BENTLEY HELPS CPS ENERGY STREAMLINE THE MANAGEMENT OF ITS SUBSTATION INFRASTRUCTURE WITH PROJECTWISE® AND SUBSTATION LAYOUT

PROJECT SUMMARY

Organization
CPS Energy

Vertical market
Geospatial – Utilities

Location
San Antonio, Texas, United States of America

Project Objectives

- To improve the overall management of CPS Energy's substation infrastructure across the asset's lifecycle
- To efficiently archive and manage over 23,000 legacy CAD drawings covering the company's 87 substations with ProjectWise
- To introduce new, streamlined workflows supported by MicroStation, ProjectWise and Bentley's substation layout capability

Bentley Products Used
Bentley's Substation Layout, MicroStation, ProjectWise

FAST FACTS

- CPS Energy is the largest combined electric and natural gas utility in the United States
- All of the utility's legacy substation CAD drawings are now archived in and accessed through ProjectWise
- The substation design team can now handle more projects with the same number of resources
- Clash detection using 3D designs saves money by avoiding expensive change orders during the construction process
- Project costings and materials take-offs are now more accurate and easier to calculate
- All manual processes have been retired and the entire design workflow is automated

BACKGROUND

CPS Energy, founded and publicly owned since 1942, is the largest combined electric and natural gas utility in the United States with a service area of 1,566 square miles across 7 counties in Texas, including the city of San Antonio. The utility is vertically integrated, owning power generation facilities, transmission and distribution infrastructure, including 87 substations. CPS Energy began a project to change the way it managed the lifecycle of its substation infrastructure early in 2007.

PROJECT OBJECTIVES

The overall goal of the project is to improve the management of the lifecycle of CPS's substation infrastructure. This overall goal then generated two specific goals:

1. To effectively archive and manage over 23,000 legacy CAD drawings covering the company's 87 substations with ProjectWise
2. To introduce new, streamlined workflows supported by MicroStation®, ProjectWise and Bentley's substation layout software

"The project was initiated," as David Luschen, Director, Transmission and Substation engineering explains, "to bring our working practices into the twenty-first century. It's easy to carry on doing things as they've always been done, but two factors brought us to the point of initiating this change. First, we need to attract new talent into the organization to design and manage our ever-expanding substation infrastructure, and these young engineers want to use the latest software tools available and to work within highly automated, efficient workflows – they are not hampered by the old ways of doing things. Second, we have to handle even more projects with the same headcount – we therefore need to become more efficient in how we work. It is at this point that we started to talk to Bentley about how their substation layout software could help us."

THE PROJECT IN PRACTICE

The first phase of the project involved putting the existing library of substation infrastructure CAD drawings into ProjectWise – and this portion of the project has already been completed. The second phase involves adding the drawings covering the wider transmission infrastructure. From now on, and thanks to ProjectWise, only one person is able to work on a drawing at any one time and documents can easily be searched for by any relevant criterion such as who the designer was, location, material type, the year of project etc. Going forward, all new designs will be managed in ProjectWise for both version control reasons and effective server-side archiving.

Historically, the workflow for designing substation infrastructure started with hand-drawn sketches, which were then worked up into 2D CAD drawings, but now the design will be done in MicroStation using 3D designs from the outset. Not only will the design process be shorter and produce more accurate engineering drawings, but the project will also improve the company's ability to produce more accurate cost estimates and bills of materials. CPS Energy will also be able to execute interference checks before construction, and reduce the overall cost of building new substation infrastructure and maintaining the existing infrastructure.

And there are copious benefits in moving from a 2D to a 3D design process. Plan and section views can now be generated from a single model and material lists and bills of materials will be extracted from the section views. Previously this was done manually introducing the risk of errors and taking more time to complete. In order to ensure that the bills of materials are fully up-to-date, substation layout will import materials and

"It's all about getting more done more efficiently using the same resources"

ABOUT BENTLEY

Bentley Systems, Incorporated is the global leader dedicated to providing comprehensive software solutions for sustaining infrastructure. Architects, engineers, constructors, and owner-operators are indispensable in improving our world and our quality of life; the company's mission is to improve the performance of their projects and of the assets they design, build, and operate. Bentley sustains the infrastructure professions by helping to leverage information technology, learning, best practices, and global collaboration – and by promoting careers devoted to this crucial work.

For more information, visit www.bentley.com

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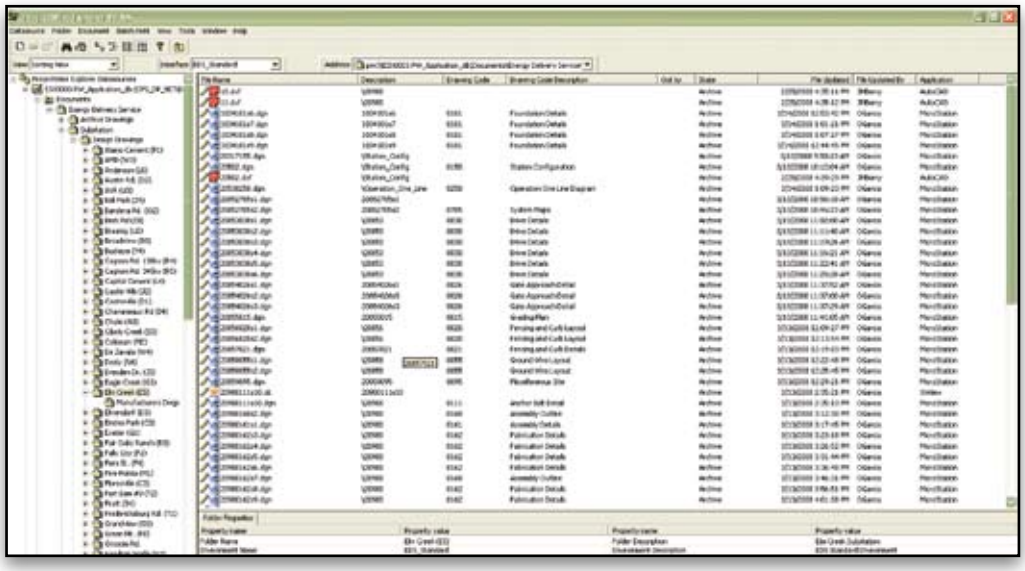
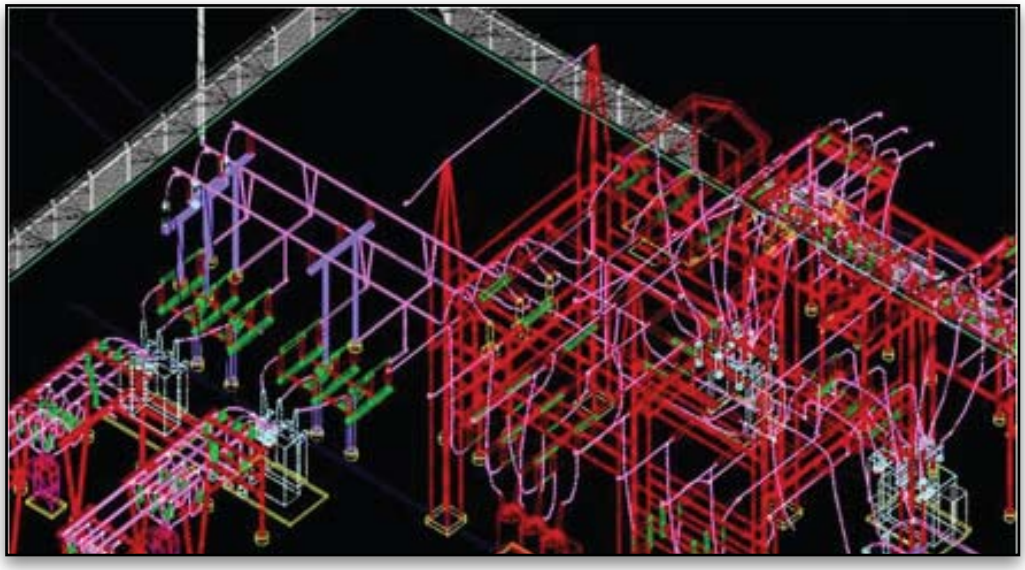


CPS Energy's engineering documentation is now stored in and accessed through ProjectWise.



An example of how 3D design can be used for clash detection and public consultation processes.

Configurable Standard Network (CSN) data from SAP's Project Systems module on a periodic basis.

The 3D renditions are also perfect for supporting presentations given to the public to show the overall impact of new substation infrastructure on their local environment. Increasingly, it is important to be able to support public consultation processes with 'real-world', 3D views of the proposed infrastructure in order to speed the decision-making process and to ensure a favorable outcome for CPS Energy and its customers.

The 3D model is also used to detect clashes and interferences before the design is signed off. This avoids highly expensive change orders during the construction process itself. A single change order during the construction process itself could run to tens of thousands of dollars.

This new technology and these new workflow practices will support a new generation of engineers who are used to working in fully-automated workflows supported by effective enterprise software systems.

CPS Energy has moved on from the days of manual sketches, workprints, hand mark-ups and redlines, and manual computation of potential interferences and bills of materials.

EXPECTED OUTCOMES

As David Luschen says, "It's all about getting more done more efficiently using the same resources – I fully expect this project to transform the way in which we design and manage our substation infrastructure – we will have easier access to existing drawings, enjoy streamlined workflows and improved version control, produce more accurate bills of materials and save costs in construction through the avoidance of change orders".

Bentley
Sustaining Infrastructure