PERSONNEL QUALIFICATIONS

Robert W. Warke | Associate Principal

EDUCATION

- LeTourneau University
  - Bachelor of Science, Welding Engineering, 1986
- Illinois Institute of Technology
  - Master of Science, Metallurgical and Materials Engineering, 1994

PRACTICE AREAS

- Failure/Damage Investigations
- Engineering Critical Assessment
- Fatigue Analysis
- Metallurgical Evaluation
- Welding and Weld Repair
- Ferrous Heat Treatment
- Litigation Consulting
- Database Design for Engineering Applications

REGISTRATIONS

- Professional Engineer in TX

PROFESSIONAL AFFILIATIONS

- American Welding Society
- ASM International
- The Minerals, Metals & Materials Society (TMS)

TECHNICAL COMMITTEES

- ASM Failure Analysis Society
- AWS Welding Handbook Committee – First Vice Chair
- TMS Professional Registration Committee

CONTACT

rwarke@wje.com
847.272.7400 (main)
847.753.6349 (direct)
832.929.5170 (mobile)
www.wje.com

EXPERIENCE

Robert Warke joined WJE in 2017 with a diverse, thirty-year background in industry and industrial consulting, forensic investigation, applied research and development, and engineering education. He is a metallurgical generalist but has particular expertise in the analysis, diagnosis, prediction, and prevention of failure and in the physical and welding metallurgy of ferritic and austenitic steels. Mr. Warke also has significant experience in the fatigue and fracture analysis of welded and other structures and components and in the application of probabilistic methods to the assessment of fitness for service.

Mr. Warke's experience spans a variety of industries including oil and natural gas production, processing, storage, and transmission; railroads, rail cars, and locomotives; agricultural, construction, and mining equipment; automotive and military vehicles; aircraft; building, bridge, and ship structures; metal ore processing; steel mills and foundries; fossil fuel and nuclear power plants; building materials, pulp and paper, chemical, gas liquefaction, and food production facilities.

Mr. Warke has been an active member of his technical community, having served on a variety of technical committees, authored or coauthored sixteen papers and two handbook chapters, and given numerous conference presentations and seminars. As a full-time professor at LeTourneau University, he taught courses and supervised research and design projects in materials and welding engineering and served as faculty advisor to the joint AWS/ASM/TMS student chapter.

REPRESENTATIVE PROJECTS

Failure/Damage Investigations

- Multistory Parking Structure - KY: Weld-related cracking in double-tee beam flange connectors
- Solar Farm - TX: Weld-related cracking in solar panel mast foundation hubs
- Coal-Fired Power Plant - TX: Catastrophic failure of boiler exhaust gas recirculation fan*
- Nuclear Power Plant - OH: Extensive cracking in multiple cooling water pump impellers, forcing plant shutdown*
- Building Products Manufacturer - TX: Structural failure of inlet dampers in ductwork feeding OSB chip dryer*
- Automotive Component Supplier - UT: Weld-related fracture of inflator housings during airbag deployment tests*
- Oil Sands Bitumen Upgrader - AB, Canada: Girth weld cracking in heavy-wall hydrotreater vessel*
- Liquefied Natural Gas Plant - Indonesia: Cracking at LNG compressor impeller blade attachment welds*
- US Air Force: Evaluation of cracks found in teardown inspection of 1950s-era trainer*

Engineering Critical Assessment

- Pipeline Owner/Operator - TX: Fracture assessment and rupture testing of hard spots in 1950s-era gas transmission lines*
- Public Utilities - CA: Probabilistic fracture and plastic collapse assessments of 1930s-era gas transmission pipelines subject to seismic deformation and slope instability*
- Pipeline Research Council Int'l (PRCI): Partial safety factors and methods for assessing reliability of flawed girth welds subject to ground movement hazards*
- PRCI: FAD-based method for assessing reliability of segments containing flawed girth welds with strength mismatch*
- PRCI: Confidence-based optimal sampling frequencies for assessing girth weld reliability in long pipeline segments*
- Gas Research Institute: Metallurgical evaluation of mechanically damaged pipes for enhanced assessment criteria*

Fatigue Analysis

- Oilfield Equipment Manufacturer - TX: Stress-life analysis of slip bowl design for workover rig*
- Nuclear Power Plant - TX: Crack growth analysis of welded pipe hanger failures*
- Vehicle Safety Systems Manufacturer - AZ: Cyclic testing and crack growth analysis of friction welds in airbag inflator*
- Military Contractor - MI: Variable-amplitude fatigue analysis of hull corner joints in armored personnel carrier*
- Municipal Recycling Station - CA: Fatigue analysis and life extension of refuse-sorting trommels*
- RPI/AAR: Characterization of cracking in rail tank car stub sill weldments to calibrate fleet life management system*

**Prior to WJE employment*