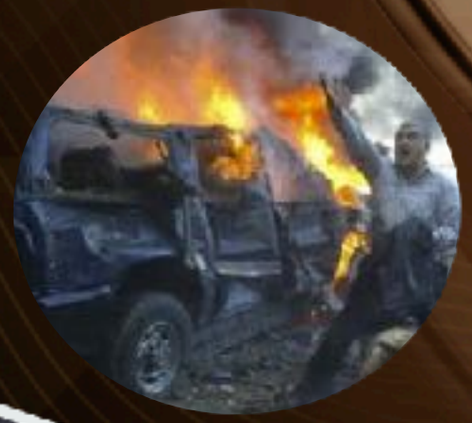
CANNEY BROOK FORENSIC ENGINEERS

R. CRAIG WILLIAMS, PE CFEI CFI



SELECTING YOUR EXPERT
WHEN, WHY, HOW, AND WHO

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R. CRAIG WILLIAMS PE CFEI CFII

- Licensed Professional Engineer, PE Mechanical & HVAC (Year of Licensing 1981)
- BS Mechanical Engineering
  - Thermodynamics, Heat Transfer, Fluid Dynamics, Materials Science
- MS Architectural Engineering
  - Convection, Conduction, Radiation, Boiling and Condensation, & Numerical Methods
  - HVAC, Acoustics, Lighting, Building Systems
- PhD (abd) International Business – Finance, Strategy
- 27+ Years PE -- Research, Design, Specification, Operations & Maintenance
  - Mechanical, HVAC, Materials, Electrical, Machinery, Heavy Equipment, Combustion, Boilers, Buildings, Heat Transfer and Fluid Dynamics
- 9 Years PE -- Forensic Engineering Expert
- Certified Fire and Explosion Investigator & Instructor

WHY EMPLOY AN EXPERT

- Involved in a competition (game) to determine liability and the funding/compensation for the loss or injury.
- An expert is necessary to preserve and protect the interests of the insured and the insurer.
- The expert is responsible to provide an accurate analysis and defendable opinions which may be advanced in the client's interest.
- Minimize bad outcomes

EXPERT LICENSURE

- Mass law requires persons who investigate insurance losses or who provide investigative information in arbitration or to court proceedings be licensed
  - Adjusters, Attorneys, CPA's, etc.
  - Private Investigators (& assistants)
  - Licensed Trade Professionals
  - Professional Engineers, Architects, Surveyors
- Is employing non-licensed investigators negligence?
- Does employing competent licensed professionals matter?
- Is your investigator properly licensed? Do you know?
- Is your investigator an "expert" in area assigned?

EXPERT COMPETENCIES

- Is your expert competent? Do do you know?
- Did you validate the required competencies?
  - License relied to employ ? PI or PE
  - PI – competencies generally public sector experience
  - PE - Licensed competency – mech, elec, struct, fp, H&V
    - Always verify practice outside licensed competencies (specific demonstrated consulting and manufacturing design & operations)
  - Years licensed practice – consulting & manufacturing ?
  - Years of practice prior to becoming an expert ?

GAME THEORY – GOALS AND PAYOFFS

- Investigation of Losses = Playing a Game
- We Organize the investigation game into players, their strategies, their goals, and their payoffs.
- Need to determine what our goals are before making choices.
- With some plausible payoffs, our game is a prisoner's dilemma.
- We learn never to choose a dominated strategy – but rational play by rational players can result in bad outcomes.

INVESTIGATION COORDINATION PROBLEM

- Very different outcomes are possible with same evidence
  - Different payoffs matter
- Need to not only consider our own payoffs, but those of others
  - Need to put oneself in the others shoes to predict what they will do.
- Essence of “Strategic Thinking”
  - Experts Matter

TYPES OF GAMES

- Cooperative and Non-cooperative Games
- Simultaneous and Sequential Games
- Constant Sum zero sum, and non-zero sum games
- Symmetric and Asymmetric Games

COOPERATIVE AND NON-COOPERATIVE GAMES

- Cooperative – players adopt a particular strategy through negotiations and agreement between players .
  - Every player wins or loses together

- Non-cooperative – players develop strategies to maximize their own outcomes.
  - Non-cooperative games tend toward accurate results.

SIMULTANEOUS MOVE GAMES
SEQUENTIAL MOVE GAMES

- Simultaneous Move Games
  - Players adopt a strategy- move and act simultaneous without knowledge of the others moves.
- Sequential Move Games
  - Players have deep knowledge of the strategies of other players.

CONSTANT SUM, ZERO SUM, AND NON-ZERO SUM GAMES

- Constant sum – Zero Sum – causality losses
  - Total outcome of all players is constant
  - Individual outcomes different
  - Players cannot affect available resources
  - One players loss is equal to another players gain
- Non-Zero Sum
  - Outcomes are dynamic – total payoffs are variable (liability cases)

SYMMETRIC AND ASYMMETRIC GAMES

- Symmetric Games
  - Strategies adopted by all players are the same
  - Can only occur in short term
  - Players have adopted a dominated strategy

- Asymmetric Games
  - Adopted Strategies are Different
  - Strategy adopted by one player may not benefit other players

WHEN TO EMPLOY EXPERT

- Immediately upon determining the required competencies
- Immediately upon determining additional competencies are required.
- Employ an “Expert” capable of competing with other experts to protect your interests, advance your interests, and dispel invalid claims.
- Expert must provide accurate, defendable, scientific opinions.

HOW TO SELECT YOUR EXPERT SYSTEMATIC APPROACH

- Selection of experts requires the attorney or insurance professional to adopt a systematic approach to employing their expert.
- Use of an analytical process to define the loss event.
- Once required competency parameters are determined the process of selection can proceed.

HOW TO SELECT YOUR EXPERT CONT.

- Define the Loss Event & Level of Exposure
- Identify the Scope of the Event
- Identify Critical Elements (Building, Equipment, Machinery etc.)
- Identify Required Competencies
- Predict Actions of Other Players
- Develop a Dominate Strategy

FIRE INVESTIGATIONS

- Scope and Scale of Loss or Liability
- Complexity of Loss or Liability
- Electrical & Mechanical Equipment Involved
- Installation, Operational & Maintenance Actions
- Number of Interests & Parties
- Skill Sets Required to Investigate and Litigate
- Private Investigator or Professional Engineer

TYPES OF INVESTIGATORS

- Private Investigators – Often Fire Investigators
- Licensed Trades Persons – Plumbers, Gas Fitters, Electricians. Often for Assistance and Fact Witnesses
- Professional Engineers – Fire Investigations, Mechanical, HVAC, Electrical, Machinery, Materials & Structural Experts.
- Other Licensed Professionals

PART 1 TITLE XX CHAPTER 147 SECTION 22 DEFINITIONS

- ''Private detective'' “private investigator” … including any person who, for hire, fee, reward or other consideration, ….(2) engages in the business of making investigations for the purpose of obtaining information with reference to any of the following matters, ... or other persons who are employed to assist in making such investigations:
- (c) Libels, fires, losses, accidents, or damage to, or loss or theft of, real or personal property;
- (d) Evidence to be used before any investigating committee, board of award, or board of arbitration, or in the trial of civil or criminal cases.

PRIVATE INVESTIGATORS

MASSACHUSETTS GENERAL LAW § 1-20-147, SECTIONS 22-23

- An investigator in Massachusetts must be licensed.
  - PI licenses are often firm umbrella licenses covering all employees)
- Exceptions include "Individuals who are independently and currently licensed by the commonwealth in a profession or field of expertise, whereby they are exclusively utilized and confined in conducting an investigation to that profession or field of expertise, inasmuch as the context and extent of their inquiry and investigation does not exceed the particular area of their profession or field of expertise in which they are independently licensed within the commonwealth. "

PI LICENSE REQUIRED

MASSACHUSETTS GENERAL LAW § 1-20-147, SECTIONS 23

- Section 23: Necessity of license; exceptions
- Section 23. No person shall engage in, advertise or hold himself out as being engaged in, nor solicit private detective business … unless licensed for such purpose as provided in section twenty-five.
- Exceptions: Governmental Employees. Law Enforcement, Those Licensed -Attorneys, Insurance Adjusters, Professional Engineers, Architects, Surveys, Licensed Trades

PI LICENSURE REQUIREMENTS MASS.

- Three References – Character & Experience
- Regularly Employed 3+ years as law or governmental investigator or under licensed investigator (Section 28 Assistants).
- Felony Conviction exclusion (Section 25)
- Firm licenses are umbrella licenses - allows employees to operate under license
- PI license does not convey any competency

PRIVATE INVESTIGATOR ATTRIBUTES

- Witness Interview Skills
- Documentation Skills
- Ability to Render Opinions Restricted
  - Documented Experience and Education
  - Must Establish Competency
  - Additional Licensure
  - Fire Investigators & Code Officials

UNLICENSED INVESTIGATIONS

PART 1 TITLE XX CHAPTER 147 SECTION 23: PENALTIES

- Whoever violates any provision of this section shall be punished by a fine of not less than two hundred nor more than one thousand dollars or by imprisonment for not more than one year, or by both such fine and imprisonment

TRADES PROFESSIONALS

- Licensed Trade Professionals – Exemption
  - Gas Fitters, electricians, plumbers, HVAC technicians, equipment operators
  - Often Assist in operating and to disconnect equipment
  - Provide Operations, Maintenance, Service Information.
  - Opinions limited to specific licensure

PROFESSIONAL LICENSE EXCEPTION

- Attorneys
- Insurance Adjusters
- Licensed Trades
- Engineers, Architects, Surveyors, CPAs

PROFESSIONAL ENGINEERS
250 CMR 5.08: USE OF TITLE ENGINEER

- No person, other than a Registrant holding a current License to practice in the applicable profession, shall advertise or hold themselves out as either a Professional Engineer or use any other title to imply that they are qualified to practice engineering in the Commonwealth, or in any other way hold themselves out as able to perform any of the Licensed Branches of engineering.

PROFESSIONAL ENGINEERS
250 CMR 5.01: SCOPE OF PRACTICE

- All engineering work … is considered work of a professional nature and shall be performed in conformance with 250 CMR ……
  - Losses involving mechanical equipment (machinery, boilers, pumps, appliances, hydraulics, pneumatics, materials, building envelops), electrical equipment (arc, ground fault, lightning) building structures, fire protection equipment, fire & explosion events.

NON-LICENSED INDIVIDUALS
250 CMR 5.04: SUPERVISION

- Registrant must exercise unambiguous decision making authority over unlicensed individuals
- Registrant must have a verifiable written record establishing the contributing work provided by unlicensed individual was subject to regular and continuing “Direct Charge and Supervision” through development
- Work performed by unlicensed individuals does not include approval of final designs or decisions (may not make determinations, issue opinions or act as expert)

NORTH READING MAN ARRAIGNED FOR IMPERSONATING A LICENSED ENGINEER

- "the unlicensed practice of engineering and land surveying"
- of North Reading, was arraigned in Woburn District Court on charges of larceny over $250 (two counts), identity fraud (two counts), and the unlicensed practice of engineering or land surveying.

UNLICENSED PRACTICE OF TRADE, PENALTIES

PART 1 TITLE XVI CHAPTER 112 SECTION 65 A

- Upon a person who, without holding the required license, certificate, registration or authority, engages in the practice of a trade or profession for which a license, certificate, registration or authority is required.
- Assessments - Not to exceed $1000 first violation
- Assessments - Not to exceed $2,500 for a second or subsequent violation
- Nothing in this section shall affect, restrict, diminish or limit any other penalty or remedy

WHO TO SELECT
FIRE INVESTIGATION

- PI and/or PE depending on size of loss and its complexity
- Licensure in State of Loss & of Evidence Examinations
- CFEI and CFI – Certifications not Licensure
- PI – 5-10 years of Fire Investigation in public sector
- PE – 5-10 years of Licensed Design or Operations in Areas of Practice
- 3-5 Years Private Sector Fire Investigation Experience

NFPA 1033

NFPA 1033 is the Minimum standard for fire investigators

1. Fire Science
2. Fire Chemistry
3. Thermodynamics
4. Thermometry
5. Fire Dynamics
6. Explosion Dynamics
7. Computer Fire Modelling
8. Fire Investigation
9. Fire Analysis
10. Fire Investigation Methodology
11. Fire Investigation Technology
12. Hazardous Materials
13. Failure Analysis and Analytical Tools

ASTM E-620
REPORTING SCIENTIFIC OPINIONS

- This practice covers the scope of information to be contained in formal written technical reports which express the opinions of the scientific or technical expert with respect to the study of items that are or may reasonably be expected to be the subject of criminal or civil litigation.
- If compliance with this standard is claimed, the justifications for any deviations from this standard must be documented.
- The report shall contain the signature of each person who has rendered a joint or separate opinion contained in the report. The signature(s) shall be at the end of the opinion.
- PE's - professional seal - PI's and others license #

ASTM E-678
EVALUATION OF SCIENTIFIC DATA

- This practice establishes criteria for evaluating scientific and technical data, and other relevant considerations, which constitute acceptable bases for forming scientific or technical expert opinions.
- The Scientific Method must be followed

ASTM E-1188
COLLECTION & PRESERVATION OF EVIDENCE

This practice covers guidelines for the collection and preservation of information and physical items by any technical investigator pertaining to an incident that can be reasonably expected to be the subject of litigation.

ASTM E-2713
FORENSIC ENGINEERING

- Professional practice of forensic engineering, and discusses the typical roles and qualifications of practitioners.
- State licensure as a Professional Engineer (PE) in one or more disciplines of engineering.
- Communication of Engineering Insight:
  - Assisting the engineer's client: The engineer's first objective is to clearly explain the technical factors of the incident to the client.
  - Assisting the court, jury, or other triers of fact.

PE LICENSURE REQUIREMENTS

- BS Engineering (Accredited University)
- MS Engineering (Optional) (Qualifies as 1yr Intern)
- 8 hour Fundamentals Examination
- 4 Years Supervised Design (Intern) – Under PE
- 8 Hour Professional Exam in Area(s) of Practice
- Examples of Work
- Letters of References
- Ongoing Continuing Education (Most States)
- Licensure in each State of Practice

WHO TO SELECT COMPETENCY REQUIREMENTS FOR PE

- PE's - Demonstrated design and operations competencies in the area of practice prior to becoming a forensic engineer "Expert."
- 5-10 years Licensed Engineering in Consulting and/or Manufacturing practice prior to forensic work
  - Mechanical, HVAC, Electrical, Materials, Structures, Fire Protection, Machinery, etc.
- Expert must provide specific evidence of engineering design and operations experience in area of investigation
- Verify year of professional licensure

FORENSIC ENGINEERING PRACTICE

- Demonstrated design & operations (consulting and manufacturing) competencies in areas of practice.
- Licensure in each state of practice
- National Engineering Record – NCEES
- Signed, dated, and stamped reports

RED FLAG WARNINGS

- No professional licensure
  - “Senior Engineer,” “Electrical Engineer,” “Senior Associate,” “Inspector,” “Project Manager” or “Consultant” are meaningless
- Reports not signed, dated, and stamped by PE
- Year of Professional Licensure not disclosed
  - CV may not accurately report “Professional Experience” (CV’s sometimes include high school activities as years of experience)
  - Begin professional experience with licensure
- Practice out of area of licensure & competency

RED FLAGS – CONT.

- Limited (or no) design and operations experience following licensure and/or in area of practice.
- Advertising “mechanical & electrical” as practice area competencies when licensure and experience is limited to “fire protection”
- Years of licensed engineering practice prior to becoming “Forensic Engineer” not disclosed
- CFEI or CFI without P.E. or PI being reported
- Lists of non-accredited training used to justify engineering competencies and practice areas

HIRE THE EXPERT – NOT THE FIRM

- When selecting an expert – select the expert not the firm.
- Do not accept entry level engineers – Licensure date
- Verify licensure discipline mech, elec, struct, fp
- Require broad professional engineering experience prior to becoming a forensic engineer
- Require expert to verify professional design and operations experience in areas of practice.

THANK YOU

R. Craig Williams P.E.
solutions@canneybrook.com
603.742.7200