



J. ROGER CRADDOCK, P.E.
PRINCIPAL ENGINEER

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Roger Craddock holds a B.S. in Civil Engineering from the Virginia Military Institute (VMI) and has practiced engineering for over 55 years. A registered Professional Engineer (P.E.) in multiple states, Mr. Craddock specializes in failure analysis and accident investigation in matters involving; petrochemical, natural gas and propane facilities, petroleum refineries, oil field and pipeline operations, marine and offshore structures, and heavy construction.

Combined with a special interest in fires and explosions, combustion and gas mechanics, controls, piping, and process equipment, he offers extensive experience in the design and implementation of specialized testing programs involving fires, explosions and combustion related matters, and was an early participant in the use of video and technical computer graphics for legal presentations.

Prior to joining ESI, Mr. Craddock was the President, and later, Vice Chairman of an engineering company which he founded in 1979 and subsequently sold in 1990. With over 40 years of experience in this industry, he has been involved in the investigation of over a thousand incidents that include a number of the largest fires and explosions within the United States during that time. He has also consulted in matters internationally and lectured before a wide range of professional organizations.

Areas of Specialization

Petrochemical and Marine Structures
Refineries
Heavy Equipment
Fires and Explosions
Construction
Structures
Mechanical systems
Oil Field and Pipeline

Education

B.S. Civil Engineering, Virginia Military Institute, Lexington, Virginia, 1963

May 2022



Licensed Professional Engineer (P.E.)

State of Texas.....License No. 46609
State of Alabama..... License No. 9239
State of Georgia.....License No. 9227
State of Kentucky.....License No. 8487
State of Louisiana..... License No. E-21581
State of S. Carolina... License No. 5526
State of W. Virginia... License No. 6507

Professional Affiliations/Honors

National Fire Protection Association (NFPA)

Member

American Society of Civil Engineers (ASCE)

Member

American Society of Nondestructive Testing (ASNT)

Member

American Society for Testing and Materials (ASTM)

Member

American Welding Society (AWS)

Member

National Association of Corrosion Engineers (NACE)

Member

National Society of Professional Engineers (NSPE)

Member

Texas Society of Professional Engineers (TSPE)

Member

American Concrete Institute (ACI)

Member

Positions Held

Engineering Systems Inc., Houston, TX

Principal, 1998 – Present

EFI (CH&A Corporation), Kingwood, TX

President/Consulting Engineer - Vice Chairman /Consulting Engineer, 1979-1998

Versitech Corporation, Atlanta, GA

President/Principal/Consulting Engineer, 1976-1979

Systems Engineering Associates, Columbus, OH and Atlanta, GA

Vice President/Principal/Senior Engineer, 1972-1976

Law Engineering Testing Company, Washington, DC

Senior Materials Engineer, 1971-1972

Columbus Testing Laboratory, Columbus, OH

Senior Materials Engineer, 1970-1971

Law Engineering Testing Company, Birmingham, AL

Materials Engineer, 1967-1970

E.I. DuPont de Nemours & Co, Brevard, NC

Construction Engineer, 1966-1967

United States Army, Europe

Officer/Corps of Engineers, 1964-1966

E.I. DuPont de Nemours & Co, Circleville, OH

Plant Engineer, 1963-1964

Publications/Presentations

"A Practical Look at Soil Penetrabilities of Odorant Compounds," a paper presented at the American Gas Association Claims Committees meeting, Boston, October 1977.

"Testing the Strength of BUR membranes," RSI, August 1975 (with D.A. Guenther).

Summary of Research

Developed numerous fire tests involving a wide range of materials and equipment to include appliances, water heaters, furnaces, furniture, and various combustible materials.

Developed flammable vapor dispersion testing programs.

Developed numerous carbon monoxide testing programs for gas fired appliances.

Studied mixing characteristics of natural gas and air under flow conditions for purging of new pipeline.

Performed programs to determine reactions of odorants for propane and natural gas to "scrubbing" by various soils.

Designed and operated odorant test facility for testing of reactions of Tetrahydrothiophene (THT) in natural gas to "new" steel pipe under static and flow conditions.

Performed program for testing of Dimethyl Sulfide (DMS) and Tert-Butyl Mercaptan (TBM) odorants for reactions with "new" steel pipe under static and flow conditions.

Performed program for testing of Ethyl Mercaptan to determine reaction with "new" steel pipe and containers under static and flow conditions.

Studied and developed trace techniques for determination of gas odorant residuals.

Developed piezometer usage techniques to study hydrocarbon dispersion in soils.

Developed a number of testing techniques for the evaluation of insitu roof membranes to known standards.

Mr. Craddock has worked on numerous national fires and explosions involving structures, gas and oil production facilities, refineries and petrochemical plants. These incidents include the following:

Phillips Polyethylene Unit Explosion of October 1989 near Pasadena, TX that killed 23 people and caused approximately \$1 billion in damage. Headed investigative expert team representing Phillips.

Pepcon Ammonium Perchlorate Plant Explosion in Henderson, NV in May 1988. Explosion resulted in total destruction of plant and over \$150 million in property loss. Headed investigative team representing Southwest Gas to determine cause and origin.

MGM Grand Hotel Fire that resulted in 85 deaths and over \$100 million in property damage. Worked as lead engineer/investigator concerning fire and smoke spread for a primary defendant.

Marathon Oil East Cameron EC321 Oil/Gas Production Platform Fire. \$100 million loss in Gulf of Mexico. Worked as lead engineer on investigation for Texas Eastern Corporation.

Arco Oil & Gas South Pass Baker Platform Fire in the Gulf of Mexico. \$300 million fire destroyed platform and caused multiple deaths. Worked as head engineer in fire cause and origin for Arco.

Arco Chemical Tank Explosion in July 1990. Large multi-million dollar loss with multiple deaths in Channelview, TX. Worked as a primary lead investigator/engineer on cause of loss.

IMC Nitro Paraffins Plant Explosion in Sterlington, LA in May 1991. Multiple deaths with \$100 million property loss. Headed initial investigative team on behalf of IMC.

Texas City Refining Alky Feed Unit Explosion in 1979. Multiple deaths and large property loss. Worked as engineering expert in the cause of this incident

Delta Storage Salt Dome Blowout in Dragon, MS in 1986. Blowout of salt dome storage cavern released large quantity (50,000 brls +) of partially refined hydrocarbon feed stock. Large fire resulted in destruction of gas and liquid storage/loading facilities. Represented Enterprise Products and headed expert team to determine cause.

Inverness Hotel Fire in Hamilton, Bermuda. Large property loss involving gas fired equipment. Represented Bermuda Gas & Utility as an expert engineer for the investigation and testimony.

Warren Petroleum Hydrocarbon Storage & Transportation Explosion & Fire in Mt. Belvieu, TX. Large fire and explosion resulting in multiple deaths and large property loss. Served as expert engineer for investigation of cause.

Archem Corporation Batch Reactor Explosion & Fire in Pasadena, TX. Large explosion from run-away exothermic reaction caused large property loss and operator death. Served as expert engineer for investigation of cause.

Rohm Haas Batch Reactor Flash Fire in Pasadena, TX. Multiple injuries and fire damage to process reactor. Investigated cause of loss as expert engineer.

Dow Chemical Polyethylene Reactor Explosion in Freeport, TX. Caused multiple deaths and large property loss. Served as expert engineer to determine cause of incident.

Rhodia Chemical Plant Batch Reactor Explosion in Freeport, TX. Caused multiple deaths and large property loss. Served as expert engineer to determine cause of incident.

Amoco Oil Refinery Oil Tank Explosion & Fire in Texas City, TX. Multiple deaths and large property loss. Worked as expert engineer to determine cause.

Amoco Oil Refinery Coker Unit Fire in Texas City, TX. Resulted in multiple injuries and large property loss. Worked as expert engineer to determine cause.

Conoco Refinery Fire in Lake Charles, LA. Multiple deaths and injuries and significant property loss. Worked as expert engineer to determine cause.

Oasis Pipeline Natural Gas Transmission Line Compressor Station Fire, in Ozona, TX. Fire destroyed compressor station causing large property loss. Worked as expert engineer to determine cause.

Shell Chemical Plant Explosion, in Belpre, OH. Batch reactor explosion destroyed large section of plant, causing several deaths and large property loss. Large fire caused environmental problems from run-off into Ohio River and airborne emissions from styrene smoke.

BP Texas City Refinery Explosion and Fire, in Texas City, TX in 2005 that killed 15 people and multiple injuries as well as extensive property damage. Headed investigative expert team representing BP.