



FACTS AT A GLANCE

Company: Zinfra

Website: www.zinfragroup.com.au

Description: Zinfra, as part of Zinfra Group, is a leading national service provider to the utility infrastructure sectors, delivering a comprehensive range of engineering, operations, maintenance, and construction services within Australia. Services provided by Zinfra include engineering and design, project management, construction, civil, maintenance, and asset operations.

Industry: Mining, Gas, Power, Water

Employees: 1,500

Country: Australia

PRODUCTS USED

- CAESAR II®

KEY BENEFITS

- Easy to use
- High level of detail, functionality, and sophistication
- Automated code compliance processes

ZINFRA UTILIZES CAESAR II® FOR DETAILED MINE SUBSIDENCE ANALYSIS

Leading pipe stress analysis package helps design out future threats to pipeline

IDENTIFYING GOALS

Zinfra is a leading provider of engineering, operations, maintenance, and construction services to the utility infrastructure sectors. As part of its full suite of capabilities, Zinfra provides specialty engineering services for buried pipelines, including detailed analysis of the impact of future mine subsidence.

Roughly, mine subsidence can be defined as movement of the surface of the earth as a result of readjustments of the overburden due to the collapse or failure of underground mine workings, typically resulting in either sinkholes or troughs. Mining-induced subsidence can be managed through a combination of planning, preventative action, and repair works.

Zinfra was engaged recently to work on two projects where its mine subsidence expertise came to the fore – one in New South Wales and one in Queensland. Both projects were situated on land that has been earmarked for future mining activity, which will occur underneath each project's respective pipeline. However, analysis also identified that both areas of land were vulnerable to mine subsidence.

OVERCOMING CHALLENGES

Given that prevention plays a major part in the management of mine subsidence, Zinfra identified from the outset that its pipeline analysis would need to be both extremely accurate and highly detailed.

Both projects involved the design and construction of high-pressure pipelines compliant with Australian Standard 2885, which stipulates that the pipeline must be able to withstand future threats. Failure to comply with AS2885-1 can prove costly in the long run – especially if remediation works are required. Such works often involve excavating the pipeline and allowing the ground to move around it. Given that the pipeline has to be exposed while this work occurs, safety of the workforce and community becomes an additional consideration.

REALIZING RESULTS

After an evaluation process that took into consideration the experience of Zinfra employees and contractors, as well as the preferences of several key clients, Intergraph® CAESAR II was selected for the job.

CAESAR II makes it easy to input and display all the data needed to accurately define a piping system analysis model. It evaluates the structural responses and stresses of piping systems to international codes and standards, and enables users to access and modify, if necessary, input element by element or globally.

CAESAR II makes quick work of developing analysis models while clearly indicating areas of concern via color-coded stress models and animated displacements for any stress load case. Included are tools and wizards to help create expansion loops or view plant models, removing the guesswork from producing accurate analysis and recommending practical design changes.

According to Zinfra's Engineering Manager, Andrew O'Neill, it was crucial to "get things right" during the design phase of both mine subsidence projects, and CAESAR II was more than up to the task.

"CAESAR II's level of detail, functionality, and sophistication are integral to the successful completion of the design for both projects," said O'Neill. "The automated code compliance features were particularly useful, and saved us an immense amount of time in the analysis phase."

Beyond mine subsidence analysis, Zinfra continues to develop its capabilities around overall pipeline design. Therefore, CAESAR II's versatility and ability to handle a range of projects was another major selling point for the company.

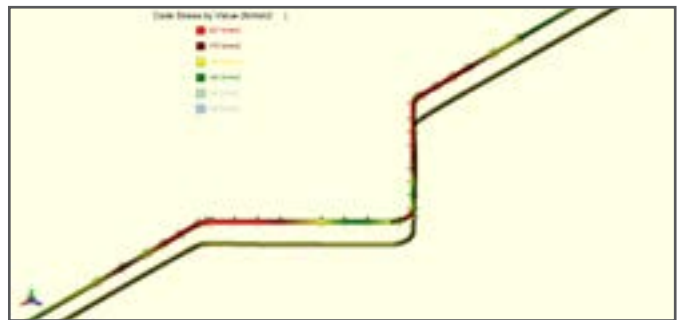
"Our projects involve both above-ground piping and buried pipelines, as well as the transitions between the two," said O'Neill. "We needed a program that can model the stresses that result from those transitions and then create an accurate, detailed model."

"CAESAR II really is the industry standard in pipe stress analysis software, and it provides an extra capability we can provide to our clients. It has become a selling point for us."

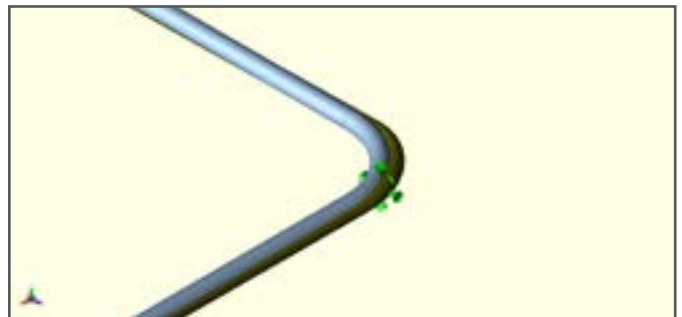
MOVING FORWARD

Zinfra intends to utilize CAESAR II for all projects requiring pipeline design going forward. It is also in the process of evaluating the implementation of CADWorx® Plant Professional, Intergraph's plant design suite for small-to-mid sized projects.

"Given that CADWorx Plant Professional integrates seamlessly with CAESAR II, we are exploring the efficiencies we could deliver for our clients by implementing the two as companion products," said O'Neill.



Stress and deflection on buried pipeline - post subsidence



Thermal expansion on 90Deg buried pipeline bend

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