CASE STUDY

Proplant redesigns an extruder valve stand in record time

Key facts:

Company: Proplant

Website: www.proplant.sk

Industry: Chemical, power generation, pharmaceutical

Country: Slovakia

Octave products used: Forte 3DWorx *(CADWorx Plant Professional),* Aspect Pipe Stress *(CAESAR II),* OrthoGen for Forte 3DWorx *(OrthoGen for CADWorx),* Forte Isogen *(Isogen)*

Identifying goals

Proplant is an engineering company established in 2012 in Nitra, Slovakia. It is a multi-service company focusing on chemical, pharmaceutical and power industries. Proplant specializes in basic and detailed engineering, design documentation, stress analysis and creation of as-built documentation.

Together with a local partner, Gasinex Projekt Ltd., Proplant was contracted to redesign and reconstruct the valve stand (heating and distribution system) of an existing extruder unit located in a petrochemical (plastic molding) facility. The main project goal was to design the steam distribution and cooling water system. The system had to be improved so that the plant operator could quickly identify and control particular valves used to regulate the temperature of the various zones inside the extruder. The zones of the extruder need to be quickly cooled, warmed-up, or cooled and warmed-up simultaneously, according to the needs of the product being manufactured.

The secondary goal was to improve the maintenance and accessibility of the valves and other controls by reconfiguring the plant design.

After an initial review process, Proplant decided that the best approach for the future would be to completely redesign the valve stand for the extruder, including all equipment, steel access structures, pipes, valves, other devices and supports, because the outdated structure of the existing distribution unit hampered maintenance activities and safe operations.

Overcoming challenges

The client supplied the design fundamentals, P&IDs and a basic piping layout in AutoCAD® format. This design basis showed important details such as the connection points to the piping connected to the extruder itself. The client also supplied, in traditional paper form, piping classes, datasheets for piping and instrumentation, and valve vendor data sheets.

Due to access and space constraints, the new valve stand for the extruder needed to be designed as two separate but connected units that later could be joined together on-site.

To successfully achieve this, Proplant needed 100% accurate materials information for all new components to be included in the design and to be constructed and installed in the facility eventually. Four piping classes containing more than 3,000 components were quickly developed for the project using CADWorx Specification Editor.

Once specifications were available, a 3D model was created using Forte 3DWorx. Proplant redesigned all the pipelines to include new valves, existing relief valves, and condensate drain points, and in addition, all steel constructions and supports.

Key benefits:

- Data-driven, accurate and timely materials procurement
- Bi-directional integration avoids re-modeling, saving time
- Automatically produced consistent, high-quality, industry-standard deliverables for fabrication and construction
- Fast-track project execution supported by a simple, intuitive, integrated software

The next step was to conduct static and dynamic analysis checks using Aspect Pipe Stress to check the stability and performance of the new piping design. The analysis showed that no rework was necessary.

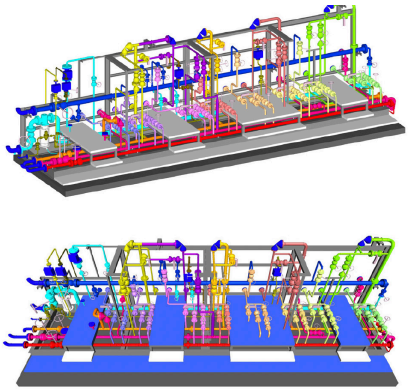
As the project progressed, the client raised several queries about commodity codes used for procurement, which had to be revised accordingly. To ensure consistency in all deliverables produced, the Forte 3DWorx model was connected to a project database. This enabled the same codes to be output to all reports automatically and directly from the model or database, without manual intervention being necessary. Saving time and avoiding error, high-quality, industry-standard, piping isometrics were produced using Isogen, and orthographics and 2D layouts were created via OrthoGen for Forte 3DWorx.

For progress checking and ongoing discussions with the client, the 3D model was periodically exported to NavisWorks, which uncovered several minor clash situations requiring design modifications. These were easily remedied using Forte 3DWorx's powerful and user-friendly pipe editing tools.

Realizing results

Thanks to the efficiency and ease of use of Octave's design software, Proplant was able to fast-track the design and deliver the project on- schedule and on-budget. This was largely due to:

- Quick and easy definition and customization of accurate materials catalogues and piping classes, including client codes aiding efficient and timely procurement and materials management
- 100% time savings during pipe stress checks due to bidirectional integration between Forte 3DWorx and Aspect Pipe Stress, avoiding remodeling having to be performed
- The ability to automatically produce high, consistent quality isometric, orthographic and BOM deliverables
- Improved designer efficiency and productivity – one person was able to carry out multiple design tasks including piping classes, 3D models, pipe stress analysis, review mode



Moving forward

Vladimir Cebo, owner and project manager at Proplant, said about the company's experience with Forte 3DWorx tools: "Forte 3DWorx and Aspect Pipe Stress are exactly what a company needs to improve project execution. The bi-directional links between the software enable easy sharing of data between different disciplines we've improved efficiency by 100% since implementing Forte 3DWorx and Aspect Pipe Stress."

During the project, Proplant standardized its work processes on the Forte 3DWorx solution suite. The company expects to employ Forte 3DWorx solutions in all its future plant design and pipe stress analysis projects.

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property and assets – for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.