MATTHEW T. EDEL, P.E.

Senior Principal Engineer

BAKER ENGINEERING AND RISK CONSULTANTS, INC.

San Antonio

Education:

B.S., Civil Engineering, Texas A&M University

M.S., Civil Engineering, Texas A&M University

Areas of Practice:

Mr. Edel works at BakerRisk's San Antonio office in the Protective Structures Section. His work focuses on impulsive and conventional loading of structures for industrial and government applications. This has primarily included analysis and design of new and existing buildings, blast-resistant upgrade designs, explosive test containment enclosures, and federal building and airport evaluations and site planning. He has performed siting studies for various petrochemical plants to determine the response of structural components and systems to blast loads.

Experience:

- Test enclosure evaluations and designs for protection from projectiles, blast loads, and other hazards:
  - Work conducted for oilfield services companies, DOE facilities, airbag manufacturers, explosives handling facilities, industrial gas manufacturers, and heat exchanger organizations by modeling hazardous impacts on structures.
  - Assisted in the organization and management of the Pressure Testing Research Cooperative, a Joint Industry Program offered to organizations dealing with potential hazards from pressurized items. This research cooperative is comprised of several oilfield equipment companies for the purpose of investigating various aspects of pressure testing hazards and has included experimental testing at BakerRisk's test facilities to simulate accidental tool failures to observe and record blast loads and projectile characteristics.
- Evaluated various types of buildings and structures for response to blast loads. Developed upgrade concepts and final detailed retrofit designs to enhance blast capacity of buildings.
- Initial developer of the structural analysis tool used at BakerRisk (ISADS), which involves detailed nonlinear single degree of freedom (SDOF) modeling of structures subjected to dynamic loadings.
- Assisted with several refinery and chemical processing facility accident investigations.
  - Observed/measured structural component damage from blast loading to use as damage indicators. Estimates/ conclusions for source/nature of explosive events led to litigation support. Supported evidence collection during site investigation.
- Analyzed federal and embassy buildings, airports, and courthouses. Developed design guidelines per FAA security criteria for terrorism protection following 9/11.
- Finite element analysis (FEA) modeling using programs such as ADINA and DYNA-3D:
  - Programs model frame sway blast response of multi-story buildings with several bays of framing.
  - Some FEA modeling applications have included large storage tanks that sustain internal pressurizations and explosion loadings, curtain walls subjected to external blast loads, bridge suspension cable sockets subjected to thermal loads, and blast-resistant modular steel buildings. These models have included nonlinear material models and transient structural responses.
- Provided training to the engineering community of blast resistant design and pressure testing hazard evaluations.
- Research at Texas A&M University focused on the effects of temperature on the bending strength of architectural laminated glass.
  - Efforts involved testing of laminated glass beams at varying temperatures and development of FEA model used as the basis for development of a new approach for laminated glass design.

Professional Chronology:

Texas A&M University, Department of Civil Engineering (Teaching Assistant, 1996-1997); Baker Engineering and Risk Consultants, Inc. (Senior Principal Engineer, 1997-present).

Professional Registrations & Certifications:

Professional Engineer (Alabama, Kansas, Louisiana, Montana, Ohio, Pennsylvania, Texas, and U.S. Virgin Islands – Civil); Certified Fire and Explosion Investigator (CFEI)

Professional Memberships:

American Society of Civil Engineers (ASCE); American Society of Mechanical Engineers (ASME); National Association of Fire Investigators (NAFI)

Committee Memberships:

ASME Post Construction Committee PCC-3: Inspection Planning Using Risk-Based Methods (Member)
ASME Post Construction Committee PCC-2: Repair of Pressure Equipment and Piping (Member)