

# Robson Forensic

Engineers, Architects, Scientists & Fire Investigators

## DAVID CAGGIANO, P.E., LEED AP, CFEI Mechanical Engineer

### PROFESSIONAL EXPERIENCE

2007 to present **Robson Forensic, Inc.**  
*Associate*

Provide technical investigations, analysis, reports, and testimony towards the resolution of commercial and personal injury litigation involving building mechanical systems, products and failure analysis.

#### HVAC

- Heating equipment: Hydronic and steam heating systems, gas and oil-fired burners, boilers, air separators, safety relief valves, heaters, furnaces, flues, cabinet unit heaters, economizers, heat exchangers, base board radiators, radiant tubing, variable air volume boxes (VAV), ducted fan coils, balancing valves, strainers, heat trace.
- Carbon Monoxide: Testing, source determination, exposure method.
- Cooling equipment: Chillers, DX, cooling towers, condensers.
- Controls: Temperature and pressure control, modulating valves, safety, BMS, DDC, VFDs, flame safeguard, lead Lag, auto rotation, PLCs, touch screens, Modbus protocol, freeze stats.
- Distribution: Air handlers and ductwork, pumps and piping, circulators, valves, exhaust fans, outdoor air.
- TAB: Testing, adjusting, and balancing of air and hydronic systems using NEBB procedures.

#### Plumbing, Water, Gas and Oil

- Domestic hot and cold water: Temperature control, water heaters, mixing valves, circulators, auto flush devices.
- Gas systems: Natural gas and propane, gas piping, regulators, appliances, gas valves.
- Gas fired appliances: Ovens, construction heaters, barbeques, gas logs, turkey fryers.
- Oil systems: #2, #4, #5, #6 oil systems, pumps, strainers, centrifugal separators.

#### Industrial Systems

- Process: High pressure steam, generators, pneumatic conveying systems, belt conveying systems, packaging machines, food processing, ovens.
- Air quality and ventilation: Fans, ductwork, exhaust hoods, fume hoods, blowers, electrostatic precipitators, cyclone separators, SCR units.

#### Fire Science and Fire Protection

- Fire alarm systems: Heat detectors, smoke detectors, carbon monoxide detectors, flow detectors, OS&Y valve switches.
- Combustion: Combustion control of natural gas, propane, #2, #4 and #6 oil, low NOx techniques.

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### Electrical

- Power: 480, 220, 208, 120 VAC, generators, transformers, breakers.
- Control: 24, 120VAC, low voltage DC, burner & boiler control panels, VFDs, PLCs, touch screens, switches, temp and pressure sensors, loop controllers, transmitters, I/P converters, level sensors.

### Types of Facilities and Buildings

- Educational, health care, industrial, commercial, food processing, residential, marine.

### Equipment

- Operation experience with the following equipment: voltmeter, amprobe, thermocouples, data loggers, combustion analyzers, smoke gun, balometers, anemometers, ultrasonic flowmeters, gas meters, water meters, fuel oil meters, tachometers, manometers, air flow hoods.

### Manufacturing Process

- General machining, metal forming, welding, soldering, oxyacetylene cutting, plasma cutting, drilling, sawing, rolling.

### Product Development

- Prototyping, testing, certification, training, instructional manuals, application engineering, material and component selection.

2008 to  
present

### **Fournier Robson & Associates, LLC**

*Associate*

Provide technical assistance and support to contractors and owners on matters involving HVAC and plumbing systems.

2005 to  
2007

### **Horizon Engineering Associates, LLP**

*Senior Project Engineer.*

- Responsible for the management and commissioning of multiple MEP projects in accordance with BCA and ASHRAE guidelines.
- Managed 5 engineers in a professional engineering office.
- Provided professional technical services for the review, inspection, and testing of mechanical, electrical, plumbing, and fire protection equipment and systems. Systems evaluated from design phase through final acceptance.
- Conducted drawing reviews, spec reviews, and submittal reviews of MEP systems.
- HVAC systems, air handlers, chillers, pumps, cooling towers, VAV boxes, cabinet unit heaters, condensing boilers, condensing furnaces, emergency generators, exhaust fans, air and water balancing.

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- Developed and conducted in-house training sessions on boilers, hot water and steam systems.
- Sustainable design consulting services for the USGBC's Green building LEED Certification program.

1995 to  
2005

### **Burnham Corporation**

*Senior Product Development Engineer*

1999-2005

- Managed 4 non-union technicians in commercial Research and Development lab. Provide supervision and technical support of nonunion personnel in production firetest area. Designed and programmed the ECCS Lead Lag boiler control system utilizing the Siemens 226 series PLC, touch screen interface, and Modbus protocol to control up to 6 modulating boilers.
- Responsible for the management of new product development projects in the Thermal Solutions line of boiler and control products. Designed burner/boiler control systems utilizing Honeywell and Fireye flame safeguards, variable speed drives, temperature sensors, and fuel/air ratio controllers. Duties included design, prototyping, testing, training, and product launch at sales meetings and ASHRAE shows.
- Customer support and on-site service, responsible for application testing on commercial/industrial firetube and water tube type boilers used by schools, office buildings, manufacturing plants, etc. Performed safety testing in accordance with UL standards. Completed efficiency and steam quality testing for certification agencies.
- Developed and taught training program for technicians and plant employees on basic electricity, burner controls, and combustion.

*Product Development Engineer*

1995-1999

- Responsible for the design, prototyping, testing, development and certification of an industrial low emission natural gas and #2 oil burner line for firetube boilers. Managed project from design through transition to commercial production. Performed UL testing for certification of low emission burners. Emissions tested for include oxygen(O<sub>2</sub>), carbon monoxide(CO), and nitrogen oxides(NO<sub>x</sub>).

1992 to  
1995

### **Tampella Keeler Company**

*Field Engineer*

- Independently responsible for the calibration, commissioning, start-up and service of industrial burners and boilers. Fuels consisted of natural gas, oil, coal and wood, with and without Low NO<sub>x</sub> systems.
- Duties included on-site inspection and coordination of start-up activities with customer, contractors and vendors. Set up and test combustion control systems to meet performance and emissions guarantees. Emissions tested for Include oxygen (O<sub>2</sub>), carbon monoxide(CO), nitrogen oxides(NO<sub>x</sub>), and Sulfur oxides(SO<sub>x</sub>).
- Commission control systems consisting of PLC's, single loop controllers, pressure, temperature, flow and level transmitters, actuators, and recorders.

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1989 to **Best Foods Muellers**

1991 *Maintenance Supervisor*

- Supervised electrical department with seven union electricians for three-shift, 300-person food processing and packaging operation.
- Developed and initiated in-house preventative maintenance program.
- Management and budgetary project responsibility for ongoing plant improvements.

1989 **U.S. Merchant Marine**

*Engineering Officer*

Sailed on a dredge collecting sand from the inlet to the Chesapeake Bay and pumped it onto Virginia Beach. Insured proper operation of diesel engines, generators and pumps. Sailed on various ships that transported cement around the Great Lakes. Operated diesel engines, boilers, generators and steam reciprocating engines.

## PROFESSIONAL CREDENTIALS

Registered Professional Engineer: NCEES, Pennsylvania, West Virginia, New Jersey, Maryland, Maine, District of Columbia, Connecticut, California  
LEED Accredited Professional, USGBC  
Certified Fire and Explosion Investigator (CFEI)  
3<sup>rd</sup> Asst. Engineer, Steam and Motor Unlimited Horsepower, USCG (Inactive)  
Honorable Discharge, Lieutenant, U.S. Naval Reserve

## EDUCATION

B.E., Electrical Engineering, SUNY Maritime College at Fort Schuyler, 1989

*Additional training:*

Appliance Fire and Failure Investigation, Pennsylvania Association of Arson Investigators (PAAI) – State College, PA, 2011

National Fire, Arson, & Explosion Investigation Training Program, NAFI, 2010

Safety and Emergency Response Training, Confined Space Safety, FIRECON, 8-hr, July 24, 2009

ASHRAE, Humidity Control: Applications, Control Levels, & Mold, 3-hr., 2009

Building Codes in New Jersey, Lorman Education Seminar, 6-hr. course, November 13, 2008

NFPA 25: Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, 7-hr course, NFPA, 2008

Propane tank cylinder requalification, PAPGA, 5-hr. course, 2008

Maritime Accident Investigation Analysis and Reconstruction, 40 hrs. World Maritime University

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LEED workshops 2005, 2006, 2007  
Building Commissioning, 40-hr. course, 2005  
ASHRAE 90.1, Energy standard for buildings, 6-hr. course, 2004  
Siemens 200 series PLC course, Basic & advanced, 40-hr. course, Siemens SE&A, 2003  
Project management, 16-hr. course, 2002, SkillPath Seminars  
National Electric Code, 24-hr. course, 2001  
Managing Multiple Projects, 8-hr. course, 2000, SkillPath Seminars  
DDC open control systems, 16-hr. course, 2000  
Optimizing Fuel, 24-hr. course, 1998  
Inverters, 16-hr. course, 1999  
Applied Combustion Technology, 40-hr. course, 1997  
Photovoltaic workshop, 8-hr. course, 1992  
Best Foods management skills seminar, 16-hr. course, 1991  
Military Sealift Command – Marine Fire Fighting course, 1986

### PROFESSIONAL MEMBERSHIPS

American Society of Heating, Refrigeration & Air Conditioning Engineers (ASHRAE)  
Certified SCUBA diver – NAUI  
Pennsylvania Association of Arson Investigators (PAAI) - Associate Member

### PUBLICATIONS and PRESENTATIONS

Heating system failures, Pennsylvania Association of Independent Insurance Adjusters (PAIIA), November 2011  
Building Mechanical Systems, Lorman Education Seminars (DE), January 2009  
Building Mechanical Systems, Lorman Education Seminars (PA), December 2008  
Building Mechanical Systems, Lorman Education Seminars (NJ), November 2008  
HVAC Equipment and Electrical Investigation, Pennsylvania Association of Arson Investigators (PAAI), January 2008  
Article: "Boiler Diagnostic Equipment," Systems Engineering Magazine, June 2001