The Synergies of Single-Sourcing Tanks and Equipment, Complete with Linings

Purchasing a tank and liner from a one-stop shop can save power companies on purchase price, turnaround time, and unplanned downtime costs.

As the use of fully lined, corrosion-resistant storage or process tanks and piping with rubber lining continues to expand in the power generation sector, many who purchase these products or have them repaired are beginning to see significant benefits in single-sourcing them. These include lined tank applications utilized with wet FGD scrubber systems, water filtration, acid tanks, slurry pipes, ball mils and associated components.

For many power companies, purchasing lined tanks and equipment from two vendors – the tank fabricator and a lining specialist - is an expensive and time-consuming process that requires additional planning, coordination, transportation, and scheduling as well as frequent quality issues. Sourcing them from two separate vendors usually adds substantial cost and time.

On the other hand, companies that source custom, fully lined tanks and other equipment requirements from a single source can save on the purchase price and speed turn around while assuring that their tanks and liners are designed and built to maintain integrity.

A combination of specialties

To be sure, the fabrication of tanks or other equipment and the subsequent application of linings are unique specialties, which is why many power companies contract with two

separate suppliers.

For tanks that are constructed at the vendors' plant (rather than in the field), fabrication entails sophisticated processes and equipment. Fabrication facilities must include extensive lifting capabilities and equipment such as heavy-duty break presses, automated submerged-arc welding, CNC plasma burning machines and specialized fabrication equipment.

The formulation and application of tank linings is also a highly sophisticated business that involves materials such as natural rubber, chlorobutyl rubber, epoxies, vinyl esters, polyesters, and specialty coatings. In some cases composite fiberglass lining systems are required utilizing a resin base, fiberglass mesh is then applied by hand in conjunction with an abrasion resistant topcoat. The installation of rubber linings to contain highly corrosive acids may require the use of high pressure steam vulcanizers to cure the lining.

Plus, preparation work such as sandblasting is required to prepare the applicable surface for lining. In addition, spark testing is required to ensure there are no pinholes or other breaches in the membrane allowing corrosive chemicals to undermine the lining and eventually cause a failure.

Avoiding construction issues

When power companies source lined tanks and components from two separate suppliers, they are likely to experience difficulties that can be avoided when a fully-lined tank is sourced from a single supplier.

Single-sourcing of a lined tank means one point of contact. This can be advantageous when construction issues need to be addressed. Dealing with two suppliers may lead to construction disagreements or the suppliers finding fault with one another, which usually places the buyer in the middle of disputed issues.

"A lot of companies can build tanks, but not many will also put the rubber liner in them," Says Edward Rafacz, P.E., Utilities Engineer at Purdue Energy (West Lafayette,

IN). "That's one of the reasons we contracted with Moon Fabricating Corp. to build three tanks for our power plant's boiler operations. All three required a chlorobutyl rubber lining. While we could have gone to two suppliers for the tanks and linings, it was much more efficient to source the completed tanks from a single supplier who also produced the CAD drawings for each tank, which saved us the time and effort."

Located in Kokomo, IN, Moon Fabrication (www.moontanks.com) constructs tanks weighing up to 60,000 pounds from carbon steel, stainless steel, and specialty alloys, and installs a wide variety of protective linings including chemical and abrasion resistant rubber, Koroseal PVC liners, Carboline, Herisite and many other specialty coatings. Applications include power generation and other industrial applications at plants throughout the U.S.

Rafacz's operation, Purdue's Wade Utility Plant is a heat and power cogen system that utilizes steam from boilers to generate electricity approximately 40MW of electric power as well as heat to the 2,468-acre campus. "The water we use in our boilers must be very pure," Rafacz explains. "So we demineralize it through a mixed-bed demineralizer filter train. The demineralizer regeneration process produces very caustic water, so the protection of the rubber tank lining is critical to preventing tank corrosion."

In addition to this and a "mixing tank," Moon provided the Purdue plant with two rubber-lined water storage tanks. All

three tanks are 12 feet in diameter and 35 feet in height, each with a rating of approximately 30,000 gallons.

Scrubber solutions

Another popular application where single-sourcing tanks and linings provides synergies is emission scrubbers, generally known as FGDs (flue-gas desulphurization systems) used by coal-fired power plants.

"There are several different designs and a couple of different technologies, including wet FGD scrubber system, as well the as associated ball mills, piping, tanks and waste water treatment equipment" explains Greg Veach, president of Moon Fabricating. "The dry systems use silos and sorbent injection. The dry FGD scrubber systems don't require a lot of lining. However, these are large vessels that involve a great deal of fabrication expertise."

Veach explains that wet FGD systems, which utilize a caustic limestone slurry, require rubber-lined tanks or tanks that are lined with fiberglass composite linings to maintain the limestone in solution.

"These slurry-mixing tanks agitate the slurry and then use rubber-lined pipes to transport the slurry to the scrubber modules," Veach says. "Our firm provides both the tanks and the pipe for this type of application."

Savings on turnaround and freight

When a company commissions the fabrication of a tank in one location and application of a liner at a plant perhaps hundreds of miles away, there will obviously be added freight costs involved and most likely additional delivery time.

Having a single-source supplier provide substantial savings on both costs, and also saves time from a purchasing perspective, on inspections, engineering, and communication of specifications or drawings.

Efficient repair services

The ability to single-source tank and lining repairs can be equally important to power generation companies.

"When tank or vessel inspections and repairs are required, having a single supplier that can handle everything will make the job go smoothly and usually save on costs," Veach advises. "And completing work within planned shutdown windows is critical to getting plants back online on schedule."

In the summer of 2015 Zimmer Generation Station in Moscow, Ohio was getting ready for a scheduled fall outage. Among the equipment to be inspected and repaired were six filtration vessels used for polishing condensate for a 1,300 MW coal-fired generation unit.

"This is a super-critical, once-through generation unit, so it was vital to get inspections done on a timely and reliable basis," says Timothy Nartker, chemistry supervisor at Zimmer station. "Since the vessels were first installed in the 1990s, we anticipated that there could be damage to some of the linings, which were to be inspected and repaired as needed."

Nartker says a corrosion engineer at AEP, co-owner of the plant (along with Dayton Power and Light and operator Dynergy) recommended Moon Fabricating Corp. to handle the project.

"They went through the inspection process and determined that extensive repairs would be required for all six units," Nartker explains. "The linings were hard and had begun cracking, as well as other damage. Moon assessed the requirements and handled the entire repair project. Approximately three weeks later we were up and running again."

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