

RONALD J. NATOLI, P.E., C.F.E.I.

Mechanical Engineer - Building, Industrial, and Process Systems & Control / Automation

PROFESSIONAL EXPERIENCE

2010 to present **Robson Forensic, Inc.**
Associate

Provide technical investigations, analysis, reports, and testimony toward the resolution of industrial, commercial and personal injury litigation involving construction activities, industrial systems and automation, Underground Storage Tank (UST) and gas station operation and maintenance, and mechanical systems for buildings: design, construction, products, testing, evaluation and failure analysis. Areas of expertise include:

CONSTRUCTION MANAGEMENT AND COORDINATION

- Review and evaluate mechanical, electrical, and low voltage systems and identify design issues prior to construction.
- Review contractor work quality and approve daily logs.
- Ensure the work is installed and performed in accordance to the plans and specifications and schedule of installing contractors.
- Processed Request for Information (RFI's).
- Maintain current contractor scope and approve/negotiate change orders.
- Oversee the installation, startup and commissioning of mechanical, electrical, plumbing and process systems.
- Oversee and enforce site safety requirements for HVAC Contractors, Plumbing Contractors, Piping Contractors and Electrical Contractors.
- Oversee, review and enforce contractor Activity Hazard Analysis (AHA), Job Safety Analysis (JSA), and Job Hazard Analysis (JHA) requirements.
- Oversee various contractor activities including piping installation; trenching, trench safety and trenchless installation activities; horizontal directional drilling activities; piping system flushing & treatment; ductwork installation and supports; electrical wiring installation; welding, cutting, burning and other hot work; equipment and crane lifts; overhead and elevated work; system pressure testing; gas system purging; material delivery & storage.
- Oversee contractor/construction teams that included union and non-union mechanical, plumbing, electrical and low voltage contractors.

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 pumps, heat exchangers, heat & enthalpy recovery units, base board radiators, radiant tubing, variable air volume boxes (VAV), ducted fan coils, balancing valves, strainers, electric & steam heat trace
- Cooling equipment: DX, closed circuit fluid coolers, chillers, cooling towers, condensers.

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- Controls: Temperature, pressure and humidity control, safety, energy management, building management, chilled water systems, heating/hot water/steam systems, burner control, control valving, VFD's, Lead/Lag/Auto Rotation, DDC, system integration, freeze protection, heat trace, load shedding/power management, system security/remote control, alarm reporting and historic data/reporting. 24, 120VAC, low voltage DC and compressed air systems.
- Distribution: Air handlers and ductwork, pumps and piping, circulators, noise control, fire safety/ smoke control, general and process exhaust systems, kitchen exhaust systems, outdoor/makeup air.
- Ventilation: Outdoor/makeup air, sick building syndrome, indoor air quality.
- Carbon monoxide: Testing, source determination.
- TAB: Testing, adjusting, and balancing of air and hydronic systems using NEBB procedures.

Plumbing, Water and Sewage

- Domestic cold and hot water: Temperature controls, boilers/water heaters, mixing valves, circulators, softeners, auto flush devices, washdown & landscape watering systems, water hammer and surge suppression.
- Sewage systems: Gravity and pumped, grease collection and interceptors, sludge dewatering, belt filter presses, sludge pumping station, polymer feed systems, odor control, chlorination, sand filters, flume and weirs.
- Gas systems: Natural and propane gas, nitrogen piping, oxygen piping, natural gas piping, regulators and venting, hood safety interlock, appliances. Gas cylinders and appurtenances.
- Oil systems: Fuel oil storage and containment, distribution pumps/skids, generator freeze/gel protection, daytank controls & piping, alarming and safety interlocks.
- Septic/Septage Systems: Gravity and pumped, conventional and mound systems, leach field design and sizing, tank sizing and design, baffles, access maintenance and repair.

Industrial Systems

- Fuel Systems: Tank farms/batteries, underground storage tanks (UST's), fuel delivery and dispensing systems, UST's and fuel delivery operation/maintenance/training. Layout, design, installation, permitting, records collection and maintenance of underground fuel storage tanks, fuel delivery systems, dispensers, automatic tank gauge (ATG) systems, fuel inventory, vapor recovery, shear valves, poppet valves, leak detection systems, and gas station & convenience store operations. Class A & B (Owner and Operator certification). Owner and operator of a convenience store/gas station.
- Oil & Gas: Natural gas production units & dryers, natural gas sweetening plants (SO₂ & CO₂ removal), process controls, plant design.

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- Process: High pressure air and steam, hydraulic systems, ammonia refrigeration, flash mixing, pumps and controls, natural gas processing/sweetening (amine) facilities, natural gas compression stations, flare systems, digester gas systems, engines, generators. Belt and drag-link conveyors, lime slurry, incinerators, rolling mills, cleanrooms, acid exhaust, solvent exhaust, ovens, autoclaves. Medical gas systems. Explosion-proof equipment.
- Air quality and ventilation: Fans, blowers, ductwork, exhaust hoods, fume hoods, clean air systems, wet scrubbers, carbon absorbers, cyclone separators, biofilters, activated carbon filtration, spray dryers, baghouses, odor control, MG sets, DC motors, battery room ventilation.
- Power: Generators, Cogeneration, combined Heat & Power Plants, ATS's, tie-breakers, wet & dry transformers, harmonic mitigating transformers, UPS's, switchgear, main distribution panels.

Fire Science and Fire Protection Engineering

- Fire alarm systems: Heat detectors, smoke detectors, carbon monoxide detectors, combustion gas detectors, flow detectors, OS&Y valve switches.
- Fire systems: Wet, dry, and double interlock preaction sprinkler systems, Halon suppression systems, CO2 systems.
- Combustion: Combustion control of natural gas and fuel oil, low NOx techniques. Combustion analysis and analyzers.
- Equipment: Fire pump systems (electric/diesel), jockey pumps, vertical turbine fire pumps, heated water storage tanks, dual use storage tanks.
- Fire science: Fire chemistry, fluid mechanics, thermodynamics, combustion, flame spread, smoke spread, fire safety.

Manufacturing Process

- Welding, soldering, oxyacetylene cutting/scarfing, plasma cutting, drilling, sawing, rolling, material conveying, etching, chemical baths.

Types of Facilities and Buildings

- Educational, healthcare, industrial, commercial, cleanrooms, residential.

Equipment

- Operation experience with the following equipment: Voltmeter, amprobe, thermocouples, data loggers, combustion analyzers, anemometers, ultrasonic flowmeters, gas meters, water meters, fuel oil meters, tachometers, manometers, air flow hoods.
- Maintenance programs for mechanical, electrical and plumbing systems.

THE EXPERTS
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- 2010 **TUDI Mechanical Systems**, Pittsburgh, PA
Commercial Projects & Design Build Operations Manager
- Responsible to review and evaluate proposed mechanical, electrical, and low voltage systems. Systems evaluated from design phase through installation and final acceptance. Conducted drawing and specification reviews, and submittal reviews of MEP systems.
 - Responsible for the management, startup and commissioning of multiple projects.
 - Provided technical support of the energy solutions group to modify existing mechanical or electrical systems to provided energy savings.
 - Systems include BAS systems, VFD's, HVAC systems, air handlers, chillers, pumps, cooling towers, VAV boxes, cabinet unit heaters, boilers, furnaces, exhaust fans, air and water balancing.
- 2007 to 2010 **L.P. Ciminelli Inc.**, Buffalo, NY
MEP Operations; Project Manager
- Responsible to review and evaluate mechanical, electrical, and low voltage systems and identify design issues prior to construction.
 - Responsible to maintain the work quality and schedule of installing contractors and ensure the work is in accordance to the plans and specifications.
 - Process Request for Information, maintain the current contract scope and approve and negotiate valid change orders.
 - Oversee the installation, startup and commissioning of MEP systems. Systems include low, medium and high voltage systems, emergency generation/ transfer systems, lighting (including dimming and emergency systems), fire alarm, data, telephony, BAS, mechanical wet-side systems, mechanical dry-side systems, food & beverage, plumbing systems and compressed gas systems.
 - Oversee, review and enforce site safety requirements for HVAC Contractors, Plumbing Contractors, Piping Contractors and Electrical Contractors.
 - Oversee, review and enforce contractor Activity Hazard Analysis (AHA), Job Safety Analysis (JSA), Job Hazard Analysis (JHA) and oversee various contractor activities including welding, hot work, equipment/crane lifts, elevated work, system pressure testing, gas system purging, and trench work.
 - Piping system flushing and treatment
 - Construction team included union mechanical, plumbing, electrical and low voltage contractors.

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2003 to 2007 **Johnson Controls Inc.**, Pittsburgh, PA
Area Manager

(Western Pennsylvania, West Virginia, Ohio, Maryland and counties in Kentucky)

- Responsible for sales, engineering and operations (engineering and delivery) of the Building Efficiency Group.
- Oversaw engineering and startup of complex air-handling, chilled water, heating hot water and laboratory ventilation systems.
- Oversaw the design and implementation of low voltage systems. Low voltage systems included data and telephony infrastructure, paging, RF location/warehouse management systems, nurse call, access control, surveillance, fire alarm, wireless clock, and various building automation systems (BACnet, LON, N2 and various propriety protocols). Systems also included Enterprise Asset Management and Physical Asset Management (MRO, CMMS, TPM) solutions.
- Oversaw Johnson Controls electricians and the installation of electrical support systems and appurtenances.
- Provided and oversaw the field technician and electrician safety program.
- Approved daily tool box talks and weekly safety meeting topics.
- Reviewed jobsite safety programs.
- Reviewed, approved, wrote and executed mechanical and electrical subcontractor contracts as well as Johnson Control's contract to prime contractors.
- Supported field services with startup, troubleshooting and forensic services.
- Worked with design consultants to identify design deficiencies and errors

2002 to 2003 **CDM Inc.**, Pittsburgh, PA
Strategic Business Development Manager – Sr. Engineer

- Responsible for the development, implementation and delivery of MEP system solutions to the private sector.
- System solutions included: the air and waterside of HVAC; cleanroom systems; process air, water and gas systems; process exhaust systems; power generation, cogeneration, fuel tanks/storage and fuel delivery/dispensing systems, energy recovery, and secondary power; boiler & chiller plants; building and process automation.
- Oversaw production of design documents.
- Provided Services During Construction and Commissioning Services.

1998 & 2000 to 2002 **XConnect - PricewaterhouseCoopers LLC**, Pittsburgh, PA
Consultant; Associate Director

- Responsible for the sales and support of the PricewaterhouseCoopers Mid-Atlantic Consumer Industrial Product & Technology Consulting Practice. Solutions.
- Services include: process improvement, energy management & minimization solutions, lean manufacturing/lean enterprise, ERP/MRP solutions, business continuity/disaster recovery evaluations, enterprise service management/asset management, and business process optimization.

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1994 to **Industrial Design Corporation**, Pittsburgh, PA

1998 *Lead Mechanical Engineer; Assistant Project Manager*

- Responsible for all phases of project development (strategic planning, contract negotiations, programming & design development, construction services and implementation. Managed design teams. Teams ranged in size from 20 to 100 persons.
- Responsible for the design and construction of a 100,000 class to sub-class 1 semi-conductor cleanroom facilities, research facilities and product development facilities.
- Led a 10-person on-site SDC (services during construction) team to assist Marshall Construction in their construction management efforts and to quickly solve all constructability and operation issues.
- Systems included large chilled water plants (12,000 to 28,000 tons including absorption chillers), hot water and steam boiler plants, chilled water distribution, medium and high temperature hot water systems, steam distribution systems, process cooling water systems, various exhaust systems (ammonia, acid, solvent, general), reverse osmosis and de-ionized water systems, various process exhaust and ventilation systems, cleanroom and isolation room systems, energy recovery systems, air pollution control (lime slaking/desulphurization) systems, fire protection, make-up air handling systems, cleanroom & recirculation air-handling systems, general air-handling systems, automated material handling systems and process/building automation systems, emergency power systems, and fuel tanks/storage and fuel delivery/dispensing systems.

1990 to **Chester Environmental Group**, Pittsburgh, PA

1994 *Sr. Mechanical Engineer; Project Lead*

- Responsible for engineered solutions for environmental and industrial processing plant operations including water treatment plants, waste water treatment plants, natural gas compression stations, chemical production plants and metal production plants.
- Responsibilities included the design, approval and construction support of all mechanical systems including, but not limited to: natural gas, high & low pressure steam, high temperature hot water, potable water, chilled water, boiler systems, industrial water, sludge, sludge dewatering, clarifiers, DAF's, wet/dry well ventilation, chlorine storage ventilation, de-ionized water systems, chemical distribution, oxygen, compressed air, fire protection systems, general and plant HVAC systems, odor control systems and chemical exhaust systems, UST and fuel delivery/dispensing systems.

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1987 to 1990 **Rust International Inc.**, Pittsburgh, PA
Mechanical Engineer; Project Lead

- Responsible for design, construction and startup of various MEP systems for the heavy metals, chemical, aerospace, and pulp/paper industries, as well as providing waste management solutions (energy recovery facilities) to State and Local governments associated with large metropolitan areas.
- Responsibilities included the design and approval of all mechanical systems including, but not limited to: lime slurry generation/slaking systems, spray dryers, baghouses, ID fans, incinerator/turbine steam systems, natural gas piping, oxygen piping, high & low pressure steam, high temperature hot water, potable water, chilled water systems, boiler systems, industrial water, sludge, sludge dewatering, paper pulp, de-ionized water, hydraulic, chemical and compressed air, general and plant HVAC and chemical exhaust systems.

1985 to 1987 **Gearhart Industries, Inc.**, Broussard, LA
Mechanical Engineer; Field Engineer

- Provided engineering services, support and oversight for directional drilling (HD), horizontal directional drilling (HDD) and downhole turbine/mud-motor orientation.
- Provided services and well support to the oil and natural gas industries. Information included: porosity, pressure, gamma radiation, direction, temperature, inclination, orientation and resistance on a real time basis.
- Assisted R&D department in implementing and testing new technologies.
- Operated real-time wireless downhole data tools.
- Assisted Geologist in data interpretation.
- Coordinated with mudloggers, driller, and directional driller.

PROFESSIONAL CREDENTIALS

Professional Engineer: NCEES, Alabama, Colorado, Connecticut, Illinois, Indiana, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Nevada, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Virginia, West Virginia, Wisconsin
Certified Fire and Explosion Investigator
UST Class A & B (Owner/Operator) Certification
Commercial Driver's License – Combination over 26,000 lbs./Double-Triple Trailers/Tankers
U.S. Department of Homeland Security Chemical-terrorism Vulnerability Information Authorized User Certification

EDUCATION

B.S., Mechanical Engineering, University of Pittsburgh, Pittsburgh, PA, 1985

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Additional Training:

Chemical-terrorism Vulnerability Information Authorized User Training, U.S. Department of Homeland Security, 2022
Directional Drill Safety Training, 2021
Indoor Air Quality – Buildings, 2021
Professionalism and Ethics, 2021
Operation and Maintenance: Water Supply Systems, 2021
Safeguarding HVAC Systems Against Chemical, Biological, and Radiological Attacks, 2021
Selecting the Optimum Pipe Size, 2020
Life Safety Code 101, PDH Online, 2019
National Association of Fire Investigators, International (NAFI), Advanced Fire, Arson and Explosion Investigation Training Program, 2019
Arson Case Management, Public Agency Training Council, 2018
Engineering Ethics: Social Responsibility vs. Legal Liability, 2018
Minnesota Engineering Laws, Rules and Ethics (Revised for 2018), PDH Online, 2018
Professional Practice Board Update and Ethics, Texas Board of Professional Engineers, 2017
Laboratory Designs: Specializing in Fume Hoods and Room Controls Selecting Air Distribution in Tall and Wide Spaces, PTP 3020, Price Training, 2017
Air Distribution for the Modern Operating Room, Price Training Programs, 2017
Modern Closed Circuit TV Design, PDH Online, 2017
Electrical Engineering Concepts for Non-Electrical Engineers, PDH Engineer, 2017
Future-Proof Your Automation Solutions with Standards-Based Design, International Society of Automation (ISA), 2017
Analysis of Surge Problems with Caesar II and BOSfluids, Hexagon PPM, 2017
Basic Overview of Stormwater Management, PDH Engineer, 2017
What's New in Power Water Analytics, HACH and Power Magazine, 2017
OSHA 40-hour Construction Industry Health & Safety Certification, Construction Safety Awareness for Contractors, EM 385-11, 2016

Courses include:

- Accident Prevention
- Control of Hazardous Energy Lockout/Tagout
- Excavations and Trenching
- Welding and Cutting
- Fall Protection
- Rigging: Cranes and Hoisting Equipment
- Stairs and Railing Systems
- Personal Protective and Safety Equipment
- Hazardous Waste Operations and Emergency Response (HAZWOPER)
- Hazardous or Toxic Agents and Environments
- Machinery and Mechanized Equipment
- Hand and Power Tools
- Sanitation
- Lighting
- Medical and First Aid Requirements
- Diving Operations
- Electrical Safety
- Safe Access, Ladders, Floor and Wall Openings
- Fire Prevention and Protection
- Work Platforms and Scaffolding
- Pressurized Equipment and Systems
- Confined Space Entry
- Underground Construction: Shafts and Caissons
- Munitions and Explosives of Concern (MEC) Encountered During USACE Activities
- Material Handling, Storage and Disposal
- Conveyors
- Demolition
- Temporary Facilities
- Concrete, Masonry and Steel Erection
- Blasting
- Floating Plant and Marine Activities
- Motor Vehicles

THE EXPERTS
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- All-Terrain Vehicles: Utility and Specialty
 - Program Management
 - Airfield Operations
 - Tree Maintenance and Removal
- Industrial Water Treatment: Legionella and Reuse Waters, Applying the ASHRAE 188 Legionella Standard, 2016
- Transitioning from UL 1995 to UL 60335-2-40, 2016
- Engineering Ethics: Social Responsibility vs. Legal Liability, 2016
- Rules, Regulations, and Ethics for Professional Engineers, 2015
- Ventilation Flowpaths and Fire Growth, 2014
- A Guide for Kitchen System Fires – Prevention and Investigation, 2014
- National Fire, Arson and Explosion Investigation Training Program, 2014
- Industrial Water Treatment – Operation and Maintenance, 2013
- Healthcare HVAC Codes, Guidelines and Design, 2013
- Plumbing System Design, 2013
- Pennsylvania Underground Storage Tank Class A&B (Owner/Operator) Training, 2012
- LEED Outdoor Airflow Control Improves Buildings Project Systems and Energy Impacts Course, 2012
- Airflow Measurement for Acceptable Indoor Air Quality, 2012
- Plastics Fundamentals: Properties and Causes of Failures, 2012
- CSST and Fire Spread Claims, NASP Ohio Chapter, 2012
- National Association of Subrogation Professionals (NASP) – Commercial Kitchen Fires, 2012
- Marcellus Shale in WV: Emerging Issues, 2011
- Outside Air, Humidity & Chilled Beams, 2011
- Appliance Fire and Failure Investigation, Pennsylvania Association of Arson Investigators (PAAI), State College, PA, 2011
- Boiler Applications - ASHRAE, 2010
- Recognizing Revenue Potential
- Managing Interpersonal Relationships
- DPIC: Risk Management
- Situational Leadership
- Total Quality Management
- DPIC: Lessons in Liability
- Managing for Productivity
- Systems Management Discipline I, II, III
- Project Management
- Basic Six Sigma
- Live Electrical Safety Training
- Arc and Blast Safety Training
- Electrical Shock Safety Training
- Sources of Electrical Hazards Safety Training
- Electrical Safety Comprehensive Training
- Lockout Tagout Safety Training
- Fall Protection Safety Training
- Ladder Safety Training
- Contractor Safety Pre-Qualification Training
- Jobsite Safety Audit Training
- Asbestos Awareness Safety Training

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PROFESSIONAL MEMBERSHIPS

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
Pennsylvania Association of Arson Investigators, Associate Member (PAAI)
National Association of Fire Investigators (NAFI)
International Association of Arson Investigators
Petroleum Retailers & Auto Repair Association

PRESENTATIONS

Old and New Hazards and Managing Risk in the Marcellus Shale Era, West Virginia Association of Justice, October 5, 2018
2015 Connectionology Seminar, "Daubert-Proof Depositions," Cleveland, OH, April 2, 2015
Columbus Bar Association, Procedural Pitfalls CLE; "Fire, Explosions, Water Damage and CO Poisoning Cases"
CEU Institute 2011 Property Coverage and Risk Seminar; "Moisture Control & Water Intrusion – The Theory"