OAK FORENSIC ENGINEERING

Gilles Amirault, P.Eng.

Principal Engineer

Office: 403-244-7440

Cell: 403-618-2749

Email: gilles.amirault@oakforensic.com

PROFESSIONAL PROFILE

Gilles Amirault is a senior forensic engineer with 20 years of experience. His specialty is in mechanical and materials failure analysis and has managed teams on complex multidisciplinary failure investigations for several years. Gilles oversees operations in Oak's Calgary office. Gilles' expertise includes:

- Mechanical Failures
- Material Failures, including metal, composites, plastics, rubber, and glass
- Managing complex and multidisciplinary failure investigations
- Plumbing and piping
- High-rise mechanical systems
- Sanitary and storm line failures
- Fractography
- Industrial machinery
- Oil and gas production facilities
- Pipeline failure analysis
- Pipeline leak detection analysis
- Fire suppression systems
- Mechanical testing
- Vehicle component failures
- Pressure vessels
- Hydraulic failures

EDUCATION

B. Eng. Mechanical Engineering, Dalhousie University, Halifax, NS 2004

- Graduated with High Distinction

Postgraduate courses in Materials Engineering, Polymer Engineering, Finite Element Analysis, Pipeline Corrosion, Pipeline Coatings (2010-2012).

PROFESSIONAL AFFILIATIONS

Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS)

Engineers and Geoscientists BC (EGBC)

ASM International (formerly American Society of Metals)

American Society of Mechanical Engineers (ASME)

WORK HISTORY

2020 – Present: Founder and Principal Engineer, Oak Forensic Engineering Ltd., Calgary, AB

Founded in 2020, Oak Forensic Engineering is a failure analysis and prevention engineering firm with offices in Calgary and Edmonton, Alberta. Primarily servicing Western Canada, the firm's focus is on mechanical failure analysis, materials failure analysis, and structural engineering.

2018-2019: Assistant Vice President, Envista Forensics, Calgary AB

SAMAC Engineering was acquired by Envista Forensics in 2018. Being with SAMAC prior to the acquisition, Gilles' new role was to oversee operations for Western Canada for Envista Forensics, consisting of two offices (20 people). Disciplines included mechanical, materials, electrical, structural, fire origin and cause, vehicle accident reconstruction, and biomechanical.

In addition to the management role, Gilles often led or provided guidance to lead investigators of large complex losses throughout Western Canada.

2015 – 2018: Director of Property Division, SAMAC Engineering, Calgary, AB

2004 – 2015: Failure Analysis Engineer, SAMAC Engineering, Calgary, AB

Contributed to business expansion and staff mentoring, beginning with a team of 2 engineers in 2005 and eventually overseeing a team of 14 staff and 4 consultants at the time of the firm's sale in 2018. The company had steady and stable growth throughout this period.

Responsible for overseeing many of the large losses ($2M and above) in mechanical/materials engineering, or as lead investigator in multidisciplinary cases. Examples of these investigations can be found below under *Sample of past investigations*.

Responsible for the management and mentoring of many other engineers within the firm in a variety of disciplines, both junior and senior staff members.

SAMPLE OF PAST INVESTIGATIONS

Mechanical and Materials Investigations

- Oil pipeline leak, $10M, Fort Saskatchewan, AB 2016
- Ammonia leak from ice arena rink chiller, triple fatality, Fernie, BC 2017
- Hot air balloon failure, double fatality, Surrey, BC, 2007
- QA/QC on mechanical system installation of a 35 story residential tower, Calgary, AB, 2018
- Amusement ride failure investigation with 10 people injured, Calgary, AB, 2010
- Dry sprinkler line failure, $2M, Edmonton, AB, 2015
- Gasoline line failure, $1M, Hanna, AB, 2012
- Arena ammonia chiller failure, $1M, Calgary, AB, 2018
- Hydroelectric generator failure, $1M, BC, 2019
- Various high-rise plumbing failures, Calgary, AB
- Beef processing plant hanging conveyor collapse, $2M, Brooks, AB, 2008
- 36" pipeline rupture, Buffalo Pound Lake, Saskatchewan, 2008
- Gas leak resulting in hotel explosion, $1M, Lake Louise, AB, 2009
- Riser failure in 56 story tower, $2M+, Calgary, AB, 2015
- Hydrogen pipeline built of CPVC/fiberglass failure investigation, Grande Prairie, AB, 2015
- Several fiberglass pipeline failure investigations, Saskatchewan and Southern AB, 2010 to 2015
- Hydraulic ram failure on oil sands excavator, Fort McMurray, AB, 2014
- Oxygen compressor failure in pulp mill, Prince George, BC, 2018

Lead in Multidisciplinary Investigations

- Oil and gas-fired heater failure, $75M+, Fort McMurray, AB, 2017 (Process Engineering, Mechanical Engineering, Materials Engineering)
- Fiber-optic line investigation, $50M+, Northwest Territories, 2016 (Geotechnical Engineering, Mechanical Engineering, Electrical Engineering)
- Incinerator failure at LPG facility, $2M, Delta, BC, 2017 (Process Engineering, Mechanical Engineering, Materials Engineering)
- Assessment of steel structure for fire damage, $4M, Fort McMurray, AB, 2017 (Structural Engineering, Materials Engineering)
- Storm and sewer line failure, $3M, Calgary, AB, 2017 (Geotechnical Engineering, Mechanical Engineering)
- Electrical switchgear failure investigation in a high-rise, $25M, Calgary, AB, 2012 (Electrical Engineering, Fire Cause and Origin, Mechanical Engineering)

CONTINUING EDUCATION / ADDITIONAL TRAINING

American Society of Mechanical Engineers, *ASME Section VIII Div 1 – Design and Fabrication of Pressure Vessels*, 5-day course, 2015.

American Society of Mechanical Engineers (ASME), *ASME 31.3 Process Piping***,** 5-day course, 2014.

University of Calgary Graduate Course, *Numerical Methods for Engineers***,** 2012.

University of Calgary Engineering Course, *Polymer Engineering*, 2012.

American Society of Mechanical Engineers, *Bolt Design and Joint Assembly***,** 5-day course, 2011.

University of Calgary Graduate Course, *Corrosion Science in the Pipeline Industry*, 2011.

University of Calgary Graduate Course, *Finite Element Analysis*, 2011.

ASM International*, Introduction to Metallurgical Lab Practices***,** 3-day course, 2010.

University of Calgary Engineering Course, *Materials II*, 2010.

University of Calgary Graduate Course, *Pipeline Coatings*, 2010.

Commercial Vehicle Braking Systems, 3-day course, 2009.

PC-Crash Advanced Training Workshop, 4-day course, 2009.

CDR Operator and Analyst Course, 5-day course, 2008.

Tire Technology, 2.5 day course, 2008.

Motorcycle Crash Investigation, 5-day course, 2007.

Pedestrian Collision Investigation Course, 5-day course, 2007.

PC-Crash Advanced Training Workshop, 2-day course, 2006.

Vehicle Accident Reconstruction Methods, 2-day course, 2006.

Commercial Vehicle Collision Reconstruction, 5-day course, 2005.

PATENTS

Tatsu, C.; Amirault, G.; and Zdravkovic, D. *Purge Valve Including a Permanent Magnet Linear Actuator*, 2004.

Tatsu, C.; Amirault, G; Zdravkovic, D, Weldon, C.; and Modien, R. *Purge Valve and Method of Purging Using an Annular Permanent Magnet Linear Actuator*, 2004.

PUBLICATIONS

Amirault, G. and MacInnis, S., *Variability of Yaw Calculations from Field Testing,* Society of Automotive Engineers (SAE) Technical Paper 2009-01-0103, 2009.

- Lead author of a peer-reviewed paper published by the Society of Automotive Engineers (SAE) based on two years of high-speed vehicle testing. The paper discusses the accuracy of the yaw formula at higher speeds, the optimal chord length to be used, and the use of the centre of gravity method.