



#### EDUCATION

- University of Minnesota
  - Bachelor of Science, Civil Engineering, 2002
  - Master of Science, Civil Engineering, 2004
- Purdue University
  - Doctor of Philosophy, Civil Engineering, 2008

#### PRACTICE AREAS

- Engineering Criticality Assessment (Fatigue and Fracture Mechanics)
- Component and Performance Evaluation Testing
- Finite Element Analysis
- Fitness for Service
- Peer Review
- Repair and Rehabilitation

#### REGISTRATIONS

- Professional Engineer in FL, IA, ID, IL, IN, KS, KY, MD, ME, MI, MN, MO, MT, NC, ND, NE, NJ, NV, NY, OH, SC, SD, TX, VA, WI, and WV

#### PROFESSIONAL AFFILIATIONS

- American Society of Civil Engineers
- American Society of Mechanical Engineers
- ASTM International
  - Committee E08 Voting Member
  - Committee F16 Voting Member

#### CONTACT

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#### EXPERIENCE

Steven Altstadt's primary interest is in the strength and behavior of metals, with a specialization in fatigue and fracture. He has conducted a wide variety of analyses using finite element analysis, classical methods, industry design codes, and recommended practices. Dr. Altstadt's past work has included extreme event strength assessments, extreme event strain-based assessments, defect acceptance criteria, fatigue life predictions, experimental testing, and field monitoring programs. He has conducted large-scale test programs for welded and bolted connections in structural components and pressurized components. Dr. Altstadt has experience with using API 579, BS 7910, ABAQUS finite element software, special purpose fracture mechanics software programs, classical methods, and design documents (e.g., API, ASME, AISC, AASHTO, AWWA, BS, DNV) to calculate defect acceptance criteria, material requirements, remaining fatigue lives, strength, and ductility.

Dr. Altstadt's graduate work focused on the fracture of TMCP and traditional low-alloy steel-plate structures. He has been using ABAQUS since 2002. He has been involved in large-scale testing since 2000 and has published papers in various engineering journals and conference proceedings.

#### REPRESENTATIVE PROJECTS

##### Engineering Criticality Assessment - Alternative Weld Defect Acceptance Criteria by Engineering Critical Assessment

- Past project experience includes subsea pipelines, onshore pipelines, jumpers, risers, downhole tubulars, hulls, fixed offshore structures, pressure vessels, piping, tanks, mooring equipment, and chain
- Failure assessment diagram and nonlinear finite element-based methods
- Experience spans conventional stress-based assessments through strain-based assessments
- Corrosion fatigue and aggressive environments

#### Component and Performance

##### Evaluation Testing

- High-cycle and low-cyclic fatigue of various welded joints
- Strength testing of welded and mechanically fastened joints
- Burst testing of pressurized components
- Strain-based pipe testing
- Full-scale testing of stiffened panels, truss structures, and beams
- Rotating machinery

##### Finite Element Analysis

- Elastic analysis for design code-based fatigue and strength requirements
- Nonlinear fracture mechanics and material failure
- Elastic-plastic and large deformation analysis for various extreme events
- Concrete structures
- Polymer structures

##### Fitness for Service

- Assessments of in-service degradation of metal components due to cracking, corrosion wall loss, extreme events, and third-party impact
- Worked with clients to assess risks and develop risk-based inspection programs
- Planning and execution of field monitoring programs

##### Peer Review

- Client's technical representative for independent assessment of contractor's design analyses and ECA-based defect acceptance criteria
- Client's representative for independent review of third-party fitness for service assessments
- Client's representative for evaluating new products and technologies
- Litigation expert witness

##### Repair and Rehabilitation

- Sleeves and clamps for pipelines and various pressurized equipment
- Bolted and weld connections for onshore and offshore structures