

# DAVID CAGGIANO, P.E., CFEI

David Caggiano Engineering LLC  
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## PROFESSIONAL EXPERIENCE

Perform investigations in personal injury and property damage related incidents involving failure analysis of mechanical equipment, plumbing equipment and building systems. Investigations include inspections, analysis, reports, and testimony in litigation and non-litigation events.

Investigations include injuries, construction defects and failures related to carbon monoxide, scalds, burns, combustion testing, heating, ventilation and air conditioning (HVAC) systems, propane, natural gas and oil-fired systems and products, fire and explosions, fire protection systems, plumbing systems, frozen pipes, oil tank leaks, combustion controls.

Failure analysis on a wide range of products including boilers, burners, furnaces, blowers, fans, hydronic and steam heating systems, water heaters, wall heaters, ranges, ovens, construction heaters, barbeque grills, gas fireplaces, turkey fryers, deep fat fryers, steamers, refrigerators, pressure washers, clothes dryers, food trucks, RV's, pumps, PVC and PEX piping, plumbing fittings, gas cylinders, gas regulators, aerosol cans, appliances, oil burners and oil tanks.

Facility and building types include commercial, residential, industrial, food processing, educational, and health care.

- Responsible for the management and commissioning of multiple Mechanical Electrical and Plumbing (MEP) projects in accordance with BCA and ASHRAE guidelines. 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 including HVAC systems, air handlers, chillers, pumps, cooling towers, VAV boxes, cabinet unit heaters, condensing boilers, condensing furnaces, emergency generators, blowers, exhaust fans, air and water balancing.
- 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.
- 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 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 natural gas and propane fired 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.

- Responsible for the design, prototyping, testing, development and certification of an industrial low emission natural gas and #2 oil burner line for Kewanee and Burham firetube boilers. 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>).
- 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. Inspection of gas and oil piping systems, burners, blowers, safety devices, venting, valves, pumps and controls. 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.
- Responsible for the maintenance of plant electrical equipment in a large food processing plant. Equipment included motors, blowers, HVAC, power distribution, control systems, heaters and actuators.
- Sailed as Engineer on a dredge in the Chesapeake Bay and on various ships transporting cement around the Great Lakes. Operated diesel engines, boilers, generators and steam reciprocating engines.

## EMPLOYMENT HISTORY

2020 to Current	<b>David Caggiano Engineering LLC</b> <i>President</i>
2007 to 2020	<b>Robson Forensic, Inc.</b> <i>Forensic Engineer</i>
2008 to 2020	<b>Fournier Robson &amp; Associates, LLC</b> <i>Engineering Associate</i>
2005 to 2007	<b>Horizon Engineering Associates, LLP</b> <i>Senior Project Engineer.</i>
1995 to 2005	<b>Burnham Corporation</b> <i>Senior Product Development Engineer</i>
1992 to 1995	<b>Tampella Keeler Company</b> <i>Field Engineer</i>
1989 to 1991	<b>Best Foods Muellers</b> <i>Maintenance Supervisor</i>
1989	<b>U.S. Merchant Marine</b> <i>Engineering Officer</i>

## PROFESSIONAL CREDENTIALS

Registered Professional Engineer: NCEES, California, Connecticut, District of Columbia, Florida, Illinois, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Montana, Nevada, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Virginia, Washington, West Virginia, Wisconsin, Wyoming. Nova Scotia, Canada (P.Eng)  
Certified Fire and Explosion Investigator (CFEI)  
Certified Vehicle Fire Investigator (CVFI)  
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:***

Pipeline Emergency Response and Damage Prevention, Sept 2022  
Welding Technology, March 2022  
Forensic Engineering Part D- Corrosion Failure Analyses, April 2022  
Investigating fires involving fireplaces, Chimneys, and fuel burning appliances, Jan 2022  
Zinc die casting, ASME, Aug 2021  
High efficiency boiler exhaust venting, Noon Pi, May 2021  
Environmental regulations and codes for underground tank storage of flammable and combustible liquids, PDH online, Feb 2021  
Designing to NFPA 720 CO alarms, PDH Online, Jan 2021  
Fire protection engineering for buildings, CED Engineering, Jan 2021  
Fire Suppression systems inspection, testing and maintenance, CED engineering, Jan 2021  
Analysis and design of bolted systems, Sun Cam, Jan 2021  
Plumbing system design, CED Engineering, Jan 2021  
Coating types and characteristics, CPE Solutions LLC, Oct 2019  
Combustible dust in industry, CPE Solutions LLC, Oct 2019  
Hydraulic power units, CPE Solutions LLC, Oct 2019  
HVAC- ventilation and exhaust systems, CPE Solutions LLC, Oct 2019  
Comparison of Data Center Classes on Energy Use, ASHRAE, February 14, 2018  
Forensic Engineering Part C, Case Histories: Metallurgical and Mechanical Failure Analyses, SunCam, Inc., October 8, 2017  
Forensic Engineering Part B, Four Classes of Metallurgical and Mechanical Failures, SunCam, Inc., 2017  
Vehicle Fire, Arson and Explosion Investigation Science and Technology Seminar (tested), 32-hour course, National Association of Fire Investigators, September 18-21, 2017  
Forensic Engineering Part A, Conducting Failure Analyses of Metallic Materials, SunCam, Inc., 2017  
Fire, Smoke, Dust Characterization & Combustible Dust, EMSL Analytical, Inc., August 23, 2017  
Corrosion Theory and Corrosion Protection, CPE Solutions LLC, February 17, 2017  
Fuel Cells, CPE Solutions LLC, February 12, 2017  
Sound Level Data for Mechanical and Electrical Equipment, CPE Solutions LLC, February 11, 2017  
Fire Suppression Systems Inspection Testing and Maintenance, CPE Solutions LLC, (PDH Direct), Feb 2017  
Metallurgical Failure Analysis, PDH Online, February 4, 2017  
Fire Protection Engineering for Buildings, CPE Solutions LLC, December 16, 2016  
Fire Science Seminar- Pyrotechnic Effects, 1033 Qualification Updates, Warnings, Lithium Batteries, Automated Home Controls, Christmas Tree Fires, Ethics, Building Materials and Fires, Sprinkler System Failures, Flame Retardant Children Materials, Defense Research Institute, November 2016  
Mistake-Proofing, Quality Training Portal, April 21, 2016  
NFPA 1033 and Your Career, International Association of Arson Investigators, October 13, 2015

Investigating Natural Gas Systems, International Association of Arson Investigators, October 12, 2015  
Arc Mapping Basics, International Association of Arson Investigators, October 8, 2015  
Fire Science and Litigation Seminars, Defense Research Institute, November 6-7, 2014  
Commercial Kitchen Fire Investigation- PA Association of Arson Investigators, 2013  
Achieving Safe Permit-Required Confined Space Entries, Competent Person Training, Fred Straub, 2013  
Fire Findings, LLC, Investigation of Gas and Electric Appliance Fires (tested), April 16-19, 2013  
FMEA investigator, Quality Training Portal, June 2012  
Why Plastics Fail, January 24, 2012  
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, NFPA, 2008  
Propane tank cylinder requalification, PAPGA, 5-hr. course, 2008  
Maritime Accident Investigation Analysis and Reconstruction, 40 hrs. World Maritime University  
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  
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  
Military Sealift Command – Marine Fire Fighting course, 1986

## **PROFESSIONAL MEMBERSHIPS**

National Fire Protection Association (NFPA)  
National Association of Fire Investigators (NAFI)  
American Society of Heating, Refrigeration & Air Conditioning Engineers (ASHRAE)  
American Society of Mechanical Engineers (ASME)  
Certified SCUBA diver – NAUI  
Pennsylvania Association of Arson Investigators (PAAI) – Associate Member

## **PRESENTATIONS and PUBLICATIONS**

Building Mechanical Codes, Lorman Education Seminars (PA), December 2014  
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