



Be Inspired Awards
2012 Winner

Project Summary

Organization:

Southern Company

Solution:

Power Generation

Location:

Kemper County, Mississippi

Project Objective:

- Enable secure, efficient management, tracking, and sharing of design and asset-related information
- Ensure complete, accurate asset information is delivered to startup, commissioning, construction, and operations and maintenance departments
- Enable easier, centralized configuration management

Products used:

eB Data Quality Manager

Fast Facts

- Southern Company deployed eB Data Quality Manager to aggregate and centrally manage design and asset-related information and automate the generation of turnover packages.
- At Plant Radcliffe, eB Data Quality Manager manages several hundred thousand assets, runs automated processes and data streams, and manages configuration changes.

ROI

- Automated data handoffs will enable projected savings of 36,000 man hours, equivalent to \$2 million.
- Integrated vendor information will provide a projected savings of \$37.5 million over 40-year lifecycle of the asset, while also reducing safety risks.
- Access to vendor data in the eB system will save an additional 6,000 man hours or \$350,000.



Southern Company Operationalizes a Data-centric Design Strategy with Bentley's eB Data Quality Manager

Optimizing Data Quality Management in Design to Meet Downstream Requirements Faster, More Accurately, and at a Lower Cost

Based in Atlanta, Georgia, Southern Company specializes in making and selling electricity across the southeastern United States. Its core operations facilities have nearly 43,000 megawatts of electricity generating capacity and result in sales of kilowatt hours equal to 4.7 percent of the U.S. electricity market. The company's competitive generation business also constructs, acquires, and manages generation assets and sells electricity on the wholesale market – so it's critical that complete and accurate asset information be delivered to startup, commissioning, construction, and operations and maintenance departments. To facilitate secure, efficient management of this information – especially for large-scale projects such as Plant Radcliffe in Mississippi – Southern Company deployed Bentley's eB Data Quality Manager.

Tackling Data Quality and Management Issues

Southern Company's design group had been using Bentley AutoPLANT and Cygna PDMS to help with asset-related data collection, and over time, the design group began accumulating large volumes of "nuts-and-bolts" information related to assets. "As people gradually rotated out of the design department and into other departments, such as operations and maintenance for plants, they recognized that the data being collected by designers would be useful for them in their new roles," explained Tedd Weitzman, engineering analyst with Southern Company's Engineering and Construction Services. "They also began referring people to the design group when they needed detailed asset information." This led to a growing number of queries, which the design group had to respond to in a timely manner.

But this approach to asset-related data management led to unorganized, decentralized transfers of questionable data. It was often incomplete, out of date, and inaccurate. Because it was fragmented across multiple systems, data was redundant and hard for people to find and access, making hand-offs to construction, start-up, commissioning, and maintenance teams costly and time consuming. "This data found its way into lots of departments in who-knows-what form, and we had no way to track what had been published or shared internally or externally," explained Weitzman. "Equally important, information was not related to physical assets and configurations, and the impact of design and asset changes was difficult to manage, making information within the company's design systems obsolete."

To address these issues, management decided to put in place a data-centric design model to ensure consistent, accurate

transmission of trusted asset information from design through operations and maintenance. The model specifies requirements for information against which the company's internal and external engineering departments, equipment vendors, and materials suppliers must supply data to support the commissioning of capital assets.

Searching for a Solution

To successfully implement its data-centric design strategy, Southern Company needed software that could consolidate correlated but disparate design data into a single repository of trusted, searchable, and linked data. It had to be able to receive information from the company's major design tools and control the output of information to other departments. After evaluating various solutions, management chose to deploy eB Data Quality Manager. "It offered the flexible architecture, data quality management functionality, and management of asset changes we needed to operationalize our strategy," said Weitzman.

For example, management could create asset types specific to Southern Company and make modifications to them as needed. "We could take an object – for example, a motor – and define it and decide what kinds of attributes should go with it," said Weitzman. "Using these attributes, we could create and quickly search for interdependencies within the system between an object – for instance, to show that the motor is related to a pump, a cable, a process line, a switch, and more." The software would also allow people to make changes to these objects on the fly during production, enabling them to be managed through change whether due to updates, modifications, additions, or other lifecycle events.

Equally important, the company could automate data quality management, scrubbing each piece of data or information to ensure data quality before it enters the eB system, as well as support a disciplined process for managing data as assets change over time. For example, as Southern Company takes an asset from a conceptual design to construction and beyond, eB Data Quality Manager would collect data about it, as the team determined was appropriate for each stage in the lifecycle. Eventually, "as built" data can be passed to teams responsible for asset start up, operations and maintenance. The company could also run any location or asset back through the asset lifecycle for retrofitting or decommissioning while maintaining the integrity of the as-built design information currently defining a plant.

"The configuration management functionality in Bentley's eB Data Quality Manager software has been integral to successfully executing capital projects like Plant Radcliffe. We've also gained the ability to manage design information in ways that enable us to meet increasingly demanding schedules and ever tighter budgets."

*— Tedd Weitzman,
engineering analyst,
Southern Company*

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Laying a Solid Foundation for a Successful Implementation

Because the design group had weak internal data quality processes, it took Southern Company several years to fully implement eB Data Quality Manager. "We first had to develop the right processes, procedures, and standards for the software to support," explained Weitzman. "When we were ready, we engaged Bentley Professional Services to consult with us on configuring the software and integrating it with Documentum, our primary system of record, and the design group's two main data source systems – Bentley AutoPlant and Cygna PDMS." This integration ensures that all data created and stored in them flows to eB Data Quality Manager."

During the deployment, it became evident that configuration management is essential to any project's success. "Given the rate of change in a modern design environment, eB Data Quality Manager is critical because it allows for frequent modifications – whether of attributes, objects, processes, or requirements," explained Weitzman. "It gives us the flexibility to manage changing information related to asset configuration." Bentley Professional Services helped Southern Company overcome technical challenges deploying this functionality and trained Southern Company, so that they can now perform over 90 percent of changes to configurations without outside assistance.

eB Data Quality Manager at Work

With eB Data Quality Manager in place, Southern Company's design and asset-related data is centralized, linked, and consistent with design procedures, standards, and guidelines across all of its engineering disciplines and outsourcing partners. Within the software's class library, users can define various types of objects, complete with their appropriate attribute information and when and by whom they are expected to be populated. The software provides a repeatable mechanism to bring engineering design data from multiple applications into a centralized asset management environment at specified intervals during the design process.

While being loaded, the design data is validated to maintain its integrity and verified to ensure the proper information is present at the specified design state. Reports are generated for invalid and incomplete assets and distributed to the various disciplines for correction. Documents and assets containing all required information are then pushed to other applications for further processing.

Southern Company created a process where drawings and data are integrated in the design review process. Functionality was built into the in-process drawing management system, ProjectWise Explorer, that allows users to review asset data quality as it relates directly to components on a specific drawing. From ProjectWise a query can be executed that compares in-process design data in AutoPlant with qualified data in eB Data Quality Manager. The query generates an HTML formatted report on demand. Similar reports are generated for drawing packages created in ProjectWise. Data integrity reports as they relate to drawing packages are procedurally required as part of the drawing approval process.

"Once we ensure data quality in eB Data Quality Manager, not only can we comfortably take this system to other departments and improve their document search capabilities, but we can transmit other types of information as it relates to assets in other departments within our organization," explained Weitzman. "For instance, we can quickly give our asset start up and commissioning teams quality asset data from a single repository of complete, normalized, trusted data, which can be fed into our proprietary system called Package Builder to generate start-up commissioning packages."

Significant, Rapid ROI at the Radcliffe Coal Plant

In 2011, Southern Company's implementation of eB Data Quality Management was put into production for the Plant Radcliffe project in Kemper County, Mississippi. Representing a \$2.5 billion total investment, Radcliffe is a clean coal processing facility using Transport Integrated Gasification (TRIG) technology, allowing it to remove 65 percent of carbon dioxide, 99 percent of sulfur dioxide, and 90 percent of mercury emissions than traditional pulverized coal plants. Once completed, it will produce 582 megawatts of power.

eB Data Quality Manager is playing a critical role in driving the success of this large, complex project, which is slated to go live in 2014. Assets in the eB Data Quality Manager system for Plant Radcliffe doubled between November 2011 and July 2012 to 200,000 and increased again to nearly 300,000 by August 2012 – quickly making it an essential store of asset-related data. This information is integral to facility construction and operation and maintenance. Without access to the vendor information contained in eB Data Quality Manager, it would cost the company approximately \$37.5 million over a 40-year plant lifecycle and create safety risks. Access to vendor data in the eB system will save the Startup and Commissioning group an additional 6,000 man hours or \$350,000 bringing total ROI for startup and commissioning to \$2.35 million.

Southern Company conservatively estimates that automations enabled by the software for Plant Radcliffe will save its Startup and Commissioning group 36,000 man hours – which is equivalent to \$2 million dollars or over 20 percent of the group's estimated budget for the two-year Plant Radcliffe construction cycle. Automations include processes that reduce time needed to analyze asset information manually and assign assets to system packages for checkout and turnover to operations and maintenance.

Facilitating a Culture Transformation

Without the ability to efficiently manage and share design and asset-related information using software solutions provided by Bentley, capital projects would struggle to meet increasingly demanding schedules and tighter budgets. But the benefits of these investments also resulted in transforming the culture of Southern Company's design group. "We've radically changed our design environment and culture," said Weitzman. "Instead of being an organization focused on producing drawings to represent a design, we now have a holistic design group focused on meeting downstream requirements. Integrating eB Data Quality Manager automations with our other design processes, such as drawing approvals, allows us to efficiently communicate designs to all construction and operations teams."

Future Plans

Southern Company plans to complete its deployment of eB Data Quality Manager across all areas of Plant Radcliffe and started new implementations across a fleet of 70 fossil fuel plants for brownfield CapEx modification projects. eB Data Quality Manager is currently running data for four brownfield environmental projects in three states. Using Plant Radcliffe as the baseline for expected ROI, the future looks promising. These projects will have an estimated 6,000 assets each, with savings estimated at \$250 per asset – or \$1.5 million per site – thanks to more efficient document searches alone. Through the commissioning cycle of these projects, an additional \$15 efficiency savings per asset – similar to that for Plant Radcliffe – is also expected.