**United States Department of the Interior**
National Park Service

# National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

## 1. Name of Property

historic name DELTA QUEEN (Riverboat)

other names/site number

## 2. Location

street & number 30 Robin Street Wharf ☐ not for publication

city, town New Orleans ☐ vicinity

state Louisiana code LA county Orleans code 071 zip code

## 3. Classification

| Ownership of Property | Category of Property | Number of Resources within Property | |
|---|---|---|---|
| | | Contributing | Noncontributing |
| ☒ private | ☐ building(s) | | buildings |
| ☐ public-local | ☐ district | | sites |
| ☐ public-State | ☐ site | 1 | structures |
| ☐ public-Federal | ☒ structure | | objects |
| | ☐ object | 1 | Total |

Name of related multiple property listing:

Number of contributing resources previously listed in the National Register 0

## 4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this ☐ 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. ☐ See continuation sheet.

Signature of certifying official Date

State or Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of commenting or other official Date

State or Federal agency and bureau

## 5. National Park Service Certification

I, hereby, certify that this property is:

☐ entered in the National Register.
☐ See continuation sheet.

☐ determined eligible for the National Register. ☐ See continuation sheet.

☐ determined not eligible for the National Register.

☐ removed from the National Register.

☐ other, (explain:)

Signature of the Keeper Date of Action

## 6. Function or Use

Historic Functions (enter categories from instructions)

TRANSPORTATION--water related
DEFENSE--naval facility

Current Functions (enter categories from instructions)

TRANSPORTATION--water related

## 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

Describe present and historic physical appearance.

Delta Queen is a riveted-steel, sternwheel-propelled, overnight passenger steamboat. The superstructure is built of steel and wood, the decks of ironwood, and the hull of steel. Delta Queen's large sternwheel is propelled by a cross-compound, condensing, reciprocating steam engine.

Delta Queen was built in 1927 at the Stockton, California, yard of the C.N.& L. Shipyard. They assembled the hull and machinery and built the superstructure. The hull had been built by the shipyard of William Denny in Dumbarton-on-Clyde, Great Britain, disassembled and sent to California to be put back together. Delta Queen began her life carrying passengers in California and was later adapted for longer trips on the Western Rivers system. Her hull was designed to allow operation on the rough waters of San Francisco Bay and this feature has served her well. Over time she has been modified to meet the requirements of trade and of governmental agencies. The principal modifications were made when Delta Queen was fitted for service with the U.S. Navy in 1942, and when she was moved to the Mississippi in 1946. Most of the original construction survives and modifications made for safety, accommodation, and luxury do not detract from her integrity. [1]

**Hull**

Delta Queen was built of heavy, triple-dipped, galvanized steel plates, double-riveted to steel, angle frames. Her register length is 250 feet, her overall length is 285 feet. She is 44.5 feet broad molded, 58 feet in overall beam, and 11.5 feet depth of hold. [2] The hull has a sharp bow flaring out to a broad midsection, a flat bottom with no external keel, and a tucked-up run to the stern with separate skegs for each rudder. There is an overhanging main deck or guard, as on most other Western Rivers steamboats, but it is supported by a flaring of the upper

☒ See continuation sheet

## 8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:
[X] nationally [ ] statewide [ ] locally

Applicable National Register Criteria [X] A [ ] B [X] C [ ] D

Criteria Considerations (Exceptions) [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F [X] G

| Areas of Significance (enter categories from instructions) | Period of Significance | Significant Dates |
|---|---|---|
| Maritime History | 1927-1962 | |
| Engineering | | |
| Transportation | | |
| | Cultural Affiliation | |
| | N/A | |
| NHL XII L: Business: Shipping and Transportation | | |

Significant Person
N/A

Architect/Builder
William Denny & Sons
C.N.& L. Shipyard

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

The sternwheel river steamboat Delta Queen, an operating vessel on the Western Rivers, is one of only two sternwheel river passenger boats operating under steam and is the sole remaining Western Rivers overnight passenger boat. [1] Such boats were the epitome of service on the rivers they served and were well known among river people. Delta Queen was built to operate on the Sacramento River in California. In later years she served as a yard ferryboat for the U.S. Navy in the Second World War, and made a hazardous voyage under tow from California, through the Panama Canal, to the Mississippi where she was reconditioned for work on the Western Rivers system. Today Delta Queen is the best known riverboat on the Western Rivers. She carries passengers on nearly the entire Western Rivers system and serves as a reminder of the time when steamboats carried the people and supplies that opened the West.

The preceding statement of significance is based on the more detailed statements that follow.

### The Development of Western Rivers Watercraft

The Western Rivers system, composed of the Mississippi, Ohio, Missouri, and other tributary rivers, carried most of the immigrants and freight that settled the Midwest. Starting in the late 1700s, most settlers travelled from the East Coast overland to Pittsburgh, Wheeling, or Redstone and then down the Ohio River to points west. [2] Only a small number traveled north from New Orleans and southern regions using the Mississippi and other rivers running from the North.

[X] See continuation sheet

## 9. Major Bibliographical References

See footnotes in text.

☐ See continuation sheet

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
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Specify repository: _____

## 10. Geographical Data

Acreage of property Less than one acre.

UTM References

| | Zone | Easting | Northing |
|---|---|---|---|
| A | 15 | 783730 | 3314945 |
| B | | | |
| C | | | |
| D | | | |

☐ See continuation sheet

Verbal Boundary Description

All that area encompassed by the extreme length and beam of the vessel.

☐ See continuation sheet

Boundary Justification

The boundary encompasses the entire area of the vessel as she floats at her berth.

☐ See continuation sheet

## 11. Form Prepared By


name/title Kevin J. Foster, Historian
organization National Park Service (418) date 5 February, 1989
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hull sides, rather than the older system which suspended the guard from a hogging truss.

Internally, Delta Queen is divided into seven watertight compartments by six athwartships bulkheads. Delta Queen's hull is supported by an internal truss system, which supports the entire structure of the hull, and superstructure. Two longitudinal skeleton truss girders tie through the bulkheads from bow to stern. The great strength of the hull allows it to support the weight of heavy fittings, such as the engines, and boilers, without distortion. This system of internal, rather than external, supports for the hull became standard on riverboats during the late 1920s. [3]

The bow compartment forward of the collision bulkhead contains the operating machinery for the steam-powered capstan on the foredeck above. It also contains a bow thruster and the small Detroit Diesel engine that powers it. The bow thruster is a pair of small propellers in an athwartships tunnel, capable of running in either direction, that helps guide Delta Queen's bow when turning.

Aft of the collision bulkhead is the forward crew hold, which once was an economy men's sleeping cabin. This area holds seven cabins with two bunks in each cabin. The next compartment aft of the forward crew hold is the boiler room.

**Boiler Room**

The boiler room occupies the middle part of the hold and extends vertically up through the main deck. The two water tube boilers are arranged sideways along the keel. Each boiler is fired from the front with heated Number 6 grade, Bunker C crude oil, atomized by air blowers. The fire passes around the water in tubes to the back of the boiler and returns to the front twice before the exhaust gasses pass through uptakes and exit through the smokestack. Steam produced by the boilers is extracted from the steam drum on top and passes through the main steam line overhead to the engine room. The entire assembly is covered by a sheet steel jacket over refractory material that covers the boilers. [4]

The current boilers are the original pair fitted to Delta Queen. The forward boiler was built by the McNaul Boiler Manufacturing Company, of Toledo, Ohio, and certified by the U S Shipping Board

in August 1919. The second boiler is a Foster Marine Boiler, serial number 4377, built by the Murray Iron Works Company, of Burlington, Iowa, for use in U.S. Navy destroyers. Sometime after the war these boilers were sold as surplus and bought for use in Delta Queen. When built they were certified for operating pressures up to 450 PSI. They are rated for pressures of up to 200 PSI in their latest inspection. [5]

The water level in the boiler is shown by a water level indicator called a sight glass. The sight glass is a heavy glass window set into a pipe, open at top and bottom to the boiler interior, through which the water level can be viewed. This allows the water tender on duty not to let the water level drop low enough to damage the boilers. A periscope from the boiler room allows the engineer on duty to get an efficient fire by checking the exhaust for excessive smoking. [6]

A number of small auxiliary steam engines power various pumps and generators. Delta Queen uses several Diesel motors and generators as well as hydraulic rams to turn the tiller. She employs a Diesel generator to provide electrical power for ship's use. Two steam reciprocating, double-acting, duplex pumps handle pumping duties. The steam pumps are all located in a machinery space forward of, and below the engine room, as is the backup steam turbine electrical generator which provides emergency power.

The next compartment aft of the engine room is the midship crew hold, which serves as quarters for more of the crew. Each of these rooms is also designed for double occupancy, as in the forward crew hold.

The after crew hold for officers and entertainers is the next compartment aft. This area also contains the crew office which serves as bank and commissary for the crew. The crew and officer messes are located aft of the dining room as well.

The next compartment aft is the lower engine room, entered from the engine room above. Here are several auxiliary pumps, two feedwater heaters which use exhaust steam to warm the water going to the boilers, a steam turbine electrical generator, and the main condenser and circulating pump.

The aftermost compartment in the hull is the area where the steam steering gear and the multiple tillers are located. This is a

cramped area because of the upward sweep of the hull bottom at the stern.

**Superstructure**

The superstructure of Delta Queen consists of four decks: the main, on which the propelling machinery is located; the saloon deck above the main deck; the observation deck above the saloon; and the Texas deck with the pilothouse atop. Delta Queen was built with an open main deck forward to allow automobiles to be carried. Stanchions and framing for the boiler deck are built of steel. Stanchions, decks, and bulkheads of the upper decks are built of wood with steel reinforcement. [5]

**Main Deck**

The main deck has an open foredeck which extends aft to the curved front of the saloon deck which stands forward of the superstructure front. A large steam powered capstan is set in the middle of the foredeck. The single mast, mounted on the centerline, supports a boom and landing stage (gangway). Two large sliding doors, to port and starboard, give access to storage and engineering spaces in the interior and an elegant wooden and brass staircase up to the saloon deck. The main stairway is flanked by rooms to port and starboard which run aft to the dining room.

The passenger dining room, called the Orleans Room, is now on the main deck, where it was moved during conversion for use on the Mississippi. Originally it was located in the corresponding space on the saloon deck above, where it was called the dining saloon. A liquor bar was set up in the early 1950s in the starboard side wing of the Orleans Room. This bar was destroyed in 1962 by a run-away barge, but was quickly repaired and put back into service. The galley is located behind the Orleans Room and produces both high-quality cuisine for passengers and more standard fare for the officers and crew. [7]

**Engine Room**

The engine room occupies the entire width of the stern on the main deck and contains the engines, rudders, auxiliary machinery, and engine controls. The engines are mounted to port and starboard in the engine room on massive structural members called cylinder timbers. The cylinder timbers support the cylinders and

crossheads at their inboard ends and the paddlewheel shaft at the after end.

The engines were designed and built by the Charles H. Evans & Company of San Francisco from rough castings provided by Krupp Steel of Germany and William Denny & Sons of Scotland. [8]

The engines are cross-compound, poppet-valve engines equipped with a full-stroke cam with a variable cutoff. The cam regulates the steam supply to provide steam during the full stroke. The california cutoff uses a linkage motion to pull out a wedge and allows the valve to close. The point when the wedge is pulled out regulates the cutoff. The cam turns inside a frame as the pitman turns the paddlewheel, and converts the motion to linear to-and-fro motion. This motion operates the valve gear which admits steam to the cylinders. The pistons push a heavy crosshead along a slide attached atop the cylinder timbers. The crosshead pushes and pulls the pitman which turns the crank and thus the paddlewheel. The cylinders are of different diameters in a cross-compound engine. The high-pressure cylinder is 26 inches in diameter, and the low-pressure cylinder is 52-1\2 inches in diameter. Both have a stroke of ten feet. Each engine develops 2000 indicated Horsepower. [9] The paddlewheel is a massive construction of steel and wood which propels the boat. It is 29 feet in diameter and 18 feet long. Six flanges, holding sixteen arms each, are evenly spaced along the paddleshaft. The arms are all held rigid by iron circles and blocking. Each arm and flange assembly forms one segment of the paddlewheel. The ends of the arms on each segment are attached to the paddle bucket planks which push the boat. A wood and steel paddlebox originally covered the sternwheel, but was removed when Delta Queen traveled to the Mississippi.

All engine room controls are located between the engines. A system of bells, connected to the pilothouse, guide the engineer on duty as to what speed and direction is desired. There must be a chief engineer and a striker on duty in the engine room and a fireman in the boiler room when Delta Queen is operated. [10]

The steering is controlled from the pilothouse, but much of the multiple rudder system is located in the engine room. The former system using cables from the pilothouse down to the central tiller at the rear of the boat proved to be too dangerous due to frequent breaks in the cable. Today, hydraulic controls guide the central tiller arm and two other tillers for sure control in

maneuvering. Delta Queen has adopted several systems for greater safety not present when she was built. Two additional rudders, called monkey rudders, have been added behind the paddlewheel for better steering. [11]

**Cabin (Saloon) Deck**

The deck above the boilers is often known as the boiler deck, but on Delta Queen, it is now called the cabin deck. When she was working in California, this was known as the saloon deck. This deck, and all higher decks, have an outside promenade with a large open area forward of the deckhouse proper. The cabin and Texas decks were extended forward of the enclosed superstructure in 1945. A sweeping curve outlines the edge of the cabin deck forward. Deck stanchions support the extension of the Texas deck forward as well. Wire mesh fills in the spaces beneath the railings in traditional Western Rivers style.

Inside the enclosed area of the superstructure of the cabin deck is the largest of the boat's three lounges. the forward cabin lounge. The lounge was once divided in half by a glass wall with a smoking room forward and a lobby aft. The stairway up from the main deck is located at the forward end of this room amidships and the stairway down to the Orleans Room is in the center of the room. Trunking for the boiler exhaust gasses up to the smokestack also is in the center of this room. The grand stairway, constructed of mahogany and brass, rises up to the Texas lounge directly over the stairway down to the Orleans Room. At the rear wall of the forward cabin lounge is a souvenir store to starboard and the pursers' office to port. [12]

A glass wall separates the forward cabin lounge from the aft cabin lounge. This lounge formerly extended forward only to the rear of the dining saloon, but now extends forward to the glass wall of the forward lounge. Large staterooms line the outside of the aft cabin lounge from the glass wall aft. Ten stateroom cabins were created in 1945 from the area formerly occupied by the dining saloon. These large cabins are called staterooms because of the tradition on Western Rivers steamboats of naming the larger cabins for states.

The next deck up is now called the Texas deck but was formerly known as the observation deck. The Texas Lounge is located forward, at the top of the grand staircase. This lounge contains a bar and windows with a fine view forward. Aft of the lounge

are a number of small cabins. little changed from their original appearance. These cabins all open onto the outside deck. Two outside stairways to port and to starboard give access up to the sun deck and down to the cabin deck. Deck chairs on the wide outside decks allow passengers to enjoy passing scenery in comfort. [13]

Above the deck now called the Texas deck is the sun deck, formerly called the Texas. The tradition on Western Rivers steamboats is that the highest deck on the boat was also used to hold the largest stateroom. That room was named for what was then the largest state, Texas. Today this deck is called the sun deck however, and holds a number of large, fine cabins, including the one to starboard aft named for its most famous occupant, President Jimmy Carter. Forward on the sun deck are the deck and engineering officer's cabins. Small staterooms house the officers during extended cruises of six weeks on, and six weeks off duty. Beyond the officers cabins there are two carbon-arc searchlights mounted on low pylons to allow landmarks to be identified at night.

The steam calliope whistles are mounted at the stern on the roof of this deck, with steam provided by pipes from the boiler and controlled by the keyboard on the rear side of this deck. The calliope is sometimes played at night and is fitted with colored lights to make different colored steam appear above the whistles. Passengers are not told of this secret process but the members of the crew hint that various flavors and colors of jello are fed into the boiler to produce the effect. [14]

**Pilothouse**

The pilothouse is a wide, glass-enclosed, house with a flat roof, mounted above the forward end of the sun deck. The roof is surmounted by a modern radar on a short mast and a short mainmast with lights mounted atop. This is the highest point on Delta Queen and occasionally prone to damage from low bridges. The one-pipe, three-chime steam whistle is mounted behind the pilothouse, on an iron steam pipe.

The main feature of the pilothouse interior is the control stand forward amidships. The wheel which formerly steered the boat has been removed. The rudders are controlled by steering levers in the modern manner. Also in the pilothouse are modern radios, controls for the spotlights, radar sets, a large coffee urn, and

a small refrigerator. A door in the rear wall gives access out onto the roof of the sun deck. Bridge wings to each side of the pilothouse allow the captain to view landing or lock-through operations from a commanding viewpoint.

**Rig**

The 41-feet tall, 16-inch diameter, single pole foremast is stepped amidships just forward of the superstructure. The foremast supports a 54-foot long boom at the level of the boiler deck. The boom is used to support and position the heavy 54-foot long, 7,800-pound, landing stage by means of the stage hoist and guys, a multiple pulley system. [15]

Boiler exhaust travels up from the boilers and out of the boat through the short, telescoping smokestack. When the boat was new, she had a taller funnel with a cowl top, but over time, fashion changes and low bridges have caused the stack to be replaced several times. Today the stack is painted black surrounded by a green band with the white initials "DQ" on the band. These colors have been inherited from the Greene Line which brought Delta Queen to the Mississippi. [16]

The only other features on the upper silhouette of Delta Queen are a flagstaff aft, four flag poles on each side of the Sun deck, and several ventilator cowls on the roof top. The flagstaff serves double duty as a place to raise the national flag and as a mark for the pilot to judge the centerline of the boat when looking aft.

**Notes**

1
"Delta Queen Scheduled For Launch Today," Stockton Record (Stockton, California: December 12, 1925) p. 1.

2
United States Department of Commerce, Merchant Vessels Of The United States (Washington, D.C.: Government Printing Office, 1929) pp. 54-55 and Frederick Way, Jr., Way's Packet Directory; 1848-1983 (Athens, Ohio: Ohio University, 1983) pp. 124-125.

3
David John Lyon, The Denny List (Vol. III, Greenwich, London: National Maritime Museum, 1975) Hull numbers 1168-1169.

4
Alan L. Bates. The Western Rivers Steamboat Cyclopoedium (Leonia, New Jersey: Hustle Press, 1981) pp. 22-30.

5
A. E. Seaton, A Manual of Marine Engineering (London: Charles Griffin And Company, Limited, 1928) pp. 37-38.

6
Letha C. Greene, Long Live The Delta Queen (New York: Hastings House Publishers, 1973) pp. 63-65.

7
Virginia S. Eifert. Delta Queen The Story Of A Steamboat (New York: Dodd, Mead & Company, 1960) p. 69.

8
International Library of Technology, Marine Boilers, Marine Engines, Western River Steamboats (Scranton, Pennsylvania: International Textbook Company, 1902) pp. 11.13 - 11.16.

9
Bates, op. cit., pp. 92-97.

10
Bates, op. cit., pp. 36-39.

11
The California Transportation Company, "Deluxe Steamers Delta King, Delta Queen, Cabin Plan" (Deck Plan from Delta King Pamphlet File, J. Porter Shaw Library, San Francisco Maritime National Park)

12
The Delta Queen Steamboat Company, "Steamboats Delta Queen & Mississippi Queen, Steamboatin' 1989" (New Orleans: The Delta Queen Steamboat Company, 1988) pp. 54-55.

13
Greene, op. cit. pp. 145-147.

14
"Delta Queen" Murray Tube Bulletin. (Vol. 12, August-September, No. 4) p. 3, and Bates, Steamboat Cyclopoedium, pp. 80-84.

15
See photographs for changes over time.

To reach the new lands of the West, Europeans adapted boat types already in use by Native Americans and on the East Coast. Explorers used birch bark canoes and settlers used larger dugouts to open the west to settlement. As more people moved west, boats with greater capacity were needed, which called for new boat types. A form of enlarged dugout, called a pirogue, was developed first. Pirogues were more capacious than dugouts and were themselves adapted into more useful forms. The first adaptation changed the method of construction, by taking the well-formed hull shape of the pirogue and replacing the hewn multiple-log construction of pirogues with European plank-on-frame construction. [3]

Plank-on-frame construction was also used for another boat type called a bateau. Bateaus had been adapted for frontier use on the eastern seaboard in the early 1700s and were built for use on the Western Rivers later. When more traditional European construction practice was followed with these vessels, they resembled ship's boats but with more substantial timbers. When the best features of pirogues and bateaus were combined, they were given a hull shape that provided little resistance to the water, an external keel to help in steering, and sufficient cargo capacity to pay their way. This new type was called a keelboat. [4]

Keelboats were the most developed form of watercraft on the river and were used for rapid transportation of passengers and high value freight. Keelboats were usually 40-80 feet long and 7-10 feet broad. They possessed a well-modelled form, and could be propelled about 15 miles a day, by either oars at the bow or by poles pushed by the crew walking along a footway at each side. A single steersman stood atop a block at the stern to guide the keelboat using a long steering oar. Some keelboats which sailed an advertised route on a regular schedule came to be known as packets, the deep water term for vessels in such service. [5]

Cheaper transportation was afforded by the use of barges and flatboats. Flatboats were box-shaped variants of the scow hull form used for ferries on shallow Eastern rivers. Flatboats were the cheapest form of transportation on the rivers. Intended to travel only one way and then be broken up for lumber, flatboats could be built, loaded with household goods, and sailed by the settlers themselves. [6]

Barges occupied the middle range of watercraft between keelboats and flatboats. Though similar in construction to keelboats, barges were built wider, more robust, and drew more water. Barges transported heavy freight on the deeper rivers. [7]

**Development of the Western Rivers Steamboat**

Robert Fulton built the steamboat New Orleans at Pittsburgh, Pennsylvania, in 1811, and started a revolution which changed the pattern of commerce on the rivers. She proceeded down the Ohio and Mississippi Rivers to her namesake city attracting publicity and attention along the way. The advent of steam propulsion on the Western Rivers revolutionized river transportation. Steamboats would provide convenient, inexpensive transportation and greatly facilitate the opening of the continent to settlement. New Orleans, and the boats which were built on her pattern, were powered versions of canal boats. Their long, narrow, deep hulls were better suited to deep eastern rivers than the shallow Mississippi, but were needed to support heavy steam machinery. Another sort of boat was required, but several design problems had to be overcome before steamboats could be a success on the Western Rivers. [7]

To navigate on the shallow rivers of the West, steamboat hulls and machinery had to be made as light as possible. Machinery weight problems were solved first. A lightweight, high-pressure engine was employed to propel a small boat called Comet in 1813. The powerplant was further refined in 1816 by Henry Shreve, who put the boilers on deck and designed a new type of engine to distribute machinery weights out over a large area of hull. Shreve's new engine design used a direct-acting, horizontal, high-pressure engine to drive the paddlewheel propeller. The second design problem was gradually overcome over time. Lightweight hull construction gradually replaced earlier robust "canal boat" construction. A broad, shallow-draft, hull form, using a truss rod system rather than heavy wooden beams, developed over time.

To succeed in business, these lightly built boats had to carry a large amount of freight and many passengers. In answer to this requirement, sponsons were built over each side of the hull to extend the deck area and the superstructure was extended several decks above the boiler deck to support passenger cabins.

All of the essential elements of the Western Rivers steamboat were present by 1825. Broad, shallow-draft, vessels with boilers and engines on deck, sidewheels or sternwheels for propulsion, and cabins built on lightweight decks above the freight and machinery-laden maindeck, soon appeared on every tributary of the Mississippi. The ease and economy of this service caused the value of goods reaching New Orleans to double every ten years from 1820 to 1860. [8]

One feature of cardinal concern in the development of Western Rivers steamboats was safety. Early boats were particularly susceptible to boiler explosions, fires, and sinkings caused by hitting snags. Extraordinary dangers included being damaged in floods, tornadoes, and ice gorges. The lifetime of a steamboat in the 1840s and 1850s was estimated to be below five years. Owners could accept such losses because profits were high enough to more than offset them. This situation changed very slowly.

Government intervention forced builders and operators of steamboats to become more conscious of safety considerations in a way that commercial motivations could not. In 1838, Congress responded to the need for increased safety aboard steamboats when it passed an act requiring the inspection of steamboats. In 1851, six steamboat disasters took more than 700 lives and caused Congress to tighten these safety regulations. The Steamboat Inspection Act of 1852 set standards for both boats and operators, and created a system of Federal inspection to oversee them. Later acts and regulations strengthened these laws considerably. One later act related to safety nearly put Delta Queen out of business. [9]

The many hazards to navigation did not deter business and many new boats were built to replace those lost to various causes. A substantial salvage business grew up in consequence, and parts produced for one steamboat might be reused on a succession of later boats.

As time progressed, steamboat designs began to diversify to meet the needs of various trades and routes. Various features advantageous to a particular trade or route were accentuated in vessels built for them. Passenger vessels required high speed and high-class accommodations. Ferries called for wide stable hulls. Package freighters required dependable engines and robust construction as they carried heavy cargo on deck or in barges alongside. In some services speed became paramount even

surpassing safety concerns. Faster vessels required fine lines. powerful engines, and multiple boilers to supply plenty of steam. [10]

Shallow tributary rivers such as the Missouri and the upper regions of other rivers required boats with exceptionally shoal draft. Bertrand, sunk in 1865 on the Missouri River. drew only 18 inches when light. To operate in such shallow water steamboats had to sacrifice all unnecessary weight and be satisfied with minimal superstructures. [11]

By 1880, though a depression in river trade had hurt steamboat companies, there continued to be advances in riverboat technology. Several distinct types of steamboats had been developed for work on the Western Rivers. Passengers were carried on riverboats of any kind from time to time but several types were particularly adapted for passenger service. The most elaborate of these were saloon or palace steamers providing luxury passenger transportation in elegant cabins. Such boats usually ran on schedule, and often carried mail to designated ports. These services duplicated those of ocean-going packet companies and these boats were aptly termed packets. [12]

Other passenger vessels were adapted for short day excursions carrying groups and charters to nearby scenic areas and for cruises to nowhere. These excursion boats were usually large sidewheelers operating from large port towns, but smaller boats also made occasional trips on the rivers "tramping" for charters.

More mundane sisters to the packets operated carrying passengers and cargo, wherever it could be found. Such non-scheduled steamboats often pushed one or more barges to increase cargo capacity. Over time a separate type also developed that was adapted just to tow barges. [13]

Some passenger boats were adapted to carry vehicles and livestock across the river or for short distances up- or downstream. These boats were of two general types: ferries and day packets. Ferries were more heavily built than day packets. Western Rivers ferries were unlike ferries in most other regions of the country. Vehicles entered the main deck from the sides rather than the ends of the boat because swift currents forced the ferry to land with the bow upstream. [14]

Day packets were faster and designed to provide better accommodations than ferries so that they could be used for occasional excursion trips. This adaptability allowed day packets to survive when bridge construction put ordinary ferries out of business.

California Steamboats

The first steamboat to operate on the West coast of North America was the sidewheeler Beaver which operated briefly on the Columbia River in 1835. Western Rivers style steamboats spread to California with the gold rush in 1849 to carry fortune seekers and supplies up the Sacramento River to the goldfields. Steamboats spread rapidly over the West Coast and by the 1850s and 1860s could be found on every major river. [15]

Steamboat operations between San Francisco and Sacramento began and boomed during the gold rush. The first steamboats for this river service were built or assembled in California from parts made elsewhere. Later, ship and boat building yards were opened in California, but some vessels that worked there continued to be brought from yards outside the state.

Various short-lived companies began steamboat lines which set up regular service to upriver ports. After large-scale wheat farming added a profitable downriver cargo in the 1870s. these companies became more stable. Seven partners began the California Transportation Company in 1875 with four steamers. By 1877, the company had done well enough to build their first steamer, the packet Reform.

Gradually the company grew and replaced vessels lost or retired with bigger and better vessels. In 1911, the company built the sternwheel river boat Capital City for the service to Sacramento. She was the first vessel to be equipped with hot and cold running water piped to every room. The California Transportation Company followed Capital City with another luxury steamer. Fort Sutter which was picked by the U.S. Army Corps of Engineers as the best type of river steamer in the United States. [16]

Construction and Career of Delta Queen

The California Transportation Company began making plans for a pair of steamboats to serve on the Sacramento and San Joaquin Rivers as luxury or "deluxe" overnight transportation between San

Francisco and Sacramento, California. The machinery plants of both boats were designed by the prominent naval architectural firm of Charles H. Evans Company, of San Francisco. [17]

Due to the decline of American shipbuilding at the time, and the high costs prevalent in U.S. yards, the hulls and some machinery for the two boats were ordered from the yard of William Denny and Sons, of Dumbarton, Scotland. Denny's offered to build the first of the two vessels on December 14, 1923. Delta King was ordered on April 1, 1924, and Delta Queen was ordered on May 11, 1924.

Denny's was given the dimensions and general particulars of the desired vessel with a free hand to model the hull as they thought best. After extensive hull model tests in their towing tank to determine the best hull form for shallow water, the yard completed the plans and bent, formed, and assembled the hull steel using removable bolts rather than rivets. Denny had built many smaller "knock down" boats for river service in South America and Asia and was well known for the high quality of their work. The hull plates and frames were formed and assembled there, and then numbered and disassembled for shipment. Denny subcontracted some of the major engine forgings and castings to the Krupp Foundry in Germany. The hulls were shipped from Dumbarton on November 8, 1924, and March 9, 1925, with Delta Queen's hull delayed at the owner's request. [18]

On May 20, 1927, the steamboats were christened Delta Queen and Delta King and launched from the C.N. & L. shipyard in Stockton, California. The new boats were completed in 1927 and began service between San Francisco and Sacramento on a schedule that let the King or Queen leave San Francisco for Sacramento and pass her sister traveling the other way. Each boat left at six in the evening and arrived at six in the morning and returned the next day. [19]

> This king and queen live up to their names. They are regal in their appointments, in their outward appearance, and in their inner quality. ... from the stem to end of the paddle guard, Delta King and Delta Queen show intelligent design and capable execution in a thoroughly finished job.
>
> Our hats are of to Captain A. E. Anderson and the organization which he directs. We salute them for a job well done. [20]

Delta Queen was designed to accommodate 234 passengers, 40 automobiles on the main deck, 15 on the outside decks, and 350-400 tons of cargo. The passengers were accommodated in 117 staterooms for two persons and a large men's dormitory area forward. The vehicles were carried on her restricted foredeck and also on her maindeck alongside the boilers. [21]

By 1941, the passenger trade on the Sacramento had dried up, and the California Transportation Company decided to send Delta King to the Mississippi and made a study of methods of getting her there. She was even sheathed-in with wood to prepare her for the long tow to the Mississippi. The Second World War intervened and Delta Queen, in 1940, was chartered for use as a minesweeping training ship in San Francisco Bay. She and Delta King were requisitioned for use by the U.S. Navy in 1941.

The Navy retained the civilian names of the two vessels but gave them navy classification numbers. USS Delta Queen became YHF-7 on December 15, 1941, and was reclassified YFB-56 on June 5, 1944. She and Delta King were employed carrying large groups of troops about the San Francisco Bay area. They were also used as gigantic lighters to carry 3000 troops at a time out to liners anchored in the bay. [22]

On August 21, 1945, Delta Queen was retired from U.S. Naval service and declared surplus on August 28, 1946, and sold to the Greene Line, of Cincinnati, the highest bidder. The Greene Line was formed in 1890 as the Gordon C. Greene Company with one operating packet steamboat. The Company grew to own more than a dozen boats by 1940, when it became Greene Line Steamers, Incorporated. [23]

The Greene Line prepared her for the long voyage to the Mississippi by removing the paddlewheel, sheathing the first three decks with wood, reinforcing deckhouses, and securing all loose gear aboard. A tug towed Delta Queen down the Pacific to Panama, through the canal, and up the Gulf of Mexico to New Orleans. There she was returned to sailing condition and steamed up the Mississippi and Ohio Rivers to the Dravo Shipyard where she was modified to suit her for service on the Western Rivers. When this conversion was completed a new queen of the river began her reign. [24]

The Greene Line sent Delta Queen on passenger cruises west to Omaha, Nebraska, south to New Orleans, north to Stillwater,

Minnesota, and Joliet, Illinois, and west to Charleston, West Virginia, and Knoxville, Tennessee.

The Greene Line went through traumatic management changes but continued to operate Delta Queen even though the company sold most of its other steamboats. The Greene Line sold Delta Queen to Edward J. Quinby and Richard S. Simonton on February 22, 1958, but she continued to be operated by the Greene Line. This company operated her on the same sort of strenuous tramping passenger excursion trips as had her earlier owners. Some minor improvements to make the boat more attractive and comfortable to passengers were made. [25]

The Safety at Sea Law of 1966 threatened the continued operation of Delta Queen because one clause of the law forbade operations of vessels with wooden superstructures in overnight passenger service. The first of a series of legal maneuverings fueled by a tremendous public outcry, allowed a special Congressional exemption from the law for Delta Queen in 1970. Several subsequent extensions of this exemption have focussed tremendous national attention on this problem. Many modifications for safety have been made, though short of the complete rebuilding sought by the Coast Guard. [26]

One of the most important activities engaged in by Delta Queen every year began on June 5, 1962, when Delta Queen raced the only other surviving sternwheel passenger steamboat during the celebrations surrounding the Kentucky Derby. She won and played the tune of "Goodbye Little Girl, Goodbye" on the calliope as she ran away from Belle of Louisville to win. A racing tradition was begun. Partisans of the Belle claim that the bow thruster of the Queen confers an unfair advantage in turning. Fans of the Queen claim that the light draft of the Belle allows her to cut inside on turns. Both sides have resorted to various outrageous forms of guile, ruse, and outright cheating over the years in the effort to win. Since the races began, the golden elkhorns have been about evenly awarded to each of the two boats with tremendous hoopla surrounding the event, no matter which boat wins. [27]

In 1973, the company was sold to Overseas National Airways and renamed the Delta Queen Steamboat Company. This and subsequent owners have maintained the same high standards as when the vessel was built. The Delta Queen Steamboat Company was acquired by the Coca Cola Bottling Company of New York in 1976. In 1980, the

company became publicly owned, but Delta Queen returned to private ownership in 1986, when the present owners, The Equity Group Investments, Inc., bought the company. [28]

As a luxury steamboat and the last traditional overnight steamboat on the Western Rivers, Delta Queen has attracted many distinguished passengers. In 1979, President Jimmy Carter and his family took a cruise on the upper Mississippi from St. Paul, Minnesota, to St. Louis, Missouri. This cruise received considerable publicity as the President worked on his energy policy and prepared for the upcoming election. A popular photograph of President Carter on the bridge of Delta Queen with a large sign reading "Steamboat 1" was reproduced in papers across the country. Princess Margaret Rose of Great Britain and a royal party made a similar cruise in 1986. [29]

Today Delta Queen plays an important part in the cultural and historical heritage of the entire region, where she is regarded with deep and abiding affection. Delta Queen is also of great importance as the sole remaining example of her type, which played an important part in America's westward expansion. [30]

**Notes**

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