

### Professional Summary:



Eric Lalli is a senior engineer with 35 years of experience in forensic investigations, including leading multinational engineering firms, major regulatory agencies<sup>1,2</sup> and large manufacturing operations in North America. This combined perspective enables him to effectively navigate and resolve complex failure investigations, spanning multiple jurisdictions.

In the world of forensic engineering, Eric is a recognized leader with a broad range of experience globally. He has conducted thousands of failure investigations of machinery, equipment, structures, product design and large complex loss incidents. As investigations leader for government regulators, Eric leads multi-jurisdictional investigations of major failures involving complex integrated technical systems in all major industries and regulated products.

Eric is an expert in occupational health & safety and personal injury investigations. His roles as investigations leader, policy analyst and operations manager for the Workers' Compensation Board<sup>2</sup>, established Eric as an authority in regulatory legislation, codes, standards, policy, regulatory compliance and safety engineering. Eric has provided litigation support, expert evidence and testimony in Supreme, State, District and Provincial Courts for civil and quasi-criminal cases.

### Expertise:

#### Forensic Engineering

Incident causation  
Product failure root cause  
Product design & liability  
Litigation support

#### Materials Engineering

Metallurgical failure analysis  
Materials design & defects  
Corrosion, fatigue, wear  
Advanced materials testing

#### Mechanical Engineering

Mechanical failure analysis  
Equipment design  
Complex integrated systems  
Damage assessment, repair

#### Building Systems

Mechanical, HVAC, plumbing  
Elevating devices  
Electrical incidents  
Building envelope & roofing

#### Fire Investigation

Fire suppression systems  
Fire cause forensics  
Damage assessment  
Equipment repair, restoration

#### Personal & Workplace Injury

Personal injury  
Workers' compensation & OHS  
Machine safety & guarding  
Risk assessment & mitigation

#### Heavy Industry

Machinery & manufacturing  
Boiler, pressure vessel, pipeline  
Refrigeration systems  
Furnaces, forging, forming

#### Rotating Machinery

Turbines, gas & steam  
Generators & gearboxes  
Wind turbine farms  
Mills, reactors & digesters

#### Transportation

Automotive, heavy vehicles  
Aircraft & aerospace  
Railway  
Marine vessels, harbor cranes

1) Technical Safety BC - Regulatory authority for gas, boilers, pressure vessels, electrical, elevating, railways, amusement rides, passenger ropeways, and complex integrated technical systems.

2) WCB, dba. WorkSafeBC - Regulate & enforce occupational health & safety regulations (OHSR, OSHA, WCA, etc.)

**Energy & Resources**

Petrochemical  
Mining & metallurgical  
Forestry and wood products  
Chemical processing

**Elevating & Cranes**

Elevators, escalators  
Cranes, hoists & lifts  
Amusement rides  
Passenger ropeways

**Renewable Energy**

Hydroelectricity  
Power distribution  
Wind turbines  
Biogas production

**Litigation Support**

Subrogation  
Expert witness  
Case consultation  
Regulations, codes & standards

**Food & Agriculture**

Greenhouse equipment  
Winery & brewery  
Food processing  
Restaurant appliances

**Medical & Specialty**

Medical & dental equipment  
Biomechanical, laboratory  
Hospitals, data centers  
Film & broadcasting

Detailed list of Eric Lalli's expertise and services are available at [www.erlforensics.com](http://www.erlforensics.com)

**Education:**

Bachelor of Applied Science (BASc), Materials Engineering, University of British Columbia, 1987  
- Vehicle design competition, won 1<sup>st</sup> place, internationally  
Post graduate courses: Mechanical Engineering

**Licenses & Certifications:**

Professional Engineer (P.Eng.) - BC, AB, TX (rec), NV (rec), 1990, 2010  
Canadian Registered Safety Professional (CRSP) - Board of Cdn. Reg. Safety Professionals, 2010  
Certified Health and Safety Consultant (CHSC) - Canadian Society of Safety Engineering, 2010  
Welding Engineer & Supervisor Certification - Canadian Welding Bureau, 2000  
Fellow of Engineers Canada (FEC) - Canadian Council of Professional Engineers, 2000  
Lead Auditor ISO 9000 Quality Management Systems - Quality Management Institute, 2000  
Certified Quality Engineer (CQE) - American Society for Quality Control, 1997  
Skippers License - Canadian Yachting Association, 1997  
Non-destructive Testing Technician - American Society for Non-destructive Testing, 1996  
Concrete Testing Technician (ACI Level 2) - American Concrete Institute, 1992  
Operating Engineer, cranes & heavy equipment - International Union of Operating Engineers, 1990

**Professional Experience:**

**EFI Global**, Assistant Vice President, Forensics, 2022 - current  
Leads forensic engineering practice, serving insurance and legal sectors, and industry.

**Technical Safety BC**, Leader Incident Investigations, 2018 - 2022  
Led the Investigations department for the regulatory authority of electrical, gas, boilers, pressure vessels, elevating, rail, ropeways, amusement devices and complex integrated technical systems.  
- Directed investigation officers in 11 regional offices to investigate over 500 incidents annually.  
- Safety officers completed over 40,000 equipment safety inspections annually.  
- Appointed as *Provincial Safety Manager*, the government authority leading major complex multi-jurisdictional investigations.

**ERL Forensics Inc**, President 2018 - 2022  
Conducted forensic investigations and litigation support for cases throughout the Americas; ran concurrently to leading investigations for TSBC and only for cases outside of TSBC jurisdiction.

**Envista Forensics**, Practice Leader/Technical Lead, 2013 - 2018

Led complex forensic investigations worldwide as leader in the Mechanical and Electrical Division.

**WorkSafeBC**, Sr. Policy Analyst/Operations Manager/Investigations Engineer, 1998 - 2013

Led investigations of equipment failures and injuries in all industries, to identify cause and liability.

- Directed 400 officers on equipment/process failures, serious injury and fatality investigations.
- Occupational health and safety regulatory compliance consulting to industry and other jurisdictions.
- Provided expert evidence at quasi-criminal prosecutions, civil actions, inquests and appeal hearings.

**Crown Packaging**, Quality Manager, 1996 - 1998

Implemented ISO 9001 quality & ISO 14001 environmental programs at three manufacturing plants.

**ALCOA**, Plant Supervisor, Lafayette IN, 1994 - 1996

Directed 400 union and professional staff at a multi-plant facility producing aerospace and automotive components for Boeing, Airbus, British Aerospace, NASA, Ford, GM and Chrysler.

**Kaiser Aluminum & Chemical Corp**, Plant Engineer, Los Angeles CA, 1993 - 1994

Manufacturer of structural aluminum components for automotive and architectural markets. Designed new patented technology and equipment at operations in California, Washington, Texas and Ohio.

**Inter-Coast Consultants**, Vice President, 1991 - 1993

Building envelope and concrete design, installation compliance inspections and failure analysis.

- Investigated water intrusion claims in hundreds of condominiums and commercial buildings.
- Building condition assessment and roofing design contract for all hospitals and schools in BC.

**Alcan Aluminum (Rio Tinto)**, Process Engineer/Plant Engineer/Quality Manager, 1987 - 1991

Designed new manufacturing technology for several plant locations in North America.

**Specialized Education:**

*Buildings & Structures*

Building Condition Assessments  
 Fire Prevention and Protection  
 Building Envelope and Roofing Design  
 Roofing Inspector-Certified  
 Advanced Concrete Technology

*Equipment*

Steam Turbine Maintenance & Reliability  
 Boiler & Pressure Vessel Design  
 Gas Turbine Engine Technology  
 Aircraft Accident Investigation  
 Welding Inspector-Certified  
 Machine & Process Safeguarding  
 Cranes, Lifting Devices and Rigging

*Legal*

Conflict Resolution & Mediation  
 Expert Witness Testimony  
 Product Liability

*Safety & Risk Management*

Combustible Dust Hazard Analysis  
 Risk Management  
 Occupational Health Safety and Environmental Systems  
 Human Factors Analysis  
 Integrated Safety Investigation Methodology  
 Root Cause Analysis

*Metallurgy & Materials*

Corrosion  
 X-Ray Diffraction & Fluorescence  
 Fourier Transform Infrared Spectroscopy  
 Scanning Electron Microscopy  
 Failure Analysis & Fracture Mechanics  
 Superalloys  
 Advanced Metallography  
 Polymers & Plastics  
 Ceramics & Refractories  
 Advanced Composites

Appendix A - Complete chronological list of specialized education and educational institutes

### Professional Associations:

Professional Engineer (P.Eng.), Engineers & Geoscientists of British Columbia  
Professional Engineer (P.Eng.), Association of Professional Engineers & Geoscientists of Alberta  
Professional Member of Canadian Society of Safety Engineering (CSSE)  
Professional member of American Concrete Institute (ICI)  
Certified member of American Society for Quality Control (ASQC)  
Certified member of Board of Canadian Registered Safety Professionals (BCRSP)  
Certified member at American Concrete Institute (ACI)  
ASM International (American Society of Materials)  
American Society for Testing and Materials (ASTM)  
Failure Analysis Society (American Society of Materials)  
American Society of Mechanical Engineers (ASME)  
National Academy of Forensic Engineers (NAFE)

### Professional Practice:

Engineers and Geoscientists of B.C.  
Applications Committee 2009 - 2012  
Registration Committee 2001 - 2008  
Vancouver Branch Chair 1997 - 2003

Applied Science Technologists and Technicians of B.C.  
Practice Review Board 2004 - 2006  
Board of Examiners 2004 - 2005

### Publications:

Failure of Gas Furnace Heat Exchangers, TSBC, 2021  
Construction Hoist Failure, TSBC, 2021  
Refrigeration System Failure, TSBC, 2018  
Automotive Equipment Failures, WorkSafeBC, 2012  
After the Floods, Insurance West, 2013  
Mobile Equipment General Requirements, WCB, 2010  
Machinery and Equipment Regulations, WCB, 2009  
Marine Vessel Hazards, WCB, 2005  
Forest Products Manufacturing, WCB, 2004  
Wood Products Manufacturing, WCB, 2004  
Tools, Machinery and Equipment Hazards, WCB, 2001  
Safeguarding Best Practices, WCB, 2000  
Scaffolds and Work Platforms, WCB, 2000  
Root Cause Analysis, Best Practices Guide, WCB, 1999  
Occupational Health & Safety Regulations, multiple sections, WCB, 2008 - 2013  
OHS Policies and Guidelines, multiple sections, WCB, 2010 - 2013  
Authored 100's of publications through Technical Safety BC, WCB/WorkSafeBC and others.

Appendix B - Complete chronological list of publications and presentations

### Presentations:

Environmental and Forensic Investigations - Vancouver Club, 2022  
Incident Investigations, Systemic Causal Factors - Technical Safety BC, 2022  
Arc Flash Incidents - TSBC, 2021  
Gas Furnace Heat Exchanger Failures - TSBC, 2021  
Passenger Ropeway and Amusement Devices - TSBC, 2021  
Ammonia Release, Equipment & Process Failures - TSBC, 2021  
Carbon Monoxide Fatality Investigations - TSBC, 2021  
Elevating Devices Investigations - TSBC, 2019  
Passenger Ropeway & Amusement Devices - TSBC, 2019  
Investigations by Regulatory Authorities - TSBC, 2019  
Forensic Investigation of Complex Losses - Cansure, Intact, ClaimsPro, 2018  
Leading Issues, Trends & Challenges Impacting the Expert Witness - Expert Witness Forum, 2017  
Safeguarding the Case File, Best Practices for Experts - Expert Witness Forum, 2016  
Crane Failure Claims - Webinar series, 2016  
Metals, Plastics and Ceramic Failure Investigations - Webinar Series, 2014  
Turbine Failure Analysis - Lloyd's of London (London HQ), 2014  
Liability Investigations - Oregon Claims Adjusters Association, 2013  
Lecturer for University of British Columbia - Faculty of Engineering, 2000 - 2013  
Safety Guarding Standards: Their role in assessing liability - Webinar, 2013  
Occupational Safety & Health Regulations (OSHA/OHSR) - Workers Compensation Board 1999 - 2013  
Automotive Lifts and Vehicle Supports - Ministry of Education, 2012  
Law & Ethics - EGBC Professional Development Seminars, 1998 - 2010  
Professional Engineering - University of BC, Ministry of Education, 1998 - 2010  
Root Cause Analysis - Canadian Society of Safety Engineering, 2006  
Subject Matter Expert (Indoor Air Quality) - Workers Compensation Board public hearings, 2000  
Provided numerous other presentations to associations, institutions and conferences, (Appendix B).

### Expert Witness:

Litigation support in 24+ cases in USA and Canada, expert testimony provided in matters involving:

Building mechanical systems, plumbing	Cement and concrete plants
Boilers and pressure vessels	Film studio equipment
Building construction	Ladders, scaffolds
Pipelines	Metal casting and forging plants
Oil & gas equipment	Furnaces, industrial & commercial
Electrical transformers	Cellular equipment
Elevators, elevating devices	Machine guarding
City sewer systems	Plastics and polymers
Cranes and lifting devices	Fire suppression systems
Restaurant equipment	Sprinkler pipes & components
Industrial equipment	Ceramic products
Automotive	Corrosion failures

Appendix C - Litigation Curriculum Vitae

## Project Examples:

### ***Building Systems***

#### **Water Leaks, Mechanical**

Multiple investigations to determine cause of failures in fire protection systems, sprinklers, HVAC, plumbing, hydronics and drainage systems. Causes due to defective product, design, installation, maintenance, misuse and lifecycle overuse.

#### **Plumbing Components**

Fire suppression: Numerous failures in sprinkler and fire protection system piping (plastics, steel, iron, composites), fittings, valves, pumps, controls and drains.

Fixtures & Fittings: Numerous investigations of plumbing fittings, fixtures, valves, appliances, tanks, and ceramics. Lead engineer on successful class-actions in Canada and USA.

Plumbing: Water supply, drainage, HVAC and specialty systems in residential, condominiums, commercial, hospital, university, food/beverage, agricultural and industrial applications.

#### **Fire & Smoke Damage**

Equipment fire damage and smoke contamination assessment of all equipment in hospitals, university, laboratory, broadcast studios, computer server rooms, commercial, food manufacturing, residential and industrial facilities. Applied contamination testing processes using analytical chemistry, materials analysis and functional testing to identify restoration options and targeted component replacement. Directed equipment restoration processes to fully restore applicable equipment, providing quality verification that maintained many of the original equipment warranties.

### ***Building Structures***

#### **Building Envelope**

Numerous water intrusion investigations for strata buildings, schools, hospitals; from 1990 "leaky condo crisis" through to 2022 in BC and Alberta. Identified root causes and remediation options.

#### **Concrete Structures**

Investigated numerous concrete foundations, floor slab, structural failures and water intrusion incidents. Determined cause of failure and repair options for commercial and residential buildings. Recent projects include commercial/residential high-rises in BC, Alberta, Florida and Mexico.

### ***Boilers, Pressure Vessels & Pipelines***

#### **Industrial**

Identified cause of failures in BPV systems from residential to heavy industry applications, examples include industrial boiler explosions, pressure vessel, petrochemical vessel and reactor failures.

#### **Residential/Commercial**

Gas furnace heat exchanger failures, explosions and carbon monoxide poisoning injuries/fatalities. Chiller failures and ammonia release injuries. Causes include product defects, installation and misuse.

#### **Greenhouse & Agriculture**

Investigated losses due to heating systems failures, boiler fires, electrical fires, and micro-nutrient distributions system failures. Facilities included vegetable, flower, and cannabis production.

#### **Pipelines**

Major petrochemical pipeline failures and fatality investigations in Canada and USA.

### ***Turbines & Generators***

**Wind:** Numerous wind turbine failure investigations in the USA, Mexico and South America. Turbine blades, nacelle, gearboxes, control systems, towers. Makes include Vestas, GE, Siemens and Gamesa.

**Steam:** Determined root cause of steam turbine blade failures in Canada, USA, Colombia and Mexico. Causation identified as metallurgical design, maintenance, retrofit procedures and misuse.

**Gas:** Determined cause failures in gas turbine engines used in domestic and military aircraft, and industrial applications: blade failures, combustion systems and control systems. Makes include GE, Rolls-Royce, International Aero, Pratt & Whitney, Siemens, Alstom and Ansaldo Energia.

### ***Heavy Industry***

#### **Materials Production**

Mining, industrial materials manufacturing and chemical processing equipment, vessels and reactors for metals, glass, ceramics, concrete and hazardous chemicals. Determine cause of failures for major damage, injuries and fatalities in USA, Canada, Mexico, China, Colombia, Netherlands and Mongolia.

#### **Manufacturing**

Industrial manufacturing from casting and forging to final assembly machinery for automotive, aerospace and heavy parts manufacturing factories in Canada, USA, Mexico, South America and Asia.

### ***Automotive & Aerospace***

Numerous cases of vehicle failures and fatalities involving design, manufacturing and product defect, misuse, fatigue, corrosion, wear and maintenance deficiencies. Vehicles included automotive, tractor trailer, heavy mobile equipment, aircraft and aerospace.

### ***Large Complex Loss***

#### **Floods**

Lead investigator directing multidisciplinary teams on hundreds of claims assessing damage to buildings, equipment and infrastructure. Provided loss valuations, repair and restoration specifications. Facilities included colleges, hospitals, factories, laboratories, commercial/residential buildings, and pipelines. Examples: 2021 floods in British Columbia (\$500M), 2013 floods in Alberta, (\$200M).

#### **Fires**

Equipment damage assessments (\$200M) from smoke contamination in public schools and government buildings due to the 2016 wildfires in Fort McMurray, Alberta. Led multidisciplinary team to assess smoke damage to a 7-storey (300,000 sq.ft.) hospital, providing cost valuations, directing restoration, repairs and warranty reinstatement on all building systems, life safety and diagnostics.

#### **Equipment**

Led teams of engineers, regulatory authorities, police, fire and coroner services during investigations of catastrophic equipment failures in factories, energy plants, railways, buildings and public facilities.

### ***Personal Injury***

Hundreds of personal injury and workers' compensation investigations in Canada and USA involving failures or misuse of equipment, processes, facilities and safety system failures. Regulatory expert in multiple jurisdictions for Workers Compensation Acts, Occupational Health and Safety Administration, Safety Standards Act and codes (OSHA, WCA, OHSR, ANSI, CSA, API, ASME, NFPA, DOT, ASM, etc.).

Appendix D - Complete chronological project history.

### Insurance Carriers:

Qualified as a forensic engineering expert and completed projects for the following insurance carriers:

AIG	Co-operators Group	McLarens
Alaska National	Economical	Munich Re
Allianz	Factory Mutual	Mutual Fire
AON	Federated	Nationwide Mutual
Aviva Canada	FM Global	Navigators London
AXA XL Insurance UK	Gore Mutual	Northbridge
BFL Canada	Hartford	PT Asuransi Tokio Marine Indonesia
CNA	HSB Canada	RSA Canada
Canadian Claims Services	HUB International	Sovereign General
Cansure	Intact	State Farm
Catlin	Liberty International	Travelers
Chartis	Liberty Mutual	Wawanesa Mutual
Chubb	Mapfre Mexico, S.A.	Western National
Cincinnati	Marsh Canada	Zurich

### Appendices:

Further details are available in optional appendices:

- A - Specialized Education
- B - Publications and Presentations
- C - Litigation Curriculum Vitae
- D - Project History
- E - Personal Injury and Workers' Compensation
- F - Safety Engineering and Regulatory Compliance

Appendices also available for various technology and industry categories.

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