Ansys

CASE STUDY /

Ansys + Hargrove

"This type of nonlinear analysis is very computationally intensive, so we leveraged our Ansys Cloud solving capabilities to give us a boost we needed in terms of extra cores."

Benjamin Turner
Senior Fixed Equipment Engineer / Hargrove Engineers + Constructors

CASE STUDY

Hargrove Engineers + Constructors Use Ansys Cloud to Extend the Life of a Client's Critical Asset

Calculating the critical buckling pressure of a heat exchanger takes time. And when a heat exchanger is already deformed and corroded inside a chemical plant, every second counts. Hargrove constructs some of the most complex industrial plants, ensuring the safety of all involved. When time was of the essence, Hargrove was able to access more processing power, FAST with Ansys Cloud.

/ Challenges

Hargrove Engineers + Constructors was tasked with performing a Fitness-for-Service (FFS) analysis on a client's process condenser. The condenser, a heat exchanger comprising four different materials and thousands of tubes, experienced corrosion and/or erosion opposite its inlet nozzle. Field ultrasound inspections revealed a thickness below the API- 579/ASME Code minimum allowable thickness for external pressure.

/ Ansys Products Used

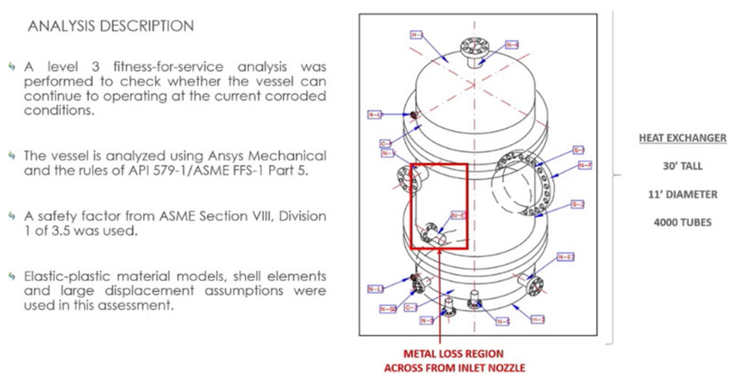
Ansys Mechanical

/ Engineering Solution

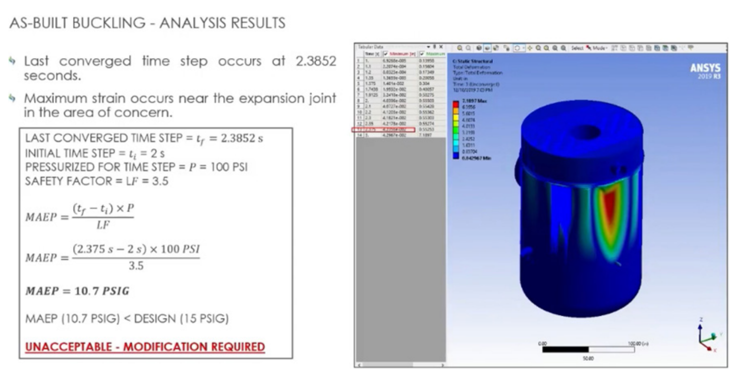
FFS-1 general metal loss level 3 FFS analysis confirmed the existing thickness was inadequate and required corrective action. Elastic plastic materials and large deformation theory was used to assess the maximum external pressure before buckling occurs. Following the FFS analysis powered by Ansys Mechanical Enterprise, engineers at Hargrove recommended a novel addition of stiffener rings without cutting the main pressure membrane. As a result, the designed stiffener rings mitigated the buckling risk by elevating the Maximum Allowable External Pressure (MAEP) above Code minimums.

/ Benefits

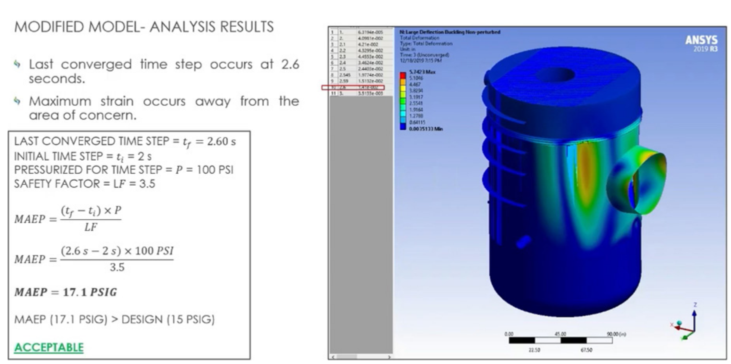
- Leveraging Ansys Cloud's high-performance computing capabilities, Hargrove quickly scaled up their processing power to run simulations faster than ever, significantly reducing the development time and overhead costs.
- The vessel required modification and four stiffening rings were added.
- The product of this analysis provided additional life for the client's asset, mitigated costs associated with significant repairs and/or total replacement and prevented lost production.



Analysis description from Hargrove for their customer



Original model simulated in Ansys Mechanical and Ansys Cloud

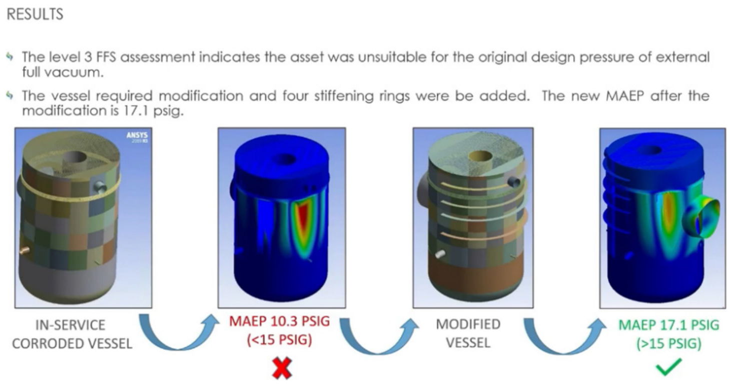


Modified model and simulation in Ansys Cloud

/ Company Description

Design, build and maintain a safe, fully compliant facility with Hargrove. Our firm has innovated sound solutions for the process, manufacturing, and energy industries since 1995.

What we build best are relationships®. We serve clients in long-term support relationships in multiple modes of service: onsite support arrangements, plant-level small projects and consulting roles, and larger capital projects. Everything we do focuses on best practices to ensure safe, efficient and profitable operations with your company's best interest in mind.



Results obtained using Ansys simulations

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