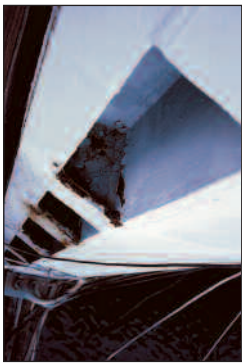


BATTLING BACK

The USS Yorktown targets corrosion in coatings overhaul



The “Fighting Lady” will not fight again. But the legendary aircraft carrier, known more formally as the U.S.S. Yorktown (CV-10), is still hard at work, offering tourists an up-close, interactive look at a wartime vessel at the Patriots Point Naval & Maritime Museum at Charleston, S. Car.

She has floated dockside here in Charleston Harbor since 1975 after a career that spanned from World War II to the Vietnam War. And while Charleston Harbor may not be the Pacific Theater, it is still a coastal environment that puts maintenance concerns at a premium. Salt and its corrosive effects are the primary concern, and a well-intentioned maintenance coating routine had given the Yorktown a new topcoat every five to eight years to fight such corrosion.

But soon after Patriots Point Director of Operations Bob Howard assumed his position upon retirement from the U.S. Navy in 2002, he knew the next paint job couldn't be business as usual.

“Beside the normal rust streaking, I could see areas where there was separation between the coating and the metal, and the coating was getting so thick from recoats that it was falling off

under its own weight,” says Howard. “But I also knew that while I had some knowledge of what it takes to take care of a ship, I wasn't a coatings expert. So I started looking for one.”

He found one in Tim Greene, a Greensboro, N.C.-based NACE Certified Coatings Inspector working for engineering firm S&ME, Inc., of

“THIS IS A NATIONAL HISTORIC LANDMARK AND IT'S OUR MISSION TO PRESERVE IT. SO WE PLANNED TO DO IT THE RIGHT WAY.”

Raleigh, N.C. After consulting with Howard, Greene spent two weeks both aboard the Yorktown and at the water line in a jonboat, inspecting its massive hull. He then enlisted the help of Rick Hiller, a Sherwin-Williams coatings specification specialist with whom he had had a past professional association.

Hiller reviewed the wealth of information Greene had gathered on the ship and came to a conclusion.

“Tim asked me what I would specify if we were just going to topcoat it again,” recalls Hiller. “I said, ‘Any of my competitors' products you want.’ We both knew that the only



Above (top), water collected in a variety of areas aboard the Yorktown, leading to corrosion. Rust streaking was also a common occurrence on vertical surfaces.

approach that would last and that was truly good for the ship would be to strip it down to bare metal.”

Greene, too, had no doubt that another pressure-wash-and-topcoat approach was doomed for failure.

“I told Bob it would last three months before exhibiting continuous coating breakdown due to the underlying coating system,” says Greene.

Howard didn’t need much selling to be convinced. But as an “Enterprise Agency” owned by the state of South Carolina, Patriots Point is supported largely by private donations and the revenues it generates, without the benefit of state aid. Fundraising would have to kick up a notch, but the cause was a righteous one.

“This is a National Historic Landmark and its our mission to preserve it,” says Howard. “So we planned to do it the right way.”

SURFACE-TOLERANT SPEC

Greene, Hiller and Sherwin-Williams Industrial & Marine representative Tom Cardwell developed coatings systems that would be surface-tolerant enough to provide protection in inaccessible areas of the ship where surface preparation would be marginal. The coatings system selected would also have to be versatile enough to be used not only on the steel substrate, but in areas where galvanized, aluminum and other substrates were found. The system ultimately selected was a Sherwin-Williams system consisting of a prime coat of organic zinc at 3.5-5.0 mils dft; an intermediate coat of Macropoxy 646 at 5-10 mils dft; and a topcoat of High Solids Polyurethane at 3-4 mils dft.

“The process of writing the specification regarding containment, surface preparation and application was unique,” says Greene. “The



Above, Tim Greene studies a schematic showing parts of the Yorktown that are scheduled for painting.



Various piping flanges and other hardware along the flanks of the Yorktown posed challenges for painters until the decision was made to remove the metal that didn’t contribute to the ship’s “historic authenticity.”



From left to right are: Randy Wilkes, Phillips Industrial Services Project Superintendent; Tim Greene, S&ME NACE-certified Coatings Inspector; Tom Cardwell, Sherwin-Williams Industrial & Marine Representative; Michael Pilley, Phillips Industrial Services Executive Vice President; Rick Hiller, Sherwin-Williams Corrosion Specification Specialist; and Brian Throneburg, S&ME Senior Engineering Technician

spec was about 80 percent written and we called a meeting for anyone who was taking part in the bidding. We asked them if there was anything in the spec they wanted to see changed. We wanted to make sure we were developing a spec that was contractor-friendly and that would expedite the work.”

The contractor submitting the low bid was Phillips Industrial Services Corporation, a versatile Charleston-based firm with SSPC, QP1, QP2 and QP3 certification.

So the team was complete — owner, engineer, supplier, contractor. And to a player, it soon became clear that the bottom line would not be the sole measure of success on the project.

“It became a matter of doing what’s right for the ship, doing something that would see it through the next 20 to 25 years,” says Hiller. “And everyone was on board for that.”

CUTTING METAL

Before the five-phase, five-year application plan could begin, Howard was faced with some decisions. Various piping, hardware, flanges and other metal pieces protrude from the flanks of the Yorktown. But they’re difficult to paint and often the source of rust streaking due to the difficulty of surface prep and the greater likelihood of pinholing in those areas.

Howard determined that any such metal on the port side — the side not visible to tourists boarding the ship — that didn’t contribute to the authenticity of the ship could be removed by ship personnel prior to the contractor’s arrival, thus solving the problems associated with coating the irregular pieces. Since the starboard side was

more visible to the public, he shifted the standard, allowing less such metal to be removed, but still enough to eliminate many potential sources of rust streaking.

“If it wasn’t historically meaningful on the port side, we cut it off,” says Howard. “There are some purists who might take issue with that, but again, we had to take a long-term view of what was best for the ship.”

Greene took the plan a step further, looking for smaller surface irregularities, such as weld burs or areas in which corrosion had caused metal loss. These were prime targets for removal and in some cases, he specified automotive-type body filler to smooth the surfaces. Pinholes in weld seams — a single one of which could cause a 6-inch rust streak — would be caulked.

“We have to find these spots early,” says Greene. “Otherwise Mother Nature is going to show them to us.”

Greene’s survey paid particular attention to how the ship shed rainwater, and he found many areas in which it was contained and pooled on the steel. Such retention led to corrosion in these areas, so he came up with new solutions.

“ALL THE WATER’S GOT TO GO SOMEWHERE. WE JUST HAVE TO MAKE SURE IT RUNS OFF THE SHIP.”

“This coating system was made for coastal conditions, not immersion, so the ponding created areas of concern,” he says. “But in some of these areas, we simply drilled a hole in the bottom of the steel so the water — and the problem — went away.

“All the water’s got to go somewhere,” he adds. “We just have to make sure it runs off the ship.”

PAINTERS ABOARD

Phillips vice president Michael Pilley brought his six-painter team, headed by project superintendent Randy Wilkes, aboard in March, 2004, with a multi-phase plan to complete, in order, the mast, the island, the hangar deck and the hull, from starboard side to port, respectively. Since the original coatings contained lead and the ship would remain open to tourists throughout the project, containment would be crucial. Painters brought aboard a 40,000-cfm dust collector unit to create a “negative air” environment within the containment and turned to sandblasting, creating an SSPC-SP 10 near-white blast profile on horizontal surfaces, and blasting to

SSPC-SP 6 commercial blast on vertical surfaces.

As of early November 2004, painters had completed the mast and the starboard side of the island, and were at work on the port side of the island, which Wilkes estimates is moving "15 to 20 percent faster" than the starboard side due to the irregular metal that has been removed.

"Patriots Point has just been great to work with," says Pilley, who reports that despite severe weather earlier in the fall, the project remains on schedule. "This is the best team I've ever seen put together for a project, so it's really going well."

For Greene, the real measure of success will come in about 10 years. If maintenance then is a matter of spot cleaning, brushing and rolling, he'll know he did his job well.

"The intended life of this system is 20 to 25 years, and I think we can get it because this project has always been about the Yorktown," says Greene. "It's not about Phillips Industrial, it's not about S&ME, it's not about Sherwin-Williams. It's been about what's right for the ship." ▣



Containment was crucial aboard the USS Yorktown, since the ship was open to tourists while blasting and painting were under way.

Case Study #3 on alternatives for removing chemically resistant coatings. Brought to you by Dumond Chemicals.

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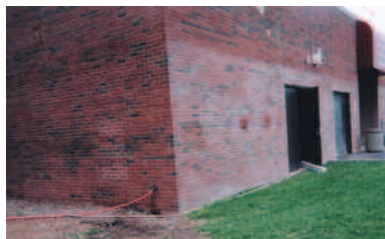
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School has stated that the Company did approve of the surface thus the product was applied.

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