



Project Summary

Organization

Elia

Location:

Brussels, Belgium

Project Objectives

- Implement a managed work environment to support a “Smart Way of Working,” ensuring compliance with industry and corporate standards.
- Move 1.2 terabytes of current project data from the HV file server to ProjectWise.

Products used

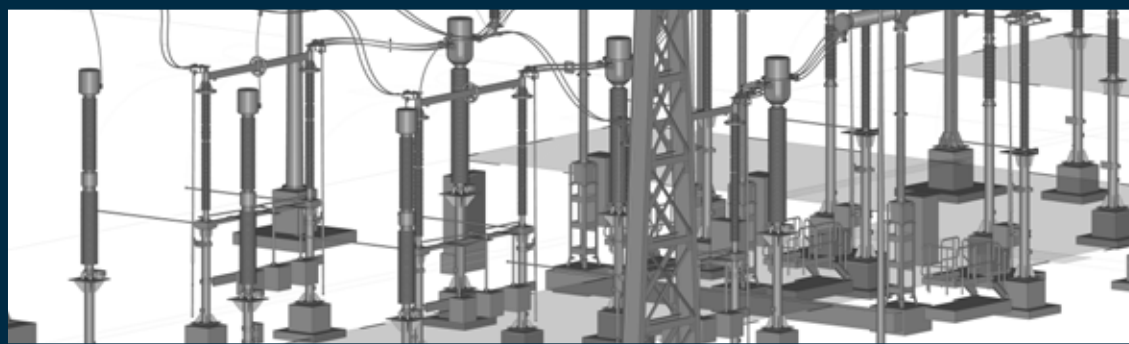
ProjectWise, ContextCapture, AECOsim Building Designer, Descartes, MicroStation, Bentley Pointools, ProStructures, and Bentley Substation

Fast Facts

- Elia adopted ProjectWise as a platform for its information management and collaboration solution to conform to corporate standards.
- Based on the success of this proof-of-concept project within the HV department, Elia plans to expand the use of ProjectWise and Bentley technology throughout the company.

ROI

- Using Bentley technology as the foundation for its asset and lifecycle management initiative improved efficiency in Elia’s HV department, and is estimated to save USD 100,000 – 150,000 annually.
- ProjectWise simplified and accelerated information searches, ensured traceability and access management, streamlined workflows, and provided unprecedented document control.
- The delta file transfer technology in ProjectWise prevented data loss transferring design files, and enabled staff to work from home securely, decreasing Elia’s carbon footprint.



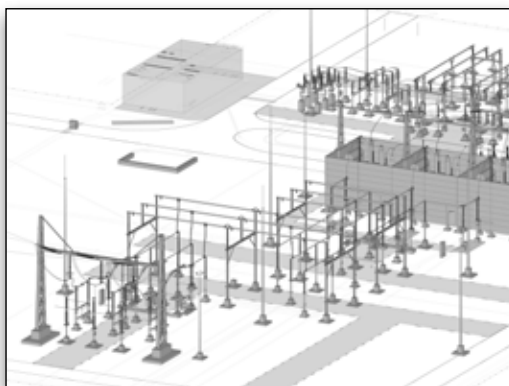
Elia Adopts Bentley Technology to Facilitate Its “Smart Way of Working”

Advanced Substation Design in a Managed Environment Saves Utility Firm More than USD 100,000 Annually

A Lifecycle Management Initiative

Located in Brussels, Elia is Belgium’s high-voltage (HV) transmission system operator. Operating over 8,000 kilometers of lines and underground cables throughout the country, the utility plays a crucial role delivering electricity nationally and is also a key player within the European electricity grid. Typically, Elia has approximately 60 ongoing HV infrastructure projects annually using different software, and relies on MicroStation® for advanced substation design and editing information for the assets in its spatial database. To conform to industry regulations and corporate standards, and facilitate its 2013 “Smart Way of Working” paradigm, Elia’s HV engineering department investigated new methods to improve documentation, collaboration, data consistency, and workflow processes in the substation design group.

With numerous file servers storing extremely large amounts of project data, Elia sought to move from a file server-based storage system to an access-controlled, traceable, workflow-based system requiring the transfer of 1.2 terabytes of information. To meet these objectives, the team needed collaborative, interoperable applications for optimal information mobility, and researched different technology solutions to deliver an integrated solution.



The interoperability of Bentley applications facilitated an integrated approach to modeling, analysis, optioneering, and geo-coordination, enhancing engineering processes.

ProjectWise® Provides Common Data Structure in a Shared Environment

In 2015, Elia started the ProjectWise pilot. Elia’s CAD expert, Nicolas Tobbackx, commented, “With a crucial aspect of ISO 55000 relating to documentation and traceability of all documents, that is where we come to this managed environment – and ProjectWise allows us to manage all this information.”

The company adopted the ProjectWise platform as the foundation for its managed work environment, enabling a controlled, transparent, workflow-based system with internal and external accessibility. Using ProjectWise optimized collaboration and information mobility, facilitating file transfers, reporting and traceability, file access and management, and search/find performance.

Elia transferred the 1.2 terabytes of data from the substation file server to ProjectWise. With its delta file transfer technology, ProjectWise saved significant time and prevented data loss by transferring only design changes rather than entire files when sending data. This facilitated the company’s 2013 “Smart Way of Working,” which offers its staff options to work from home by accelerating transfer time and eliminating damaged files for large 3D design files.

Furthermore, using ProjectWise to customize workflows and specify access rights allowed the department to control document ownership at a previously unprecedented level, improving reporting and file reference management. The check-in and check-out system in ProjectWise with reference file support enables the department to better understand file structure and locate missing or erroneous files, while the component indexing function in ProjectWise allows for faster, more specific search-and-find capabilities, making the company’s archives a rich data mine.

Using ProjectWise as its collaborative software platform provides a common, managed data environment consistent with Elia’s lifecycle and asset management strategy to meet industry regulations and improve productivity and engineering efficiencies.

"We have been working in 3D for years, but our models are not intelligent unless we use ProStructures, AECOsim [Building Designer], and Bentley Substation. This technology makes them intelligent."

*— Nicolas Tobbackx,
CAD expert, Elia*

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Intelligent 3D Models Foster Efficiency

Simultaneously while migrating to ProjectWise, Elia explored the integration of additional Bentley design and analysis technology as part of its proof-of-concept initiative for lifecycle management and process improvement. Elia used Bentley Substation for optioneering, analyzing different design scenarios regarding lightning protection. Done manually with modeling tools, the design and analysis process to ensure lightning protection takes three to four hours. "Bentley Substation allows us to do this in just a few minutes," stated Tobbackx. Substation's built-in 3D capabilities enable dynamic modeling and analysis of various scenarios to quickly determine optimal substation protection.

Because Elia also does a large amount of brownfield work, it is vital that the company ensures clearances for its HV equipment. ContextCapture, Descartes, and Bentley Pointools facilitated hybrid modeling for the power lines and pylons. Elia used laser scanning supplemented with ContextCapture to capture data to produce point clouds, and with Descartes meshed the point clouds to terrain models to simulate constraints required for power line planning and safety clearances during HV substation design.

As part of the substation design process, Elia also needs to ensure there is optimal lighting along the roadways and must perform calculations relating to the substation steel structures. Determining the appropriate location for light poles, for example, requires that thematically colored isolines be incorporated into the models. Integrating AECOsim Building Designer enabled the isolines to be added in the intelligent substation designs. ProStructures allowed the team to analyze the steel beams and connections using an IFC model. Elia relied on the flexibility and interoperability of Bentley applications to make its models intelligent. "We have been working in 3D for years, but our models are not intelligent unless we use ProStructures, AECOsim [Building Designer], and Bentley Substation. This technology makes them intelligent," explained Tobbackx.

Proof of Concept Delivers Savings

Elia's HV engineering department leveraged Bentley technology to deliver its proof of concept for improving engineering processes, productivity, and safety in advanced substation design. Using ProjectWise as the collaborative platform for the managed work environment improved planning and efficiency, and is estimated to save the HV department USD 100,000 to 150,000 annually. Working in a managed environment enables

the department to streamline workflows and ensure transparency and traceability to track changes, improve collaboration, and optimize document control to conform to corporate and industry lifecycle management standards. The ability to save file searches and workflow phases simplifies status reporting while the indexing feature in ProjectWise enhances data quality and accelerates information mobility.

With 60 HV projects among five designers requiring lightning protection designs, the department produced a great business case using Bentley Substation, reducing hours of design work to minutes.

Incorporating Bentley modeling, analysis, and data-capture technology provided Elia the interoperability necessary to enhance collaboration, improve project, resource, and asset management. The integrated solution optimizes overall engineering processes in a managed environment to better sustain electrical power and transmission.

Strategizing on Technology-driven Success

Based on the success and savings afforded in the HV substation department using ProjectWise and working in a managed environment, Elia is expanding its use throughout the company and anticipates a savings equivalent to four to six full-time employees. In 2017, Elia plans to roll out ProjectWise corporate-wide for 600 viewers, 300 field technicians, 125 designers, and 25 project leaders; and the company will continue the integration, connecting to the geospatial servers in other departments.

Elia's goal is to have Bentley's integrated, compatible applications bundled into one software installation package for Windows 7 to facilitate a smooth migration as the company transitions to Windows 10 mid-year. As the company's use of point clouds continues to grow, it will further explore and expand the use of ContextCapture and Bentley's point-cloud solutions.

Lastly, with Bentley technology as the foundation for the management of its electrical products, Elia is prepared to meet future IEC 61850 standards that will require substation schematics be digital, as an Excel spreadsheet with values and functions, as opposed to linear drawings. According to Tobbackx "Bentley's engineering, design, and collaboration solutions help us daily to develop diversified, sustainable, and reliable power systems – spanning land and sea – enabling new possibilities."