NPS Form 10-900 (Rev. 8/2002) OMB No. 1024-0018 (Expires 1-31-2009)

United States Department of the Interior
National Park Service

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NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. **Place additional certification comments, entries, and narrative items on continuation sheets (NPS Form 10-900a).**

1. Name of Property

Historic name USS *MACON*, Airship Remains

Other names/site number N/A

2. Location

street & number NOAA/ Monterey Bay National Marine Sanctuary ☒ not for publication

city of town Offshore – Monterey County/Big Sur ☐ vicinity

State California code CA county Monterey code 053 zip code N/A

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this X nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property ___ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

X national X statewide ___local

Signature of certifying official — Date April 7, 2009

Federal Preservation Officer — Title

NOAA/National Oceanic and Atmospheric Administration — State or Federal agency and bureau

In my opinion, the property X meets ___ does not meet the National Register criteria.

Signature of commenting official — Date 9 NOV 2009

STATE HISTORIC PRESERVATION OFFICER — Title

State or Federal agency and bureau

4. National Park Service Certification

I, hereby, certify that this property is:

Signature of the Keeper — Date of Action

✓ entered in the National Register — for Erika K. Martin Gilbert 1/29/10

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:)

NPS Form 10-900 OMB No. 1024-0018 (Expires 5/31/2012)

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DRAFT

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form (continuation)

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. **Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).**

1. Name of Property

historic name USS *MACON*, Airship Remains

other names/site number N/A

2. Location

street & number NOAA/Monterey Bay National Marine Sanctuary [x] not for publication

city or town Offshore – Monterey County/Big Sur [ ] vicinity

state California code CA county Monterey code 053 N/A

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this X nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property X meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

X national X statewide local

Signature of certifying official — Date: June 30, 2009

Federal Preservation Officer — United States, Department of the Navy
Title — State or Federal agency/bureau or Tribal Government

In my opinion, the property X meets ___ does not meet the National Register criteria.

Signature of commenting official — Date: 9 NOV 2009

STATE HISTORIC PRESERVATION OFFICER
Title — State or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I, hereby, certify that this property is:

✓ entered in the National Register
___ determined eligible for the National Register
___ determined not eligible for the National Register
___ removed from the National Register
___ other (explain:)

Signature of the Keeper — Date of Action: 1/29/10

5. Classification

Ownership of Property
(Check as many boxes as apply)

___ private
___ public - Local
___ public - State
X public - Federal

Category of Property
(Check only one box)

___ building(s)
___ district
X site
___ structure
___ object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Non-Contributing	
0	0	buildings
1	0	sites
0	0	structures
0	0	objects
1	0	Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

N/A

Number of contributing resources previously listed in the National Register

N/A

6. Function or Use

Historic Functions
(Enter categories from instructions)

DEFENSE: air facility

Current Functions
(Enter categories from instructions)

Vacant/Not In Use

7. Description

Architectural Classification
(Enter categories from instructions)

N/A

Materials
(Enter categories from instructions)

foundation: N/A
walls: N/A
roof: N/A
other: N/A

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets)

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)

X A Property is associated with events that have made a significant contribution to the broad patterns of our history.

___ B Property is associated with the lives of persons significant in our past.

___ C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

X D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply)

Property is:

___ A owed by a religious institution or used for religious purposes.

___ B removed from its original location.

___ C a birthplace or grave.

___ D a cemetery.

___ E a reconstructed building, object, or structure.

___ F a commemorative property.

___ G less than 50 years old or achieving significance within the past 50 years.

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets)

Areas of Significance
(Enter categories from instructions)

Archaeology - Historic
Engineering
Military

Period of Significance
1933-1935

Significant Dates
03/11/1933 (christened)
02/12/1935 (lost)

Significant Person
(Complete if Criterion B is marked above)

Cultural Affiliation
European-American

Architect/Builder

9. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

Previous documentation on file (NPS):

___preliminary determination of individual listing (36 CFR 67 has been requested
___previously listed in the National Register
___previously determined eligible by the National Register
___designated a National Historic Landmark
___recorded by Historic American Buildings Survey #_____

___recorded by Historic American Engineering Record #_____

Primary location of additional data:

___State Historic Preservation Office
___Other State agency
X Federal agency
___Local government
___University
X Other

Name of repository: NOAA Office of National Marine Sanctuaries

10. Geographical Data

Acreage of Property [redacted]

UTM References
(Place additional UTM references on a continuation sheet)

[redacted]

North Zone	Easting	Northing

3 [redacted]

North Zone	Easting	Northing

[redacted]

North Zone	Easting	Northing

[redacted]

North Zone	Easting	Northing

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet)

11. Form Prepared By

name/title Bruce G Terrell, Chief Historian/Senior Archaeologist

organization NOAA, Office of National Marine Sanctuaries date 10 February 2009

street & number 1305 East-West Hwy telephone 301-713-7255

city or town Silver Spring state Maryland zip code 90210

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps: A USGS map (7.5 or 15 minute series) indicating the property's location. A USGS map is not available for property's location. [redacted]

Photographs: Representative **black and white photographs** of the property.

Additional items: (Check with the SHPO or FPO for any additional items)

Property Owner

name United States Navy (Naval Historical Center)
Office of the Underwater Archaeologist

street & number 805 Kidder Breese St. SE
Washington Naval Yard telephone 202-433-2210, fax: 202-433-2729

city or town Washington state DC zip code 20374-5060

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, PO Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.

SECTION 7 – DESCRIPTION

SUMMARY

(Please note, text in bold is confidential and should be withheld under Section 304 of the NHPA) The archaeological remains of the U.S. Navy airship USS *Macon* (ZR-5) lie approximately 3 miles off California's Big Sur coast in NOAA's Monterey Bay National Marine Sanctuary. The site also contains the remains of four of the airship's squadron of small Curtiss F9C-2 Sparrowhawk scout aircraft (Bu No. 9058, 9059, 9060, 9061), which the *Macon* carried in an internal hanger bay.

USS *MACON* (ZRS-5), 1933-1935

The rigid airship USS *Macon* was built, along with its sister-ship USS *Akron*, by the Goodyear Zeppelin Corporation near *Akron*, Ohio in 1933. The airship's frame was constructed of duraluminum (an alloy of aluminum, copper and several other metals) box girders to ensure rigidity and light weight. The frame of the airship was built of twelve unique "deep-ring" frames, which were welded to an upper and two lower keels. Each deep ring element was composed of two of equal size and a third of smaller diameter formed into a single piece. While this added more weight, it reduced the reliance on guy-wires and provided greater strength. In addition to the 3 keels, the frame contained 36 longitudinal girders.

The airship was 785 feet in length and had a maximum diameter of 132.86 feet. Twelve helium gas cells were mounted in the frame and sealed with gelatin latex. The outer covering of the airship was 2.8 ounce cotton cloth sewn into large 74-foot x 12-foot, and 74-foot x 24-foot panels, which were attached to the frames and sewn together. The skin was then covered by six coats of dope, the final two coats contained silver aluminum paint. The airship was powered by eight German Maybach VL-2 560 horsepower engines, which drove Allison Engineering Company out-drives with three-bladed propellers mounted on pivoting external brackets. The engine exhaust was captured by a closed system, which extracted water that was used as ballast to replace water ballast that was dumped on take off. The airship's control car was hung beneath the craft and contained the helm, navigation and weather offices. An auxiliary helm was also contained in the massive lower tail fin. The *Macon*'s belly housed a T-shaped hanger door, a hanger bay, and a retractable "trapeze" docking mechanism to facilitate the recovery and launch of four small scout aircraft. These were used to enlarge the scouting range in fulfillment of the vessel's designed mission. The *Macon* was capable of speeds of 75.6 knots and a useful lift of 160,644 lbs. (Smith 43, 183, 187, 191-197)

The aircraft adapted to the *Macon* and *Akron*'s scouting mission were Curtiss-Wright Corporation F9C-2 Sparrowhawk biplanes. Not deemed suitable by the U. S. Navy for aircraft carrier duty, they

were adapted to the Navy's Lighter-Than-Air service (LTA). The Sparrowhawks had an upper wingspan of 25 feet 5 inches and a maximum length of 20 feet 7 inches. The craft were powered by Wright R-975-E3 engines, which generated 438 horsepower at 2,200 revolutions per minute. The planes' maximum speed was rated at 176.5 mph, which could be increased to 200 mph with the fixed landing gear removed for in-flight operations. Stall speed was 63 miles per hour. The Sparrowhawks had a service ceiling of 19,200 feet and an operational range of 255 miles with an external fuel tank. (Smith 185)

Archaeological Remains of the USS *Macon*

The archaeological assessment of the USS *Macon* and its aircraft is based on interpretation of data gathered in several phases. The wreckage lies in deep water and is inaccessible to SCUBA divers. When discovered in 1990, the site was documented on video tape from research submarines. NOAA conducted a two phase mission between 2005 and 2006, documenting the site and its surrounding environs with sidescan sonar and high definition (hi def) video and video image grabs using a tethered remote operated vehicle (ROV). The ROV allowed more time on site and also allowed more controlled lane spacing and elevation over the seabed than a manned submersible. This made the production of a photomosaic more cost-effective and accurate. (NOAA) A photo mosaic of the remains was also prepared using hi def video stills. Artifact and feature locations, as well as elevations, were mapped using a Global Positioning System integrated with a Geographic Information System (GIS).

The remains of the USS *Macon* lie partially embedded on a sand bottom approximately [redacted] It is located on submerged lands owned by the State of California within the boundary of NOAA's Monterey Bay National Marine Sanctuary. [redacted]

A primary goal of the 2005 sidescan sonar survey was to determine the distribution of the remains discovered in 1990 and to locate any previously unknown wreckage on the seabed. The survey confirmed that the *Macon's* wreckage was distributed into two discreet mounds, referred to as "fields A and B." Both mounds were approximately 60 meters (196 feet) in diameter and they were separated by a distance of 250 meters (820 feet). Each mound is elevated between approximately three to five meters (10 - 16 feet) above the seafloor. The entire site encompasses approximately 5654.7 square meters (60867.19 square feet). The remote sensing and archaeological assessment indicates that the site constitutes the complete remains of the USS *Macon* and its aircraft.

Field A contains material relating to the crew and officers' galley (table, chairs, propane tanks, stove), airship propulsion systems (including five of the ship's eight Maybach VL-2 engines, one Allison propeller out-drive, fuel tanks and the engine water recovery system to replenish lost ballast) and the aircraft hanger, which contained the four Curtiss F9C-2 Sparrowhawks (Bu No. 9058, 9059, 9060 and 9061). All of these objects were documented and the team worked with airship historians associated with the U.S. Naval Airship Association to identify objects and function.

Field B contains material relating to the *Macon*'s bow section including the mooring mast receptacle assembly and another engine water recovery condenser rack. A chair and file cabinet were possibly associated with keel-located quarters and offices or with the control car's radio and navigation room.

Both fields contained fuel and water tanks and the *Macon*'s duraluminum box girders, which showed marginal signs of degradation after over 70 years in the marine environment. Comparisons with the 1990/91 expeditions indicate that several centimeters of sediment have built up on the site. In 1991, a US Navy expedition recovered several plates from the ship's galley and a disarticulated docking hook from one of the Sparrowhawks, but it appears that the site has not been disturbed by either fishing or looting since then.

It is not clear at present if any of the doped cotton fabric which covered the girder structure of the airship has survived. The expedition did not seek to disturb the site, therefore no penetration of the site occurred and and no "dusting" of the site took place. Therefore, the distribution of artifacts beneath the documented wreckage is unknown. However, extensive survey around the site with sidescan sonar and a ROV indicate only a few fuel tanks and no other remains associated with the airship. It is assumed by the project archaeologists, that the control car should be located within Field B in the vicinity of the bow remains since it was originally sited forward of the hanger. The airship appears to have broken in half between the hanger and the control car. (Office of National Marine Sanctuaries, Expedition Field Notes)

Integrity

The remains of the USS *Macon* are the only known documented remains of a rigid airship. Research suggests that most, if not all, of the craft's remains exist at this site. NOAA is aware that remains belonging to the USS *Akron* off of New Jersey's coast have been imaged by a U.S. Navy sidescan sonar but no efforts, to date, have been made to relocate them. (Savage) Additionally, enquiries to various airship groups (Zeppelin Museum Friedrichshafen and the Naval Airship Association) and have identified no known examples of documented airship remains in Europe.

SECTION 8 – STATEMENT OF SIGNIFICANCE

The remains of the USS *Macon* (ZRS-5) and its four Curtiss F9C-2 Sparrowhawk scout aircraft are significant at the national level under Criterion A and D.

When the airship USS *Macon* was christened on March 11, 1933, it was the most sophisticated of the Navy's lighter-than-air (LTA) fleet. Along with her slightly-earlier sister-ship USS *Akron*, *Macon* was envisioned by its supporters to be the first of an innovative series of aerial fleet scouts whose range and capacities were enhanced by a squadron of scout aircraft launched and retrieved from internal hangers. *Macon* exhibited the highest expression of naval LTA technology and fleet scouting tactics during its short career. At 785 feet in length, the airship's size captured American fascination during flyovers of U.S. communities as chronicled in numerous advertisements, articles and newsreels. The dramatic loss of both the *Akron* and the *Macon* within two years of each other contributed to the cancellation of the Navy's rigid airship program. [redacted] the remains of the USS *Macon* constitutes the only comprehensive archaeological record of this unique era of aviation history left in the world.

The USS *Macon* qualifies for listing under National Register Criteria A based upon its association with events leading to the demise of the Navy's rigid lighter-than-air airship program. The site has both an integrity of location and an integrity of association as required by the National Register of Historic Places. Unlike most crash sites, the resting place of this famous airship's remains has been relatively undisturbed since 1935. Many significant elements of the site are presently visible on the seabed including the four F9C-2 Curtiss Sparrowhawk aircraft, five of *Macon*'s eight Maybach VL-2 engines, the bow-docking mechanism, several of the engines' exhaust water-recovery systems and examples of the distinctive duraluminum box girders and deep-ring assemblies. While most terrestrial aircraft crash sites are salvaged, the deep waters at the *Macon*'s resting place have served to preserve the airship's remains in two compact mounds allowing the possibility of modern forensic and archaeological studies. To have the remains of a historical event arrayed visibly in the context of their last moment is rare. The exposed Sparrowhawk aircraft, also, provide a dramatic visual anchor that makes plain that this jumble of girders and other early 20th century material culture has an association with aeronautical history. The enclosed examples of hi def photographs help to convey this site's significance.

The USS *Macon* qualifies for listing under National Register Criteria D based on the site's likelihood to yield information important to history. The *Macon*'s remains represent the only archaeologically-documented example of a rigid lighter-than-air craft in the United States and possibly the world. Only apparent fragments remain of the Navy's first three rigid airships (ZR1 - ZR3), although the undocumented remains of the USS *Akron* (ZRS-4) have been recorded on sidescan sonar off of the New Jersey coastline where it crashed in 1933. (Savage, Cussler) Recent archaeological survey indicates that the *Macon*, which gradually settled onto the ocean during its "crash", also had a relatively gentle trip to the seabed. The remains exist in two compact mounds on the seabed in 1500 feet of water. The remains exhibit integrity of location as well as integrity of workmanship. The data indicates that the site is in a relatively stable state of preservation and has been undisturbed except for minor intrusion by previous expeditions to the site in 1990 and 1991. The four biplanes are situated in the middle of one of *Macon*'s mounds. Although the *Macon*'s girder structure has collapsed as a result of the crash and possible (but not yet confirmed) deterioration of the outer fabric, the site contains most, if not all, of the rigid duraluminum box girders and deep ring structures. Also, the four Sparrowhawk aircraft are still in a relatively stable state of preservation. Two show damage from the crash as well as degradation of some of the aluminum wing structure. They still have extant, though partial, wing and fuselage fabric, some of which still maintains the paint schemes. These two aircraft were positively identified through analysis of the individually-colored wing stripes.

Development of Rigid Lighter-Than-Air Ships

France's ballon-designing Montgolfier brothers are most commonly attributed as the first successful lighter-than-air inventors in 1783. Powered LTA flight was achieved in the late 19th century by mating internal combustion engine-driven propellers with elongated balloons. The first true rigid airship was built by German Count Ferdinand Von Zeppelin whose name became synonymous with the type. Previous non-rigid airships were single envelope balloons filled with pressurized hydrogen lifting gas that carried its pilots and power source underneath. Semi-rigid airships had single gas envelopes attached to a rigid, usually metal, girder-built "keel" upon which propulsion and pilot stations were attached. The keel allowed for longer, somewhat sturdier craft.

Von Zeppelin's contribution was to design a craft built of one or more longitudinal keels to which concentric vertical rings (also girder-built) were attached, much like the keel and frames of a ship. This construction allowed for a structure which housed several cells or bags which contained hydrogen. The entire structure was covered in a skin which made it aerodynamic. The airships had controllable fins at the aft end. A control car was attached to the bottom, hanging outboard of the airships' frame. Engines were mounted externally and cabins, work areas and offices could be arranged internally on the keels.

Von Zeppelin's rigid airship designs allowed for larger aircraft, strong enough to carry heavy loads, be it passengers, cargo or bombs. (Botting 30) By 1909, the first passenger airline was created in Germany with four Zeppelin-manufactured airships and by 1913, the ships had carried 37,000 passengers in 1,600 hours of flight demonstrating the reliability of LTA flight. (Heppenheimer 55) During World War I, German Army and Navy Zeppelins were successful instruments of terror used to bomb Allied cities such as London and Antwerp. The Allies utilized non-rigid "blimps" for anti-submarine patrol.

Following World War I, several countries developed rigid LTA programs. Germany's wartime refinement of rigid airship design had shown that there was a potential for transoceanic and, even, world-wide passenger air service. The Zeppelin Company, saved from dissolution at the last moment by the 1925 Treaty of Locarno, began building airships such as the *Graf Zeppelin* and *Hindenburg* that became famous around the world. So famous were they that they were used by the Nazis as propaganda (and spy) tools in the late 1930s. (Dick 170) The Italians showed interest in airships as well. General Umberto Nobile had both the *Norge* and the *Italia* semi-rigids built to explore the North Pole in the 1920s. However, airships were found to have faults. On May 24, 1928, the *Italia*'s control car separated from the airship, killing all except Nobile while the body of the airship floated away carrying the rest of the crew to unknown oblivion. Several tragic airship crashes in the between-war years including the British R-38 (see ZR-2 below), the R-101, the USS *Akron* and Germany's *Hindenburg* caused military and business entities, as well as the public, to loose faith in airships as a reliable and useful mode of transportation.

The U.S. Navy's LTA Program

In 1915, the U.S. Navy's burgeoning aviation program first used LTA non-rigid ships for anti-submarine patrols along the U.S. Atlantic coastline. While several classes of blimp were built primarily at the Goodyear Company factory in Akron, Ohio, none were used overseas during America's participation in the First World War. Navy pilots were trained in U.S. built craft and then flew French and English ships to patrol the European coastlines. (Grossnik 3 - 8) In 1918 the Navy made a switch in lifting gas from flammable hydrogen, to helium following the discovery of helium gas fields in Texas. While it provided slightly less lift than hydrogen, helium's non-flammability was a desireable property. Further, it was only produced in the United States and the U.S. Congress subsidized its production. (Grossnik 22-23)

Soon after the end of World War I, the U.S. Navy began to explore the possible value of developing its own rigid airships. The Naval Appropriations Act of July 11, 1919 provided for the construction of one rigid airship and the purchase of one other. Since the United States did not have the capability to

build an airship, the Navy elected to have one of German design assembled in the United States and a second built in England and delivered to the U.S.

The ZR-1*, named USS *Shenandoah*, was based on plans of a captured German airship but used American engines. Using materials shipped from Europe, its components were manufactured at the Naval Aircraft Factory at Philadelphia and assembled at the Naval Air Station (NAS) Lakehurst, New Jersey. It was completed in 1922. For two years, the *Shenandoah* was involved in tests, mock drills and fleet maneuvers. It became a familiar sight in U.S. skies as it crossed the entire country visiting air shows and performing flyovers of American cities to promote the Navy's LTA program to the American people and politicians. The USS *Shenandoah* was lost in a disastrous crash over Ohio in a storm on September 3, 1925. (Grossnik 24 - 26). The site of that crash is now on the National Register of Historic Places. One of the land owners at the present site and owner of an exhibit that includes artifacts from the crash, indicates that the Navy collected the remains of the airship and had them transported to an ALCOA facility and melted. The disposition of the *Shenandoah*'s Packard engines and the airship's control car are presently unknown. (Rayner)

The ZR-2 was built in England as the R-38 from a British design but never made it across the Atlantic. It crashed into the Humber River on August 23, 1921 killing its British crew and seventeen American officers and sailors. (Grossnik 24)

At the same time that the first two airship were being planned, NAS Lakehurst, New Jersey, was designated to be the Navy's primary LTA base. A large hanger was constructed to house the massive airships and mooring masts were built to facilitate takeoffs and landings. Lakehurst became the center for training and testing related to the rigid airship program. (Grossnik 24)

Realizing that the United States had no capability to design and build rigid airships, the Goodyear Tire and Rubber Company collaborated with Luftschiffbau Zeppelin in 1923 to form the Goodyear-Zeppelin Corporation. At the time, the Zeppelin Company was in danger of being dissolved due to the Treaty of Versailles and this move sustained the company long enough to build a new Zeppelin, LZ-126, for the U.S. Navy. The company was saved by the Treaty of Locarno in 1925. (Smith 7)

LZ-126 was delivered to the United States in 1926 in what was the first non-stop east to west flight by an aircraft between Europe and the American mainland. This airship was constructed as a result of

* The prefix "ZR" [illegible] designated heavier than air while Z designated lighter than air. The letter "S" was added beginning with *Akron* to designate "scout." The USS *Macon*'s ZRS-5 meant that it was [illegible] fifth LTA airship scout.

World War I reparation agreements decreed by the 1921 Council of Ambassadors of the Allied Nations. (Grossnick 26) The ship was rechristened by Mrs. Calvin Coolidge on November 25, 1924 and was commissioned USS *Los Angeles* (ZR-3). The *Los Angeles* proved to be the Navy's most long-lived and successful rigid airship, remaining on the Navy's list until October 1939. The ship was used in tests and fleet maneuvers designed to pave the way for two more advanced airships, then being planned, the ZRS-4 and ZRS-5. In 1929 the *Los Angeles* was used to test the feasibility for operating heavier-than-air craft. It was fitted with a trapeze and at a cruising altitude of 2,500 feet and a speed of 48 knots, successfully captured and released an airplane that had a special hooking mechanism. In 1931 *Los Angeles* participated in fleet exercises near the Panama Canal, scouting for the fleet. Although repeatedly "shot down," she proved her value by spotting "enemy" fleets before she was discovered and eliminated. Thus, a scouting mission for the new, larger airships was created. (Grossnick 27)

Between 1925 and 1933, Rear Admiral William A. Moffett was Chief of the Navy's Bureau of Aeronautics. Moffett was a champion of LTA flight potential for the Navy. In 1926 he prevailed upon Congress to provide funding for a more extensive airship program. H.R. 9690 created the Navy's "Five Year Aircraft Program" which included an authorization for two large rigid airships, the ZRS-4 and ZRS-5. In 1928, Goodyear-Zeppelin won a series of design competitions initiated by the Navy. The company signed a contract with the Navy for two rigid airships. ZRS-4 was to be delivered in thirty months and cost $5,375,000 and ZRS-5 was to be delivered fifteen months after the first for a cost of $2,450,000.(Smith 13-18) To facilitate the construction of the airships, Goodyear-Zeppelin completed the massive "Airdock" hanger (1,175 feet long by 325 feet wide by 211 feet high) at Akron which is still standing and is on the National Register of Historic Places. (Millbrooke)

The chief designer of the *Akron* and *Macon* was Dr. Karl Arnstein. Born in Prague in 1887, Arnstein studied engineering at the Czech University of Prague. He pioneered the field of stress analysis, by which engineers determine the strength of building materials. Early in World War I, Arnstein was drafted but his services were soon requested at the Luftschiffbau-Zeppelin Company by Count Ferdinand von Zeppelin. As Chief designer, Arnstein designed airship LZ-126 which was destined for the United States as the USS *Los Angeles* (ZR-3), the most successful of the U.S. Navy's rigid airships.

The economic and social turmoil in 1920s Germany compelled Arnstein to accept a position as vice president in charge of engineering at the new Goodyear-Zeppelin Company in Akron in 1924. At Goodyear, Arnstein obtained numerous patents for his designs for both blimps and the rigid airships USS *Akron* and *Macon*. He also designed the Goodyear Zeppelin Airship Factory and Airdock. By the time of his retirement for Goodyear in 1957, he was director, vice president and chief engineer

and had designed almost seventy airships. Among Arnstein's accomplishments were numerous patents for box girders and deep ring structures used in rigid airship construction, the Goodyear Airdock and factory, and airship, blimp and aircraft designs. Upon his retirement, the U.S. Navy awarded him its Distinguished Public Service Award for his contributions to its airship program. Other honors included an honorary doctorate degree from the University of Akron in 1967, an annual Goodyear Aerospace award named after him, and his entry in the Western Reserve Aviation Hall of Fame in Cleveland. (Topping)

The first built airship, ZRS- 4, was named the USS *Akron* in honor of the home of Goodyear's new airship factory. ZRS-5's name came as an act of political supplication. Georgia representative Carl Vinson was, at that time, the senior member of the House of Representatives' Naval Affairs Committee and so the airship was named *Macon* in honor of the largest city in his congressional district. (Smith 33, 95)

Akron-Class Airships

The *Akron*-class airships (so named because *Akron* was built first) were actually experimental prototypes for a planned class of ten larger "super" airships. As such they were the largest U.S. Naval airships built up to that time and were the first to carry aircraft in an internal hanger (Smith 45). *Akron*-class airships contained a number of innovations which separated them from earlier German rigid airship designs. U.S airships were structurally more rigid than the German craft. Ten of the main frame girders were constructed from stiff triangular "deep rings" as opposed to the German flat rings. The *Akron*-class had rectangular longitudinal girders versus German triangular girders and the U.S. craft had three rigid keels while the German craft had a single keel (Robinson 179, Dick 174-175). The three keels were arranged as an inverted triangle with the angles at the top and both sides of the airship. The arrangement allowed for open hangers along the bellies of the ships. The two lateral keels also permitted eight German Maybach engines to be mounted internally, a first for airship design, which enhanced the crafts' aerodynamics (Smith 179).

The Project 1 design, from which the *Akron* and *Macon* were derived, could be outfitted with either Maybach or U.S.-built Packard engines. The Navy was not eager to rely on foreign-built power-plants, but the reliability of Maybach engines ultimately resulted in that company's selection. The Maybach VL-2 12 cylinder engines were also used to power the *Graf Zeppelin*. The eight Maybachs weighed 2,600 pounds each and produced 560 horsepower at 1,600 rpm. (Robinson 136, Smith 182) The propellers were mounted on external brackets and could be rotated three hundred and sixty degrees which enabled vertical takeoffs and landings.

Another feature unique to the *Akron*-class was the water recovery system, seen as external condenser racks in sets of five that were positioned flush with the hull above each engine. The hot exhaust from the engines was directed into the top of the condensers. The gasses broke down into water which was held in dedicated tanks to supplement ballast water that was dumped during take off. (Robinson 179)

The single control cars were divided into three sections; a forward pilot house, adjacent to the chart room, and a smoking room abaft. A backup control cab with steering gear and windows was built into the forward end of the lower fin. This cab was also used to assist aircraft docking activities. Finally, anti-aircraft machinegun emplacements were placed along the lateral keel, the tail cone, the auxiliary control cab (lower fin) and the aft control car room (Robinson, 179)

The early tail fin designs for the *Akron* class followed the long, thin model of the German craft. However, to address complaints from airship pilot's that the lower fin was not visible from the control car during landing operations, the fins were shortened, deepened and widened. While satisfying the design requirement, the modification reduced the four fins' attachment points along the main frames from three to two. The forward edge, also, no longer attached at a main frame but on a weaker, intermediate frame. This was believed to have had serious consequences for the *Macon*. (Robinson 179)

Heavier-than-Air Operations

The ability to carry aircraft expanded the scouting range of the airships and, subsequently, modified their mission from fleet scout to base for heavier than air scout aircraft. Concept testing for aircraft launch and recovery began on the USS *Los Angeles* using a variety of biplanes in the 1920s. The dimensions of the T-shaped hanger door in the *Akron* and *Macon*'s bellies determined the parameters of the airplanes that would ultimately compose the new airships' squadrons. The hanger doors could only accommodate an aircraft no longer than 24 feet with a wingspan no wider than 30 feet. (Smith 25)

As the options were limited and the demand was immediate, the Navy selected an aircraft that had already been rejected as unsatisfactory for carrier duty. The Curtiss F9C biplane did not fit the profile for a high performance aircraft with good all around cockpit visibility, but it was superior to any likely competitors. While a call went out for pilots for a heavier-than-air squadron, the Navy placed an order with Curtiss-Wright for six aircraft.

The F9C-2 had two predecessors. The first XF9C-1 was built in 1930 as an experimental aircraft. Following its failure as a carrier-based aircraft, it was fitted with a skyhook and tested with other aircraft on the USS *Los Angeles*.

This particular aircraft was never made part of the *Akron* or *Macon*'s operational squadron. The XF9C-2, produced in 1931, was an improved version that included a more powerful engine. Following evaluation of this aircraft, the Navy ordered six operational craft to serve on the USS *Akron*, then being completed. Following the demise of the *Akron*, they were transferred to the *Macon*. The delivered F9C-2s were designated "Sparrowhawk" in keeping with the tradition of naming Curtiss fighters after hawks (ex. Hawk, Goshawk, Kittyhawk, etc.).

The Sparrowhawks were powered by Wright R-975-E3 power plants which generated 438 horsepower. Their maximum upper wing span measured 25' 5" and their length was 20' 7". They had an internal fuel capacity of 60 gallons and an external belly tank that could carry 30 gallons. They were equipped with two thirty-caliber machineguns mounted over the engine. Flight characteristics included a maximum speed of 200 mph (174 knots) with the undercarriage removed, a stall speed of 63 mph (55 knots), an initial climb rate of 1,700 feet per minute and a service ceiling of 19,200 feet. The aircraft had an operational radius of 176 miles and 255 miles with undercarriage removed and external fuel tanks in place. (Smith 185)

The biplanes had distinctive paint schemes from other contemporary naval aircraft. While they sported the standard high-visibility yellow top wing and gray fuselage, each plane in the Squadron exhibited its own designated color on a top wing chevron, engine cowl and wheel spats. The designated colors for each aircraft were:
9056 - Royal red
9057 - White
9058 - True Blue
9059 - Black
9060 - Willow Green
9061 - Lemon Yellow
(Smith 201 - 203)

A single example of a Curtiss F9C-2 Sparrowhawk remains today. Sparrowhawk 9056 is presently in the National Air and Space Museum collection at the Udvar Hazy Center. Aircraft 9058, 9059, 9060, and 9061 were on board the *Macon* at the time of its crash. Surviving top wing fabric made it possible to identify 9058 and 9061 by their top-wing chevron color. (ONMS) *Macon* had several other

aircraft attached to its heavier-than-air squadron but none were aboard at the time of its crash. The six Consolidated N2Y-1 aircraft used for training and early hook-on maneuvers were transferred to the *Macon* following *Akron*'s crash, but were then sent elsewhere when *Macon* was transferred to California's Moffett Field. Two Waco XJW-1 two-place civilian aircraft also were fitted with sky-hooks, but could not fit in the *Macon*'s internal hanger. They were used as supply and mail planes.

The technical process by which the airships recovered and launched aircraft was innovative. Because of the weight of the aircraft (2,770 pounds each), the airships took off without them. The planes then rendezvoused with the mother ship in the air. As the airship flew into the wind at approximately 80 knots (92 mph), with the retractable trapeze extended, the aircraft would approach from beneath. The aircrafts' "skyhook" had a guide bar that protected the propeller and served as a guide to the hook. Once the pilot captured the trapeze with the hook, a spring lock was automatically activated and the plane was secured. The airship crew, then winched down an arm holding a "saddle" that was attached at a pivot at the "elbow" of the trapeze end. The saddle stabilized the aft end of the aircraft so that it could be raised into the airship once the engine power was cut.

As each aircraft was lifted into the hanger bay, it was transferred to a monorail transport system that was arranged in an "x" pattern. This allowed four aircraft to be stored and maintained. A catwalk provided access for maintenance crew to service the planes. The landing gear were often removed and stored while auxiliary fuel tanks were attached to extend the aircrafts' range. All aircraft fueling was performed at a fixed auxiliary trapeze or "perch" set aft of the hanger and external of the hull. (Miller, Williamson)

USS *Akron* and USS *Macon*

The USS *Akron* was christened on August 8, 1931. Based at NAS Lakehurst, New Jersey, the airship entered into numerous flight tests to assess the airship and to develop protocols for managing the heavier than air squadron. The airship's experience with fleet exercises was perceived as less than successful as it was seen and "shot down" repeated times. On a mission without its aircraft on April 4, 1933, the *Akron* crashed in a storm off the New Jersey coast killing seventy-three U.S. Navy personnel. Most prominent among the fatalities was Rear Admiral William A. Moffett who was the Chief of the Navy's Bureau of Aeronautics and the prime supporter of the service's lighter than air program.

Construction on the USS *Macon* began in October 1931 and it was christened just before the *Akron*'s demise on March 11, 1933. The *Macon* benefited from the *Akron*'s shakedown flights and four tons of dead weight were eliminated from *Macon*. It contained numerous modifications including three-bladed propellers which increased its speed as well as its fuel efficiency.

Under Cdr. Alger H. Dresel, the *Macon* began extensive trials including hook-on tests with the Sparrowhawks, which had been transferred following the *Akron*'s crash. In October 1933, *Macon* made its first transcontinental cruise to its new base at Moffett Field in Sunnyvale, California. During its first fleet exercises, *Macon* was repeatedly "shot down" by enemy cruisers and aircraft. (Grossnick 28 - 33)

Macon's performance during the fleet exercises was poor. It was repeatedly "destroyed" and her value as an advanced scout was in doubt. In July 1934, Lieutenant Herbert V. Wiley assumed command of the airship. A former executive officer on the *Akron* and a veteran of both the airship service and the "blue water" Navy, Wiley was a flexible and insightful commander who realized the value of using the Sparrowhawks as scouts and of keeping the *Macon* at a safe distance as the aircrafts' base of operations.

To illustrate the *Macon*'s versatility, Wiley used the Sparrowhawks in a surprise mission to drop packages and souvenir letters on board the Navy cruiser USS *Houston* far out into the Pacific Ocean. On board the *Houston* was President Franklin D. Roosevelt. This risky publicity stunt showed the Navy's vulnerability to surprise "bombing attack," which angered the Navy brass. Wiley's career was reputedly saved by President Roosevelt's compliments and commendations. (Smith 127 - 131) The *Macon* continued to participate in fleet exercises and training for the next year during which time Cdr Wiley's tactics began to show promise for the airship's future missions.

On the stormy night of February 11 - 12, 1935 the *Macon* was returning to Moffett Field following a successful exercise over the Channel Islands. While over Point Sur, the upper tail fin tore away. The damage caused a loss of gas in the aft cells which forced a nose-high attitude. The crew's frantic dropping of ballast and heavy gear such as the radios caused the ship to shoot above its maximum operational ceiling and caused gas vents to pop open which released more lifting gas. During the confusion, the crew also attempted to jettison the aircraft in the hanger bay, with no success. The *Macon* settled gently onto the surface of the ocean about three miles off the coast. All but two of the crew were saved by nearby Navy ships. The *Macon* and its Sparrowhawks sank from sight. The subsequent inquiry focused on the upper tail fin which had been damaged ten months earlier. Witnesses included a light keeper at the Point Sur lighthouse who was observing the airship as the fin tore away. (Grossnick 32-33)

The loss of the *Macon* lowered the curtain on the U.S. Navy's rigid airship program. The program had several prominent Navy champions for over fifteen years. Unfortunately, a combination of poor fleet

exercise performances and too many high-profile LTA disasters ending with the *Macon*'s soured the Navy's high command (and Congress) on further expenditure of funds and other resources on rigid LTA craft. Additionally, aviation technology had advanced to the point that seaplanes could now fulfill the scouting mission. The Navy's Bureau of Aeronautics continued to promote plans for large "super airships" that were capable of carrying nine dive bombers but the lack of higher support prevented their moving off the design tables. While there was no official announcement that the rigid airship program was cancelled, the Navy ceased to ask for funding and the program died when the Goodyear-Zeppelin Corporation was dissolved on December 16, 1940. (Smith 163 - 170)

The Navy's airship program was a refinement of 19th-century technology which, in hindsight, could not possibly have survived the demands of battle in World War II. The airship concept of maritime reconnaissance continued to be used to success as blimps participated in the battle against submarines, particularly in the Battle of the Atlantic between 1942 and 1945. (Smith 162 - 163) The Navy and Goodyear, under Karl Arnstein's leadership, continued to collaborate on the blimp program, using them in the Airborne Early Warning program during the 1950s, but the program were finally phased out in the early 1960s. (Topping 236)

Association With a Historical Event/Criterion A

As stated previously, the USS *Macon* qualifies for listing under National Register Criteria A based upon its association with events leading to the demise of the Navy's rigid lighter-than-air airship program. The airship's conspicuous remains provide mute testimony to the dramatic crash that took two crew members' lives. On a larger scale the site provides a frozen moment in time that allows one to see the event that caused the cessation of the Navy's rigid airship program. The still-extant aircraft in Field A were the raison d'etre for the *Akron* and *Macon*'s design as fleet scouts. They provide a point of orientation within the jumble of girders that indicates the location of the hanger bay. Likewise, the existing water reclamation system which was conspicuous along the sides of the *Macon* above each engine provide a visual reference. And again in Field B, the bow docking mechanism provides a visual reference for that field's orientation.

Research Potential/Criterion D

The extant physical remains of the USS *Macon* present potential research opportunities. The site contains the most complete known remains of an early 20th-century rigid airship as well as the remains of the four Curtiss F9C-2 Sparrowhawk scout aircraft carried in the *Macon*'s hanger bay. The foremost research potential is for the student of post WWI airship technology including:

- The site contains numerous examples of the duraluminum box girders and deep ring frames built from girders that were designed by chief designer Dr. Karl Arnstein. The girders and their joint boxes could be contrasted with existing girder sections from other airships now found in German and British museums.
- Five of the German Maybach VL-2 engines have been identified at the *Macon* site, complete with carburetors and electrical wiring. One of the engines is still attached to its Allison rotatable outdrive transmission. The only engine of similar design in the U.S. known to this author presently is curated at the National Air and Space Museum's Paul E. Garber Preservation, Restoration and Storage Facility in Suitland, Maryland. This engine was built as a display piece by Maybach. Other Maybach engines are known to exist at the Zeppelin Museum in Friedrichschafen, Germany. Study of the *Macon*'s engines would be useful for U.S. aviation scholars.
- Since only a percentage of the *Macon*'s remains are exposed above the mounds in the two fields, excavation may reveal the remains of the control car, other offices and crew quarters, other parts of the hanger, maintenance area and monorail transport system. It would be instructive to study electrical and communication systems that the control car housed.
- Personal objects belonging to crew and officers might provide insight into living and working on a LTA craft.
- Since the reported loss of the upper tail surface of the *Macon* reputedly caused the loss of control resulting in the crash, researchers could excavate Field A to search for its remains.
- Excavation around the underside of the Sparrowhawks might reveal more about the removable landing gear and operations in the unique "monorail" hanger bay.
- Studies measuring the rate of deterioration of the metals from the *Macon* and the Sparrowhawks may be useful to aircraft restorers and aviation museum preservationists.

Summary
NOAA's documentation of the submerged remains of the USS *Macon* and its four Curtiss F9C-2 Sparrowhawk aircraft was undertaken in compliance with Section 110 of the National Historic Preservation Act, to inventory resrouces in it's management area and assess them for eligibility for the National Register of Historic Places. It is presently the only documented assemblage of an early twentieth century rigid airship. The deep-water site exhibits integrity of location since the site has been undisturbed since the airship's demise in 1935 and is protected both by its difficult access in deep water and by federal and state agencies. Except for a light overburden of silt and some degradation from the undersea environment, the site is arrayed as it was at the time of the crash. The site also exhibits integrity of workmanship in that the materiel that composed the airship is intact and is available for study by researchers. The unique girder assemblage designed by Dr. Karl Arnstein may be seen in abundance in the two compact concentrations on the seabed.

It is NOAA's Office of National Marine Sanctuaries' conclusion that the site of the USS *Macon* is eligible for the National Register of Historic Places under two of the National Register's criteria. The site is eligible under Criteria A based on its association with historic events leading to the demise of the Navy's rigid light-than-air program. The loss of the *Macon*, exhibited in this undisturbed, protected site, directly led to the cessation of congressional funding for further rigid airship construction. The site also qualifies under Criteria D due to its documented archaeological resources that have the integrity to provide nationally significant information. Sonar mapping, photomosaic development and detailed feature documentation indicates an undisturbed archaeological site that presents the remains of the airship and its aircraft in original context as they were at the time of the crash. All components that represent an operational naval rigid airship plus its scout aircraft are represented at the site. The deep-water site is protected by three agencies (NOAA's Monterey Bay National Marine Sanctuary, the State of California, and its ownership by the U.S. Navy), and no unpermitted intrusion is allowed by virtue of the National Marine Sanctuaries Act. This unique site will be protected in perpetuity for aeronautical researchers for the ages to come.

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"Many materials from this era pertain to the effort of Goodyear-Zeppelin Corporation to design and manufacture two large dirigibles for the U.S. Navy, the ZRS-4 (U.S.S. *Akron*) and ZRS-5 (U.S.S. *Macon*). Artifacts include the factory construction logbooks and several hundred black-and-white photographs showing the stages in the giant airships' assembly."
Series F: [includes blueprints for rigid airships], Series G - photographs, Series F - [materials regarding airships including blueprints]
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SECTION 10 – GEOGRAPHIC DATA

BOUNDARY DESCRIPTION

Please note: A USGS map (7.5 or 15 minute series) indicating the property's location is usually required for a National Register nomination. A USGS map is not available for this submerged property, [redacted]

The USS *Macon* is sited approximately three nautical miles west of Partington Canyon in the Big Sur region of western California. [redacted] The property is managed jointly by the US Navy Historical Center, the California State Lands Commission and NOAA.

National Register of Historic Places Continuation Sheet

The property is sited within Zone 10 North UTM, North American Datum 1983. The approximately 17 acre site is composed of a rectangle of approximately 307 meters (N/S) by 225 meters (E/W). This contains all of the remains detected by sidescan sonar as well as identified by remotely operated vehicles with high definition cameras.

BOUNDARY JUSTIFICATION

The National Register boundaries of the USS *Macon* airship wreckage encompasses the footprint of its articulated remains within a rectangle of approximately 307 meters (N/S) by 225 meters (E/W) to capture the two concentrations of historical remains as well as several scattered artifacts, primarily several fuel and water tanks. Sidescan sonar and Remotely Operated Vehicle surveys conducted by the Monterey Bay National Marine Sanctuary indicate the extent of the airship's distribution. The UTM box is bounded by the following coordinates:

[redacted]

PHOTOGRAPHS

Photograph/Image 01: USS *Macon* arriving at Lakehurst, N.J., June 1933. #NH669
Name of Photographer: unknown
Date of Image: June 1933
Location of Image:
Department of the Navy
Naval Historical Center
805 Kidder Breese SE
Washington Navy Yard
Washington D.C. 20374-5060

National Register of Historic Places Continuation Sheet

Photograph/Image 02: USS *Macon* over San Diego Harbor. #NH65304
Name of Photographer: Franklin Morgan
Date of Image: 9 February 1934
Location of Image:
Department of the Navy
Naval Historical Center
805 Kidder Breese SE
Washington Navy Yard
Washington D.C. 20374-5060

Photograph/Image 03: USS *Macon* (ZRS - 5) under construction in the Goodyear-Zeppelin Corporation hanger at Akron, Ohio. #NH42021
Name of Photographer: unknown
Date of Image: c. 1932
Location of Image:
Department of the Navy
Naval Historical Center
805 Kidder Breese SE
Washington Navy Yard
Washington D.C. 20374-5060

Photograph/Image 04: F9C-2s from USS *Macon* floy over Moffet Field, California. #NH77426
Name of Photographer: Harold B. Miller collection
Date of Image: c. 1934
Location of Image:
Department of the Navy
Naval Historical Center
805 Kidder Breese SE
Washington Navy Yard
Washington D.C. 20374-5060

Photograph/Image 05: F9C-2 hooks onto USS *Macon*. #NH77433
Name of Photographer: Harold B. Miller collection
Date of Image: c. 1934
Location of Image:
Department of the Navy
Naval Historical Center
805 Kidder Breese SE
Washington Navy Yard
Washington D.C. 20374-5060

Photograph/Image 06: USS *Macon* site, girder assembly remains.
Name of Photographer: NOAA/MBARI
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Photograph/Image 07: Water recovery system condenser
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Photograph/Image 08: Office desk and chair
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Photograph/Image 09: Maybach V-2 engine
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

National Register of Historic Places Continuation Sheet

Photograph/Image 10: Mooring Mast receptacle
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Photograph/Image 11 F9C-2 Sparrowhawk cockpit w/arresting hook
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Photograph/Image 12: Mosaic of Field A
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Photograph/Image 13: Sidescan sonar image of Field A
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Photograph/Image 14: Contour elevations of Field A
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Photograph/Image 15: Primary features of Field A
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

National Register of Historic Places Continuation Sheet

Photograph/Image 16: Mosaic of Field B
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Photograph/Image 17: Sidescan sonar image of Field B
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

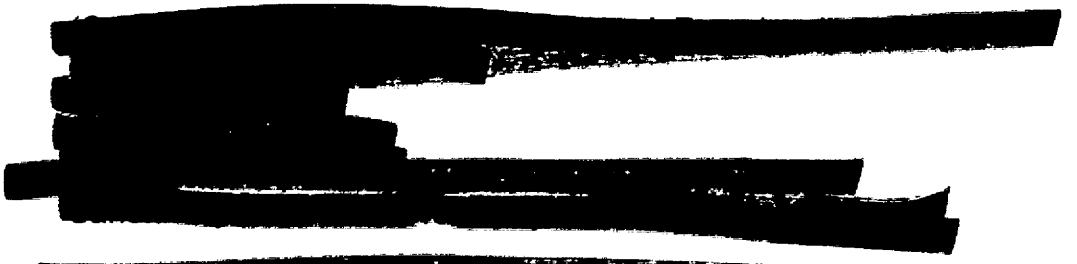
Photograph/Image 18: Contour elevations of Field B
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Photograph/Image 19: Primary features of Field B
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

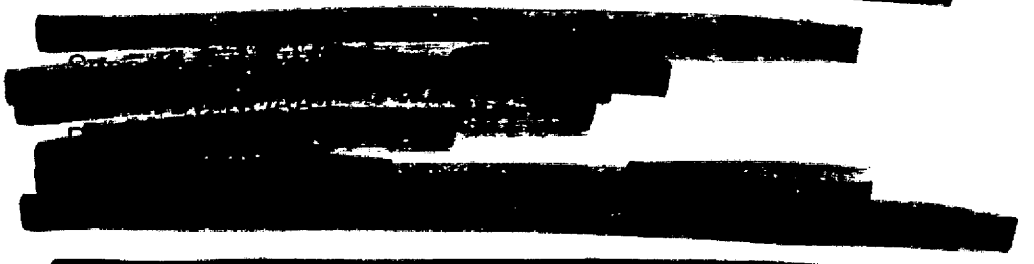
Photograph/Image 20: Oblique elevation view
Date of Image: September 2006
Location of Image:
NOAA, Office of National Marine Sanctuaries,
1305 East West Hwy, Silver Spring, MD 20910

Map 1: [redacted]

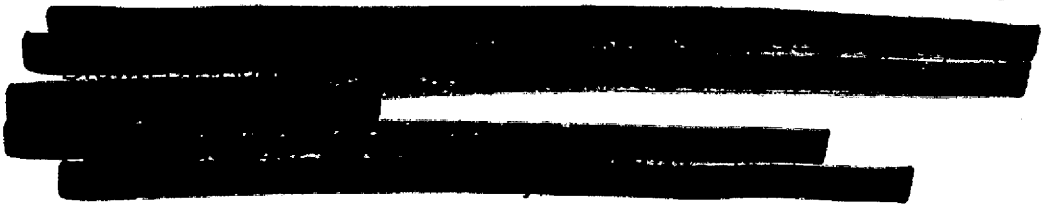
Map 2:



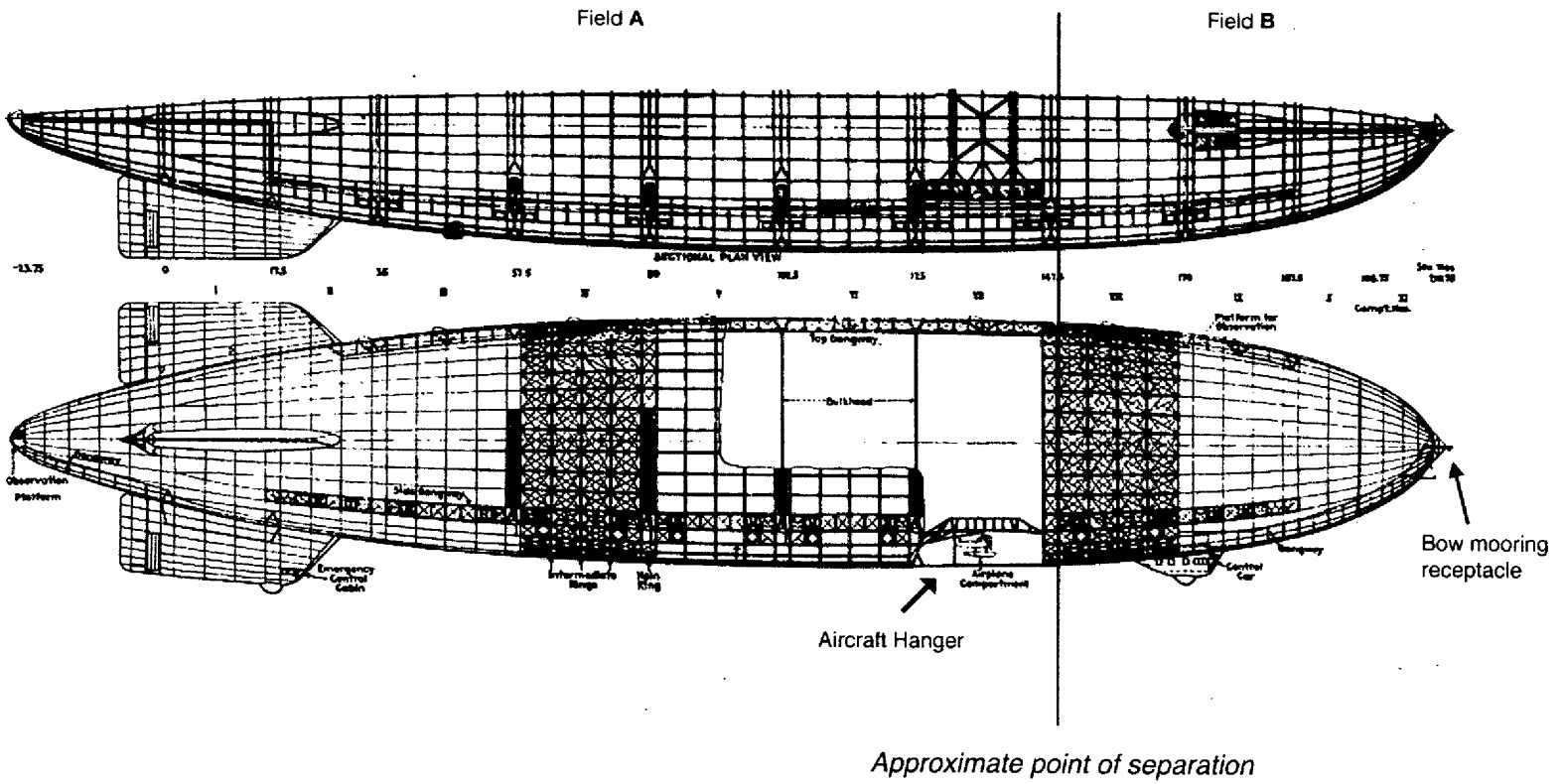
Map 3:



Map 4:



Map 4: Schematic of USS *Akron* (USS *Macon*'s sister ship)
Illustrating site formation process.



Figures & Maps Redacted

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

USS MACON (airship remains)

Monterey, California

Name of multiple property listing (if applicable)
N/A

Section number Page

SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 09001274

Property Name: USS MACON (airship remains)

County: Monterey State: California

Multiple Name: N/A

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

for Erika Martin Seibert 1/29/10
Signature of the Keeper Date of Action

Amended Items in Nomination:

The nomination is amended check "public-State" as well as public-Federal under 5. Classification, Ownership of Porperty.

The _____State Historic Preservation Office was notified of this amendment.

DISTRIBUTION:
National Register property file
Nominating Authority (without nomination attachment)

Photo # NH 669 USS Macon arriving at Lakehurst, N.J., June 1933

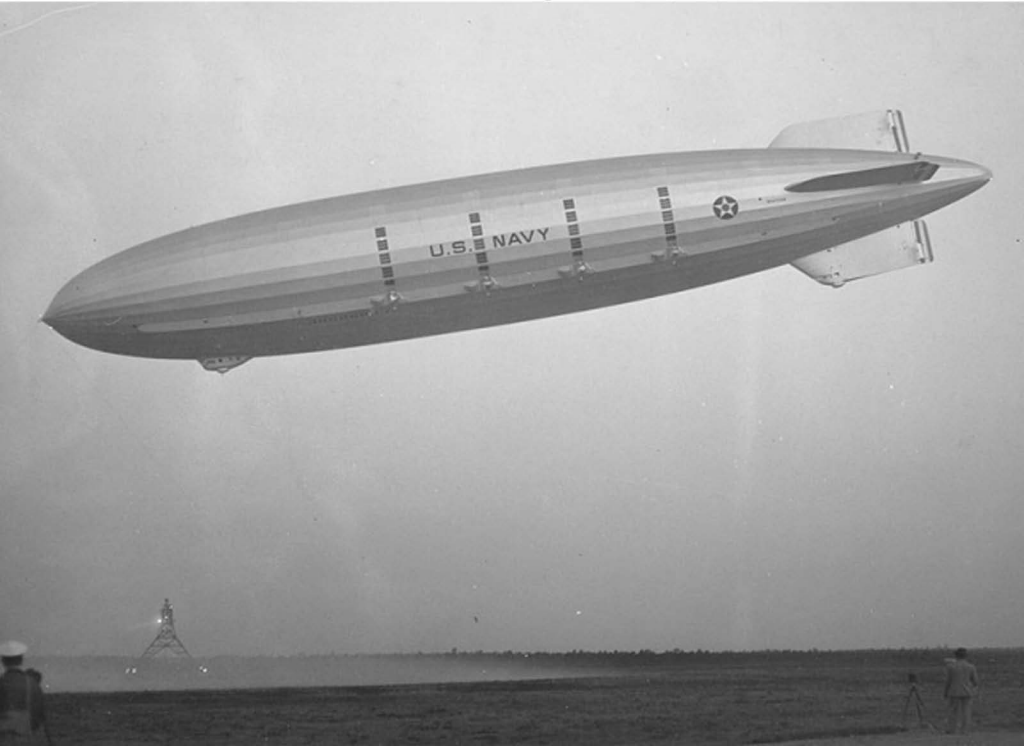


Photo # NH 65304 USS Macon flying over San Diego harbor, 9 February 1934

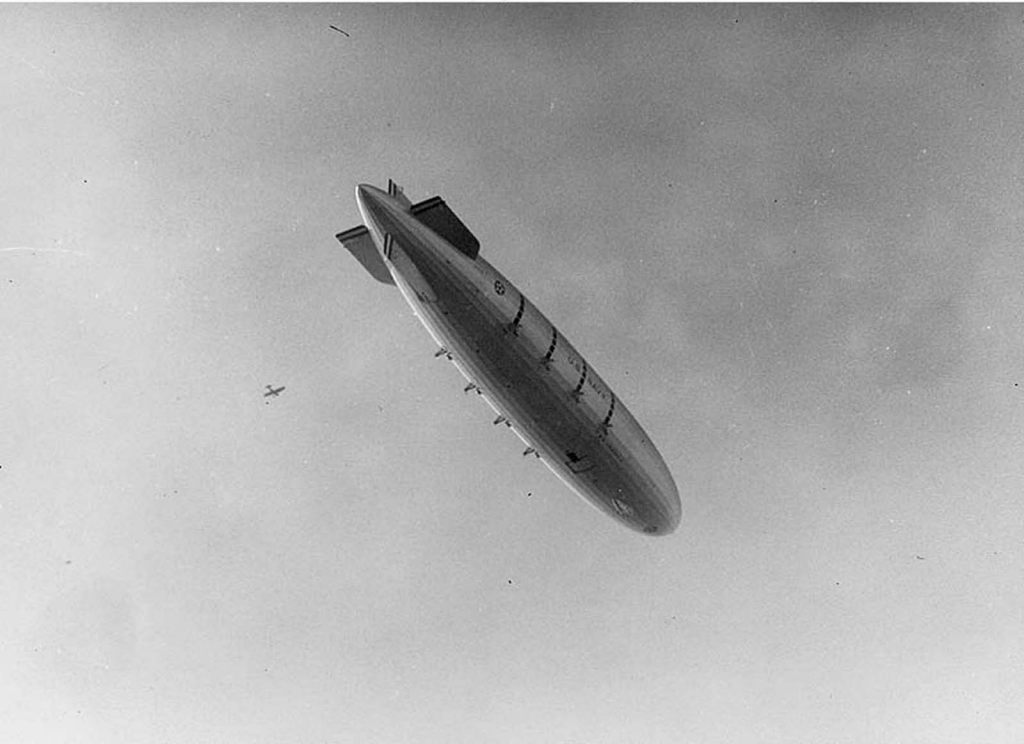


Photo # NH 42021 USS Macon under construction, circa 1932

Photo # NH 77426 F9C-2s from USS Macon fly over Moffett Field, California, 1934

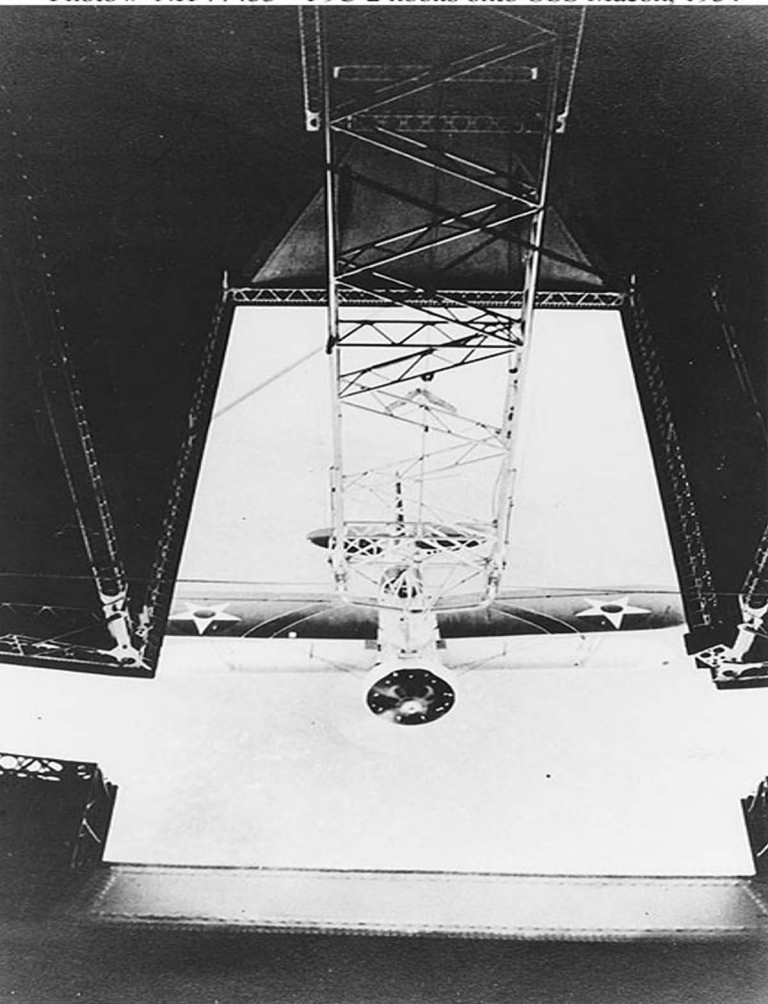



Photo # NH 77433 F9C-2 hooks onto USS Macon, 1934