One Better

Lakehead Painting fine-tunes unique gas sphere recoat procedure

AT A GLANCE

- Gas sphere "shrink-wrapped" in polyurea system in part to preserve existing insulation.
- This tank, completed in 2005, was second to occur on the grounds. First was refinished with a similar system in 2004.

When Lakehead Painting took on the tricky task of refinishing one of six spherical gas tanks owned by BP in Superior, Wis., this past summer, the contractor's challenge went beyond getting the job done right.

Lakehead, the versatile Superior-based firm that has notched successes in industrial and commercial projects throughout the Midwest for more than 35 years, had already completed a BP-owned sphere in 2004 with an innovative Sherwin-Williams Envirolastic AR 425 polyurea system. This time around, they wanted to match their previous success and improve the process.

"Our greatest teacher is experience," says Bob Johnson, Sherwin-Williams Director of Control Tech Marketing. "We — inspectors, suppliers, contractor, safety personnel — met daily with BP's facility manager Mike Johnson to review what we had accomplished, what went right, what went wrong, and what we could do to improve our performance going forward. This style of cooperation really helped us be so remarkably successful on the project."

TEAMWORK KEY IN 2004

Success on the first sphere project in 2004 depended on cohesive teamwork, especially given that the project was "out-of-the-box" on several counts. The steel spheres, built in 1970, had last seen exterior coating in the form of a vinyl system applied to a 3-to-6-inch layer of foam that insulated the tank. But age, weather, the tank's tendency to sweat, and pressure changes inside the tank had broken down the coating and dictated that a similar system would

be doomed to a short service life. Furthermore, a conventional coating system would have necessitated full removal of the existing foam insulation, which exhibited some water damage but was in large part still functional.

"We were looking for a system that would allow us to repair the foam where necessary and apply over the top of it," says Gene Rands, Lakehead's Director of Specialty Coatings. "The structural steel beneath it was in good shape."

So in conjunction with Sherwin-Williams personnel, Rands developed and proposed a system to BP that would in effect shrink-wrap the sphere.

"We weren't going to adhere to the tank, and it took a while to convince ownership that a system that wasn't adhering to anything would work," says Rands. "But we couldn't let this project go forward by applying a system that we knew would eventually fail. We were convinced the polyurea would do the job."

After determining that the Sherwin-Williams system would provide rapid return to service, low permeability, long-term durability and an aesthetically appealing finish, the refinish of the first sphere got under way with the erection of engineered scaffolding in June, 2004. Water-damaged foam was removed and replaced — an estimated 20 percent of the existing foam had shown some damage.

An impermeable butyl coating was applied by rollers at 50 mils directly onto the repaired foam insulation. After a 10-day cure, the tank was washed and rinsed into special containment constructed at ground level below the tank. These fluids were then pumped into a waiting tank truck for proper disposal.

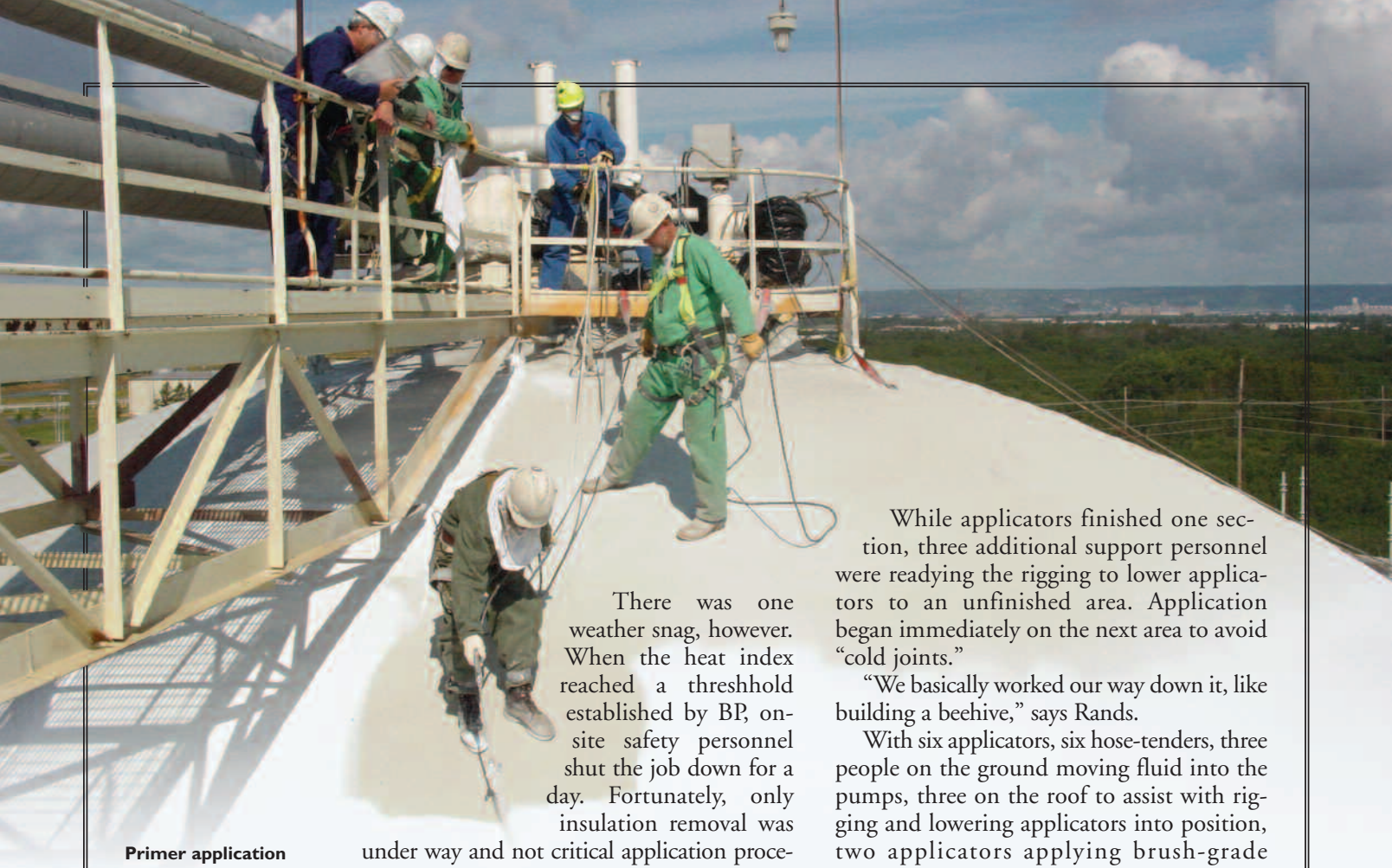
Next up was the first of four work-intensive days for everyone on-site. Day one started with the spray application of 4-5 mils of Sherwin-Williams Corobond HS, which was broadcast with sand to extend the recoat window and provide an anchor for the polyurea. The polyurea was then spray applied by six applicators at 80-100 mils on day two. Day three saw the airless spray application of one coat of SherCryl Ultra White acrylic at 2.5-4.0 mils dry — a process that was hampered by intermittent rain showers that blew in off nearby Lake Superior — and on day four application was completed with a 1-2 mil coat of SherClear acrylic clear coat.

By mid-September, the first gas sphere was finished.

SECOND SPHERE

So what went better in 2005? Certainly, the rain-free weather and the more conducive ambient conditions contributed to the success of the project. By pushing the project into July and August, Lakehead applicators were able to avoid higher dewpoints that had caused an issue with acrylic application in 2004. (Rands is considering a Sherwin-Williams moisture-cure topcoat on the polyurea when they take on another sphere in 2006 in order to completely eliminate the challenges caused by higher dewpoints).

A team led by Lakehead Painting personnel managed logistics in the application of an innovative Sherwin-Williams polyurea system (left) to one of six gas spheres (below) owned by BP Canada in Superior, Wis., last summer. As is typical of BP projects, safety was made top of mind for all subcontractors present (above).



Primer application (above) occurred in a single day in order to allow consistent cure times.

There was one weather snag, however. When the heat index reached a threshhold established by BP, on-site safety personnel shut the job down for a day. Fortunately, only insulation removal was under way and not critical application procedures that would have been adversely affected by a shutdown.

But weather during the four application days allowed the team to work sunup to sundown.

"We worked long days but we're used to long days in the summer," says Rands. "Once we got going, everybody was pretty psyched up to get at it."

SPHERE SECTIONS

After insulation repair and application of the same butyl coating and Corobond HS primer used in 2004 was complete, Lakehead, Sherwin-Williams and BP personnel collaborated in sectioning the sphere into defined application areas. By calculating the volume of polyurea necessary to achieve the 80-100-mil dft specified over the given measured area, inspectors determined actual millage by monitoring the volume of polyurea with data recorders mounted to pumps at ground level.

"We sprayed lighter and moved around more this time," says Rands. "The main thing is to keep everything even so you get the right amount of tension and the product stays there. This stuff hangs pretty well."

While applicators finished one section, three additional support personnel were readying the rigging to lower applicators to an unfinished area. Application began immediately on the next area to avoid "cold joints."

"We basically worked our way down it, like building a beehive," says Rands.

With six applicators, six hose-tenders, three people on the ground moving fluid into the pumps, three on the roof to assist with rigging and lowering applicators into position, two applicators applying brush-grade polyurea in touch-up roles, two supervisors and one additional utility person on the ground, Rands committed 23 people to the project during application. Additionally, BP committed six inspectors — assigning one to each of the six applicators — to the project during application.

Acrylic application was less complicated in 2005 because of two factors: one, testing conducted by Sherwin-Williams determined that they actually had a longer recoat window than the 16 hours they were bound by in 2004. And two, a dye was added to the clear coat so applicators could determine exactly what was finished and what still needed painting during the final application day.

What didn't change from 2004 to 2005 was BP's commitment to a safe project that kept the focus on long-term system performance. Daily meetings — much of which were devoted to safety matters — kept all present up to speed.

"This was typical of a BP project," says Rands. "They make a point of making sure everyone goes home in the same health they came to work in. Between them and Sherwin-Williams, we really had some pretty darn good companies to work with."