Asphalt Refinery Improves Distribution With New Railcar-Loading System

When CITGO Asphalt and Refining Co. purchased a 70-year-old Savannah, GA, refinery in 1993, the company bought into an outdated and non-compliant facility with operational problems. In particular, the plant's 18-spot railcar loading station was not only inefficient and in need of continuous repair, it was unsafe and its location impeded truck-loading operations.

"When we bought the refinery we identified a number of non-compliances and inefficiencies with the older bulk-loading system," says Mike Fajen, General Manager of the CITGO Asphalt refinery. "The system was similar to a top-to-bottom loading system which is used in lubricant distribution. The wooden components were rotting, the steelwork was rusted, and there were compliance issues with the Department of Transportation (DOT) and the Occupational Safety and Health Association (OSHA)."

According to Fajen, operators were cautioned when spotting railcars because of the limited room between the side of the tank car and the edge of the rack. A railroad track centerline warning sign on the rack read "No Room for Man on Side of Car," a violation of a DOT regulation that requires at least 9-ft. clearance between the side of the tank car and the edge of the rack. The drop-down walkway, originally designed for older, shorter and smaller rail cars, also violated OSHA regulations. On the new tank cars, the walkway sloped at a steep angle creating a risky walkway. This outdated bulk-loading system had already cost the refinery thousands of dollars in maintenance and repairs.

In view of these problems, CITGO's planning group concluded that the tank-car loading system presented too many regulatory violations and safety hazards to be viable. They considered three options: The refinery could pull out of the rail mode of transportation completely, rebuild the existing loading system to meet current requirements or construct a new and more efficient system.

"The company decided to make a commitment to remain in the railroad shipping business," recalls Fajen. "Then we had to address the alternatives of reconstructing or replacing the system." Considering its inefficient design and location, the group agreed to build a new railcar loading facility 300 ft. in front of the old rack and 750 ft. from the Savannah River. "The new location was closer to the pumps and tanks, and was physically separate from the truck loading docks," says Fajen. "Also, the relocation of the facility would allow us to continue limited operation from the old rail rack during the slower winter season while the new rack was being built."

CITGO's planning group considered placing the engineering and construction of the rack up for turnkey bid but decided to purchase a rack designed and manufactured by Carbis, Inc., of Florence, SC.

A two-phase construction project began in early 1998. The first phase was the construction of a six-car aluminum loading rack along with the supply infrastructure. Refinery operators and maintenance personnel at the CITGO plant collaborated with Carbis engineers on the design. The first phase of the new loading rack became operable May 1, 1998, and CITGO was ready to tear down its old rack.

The second phase was started after demolition and was completed in early 1999, as the peak asphalt season began. This phase consisted of an additional six-car loading rack extension to the first phase after the old rack was demolished. The new rack was the focal point of the distribution system with rails that split on either side at 30 ft. apart. The loading facility, according to Fajen, stretches the length of six rail cars. Each spot is on 56-ft. centers. Instead of the former 18-car rack, the 12-car design allowed for six cars on either side of the rack. In addition, the height of the drop-down walkway was raised and was flexible enough to adjust to various railcar positions. A canopy was added to protect workers from inclement weather. When the project was completed, it had cost $1.3 million.

"We recognized that the new rack would cost about the same or perhaps even less than a major modification or rebuilding of the existing rack," says Fajen. "We avoided some of logistical problems trying to repair an existing facility, and the new location and new modular design made construction easier. We used the old rack until the new rack was operable and that made a big difference."

Since the new loading system has been in operation, the benefit that's been easiest to track is the change in shipping volume, which rapidly doubled. "We believe the cost for the new rack was paid for in the first year of its inception through the returns on the volumes shipped," says Fajen says. More importantly, in 1999, its two rail suppliers, Norfolk Southern Corp. and CSX Corp., recognized the Savannah CITGO refinery for outstanding safety in rail car shipping.

The railcar loading system has operated without a single incident since the new Carbis rack was installed. Overall, says Fajen, it has provided a more efficient and safe process to his refinery's distribution system.

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