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UNITED STATES LINES M.S. PATRIOT EMERGES FROM PORTLAND SHIPYARD

After a historic re-flagging and a major five-week conversion by Cascade General, United States Lines M.S. Patriot emerged from the Portland Shipyard on November 23, 2000. This was the first-ever re-flag of a foreign cruise ship by the U.S. Coast Guard, and required an act of Congress to allow an exemption to the Jones Act.

The 214.6 m (704') Patriot, formerly Holland America's Nieuw Amsterdam, began service in Hawaii on December 6.

Following its final assignment as a floating hotel during the Sydney Olympics, the 17-year-old ship officially changed ownership before entering the Columbia River. Detailed advance planning by Cascade General ensured that work began in four specific areas the moment the ship arrived: 1) New bow and stern thrusters, 2) Conversion of three public spaces to suit the Hawaiian market, 3) Complete re-fit with Coast Guard-approved safety equipment, 4) Identity change.

DRYDOCK WORK

Both Lips C.P. propellers were dismantled during the 17-day stay in the Portland Shipyard's 982' Drydock 4. The hubs were overhauled and the blades polished, the starboard shaft was pulled for inspection by Lloyds officials and the line-shaft bearings inspected. The pintle bearing clearances were measured, the steering gear serviced, the stabilizer seals replaced, and over 100 anodes replaced.

While the sea chests were open for maintenance, the bottom was spot blasted and an International four-coat system was applied to the entire hull below the waterline.

All the Patriot's sea valves were checked. The 20-ton anchor was replaced and the chain ranged and marked. After Lloyds supervised the ultra-sonic and vacuum testing of the exterior thruster welds, a video record of the underwater markings was

made for reference. Internally, several ballast tanks were modified and converted to hold graywater.

THRUSTER INSTALLATIONS

Computer simulations had tested the suitability of the 33,800 GRT ship's existing pair of 750 kW thrusters for potential conditions in the Hawaiian Islands. These tests revealed that additional thruster power would markedly improve maneuverability and safety, especially in outlying ports or when the trade winds picked up. However, any addition was made problematic, because of the lack of usable space below the waterline at both ends of the ship.

Hardly any shipyard in the world has more experience in thruster installation than Portland, which has now successfully fitted six thrusters to cruise ships in the last three years. Under the direction of Suren Menon, executive vice-president in charge of cruise ship operations, Cascade General's superintendents and tradesmen have learned to make the most of the very limited spaces available. "Previously, we've only contracted to add one thruster per ship," he explained. "However, we have a large and experienced engineering team here who are perfectly capable of working at both ends of the ship simultaneously."

BOW THRUSTER

In the bow, a team of Cascade General electricians began preparing the route for the power and control cables for the thruster while the ship was still dockside. The raceway for the high voltage cable required overhead supports every few feet in the overhead of Deck 4 and consumed close to 850' of the heavy cable. The 480-volt current produced by the ship's 4-cylinder Sulzer diesel generator was to be stepped up to 6,600 volts by a new transformer installed in a small storage space above the aft thruster room. This high-voltage transformer room is protected by a security screen and serviced by a dedicated cooling and fire protection system.

On the drydock floor, Menon's engineering team used their well-proven method of mounting a cutting torch on a radius arm rotating on the bow thruster centerline. This Cascade General innovation automatically ensures a perfect fit for the flared thruster mouth on the convex curve of the bow plating. Four frames and three decks were cut back to create the thruster aperture and motor room.

The 5-ton ABB electric motor was lifted from a trailer by Cascade General's rigging crew, hauled into the thruster aperture in the bulbous bow, and hoisted up and secured on a temporary base. The riggers then expertly maneuvered the 5.5-ton thruster inside the bow using an array of pneumatic and hand tackles. It was carefully lowered into place by these shipyard specialists while work continued on the decks above to convert a forecastle ballast tank into the motor room with all required lighting, cooling and alarm systems,

Because the hull directly over the tunnel was only 7' wide (2.2m), the motor was not installed directly on the thruster but on Deck 2, after reinforcements were added to framing on Deck 1 to support it. After laser alignment to 3/10,000", a 6' (1.6m) shaft was used to connect the raised motor to the thruster. Ventilation ducting for the compartments passes through the bosun's storeroom to the foredeck.

STERN THRUSTER

The only available position for the additional stern thruster, weighing in at 4.5 tons, was in a supplementary fuel tank just two feet below the bottom of an elevator shaft. To direct the thruster's flow under the propeller shaft housing, the mouth of the tunnel was to be flared out and angled down 20 degrees to within 6" of the keel. However, because of the short lead time, both thrusters arrived from KaMeWa's Swedish headquarters without the necessary tunnel extensions.

"We weren't made aware of this situation until the thrusters actually arrived here," Menon explained. "There was absolutely no time to spare." Cascade General's metal shop quickly rose to the challenge to extend the nozzles, forming and fabricating two pairs of flared tunnel extensions using 26,000 lbs of Lloyds-approved 1" steel. "That's when the kind of facilities and experience we have here are invaluable," Menon stressed.

The thrusters and extensions were delivered straight from the welding shop to Drydock 4, where a U-shaped cut-out had been removed from the hull. Extensive steel removals included three frames, the centerline bulkhead and a horizontal baffle. Accesses were opened through two bulkheads and the ceiling, then the entire space was steam-cleaned and blasted.

Structural reinforcement from the keel up was necessary to absorb the thruster system's 1510 kW maximum output and integrate it into the existing structure. Precise

preparation was required to ensure that the many frame extensions and angled gussets delivered to the welding crew matched the varying angles of the hull shell and flared, down-turned tunnel. With the thruster wedged under the elevator shaft, a unique solution was required to connect the 480-volt ABB electric motor: it was installed on its side--at 15 degrees above horizontal—forward of the elevator shaft, laser-aligned and liquid chocks poured.

Because of the hull's flare, it was necessary for the lower half of the tunnel to extend well beyond the shell plate. To support this projection and improve water flow, a curved lip was added below the tunnel mouth. New ladders and watertight hatches were installed in the space to allow easy inspection. Two large-diameter oil pipes were re-routed over the tunnel, the electric cables run from the engine room, and the hydraulic system for pitch control installed.

The existing thrusters were integrated into three new KaMeWa instrument panels fitted on the bridge and in the port and starboard wing stations. With its thrusting power tripled, the Patriot was now fully equipped to face navigation in the Hawaiian Islands. The United States Lines representative in the yard was project manager Arne Baekkelund. "I'm very satisfied with the work Cascade General performed on the Patriot," he stated. "They finished on-time and made this project a positive experience for us."

NEW PUBLIC SPACES

Since the Patriot will remain in U.S. territorial waters on its seven-day, four-island cruises, the spaces occupied by the duty-free shop and casino became available for other uses. Alterations to the interior of the Patriot were designed by architects Yran & Storbraaten and carried out by cruise ship specialists James P. Colie of Florida, who are frequent visitors to the Portland Shipyard. The shop space, adjacent to the existing shore-excursion office on the Broadway Deck, allowed for the addition of an information center for the ship's popular shore trips.

Cascade General welders removed internal walls and cut openings for view windows on the starboard wall of the former casino on the Promenade Deck. Colie's team then began creating a "destination learning center" in the cleared space. The "aloha spirit" is clearly visible in Hawaiian-motif room dividers, hardwood paneling and louvers, and wicker furnishings.

On the deck above, a bar and lounge were also removed, to make room for children's and teenagers activity rooms. Here the ceilings have a contemporary metallic finish, while the walls are decorated with colorful murals--underwater life in the Kaleidoscope Children's Club and surfing in the Graffiti Teenage Center.

The Dutch-themed library forward of the dining area was also slated for a change of identity—reflecting the increased need for passengers to keep in touch with home, business and the news. It became the Internet Lounge, managed by Digital Seas, with nine workstations operating at 128 Kbps via an MTN satellite.

On the ship's upper-deck, two first-class cabins were combined into a luxurious Presidential Suite, which the owners plan to make a feature of all future United States Lines ships. The design included a complete, tiled bathroom and marble-floored entry foyer. Here and throughout the ship, Hawaiian décor and art were added. Other work included adding an 80-amp/220-volt service and a 220-square foot canopy for outdoor entertainment aft of the pool on the Broadway Deck.

IDENTITY CHANGE

Identity change work took place throughout the ship during the re-commissioning. At the bow and stern, the old name was completely erased and replaced by Patriot/Honolulu." The color of the topsides was changed from navy blue to International Paint's "US Lines Blue." On the stack, the curved side panels were removed and replaced. Then the owners' design for the new emblem--an eagle in a circle of stars--was reproduced in steel plate, and the 17 pieces individually welded in place. The result—a blue stack highlighted by the gold eagle and stars--is a striking complement to the ship's traditional lines.

COAST GUARD-APPROVED SAFETY GEAR

The French-built Nieuw Amsterdam's twelve lifeboats and four tenders did not release simultaneously at the bow and stern, as required by U.S. Coast Guard regulations. All sixteen boats were lowered and transported to a building bay where a production line was set up. The " " wires were replaced and davits serviced while each hull underwent structural alterations and reinforcement to accept the new Norwegian Durapart releases. Each boat was then tested on the water with a 20-ton load to check the functioning of the hydrostatic release and manual over-ride.

The re-flagging process also included an official inclination test, new emergency signage and lighting, replacement of all inflatable liferafts, and the distribution of 2,500 new U.S.-made lifejackets throughout the ship. A new crew of five hundred also joined the ship during the Portland stay and took part in full abandon ship and fire drills to the satisfaction of the Coast Guard's safety officers.

Under the Coast Guard's Alternative Compliance Program, Lloyd's, which has classified the ship since its launch, will continue as certifying authority on everything except safety issues. The Patriot received her final Certificate of Inspection from the Coast Guard and Lloyd's Register on 23 December and departed for San Francisco.

"This was the first re-flagging of a foreign cruise ship to the US flag," stated Suren Menon, "and the successful completion of this conversion has a great significance for many people in the maritime community, besides ourselves. It puts a modern cruise ship under the American flag for the first time, gives American Classic Voyages a first-class vessel for their Hawaiian service, and revives a historic name in shipping--the United States Lines. Cascade General is proud to have been a partner in the project."

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Cascade General owns and operates Portland Shipyard, the largest and most complete ship repair and industrial facility on the West Coast of the United States. We provide full-service repairs and conversions for tankers, cruise ships, bulk carriers, container ships, government vessels, tugs, barges and workboats. Cascade General's Portland facility includes a 60-acre (24.2 ha) yard, 550,000 square feet (51,096 square meters) of craft shops, more than 7,600 ft. (2,326 meters) of full-service repair berths, and three floating dry docks – including Dry Dock 4, the largest in the Americas. Cascade General also provides emergency topside repairs at any location on the U.S. West Coast and operates Voyage Repair Stations at Port Angeles, Washington and Astoria, Oregon.