

CASE STUDY

FLUID CODES

 SOFTWARE  SUPPORT  TRAINING  CUSTOMIZATION

CONTACT OUR LOCAL OFFICES

UNITED ARAB EMIRATES +971 4330 8666
SAUDI ARABIA +966 13 8318182
EGYPT +971 4330 8666
BULGARIA +359 88 8813820
UNITED KINGDOM +44 20 3753 4607

 sales@fluidcodes.com
 consulting@fluidcodes.com
 fluidcodes.com

ASSESSING REACTOR TANK INTEGRITY

CHALLENGES

The Customer wanted to investigate the Agitator Blades Failure in one of their reactors for which CFD and FEA analysis were carried out. 3D CAD models of the tank and the agitator rotor blades were generated as per the drawing provided by the client.

ENGINEERING SOLUTION

Initially, the CFD analysis was performed with Lagrangian particle tracking to track solids particles, and rotor interactions are calculated by frozen rotor approximation.

Followed by the CFD analysis, FE Analysis was performed. A Linear static analysis was carried out to predict the stress distribution on the blades and shaft due to fluid loads. Pressure forces acting on the rotor blades were transferred to the FE analysis.

The study consisted of three scenarios of differing blade positions to ascertain the flow conditions and deduct the worst case scenario. The results exactly predicted the failure location and design modifications were suggested for the operating conditions.

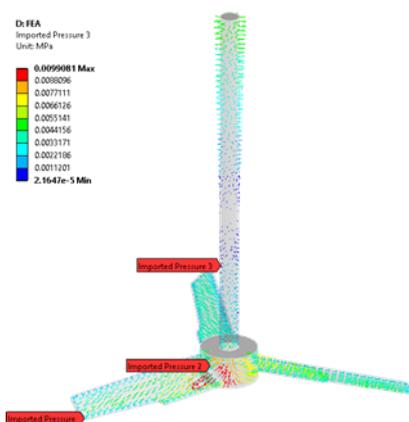


Figure 1. Imported Pressure distribution from CFD

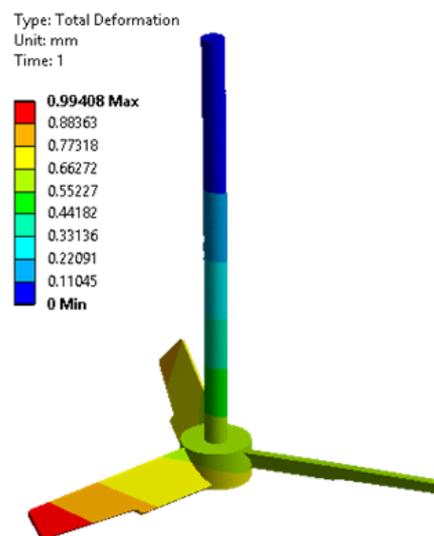


Figure 2. Deformation plot of Rotor Blades

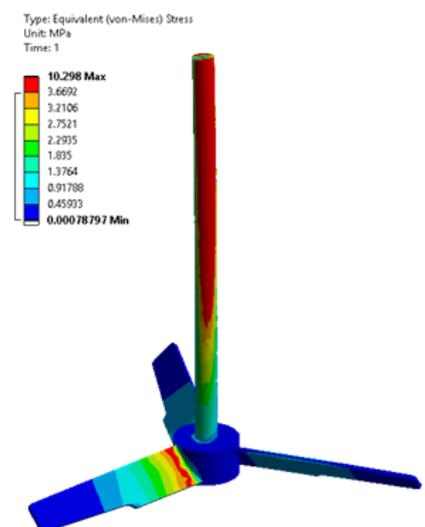


Figure 3. Stress contour plot of Rotor Blades