

Case history

A better storage tank system

An engineering company finds a way to improve its storage tank installation process.

Stanco Projects, a division of Semco Systems Ltd., Richmond, British Columbia, designs, manufactures, and installs a wide range of turnkey bulk chemical handling systems for power, mining, and petrochemical facilities around the world. The company frequently installs chemical slurry makeup systems for produced water treatment at oil and gas facilities in northern Canada. Each system includes a large-diameter steel storage tank and various ancillary equipment. Since many of the oil and gas facilities are located in remote areas with limited access, shipping the tank and other equipment to a facility and assembling a system on-site is time-consuming and costly. Several years ago, the company needed to find a way to decrease the system installation time and costs, so it worked with a tank supplier to improve the process.

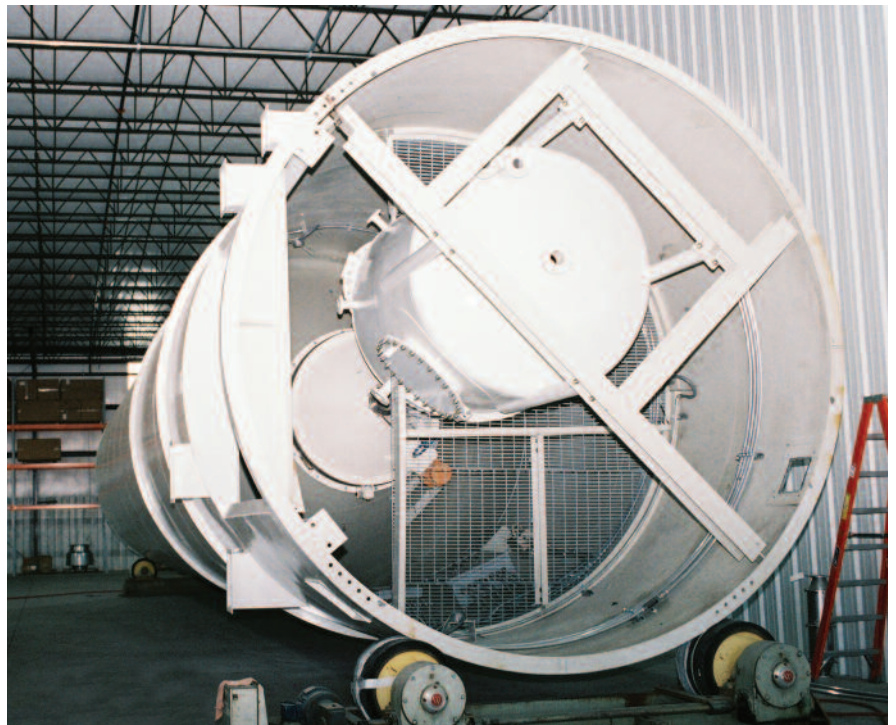
topped by a dust collector and a lower skirted section that holds ancillary equipment, including a slide gate, screw feeder, slurry mixer, slurry pump, and other controls and components. For many of the company's projects, the tank can be up to 14 feet in diameter and up to 100 feet tall.

In the past, the company typically purchased shop-welded steel tanks from one supplier and the other equipment from other suppliers and shipped these various system components to the installation site. An on-site assembly crew erected the tank by crane and installed the ancillary equipment inside the tank's lower skirt section. However, this was an expensive and time-consuming way to do things, says Dave Clarke, Stanco vice president of marketing, and it generally took about 4 weeks to complete.

System installation gets expensive

A typical system consists of a storage tank with an upper storage section

“It's expensive to transport equipment to remote locations,” says Clarke. “The farther away and more isolated a



System components are installed inside a tank before the tank is transported to a job site.

job site is, the higher the freight costs. Also, the cost of getting a crew to and from the site is expensive, and the working conditions can be difficult because of the weather. Then there's the issue of overtime: A crew traveling fifteen hundred miles to a job site doesn't want to work a standard five-day, forty-hour week. They want to work straight through and get the job done as fast as possible so they can get back home to their families."

The company tried to reduce the cost of some projects by using local contractors to install the systems, but found that when it could find qualified contractors in such remote locations, they usually cost more. As the company began installing more systems at facilities in increasingly remote locations, it realized that to stay competitive it needed to decrease the number of workers required to install a system and the amount of time the workers spent at a job site.

Long-time supplier provides solution

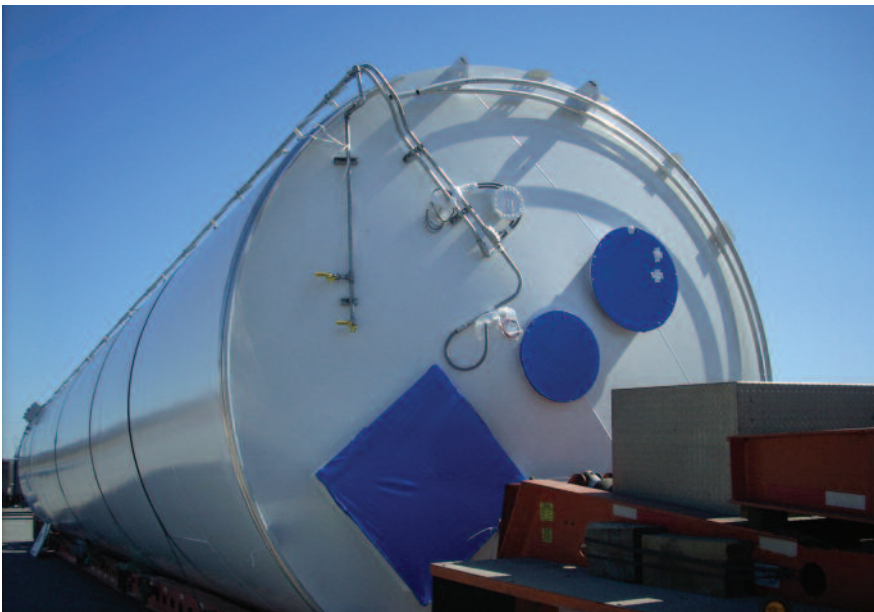
Since 1975, one of the engineering company's suppliers has been providing both bolted and welded steel tanks for the company's various projects. Columbian TecTank, a division of

CST Industries Inc., Kansas City, Kans., manufactures storage tanks for companies in the minerals, plastics, chemicals, wood, grain, food, and other dry bulk solids industries. In early 2000, with Stanco's installation costs continuing to rise, the company decided to approach the tank supplier with an idea about improving the slurry system installation process.

"We asked them if they could install the mechanical equipment inside a tank before shipping the tank to our installation site," says Clarke. "They agreed to try this, and after discussions to determine the logistics, we had the equipment shipped to their welded steel tank production plant in Winchester, Tennessee, and they pre-assembled the first tank in about two weeks. This tank arrived at our job site with about seventy percent of the equipment already installed, which significantly reduced our installation costs and on-site time."

The supplier continued to pre-assemble the systems for the engineering company, producing what it calls CIT systems, or component installed tank systems. However, it soon became clear that "our projects were impacting their plant's production efficiency," says Clarke.

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A component installed tank system typically arrives at a job site with more than 70 percent of the required equipment already installed.



Two cranes work in unison to install a tank, lifting and guiding the tank into place and standing it upright on a concrete base.

The Winchester plant was designed for manufacturing welded steel tanks as quickly and economically as possible, and pre-assembling the systems in the tanks interfered with that goal. So around 2006, the tank supplier built a second plant adjacent to the original Winchester plant that's dedicated to making the CIT systems for the engineering company and others.

The component installed tank systems

The CIT systems use shop-welded carbon steel, stainless steel, or aluminum tanks that can vary in diameter and height, depending on a customer's requirements. The systems can be used with such dry bulk solids as hydrated and quick lime, soda ash, magnesium oxide, activated carbon, alum, calcium sulphate, sodium sulphate, cement, fly ash, gold ores, polymers, and plastic pellets. Stanco primarily uses CIT systems with carbon steel tanks for hydrated lime, magnesium oxide, and soda ash slurry systems, which account for about 40 percent of its projects.

The supplier installs various customer-supplied components in the tank, including electrical conduit, pumps and metering devices, bin activator and motor combinations, level



After the tank is secured to its base, the system's bin vent filter, level probes, and other exterior components are installed on the tank.

indicators, vibratory units, volumetric feeders, piping and valves, and others. Components that are installed outside the tank, such as bin vent filters, ladders, guard rails, and level probes, can't be attached to the tank during transport; however, the supplier runs the wires and conduit for those components so an installation crew can easily connect them on the job site.

"We can build just about any size tank and install the equipment required by the customer," says David Wheat, Columbian TecTank director of dry bulk sales. "A company sends us the equipment and controls along with engineering drawings and local construction code information, and our technicians and licensed electricians install and wire everything accordingly. When everything is completed, we load the entire system onto a truck for transport. All the company has to do after the system gets to the job site is stand it up, reconnect the external accessories and utilities, plug it in, and it's ready to go."

CIT systems improve installation process

The CIT systems have improved the engineering company's installation efficiency and decreased system installation costs and travel and over-

time expenses. "Since the CIT systems eliminate a lot of on-site work, it only takes us up to about one and a half weeks to install one, which is less than half the time of assembling everything at the job site," says Clarke. "This allows us to meet tight installation deadlines, and it also cuts the installation costs by about seventy-five percent, since we require fewer workers at the job site for less time. Overall, we've found the CIT systems to be a cost-effective and time-saving solution."

The CIT systems have also improved the quality of the systems that the company installs. "The equipment and controls are installed in the controlled environment of the supplier's plant rather than outside in the middle of subzero weather, so the assembly is done better," says Clarke. "And before we transport a CIT system to a job site, we thoroughly inspect it, and usually have our client inspect it as well, so they know exactly what they're getting before it arrives at their facility. If any problems or deficiencies are found, we correct them before transporting the tank. This reduces the installation and start-up time and ensures a quality installation." **PBE**

Note: Find more information on this topic in articles listed under "System or equipment design" and "Storage" in *Powder and Bulk Engineering's* comprehensive Article Index in the December 2008 issue and at *PBE's* Web site, www.powderbulk.com. You can also purchase copies of past *PBE* articles at www.powderbulk.com.

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