Leading structural digital twin company Akselos relies on Coreform Cubit to efficiently mesh complex models

To mesh assemblies of thousands of components for highly accurate simulations, Akselos uses the scripting power of Coreform Cubit.

BACKGROUND

Akselos SA is a fast-growing software technology company with offices around the globe, enabling the delivery of structural digital twins for integrity management of large complex assets in operation for leading companies in oil and gas, mining, and green energy production.

> **Our production team has used Coreform Cubit extensively on a daily basis across the team for over five years. We have found Coreform Cubit to be a fully comprehensive, powerful, fast and intuitive meshing tool, which our customers often end up using as well. We have built many plugins to our software that run Coreform Cubit meshes automatically based on Python scripts. Coreform Cubit remains our preferred meshing technology.**

— *Phuong Huynh, Founder and Head of Research & Operation at Akselos*

Akselos simulation models push the boundaries of what modern engineering can achieve, leveraging their patented, advanced, super-fast reduce-basis finite element solver. Astoundingly, Akselos technology can run a model of over 100 million degrees of freedom in as little as ten seconds.

THE PROBLEM

To run accurate simulations of these complete, holistic simulation models requires high-fidelity meshes, and Akselos relies on Coreform Cubit to produce these meshes. Generating these high-fidelity meshes of complex structures is a challenging problem that can be very time and resource intensive.
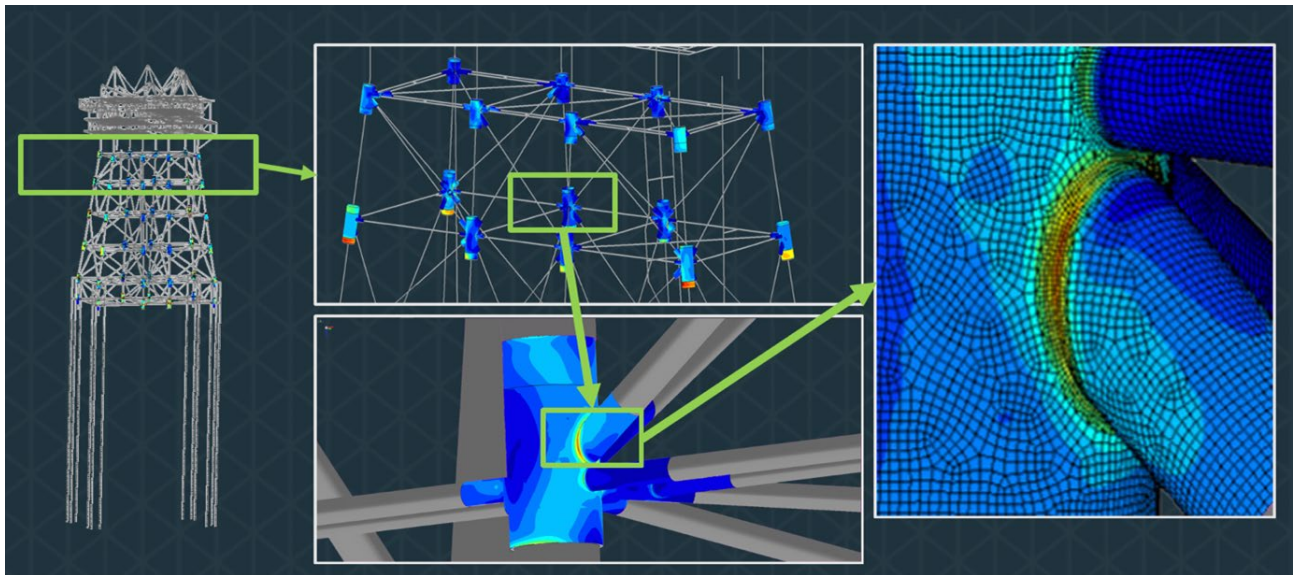

Figure 1: Standards-based meshes at welds in offshore jackets, generated by scripting in Coreform Cubit.

THE SOLUTION

Coreform Cubit provides advanced meshing for challenging simulations.

Akselos uses Coreform Cubit to build models of complete structures such as entire offshore fixed and floating platforms. In fact, Coreform Cubit meshing technology has been Akselos's exclusive choice from the beginning—the company's founders were familiar with Cubit as an award-winning mesh generation tool heavily used for hard problems in academia and U.S. national labs, and found it to be ideally fit for purpose for the creation of digital twin models.

Akselos has used Coreform Cubit's automated scripting capabilities and exacting mesh controls to build many extremely large-scale, high-quality models. Some of these

structures, such as complete oil platforms, wind turbine models and large floating production storage and offloading (FPSO) units, entail models with hundreds of millions of degrees of freedom. Coreform Cubit's power and customizability have ably handled this challenge, so far yielding successful meshes of up to 500 million degrees of freedom.

Akselos cites Coreform Cubit's powerful CAD features for pre-processing activities such as building and defeaturing CAD, along with its easy-to-use, friendly, and scripting capabilities for running batch processing activities as key enablers for its process. Complex structures, made up of thousands of components, are meshed with automated scripts within Coreform Cubit in minutes to hours, then solved within Akselos within seconds.

CONCLUSION

Structural Digital Twins of complex real-world assets are made possible by Akselos solver technology in combination with the power of Coreform Cubit meshing.

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