

2025 SGA Awards Finalists: Engineering Innovation

Entry: Gas GPT

Your Company: Exelon - Baltimore Gas and Electric

Linking people, ideas and information:

This project connected teams across a large portion of our Business - including our advanced analytics team, gas construction, contractor management, our preventative maintenance teams, new business, compliance, engineering, and more!

Name of Your Project / Initiative

Gas GPT

The Solution

This newly developed a.i. chat bot, "Gas GPT", has been built to answer employee questions about many different topics. So far, we have thousands of pages of information uploaded. The documents include gas construction standards, gas engineering standards, OQ Plan, TIMP, DIMP, Gas Emergency Plan and 192. This tool allows users to ask a specific question like "what is the pressure test criteria for high pressure, high density plastic with a maop of 99 psi?". Then, the user receives a response back with the duration and pressure along with citations of exactly where the answer can be found in the standards (or any other pertinent document). This has allowed the BGE team to research questions faster and lowered the barrier to entry for team members who may not want to search through a large document for an answer.

Results of Your Project / Initiative.

"Gas GPT" was first discussed as a new idea in August of 2023 during an Innovation Ideation session. This led to BGE's Gas Engineering and Advanced Analytics teams partnering with internal stakeholders to develop a chat bot that would house the thousands of pages of information that govern our every day work. We embarked on the journey to upload pertinent documents and start the process of training the bot. This included many hours of work reviewing questions and providing information maps to help the model understand where to go for certain information. While training was tough and there were several setbacks with answers that were not accurate, one of the biggest challenges faced was understanding the value proposition – how much money will be saved by implementing the tool? How do you quantify the benefits? BGE teams had many difficulties developing a way to track potential improvements and time

savings. After months of discussion, the team settled on a rough estimate of time saved per question asked of the chat bot and currently use this model to track efficiency gained with the tool. Today, the bot answers between 350-400 questions per month from over 150 distinct users. For a business of about 650 employees, this is pretty impressive! The chat bot can answer a large array of questions and has been very helpful for new employees who often need help finding not only an answer but where to look for the answer. In 2025, new "like" and "dislike" buttons were added so the team can focus on quality of answers as well. While the bot has been fantastic at answering most questions, some more complex questions still give it challenges. With each "disliked" question we review and update the bot to make it even better! Finally, an improvement that we did not anticipate – the bot has been successful in showing us areas of contradiction between different documents. Sometimes when the bot is "wrong" it's actually that our standard conflicts with another section in the standard or another document.

Entry: Southern Company Gas Uses Predictive Modeling to Achieve High Accuracy Forecasting

Your Company: Southern Company Gas

Linking people, ideas and information:

Southern Company Gas serves approximately 4.3 million natural gas customers across four states, with 2,000 frontline employees completing nearly 2 million orders each year. One of the primary functions of the Forecasting & Organizational Effectiveness department is to develop an annual forecast comprised of work volumes and required resources, by month and service center.

The previous demand forecasting model used by Southern Company Gas was based solely on historical order completion data, which does not necessarily consider economic trends and their impact on customers' ability to satisfy billing arrangements. The predictive analytics model integrates internal order data with external economic and weather factors to predict work order volumes. More accurate, refined insight into disconnects and subsequent Reconnect volumes allows for enhanced forecasting and strategic planning.

This predictive analytics model allows Field Operations and Resource Management to have an improved, proactive work plan, rather than taking a reactionary approach. Additionally, these insights allow for optimized shift scheduling around periods of peak demand, particularly in the spring and fall, leading to a more accurate financial budget, benefiting our Financial Planning & Analysis and Regulatory teams.

Enhanced accuracy of customer-driven work orders from a timing perspective lets forecasters sculpt and smooth other order types around anticipated customer demand peaks. Subsequently, this affords Field Operations the ability to complete compliance-related work ahead of deadlines while minimizing cost impacts, such as overtime.

From a staffing and workforce complement perspective, the predictive analytics model helps create a more realistic picture of our workforce needs, allowing us to precisely predict resource requirements and overtime rates. By reducing overtime for field employees, we mitigate risks to both our personnel and the public.

Name of Your Project / Initiative

Predictive Analytics Solution for High Volume Work Orders

The Solution

Southern Company Gas' Enterprise Decision Support and Data Governance (EDGE) team, part of the Data Office, focuses on enhancing business effectiveness through data and analytics.

The team ensures the quality of data and solutions, collaborating with business units, the Technology Organization, and vendors to drive informed decision-making and strategic initiatives. In partnership with the Forecasting & Organizational Effectiveness group, the EDGE team has developed a predictive model using machine learning and artificial intelligence to improve the demand forecast for high-volume orders influenced by economic variables such as interest rates, unemployment rates, natural gas prices, and weather conditions. High-volume orders, including Disconnects, Reconnects, and Activates, make up nearly half of the work volumes for our local distribution companies (LDCs).

The predictive model refreshes monthly and provides an updated, rolling two-year outlook that incorporates the latest external insights. This dynamic adjustment ensures that our forecasts remain relevant and precise, enabling better planning and resource allocation.

Results of Your Project / Initiative.

The EDGE team's predictive analytics tool has significantly enhanced the accuracy of the annual forecast. Each month, the Forecasting & Organizational Effectiveness Team completes a demand variance analysis to evaluate how actual order volumes completed in the field compared to forecasted volumes. This analysis helps to explain the drivers that may impact monthly work plans and budget. In February 2025, actual volumes for Disconnects, Reconnects, and Activates were within 1.83%, or 493 orders, of forecasted volumes for our LDCs (98.17% accuracy), compared to a variance of 17.32% (or 5,659 orders) in February 2024 (82.68% accuracy).

At Southern Company Gas, the customer is at the center of everything we do. Availability is the regulatory requirement related to restoring service to a customer's premise after payment within a specified time (based on each LDC's state regulator). By increasing the accuracy of the forecast using the predictive analytics model, the ultimate benefit is to our customers by ensuring that we have the staffing and resources available to turn on/reconnect a customer's service quickly after disconnection. Additionally, these insights allow Credit, Collections and Energy Assistance to examine customer trends and proactively develop strategic marketing initiatives, energy assistance programs and payment arrangements for at-risk customers to help avoid interruption of service for non-payment. Moreover, the integration of machine learning and artificial intelligence in our forecasting processes represents a significant step forward in our commitment to innovation and excellence. It demonstrates our dedication to leveraging cutting-edge technology to solve complex problems and enhance our service delivery. Thank you for considering Southern Company Gas for this prestigious award!

Southern Company Gas-High Accuracy Forecasting with Predictive Modeling

Increased variance accuracy from 82.7% to 98.2% February 2025

Month	Order Type	Original Forecast	Actuals	Original FC Variance	Original FC Variance (%)
February	Reconnect or Credit	8,530	10,958	2,428	28.46%
February	SONP or Credit	13.557	16.926	3.339	24.57%
February	Turn CN	10 553	10,445	-108	-1.02%
Total		32,670	38,329	5,659	17.32%







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Entry: Crossing the Coosa River

Your Company: Williams Companies, Inc.

Linking people, ideas and information:

Williams Companies, Inc. has made significant contributions to the natural gas industry, connecting people, ideas, and information through engineering innovation. One of their most notable achievements is the development and expansion of the Transco Pipeline System, the nation's largest and fastest-growing natural gas pipeline network. This system spans over 10,000 miles, delivering natural gas from South Texas to New York City, and supplies approximately 15% of the nation's natural gas.

Williams has been instrumental in addressing the growing demand for natural gas driven by industrial reshoring, electrification, and the expansion of data centers. As industries return to the U.S., the need for reliable and efficient energy sources has increased. Natural gas has become a preferred choice due to its cost-effectiveness and lower environmental impact compared to coal. The shift from coal to natural gas for power generation has further boosted demand, as utilities seek cleaner energy.

Electrification efforts, particularly in the transportation and manufacturing sectors, have also contributed to the rising demand for natural gas. Data centers, which require substantial and consistent power, are increasingly relying on natural gas for their energy needs. This trend is expected to drive significant growth in natural gas consumption over the next decade. A key example of Williams' innovative approach to meeting growing demand is the successful crossing of the Coosa River using horizontal directional drilling (HDD) as part of the Southeast Energy Connector project. Historically, the Coosa River has presented significant challenges due to its subsurface geology and topography. By collaborating with Michels Trenchless, Inc., Williams overcame these obstacles and installed approximately 3,400 feet of 42-inch diameter steel pipeline beneath the river. This project eliminated a critical bottleneck in the Transco System, enhancing its capacity and reliability.

Through these efforts, Williams connected people, ideas, and information to drive innovation.

Name of Your Project / Initiative

Crossing the Coosa River

The Solution

The Coosa River has presented significant challenges for pipeline crossings over the decades. These challenges include difficult subsurface geology, such as limestone with karst features, and the drastic topography of the surrounding region. These factors made trenchless construction difficult through the 1990s and early 2000s, including unsuccessful HDD attempts for other pipeline operators at various locations on the Coosa River. Open cut methods were challenging due to environmental considerations and steep terrain.

Previously, Williams installed four pipelines across the Coosa River using aerial span and open cut construction. The first two pipelines were installed via an aerial span in the 1950s, and the second two pipelines were installed via open cut in the 1960s. However, Williams needed a fifth, 42-inch diameter pipeline to alleviate capacity concerns for the Southeast Energy Connector project. Williams approached Michels to evaluate potential trenchless pipeline installation methods to minimize the environmental impact of crossing the river .

Michels explored several options, including horizontal directional drilling, Direct Pipe®, microtunneling, and open cut. Open cut methods were deemed impractical due to the depth of the river, flow rates, and environmental regulations. Microtunneling was considered, but faced challenges due to the compressive strength of the rock and the need for deep shafts, making it economically unviable. Direct Pipe® also faced similar challenges with bedrock and would require multiple tooling changes and deep reception shaft, leading to high costs and extended construction duration.

Ultimately, HDD emerged as the most feasible option despite initial reservations. The preliminary investigation revealed that the subsurface geology at the proposed crossing location did not contain abundant limestone or karst features present at other crossing locations. This allowed Michels to fully vet HDD as a viable solution to install approximately 3,400 feet of 42-inch diameter steel pipeline beneath the Coosa River, eliminating the bottleneck.

Results of Your Project / Initiative.

The Coosa River HDD installation project near Clanton, Alabama, faced several significant challenges, including subsurface geology with hard and abrasive gneiss bedrock, drastic topography, and subsurface artesian water. Access to construction sites was limited due to steep hills, heavy vegetation, and multiple tributaries. Despite these obstacles, the project was successfully completed through innovative engineering solutions and collaboration between Williams, Michels Trenchless, Inc., and U.S. Pipeline.

To address the challenges, Michels and Williams conducted extensive geotechnical investigations and developed detailed plans for navigating the terrain. Michels utilized the pilot hole intersect method for HDD, which involved installing 60-inch-diameter conductor casing on both sides of the river and setting up dual HDD maxi-rigs, one on each side of the river. Constant communication and collaboration between Michels and U.S. Pipeline ensured efficient operations despite limited space and site access. A winching strategy was implemented to mobilize and demobilize equipment, and an extensive spoils disposal plan was developed to manage the removal of approximately 6,600 tons of material.

Completing the Coosa River HDD installation project has provided numerous benefits for Williams, the natural gas industry, and surrounding communities. For Williams, the successful installation of the fifth pipeline eliminated a critical bottleneck in the Transco Pipeline System, enhancing its capacity and reliability.

This HDD project was a critical component of the Southeast Energy Connector project, an expansion of the existing Transco pipeline in Alabama. The Southeast Energy Connector aims to support the conversion of electric power generation in Alabama from coal to natural gas, leveraging existing pipeline infrastructure to provide year-round, American-produced natural gas.

The project also benefited the natural gas industry by demonstrating the feasibility of using HDD for challenging pipeline crossings, setting a precedent for future projects. Surrounding communities benefited from increased energy reliability and the economic growth associated with improved infrastructure. The project highlights the importance of collaboration and innovative engineering solutions in overcoming complex challenges and delivering essential energy resources sustainably and responsibly.

Completing the Coosa River HDD installation project positions Williams for continued growth with reliable, clean assets. The successful implementation of HDD demonstrates Williams' commitment to innovative and sustainable engineering practices. By enhancing the Transco Pipeline System's capacity, Williams can better meet the increasing demand for natural gas, ensuring that Williams remains at the forefront of delivering reliable and clean energy solutions. The Coosa River HDD installation is a paramount example of efficient project delivery through collaboration and best-in-class project execution. Williams' approach from the project's conception established a strong foundation that led to its overall successful execution. The thorough vetting of project parameters and viable trenchless possibilities helped dissolve historical assumptions impacting one of the United States' largest energy infrastructure systems. The approach implemented for the execution of the Coosa River HDD installation should be considered by owners, engineers, and contractors alike in an effort to provide technically feasible and commercially viable infrastructure solutions within North America and throughout the world.

Supplemental video.

