called Robertson decking, including both corrugated section and flat deck plating. They wanted to understand what issues they might encounter when applying galvanized decking. The Navy tested the viability of the "Robertson decks" against "Navy decks" by installing both versions on the new flight deck using a checkerboard pattern (fig 3.4).

[29] Naval Correspondence: Supervisor of Shipbuilding, USN, Cleveland, OH, to the Chief of the Bureau of Ships, November 23, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[30] Naval Correspondence: Supervisor of Shipbuilding, USN, Cleveland, OH, to the Chief of the Bureau of Ships, November 23, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

Figure 3.4. USS *Sable* deck during refitting, looking aft with smoke from coal-fired boilers, March 1943 (Courtesy, National Archives, D.C.).

They also tested eight types of commercial non-skid coatings. The Navy laid out the decking in alternating sections from stem to stern, with each steel deck type getting roughly forty ship frames worth of surface area, as seen in figure 3.5.[31]

Figure 3.5. USS *Sable* steel decking differences evident aft of conning tower, June 1945 (Courtesy, Naval History and Heritage Command).

[31] Navy Department Bureau of Ships: Memorandum for File, November 16, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

The Robertson Company contractors increased their steel thickness in the lower corrugated portion from 10-guage to 12-guage, which boosted the total weight of the decking by 16 lbs. per square foot. Navy decks consisted of 10.2 lb. steel plates that were stiffened transversely by 3" x 3" x 5/16" T' shaped beams, with 12" centers. The T's, with the flange or horizontal side down, were laid on top of longitudinal girders. (To visualize T's, think of I-shaped rails on railroad tracks but without one flange.) In the end, Navy engineers concluded that "Robertson" steel plate deck was likely too light to stand up well, but they approved it anyway because USS *Sable* would only be needed as a training carrier for two or three years.[32]

Final Installations

Pushing the completion date back six months gave engineers more time to install electrical cables and wire radio equipment. The result was a neater cable bundle, plus the inclusion cables to the landing signal officer's (LSO) aft platform that had been left out on USS *Wolverine* in the rush to meet the completion deadline. The Bureau of Ships supplied all requested radio equipment, but they needed to obtain a number of items from the Radio Material Officer of the 9th Naval District at Norfolk Navy Yard.[33] The contractors were still modifying the arrangement of flight deck barrier wires in mid-December 1942, to fit the structure of the pilothouse and location of the weathertight doors. By moving the barrier wires forward six feet, but keeping the barriers the same distance apart, the doors and the wires would clear each other.[34]

[32] Navy Department Bureau of Ships: Memorandum for File, November 16, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[33] Naval Correspondence: Chief of the Bureau of Ships to the Supervisor of Shipbuilding, USN, Cleveland, OH, November 23, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[34] Naval Correspondence: Supervisor of Shipbuilding, USN, Cleveland, OH, to the Chief of the Bureau of Ships, December 14, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

A major problem was a shortage of arresting gear accumulators that put the entire project in jeopardy for more than two months. Active duty warships had priority on this critical component. During the two-month delay, the Navy lost USS *Wasp* in the Solomon campaign and USS *Hornet* in the Battle of the Santa Cruz Islands, as well as a several other ships, including USS *Juneau*, and a large number of trained pilots. Navy officials debated installing on USS *Sable* echo sonar equipment from the New Jersey manufacturer, but they nixed the idea when they learned that it would require the ship to be dry-docked, and the only dry-dock in the Great Lakes was located at Manitowoc, Wisconsin, which was difficult to reach.[35]

On February 15, 1943, Lt. J. J. Manley D-V(S), USN Captain R. L. Bowman, and USN Lt. R. A. Haynie D-V(S) inspected the vessel and approval the work. They found that the alterations "permit a reasonably accurate estimate of their usefulness in the operation of the USS *Sable* as a training carrier." [36] However, the vessel was not quite as fast as USS *Wolverine* due to its larger size.[37] Unfortunately, icy weather conditions affected welders working on the steel deck, which delayed the conversion process even further (fig 3.6). In the end, USS *Sable*'s completion date was pushed almost another month, to March 29, 1943.

[35] Naval Correspondence: Supervisor of Shipbuilding, USN, Cleveland, OH, to the Chief of the Bureau of Ships, December 14, 1942, IX81 Vol. 1/417/A1 1266-F/RG 19/NARAII.

[36] Naval Correspondence: Commanding Officer, USS *Wolverine*, to Bureau of Ships, DC, February 15, 1943. Folder "IX-81 Vol. 2," Box 418, Section A1 1266-F, Record Group 19, National Records Administration II (herein abbreviated as IX81 Vol.2/418/A1 1266-F/RG 19/NARAII.).

[37] Naval Correspondence: Commanding Officer, USS *Wolverine*, to Bureau of Ships, DC, February 15, 1943. IX81 Vol.2/418/A1 1266-F/RG 19/NARAII.

Figure 3.6. USS *Sable* moored in Lake Erie ice, April 1943, American Shipbuilding Company, Buffalo (Courtesy, Naval History and Heritage Command).

Final Inspections and Commissioning

American Shipbuilding Company submitted a summary report on April 2, 1943, which revealed a huge cost overrun of $301,000, largely due to repeated design changes while the work was in progress.[38] Most important was changing the steel on the flight deck after the deck had been laid. Workers had to spend many hours with blow torches cutting off the old deck, rather than working on the conversion. This change of direction also meant that the vessel was left uncovered in bad weather, which doubled the cost of steel and raised overhead costs.[39]

Regarding the ship's compass, the Navy sent out a record summary from the Bureau of Ships, Magnetic Compass Section, on May 7, 1943, happily reporting that "no great difficulties have been encountered in compensating the magnetic compasses aboard CV's or ACV's." The Navy also noted that the data compiled on plus "E," or quadrangle error, was due to the off-

[38] Naval Correspondence: Resident Cost Inspector from the American Shipbuilding Company to the Officer-in-Charge, Branch Office of the Supervisory Cost Inspector, 3rd Naval District, Buffalo, NY, April 2, 1943, IX81 Vol.2/418/A1 1266-F/RG 19/NARAII.

[39]Naval Correspondence: April 2, 1943, IX81 Vol.2/418/A1 1266-F/RG 19/NARAII.

centered location of the magnetic compass. Fortunately, the Bureau of Ships had compass adjusters who could fix any compass problems that arose.[40]

Finally, on May 8, 1943, the sleek USS *Sable*, with its silhouette lowered and black and white paint replaced with battleship gray, entered service under Lt. W. K. Berner, who was the Navy staff commander at the Norfolk, Virginia, naval base.[41] However, the Navy had to delay the sea (lake) trials until May 21, 1943, because the ship could not leave the dock due to due to ice on Lake Erie and poor visibility for the accompanying officers (fig. 3.7). The vessel departed for Chicago a few days after its trials, with the promise that all minor issues discovered during the trials could be fixed satisfactorily before flight training began.[42]

While the steel flight deck decision, combined with poor weather and material shortages, delayed the predicted fast turnaround, USS *Sable* still went into service less than a year after being purchased by the Navy. USS *Sable* sailed the Great Lakes over the summer of 1943 to familiarize pilots with shipboard landings, and the vessel moored at Navy Pier (fig. 3.7).[43] The Navy now had two vessels dedicated to qualifying pilots to land and take off from carriers, helping to turn the tide of the war in the Pacific.

[40] Naval Correspondence: The Chief of the Bureau of Ships to the Prospective Commanding Officer of USS *Sable*, May 7, 1943, IX81 Vol.2/418/A1 1266-F/RG 19/NARAII.

[41] "Second Lakes Liner Turned into Carrier," *Detroit Free Press*, May 9, 1943.

[42] Trial Board, Office of Supervisor of Shipbuilding, USN, Cleveland, OH to President, Board of Inspection and Survey, June 4, 1943, Folder "IX-81 Restricted," Box 418, Section A1 1266-F, Record Group 19, National Archives Records Administration II.

[43] Trial Board, Office of Supervisor of Shipbuilding, USN, Cleveland, OH to President, Board of Inspection and Survey, June 4, 1943, Folder "IX-81 Restricted," Box 418, Section A1 1266-F, Record Group 19, National Archives Records Administration II.

Figure 3.7. USS *Sable* moored at Chicago's Navy Pier during WWII (Courtesy, Naval History and Heritage Command).

Chapter 4: Training Carriers: Use and Effectiveness

The most significant impact that flattops USS *Wolverine* and USS *Sable* had during World War II was that thousands of pilots and carrier personnel were certified from their decks. Another major contribution was experimentation and innovation in drone technology on USS *Sable*. The Navy accomplished these remarkable feats with limited resources and under extreme pressure to get pilots and support personnel to the war theaters.

During the three years of the training program from 1942 to 1945, the Navy trained 17,820 pilots to land on carriers[1] (although other sources indicate only 14,595 qualified pilots[2]), 40,000 sailors were trained, including landing signal corpsman, radio signal and radar operators, and other support personnel. This chapter discusses the ships' flight operations, naval aviators' training program, their training aircraft, pilot experiences, and experimental programs, notably, the secret drone program. The chapter concludes by covering the ships' decommissioning, delisting, and public outreach that continues to excite audiences today.

Glitches

As with any new project, there were bound to be glitches and a learning curve, and USS *Wolverine* was no exception. The crew faced several different issues in the early months, mainly operational and layout issues that they fixed quickly. A critical limitation for both carriers was lack of speed. Before their conversions, both vessels had an average speed of 22 knots. However, after the addition of heavy steel frames for the flight deck, the average speed slowed to 18 knots,

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[1] Somers, Paul M, *Lake Michigan's Aircraft Carriers*. Charleston, SC: Arcadia Publishing, 2003, 113; "Fresh-Water Flattops—The U.S. Navy's Forgotten Great Lakes Aircraft Carriers," Military History Now (website), August 29, 2016, https://militaryhistorynow.com/2016/08/29/fresh-water-flattops-the-u-s-navys-forgotten-great-lakes-aircraft-carriers/.

[2] "Navy Retires 2 Lake Flattops: 14,595 Trained," *Chicago Tribune*, September 23, 1945; Hill Goodspeed, "Lake Michigan's Naval Aviation History," *The Sextant*, September 27, 2019.

with a maximum speed of 22 knots.[3] This meant that for aircraft to achieve take-off speed, they had to sail into the wind. On days with little wind, they had to halt the operation.

Another limitation was the lack of a hanger bay and elevator. As soon as deck slots were filled with landed or damaged aircraft, the training carriers had to return to port to off-load aircraft. Each ship operated independently of the other, but each often had a support vessel from the Coast Guard escorting it to pick up downed pilots from the frigid waters of Lake Michigan if something went wrong (fig. 4.1).[4] Coast Guard vessels also escorted commercial ships and ferried personnel, supplies, and severely damaged aircraft between shore and the carriers. Personnel included new groups of pilots, as well as crew members and civilian support staff.[5] Plumbing problems were less critical but still daunting. Drinking water aboard ship was of poor quality and sewage lines installed during conversion were woefully inadequate; but the Navy resolved both problems.[6]

[3] Somers, *Lake Michigan's Aircraft Carriers*, 60-61.
[4] "Coal-Burning Carriers," *Naval Aviation News,* March 1954, 1.
[5] Somers, *Lake Michigan's Aircraft Carriers*, 82.
[6] Naval Correspondence: The American Shipbuilding Company to the Supervisor of Shipbuilding, USN, September 29, 1942, Folder "QM American Shipbuilding Vol. 1-2," Box 141-142, Section A1 1266-L, Record Group 19, National Archives Record Administration II.

Figure 4.1. Coast Guard crash boat assigned to USS *Sable* (Courtesy, Mark Allen).

Learning Problems

From the start, the Navy debated whether to convert the engines from burning coal to oil, due to the heavy black smoke emitted from the coal stacks that sometimes covered the deck and prevented planes from landing. It also made the deck treacherous for the crew because of the residual ash in the smoke. Eventually, Navy boiler operators learned how to maximize the efficiency of coal usage, based on where they placed the fuel in the coal burner. The Navy also switched to Pocahontas coal, a type of coal that was virtually smokeless and produced little residual ash. The Pocahontas Coalfield of Virginia, rated at 15,000 Btu/lb., produced the best quality coal in the world and the US military came to rely on it.[7]

[7] Somers, *Lake Michigan's Aircraft Carriers*, 81; "*Smokeless Coal Fields of West Virginia," The Coal and Coke Operator and Fuel Magazine*, 17 (July 1913): 249; Naval Correspondence: The Commanding Officer of USS

Because of the heavy upfront costs of the conversions, the Navy decided to keep using coal to power these carriers. This enabled them to function without interruption and it freed up oil for use elsewhere in the war effort. One downside of using coal was the fact that the Chicago area only had one coaling station nearby, and if that station shut down for maintenance or any other reasons, the training carriers were put out of commission. Yet, the rewards outweighed the risk and both ships were kept as coal-burning vessels.[8]

Flight Operations

To conserve fuel, the ships operated between refueling stations in Calumet, IL, just south of Chicago, and in the general vicinity of Chicago Harbor. Four-Mile Crib, Wilson Ave Crib, Carter Harrison Crib, and the Eight-Mile Buoy were the four most mentioned landmarks outside of Chicago Harbor in both USS *Sable* and USS *Wolverine*'s deck logs.[9] This route allowed for planes to meet over a very distinct landmark, the Bahá'í House of Worship, otherwise known as Point Oboe, in Wilmette. (see earlier fig. 1.3).[10]

In June 1944, Comdr. R. R. De Wolf oversaw the 30,000th landing on USS *Wolverine*. In late August, the officers and pilots celebrated 40,000 landings on the ship (fig. 4.2). Lt. Comdr. M. A. Peters, who was also a landing signal officer attached to the CQTU, made the landing. By August 1944, the USS *Sable* had also achieved more than 30,000 landings since its commissioning.[11]

Wolverine to the Chief of the Bureau of Ships, USN, September 6, 1942, Folder "C-IX64," Box 414, Section A1 1266-F, Record Group 19, National Archives Records Administration II.

[8] Naval Correspondence, September 6, 1942, C-IX64/414/A1 1266-F/19/NARAII.

[9] United States Navy, USS *Sable* deck logs; United States Navy, USS *Wolverine* deck logs.

[10] Somers, *Lake Michigan's Aircraft Carriers*, 82.

[11] "40,000 Landings on Lake Carrier," *Chicago Tribune* (Chicago, IL), August 29, 1944, 4.

Figure 4.2. 40,000th landing on USS *Wolverine*, August 29, 1944, (l-r): Lt. Comdr. M. A. Peters receives congratulations from Lt. Comdr. C. W. Stewart, air officer of USS *Wolverine*, Lt. Comdr. Charles Roemer, Comdr. R. R. De Wolfe, captain of the ship. Peters and Roemer were attached to carrier qualification training units at Glenview Naval Air Station (*Chicago Tribune*, August 29, 1944).

The next operational issue arose when winter hit. The winter of 1942 was incredibly harsh in the Chicago area, but training had to press on. Flight operations continued until Christmas Day 1942 when USS *Wolverine* could not leave its mooring because of ice conditions in the harbor and on the lake (fig 4.3). Despite the rugged conditions, 287 pilots had qualified on USS *Wolverine* since the beginning of the training program.[12]

[12] Somers, *Lake Michigan's Aircraft Carriers*, 81.

Figure 4.3. USS *Sable* icebound (Courtesy, Mark Allen).

During the late winter of 1942, the Carrier Qualification Training Unit (CQTU) headquarters moved to San Diego. The move, though costly, took only eleven days. While the weather was not a factor in training in San Diego, other operational constraints arose. The two carriers assigned for training, USS *Long Island* and USS *Core*, were not always available. They were required to operate at sea more than one hundred miles away, and with armed escorts that were unnecessary on Lake Michigan. The ships usually returned to port on weekends for required maintenance and repairs. Importantly, USS *Long Island* and USS *Core* were short and tended to pitch, making it very challenging for pilots learning to master carrier landings and take-offs. During the CQTU unit's few months in San Diego, 240 additional pilots qualified on the two carriers. However, when Navy planners compared the costs of operating in San Diego, they

decided that operations were more cost-effective at NAS Glenview, especially operating year-round.[13]

Operations moved back to Illinois in March 1943. Deck logs of USS *Wolverine* indicate that flight quarters and qualifying landings resumed on March 16.[14] When needed, Coast Guard icebreakers cleared the way to enter and exit the harbor, and when the lake froze over they broke ice ahead of the ships.[15] That winter, USS *Wolverine* was essentially alone on the lake, and the training program operated seven days a week, only stopping for bad weather.[16]

Typical commercial shipping in the Great Lakes did not begin until at least May due to weather conditions, but the war forced the Navy's hand early in 1943, when the battle of Guadalcanal, the New Guinea campaign, and the Solomon Islands campaign intensified. The three-day Battle of the Bismarck Sea highlighted the power of Allied aircraft, when the US Fifth Air Force and the Royal Australian Air Force (RAAF) destroyed all eight Japanese troop transport vessels and four of eight escort vessels, with minimal losses on the Allied side. Only 1,200 out of nearly 7,000 Japanese troops made it to their convoy's destination and a little less than 3,000 survived to make it back to the convoy launch point of Rabaul, Papua New Guinea.[17]

Planes Assigned to USS *Wolverine* and USS *Sable*

A variety of aircraft operated from the ships during the war, including the SBD Dauntless, the TBM/TBF Avenger, the F4F/FM-2 Wildcat, and more. Early in the war, the CQTU program used planes that had seen frontline action and were replaced with upgraded

[13] Somers, *Lake Michigan's Aircraft Carriers*, 81-82.
[14] United States Navy, USS *Wolverine* deck logs.
[15] Norman Polmar, *Aircraft Carriers: A History of Carrier Aviation and Its Influence on World Events*. Vol 1, 1909-1945 (Washington, DC: Potomac Books, 2006.), 1:272; Somers. *Lake Michigan's Aircraft Carriers*, 82.
[16] Polmar, *History of Carrier Aviation*, 272–73; Douglas Bukowski. *Navy Pier: A Chicago Landmark. Metropolitan Pier and Exposition Authority* (Chicago, IL: Metropolitan Pier and Exposition Authority, 1996), 41.
[17] Eric M. Bergerud, *Fire in the Sky: The Air War in the South Pacific* (Boulder, CO: Westview Press, 1999), 590-91.

aircraft. One of these planes was the SBD Dauntless, Bureau Number (BuNo) 06624. Before being assigned to the CQTU in Glenview, it participated in Operation Torch in North Africa from USS *Ranger*, as well as in other operations off Brazil as a part of the first operations of anti-submarine, carrier-centered task groups.[18]

Another significant plane in the CQTU fleet was SBD-2 Dauntless BuNo 2106. It is the only known plane tethered on the airfield to survive the attack on Pearl Harbor. Later it was riddled with bullet holes fighting in the Battle of Midway. After a prestigious frontline career, Dauntless returned to the United States for repair, and subsequently in March 1943, for reassignment to NAS Glenview. Another combat veteran assigned to CQTU was TBF-1 Avenger BuNo 06354. Before its assignment, it was part of VC-19, an escort composite squadron that the Navy assigned to USS *Bogue*. This squadron, when on anti-submarine patrol, sank eleven German U-boats. After *Bogue's* 1943 patrol ended, VC-19 was moved to NAS Fentress, Virginia, and in February 1944, 06354 was transferred to NAS Glenview and the CQTU.[19]

Vought F4U Corsair

The Vought F4U Corsair was an American fighter aircraft that saw service primarily in World War II and the Korean War. Chance Vought designed and initially manufactured the Corsair, and it was soon in great demand. Goodyear won additional production contracts, and their Corsair was designated FG. Corsair was designed and operated as a carrier-based aircraft; it had a 41- foot wingspan and a gull shaped wing to improve its aerodynamics. The aircraft entered service in large numbers with the US Navy in late 1944 and early 1945. It quickly became one of the most capable carrier-based, fighter-bombers of World War II and its naval

[18] *AAR BuNo 06624*, Aviation History Branch, Naval Warfare Division, Naval Historical Center, Washington Navy Yard, DC, July 29, 1944.

[19] *AAR BuNo 06354*, Aviation History Branch, Naval Warfare Division, Naval Historical Center, Washington Navy Yard, DC, July 29, 1944.

aviators achieved an 11:1 kill ratio. Japanese pilots regarded it as the most formidable American fighter that they faced. Early problems with carrier landings and logistics led to it being eclipsed as the dominant carrier-based fighter by the Grumman F6F Hellcat, powered by the same Double Wasp engine mounted on the Corsair's first prototype in 1940. Instead, the Corsair's early deployment was to land-based squadrons of the US Marines and Navy.[20]

Relatively few Corsairs were assigned to NAS Glenview as a part of the CQTU because they were originally thought to be unfit for carrier-based operations. Marines operated the majority of Corsairs throughout the war. Only two were known to be assigned to the CQTU and at least one of them had the infamous birdcage, cockpit window configuration (fig 4.4). The Navy originally decided that the birdcage limited visibility too much while taxiing on the deck of a carrier and that its controls were too sensitive. Many pilots, however, indicated the Corsair was easy to land aboard the carriers and did not handle much differently than any other aircraft.[21]

Figure 4.4. F4U-Corsair landing on USS *Wolverine*, 1943 (Courtesy, Mark Allen).

[20] Tillman. *Corsair*, 26.

[21] Dana Bell. *F4U-1 Corsair*, Vol. 1. (Tucson AZ: Classic Warships Publishing, 2014), 2; Tillman. *Corsair*, 23.

Douglas SBD Dauntless

The Douglas SBD Dauntless, dubbed "Slow But Deadly," was a World War II American naval scout plane and dive bomber manufactured by Douglas Aircraft Company from 1940 through 1944.[22] The SBD was the Navy's main carrier-based scout/dive bomber in the Pacific Theater from mid-1940 through mid-1944. Throughout the war, Douglas produced six different versions of the SBD, each an improvement from the model before.[23] With a maximum speed of 255 mph and a wingspan of 41 ft., Dauntless cruised through the skies carrying two crew and a bomb load up to 2,250 lbs. (fig. 4.5). Dauntless has the distinction of being one of the few fixed-wing planes in the Navy's carrier-based arsenal. Most aircraft based on carriers have wings that fold up to conserve space when not in the air. However, due to the extreme G-forces the plane experienced during dive bomb runs, both the Navy and the manufacturer agreed to strengthen the internal structure of the wing for safety.[24]

Figure 4.5. SBD Dauntless taking off from USS *Wolverine* on March 20, 1943, (Courtesy Mark Allen).

[22] Barrett Tillman, *The Dauntless Dive Bomber of World War II* (Annapolis, MD: Naval Institute Press, 1976), 11.

[23] Douglas Aircraft Company, founded in 1921 in Santa Monica, California, is most famous for the "DC" (Douglas Commercial) series of commercial aircraft, notably the Douglas DC-3, Douglas designed and built a wide variety of aircraft for the U. military, including the Navy, Army Air Forces, Marine Corps, Air Force, and Coast Guard.

[24] Bergerud, *Fire in the Sky*, 293.

Grumman TBF/TBM Avenger

The Grumman TBF Avenger (designated TBM for aircraft manufactured by General Motors) was a torpedo bomber developed initially for the US Navy and Marine Corps, and eventually used by several air and naval aviation services around the world.[25] Avengers played a vital role in destroying the German U-boats that were attacking Allied shipping in the Atlantic. The aircraft proved to be capable and trustworthy tools in the Allied war effort. Pilots liked the plane due to its strength, durability, and maneuverability. While it was not the fastest nor highest flying aircraft, Avenger proved immensely adaptable to all combat challenges (fig 4.6).

Avenger's durability also saved many an aircrew's life, including that of future president George H.W. Bush. Anti-aircraft fire struck his plane during a bombing run on Chichi Jima. The plane held together long enough for Bush to drop his payload on his target and head out to sea before bailing.[26] With a three-man crew and a 54-foot wingspan, Avenger lived up to its name in both the Atlantic and Pacific Theaters.

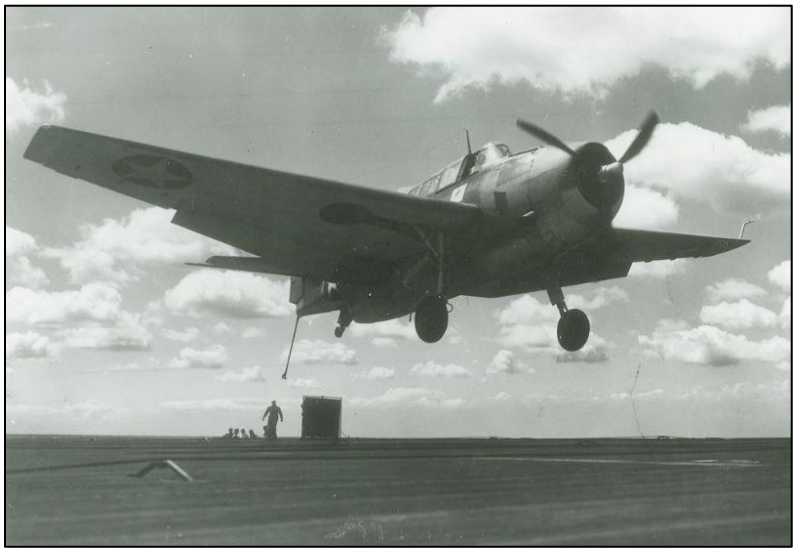

Figure 4.6. TBF Avenger landing on USS *Wolverine*, 1943 (Courtesy Mark Allen).

[25] Bert Kinzey, *TBF/TBM Avenger: In Detail & Scale* (Carrollton, TX: Squadron/Signal Publications, 1997), 32.

[26] Jesse Greenspan, "George H.W. Bush's Role in WWII was among the Most Dangerous," 13 February 2019, *A&E Television Networks*, https://www.history.com/news/george-hw-bush-wwii-airman.

Grumman F4F/FM-2 Wildcat and F6F Hellcat

The Wildcat was a very rugged, armored aircraft, which meant it could survive an attack from its enemy counterpart, the Japanese Mitsubishi Zero, even though the Zero drastically outperformed it. The Wildcat could not outmaneuver the enemy plane, but it could endure the attack and complete targeted attacks. The Wildcat was aptly named, as the pilots stated it was tricky and unforgiving to fly (fig. 4.7). The controls could feel like they were moving through syrup when they needed maneuverability the most—especially when they were trying to get around more agile Zero. The Navy relied heavily on the Wildcat in the first half of the war, but by the end of 1943, the Hellcat overtook the Wildcat in combat effectiveness. The Navy assigned several Wildcats for training pilots. With a 38-foot wingspan and a maximum speed of 331 mph, the Wildcat helped the Navy to survive until they could bring in more advanced planes.[27]

The Hellcat pushed the envelope for carrier operations. It appeared to be too large to take off from a carrier, but Grumman cleverly designed the wings to be proportionally larger than the plane. This reduced wing load and allowed for takeoff and landing speeds to be reasonable from a carrier (fig 4.8). Although the Hellcat replaced the Wildcat on the front lines, only a few were assigned to CQTU, because pilots preferred to practice in planes they would fly in combat.[28]

[27] Stephen Sherman, "Grumman F4F Wildcat," *AcePilots*, January 23, 2012, http://acepilots.com/planes/f4f_wildcat.html.

[28] The Grumman Aircraft Engineering Corporation, later Grumman Aerospace Corporation, was a leading 20th century U.S. producer of military and civilian aircraft. Founded on December 6, 1929, by Leroy Grumman and partners, it merged in 1994 with Northrop Corporation to form Northrop Grumman (Barrett Tillman, *Hellcat: The F6F in World War II* [Annapolis MD: Naval Institute Press, 1979], 6).

Figure 4.7. FM-2 Wildcat onboard USS *Sable*, 1945 (Scharch, http://www.scharch.org/Ed_Scharch/usn-aircraft/05-f4f-wildcat.html).

Figure 4.8. A F6F Hellcat hangs over the starboard side, after running off the deck and over the side of USS *Sable*, with guard boat following (Courtesy, Warbird Information Exchange via Mark Allen).

Vought SB2U Vindicator

The Vought SB2U Vindicator was a carrier-based, dive bomber developed for the Navy in the 1930s. Obsolete at the outbreak of World War II, Vindicators remained in service at the time of the Battle of Midway, but by 1943 the Navy transitioned all of them to training or scout aircraft.[29] SB2U Vindicator was among the first folding wing carrier planes and was one of the Navy's first monoplanes (fig 4.9). It helped prove the superiority of the monoplane design over the tried-and-true biplane design, which US designers had used since the Wright Brothers first airplane. The Navy only ordered fifty-eight Vindicators, and most were assigned to NAS Jacksonville. Only two were stationed at NAS Glenview as a part of the CQTU.[30]

Figure 4.9. SB2U-3 Vindicator preparing to land on USS *Sable*, 1943 (Courtesy, Mark Allen).

[29] Thomas Doll, *SB2U Vindicator in Action—Aircraft No. 122* (Squadron/Signal Publications, 1992), 46.
[30] Doll, *SB2U Vindicator*, 46.

North American SNJ Texan

The North American Aviation T-6 Texan was a single-engine, advanced trainer aircraft used to train pilots of the US Army Air Forces (USAAF), the US Navy, the British Royal Air Force, and other air forces of the British Commonwealth during World War II.[31] As a trainer, the T-6 Texan was most likely the first plane any naval pilot ever flew (fig 4.10). It was easy to produce, easy to modify in case of material or parts shortages, and easy to fix. However, the T-6 Texan was not all that easy to fly, which made it a less than ideal training aircraft. North American Aviation built the cockpit of the Texan to look and handle like a fighter to give the student a feel for a fighter plane, but it did not maneuver like one. The cockpit configuration gave students the necessary feel for the controls. Other than its ground handling, it was also relatively easy to spin, and to spin again, if pilot overcompensated on the initial spin correction.

Figure 4.10. SNJ Texan prepares to take off from USS *Sable*, 1945 (Courtesy, Mark Allen).

[31] "North American AT-6/SNJ-6," Lyon Air Museum, http://www.lyonairmuseum.org/exhibit/north-american-A6-snj6.

US Navy Drone Program in Michigan

Another significant use of the training carriers was to experiment with drone technologies, which are unmanned aerial vehicles. The USS *Sable* was instrumental in advancing this technology and integrating it with aircraft carrier operations. Early aviation innovators Glenn Curtiss and Elmer Sperry, a gyroscope expert, are credited with establishing the unmanned branch of US aviation. The Curtiss-Sperry Automatic Airplane project in the 1910s designed and tested the Curtiss-Sperry Aerial Torpedo for the Navy. The "flying bomb" was somewhat successful despite multiple setbacks, crashes, and failures.[32] The Navy was interested in this technology, but decided not to buy it at that time because "it was no substitute for an experienced pilot."[33] However, both the Navy and Army conducted parallel "pilotless plane" projects for the next several years to explore how to remotely-control unmanned planes and fly them stably.[34]

While unmanned flights occurred during World War I, they were used primarily as target drones rather than for bombing runs. However, in 1935 Admiral William Standley, Chief of Naval Operations, attended the London Disarmament Conference and saw a demonstration of the British Royal Navy's remotely piloted aircraft, called the "Queen Bee." This target drone led to significant improvements in British antiaircraft weapons. As a result, on July 20, 1936, Admiral Standley tasked Lt. Commander Delmer Fahrney to develop a similar unmanned aircraft for the US Navy.[35] The Navy Research Lab N2C-2 Target Drone, a radio-controlled aircraft controlled

[32] Richard K. Barnhart, Stephen B. Hottman, Douglas M. Marshall, and Eric Shappee, eds., *Introduction to Unmanned Aircraft Systems* (Boca Raton, FL: CRC Press, 2012), 4; Laurence R. Newcome, *Unmanned Aviation: A Brief History of Unmanned Aerial Vehicles* (Reston, VA: American Institute of Aeronautics and Astronauts, 2004), 21.

[33] Newcome, *Unmanned Aviation*, 16.

[34] Newcome, *Unmanned Aviation*, 31.

[35] Newcome, *Unmanned Aviation*, 63; William F. Trimble, *Wings for the Navy: A History of the Naval Aircraft Factory, 1917-1956* (Annapolis, MD: United States Naval Institute, 1990), 188.

by another aircraft flying nearby, became operational in the late 1930s.[36] On October 7, 1936, the first of the airplanes took off and landed under radio control, but they had a safety pilot on board in case there were any problems. By November 15, 1936, a N2C-2 drone took off without a safety pilot, flew for ten minutes, and landed successfully (fig. 4.11).[37]

Figure 4.11. USS *Sable* launches a TDN-1 drone while steaming off Traverse City, Michigan, during flight tests on 10 August 1943 (Courtesy, Naval History and Heritage Command).

In early 1942, Rear Admiral John Towers, Chief of the Bureau of Aeronautics, convinced Admiral Harold Stark, Chief of Navy Operations, to build a radio-controlled aircraft capable of dropping either aerial torpedoes or depth charges.[38] When the United States entered the war,

[36] Barnhart, Hottman, Marshall, and Shappee, *Unmanned Aircraft Systems*, 7; John F. Keane and Stephen S. Carr, "A Brief History of Early Unmanned Aviation" *Johns Hopkins APL Technical Digest*, 32, no. 3 (2013): 563.

[37] Trimble, *Wings for the Navy*, 192.

[38] Keane and Carr, "A Brief History of Early Unmanned Aviation," 564; Bill Yenne, *U.S. Cruise Missiles: From Kettering's 1920s' Bug & 1950's Snark to Today's Tomahawk* (Forest Lake, MN: Specialty Press, 2018), 22.

naval forces in Europe sent urgent requests for a weapon that could be flown into protected areas along the coast of France to take out German U-boats and attack Japanese forces in the South Pacific. The Navy leveraged its experience with the N2C-2 drone to develop a large-scale aerial torpedo, or "assault drone."[39] By March 1942, the Navy successfully conducted the first live attack test of the TDN-1 assault drone. The Navy then ordered 200 drones; the first 100, built by the Naval Aircraft Factory, were called TDN-1s, while the second 100 that were built by Interstate Aviation and Engineering Company were called TDR-1s.[40] They were capable of interchanging television and radar sensors. Both types were made of plywood and performed poorly but they could carry a 2,000-lb. bomb load.[41]

Use of Drones on USS Sable

The Navy established the Special Task Air Group One (STAG-1) to oversee drone development in August 1943.[42] Operations were first based in Oklahoma, where they launched drones from runways over two miles long.[43] After the STAG-1 team worked out the training basics of launching, landing, and controlling drones in flight, they moved the operation to Traverse City, Michigan to test it in open water over Grand Traverse Bay.[44]

On July 8, 1942, the Navy established Naval Air Station Traverse City (NASTC) (now Cherry Capital Airport), and eventually, NASTC helped develop the highly-classified STAG-1 drone program and to train pilots on other aircraft.[45] Navy contractors built four runways over

[39] Barnhart, et, al., *Unmanned Aircraft Systems*, 7.
[40] Trimble, *Wings for the Navy*, 263.
[41] Newcome, *Unmanned Aviation*, 69; Keane and Carr, "Early Unmanned Aviation," 565.
[42] Maxwell White, *An Interpretive History of the Pacific Missile Test Center* (Point Mugu, CA: Pacific Missile Test Center, 1991), 13; Keane and Carr, "Early Unmanned Aviation," 565; Yenne, "Cruise Missiles," 24.
[43] Keith Matheny, "TC Had Key Role in Secret WWII Project," *Record-Eagle*, November 14, 1999.
[44] Nick Beadleston, "Yes, an Aircraft Carrier on Grand Traverse Bay," *The Ticker* (Traverse City), February 18, 2015; Fitzpatrick, "Drone Training."
[45] Bill O'Brien, "Marker Plays Tribute to Secret WWII Work," *Record-Eagle*, December 8, 2011; Stephanie Staley and Amanda R. Wetzel, "Carriers in the Bay: Lake Michigan Aircraft Carriers," *A Magazine of the Grand Traverse Lighthouse Museum*, 2016, 24.

5,000 feet long, as well as twenty-five Quonset huts near the airplane hangar that they used for offices and communication operations. The STAG-1 headquarters was officially established on September 5, 1943, at NAS Traverse City.[46]

Almost 200 Navy personnel from Utility Squadron 6 and nineteen planes arrived from Cape May right away. The numbers swelled to 1,000 enlisted Navy and 150 naval officers at the height of the operation.[47] Even though Navy personnel were a common sight, they rarely discussed their training and testing efforts, as most everyone believed that there were German and Japanese spies everywhere.[48] Officers and their wives mostly stayed at the downtown Park Place Hotel, while the enlisted servicemen rented houses or boarding rooms.[49] However, most residents did not know about the program going on around them during the war.[50]

Navy personnel conducted dozens of test flights daily from both the airport and the USS *Sable*, which was anchored in West Grand Traverse Bay throughout most of August 1943 (fig. 4.12).[51] During this time, a TDN-1 drone took off freely from the deck of the USS *Sable* for the first time—truly a historic occasion.[52] The drone operator dialed in coordinates on a spin-dial telephone to direct the drone and after it launched, pilots in a second plane watched the drone on a television in the cockpit.[53] According to aviation machinist Michael L Behera, "They had a

[46] Staley and Wetzel, "Carriers in the Bay," 24; "Life after Wartime: The Fate of the Waugoshance Lighthouse, *Northern Express*, November 4, 2016, https://www.northernexpress.com/news/feature/article-7908-life-after-wartime/; O'Brein, "Marker Plays Tribute."

[47] O'Brein, "Marker Plays Tribute"; Matheny, *Record-Eagle*, November 14, 1999.

[48] Beadleston, "Yes, an Aircraft Carrier"; Garret Ellison. "Lake Michigan Navy Carriers." *M-Live*. 2015.

[49] O'Brein, "Marker Plays Tribute"; Staley and Wetzel, "Carriers in the Bay," 24; Beadleston, "Marker Plays Tribute."

[50] Sean Miller, "Carrier in GT Bay Aided in Secret Drone, Flight Training," *Record-Eagle*, December 7, 2017; O'Brien, "Marker Plays Tribute."

[51] Elliot Carter, "Ruins of the Waugoshance Light Station," *Atlas Obscura*, Carp Lake, MI. https://www.atlasobscura.com/places/ruins-waugoshance-lighthouse.

[52] Jeremy Hsu, "When US Navy Suicide Drones Went to War." *Discover Magazine*, February 18, 2017; Polmar. *History of Carrier Aviation*, 272; Bill Lee, "TDN-1: First Operational US Navy Drone," *Explorer Magazine*, September 23, 2013.

[53] Garret Ellison, "Lake Michigan Navy Carriers." *M-Live*, February 19, 2015.

television camera in the nose and a hydraulic unit that was controlled by radio impulses for each operation they wanted to control."[54]

Figure 4.12. Crew preparing drone aircraft on USS *Sable* in West Traverse Bay, Traverse City, Michigan (Courtesy, Traverse City District Library).

The crews practiced flying the drones and dropping bombs. Crews did much of the flying at night, making test runs in northern Lake Michigan.[55] After loading the drones on the USS *Sable*, they would sail to the Straits of Mackinac. The Navy used the abandoned Waugoshance Point Light off the east coast of Michigan near the Canadian border for hundreds of secret test attacks.[56] The pilots flew long-distance practice runs over the water to the lighthouse with a fifty-

[54] Preston Lerner, "The First Drone Strike–In 1944," *Air & Space Magazine*, October 2017. https://www.airspacemag.com/military-aviation/drone-strike-180964753/; Carter, "Ruins of the Waugoshance Light Station."

[55] O'Brien, "Marker Plays Tribute"; Staley and Wetzel, "Carriers in the Bay," 24; Matheny, "TC Had Key Role."

[56] *Express*, "Fate of the Waugoshance Lighthouse;" Carter, "Ruins of the Waugoshance Light Station"; Ellison, "Lake Michigan Navy Carriers;" Lee, "TDN-1"; John Mason, "This Inaccessible Michigan Lighthouse was Used during WWII to Develop Drones," *K102.5*, November 13, 2017; Miller, "Carrier in GT Bay."

mile separation between drone and control plane. The drones dropped their 2,000-pound bombs and then crashed into the water since the pressed plywood craft were expendable. One exploded close enough to the lighthouse to set off a fire that gutted the structure.[57] Pilots also crashed drones into the lighthouse and the light keeper's house. Remnants of the drones and bombs still lie in the surrounding waters.

The Navy continued to enhance the drone technology over the next three months. In November 1943, with winter starting in earnest in northern Michigan, the STAG-1 operation moved to Monterrey, California. First, STAG-1 deployed TDR-1 drones to the Russell Islands in the Southwest Pacific to prepare for combat.[58] Then STAG-1 deployed to the Solomon Islands between July and October 1944 to implement the new drone operation against the Japanese.[59] While drones saw only limited use in combat in the western Pacific, the experiments that the Navy conducted from both USS *Sable* and escort carrier USS *Charger* demonstrated the feasibility of deploying TDR-1s from aircraft carriers. The program resulted in several significant design advancements in radio-control and other guidance systems.[60]

Naval Aviator Carrier Training

By the time the two training carriers were ready for use, the Navy had developed an extensive pilot training operation on the Chicago lakefront, which coordinated multiple sites and training centers, including Great Lakes Naval Training Station and Naval Air Station Glenview, which served as the headquarters for the CQTU. Pilot recruits, having just completed basic operational flight training, entered the CQTU program to get qualified in carrier landings.[61] They

[57] "Fate of the Waugoshance Lighthouse;" Carter, "Waugoshance Light Station."
[58] Hsu, "US Navy Suicide Drones."
[59] Fitzpatrick, "Drone Training"; Keane and Carr, "Early Unmanned Aviation," 565.
[60] Keane and Carr, "Early Unmanned Aviation," 565; Trimble. *Wings for the Navy,* 267.
[61] Robert Haymes, "*The* USS *Wolverine* and *Sable* in World War II," *Warfare History*, February 11, 2019, https://warfarehistorynetwork.com/2019/02/11/the-uss-wolverine-and-sable-in-world-war-ii/.

felt the urgency of their training and were well aware of the risks ahead, both during their carrier flights and in combat. On the war front, German submarines were decimating Allied shipping and the United States and British forces were dropping thousands of tons of bombs monthly on targets deep in Europe. In the Pacific Theater, major air battles at Guadalcanal and island-hopping by the Marines across the Solomon Islands were advancing steadily toward the Japanese homeland.[62] At this critical juncture, the Navy needed to qualify pilots as quickly as possible.

USS *Wolverine* successfully launched its first aircraft on August 25, 1942, while the USS *Sable* qualified its first two naval aviators on May 29, 1943.[63] The training program operated seven days a week, only stopping for bad weather.[64] Since the pilots were usually only at NAS Glenview for a few days, the daily training routine was intense. The take-offs and landings were constant throughout the day, totaling around 300 flights per day, per ship. One career naval aviator (unnamed), who qualified in 1943 as an eighteen-year-old, said: "We spent a couple of days practicing approaches to the training field, and when our instructor thought we were ready, he sent us to the carrier."[65]

Navy pilots had to master a very complex, coordinated series of steps to safely land on the flight deck. First, they had to make sure to deploy the landing flaps, wheels, and tail hook as they approached the ship. At the same time, they had to cut their speed as much as possible without stalling out and watch for their signals from the Landing Signal Officer (LSO), who was

[62] Joe Hyams, *Flight of the Avenger: George Bush at War* (San Diego: Harcourt Brace Jovanovich, 1991), 49.

[63] Hill Goodspeed, "Lake Michigan's Naval Aviation History," *The Sextant*, September 27, 2019; Haymes, "USS *Wolverine* and *Sable*."

[64] Polmar, *History of Carrier Aviation*, 272–73; Bukowski, *Navy Pier*, 41.

[65] Bill Lee, *Paddlewheel Aircraft Carriers: A Prime Example of Necessity Being the Mother of Invention*, August 21, 2009, 4. https://docplayer.net/39858103-Paddlewheel-aircraft-carriers.html.

monitoring the approach. At the last minute, the pilot would cut the engine and drop onto the flight deck, catching the hook wire to stop the plane in a sudden jerk.[66]

Each aviator had to make eight (which was later reduced to six[67]) successful flights, which meant not crashing on the flight deck or into Lake Michigan.[68] A former naval aviator described his experience in an oral history project:

> I flew upward on the starboard side of the carrier with the canopy open to the freezing wind and my nerves stretched pretty thin. As I passed by the *Sable*'s bow, I snapped the aircraft into a hard 180-degree port turn. I lowered the wheels, flaps, and landing hook as I flew the aircraft downwind along the carrier's port side. Next came the gentle turn into the landing groove to sight the LSO, receive his "cut" signal, and make my first arrested landing on a carrier. Due to the sudden deceleration, when the hook engages the arresting wire, one must lock the canopy open, remove the hand from the throttle, and remove the feet from the brakes. I forgot all three. When my Wildcat hit the deck and grabbed the cable, the canopy slammed forward, my hand shoved the throttle to full power, and my feet applied the brakes! The Wildcat's nose went down and the tail went up [fig. 4.13]. With luck, no damage was done. The air boss, who was standing on the deck in the freezing wind in a full-length leather coat, was about 6 feet 4 inches tall, and looked as if he could eat ensigns alive - and very nearly did. Afterward he made his way to shepherd the next aviator to come aboard and was mumbling something about 'idiots in airplanes.' This was the first of many hundreds of carrier landings I experienced in my naval service, but I will always remember that first one on the USS *Sable*.[69]

[66] Andrew Knighton, "How the US Navy Trained Its Pilots in WWII: The Bar for Entry was High," *War History Online*, October 5, 2017, https://www.warhistoryonline.com/world-war-ii/how-the-us-navy-trained-its-pilots-in-wwii-the-bar-for-entry-was-high.html.

[67] Barrett Tillman, *On Wave and Wing: The 100-Year Quest to Perfect the Aircraft Carrier* (Washington, DC: Regnery History, 2017), 68.

[68] Ted St. Mane, *Lost Passenger Steamships of Lake Michigan* (Charleston, SC: The History Press, 2010); Ed L. Scharch, "NAS Glenview, Illinois: Carrier Qualification Training Unit (CQTU)," http://www.scharch.org/Ed_Scharch/09-nas-glenv-cqtu.htm; Nick Beadleston, "Yes, an Aircraft Carrier on the Grand Traverse Bay," *The Ticker* (Traverse City), February 18, 2015.

[69] Bill Lee, *Paddlewheel Aircraft*, 4. https://docplayer.net/39858103-Paddlewheel-aircraft-carriers.html.

Figure 4.13. FM-2 Wildcat fighter nose down after a barrier crash on board USS *Sable*, May 1945 (Courtesy, Naval History and Heritage Command).

The training program did not include night operations, but the pilots dealt with limited visibility due to snow, wind gusts, and clouds of exhaust smoke from the ship's engines. When the pilots took off, the cockpit canopies had to be open for safety reasons, so they also had to suffer through cold, blustery winter winds to take their training runs. Additionally, the flight decks were only 27 feet above the water, making it quite dangerous to land on the ship. Tim Claggett, who was 93 at the time of a 2015 interview with *The Ticker*, vividly remembered the harrowing days of learning to take off and land on the USS *Sable*, "You practiced day in and day out. You didn't take your eyes off of those flags when you were landing."[70]

[70] Beadleston, "Yes, An Aircraft Carrier."

President George H. W. Bush also went through the carrier training program at NAS Glenview in August 1943, after learning how to fly the Avenger at the Navy flying base in Ft. Lauderdale, Florida in mid-June 1943. He mastered torpedo bombers in a class of ten pilots at Lauderdale and practiced more than thirty field landings, which were marked out to match the size of a carrier deck. He also learned to work with landing signal officers who were responsible for directing his landing and signaling when to cut the engine to catch the wires. He would need these skills on carriers.[71] On August 24, 1943, Bush discovered to his dismay that landing in a field was quite different from landing on a pitching and rolling flight deck over the water. On that day, he qualified in carrier landings by making six landings and takeoff in an Avenger on the USS *Sable* in little more than two hours (see fig. 4.14).[72] He recalled the experience as "exciting, like when I soloed. One can practice carrier landing on land forever without knowing the thrill of actually landing on a moving ship at sea. There's something about the isolation, the ocean, the tiny carrier below that gets the adrenaline flowing."[73]

[71] Hyams, *Flight of the Avenger*, 50.
[72] Goodspeed, "Lake Michigan's Naval Aviation History"; Hyams, *Flight of the* Avenger, 53.
[73] Hyams, *Flight of the* Avenger, 53.

Figure 4.14. US Navy Pilot George Bush in the cockpit of an Avenger, 1942-1945 (Courtesy, George H.W. Bush Presidential Library and Museum).

End of an Era: Decommissioning

After World War II ended in August 1945, the Navy decommissioned USS *Sable* and USS *Wolverine*, and in November 1945 the vessels were struck from the Naval Vessel Register. USS *Wolverine* was sold for scrap metal in 1947. Before USS *Sable* was auctioned off, the Great Lakes Historical Society proposed to convert the historic vessel into a museum for Great Lakes history at Put-In-Bay, Ohio, near the Commodore Perry monument. However, the society was

unable to raise enough money and the vessel was sold for scrap metal in 1948.[74] The final voyage remains a sad ending to the physical reminder of an important part of American history (fig 4.15).[75]

JOURNEY'S END: The U.S. Navy flat-top, U.S.S. Sable, is shown here being towed through the Burlington ship canal en route to Steel Company of Canada's Hamilton, Ont., blast furnaces. The 600-foot vessel, used as a training ship for naval pilots on the Great Lakes, was a Detroit-Buffalo passenger steamer before the war. Some of the overhanging structure was cut away to permit passage through the Welland canal.

Figure 4.15. "Journey's End," USS *Sable* being towed for salvaging, Leader Post (Regina, Saskatchewan, Canada), November 12, 1948.

[74] "Will Scrap Carrier," *Daily News* (New York, NY), October 25, 1948.
[75] "Journey's End," *The Leader Post*, (Regina, Saskatchewan, Canada), November 2, 1948.

Evaluation

The overall training operation was a huge success. Throughout the war effort between 1942 and 1945, the Navy qualified 17,820 pilots for carrier duty and trained 40,000 sailors to work on carriers.[76] Pilots completed nearly 136,000 successful landings on the ships.[77] The Navy expected mishaps during this demanding training program and it turned out that 122 planes crashed, including 38 SBD Dauntless planes and there were more than 200 separate flight deck accidents. The majority of the time, pilots were not seriously injured, but sadly, eight naval aviators lost their lives.[78] Those who made the ultimate sacrifice while taking off or landing on USS *Wolverine* and USS *Sable* (not including a few other pilots who died over land) included:

Ensign Fred Morgan Cooper, a naval reserve aviator, crashed his F4F-3 Wildcat while he was launching off USS *Wolverine* on October 21, 1942. Neither he nor his aircraft were covered at the time.[79] This was the first accident onboard one of the Great Lakes training carriers.[80]

Ensign Herbert Welton McMinn, a naval reserve flyer from Gouldbusk, Texas, plunged into the lake on November 23, 1942 about five miles off Chicago's north shore.[81] His body was not recovered, but his SBD Dauntless was salvaged and is on loan in Alabama.

Ensign George Henry Bartlett Green III, 25 years old, from Boston, Massachusetts, died on April 14, 1943. Navy officials stated that a sudden squall came up shortly after five planes took off about 10:00 am, which blew up almost immediately after his Dauntless left USS

[76] "Navy Retires 2 Lake Flattops: 14,595 Trained," Chicago Tribune, September 23, 1945; Hill Goodspeed, "Lake Michigan's Naval Aviation History," *The Sextant*, September 27, 2019; Ted St. Mane, *Lost Passenger Steamships of Lake Michigan* (Charleston, SC: The History Press, 2010).

[77] "Navy Retires 2 Lake Flattops"; "U.S. Naval Air Station Glenview: The Final Salute, 1937- 1995," 10.

[78] "The Navy's Historic Aircraft Wrecks in Lake Michigan," Naval History and Heritage Command, published February 26, 2018, https://www.history.navy.mil/content/history/nhhc/research/underwater-archaeology/sites-and-projects/aircraft-wrecksites/aircraft-wrecks-in-lake-michigan.html.

[79] "Student Flyer on USS Wolverine Lost," *Times Herald* (Port Huron, MI), October 22, 1942.

[80] Goodspeed, "Lake Michigan's Naval Aviation History."

[81] "Hunt Navy Flyer Lost as Plane Dives into Lake," *Chicago Tribune*, November 23, 1942, 9.

Wolverine, which was lying off Evanston. Lt. M B. Alexander, public relations officer at Glenview said, "His body was recovered a considerable distance from shore, floating in the lake. He apparently died of drowning, rather than from injuries suffered in the crash." [82] His plane was not found at the time. Ensign Arthur H. Phillips, 22, of Boston (and best man at Green's wedding shortly before his accident) who flew off the carrier with Green made a crash landing about 200 yards off Sherwin Avenue beach and was rescued.[83]

Ensign Herbert Dean Brown, 24 years old, from Trenton, New Jersey, who also took off in the group of five planes with Green and Phillips, went down on April 14, 1943, as well. He and his Dauntless were not recovered. The other two pilots made it back to the carrier safely.[84]

Ensign James L. Warren, 22 years old, from Emporia, Kansas, was killed as he attempted to land on the USS *Sable* on Saturday, July 3, 1943. They were not able to recover his body or his Avenger.[85]

Ensign James Robert Hedgecock, of Fieldale, Virginia, crashed his Wildcat over the bow when he was taking off from the USS *Sable* on April 6, 1944, on his second flight of the day. His body was not recovered. [86]

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[82] "3 Navy Planes Crash in Lake During Storm: 2 Flyers Lost," *Chicago Tribune,* April 14, 1943, 1.

[83] "3 Navy Planes Crash"; "Lake Hunt Fails for Lost Ensign," *Democrat and Chronicle* (Rochester, NY), April 15, 1943, 1.

[84] "3 Navy Planes Crash"; "Second Carrier Flyer Presumed Lost in Icy Lake," *Chicago Tribune*, April 15, 1943, 30.

[85] "Navy Pilot Killed in Lake Michigan Crash," *Decatur Daily Review* (Decatur, Illinois), July 4, 1943, 7; "Navy Flyer Dies in Lake Michigan," *Kingsport Times* (Kingsport, TN), July 4, 1943, 9; "Carrier Pilot Killed," *Alton Evening Telegraph* (Alton, IL), July 3, 1943, 2.

[86] "Ensign is Killed in Take-off: Martinsville Youth Carrier Victim," *The Bee* (Danville, Virginia), April 7, 1944, 6; "Student Flyer on USS *Wolverine* Lost: Killed in Carrier Takeoff," *The La Crosse Tribune* (La Crosse, Wisconsin), April 7, 1944, 2; "Ensign Killed in Plane Crash over Lake Michigan," *Kenosha Evening News*, April 7, 1944, 7.

Ensign Frank Allen Richardson, 22 years old, of Jenkintown, Pennsylvania, died when he failed his first landing approach on the USS *Sable* on Friday, April 14, 1944.[87] Navy planes and the Coast Guard searched for the missing pilot and plane.

Ensign Richard P. Benson, 22 years old, of Algonquin, Illinois, was killed on Wednesday, June 28, 1944, about four miles north of Wheeling, Illinois.[88] Both his body and plane were likely recovered as the crash happened on land, not out on the lake.

In the end, thousands of pilots who successfully qualified on the USS *Wolverine* or USS *Sable* went on to serve in combat. Lt Comdr. J.P. Preston, commander of the CQTU, estimated 80 percent of navy and marine pilots who saw combat in the Marshall Island campaign conducted their training flights aboard USS *Sable* or USS *Wolverine*.[89] One combat veteran, George H. W. Bush is often mentioned, but finding information on other pilots who qualified on these two training carriers is more challenging. A recent film, *Heroes on Deck*, discussed Ensign William Forbes, who was an aircraft carrier pilot trainee on the USS *Sable*. He was on his third take-off on December 28, 1944, when he crashed his FM-2 Wildcat. Engine failure caused the plane to roll overboard and be cut in two by the carrier's bow. Thankfully, Forbes survived the crash and eventually completed his carrier qualification training in Lake Michigan before becoming a Navy aviator. He died at the age of 85 in 2008.[90]

Enlisted naval aviation pilots specifically identified three aviators who qualified in the directory entries: William F. Banks, Harold H. Kelly (Hal), and William J. Price.[91] William F.

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[87] "Navy Flyer Killed in Lake Michigan Crash," *The Dispatch* (Moline, Illinois), April 15, 1944, 5; "Ensign Missing after His Plane Falls into Lake," *Chicago Tribune*, April 15, 1944, 9.

[88] "Naval Flyer Dies in Crash near Wheeling," *Chicago Tribune*, June 29, 1944, 11.

[89] Frank Sturdy, "Lake-Trained Pilots Rule Air in Marshalls," *Chicago Tribune*, February 23, 1944, 8.

[90] Mark Bugnaski, "Secret WWII Pilot Training on Lake Michigan Chronicled in New Film," *MiLive*, posted February 14, 2016; updated January 19, 2019, https://www.mlive.com/news/kalamazoo/2016/02/heroes_on_deck_film_premiere_h.html.

[91] *Enlisted Naval Aviation Pilots*, 2nd ed. (Paducah, KY: Turner Publishing, 2002), 102.

Banks, of Lewisport, Kentucky, enlisted in the Navy on January 23, 1941 and attended boot camp in Great Lakes, Illinois. He served on the cruiser *Minneapolis* and went to Pearl Harbor for training and exercises. He survived only because he was at sea on December 7, 1941. He served in every major battle from Midway to Guadalcanal, until being reassigned in March 1942. He went to flight training for the next year in several locations and completed his operational training in Florida flying Wildcats. He then qualified on USS *Wolverine* in 1943 and deployed to the Pacific, serving with the VF-80 fighter squad. Later he became an operational instructor, took helicopter training and served with HU, and then worked in Kodiak as station pilot on visual duty. He also served in Korea; on the Flight Test Line in San Diego with HU-2 Lakehurst; and finally, on cruiser *Tanner* in the Mediterranean in 1956. He retired on June 8, 1960, his 37th birthday, with 8,000 Navy flight hours and 5,000 Army flight hours.[92]

Lt. Comdr. Harold H. Kelly (Hal), of Byrneville, Florida, enlisted in the Navy on May 12, 1936. He initially trained as a firefighter and then as an aviation machinist. In March 1943 he was selected for flight training and graduated as a naval aviation pilot in November 1943. He acquired his advanced training flying Avengers at Ft. Lauderdale. He received his carrier landing qualification on USS *Wolverine* and started in the VC-97, a new squadron forming in Klamath Falls, Oregon in early 1944. His Fishbrook Squadron went to the Pacific in mid-1944 on the jeep carriers, *Makassar Strait* (CVE-91) and later *Shipley Bay* (CVE-95). His combat experience included anti-submarine patrol flights, and covering troop supports ships at Iwo Jima and Okinawa. The squadron of Avengers laid a smokescreen for the initial troop landings on Iwo Jima and provided airborne firepower support with machine-guns, rockets, and bombs for ground troops at Okinawa. Kelly's group also attacked Japanese military installations, harbor areas, and

[92] *Enlisted Naval Aviation Pilots*, 102.

shipping lanes around several of the islands. Kelly retired on December 31, 1963, with twenty-six years of military service, having flown seventeen types of aircraft, totaling 10,823 pilot hours. He earned the Distinguished Flying Cross, Air Medals with three stars, Navy Good Conduct Medal, American Defense Service Medal, Asiatic-Pacific Campaign Medal with two stars, American Campaign Medal, National Defense Service Medal, and World War II Victory Medal.[93]

William J. Price, from Youngstown, Ohio, joined the Navy on March 5, 1941, and went through boot camp at Great Lakes. His first assignment was USS *Melville*. He went to flight school in March 1943, graduated in April 1945 from Pensacola, and was commissioned an ensign a month later. He proceeded to Sanford, Florida, for operational training flying F4F Wildcats. Price was carrier qualified at Great Lakes on USS *Sable* and served in combat in the Pacific, Hawaii, and later Vietnam. He earned the Air Medal.[94]

Aviator Fred Mc Daniel gave an interview for the National Museum of the Pacific War on April 8, 2015. McDaniel, born in Houston, TX, entered the Marine Corps in 1942 and received his wings in 1943. He began flying the F4U Corsair fighter plane in Jacksonville, and after several months he was sent to the Naval and Marine Corps Reserve Station located in Danville, Illinois, where he completed his carrier qualification on USS *Wolverine*. The Japanese surrendered as he was on his way to Hawaii, so he was assigned to the Joint Intelligence Corps Pacific Ocean Area and sent to Japan for three months.[95]

Roger H Went, born in Summit, New Jersey, also gave an oral interview for the National Museum of the Pacific War on March 12, 2008. He enlisted in the Navy in August 1942 and

[93] *Enlisted Naval Aviation Pilots*, 147.
[94] *Enlisted Naval Aviation Pilots*, 173.
[95] Fred McDaniel and John Fargo (interviewer), "Fred McDaniel Oral History Interview," Nimitz Education and Research Center, National Museum of the Pacific War, April 4, 2015.

completed his basic flight training at Glenview Naval Air Station by July 1943. After getting his wings and commission as an ensign on February 4, 1944, in Corpus Christi, Texas, he returned to Glenview and qualified on USS *Sable* flying an SBD in about four days in mid-1944. He recalled: "It was scary. It demanded intense concentration. As with any dangerous operation, you have to be tense."[96] He mastered carrier landings on USS *Charger* and USS *Shangri-La*, flying SB2C-4s. On April 25, 1945, he flew his first combat mission in the Western Pacific at Okino Daito Jima, and then fought at Kakia Jima. He was shot down by antiaircraft guns on April 29, north of Okinawa but was able to land his badly damaged plane on the water, and he and his gunner were rescued three hours later from their life raft by a PBM, a patrol bomber flying boat. Later he bombed Tokyo Honshu airfields and Kure Harbor warships, and he dive-bombed two battleships and a cruiser. He received four medals—Atlantic Theater, Pacific Theater, Victory Medal, and an Air Medal from his home state of New Jersey.[97]

[96] Richard Misenhimer (interviewer), "An Interview with Roger M. Went," The National Museum of the Pacific War, Center for Pacific War Studies, Fredericksburg, TX, March 12, 2008, 12.

[97] Misenhimer, "Roger M. Went."

Chapter 5: Impacts of the Ships and Aircraft Training Carrier Operation After the War

Within weeks of the Japanese surrender that ended the war, the Navy decommissioned the training carriers and shut down the CQTU.[1] The skies above Chicago were suddenly quiet, and the operation faded from view for over forty years. Dozens of planes still rest largely forgotten in the depths of Lake Michigan. However, since the submerged aircraft are valuable as representatives of their type and many of them are rare, their historical significance has grown over time. Carrier airplanes are also historically significant, not only for their service in qualifying pilots, but also for the Navy, for the Great Lakes region, and for the nation.[2] This chapter discusses what happened to USS *Wolverine* and USS *Sable*, the aircraft, and the operational locations after the war. Altogether, these demonstrate the historical and cultural impact of this fascinating wartime training carrier operation.

Scrapping of USS *Wolverine* and USS *Sable*

With the war's end, the Navy decommissioned both USS *Wolverine* and USS *Sable*.[3] Interested parties then approached the Navy with ideas for preserving the historic vessels. In September 1946, R.M. Jackson, a Chicago-area resident, proposed converting the carriers along with another idle boat into floating dormitories for the University of Illinois' Navy Pier branch school.[4] Although the university was interested, the project did not materialize. The War

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[1] "Naval Aviation in WWII," (*Naval Aviation News*, November-December 1995), 27.

[2] "The Navy's Historic Aircraft Wrecks in Lake Michigan," Naval History and Heritage Command (website), https://www.history.navy.mil/research/underwater-archaeology/sites-and-projects/aircraft-wrecksites/aircraft-wrecks-in-lake-michigan.html.

[3] "USS *Wolverine* (IX-64)," Naval History and Heritage Command, National Museum of the US Navy, https://www.history.navy.mil/content/history/museums/nmusn/explore/photography/ships-us/ships-us-w/uss-wolverine-ix-64.html; "USS *Wolverine* (IX-64)," NavSource Online: Service Ship Photo Archive (website), http://www.navsource.org/archives/09/46/46064.htm; Ed Scharch, "USS *Wolverine* (IX-64) WWII Training Carrier 1942-45," http://www.scharch.org/Ed_Scharch/23-uss-wolvering-ix64.htm; "USS *Sable* (IX-81)," NavSource Online: Service Ship Photo Archive (website), http://www.navsource.org/archives/09/46/46081.htm; Ed Scharch, "USS *Sable* (IX-81) WWII Training Carrier 1943-45," http:// http://www.scharch.org/Ed_Scharch/22-uss-sable-ix81.htm.

[4] "Carriers May Ease Housing," *Decatur Daily Review* (Decatur, IL), September 14, 1946, 28.

Shipping Administration placed USS *Wolverine* up for auction, and on November 21, 1947, A. F. Wagner Ironworks Company of Milwaukee bought the ship for $46,789 for its scrap value.[5] It was scrapped two years later.[6]

USS *Sable'*s journey at the end of the war had a few more twists and turns. A sub-board of the Board of Inspection and Survey, appointed by the Commandant, Ninth Naval District, held a material inspection survey of the vessel on October 17, 1945. After appraising the ship and its naval furnishings, the sub-board decided to remove the material and sell the ship for scrap. They also recommended striking the ship from the US Naval Register.[7] The War Shipping Administration took over ownership of the ship in late 1945.[8]

In early 1948, the Great Lakes Historical Society sent a letter to the Navy requesting the right to turn it into a national museum in Put-in-Bay, Ohio.[9] The Navy said the society was free to bid for the ship at the auction on June 25, 1948. Unfortunately, the H.H. Bunchner Company outbid the Historical Society with a bid of $126,176.[10] After undergoing significant stripping and "shaving," USS *Sable* barely squeezed through the Welland Canal locks on its final voyage to Hamilton, Ontario for scrapping (fig 5.1).[11]

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[5] Scharch, "USS *Wolverine* (IX-64) WWII Training Carrier 1942-45."

[6] "USS *Wolverine* (IX-64)," Naval History and Heritage Command, National Museum of the U.S. Navy; "USS *Wolverine* (IX-64)," NavSource Online: Service Ship Photo Archive.

[7] Naval Correspondence: President of Board of Inspection and Survey to the Chief of Naval Operations, USN. October 31, 1945, Folder "IX-81 Restricted," Box 418, Section A1 1266-F, Record Group 19, National Archives Records Administration II; "USS *Sable* (IX-81)," NavSource Online: Service Ship Photo Archive.

[8] Naval Correspondence: President of Board of Inspection and Survey to the Chief of Naval Operations, USN. October 31, 1945, Folder "IX-81 Restricted," Box 418, Section A1 1266-F, Record Group 19, National Archives Records Administration II; "Fresh-Water Flattops—The U.S. Navy's Forgotten Great Lakes Aircraft Carriers," Military History Now (website), August 29, 2016, https://militaryhistorynow.com/2016/08/29/fresh-water-flattops-the-u-s-navys-forgotten-great-lakes-aircraft-carriers/.

[9] "Famed Lake Vessel Sought as National Museum," *Toledo Blade*, June 16, 1948; "Fresh-Water Flattops."

[10] "USS *Sable* (IX-81)," NavSource Online: Service Ship Photo Archive.

[11] "On Worldwide News Front," *Minneapolis Star* (Minneapolis, MN), June 16, 1948, 22; "Sidewheeling Carrier Towed by Tugs on Final Great Lakes Voyage," *Times Herald* (Port Huron, MI), August 12, 1948, 1.

Figure 5.1. USS *Sable* passes the Welland Canal after being "shaved" (Courtesy, Warbird Information Exchange).

Continued Military Operations

Naval Air Station Glenview

Naval Air Station Glenview continued as a vital military training base for many years after the war. In 1946, the Navy designated the station as headquarters for navy and marine reserve aviation training commands.[12] During the Korean War, NAS Glenview deployed a number of carrier-based reserve squadrons, but by 1969 Glenview housed only seven Navy and four Marine squadrons. The Navy decommissioned most of those squadrons in 1970 when the service reorganized the Naval Reserve program. Only two surveillance squadrons, VP-60 and VP-90, continued after 1973, when the Naval Air Reserve Headquarters moved from Glenview to New Orleans.[13]

NAS Glenview remained an active naval base until 1993 when the Base Realignment and Closure Commission (BRAC), established by the US Department of Defense in the late 1980s,

[12] Beverly Dawson, *Glenview Naval Air Station* (Charleston, SC: Arcadia Publishing, 2007), Ch. 5, Kindle.
[13] Dawson, *Glenview Naval Air Station*, Ch. 6, Kindle.

listed the base on its 1993 final closure list. In August 1993, Capt. James Schultz relieved Capt. Paul Kinneberg as Glenview's final commanding officer. Schultz was responsible for directing the closure and transiting the base to civilian ownership. On September 9, 1995, exactly one week after the 50th anniversary of Japan's surrender aboard USS *Missouri*, Schultz officially decommissioned NAS Glenview, and the Department of Defense awarded the property to the Village of Glenview. [14] The glory days of NAS Glenview ended with barely a whimper (fig 5.2).

Figure 5.2. The control tower at the former NAS Glenview now sits above a shopping center (Photo by author, 2019).

Naval Training Station Great Lakes

When Japan surrendered to the Allies on August 14, 1945, more than 16 million men and women were serving on active duty in the US armed forces. Fully one quarter of them had

[14] "U.S. Naval Air Station Glenview: The Final Salute, 1937- 1995," *GNAS Base Closure Magazine*, 1995, 33; Dawson, *Glenview Naval Air Station*, Ch. 7, Kindle.

trained at Naval Training Station Great Lakes (NTS Great Lakes). The station was vital to the Navy's wartime success.[15]

Just as NTS Great Lakes had rapidly geared up to become the largest naval training center in the world during World War II, it became one of the biggest demobilization sites afterwards. Within weeks, NTS Great Lakes was out-processing 3,000 sailors, marines, soldiers, and airmen *per day* into civilian life. "It was like air coming out of an enormous balloon—a fast and steady stream of men and women leaving military service and coming back home."[16]

NTS Great Lakes became Naval Training Center Great Lakes (NTC Great Lakes) during 1944 and served for six decades, from 1944 until 2003, when naval command wrapped all enlisted and officer training accessions into the Naval Service Training Command (NSTC).[17] The new command, based at the newly created Naval Station Great Lakes (NS Great Lakes) placed more than 50,000 trainees annually under a single command structure which made it the Navy's largest training facility. NS Great Lakes provides base operating support for Navy Region Midwest, a sixteen-state regional body.[18] Currently, approximately 40,000 recruits pass through basic training annually, with up to 7,000 enrolled at any time. Although the station continues to grow, the only time that a United States naval vessel appears in Chicago is when a single escort vessel shows up for a week each summer as part of the Navy's annual Great Lake recruiting cruise.[19]

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[15] "Naval Station Great Lakes: Your Navy in the Midwest," Commander, Navy Region Mid-Atlantic, Naval Station Great Lakes, https://www.cnic.navy.mil/regions/cnrma/installations/ns_great_lakes.html; Therese Gonzalez, *Great Lakes Naval Training Station* (Charleston, SC: Arcadia Publishing, 2008), Ch. 5, Kindle.

[16] "Naval Station Great Lakes: Your Navy in the Midwest," Commander, Navy Region Mid-Atlantic, Naval Station Great Lakes, https://www.cnic.navy.mil/regions/cnrma/installations/ns_great_lakes.html.

[17] "Naval Station Great Lakes: Your Navy in the Midwest."

[18] "Naval Station Great Lakes: Your Navy in the Midwest."

[19] "Great Lakes Naval Training Station," Chicago Maritime Museum (website), https://www.chicagomaritimemuseum.org/great-lakes-naval-training-station.html.

Development of Locations Related to the Training Carrier Program

Navy Pier

The Navy took over Navy Pier in 1941 and converted it into the largest training facility of its kind in the world. About 10,000 people lived, trained, and worked there, utilizing a 2,500-seat theater, a gymnasium, twelve-chair barber shop, tailor and cobbler shops, a soda fountain, an enormous kitchen, and a hospital.[20] By 1946, more than 60,000 sailors and marines had trained at Navy Pier as metal smiths, aviation mechanics, and diesel operators.[21] At the end of the war, the Navy relinquished the Pier to the City of Chicago.

On October 21, 1946, the University of Illinois set up a temporary branch at Navy Pier, dubbed "Harvard on the Rocks," to accommodate the large number of GI Bill students who were taking advantage of free tuition for veterans.[22] The campus offered the first two years of an undergraduate program, and 4,000 students from blue-collar families enrolled in hopes of moving into the middle class by studying accounting, pre-law and pre-med. By 1965, the school outgrew the Pier's 5,500 capacity and classes were moved to the University's Circle Campus on Chicago's near west side.[23]

Today Navy Pier is a Chicago entertainment, commercial, and cultural center. At the very end of the complex, however, curious visitors will find a plaque memorializing the training aircraft carriers stationed there during the war. The inscription reads: "Navy Pier honors and salutes the members of the U.S. armed forces whose lives were lost while conducting training

[20] Stephan Benzkfer, "Navy Pier's Zany Past," *Chicago Tribune*, January 8, 2012, https://www.chicagotribune.com/ct-per-flash-navypier-0108-20120109-24-story.html.

[21] Ron Grossman, "University of Illinois at Navy Pier Opened in 1946 to Serve WWII Veterans," *Chicago Tribune*, July 8, 2016.

[22] "Navy Pier Campus, 1946-1948 (University of Illinois at Chicago)," CARLI Digital Collections, http://collections.carli.illinois.edu/cdm/landingpage/collection/uic_npc.

[23] Grossman, "University of Illinois at Navy Pier."

exercises at the Pier during World War II. We commemorate their brave efforts and recognize their sacrifice while serving our country" (see fig. 5.3).

Figure 5.3. Navy plaque honoring members of the US armed forces whose lives were lost while conducting training exercise at the Pier during World War II (Courtesy, Sarah Swierenga).

NAS Glenview

Throughout much of NAS Glenview's service years, the surrounding village of Glenview was not thrilled with its presence. Many local citizens complained of planes "buzzing" their houses, which caused damage due to vibrations.[24] One naval cadet, Ensign John R. Milligan, earned a court martial for "stunting his plane over and near the city" on April 4, 1945.[25] Homeowners later complained when jets operated from the base, fearing that the noise decreased property values.[26] The city of Glenview annexed the base into its city limits in 1971 and military operations substantially declined after this decision.[27]

[24] Don Andries and Thomas J Fritz, "1st 'Top Guns' Flew Here," *Chicago Tribune,* April 1, 1993. https://www.chicagotribune.com/news/ct-xpm-1993-04-01-9304010471-story.html.

[25] "Court Martial Ensign for Stunting Over City," *Decatur Daily Review* (Decatur, IL), April 5, 1945, 7.

[26] Paul Freeman, "Abandoned & Little-known Airfields: Illinois, Northern Chicago Area," 2002, http://www.airfields-freeman.com/IL/Airfields_IL_Chicago_N.htm.

[27] Jonathan Zamaites, "Naval Air Station Glenview," Military History of the Upper Great Lakes (website), October 21, 2017, https://ss.sites.mtu.edu/mhugl/2017/10/21/naval-air-station-glenview/.

In the early 1990s, the Navy awarded ownership of the recently decommissioned NAS Glenview back to the village, which immediately dismantled much of the base to create a scenic park, "The Glen," and a shopping center. The only administrative buildings left are the Chapel and a portion of the control tower that overlooked the two runways. The runways have given way to roads, houses, a nature preserve, and retail shops.[28]

The Hanger One Foundation, along with countless others, is dedicated to preserving the history of NAS Glenview, even if the most obvious physical evidence of the base is gone. In 2003 the foundation, with the financial help of developer Oliver McMilland, dedicated Navy Park, which features three statues, a flagpole, and many historical plaques (fig 5.4).[29]

[28] Nancy LaMair Glazers, ed., *Glenview: The First Centennial* (Glenview, IL: Glenview Centennial Commission, Paul H. Thomas, Publisher, 1999), 295.

[29] Todd Price (Superintendent of Leisure Services, Glenview Park District, Glenview, IL), in discussion with the author, May 9, 2019; "Glenview Hangar One," (website), http://www.thehangarone.org/newlayoutindex.asp; Naomi Malm, "The Glen: From Naval Air Station to Economic Engine," *Patch Media*, August 24, 2010; Zamaites, "Naval Air Station Glenview," 2017, https://ss.sites.mtu.edu/mhugl/2017/10/21/naval-air-station-glenview/.

Figure 5.4. One of many NAS Glenview memorial plaques placed around the shopping center at the Glen (Photo by author, 2019).

Archeological Research Projects

National Naval Aviation Museum aircraft recovery initiative

The National Naval Aviation Museum in Pensacola, Florida, is an official Department of the Navy museum. It houses some 150 restored aircraft, representing Navy, Marine Corps, and Coast Guard aviation. World War II era exhibits, dedicated mainly to carrier aviation, include such famous aircraft as Corsair, Dauntless, and Hellcat, as well as a full-size replica of the aircraft carrier USS *Cabot*'s island and flight deck.[30]

In the late 1980s the A&T Recovery prompted the museum to start an initiative to retrieve planes resting in Lake Michigan for display at various sites around the country, since

[30] "Undiscovered Treasures of the Museum," National Naval Aviation Museum (website), https://www.navalaviationmuseum.org/now-hear-this/undiscovered-treasures-museum/.

these aircraft represent the largest and best-preserved group of sunken and historic naval aircraft in the world. At first, A&T Recovery contracted with different museums around the country with permission from the Naval Air Systems Command (NavAir), which was in charge of the missing or lost aircraft at the time. A&T Recovery maintained that recoveries were "a race against time" because "marine life, corrosion and naval bureaucracy are taking a toll on the underwater treasures."[31] However, when the National Naval Aviation Museum took over from NavAir in the late 1980s, they required A&T Recovery to contract only with them and not with any other museums, which essentially revoked the prior arrangement between NavAir and A&T Recovery.

The National Naval Aviation Museum allowed A& T Recovery to continue to locate and recover aircraft from Lake Michigan if the projects did not use taxpayer funds. Using an exchange-type arrangement, the museum "gave" A&T Recovery permission to sell every third plane they pulled up after sending two planes to the museum.[32] The Naval Aviation Foundation and numerous interested parties, including contract salvagers, private individuals, and corporate entities, provided initial funding and volunteers to recover and restore airplanes.[33]

A&T Recovery brought up the first plane from Lake Michigan in 1990 and since then, they have recovered at least thirty-nine others (fig 5.5).[34] One example is a rare F4F-3 Wildcat that Albert V. Newhall, now a retired captain living in Phoenix, last flew on August 17, 1943. He crashed while taking off from USS *Wolverine*. While he did not sustain injuries, the plane sank 140 feet to the bottom of the lake. A&T raised the aircraft on December 22, 1990 and brought it

[31] "The Race is on to Save WWII Treasures of Lake Michigan," *NBC Chicago*, October 21, 2019, https://www.nbcchicago.com/news/local/wwii-secrets-of-lake-michigan/1970387/; Steve Johnson, "'Heroes on Deck' Dives into WWII Naval Pilots' Training in Chicago," *Chicago Tribune*, May 25, 2016.

[32] Taras C. Lyssenko, *The Great Navy Birds of Lake Michigan: The True Story of the Privateers of Lake Michigan and the Aircraft They Rescued*. (Charleston, SC: America Through Time 2019), 20-28.

[33] Hill Goodspeed, "Lake Michigan's Naval Aviation History," *The Sextant*, September 27, 2019.

[34] "Lake Michigan's Naval Aviation History."

to the museum for restoration.[35] Although recovering the planes to place them in museum lobbies, airports, and other buildings is controversial among archaeologists, these exhibits have raised interest and awareness not only of the planes but also the training carrier program and naval aviators.

Figure 5.5. FM-2 "Wildcat" pulled from Lake Michigan on December 7, 2012, after spending sixty-eight years beneath the waves (Courtesy, A&T Recovery).

Naval History and Heritage Command surveys

The Naval History and Heritage Command (NHHC) conducted a limited side-scan sonar survey in Lake Michigan in May 2004 to relocate and survey aircraft wrecks as well as give them a level of significance. The criteria of significance are location information, proximity to

[35] *Pensacola News Journal* (Pensacola, FL), September 5, 1993, 22.

the staging area, and level of historic significance or threat level. During the week-long survey the scans located many interesting targets for further study. Since then, the NHHC has worked with the states that border southern Lake Michigan to seek ways to manage the collection, using many different approaches to preservation, including *in-situ* wherever possible, all for the benefit of the American public, the Navy, and the local populace.[36]

In 2017, the NHHC produced a research summary about the impact of invasive zebra and quagga mussels on the downed aircraft. Recovery advocates argued that the mussels could become so numerous and dense along the planes' surfaces as to create an anaerobic environment between the mussels and the planes' surfaces that would enable corrosion-enhancing bacteria to destroy the planes faster than normal. However, the NHHC's analysis concluded that the planes are damaged more by pulling them up and removing the mussels than by leaving them rest undisturbed.[37]

In August and September 2019, the NHHC, in cooperation with the National Oceanic and Atmospheric Administration (NOAA), conducted a three-week survey that identified four possible sunken planes. They positively identified two of the targets as Avenger type craft (fig 5.6). Two other targets proved to be a set of boilers and parts of a shipwreck.[38] More surveys are planned, but no dates have been set yet.

[36] "The Navy's Historic Aircraft Wrecks in Lake Michigan," Navy Heritage and History Command, https://www.history.navy.mil/research/underwater-archaeology/sites-and-projects/aircraft-wrecksites/aircraft-wrecks-in-lake-michigan.html.

[37] Sydney M. Swierenga, Unpublished report (written during her internship with the National History and Heritage Command), 2017.

[38] "NOAA in the Great Lakes Supports Interagency Search for WWII Aircraft," NOAA Office of Coast Survey, January 7, 2020, https://www.nauticalcharts.noaa.gov/updates/noaa-in-the-great-lakes-supports-inter-agency-search-for-wwii-aircraft/.

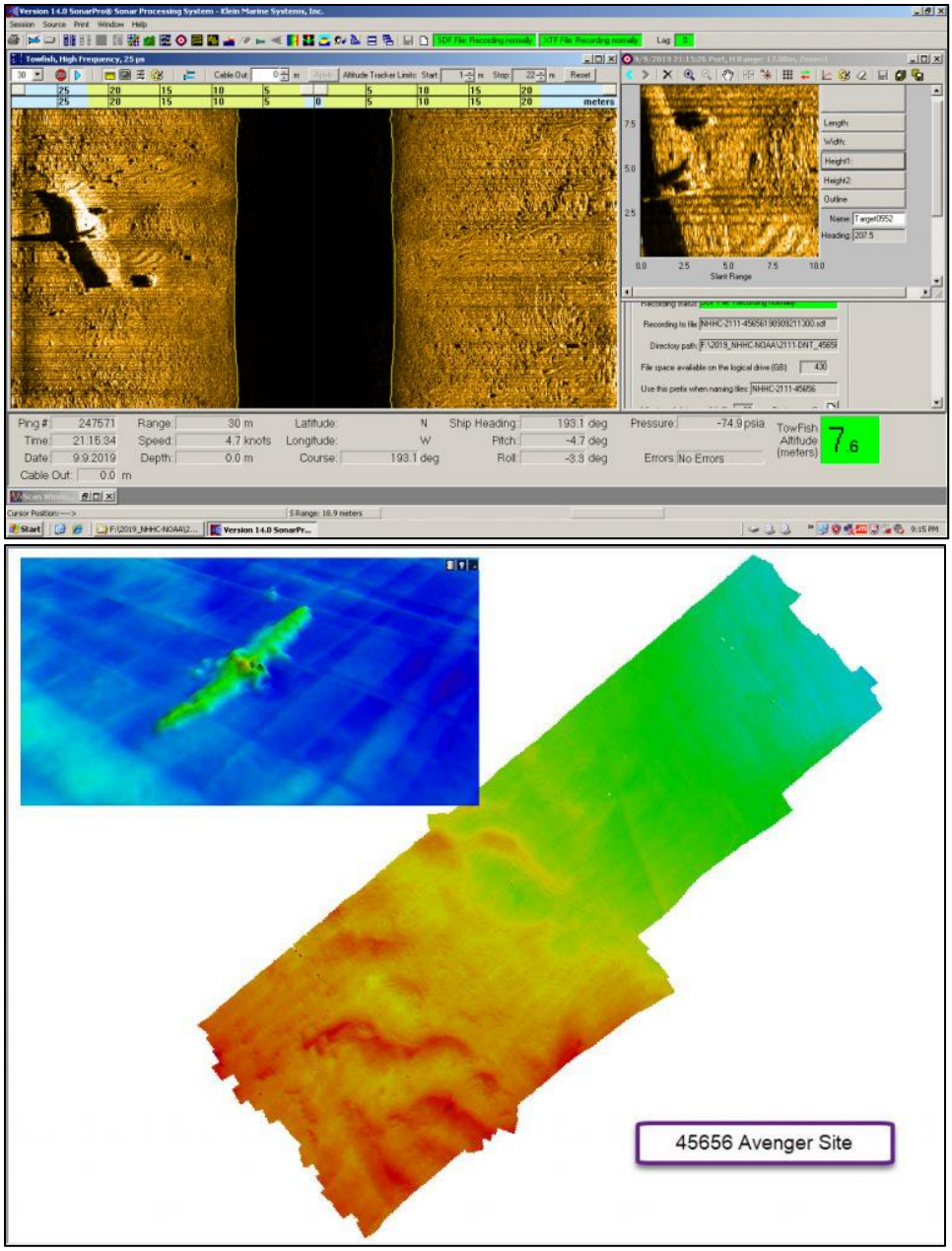

Figure 5.6. A screenshot of the side-scan sonar coverage (top) and an image of MBES on the confirmed Avenger site (below) (Courtesy, NOAA).

Recent Exhibits on USS *Wolverine* and USS *Sable*

In the past fifteen years, stories about the ships and the aircraft have steadily gained regional popularity and national recognition. Historians, archeologists, and the popular press are actively working to document and promote the ships' historical significance. Several newspapers

articles, a movie, and museum exhibits have raised awareness of these cultural assets. The topic is finally receiving the attention it deserves.

Heroes on Deck documentary

Three former WTTW producers—John Davies, Harvey Moshman, and Brian Kallies, created *Heroes on Dec*k, a half-hour, low-budget documentary on the Lake Michigan carriers back in 1988. Davies wrote and directed the film. Moshman shot high definition footage of the wrecked planes while scuba diving. *Heroes on Deck: World War II on Lake Michigan* first aired on Chicago's public television station WTTW on May 26, 2016.[39] Since then the documentary has aired on many public television stations and shown at various museums, including Grand Traverse Lighthouse Museum, Michigan Maritime Museum, Navy Pier, National Museum of the Great Lakes, and Santa Barbara Maritime Museum, among others.[40]

Air Zoo Museum

Suzanne and Pete Parish founded Air Zoo Museum in Kalamazoo, Michigan, in 1977. Suzanne served in the Women Airforce Service Pilots (WASP), and her husband Pete was a Marine Air Corps aviator.[41] The museum has a rich history of honoring and celebrating air and space flight and houses a model of USS *Wolverine* built by master model builder Bill Waldorf. The museum also displays a restored FM-2 Wildcat,[42] a restored SBD-3 Dauntless (BuNo.

[39] Michael Miner, "When World War II was Fought off the Coast of Chicago," *Chicago Reader* (website), May 23, 2016; Zak Koeske, "Documentary Explains How Lake Michigan Became an Aircraft Graveyard during World War II," *Chicago Tribune*, May 27, 2016.

[40] *Heroes on Deck: World War II on Lake Michigan*. Directed by John Davies. Chicago, IL: John Davies Productions, and Moshman Productions, 2016. DVD.

[41] "History: Our Founders; Our Founding Collection," Air Zoo Aerospace & Science Experience Museum (website), https://www.airzoo.org/history.

[42] "Air Zoo to Restore Lake Michigan-Retrieved FM-2 Wildcat," *Warbird Digest*, August 17, 2013, http://warbirdsnews.com/warbird-restorations/air-zoo-restore-lake-michigan-retrieved-grumman-wildcat.html.

06624), and a Dauntless under restoration.[43] SBD Dauntless (BuNo. 06624) participated in Operation Torch, the landings in North Africa in November 1942, operating from USS Ranger, CV-4, off Casablanca, Morocco. The North African campaign was the first American ground combat operation in World War II and the invasion of Sicily in 1943 was a massive seaborne invasion, second only to Normandy.[44]

Dauntless BuNo. 06624's final assignment was to CQTU, NAS Glenview, operating from USS *Wolverine* and USS *Sable*. The aircraft was lost in September 1943 in a landing accident some sixteen miles from Chicago, but the pilot was rescued. The Navy recovered the plane in 1990 and National Museum of Naval Aviation lent it to Air Zoo Museum for restoration and display. It is 95 percent original! (fig 5.7).[45]

Seven years after A&T Recovery raised SBD-3 Dauntless (BuNo. 2173) from Lake Michigan, it arrived at Air Zoo Museum on July 1, 2016 and is currently under restoration. The family of Lt. John Lendo, the pilot who crash-landed on February 18, 1944, is heavily involved with the project. After the restoration in complete, which is expected in summer 2020, the aircraft will be placed at the Pearl Harbor Aviation Museum in Hawaii.[46]

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[43] "The Aircraft Carrier Legacy of Lake Michigan," *The Sextant—Naval Heritage and History Command*, October 21, 2019, https://www.argunners.com/aircraft-carrier-legacy-lake-michigan/; "Night at the Museum," *AAA Living, Travel Ideas*, 2019, 39.

[44] "Air Zoo SBD-3 06624," Air Zoo Museum display, 2017.

[45] "Air Zoo SBD-3 06624," Air Zoo Museum display, 2017.

[46] "Restoration of WWII-era Plane Pulled from Lake Michigan Offers Pilot's Family Closure," *mLive* (website), August 1, 2019, https://www.mlive.com/news/kalamazoo/2019/08/restoration-of-wwii-era-plane-pulled-from-lake-michigan-offers-pilots-family-closure.html; "Air Zoo Restoring World War II Dive Bomber Pulled from Lake Michigan," *3WWMT West Michigan*, June 30, 2016, https://wwmt.com/news/local/air-zoo-restoring-world-war-ii-dive-bomber-pulled-from-lake-michigan.

Figure 5.7. The SBD Dauntless on display after restoration at Kalamazoo Air Zoo. (Courtesy, Air Zoo).

Grand Traverse Lighthouse Museum

The Grand Traverse Lighthouse Museum, located in Northport, Michigan, is a restored lighthouse within Leelanau State Park. The Lighthouse and Fog Signal Building stood vacant after closing in 1972, but in 1985 a local group organized the Grand Traverse Lighthouse Foundation to preserve the historic buildings and create an interesting and educational "living lighthouse" for the public to enjoy. After two years of renovation, the Lighthouse Foundation reopened the station as a museum on Memorial Day in 1987.[47]

The museum staff has done extensive research to commemorate secret naval training and testing conducted in northern Michigan during World War II (see Chapter 3). Amanda Wetzel, assistant lighthouse director, led the project in creating the exhibit that opened May 23, 2015. Artifacts include naval aviator Tim Claggett's original flight logs, along with other memorabilia

[47] "Grand Traverse Lighthouse: Facts and History," Grand Traverse Lighthouse Museum (website), 2020, https://www.grandtraverselighthouse.com/resources/facts-history/.

from his life and service, as well as documents, photos and various artifacts of the era.[48] Claggett, of Charlevoix, Michigan, qualified on USS *Sable* during World War II as a naval aviator. Claggett and Captain Cross, Commander of Naval Air Station Traverse City, cut the ribbon to the exhibit, which features Lake Michigan aircraft carriers and the US Coast Guard's 225 years of service.[49] The museum also has a model of USS *Sable* and an aircraft model that an Eagle Scout constructed with Lego® building bricks.

Michigan Maritime Museum

Michigan Maritime Museum in South Haven, MI, is a museum and research library dedicated to preserving and interpreting the rich heritage of the Great Lakes, while enhancing the South Haven Maritime District. The museum has a whole fleet of historic boats and offers rides on some of them.[50] The "Lake Michigan's Call to Duty Exhibit" exhibit highlights the extensive mobilization for the war in the Lake Michigan region.[51]

Information plaques in the exhibit describe the contributions of eleven Michigan-based shipbuilding companies that together built hundreds of military vessels during World War II. Manitowoc Shipbuilding Corporation in Manitowoc, Wisconsin, also built twenty-eight submarines. The exhibit describes the Coast Guard's valuable assistance during the war, as well as the importance of the Great Lakes commercial fishing industry as a food supplier.

[48] Nick Beadleston, "Yes, an Aircraft Carrier on the Grand Traverse Bay," *The Ticker* (Traverse City), February 18 2015; "Museum Researching Local Aircraft Carriers," *The Ticker* (Traverse City), September 2, 2014.

[49] "Grand Traverse Lighthouse Museum Open New Exhibition," *Petoskey News*, May 26, 2015, https://www.petoskeynews.com/charlevoix/news/community/grand-traverse-lighthouse-museum-opennew-exhibition/article_d33c3635-f870-5efc-940c-0c674767295e.html.

[50] "We are More than Just a Boat Ride," Michigan Maritime Museum (website), 2020, https://www.michiganmaritimemuseum.org/about-us/.

[51] "Lake Michigan's Call to Duty Exhibit," Michigan Maritime Museum (website), 2020, https://www.michiganmaritimemuseum.org/explore/exhibits/lake-michigans-call-to-duty/; "Lake Michigan's Call to Duty in WWII," YouTube video: Historical Geocaching with history buff tnphotobug, December 27, 2017.

The exhibit details the Great Lakes training carrier program with photographs and information about the conversions of the two ships and aircraft recovery efforts on Lake Michigan. The model of USS *Wolverine* from Air Zoo is also on display (fig 5.8).[52]

Figure 5.8. Sydney Swierenga discusses USS *Wolverine* conversion with a visitor at Maritime History Museum "Answering the Call" exhibit (Courtesy, Sarah Swierenga).

Chicago Maritime Museum

Chicago Maritime Museum, which grew out of the Chicago Maritime Society (founded in 1982), opened in June 2016 on the shores of Bubbly Creek at the Bridgeport Art Center. It offers visitors "a chronological walk through the city's nautical history."[53] The museum focuses on the developing story of Chicago's maritime traditions and impact. It has a World War II exhibit that includes a model of USS *Wolverine* built in 1991 by William G. Ballenger.[54]

[52] "WWII Bomber Considered for Recovery," *Michigan History*, Vol. 104, No 2, March/April 2020, 9.i.

[53] "The Destination July 2018: Maritime Video," Chicago Maritime Museum, https://www.chicagomaritimemuseum.org/.

[54] "USS *Wolverine*," Chicago Maritime Museum, https://www.chicagomaritimemuseum.org/uss-wolverine.html.

Conclusion and Next Steps

During World War II, over thirty US aircraft carriers supported the war effort. Arguably, however, none were more unique than the USS *Wolverine* and USS *Sable*. Converted from luxurious Great Lakes passenger steamships into aircraft training carriers in 1942 and 1943, the ships underwent remarkable transformations at a time when America was facing material shortages and desperately needed qualified pilots. USS *Wolverine* and USS *Sable* had a major impact on pilot training and technology research. Together, the vessels facilitated some 136,000 carrier landings. USS *Sable* set a record with 528 landings and takeoffs in a *single day*. In total, 17,820 naval aviators qualified for combat carrier duty on the two ships and 40,000 sailors trained for deck crew positions. USS *Wolverine* and USS *Sable* made invaluable contributions to the American wartime naval capacity and with more planes likely on their way to the surface, both the ships and the planes will be in the spotlight in the future. Scores of naval aviators who trained on these carriers helped turn the tide against the Axis. Their stories will live on through continued research efforts and exhibits that spark the publics' interest in this amazing program.

Next Steps/Further Research

A plethora of future research or project possibilities stemmed from conducting research into this thesis however only six will be highlighted here. The first is conducting an archaeological and cultural survey of NAS Glenview, its support airfields and other significant related landmarks to create an aviation landscape or "airscape," in order to understand how naval air stations contributed and affected the landscape around them. This analysis can also be used to assist in locating missing aircraft by recreating possible flight paths in ArcGIS. The second project possibility is conducting underwater archaeological surveys for missing aircraft using both side-scan sonar and multi-beam imaging technologies. While the flight operations area for

the two vessels was rather small, it could have been much larger. The vessels' operational routes marked out landmarks along with bearing and distance to those landmarks. The available information lies in USS *Sable* and USS *Wolverine* deck logs and known locations of some planes that crashed during flight operations. Using this data, USS *Sable* and USS *Wolverine*'s path of operation could be extrapolated and displayed on a map using ArcGIS. This map might be useful in determining the location of other wrecked planes.

Third, a researcher could examine how Chicago's waterfront has changed over time, and specifically, how the Navy's presence impacted the evolving waterfront landscape on and around Navy Pier. They could also conduct interviews with pilots and crew members who were affiliated with USS *Sable* and USS *Wolverine* or interview family members of those who are deceased. Fourth, a researcher could examine how the aircraft are being affected by zebra and quagga mussels by conducting tests in Lake Michigan. A biologist and/or metallurgist would most likely need to assist in order to create usable scientific results. Lastly, to increase visibility of the two ships, another project could be to create a digital model of USS *Wolverine* using photogrammetry and the existing model located at Michigan Maritime Museum. This model could then be shared with museums and other interested institutions to promote the history of these long-lost ships.

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