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FEATURED PROJECT

Composite Tank Repair

ACID AND CAUSTIC TANKS

CUSTOMER
Power Generation Facility

LOCATION
Beulah, North Dakota

APPLICATION TEAM
A&G Industrial

DATE OF APPLICATION
June 2017

SYSTEM
Acid-Resistant Carbon Fiber Lining

SUBSTRATE
Concrete

PROBLEM

A power generation facility uses 95% sulfuric acid in their water purification process. Existing overflow tanks for the sulfuric acid were made of concrete with acid brick liners that only partially extended up the wall of the tanks. Due to this, a large overflow event caused through-wall failures in the unprotected sections of the concrete walls of the overflow tanks. A crack-resistant and highly chemical-resistant coating system was required to ensure the long-term protection of the concrete tanks in strong acid service.

Figure 1 Tank After Application of FRP 200 Sealer to Bottom Half

SOLUTION

The plant decided to utilize a high-strength, carbon fiber reinforced epoxy novolac coating system from Advanced FRP Systems to repair the degraded tank walls. Due to the acid brick liner, the tanks had a complicated geometry with many corners and edges.

STEPS:

1. Any failed coating was removed and the concrete was grit blasted.
2. FRP 200 Sealer was applied at 3 - 5 mils to increase adhesion and reduce pinholes.
3. EM-110 was used to fill in any deep pitting
4. An adhesive coat, FRP 110 HT, was applied to the walls then high-strength carbon fiber reinforcement was hung vertically, conforming to the hard edges of the acid brick and installed in two layers to provide a crack-resistant coating without any pinholes or voids.
5. A novolac epoxy, HP-400 Novo, was installed in two coats at 40 mils DFT.
6. Coatings were allowed to cure for 48 hours before return to service.

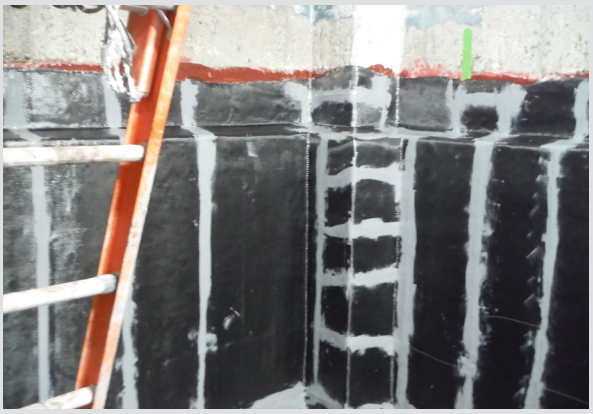

Figure 2 Carbon Fiber Reinforcement Applied over Edges and Corners

Both tank repairs were completed on time and on budget and the tanks have been in service for over 3 years with no issues.

BENEFITS

- Carbon fiber does not crack when the underlying concrete cracks
- Maintenance-free solution provides outstanding acid resistance.
- A zero-VOC, solvent-free technology was used for the entire application
- The coating will provide a 20-year, maintenance-free service life for the tank owner.

Figure 3 After Application of Second Coat of HP-400 Novo Topcoat