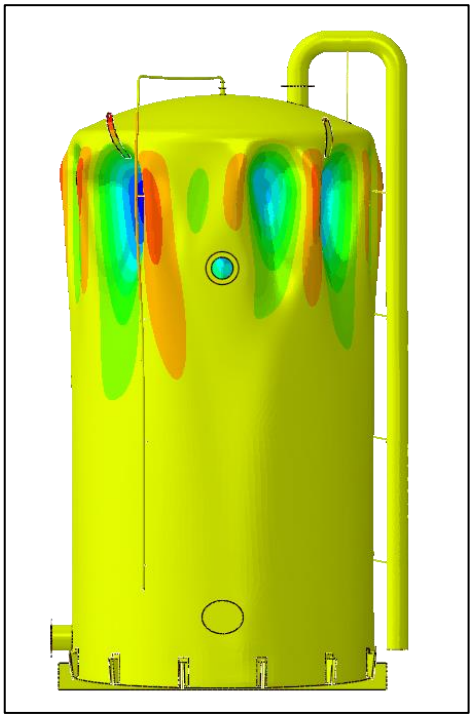
CAPABILITY PROFILE

Materials and Analytical Modeling

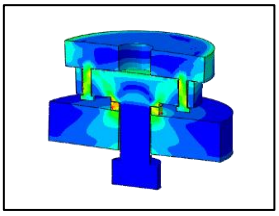


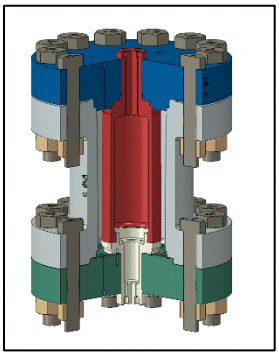
- Applications
  - Condition assessment
  - Retrofit and repair design analysis
  - Failure analysis
  - Fitness for service
  - Litigation support
- Markets
  - Industrial
  - Commercial
  - Transportation
  - Residential

WJE professionals have decades of experience providing advanced materials and analytical modeling services for all types of new and existing structures, including pressure-containing equipment. Our clients seek advanced analytical solutions in a wide variety of applications—condition assessment, forensic investigation, failure analysis, and retrofit design for complex systems—where traditional engineering methods are not as suitable. Our state-of-the-art Janney Technical Center laboratories enable our team to conduct materials testing to supplement and validate our analytical models.

The choice of analysis methodology depends on the goal of analysis and the level of error in the system's response that can be tolerated. Our advanced materials and analytical modeling services include:

- Strength assessment of existing systems that exhibit damage and/or failure
- Root cause analysis of a system failure by modeling complex failure sequences
- True materials behavior simulation (e.g., elastoplastic, viscoelasticity, plasticity with damage, hyper-elastic)
- Simulating coupled physical phenomena (e.g., temperature induced stresses with creep, fluid-structure interactions)
- Modeling nonlinear behavior of reinforced concrete structures
- High-speed dynamic events (e.g., modeling impact and impulse)
- Fracture mechanics and fitness for service
- Systems involving complex contact interactions or involving intermittent contact between components
- Transient thermal analysis





WJE ENGINEERS ARCHITECTS MATERIALS SCIENTISTS