

There Will Be Foam

Closed-cell SPF improves the efficiency of treater tanks at a North Dakota oil field

By Juan Sagarbarria

Temperature consistency and energy consumption reduction is key in certain parts of oil processing. Prior to going into a storage tank, oil has to pass through a heat treatment process, which is facilitated by oil treaters. After the oil has been treated, it passes through valves and into storage tanks before it can be transported through a pipeline. This process involves burning propane to heat up the oil treaters to an average of 125°F. Such was the case of an oil field 18 miles south of the Canadian border, where negative temperatures are common during the winter, and high propane consumption became an issue for the operator, because the oil treaters were not being kept at the optimal temperature. The owner realized that the existing fiberglass insulation on these treaters and oil valves deteriorated after the first year of their installation.



Not only had the treaters' propane consumption remained high, but also the fiberglass became wet over time, which permitted rodents to break through the batt insulation, cancel all R-value and, disdainfully, generate a rodent issue. With a high propane consumption, no air and vapor barrier, inefficient insulation, and a rodent problem to deal with, the oil field owner opted for a solution that would take care of his problems: spray polyurethane foam insulation.

These steel oil treaters are 22-feet tall and 4-feet in diameter, with 10 by 12 valve houses attached. After the processing cycle, the treater pumps the oil through the valves located in the treater house and then into storage tanks.

The owner contracted Dragon Spray Systems (DSS) for the project, which consisted of applying SPF to three oil treaters and their respective valve houses, which contained the pipelines leading to the storage tanks.

DSS' Adrian Zettell said that he proposed an SPF application to the owners because he believed it would provide a monolithic air and vapor barrier and a long-term solution that inefficient batt insulation could never match.

"Fiberglass insulation should be outlawed," Zettell said. "It's useless, it's wet, mice love the stuff, and it doesn't seal up anything."

According to Zettell in order to properly insulate the treaters, the crew only needed to insulate the bottom 15 feet of the treater.

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Top: the oil treater prior to the SPF application; **Left:** the interior of the valve houses were also foamed

“The remaining seven feet was dead space,” said Zettell. “The name of the game with this treaters is to maintain the desired temperature and we knew what was standard in order to accomplish it.”

The DSS crew used a boom lift and scaffolding to work around the treaters. Before the SPF application, the crew pressure-washed the treaters and the interior and exterior of the valve houses. Then, they wiped down the substrate with Prep-Wipe, an adhesion

solution made by Specialty Products, Inc (SPI) that left a clean surface for the foam to adhere.

The area where the oil field is located is frequently afflicted with high winds, so the crew wanted to avoid any overspray issues. Zettell noted that his crew was strategic about proceeding with the SPF project during a non-windy period with a sense of urgency. Crewmembers were outfitted with Tyvek suits and fresh air respirators for the duration of the project.

Then, the DSS crew applied 3.5 inches of Envelo-Seal, a 2 lb. closed-cell, ignition barrier rated spray polyurethane foam made by SPI, on the treaters and valve houses. According to Zettell, the crew applied a one-inch lift of foam on the treaters, waited for it to cure, and then applied the remaining 2.5 inches later. This was done to provide extra rigidity. For the valve houses, foam was applied on the interior and exterior to maintain the pipeline valves at an appropriate temperature.

Zettell and his crew decided to go one step further to ensure that the insulation doesn't succumb to high winds, so they applied an 80-mil black top coat of FMJ Ultra, a spray-on polyurea bedliner coating made by SPI, on top of the foam.

"We decided to use the FMJ ULTRA because of its extreme abrasion durability," said Zettell. "When there is 40-50 mile an hour winds coming in, the owners and oil workers won't have to worry about any of their treaters or tanks coming loose or blowing off."

The DSS crew had one rig on site equipped with SPI's LPG low-pressure proportioner, which was used for the SPF application, and a Gusmer FF 18/18 proportioner, which was used for the polyurea application. All materials were sprayed with a D7-G mechanical-purge spray gun. It took a day for the three-man DSS crew to complete the application.

Zettell noted that immediately after the application, the energy consumption had been reduced significantly.

"Before the application, each treater was using about 15 percent of the propane's tank's energy, and overnight the energy consumption went down to 4 percent," said Zettell. "The SPF and the polyurea

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One of the
treaters after SPF
was installed on it



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Left: the treater and valve house after the SPF and polyurea applications; **Right:** SPF and polyurea were applied only on the first 15 feet of the oil treater



maintained a 24-hour average of 4 percent consumption, which equated to more than two thirds of reduction in propane usage.”

Zettell said that sealing the treaters and their valve houses with SPF and creating thermal consistency and reducing energy consumption was a satisfying experience.

“It was a rewarding project to do because of the drastic change in performance,” said Zettell. “It was surprising how the results were almost immediate after we applied the SPF and the FMJ ULTRA. It was such a measurable difference that it was very impressive to see and the owners were very happy with results.”

Following the project’s success, the oil field owner has contacted DSS for another application involving six more oil treaters.

For more information on the North Dakota oil treater project and the equipment used in it, please visit www.dragonspraysystems.com and www.specialty-products.com. 