One of five extractor vessels is lifted from the truck to its foundation in the new phenosolvan unit at the Synfuels Plant. Each vessel measures about 73 feet long and 12 feet in diameter.

Two is better than one

Project enhances Synfuels Plant reliability

By Joan Dietz and Daryl Hill

Two is often better than one, and the Great Plains Synfuels Plant was built with this in mind. It has two "trains" that produce synthetic natural gas. In different instances, one can be taken off line for maintenance while the other continues producing synthetic natural gas. However, some critical parts of the gasification process don't have the benefit of this duplication. The phenosolvan unit of the plant was one such "single train" process; if it went down, so did the entire plant. That's no longer the case, thanks to a project with big benefits in reliability.

A second phenosolvan unit has been added at the Synfuels Plant near Beulah, ND. Plans for this second unit began after a vessel in the original phenosolvan unit began leaking in December 2007, shutting down the Synfuels Plant for five-and-a-half weeks. During that time, two cracks were found and repaired. The addition of the second unit will prevent other unscheduled plant outages from happening again.

Bob Fagerstrom, manager of the Synfuels Plants, said the new phenosolvan train equipment was released to the operations staff at the end of December 2009. "Since then commissioning activities have been taking place, and as of April 10, the unit was deemed fully operational."

Construction of the unit was completed under budget for about $48 million.

Following two years of design and engineering, construction of the new unit began last spring. "The new unit is built to operate just like the first phenosolvan unit," Fagerstrom said. The phenosolvan unit is used to extract phenol from the gas liquor stream. Gas liquor is primarily a water stream that comes from the gasifiers. The phenol is then sold as a co-product.

Now that the new phenosolvan unit is operational, Fagerstrom said plans are to run each unit continuously at 50-percent capacity. "That allows the existing equipment to operate closer to original design flow rates, and it ensures reliability for both units," he said.

Routine maintenance will be completed during scheduled outages for each unit on a regular basis. "When one unit is down for maintenance, the other will run at full capacity, so that full (natural gas) production rates can be maintained by the plant," Fagerstrom said. "When we only had the one phenosolvan unit we couldn't operate the plant if it was taken out of service."

The five extractor vessels in each phenosolvan unit are about 73 feet long and 12 feet in diameter.

When leaks were detected in the original phenosolvan unit in December 2007, the entire plant had to be shut down while repairs were made.

"It took a couple years to complete the engineering and design of the new unit, but now that it's up and running, it provides for better operating runs in the future," Fagerstrom said. Plans are for the original phenosolvan A-train to be inspected and cracks fixed in June while the new unit will be up and running doing its job, allowing the plant to continue operation.