



Be Inspired Awards
2012 Winner



Project Summary

Organization:
Enogex LLC

Solution:
Utilities
Power Generation

Location:
Oklahoma, United States

Project Objective:

- Reduce design and drafting cycle time, which reduces costs for gas gathering compressor stations.
- Change from one-off, site-specific designs to scalable, standardized designs.
- Improve project execution by making Bentley technology work for the design and drafting team.

Products used:
AutoPLANT
ProjectWise

Fast Facts

- Enogex used Bentley solutions to standardize the construction drawing packages for gas gathering compressor stations, costing \$10 million each.
- The team accelerated design and drafting by leveraging AutoPLANT's full capabilities using tutorials, Bentley LEARN, Bentley User Groups, and Be Community forums.
- AutoPLANT integration with ProjectWise added value in document control, workflow, and project tracking.

ROI

- Enogex reduced billable hours for design and drafting of gas gathering compressor stations by 85 percent.
- The design and drafting team reduced request-to-delivery time for all project requests by 25 percent.
- The 10-member team has maintained an average workload of 42 project requests per month since 2010 while also improving its on-time percentage by 7 percent.

AutoPLANT and ProjectWise Integration Cuts Enogex Project Delivery Time by 25 Percent

Enogex Reduces Gas Gathering Compressor Station Design and Drafting Billable Hours by 85 Percent Using Bentley Solutions

Team Boosts Productivity, Performance

Enogex LLC, an OGE Energy Corp. company providing natural gas gathering, processing, transportation, and storage in Oklahoma and the Texas Panhandle, needed to construct compressor stations more quickly and at less cost in order to stay competitive. The company leveraged Bentley solutions to create a robust and scalable standardized design package that reduced billable design hours and delivery time.

"Prior to the implementation of AutoPLANT and ProjectWise, our compressor stations averaged 1,400 billable hours to complete and included a mere 125 drawings," said Enogex Drafting Supervisor Kevin Fust. "Today, a station averages 200 hours to complete, and the drawing package now includes an average of 350 construction and maintenance drawings. Reducing design and drafting cycle time and improving project execution on our gas compressors keeps us competitive, which means greater revenue for Enogex and our customers."

Bentley solutions also improved productivity and on-time performance. In 2010, the design and drafting team completed 394 project requests at an on-time rate of 88 percent. By 2012, the team completed 410 project requests at an on-time rate of 95 percent. During that same period, project request cycle time dropped from 16 days to 12 days.

"These accomplishments are attributed to an outstanding staff, organization, and software solutions provided by Bentley," Fust said. "With the implementation of Bentley solutions, Enogex reduced the design and drafting billable hours required on our gas gathering compressor stations by 85 percent while also reducing the request-to-delivery time for all project requests by 25 percent."

Challenging Market Conditions

Enogex has expanded both gathering and transmission pipeline operations in the face of stiff competition from other midstream businesses. This competition has driven the need to reduce cycle time for delivering the gas gathering compressor stations that move the natural gas. A typical station is built on about 10 acres at a capital cost of \$10 million, supports up to six compressors, and flows

up to 36 million cubic feet of gas per day. To date, Enogex operates 110 compressor stations in the region. Any uptick in production puts considerable pressure on an already overburdened design and drafting team.

The Enogex design and drafting team is responsible for creating the construction and maintenance drawings for the compressor stations, as well as fulfilling other requests for projects of various scope and size. The team includes seven full-time members, two to four in-house contractors, and a few third-party contractors.

Standardization Streamlines Station Design

Enogex determined that, to stay competitive and grow revenue for the company and its customers, it had to focus on two main goals: reducing project cycle time and improving project execution. This meant thinking differently about how the stations were designed, and taking better advantage of 3D design technology.

The previous compression station designs were site-specific and only met the flow needs of the one location. Enogex devised a new station design that standardized some areas and scaled to each location. For example, the bench point remains constant in reference to all of the equipment within the site, while the variable area accommodates different sizes and numbers of pipelines entering and leaving the facility. A common header system running the length of the station keeps equipment in the same relative location to the bench point regardless of size. Predetermined vendor-supplied equipment, tools, and assemblies plug into the design, which scales from three to six compressor units.

AutoPLANT Delivers Intelligent 3D Models

It took advanced engineering design tools to optimize this design strategy. Enogex had been using AutoPLANT for years, but not to its full potential. To get up to speed, the design and drafting team took advantage of Bentley's software tutorials, Bentley Institute online instructor-led classes, AutoPLANT user groups, and Be Communities forums. Armed with a better understanding of what AutoPLANT can do, the team configured the software to meet the company's business needs.

"Bentley's AutoPLANT and ProjectWise enabled Enogex to dramatically increase productivity in both the creation of construction and maintenance drawings, and also to produce more accurate drawings and a greater number of documents. By 2012, we had reduced billable-hours from 1400 to 200 hours per station, while completing double the number of compressor stations. In addition, between 2009 and 2012 the total number of drawings per package increased from 125 to 345."

— Kevin Fust, Drafting Supervisor, Enogex LLC

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The compressor station materials list was exported from SAP, imported to Excel, and compared to the AutoPLANT material catalog. A database file was created using Microsoft Access and imported to Bentley's SpecGen. Now, Enogex can create a material list that matches its engineering standards and includes the data needed by the SAP purchasing system.

These material catalogs allow the team to create fully intelligent 3D models of the compression stations. Before implementing Bentley software, Enogex had a partial 2D and 3D model with limited intelligence. After the implementation, the design and drafting team had a fully intelligent 3D model with reporting capabilities. "Another advantage recently discovered is that the 3D i-model provides a visual review tool for our engineering standards team. This helps the team to better understand engineering design change requests by providing a visual aid, giving all a realistic perception of the physical site," said Enogex Technical Services Director, B. Schack.

Reporting tools include bills of material divided by construction phase for use by the supply chain and construction groups; weld inches for use in contract bidding and progress tracking; line lists and valve lists for sizing and ordering; and volume calculations for predicting and reporting gas loss due to blow down or release.

Integrating ProjectWise Improves Execution

While these design changes were in progress, Enogex experienced rapid company growth that made it necessary to improve document control and document access. ProjectWise was selected to meet this need, enabling Enogex to implement file permissions, project tracking, and document history. During the conversion to ProjectWise, Enogex moved more than 144,000 document files into ProjectWise.

The change enabled Enogex to search AutoPLANT data from the ProjectWise environment, automatically execute the proper AutoPLANT modules, and use the ProjectWise security structure within AutoPLANT applications, making it easier to administer projects. Title block integration alone saves an enormous amount of time by automatically filling out title blocks for all project documents, eliminating repetitive typing and user error. Enogex also created a custom workflow that allows the team to work in the way that is best for the company's business needs.

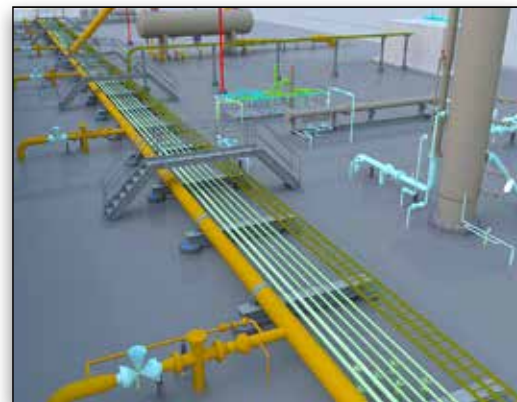
More Robust Bid Package Means Fewer Change Orders

Within this managed environment, Enogex has leveraged AutoPLANT to create a multi-level model structure that allows multiple users access and modification rights concurrently. "Bentley's AutoPLANT and ProjectWise enabled Enogex to dramatically increase productivity in both the creation of construction and maintenance drawings, and also to produce more accurate drawings and a greater number of documents," said Fust. Compared to 125 drawings before implementation, the typical compressor station now consists of approximately 541 drawings (350 drawing files, construction and maintenance drawings, and 181 weld maps used for inspection documentation). "In addition to our reduction in billable hours, the overall compressor station drawing package

became more robust, nearly tripling the construction drawings to upwards of 350 files." Fust noted, "The additional drawings, including the addition of weld maps, provide value by adding a more detailed bid package, resulting in a more consistent end product and fewer change orders."

Immediate Return on Investment

The AutoPLANT-ProjectWise integration yielded immediate benefits that helped the design and drafting team to achieve the company's goals for reducing cycle time and improving project execution. Between 2009 and 2010, the number of billable hours per compressor station decreased from 1,400 hours to 200 hours. During that time, the team completed four compression stations per year. By 2012, the team was completing eight compression stations per year and still billing an average of 200 hours per station.



Gas Gathering Compressor Station

Between 2010 and 2012, the team also reduced project request cycle time from 16 working days to 12 working days. These requests included design-specific upgrades, expansion projects, and as-built project requests. This four-day improvement in cycle time, applied to more than 500 projects, has had a huge impact on project execution. Finally, on-time delivery has also improved. The 10-member design and drafting team has maintained an average workload of 42 project requests per month since 2010 while also improving their on-time percentage by 7 percent – from 88 percent in 2010 to 95 percent in 2012.

The increase in accuracy of models and projects also improved competitiveness by allowing Enogex to move from time-and-materials bidding to a "not to exceed" method-of-contract bidding.

Today Enogex uses AutoPLANT and ProjectWise not only to design and bid-out the construction of compression stations but also to manage the maintenance lifecycle of the facilities. Due to the success Enogex has had responding to customers' demands and meeting their timelines, the company has been able to secure dedicated acreage – to date, about two million acres in the state of Oklahoma. Having dedicated acreage gives Enogex first rights to gather and transport the gas produced there, providing a competitive advantage and great revenue potential for the company.