

# The U.S. Navy's History and Architectural Heritage Program in Hampton Roads

## Supporting the Searchers: Seaplane Hangars at Norfolk Naval Air Station in World War II

### Lesson Plan Unit for Middle School Social Studies

**Introduction:** During the dark early years of World War II, Norfolk Naval Air Station played a vital role in turning the tide of the Battle for the Atlantic. With German submarines sinking ships just off the American coast almost at will, the U.S. Navy urgently needed to expand their seaplane and air patrol facilities here in Hampton Roads. In 1942, the Navy built Seaplane Hangars 1 and 2 to help house a Fleet Air Wing which was organized to patrol for and find the enemy submarines. These hanger facilities enabled the Navy to maintain a seaplane force, which had by 1944 helped drive the German submarines from American waters.

#### **Unit Objectives and Understandings:**

- By 1942, the Germans seemed to be on the brink of defeating the Allied cause.
- To fight the German submarines, air power was essential.
- Machines have to have a logistical base if they are to keep operating.
- Buildings can be and are in many cases a reflection of historical events.

#### **Instructional Objectives:**

6.6 The student will analyze and explain the major - events - effects - battles in World War II and the reasons for Allied victory.

#### **Overview:**

The students will be given a brief introduction of the German victories along the American coast and the planned American air power countermeasures in 1942. The instructor will then begin questioning the class about the logistic needs and activities that the ground personnel stationed in Seaplane Hangars 1 -2 would have had to confront to keep the patrol air wings flying. The class discussion resulting from the question and answer period will illustrate the importance of facilities like SP1 and SP2. In conclusion, the students will gain a deeper insight to the types of planning, logistics, work and facilities needed to conduct an air campaign.

#### **Preparing the Lesson:**

- Review the enclosed [historical material](#) and [questions](#) before beginning the lesson.
- Prepare a historical background materials packet for each student.
- Collect any additional research materials you may want to incorporate into the lesson.

**Conducting the Lesson:**

- Question students randomly throughout the class to insure a high level of class participation.
- Have students record their answers on paper to any questions asked.
- Then inform the students that they have been assigned to the U.S. Navy's Sea Patrol Fleet Air Wing 5 and that they are responsible for operating hangars SP-1 and 2 together which must keep approximately 8 squadrons of Navy PBV and PBM aircraft in the air on a 24 hour a day schedule.
- After and during the class discussion period, interject questions about the operation of a hangar under war conditions. Field only 2 or 3 answers per question so that the pace of the lesson moves from group to group at a quick pace.
- Shortly before the end of the allotted class period, review by guiding class comments toward the overall objectives.

**Evaluating the Lesson:**

Evaluate the student through responses to a short series of follow-up questions the next day (short quiz - 4 questions). Students should be able to demonstrate an understanding of the importance logistic and maintenance centers like SP1 and 2 played in the war effort.

**Extending the lesson:**

Extend the lesson by reinforcing the idea that SP1 and SP2 type facilities played a greater role in winning World War II than did battles in many cases. Have students see if they can relate to how the activities that occurred in SP1 and SP2 were mirrored in other structures and armed forces branches.

**Supporting the Searchers**  
**Seaplane Hangars at Norfolk Naval Air Station in World War II**  
**Background Material**

**Historical Background:**

[Seaplane Hangars 1 and 2 \(SP1 - SP2\)](#) were completed at Norfolk Naval Air Station in 1942. Their mission was to house and support the air fleet of seaplanes flying out of the Naval Air Station on scouting, anti-submarine patrols and ship survivor rescue missions. Seaplanes from patrol, bomber and scouting squadrons flew thousands of missions out of these hangars.

Aircraft types flying out of SP1 and SP included [PBV Catalinas](#), [PBV2Y Coronados](#) and [PBM Mariners](#). The U.S. Navy designated these aircraft as "Flying Boats". Smaller OS2U Kingfisher scout aircraft also flew missions out of Norfolk Naval Air Station. Along with U.S. Air Force land-based bombers, these aircraft types played a major role in finding and defeating the German submarine force off the coast of America during World War II.

Without the support network provided by the Seaplane Hangars and the Navy personnel stationed in them, the Navy's air campaign against the German submarine force would not have been possible. Only by ensuring that a constant supply of engine parts, gasoline, oil, bombs, depth charges and machine-gun ammunition reached the planes, could the search for the German submarines be

completed.

The number of Navy ground support personnel needed to keep the aircraft in the air was 10 times the number of personnel needed to man the planes. At normal capacity, SP1 or SP2 could handle at least 4 squadrons (6 to 8 aircraft in a squadron) of aircraft each. Each hangar required at least 500 men to maintain and keep the aircraft stationed with that hangar flying. Additionally, each aircraft crew worked in the hangar setting on their individual airplanes.

Activities in Hangars SP1 - SP2 areas included: engine maintenance, general aircraft repairs, building/runway maintenance, gassing aircraft, loading/unloading bombs - machine-guns and ammunition - depth charges, crew and hangar crew mission briefings, supplies administration and command operations.

When viewed through a wider perspective, the operations of aircraft hangar areas such as SP1 and SP2 were of vital importance to the entire war effort. Aircraft can not continue to fly without the complicated logistic support that SP1 and SP2 type hangar areas provided. Without Naval and Air Force patrol aircraft and bombers, the Battle for the Atlantic could not have been won. If the Allies had lost the Battle of the Atlantic, Germany could quite possibly have won World War II.

### US FlyingBoat Consolidated PB2Y Coronado



Aircraft	: PB2Y-3 Consolidated
Year	: 1940
Engine	: 4 x Pratt Whitney R-1830-86, 1200 hrs.pwr.
Wingspan	: 35.10 m
Length	: 24.18 m
Weight	: 30910 kg
Max. speed	: 358 km/h
Ceiling	: 4000 m
Range	: 5400 km
Crew	: 9
Payload	: 5400kg bombs or 2x940kg torpedoes
Armament	: 8x12.7mm guns

### US FlyingBoat Martin PBM Mariner



Aircraft	: PBM-3D Mariner
Year	: 1940
Engine	: 2 x Wright R-2600-12, 1900 hrs.pwr.
Wingspan	: 35.99 m
Length	: 24.38 m
Weight	: 23900 kg
Max. speed	: 330 km/h
Ceiling	: 5000 m
Range	: 4600 km
Crew	: 7-8
Payload	: 3000kg bombs or 2x940kg torpedoes
Armament	: 5x12.7mm guns

## US FlyingBoat Consolidated PBY Catalina



Aircraft	: PBY-5A Catalina
Year	: 1936
Engine	: 2 x Pratt Whitney R-1830-82, 1200 hrs.pwr.
Wingspan	: 31.70 m
Length	: 19.47 m
Weight	: 16100 kg
Max. speed	: 288 km/h
Ceiling	: 4500 m
Range	: 4060 km
Crew	: 7-10
Payload	: 1500kg bombs
Armament	: 2x12.7mm + 3x7.62mm guns

### Class Questions and Possible Answers

1. What types of aircraft were flown out of SP1 - SP2? Refer to handouts -PBY Catalinas, PBY2Y Coronados, PBM Mariners and OS2U Kingfishers.
2. What does SP mean? Seaplane - LP means landing plane hangar
3. How many men work out of a hangar? Around 500 at full capacity
4. How many men are on an aircraft? Refer to the handouts
5. How much ammunition, how many bombs/depth charges can each aircraft carry?  
Refer to handout
6. How many men would it take to get 1 aircraft ready for a mission? The aircraft crew (7 or 8), fueling - 2, ammunition/bombs/depth charges supply - at least 10 or more, engine tune-ups and checks - 5, command personnel, air controllers and admin support (who does all the paper work?) - 10
7. How many men would it take to get 50 aircraft ready for a mission? Figure it up
8. How much ammunition, how many bombs or depth charges would you need for 10-plane squadron mission? Refer to number of guns on each type of aircraft and how many bombs or depth charges each one could carry ( a tip - 50 cal. machineguns shot at 450 to 500 rounds a minute, 30 cal. machineguns go at 400 to 500 rounds a minute)
9. Would it be a dangerous job transporting and loading the ammunition/bomb/depth charges?
10. Would you store the bombs/depth charges in the hanger or near the gasoline lines?
11. Would it take a lot of fuel to keep a squadron up in the air for their aircraft's maximum range and how far could you plan a mission to go (time and distance)? Distance is 1/2 the plane's range (you have to come back) and mission time is aircraft mph divided into range
12. Would the hangars be open in all weather and 24 hours a day? If so, who would do the crew schedules? What if you did not have enough men to work just normal 8-hour days?
13. What is the most important factor in mounting an air campaign? Aircraft maintenance to keep as many aircraft as you can in the air, would be the correct answer.
14. As an Air Wing Commander (in charge of several squadrons), which men would you pick if you had the chance to get some extra men to help staff your unit? More pilots, more gunners, more mechanics, more air controllers or more general support men? The answer is more mechanics - pilots were always

easy to get, trained and good mechanics were always hard to come by. If the aircraft does not start, the mission does not happen.

15. Everyone had a long day yesterday, no one got any sleep last night, a seaplane crashed and burned as it tried to land, everyone did great and saved the crew but the wreckage is still on the runway and seaplane ramp. What do you do as the Commander? Let everyone go back and rest or make everyone work a double shift to finish cleaning the debris off the runway? The correct answer is, you have to clean off the runway regardless of how tired everyone is, the other squadrons will be returning soon, they might wreck coming in or be delayed getting to the hangers for fueling and maintenance, which would delay the next mission.