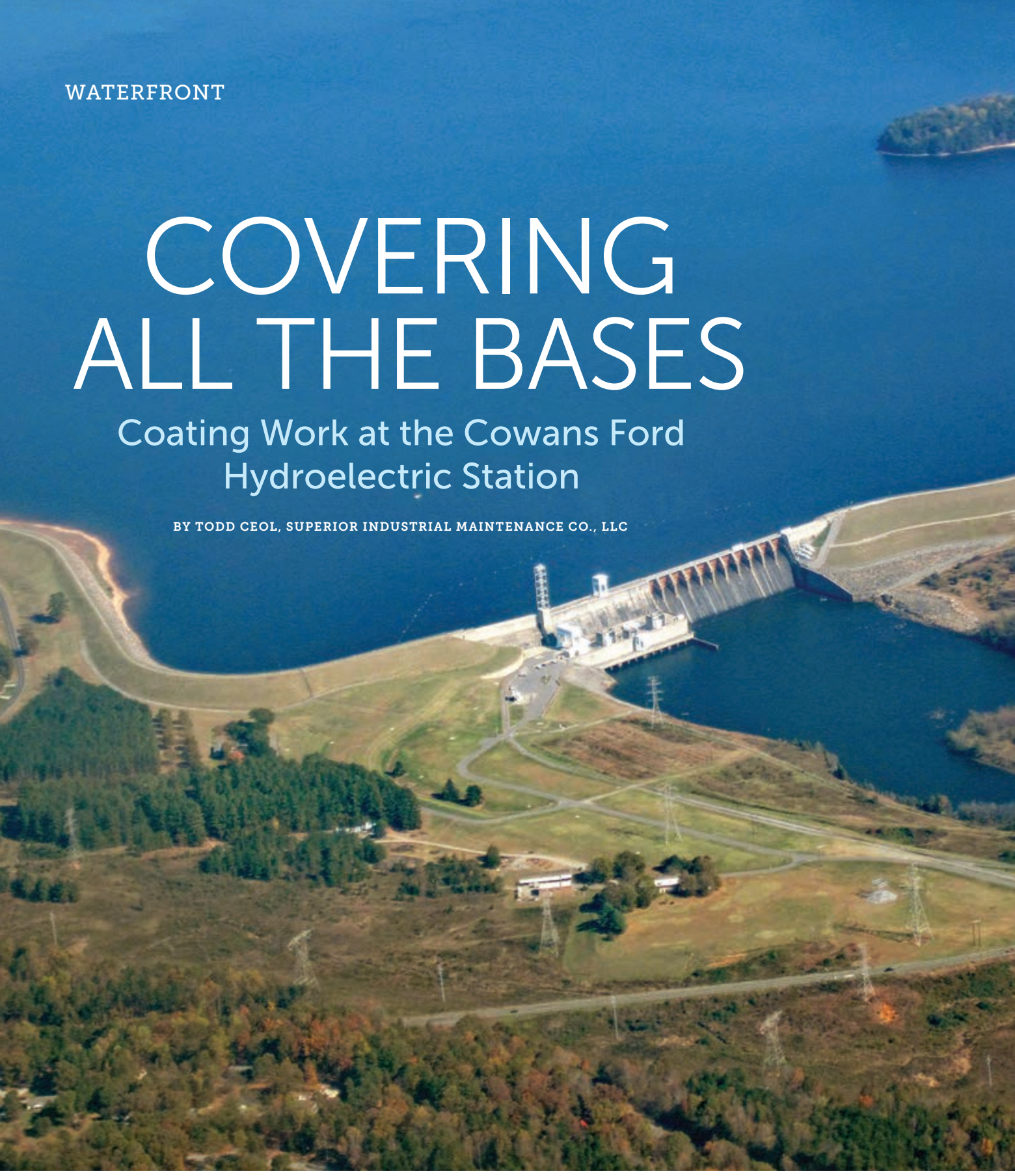
COVERING ALL THE BASES

Coating Work at the Cowans Ford Hydroelectric Station

BY TODD CEOL, SUPERIOR INDUSTRIAL MAINTENANCE CO., LLC



Coating projects range in size and scope, and while even the smallest projects require care and attention to detail, the stakes tend to rise as the scale of a project increases. Such was the case when work was needed at the Cowans Ford Hydroelectric Station in North Carolina ***(Fig. 1)***, the largest conventional hydroelectric plant owned by one southeastern U.S.-based energy provider. At peak demand, the plant is reportedly capable of producing power for roughly 280,000 local homes, so keeping it well maintained and running efficiently is clearly of critical importance.

A multi-year coating rehabilitation project was recently completed at the plant, which caused the selected coating contractor to get creative with its means and methods of completing the required work. This article details how the contractors utilized cranes, barges, an onsite layaway building and a climate-controlled paint shop – all while communicating with the facility owner, multiple subcontractors and third-party inspectors and adhering to stringent environmental guidelines – to finish the job.

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FIG. 1: At peak demand, the Cowans Ford Hydroelectric Station can produce power for approximately 280,000 households.

FIG. 2: **Intake pieces were disassembled before being transported by crane to an onsite building for repairs, blasting and coating.**

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Scope of Work

The project was an open bid to select approved contractors for the work on the facility owner's system. The overall scope of work included the refurbishing of 11 tainter gates, 12 intake gates, two sets of stop logs, six tailrace gates, five miscellaneous cranes and other associated items at the plant.

The contract was awarded in a competitive bid situation, though the contractor had completed blasting and painting projects in the past for the facility owner. This project had a large mechanical aspect to it and the contractor's in-house mechanical crews were able to make the bid more competitive by self-performing the mechanical portion of the work.

Project Sequencing

The first sequence of the project involved civil work, the pouring of a concrete pad and the erection a 42-foot-wide, 17-foot-tall, 140-foot-long building in a laydown area dedicated by the facility owner. The building was equipped with dehumidification and climate control equipment, dust collectors, air compressors and all of the necessary blasting equipment. The coating of the larger components included in the project was completed at this onsite building.

Next, the contractor began removing the pieces from the tailrace slots

FIG. 3: **Crane picks were coordinated with a crane subcontractor to get the intake pieces to the onsite building.**

and intake slots ***(Fig. 2)***. It is important to keep in mind that each tailrace gate consisted of one piece, but each intake gate had to be disassembled to form three separate pieces. The stop log pieces were also individual pieces, with two sets of stop logs consisting of eight total pieces.

The contractor teamed up with a crane subcontractor for all of the project's crane and shipping needs, including transport of these items to the onsite building ***(Fig. 3)*** and the contractor's blasting and coating shop. Use of the crane proved to be one of the biggest challenges on the project, as each crane pick had to be scheduled in advance and include a facility owner-approved crane safety plan. It took multiple trailers to get the crane to the site, which created congestion onsite during transport. Weather conditions were continuously monitored, and high wind advisories caused the rescheduling of several crane picks throughout the project, as well. However, due to pre-planning and communication between the contractor, the crane subcontractor and the facility owner, these challenges were overcome and the process went smoothly and without incident from the first pick to the last.

After the pieces were placed in the onsite building, the contractor blasted the steel to an SSPC-SP 10/NACE No. 2 Near White Metal Blast to remove the existing lead paint. The

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FIG. 4: Intake and tailrace pieces received two stripe coats and three full coats of a polyamide epoxy coating.

pieces were then inspected by the facility owner to identify any needed repairs; after these were performed, the items were re-blasted and coated with two stripe coats and three full coats of polyamide epoxy at 4–6 mils' DFT per coat ***(Fig. 4)***.

Per the specifications, the blasting and coating process had certain hold points that had to be adhered to before moving on to the next step. The facility owner had a third-party inspector who effectively worked with the contractor's NACE Level II-certified inspector to identify any quality control issues and limit project downtime. The coating was holiday tested and any defective areas were repaired. Caulking was completed on any back-to-back angle

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areas per the facility owner's specifications. After final inspection, the items were set in a laydown area before being reinstalled back in the water ***(Fig. 5)***, and additional pieces were removed to bring back to the onsite building.

During this same time, the contractor took the smaller pieces approximately 45 minutes away to its SSPC-QP 3-certified shop with a climate-controlled blast and paint booth, where blasting and coating was completed. These smaller pieces only amounted to about 10% of the total project; the contractor had hoped to complete more pieces in the shop, but some of the larger project components would not fit in the booth.

After work on the intake, tailrace and stop log pieces commenced, the contractor started work on the tainter gates – which were kept in place – with a completely different crew and separate equipment. All of the equipment to complete the work on the tainter gates had to be set on barges, which were supplied by the facility owner ***(Fig. 6, next page)***.

Environmental hazards were a significant part of the complexity of this job, based on the existing lead paint involved and the work taking place so close to the water, requiring scaffolding and containment by a subcontractor ***(Fig. 7, next page)***. The contactor blasted and coated each tainter gate to the same specifications,

FIG. 5: Finished intake pieces were moved to a laydown area before being placed back in the water.

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FIG. 6: Blasting and coating equipment for the tainter gates was placed on barges supplied by the facility owner.

though the downstream side of each gate received one coat of an epoxy at 4–6 mils DFT and one coat of an acrylic polyurethane finish coat applied at 3–5 mils DFT ***(Fig. 8)***.

Blasting and coating work on each gate was performed in three quadrants to minimize the risk of flash rusting. Even though dehumidification equipment was running inside of the containment, the crews still battled environmental conditions, especially when it rained.

As with the shop work, after each blast, the facility owner inspected the blast and the contractor performed minor repairs. After completion of the first tainter gate, the facility owner designated which gate would be completed next and that is how it went completing all 11 gates – one at a time.

The cranes were among the last items painted toward the end of the job, and these components were simply pressure washed and repainted.

In total, approximately 197,000 square feet of surfaces were coated, with more than 5,500 gallons of paint used. The contractor containerized all the blasting media during the job, and the facility owner tested the waste to confirm that it was hazardous and disposed of it properly. At the end of the job, the contractor demobilized and left the onsite building for the owner for storage instead of disassembling it.

FIG. 7: Containment and scaffolding structures were constructed around tainter gates during the project.

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FIG. 8: **The downstream sides of the tainter gates received an additional coating of epoxy and an acrylic polyurethane finish coat.**

PHOTOS: COURTESY OF THE AUTHOR

Conclusion

This was the largest single lump-sum contract the contractor has been awarded, and projects this large have to be managed correctly – or the job can go south in a hurry.

Constant communication was paramount on a project of this size and complexity. With so many moving parts, weekly schedule updates and ongoing communication with the field on safety, quality control and production updates was essential. Having an experienced superintendent and full-time safety manager onsite dealing with daily issues alleviated a host of concerns. In the end, it might be cliché, but being prepared is half the victory – and it was for this project. JPCL

ABOUT THE AUTHOR

Todd Ceol is a Senior Project Manager and co-owner of Superior Industrial Maintenance Co., LLC, an industrial coatings and linings contractor based in Concord, North Carolina. He has more than 20 years of project management experience with the company, is a NACE Level II-certified Coating Inspector and completed the OSHA Construction Industry 10-hour training course.