CASE STUDY

Numikon improves Brownfield operational safety and efficiency with Octave Forte 3DWorx and Aspect Pipe Stress

Key facts:

Company: Numikon d.o.o.

Website: https://numikon.com

Industry: Oil & gas

Country: Croatia

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

Key benefits:

- Laser scanning offered major time savings compared to manual surveys
- Laser scanning avoided the need to work at height or near hazardous equipment
- 3D models linked to equipment database and stress analysis software

Identifying goals

Numikon specializes in the calculation and analysis of mechanical, power and process equipment and components, project engineering of process and power plants, pipe stress analysis, pressure vessel design, as well as laser scanning and laser surveying.

Numikon's customer, INA-Industrija nafte d.d., a leading oil exploration, production, refining and marketing company in Croatia, was looking for an efficient solution to create as-built information for their Sisak refinery.

INA d.d. hired a consortium of three companies (Numikon d.o.o., TUV-Croatia d.o.o., KONZALT ING d.o.o.) for the project.

Overcoming challenges

Extensive asset documentation for the refinery existed, but there was uncertainty about how accurate and complete it was. Furthermore, there was insufficient information about the specifications of the piping and exact pipe routings throughout the refinery. This lack of information was highly undesirable for safety, operational and regulatory reasons.

INA decided to have all of the piping in the refinery surveyed to create an accurate and up-to-date 3D model, complete with information about the piping material grades, wall thicknesses, topology, etc. of the pipes, and document all of this on new isometric

drawings. This information could then be used to perform pipe stress analysis on critical pipelines.

The survey had to be undertaken while the refinery was operating. Some of the piping was difficult to access because of its location under ground or because it was insulated. In addition, the work had to be carried out on a tight deadline.

To save time and improve safety, Numikon proposed using:

- Leica Total Station for laser surveying and measurement of the plant
- Forte 3DWorx to create 3D model, isometrics, and data integration

Numikon first analyzed INA's drawing specifications and configured the Isogen component of Forte 3DWorx to ensure that all deliverables met the company's drawing standards and completely fulfilled the customer's requirements.

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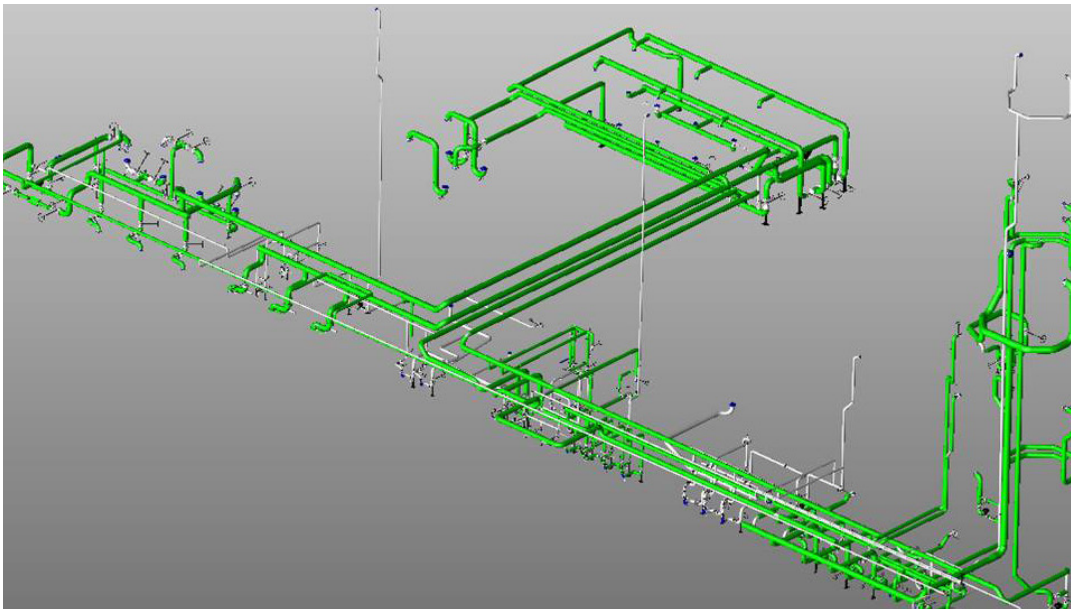
Mario Aníc
Numikon



Realizing results

Numikon surveyed its part of the Sisak refinery in 49 days. Using the laser surveyed data, they created all deliverables required by their client, including:

- 3D models
- Piping isometrics
- Details of piping components (valves, pressure regulators, flanges, supports, etc.)
- Tag and nameplate details
- Details of the equipment and connected piping
- Pipe stress analysis results (including required test pressure) and pipe data (wall thickness, material properties, etc.)

These deliverables enable the owner operator to operate the plant safely and efficiently and comply with all regulatory requirements. The detailed as-built data also greatly facilitates maintenance and plant expansion and modification.

Mario Aníc of Numikon explained, "When we first started using the Leica Total Station and Octave software, the two companies trained our staff. It took them about 10 days to get up to speed and start on their first project. We were particularly impressed by the in-depth knowledge of the Octave and Leica people. On the whole we estimate that our productivity has gone up by as much as 640 percent (six times)! This productivity gain means that we can minimize the on-site project time and maximize efficiency, offering our customers a very attractive package."

Moving forward

Anic continued, "Currently we are the only company in our region to offer this service based on laser surveying and the Octave software in a full package together with non-destructive materials testing, measurement and hardness and thickness testing. That gives us a major advantage in a competitive market.

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.

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