



**QUENTIN A. BAKER, P.E.**  
**President**  
**BAKER ENGINEERING AND RISK CONSULTANTS, INC.**

**Education:**

**B.S., Mechanical Engineering, Texas A&M University**  
**M.B.A., University of Texas at San Antonio**

**Areas of Practice:**

Mr. Baker's career has focused on explosion and combustion phenomena. He has conducted numerous R&D projects, hazards analyses, and engineering studies involving airblast effects from a wide variety of explosion sources, blast loads, fragmentation effects, debris throw, blast damage, and personnel injury. Injury prediction and risk analysis have also been the subject of Mr. Baker's research; he has contributed to the development of a building occupant vulnerability model.

**Experience:**

- Mr. Baker's experience with explosion phenomena includes experimentation with high explosives. He conducted a R&D program to develop a distributed explosives system to neutralize landmines, testing the system both on land and in shallow water to investigate blast output and sympathetic detonation of an acceptor charge. He also conducted tests to study shaped charge initiation of cased acceptor charges from long standoffs, with the acceptor charges positioned above ground and buried.
- Researched airblast propagation through openings into buildings and designed and tested passive devices to protect ventilation systems, which resulted in a patented design.
- Contributed to the design of a vapor cloud explosion test apparatus and participated in vapor cloud explosion tests.
- Developed shock tubes to simulate the blast loading from very large explosive charges and vapor cloud explosions. He subsequently tested glass/glazing systems to protect building occupants from glass fragments from vapor cloud explosion threats.
- Worked on numerous facility siting, safety analysis review, consequence analysis, explosion hazard analysis and blast-resistant structural design projects during which he predicted internal and external blast loads. The blast sources have included high explosives, runaway chemical reactions, dust explosions, electrical arc, vapor clouds, bursting pressure vessels, and propellants. He has predicted fragment size, velocity, and throw for bursting pressure vessels and cased explosives.
- Inspected numerous petrochemical plants, specialty chemical plants, refineries, offshore platform, and other industrial facilities, identified explosion hazards and developed explosion scenarios. He has conducted facility-wide risk analyses to predict the risk to personnel from potential explosion hazards.
- Investigated over 120 accidental explosions, both domestic and international, to determine the number and magnitude of explosions, their locations on the site, and probable causes of initiation of each explosion. These accidents include internal and external vapor cloud explosions at refineries, chemical plants, offshore platforms, oil/gas wells, industrial facilities, and houses; an ammonium-perchlorate plant explosion; an electrical arc in a rail-gun research laboratory; runaway reactions in reactors, pipes and tanks resulting in vessel burst and fragmentation including an ethylene oxide reactor, a waste products mixing tank, an agricultural products settling tank, ammonium nitrate reactor, a loop reactor, a fertilizer pump, and a pressure relief valve; large power generation boiler explosions; BLEVEs of rail cars and process vessels; and dust explosions in food processing, grain, rubber recycling, foundry, and rubber compounding facilities.
- Designed and conducted tests to evaluate scenarios during incident investigations, and to evaluate functionality or performance of equipment recovered from incident sites. He has developed numerous protocols for inspections and tests of evidence in-situ and in laboratories, and facilitated the execution of numerous protocols in cooperation with government and private investigators.
- He has provided incident investigation training to private industry and government personnel, and has led short course instruction in blast and fragmentation effects.



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- Managed a number of projects to develop computer programs to calculate the blast loads on structures from high explosive, vapor cloud explosion, and bursting pressure vessel sources considering ground reflection, Mach stem formation, and receptor structure orientation. He was involved in the development of a computational fluid dynamics model to predict bursting pressure vessel and vapor cloud explosion blast parameters, and with the use of this code, developed blast curves for both classes of explosions.

**Professional Chronology:**

Southwest Research Institute, 1978-1987; Baker Engineering and Risk Consultants, Inc., 1987- present

**Professional Registrations/Certifications:**

- Registered Professional Engineer (Texas, Delaware, Virgin Islands)
- Certified Fire and Explosion Investigator (CFEI)
- Certified Fire Investigation Instructor (CFII)

**Professional Memberships:**

- American Society of Mechanical Engineers (ASME)
- American Institute of Chemical Engineers (AIChE)
- National Fire Protection Association (NFPA)
- National Association of Fire Investigators (NAFI)
- National/Texas Society of Professional Engineers (NSPE, TSPE)

**Current Committee Memberships:**

- NFPA 921, Guidelines for Fire and Explosion Investigations
- Mechanical Engineering Department Industry Advisory Council, Texas A&M University

**Past Committee Memberships:**

- API Facility Siting Task Force
- CCPS Vapor Cloud Explosion Committee
- ACI Committee 370, Short Duration Dynamic and Vibratory Load Effects