



STAFF PERSONNEL QUALIFICATIONS RESUME



**MICHAEL G. MARISCALCO, PE, LEED AP, CFEI
PRINCIPAL**

PROFESSIONAL PROFILE

Mr. Mariscalco is a practicing Professional Engineer, LEED Accredited Professional, Certified Fire and Explosion Investigator, and consultant, with 35 years of experience in the responsible charge of planning, designing and constructing facilities for manufacturing, commercial, chemical and heavy industrial use. His experience as a design principal and project executive includes project development, facility siting and design, building/process design and construction, code compliance, high pressure piping and vessels, energy and utility systems, ventilation, air pollution control, HVAC, structural engineering, and bulk material handling. These activities have involved all phases of conceptual planning, design engineering and procurement, construction and erection, safety and OSHA compliance.

In addition to his direct engineering, procurement and construction (EPC) background, Mr. Mariscalco also maintains expertise in complex systems and equipment failure analysis, accident reconstruction, process hazard and risk assessment, thermal and stress analysis, fire and explosion investigation and construction claims consulting. His investigations include boiler, piping and pressure vessel failures and explosions, structural failures and collapses, and equipment fires and explosions.

EDUCATION

Bachelor of Science, Mechanical Engineering – 1975 – University of Dayton, Dayton, OH
Master of Science, Mechanical Engineering – 1976 – University of Dayton, Dayton, OH

PROFESSIONAL REGISTRATIONS & CERTIFICATIONS

Registered Professional Engineer

- Ohio (E-45495)
- Pennsylvania (PE030901E)
- Indiana (PE60860020)
- New Jersey (24GE0310390)
- Maryland (20422)
- Kentucky (12447)
- Illinois (062049798)

US Green Building Council - LEED Accredited Professional (LEED AP BD+C, 10559218)

National Association of Fire Investigators - Certified Fire and Explosion Investigator CFEI - #20975-11927)

PROFESSIONAL AFFILIATIONS

- Member, American Society of Mechanical Engineers (ASME)
- Member, National Society of Professional Engineers (NSPE)
- Member, American Institute of Chemical Engineers (AIChE)
- Member, American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
- Member, National Fire Protection Association (NFPA)
- Member, American Society of Safety Engineers (ASSE)
- Member, National Society of Professional Insurance Investigators (NSPII)
- National Association of Fire Investigators (NAFI)
- Member, American National Standards Institute (ANSI)
- Member, American College of Forensic Examiners (ACFEI)
- Member, American Society for Testing and Materials (ASTM), E58 Committee on Forensic Engineering Standards
- Board Member – Unified Board of Building Appeals, Dayton/Montgomery County, OH

CONTINUING PROFESSIONAL EDUCATION

- International Building Code
- International Mechanical Code
- Ohio Building Code
- Ohio Fire Code
- Chemical Plant Safety
- Construction Contracts and Claims
- Soils Engineering
- Forensic Structural Engineering
- LEED/Sustainable Design
- Geothermal Heating and Cooling
- Alternative Power Systems (Wind/Solar)
- Industrial Ventilation
- Air Pollution Control
- OSHA Industry and Construction Standards

- NFPA Standards
- ASHRAE Standards
- ASME/API Standards

CODES AND STANDARDS EXPERIENCE

- International Building Code (IBC)
- International Mechanical Code (IMC)
- International Plumbing Code (IPC)
- International Fire Code (IFC)
- ASHRAE 90.1 – Energy Standard for Buildings
- ASHRAE 62.1 – Ventilation for Acceptable Indoor Air Quality
- NFPA 13 – Standard for the Installation of Sprinkler Systems
- NFPA 30 – Flammable and Combustible Liquids Code
- NFPA 30A – Standard for Motor Fuel Dispensing Facilities
- NFPA 30B – Standard for the Storage of Aerosol Products
- NFPA 53 – Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres
- NFPA 54 – National Fuel Gas Code
- NFPA 55 – Compressed Gases/Cryogenic Fluids Code
- NFPA 68 – Guide for Deflagration Venting
- NFPA 70/79 – National Electric Code/Electrical Standard for Industrial Machinery
- NFPA 85 – Boilers and Combustion Systems Hazards Code
- NFPA 86 – Standard for Ovens and Furnaces
- NFPA 86C – Standard for Ovens and Furnaces/Special Processing Atmospheres
- NFPA 86D – Standard for Ovens and Furnaces/Vacuum Processing
- NFPA 91 – Standard for Exhaust Systems/Vapors, Gases, Mists, Particulates
- NFPA 654 – Standard for Fire/Dust Explosion Prevention From Particulate Solids
- NFPA 921 – Guide for Fire and Explosion Investigations
- UL 1278 – Standard for Moveable and Wall-or-Ceiling-Hung Electric Room Heaters
- OSHA 1910/1926 – Industrial/Construction Safety Rules
- ASME Section I – Rules for the Construction of Power Boilers
- ASME Section VIII – Rules for the Construction of Pressure Vessels
- ASME B30.5 – Mobile and Locomotive Cranes
- ASME B31.1 – Pressure Piping Code
- ASME B31.3 – Process Piping Code
- ISO 4414 – Pneumatic Fluid Power
- API 570, API RP 574 – Refinery Piping Inspection
- API 941 – Steels for Hydrogen Service
- API 936 – Refractories
- ASSE A10 – Construction and Demolition Safety Standards
- Ohio School Design Manual

REPRESENTATIVE PROJECT ENGINEERING EXPERIENCE

1. Principal engineer for 750 PSIG, 1100F, 20,000 SCFM process compressed air supply piping system, USAF, Wright Patterson AFB, Dayton, OH

2. Project engineer for plant-wide office/corporate facilities design & construction, General Motors Corporation parts and assembly divisions, Dayton, OH, including boilers, chillers, pneumatic power, electroplating and hazardous chemical handling, ventilation, and process heating systems
 - a) Delco Products Division – Design of new 6,000 SCFM, 120 PSIG power house compressed air system with dryers, cooling towers pumps and controls
 - b) Delco Products Division – Design of plant-wide compressed air distribution system upgrades and components for various pneumatic applications; air pumps, tooling, power presses, and equipment actuation
 - c) GM Moraine Assembly Plant – Design of compressed air systems and equipment for plant-wide process and pneumatic tooling applications
 - d) Delco Moraine Division – Design of compressed air systems and equipment for plant-wide production processes
3. Project engineer for various plant-wide upgrades to utility services for USDOE Mound Laboratories, Miamisburg, OH, including:
 - a) New 85,000 #/hr, 125 PSIG, gas-fired, D-type steam boiler
 - b) Replacement gas burner and control upgrades for a 60,000 #/hr, 125 PSIG steam A-type steam boiler
 - c) 1000 ton centrifugal chiller and cooling tower
 - d) 600 CFM, 120 PSIG compressed air, breathing-air system
 - e) facility-wide condensate handling systems
4. Principal Engineer for a new 100 TPD sodium hypochlorite manufacturing plant, Fairborn, OH, including:
 - a) Chlorine rail car RR siding, offloading and piping facilities
 - b) Sodium hydroxide trailer offloading and piping facilities
 - c) Bleach plant mixing equipment
 - d) Process cooling systems and cooling towers
 - e) Plant-wide compressed air systems, 600 SCFM, 120 PSIG
 - f) Product storage tanks and outdoor storage facilities
 - g) Product truck loading and scale facilities
5. Principal Engineer for evaluation, code assessment, corrective measures for eleven (11) large industrial, high temperature, compressed air autoclaves and related piping, 200 PSIG @ 240 F, Fuyao America Glass, Moraine, OH.
6. Principal consulting engineer for evaluation of Slab Re-Heat Furnace burner safety upgrades, AK Steel Corporation, Middletown Works, Middletown, OH
7. Principal engineer for the design and construction of a 2000 ton (refrigeration), central plant, ammonia refrigeration system, Freshway Foods, Inc., Sidney, OH
8. Project executive and principal engineer for the design of a bio-solids, rotary lime kiln, thermal oxidation plant, Butler County Division of Solid Waste Management, Butler County, OH
9. Principal engineer for upgrades to 450,000,000 BTUH, 2900F cement kiln natural gas burners, piping system and process control system, CEMEX, Inc., Fairborn, OH

10. Principal engineer for upgrades to cement kiln air pre-heater system, including piping and controls, CEMEX, Inc., Fairborn, OH
11. Principal engineer for the design and erection of feeders, conveyors and 70' tall storage silos for slag handling and cement kiln-feeding system, CEMEX Inc., Fairborn, OH
12. Principal engineer for the design and erection of emergency structural repairs to 65' tall cement storage hopper containing 280,000 lbs of cement product, CEMEX, Inc. Fairborn, OH
13. Principal engineer for upgrades to 100,000 CFM, cement clinker and fines dust collection system, including multi-level structural repairs to the 120' tall kiln tower, CEMEX Inc., Fairborn, OH
14. Principal engineer for emergency structural repairs to 10' diameter, 65' tall, cement kiln process exhaust stack, CEMEX, Inc., Fairborn, OH
15. Principal engineer for the design of a methane/steam hydrogen reforming and catalytic NOx absorption emission control system for a 10 MW gas turbine/cogeneration installation, Wyeth Biopharma, Andover, MA
16. Principal engineer for the design of a methane/steam hydrogen reforming and catalytic NOx absorption emission control system for a 50 MW gas turbine/cogeneration installation, Redding Electric Utility/EmeraChem, Redding, CA
17. Principal consultant for the design and construction of a waste oil-to-biodiesel/glycerin refinery, Jatro Diesel, Inc. Miamisburg, OH
18. Principal engineer for the development of a high temperature, hydrogen annealing safety procedures and documentation program, Brite Gas Annealing, AK Steel Corporation, Middletown Works, Middletown, OH
19. Project Executive for plant design/construction and plastic extruder systems design/installation and erection of bulk storage and handling facilities, Advanced Composites, Inc. (Mitsui Plastics, Inc), Sidney, OH
20. Principal consultant for the design of a soy bean oil-to-biodiesel/glycerin manufacturing facility, CTS Energy, London, OH
21. Project Executive and principal engineer for the design and construction of a \$60MM sodium erythorbate chemical production plant, Fujisawa Pharmaceuticals, Peoria, IL
22. Project Executive for plant and process design, construction and erection activities for a hydrogen cyanide (HCN) heat-treating facility, Nihon Parkerizing, Inc (Trutec USA), Springfield, OH
23. Principal engineer for a 350,000 CFM selective catalytic reduction (SCR) control system for the treatment of NOx in quartz processing air emissions, including erection design of 75' tall exhaust stack, General Electric Quartz, Durr Environmental, Newark, OH
24. Principal engineer for the design of a selective catalytic reduction/NOx emission control system for a petrochemical processing facility, Sam Nam Petrochemical (Engelhard Corp), Seoul, Korea

25. Principal engineer for the design of a calciner high temperature catalytic thermal oxidizer system, and related plant utilities, for a specialty chemical manufacturer, Mobil Chemical Company (Engelhard Corp), Beaumont, TX
26. Principal engineer for the design and erection of modifications to the 110' tall catalytic CO emission control reactor frame for the 240 MW Crockett Cogeneration Facility, Engelhard Corp., Crockett, CA
27. Principal engineer for the design and erection of a 110' tall, catalytic reactor frame, 500 MW primary power generation facility, Arizona Public Power (EmeraChem, LLC), Phoenix, AZ
28. Principal engineer for structural and process upgrades to styrene monomer reactor system, piping and controls, Deltech Polymers, Inc., Troy, OH
29. Principal engineer for the design and construction of a 120,000 gallon above ground, Class 1B flammable solvent storage tank facility with piping, controls and secondary containment, Textileather, Inc., Toledo, OH
30. Principal engineer for boiler plant/building upgrades to 22 school buildings, Dayton Public School System, Dayton, OH
31. Project executive for the design and construction of a 600,000 SF automotive fasteners plant, Indiana Automotive Fasteners, Greenfield, IN
32. Principal engineer for 15,000 CFM fumed silica/carbon black powder mixing and blending system, Inland Division, General Motors Corporation, Dayton, OH
33. Principal engineer for 40,000 CFM asbestos and talc dust collection systems, Lear Automotive, Danville, KY.
34. Principal engineer for the design and erection of a 140' tall, 8' diameter exhaust stack for a foundry dust collection system, Ravenna Foundry, Ravenna, OH
35. Principal engineer for the design of a 75' high foundry dust-collection system enclosure for a large vacuum casting process, A&B Foundry, Inc, Franklin, OH
36. Principal consulting engineer, design and construction of beverage waste, biological wastewater treatment facilities, Pepsi, Inc., Russia, China, Rumania, United States
37. Principal engineering consultant for hazardous liquid piping safety and related systems risk assessments, new manufacturing facility, Amylin Pharmaceuticals, West Chester, OH
38. Principal engineer for the design of a new industrial wastewater pre-treatment facility, beverage manufacturing, Pepsi Bottling, Pennsauken, NJ
39. Principal engineer for the design of a new, hazardous material, metals surface treatment facility, General Electric Company, Alpha, OH
40. Principal engineer for the design and construction of a new bulk sodium hydroxide (NaOH) rail car offloading and transfer facility, Fairborn, OH

41. Principal engineer for the design of propylene glycol-based cooling systems for high velocity, electromagnetic rail-gun projectile launcher and support components, Naval Warfare Support Center, Dahlgren, VA
42. Principal engineer for the design/build construction of \$3.8MM in HVAC system revisions and upgrades to Centerville High School, including a new water chiller plant, cooling towers, new air handling units and new VAV boxes, Centerville Public School System, Centerville, OH

REPRESENTATIVE EXPERT & FORENSIC INVESTIGATION EXPERIENCE

1. Investigation and reconstruction of a high pressure steam separator explosion in the powerhouse of an aircraft components manufacturer, resulting in a single fatality, Cincinnati, OH (Plaintiff's Expert)
2. Investigation of corrosion induced heat exchanger failures for a mechanical vapor re-compression based ethylene glycol recovery system at the Cincinnati/Northern Kentucky Airport (Defense Expert)
3. Investigations of a residential fire resulting from improper installation of a fireplace insert, gas piping and chimney construction, Ft. Mitchell, KY (Plaintiff's Expert)
4. Investigation and reconstruction of a catastrophic tube failures in two high pressure, 600 HP, steam boilers (Precision Boilers) in a large fabric manufacturing facility, Elkin, NC (Plaintiff's Expert)
5. Investigation and reconstruction of a high temperature HVAC hot water system explosion, resulting in extensive property damage, USAF, Wright-Patterson AFB, OH (Plaintiff's Expert)
6. Investigation of a coal furnace/ gas conversion burner defect resulting in excessive levels of carbon monoxide (CO), and significant personal injury, New Philadelphia, OH (Defense Expert)
7. Investigation of a gas furnace defect resulting in excessive levels of carbon monoxide (CO), and multiple fatalities, Cleveland, OH (Defense Expert)
8. Investigation and reconstruction of a steel mill coke oven gas line explosion and fire with multiple fatalities, Bethlehem Steel, Burns Harbor, IN (Defense Expert)
9. Investigation and reconstruction of a residential oil furnace explosion with personal injury, Ashland, OH (Defense Expert)
10. Investigation and reconstruction of an industrial ladder fall accident resulting in serious personal injury, Cincinnati, OH (Defense Expert)
11. Investigation of the construction site failure of pile casting machinery, resulting in serious personal injury, Pittsburgh, PA (Defense Expert)
12. Investigation and reconstruction of a construction site structural failure involving erection of a pre-engineered steel building and alleged crane operator error, resulting in serious personal injury, Maysville, KY (Defense Expert)

13. Investigation of a natural gas explosion for a Hamilton, OH residence resulting in extensive property damage (Plaintiff's Expert)
14. Investigation and reconstruction of a fatal, 600 HP high pressure steam boiler explosion with multiple fatalities at a LaPorte, IN rubber products manufacturer (Defense Expert)
15. Investigation of a refrigerated ammonia release from a food processing, scraped surface heat exchanger, resulting in a single fatality, Chicago, IL (Plaintiff's Expert)
16. Investigation and reconstruction of a multiple fatality, guylless derrick crane structural collapse, involving alleged operator error, during the construction of a 500,000 gallon, 130' tall water tower, Granville, NC (Plaintiff's Expert)
17. Investigation of design and construction defects/change orders for roofing, HVAC and related systems in (2) elementary and (1) high school construction projects totaling \$50MM of construction, Dayton Public School System, Dayton, OH (Plaintiff's Expert)
18. Investigation of design and construction defects in a municipal water park requiring complete demolition and reconstruction, Covington, KY (Defense Expert)
19. Investigation of design and construction deficiencies for a municipal water treatment facility, City of Lancaster, OH (Plaintiff's Expert)
20. Investigation and reconstruction of an explosion, fire and attendant structural failure in the dust collection system of a large metal shredding operation, Gaylord, MI (Defense Expert)
21. Investigation and reconstruction of carbon monoxide concentrations from welding activities, including ventilation/building-code compliance effects, in a 100,000 square-foot commercial food freezer warehouse, \$42MM personnel injury claim, Asher et al v Unarco Material Handling, London, KY (Defense Expert)
22. Process consulting and hazard analysis for alleged mechanical integrity defects in six (6) refinery hydrodesulphurization reactors, and related process piping, \$50MM damage claim, ExxonMobil vs. Doosan Heavy Industries and Fluor Corporation, Houston, TX (Defense Expert)
23. Process consulting and hazard analysis for alleged mechanical integrity defects in a refinery fired process heater, resulting in a personal injury to a contract inspector, Valero Energy Corp, Delaware City, DE (Plaintiff's Expert)
24. Investigation and reconstruction of a dual fatality structural roof assembly collapse during the construction of a steel mill electric arc furnace (EAF), involving construction defects and alleged crane operator negligence, Ghent, KY (Defense Expert)
25. Expert technical services for cement kiln drive system, reverse-rotation, over-speed explosion resulting in serious personal injury, Paulding, OH (Plaintiff's Expert)
26. Expert technical services for a ready-mix concrete plant material handling accident resulting in serious personal injury, Fort Mitchell, KY (Plaintiff's Expert)

27. Investigation and reconstruction of design and construction defects in a hospital emergency power facility, resulting in significant negative pressure and collapse of masonry partition walls, Atrium Medical Center, Middletown, OH (Plaintiff's Expert)
28. Expert technical services for design and construction defects/change orders for a new, \$50 MM multi-story elderly care facility, Columbus, OH (Plaintiff's Expert)
29. Investigation and reconstruction of a back-flow preventer failure and resultant electrical fire in the 30-story Kettering Tower office building, resulting in \$10MM of damage, Dayton, OH (Defense Expert)
30. Investigation and reconstruction of a blast furnace gas explosion incident involving multiple personal injuries, Republic Engineered Products, Lorain, OH (Plaintiff's Expert)
31. Expert technical services for design and construction defects related to HVAC system failure in a large hospital data center, resulting in \$5 MM of computer damage (Plaintiff's Expert)
32. Expert technical services for a \$20 MM design and construction defect arbitration claim for a new 100 TPD, chlor-alkali/bleach/chloropicrin manufacturing plant, Hamlet, NC, (Claimant's Expert)
33. Expert technical services and accident reconstruction related to a high temperature, high pressure glycerin piping system release, with attendant personal injury, Procter & Gamble Company, Cincinnati, OH (Defense Expert)
34. Expert technical and reconstruction services for a long-term, residential carbon monoxide poisoning (CO) claim, Milford, OH (Plaintiff's Expert)
35. Expert technical and reconstruction services for an automotive repair facility, carbon monoxide poisoning claim (Defense Expert)
36. Expert services for a bad-faith insurance claim involving mechanical equipment damage, loss of building heating capability, and substantial freeze-related water damage, resulting in \$3.5MM in monetary damages, Cleveland, OH (Plaintiff's Expert)
37. Expert technical and reconstruction services for a coke-oven gas explosion and fire at a major US Steel coke producer involving multiple personal injuries and extensive property damage, Clairton, PA (Plaintiff's Expert)
38. Expert technical services for an administrative appeal of OSHA Willful Violations regarding Mechanical Integrity testing in large US refinery, BP Products North America, Oregon, OH (Appellant's Expert)
39. Expert technical services for HVAC design and construction defects, renovated 120,000 square foot elementary School, Southeast Local School District, Ravenna, OH, (Defense Expert)
40. Expert technical services for HVAC design and construction defects, new 115,000 SF elementary school, New Lexington City Schools, New Lexington, OH (Plaintiff's Expert)

41. Expert technical services for fire protection sprinkler piping and roof defects, in a new 45,000 SF public library, Geauga County Public Library, Geauga County, OH (Defense Expert)
42. Expert technical services for \$10.5MM in design and construction defects involving a new roof, ground source heat pump, HVAC system in a 187,000 SF vocational school, Greene County Career Center, Greene County, OH (Plaintiff's Expert)
43. Expert technical services for a dual fatality, multiple injury, explosion and fire in a zinc reflux recovery column and furnace, Horsehead Corporation, Pittsburgh, PA (Plaintiff's Expert)
44. Expert technical services for hot water and HVAC system code-related construction defects in a newly constructed, 5-story residential building for disadvantaged women, YWCA of Greater Toledo, Toledo, OH (Plaintiff's Expert)
45. Expert technical services for a single fatality, multiple injury, structural roof collapse in a food processing facility, Fremont Corporation, Fremont, OH (Defense/Plaintiff's Expert)
46. Expert technical services for a refinery piping failure, explosion and fire resulting in multiple fatalities and property damage, ExxonMobil Corporation, Baton Rouge, LA (Plaintiff's Expert).
47. Expert technical services for a structural building slab failure resulting from the use of expansive steel slag as base course material, Youngstown, OH (Defense Expert)
48. Expert technical services for a total-loss restaurant fire resulting from a defective gas water heater flue vent, Toledo, OH (Defense Expert)
49. Expert technical services for \$2MM in claims resulting from design negligence and construction defects in the construction of a new, specialty laboratory gas system, University of Notre Dame, Notre Dame, IN (Plaintiff's Expert)
50. Expert technical services for premature corrosion failures in (6), 200,000 lb/hr high pressure steam boilers, (2) deareators, and related equipment for a large medical center, Dallas, TX (Plaintiff's Expert)
51. Expert technical services for \$1MM in claims in the KFC/YUM! Center, Louisville, KY, involving construction defects and related water damage to the main computer server equipment (Defense Expert)
52. Expert technical services for design and construction defects in a new steel slag recovery facility, Calvert, AL (Claimant's Expert)
53. Expert technical services for a residential natural gas explosion, fire and fatality, Wheeling, WV (Defense Expert)
54. Expert technical Services for a medical oxygen-related residential fire, explosion and fatality, Knoxville, TN (Plaintiff's Expert)
55. Expert technical services for an industrial accident involving compressed air equipment in an automotive industry component plant, Chicago Heights, IL (Plaintiff's Expert)

56. Expert technical services for an automobile/freight train collision on a private grade crossing, California, KY (Defense Expert)

PROFESSIONAL EMPLOYMENT HISTORY

1996 – Present	QEI ENGINEERS, INC. Dayton, Ohio Principal & Managing Partner
1996 – 2006	FERGUSON – QEI, LTD. (Limited Liability Partnership - Ferguson Construction/QEI Engineers) Sidney, Ohio Vice President
1994 – 1996	HOK/K INDUSTRIAL (Joint Venture –Kajima, Inc./HOK Architects) Miamisburg, Ohio President and Chief Operating Officer
1984 – 1994	QSOURCE ENGINEERING, INC. Miamisburg, Ohio President and Chief Executive Officer
1979 – 1984	BRUCE MENKEL AND ASSOCIATES, INC. Franklin, Ohio Chief Engineer
1976 – 1979	UNIVERSITY OF DAYTON RESEARCH INSTITUTE Applied Physics Division/Impact Physics Group Dayton, Ohio Research Engineer
1975-1976	UNIVERSITY OF DAYTON RESEARCH INSTITUTE Aero-thermal Research Group Dayton, Ohio Graduate Research Assistant