

CURRICULUM VITAE - DR RAYMOND LINDSAY HOPE

ACADEMIC QUALIFICATIONS:

Bachelor of Engineering 1994 The University of Queensland
(Mechanical -1st Class Hons.)

Doctor of Philosophy 1999 The University of Queensland

PROFESSIONAL ACCREDITATIONS:

Member, The Institution of Engineers Australia (MIEAust)
Chartered Professional Engineer Australia (CPEng)
Registered Professional Engineer of Queensland (RPEQ)
National Engineering Register (NER)
APEC Professional Engineer Register (APEC Engineer IntPE(Aus))

AWARDS:

2012 Winner, National Engineering Excellence Award, Engineers Australia, Canberra, Australian Capital Territory

2012 GHD Overall Winner, Engineering Excellence Award, Newcastle Division, New South Wales

2012 UGL Innovation in Sustainable Engineering Award, Newcastle Division, New South Wales

2012 Winner, Engineering Excellence Award, Newcastle Division, New South Wales

2010 Finalist, Engineering Excellence Awards, Engineers Australia, Queensland Division

2001 High Commendation, Engineering Excellence Awards, Engineers Australia, Queensland Division

1997 Award for excellence, most outstanding paper Rapid Prototyping Journal

1990 Dux of School, Immanuel Lutheran College, Maroochydore, Queensland

CAREER APPOINTMENTS:

2005 - Vice President Engineering, Gilmore Engineers|e3k

2003 - 2005 Manager, New Product Division, Gilmore Engineers Pty Ltd|e3k

1998 - 2003 Research and Development Engineer, Gilmore Engineers Pty Ltd|e3k

1995 - 1998 Postgraduate Research Scholar, The University of Queensland

1995 - 1997 Tutor, Mechanical Engineering Department, The University of Queensland.

AREAS OF EXPERIENCE AND EXPERTISE:

Motor Vehicle Accidents

Motor vehicle accident analysis and reconstruction, of incidents involving a single vehicle or multiple vehicles, including passenger cars, prime movers and trailers, trucks, motorcycles, marine vessels, or buses.

- Pre-incident speed analysis
- Head-on impacts
- Vehicle rollover
- Skid mark analysis
- Headlight and taillight on/off analysis
- Pedestrian impacts

- Determination of seat belt use
- Stopping distances calculation
- Position of vehicle pre-impact
- Motorcycle and Bicycle impacts
- Tyre, suspension, brakes, steering and other component failures

Machinery Failure / Forensic Engineering

Inspection, failure analysis, and root cause analysis of significant machinery failures and cracking.

- Large engines: trucks, plant, marine vessel, generators
- SAG and ball mills: cracks, bearing failures, design audits
- Nuclear facility component failure
- Drill rig damage
- Rock hammer failure
- Conveyors
- Haul trucks
- Excavators
- Dozers
- Tractors

Cranes & Elevating Work Platforms

Cranes, Elevating Work Platforms (EWP) and lifting equipment failures and root cause analysis.

- Cranes dropping load
- Near misses from dropped loads
- Mobile crane crashes
- Crane collapse
- Injuries and fatalities
- Operator error
- EWP collapse
- Failing from EWP bucket
- Lifting equipment failures

Personal Injury

Occupational health & safety, system of work assessments and investigation and analysis of injuries and fatalities from;

- Workplace incidents
- Cumulative trauma disorders
- Lifting, pushing, pulling injuries
- Slip & falls
- Crushing impacts
- Amusement rides
- Ergonomics
- Noise and vibration effects

- Ladder failures and falls
- Garage door and sliding door injuries

Patents & Copyright

Review and assessment of IP claims, including patent and copyright disputes.

- Electric vehicle systems patents
- 4WD recovery equipment patents
- Fish harvesting machine patent
- Industrial conveyor belt system
- Heavy haul trailer design copyright
- Heavy vehicle suspension performance patent
- Building product patent infringement
- Sunshade and umbrella patents
- Playground products
- Engineering comparisons of technology

Fit For Purpose Assessment

Forensic Engineering reviews and assessments of machinery and products where legal claims have arisen over fitness for purpose.

- Farming machinery
- Industrial and mining machinery
- Building lifts and machinery
- Vehicle modifications
- Heating and air-conditioning systems and building insulation
- Consumer products

Product Liability

Consumer and industrial product analysis, testing and assessment of compliance with standards. Assessment of products involved in personal injury matters or property loss.

- Chair failures
- Power tools: Angle grinder, drills and drill presses, nail guns
- Ladder failures
- Kitchen appliances
- Hot water systems
- Heating devices
- Liquid Nitrogen storage tank

Fire & Explosions

Building, plant, machinery, and motor vehicle fires & explosions. Analysis and ignition source identification.

- Crane engine fire
- Haul truck fire

- Gas well explosion
- Excavator fire
- Underground mine explosion
- Hotel/backpacker fire
- Car engine fire
- Arson investigations

Crime Scene Forensic Engineering

Forensic Engineering reviews and assessments of crime scene evidence.

- Murder / manslaughter investigations
- Death by shootings
- Death by carbon monoxide poisoning
- Death from impacts
- Death from machinery failure

Aircraft Crashes

Helicopter and Aeroplane accident reconstruction and analysis of component failures.

- Helicopter bearing failure
- Aeroplane engine failure
- Helicopter drive train failure

Product Design, Analysis, and Testing

Turning ideas and innovations into successful products.

- Concept review, generation, and development
- Detailed design and 3D modelling
- Design to Australian or International Standards
- Finite Element Analysis (FEA) computational load testing
- Physical testing of prototypes or production parts

PUBLICATIONS:

Hope, R.L., Roth, R.N., Riek, A.T. (1995) "Rapid generation of large objects", *Proc. First Asia/ Pacific Conference on Rapid Product Development*, QMI, Brisbane.

Hope, R.L., Roth, R.N., Riek, A.T. (1996) "Layer Building With Sloping Edges For Rapid Prototyping Of Large Objects", *Proc. 5th European Conference on Rapid Prototyping and Manufacturing*, June 4-6, Helsinki, Finland, pp 47-57.

Hope, R.L., Jacobs, P.A., Roth, R.N. (1997) "Rapid prototyping with sloping surfaces", *Rapid Prototyping Journal*, vol 3, no.1, pp 12-19.

Hope, R.L., Roth, R.N., Jacobs, P.A. (1997) "Adaptive slicing with sloping layer surfaces", *Rapid Prototyping Journal*, vol 3, no.3, pp 89-98.

BIOGRAPHICAL NOTES

Dr Raymond L Hope is the Vice President Engineering of Gilmore Engineers Pty Ltd | e3k. He leads an award winning, cross industry, innovative team, specialising in Engineering Failure Analysis and providing Professional Expert Witness services to the legal profession.

Dr Hope is a highly experienced Expert Witness. He has investigated more than 500 incidents over the last 25 years and prepared expert engineering evidence for the legal profession of Australia. This evidence has ranged from detailed failure analysis of major industrial accidents, machinery failure, including numerous engine failures, patent and copyright actions, motor vehicle accident investigation and re-construction and personal injury cases.

As well as providing expert reports for the Federal Court of Australia, Federal Circuit Court of Australia, Supreme Courts, Magistrates Courts, District Courts and the High Court of New Zealand, Dr Hope has appeared to give evidence in Supreme Courts, District Courts, and Magistrates Courts in Australia. Matters for which Dr Hope has presented evidence to the Court in person include cases involving charges of manslaughter; dangerous operation of a motor vehicle causing death; machinery fit for purpose matters, class actions, and various civil matters.

Noteworthy cases include Parliament House, Canberra, where he inspected and analysed the cause of approximately one million dollars' worth of accidental water damage to the Cabinet Room and the Prime Minister's office, and a crane failure that led to the destruction of the crane and major damage to a mining dragline boom.

Dr Hope received his Bachelor of Mechanical Engineering degree in 1994, with First Class Honours from The University of Queensland, Australia. He completed a Ph.D. degree in the field of Mechanical Engineering in 1998, also from The University of Queensland. His postgraduate research examined layered manufacturing of large objects, and in particular techniques to improve speed and accuracy such as five-axis profiling of layer surfaces and adaptive slicing.

Dr Hope has published four papers in journals and engineering conferences at the International level and received an award for excellence for the most outstanding paper in the 1997 Rapid Prototyping Journal published by MCB University Press, UK.

In 1998, Raymond joined Gilmore Engineers Pty Ltd as a specialist Research and Development Engineer. As well as his expert witness and failure analysis work, Dr Hope has worked on numerous design projects and developed expertise in concept generation and refinement, three-dimensional computer modelling, prototype construction and testing, and Finite Element Analysis (FEA).

Some career highlights of Dr Hope include the following:

In 2022 Dr Hope performed a design review and failure analysis, including Finite Element Analysis, of failed and replacement parts from a nuclear reactor in a nuclear medicine facility.

In 2022 Dr Hope provided expert evidence on behalf of one of the big Japanese Motor vehicle companies regarding an intellectual property dispute over a system in their electric vehicles.

In 2020 Dr Hope performed extensive testing of an off-road vehicle at the centre of a class action. Dr Hope provided an expert report and a joint expert report to the court, and in 2022 appeared in the Supreme Court of New South Wales to give joint evidence in a panel format.

In 2019 Dr Hope presented vital evidence in the Brisbane Supreme Court in a case where an excavator operator was charged with manslaughter, after a death on a work site. Dr Hope investigated the available evidence and was able to identify an excavator failure mode that

was not identified by either Workplace Health and Safety or Police investigators. The client was found not guilty of all charges.

In 2018 and 2019 Dr Hope travelled to a copper mine in Kazakhstan to inspect, review and perform detailed design and analysis of equipment and plant improvements to enable a reduction in maintenance downtime plus improved safety for key plant equipment.

In 2016 Dr Hope worked on the planning and repair of a stainless steel lined concrete tank in Laos, SE Asia, which was leaking acid. The repair was performed during a 5-day total plant shutdown and was the most significant task to be undertaken, representing the critical path on the shutdown timeline. Dr Hope and his team were engaged to be lead contractors and perform the project engineering for the repair as well as the engineering design. During, and leading up to the shutdown Dr Hope was onsite to manage the operation and trouble shoot any issues that arose during the repair.

In 2012 Dr Hope presented vital evidence to the court in person on behalf of a client charged with dangerous operation of a motor vehicle causing death. Dr Hope showed how a truck parked on the side of the road obscuring a stop sign, and the pattern of shadows on the road surface around the line markings, greatly reduced the driver's reaction times and significantly contributed to the incident. The client was found not guilty.

In 2012 Dr Hope and his team won four Engineering Excellence Awards from Engineers Australia. They won three awards in the Newcastle Division, New South Wales, including the GHD Overall Winner, and the UGL Innovation in Sustainable Engineering Award for engineering design and testing of the SeaUrchin marine power generator. They also went on to win a prestigious National Award at the 2012 ceremony held in Parliament House, Canberra. Dr Hope was on hand to receive these Awards on behalf of the Engineering Team he had led to achieve them.

In February 2014, Atlantis Resources Limited, a company grown from the technology developed by his team in the years 2000 to 2004, was admitted to trade on the London Stock Exchange. The world-patented technology part-owned by Morgan Stanley, relates to underwater tidal renewable power generation turbines. Dr Hope proposed the concept for the turbine that was originally patented and played a critical role in the development and testing of the initial prototype turbines based on that concept.

In 2009 and 2010, Dr Hope worked on the development of the FLAT hydraulic stabilising mechanism for use on any item with legs, skids, or footings. Dr Hope contributed to the development of the intellectual property and redesigned the prototype for cost effective and compact manufacturing processes in plastics. The FLAT design received an Australian International "Design Award" from Good Design Australia. The product is now available for sale through outlets worldwide.

Dr Hope worked on an energy efficiency project for Leighton Contractors Pty Ltd as part of their green program. The project led to a finalist nomination in the Queensland Division of the 2010 Engineering Excellence Awards.

Dr Hope performed optimisation and FEA analysis of a new mechanical fastening system known as "Joinlox". This product went on to win "Invention of the Year" on the ABC Television "New Inventors" program in 2008. The technology was made commercially available by Joinlox Pty Ltd, supported by Xstrata Technology who signed a global licensing agreement in 2010.

Dr Hope worked on the development of a kayak foot pedal force sensor that was used for training feedback by the Queensland Academy of Sport leading up to the 2000 Olympic games in Sydney. The project also received a High Commendation in the Queensland Division of the 2001 Engineering Excellence Awards.