

EngAnalysis

DATA DRIVEN ENGINEERING

HEAVY INDUSTRY DESIGN VERIFICATION AND VALIDATION CAPABILITY

EngAnalysis Pty. Ltd.

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Company Profile

Overview

EngAnalysis is an engineering and technology consultancy. Our aim is to enable clients to make informed decisions by applying science, engineering and measurement. This service allows us to work with clients to address critical issues about the design, performance, structural capacity and operation of major engineering assets or operations that are essential to providing their service.

EngAnalysis is an employee-owned company. All employees have a stake in our success.

Key differences:

- True depth and breadth of experience and capability in mechanical, thermo-fluid and structural design, analysis, verification and validation
- We offer a unique mix of complimentary skill sets that allows us to understand your problems, find the ideal solution and deliver it.
- We don't just provide data but in-depth analysis, interpretation and decisions
- Focused on reducing risk and uncertainty for your engineering and operations teams
- Technology agnostic, we work with numerous hardware vendors to ensure the right technology is applied for your project
- Monitoring-as-a-service offering, providing project certainty
- We deliver real-time data, analysis and notifications
- Bespoke solutions with product development capabilities. One size doesn't fit all
- High R&D to revenue ratio, and participation in innovation and research groups keeps us on the leading edge

Understanding and optimising the design, performance, structural capacity and operation of assets or operations, to proactively address and prevent critical issues.





People

Our diverse team is the core of EngAnalysis and consists of top-level engineers, data analysts, electricians and software engineers based in Newcastle, Sydney, Melbourne and Adelaide. No matter what their background they all deploy to site and understand the challenges faced in real world harsh environments.

EngAnalysis maintains partnerships with complimentary specialist capabilities, including manufacturers, university and government research agencies, specialist engineering services, vendors and electrical contractors.

Meet the team: <https://www.enganalysis.com.au/meet-the-team/>

Message from John Vazey

When founding EngAnalysis our vision was to provide Australian industry access to cutting-edge test-measurement and analysis tools.

We established an employee trust to truly share the responsibility and consequence of our internal investments and define what we mean by collaboration. The result is a motivated and experienced team using the best tools available to help make informed decisions.

We strive for excellence by harnessing the best of new thinking, new technology and new solutions to benefit our clients and the community.

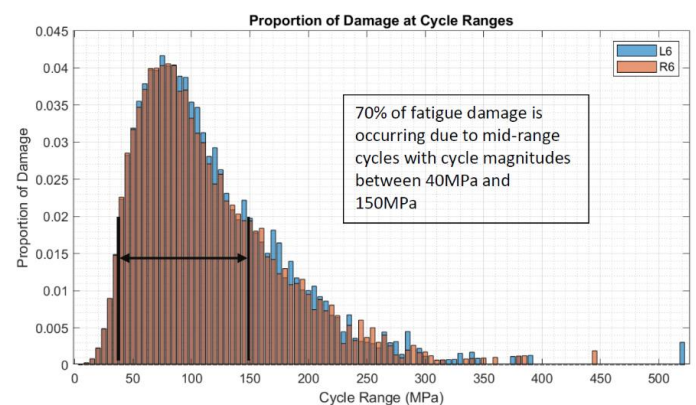
Through focusing on excellence and collaboration we have created a great place to work.



John Vazey
Founder and Managing Director

Design Audits and Verifications Involving Computational Finite Element Stress and Fatigue Analysis

EngAnalysis personnel have completed design audits/verifications on a wide range of mechanical equipment and plant items. Such audits include operational and installation load cases, and are completed in accordance with relevant Australian or international standards such as AS4324.1-2017 “Mobile equipment for continuous handling of bulk materials - general requirements for the design of steel structures”. Fatigue analysis (including multiaxial) is completed in accordance with AS4100 or BS7608, including rainflow counting to ASTM E1049 and cumulative fatigue damage summations.



Repair and Life Extension Specifications and Oversight

Investigation and analysis work scopes are fully closed out with suitable repair or life extension specifications and oversight. Associated documentation includes inspection and test plans with specific details of welding processes, joint types and sizes, post weld treatments including toe grinding or full profiling and furnace or in-situ (blanket) heat treatment stress relieving. Welding standards and inspection methods needed are detailed including visual and non-destructive testing examinations. Fasteners and bolted joint designs are fully detailed including installation torques and pre-tensions. Protective coating systems are fully detailed.

Condition and Maintenance Audits, Inspections, Maintenance Plans

EngAnalysis personnel have suitable experience completing periodic and major condition and maintenance audits of a wide range of equipment and plant types across numerous industry spheres. Such audits are mandatory for all registerable plant items and need to be completed in accordance with the relevant Australian Standards and the national and state Safework guidelines. Comprehensive inspection reports are compiled noting the condition of all areas of the plant, and repairs needed. Whole of life inspection and maintenance plans can be configured, including end of life disposal methods.



Other materials - Stainless Steel, Aluminium, Composites Including the Design and FE Analysis of Carbon Fibre Structures

We have suitable experience with numerous other materials than carbon steels including:

- Stainless steels - austenitic, ferritic and duplex grades. AS/NZS4596.
- Aluminium - 5000 and 6000 series alloys of various tempering grades. AS1664.1/2.
- Composites - including solid laminate ply lay-ups as well as sandwich panels. Reinforcements include glass, aramid and carbon fibre. Resins include polyester, vinyl-ester and epoxy.



Industry Spheres and Plant Types

Mineral processing - ore grinding mills, vibrating screens and feeders, trommel and rotary breakers, thickeners and agitators, ducting and mechanical steelwork

Rail - rollingstock: wagon, locomotive and bogies, rail infrastructure including rail, sleeper, ballast, bridges and culverts.

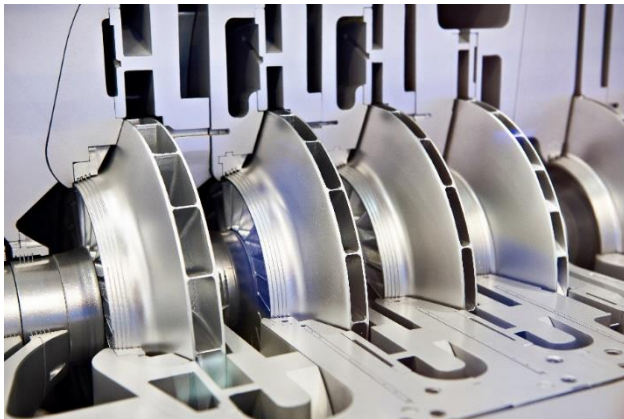
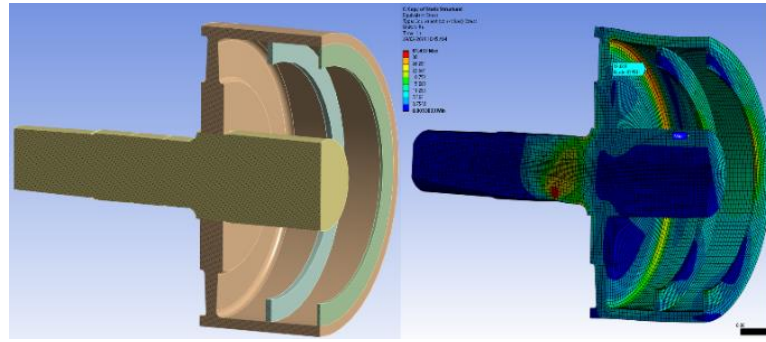
Mining - dump trucks, shovels / excavators, centrifugal / axial / mixed flow fans, conveyor pulleys.

Industrial gases - integrally geared compressors, fans and blowers, ducting systems, cooling towers, fan/blower and pump pedestals and baseplates

Critical infrastructure - Bridges, tunnels, gas and water pipelines, power assets, civil infrastructure, ports

Lifting tackle - below the hook lifting tackle arrangements including container crane spreader verifications - AS4991 "Lifting Devices". Heavy vehicle transport load restraint configuration design. Proof load testing witness services.





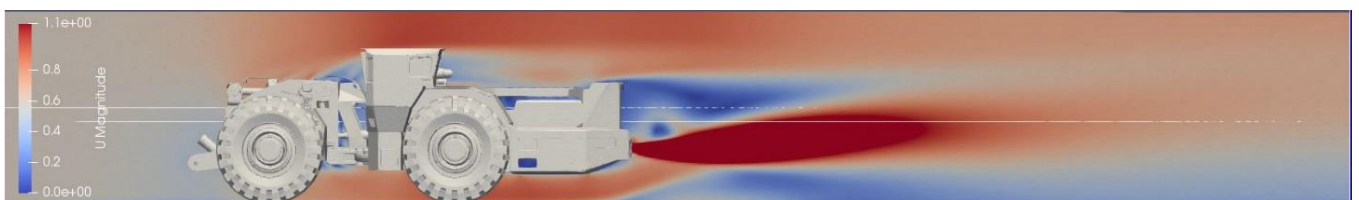
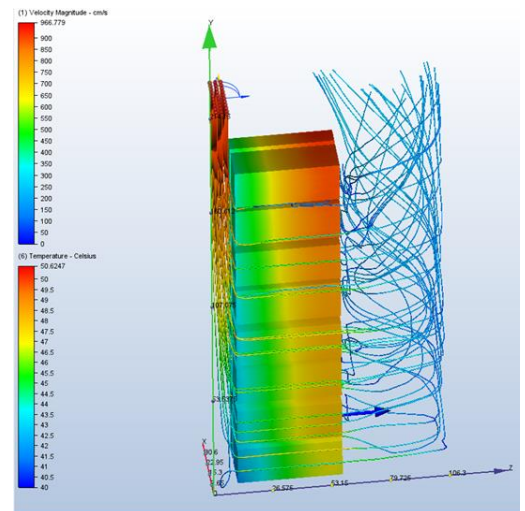
Process and Mechanical Design and Analysis

EngAnalysis provides a comprehensive range of engineering design and analysis expertise:

- Finite element analysis (FEA), including advanced non-linear, thermal and dynamic analysis
- Fatigue and damage tolerance analysis of machines and structures
- Computational fluid dynamics (CFD) and thermal analysis
- 3D modelling & simulation
- Design and analysis of rail vehicle body structures & components
- Full stress analysis packages for aerospace, rail and mining structures

Thermo-Fluid and Particle Simulation and Analysis

There are circumstances where simulation is the right tool to use, be it because the design has not been finalised and require inputs or because testing might not be viable. Our team of engineers has vast experience in complex thermo-fluid and particle simulation analysis. Past projects include developing complex models to understand vehicle emissions for sizing of emission testing equipment, flare sizes and directions for development of exclusion zones, heat dissipation through forced convection flow inside battery banks and slurry flow and mixing processes for front end engineering design feasibility.



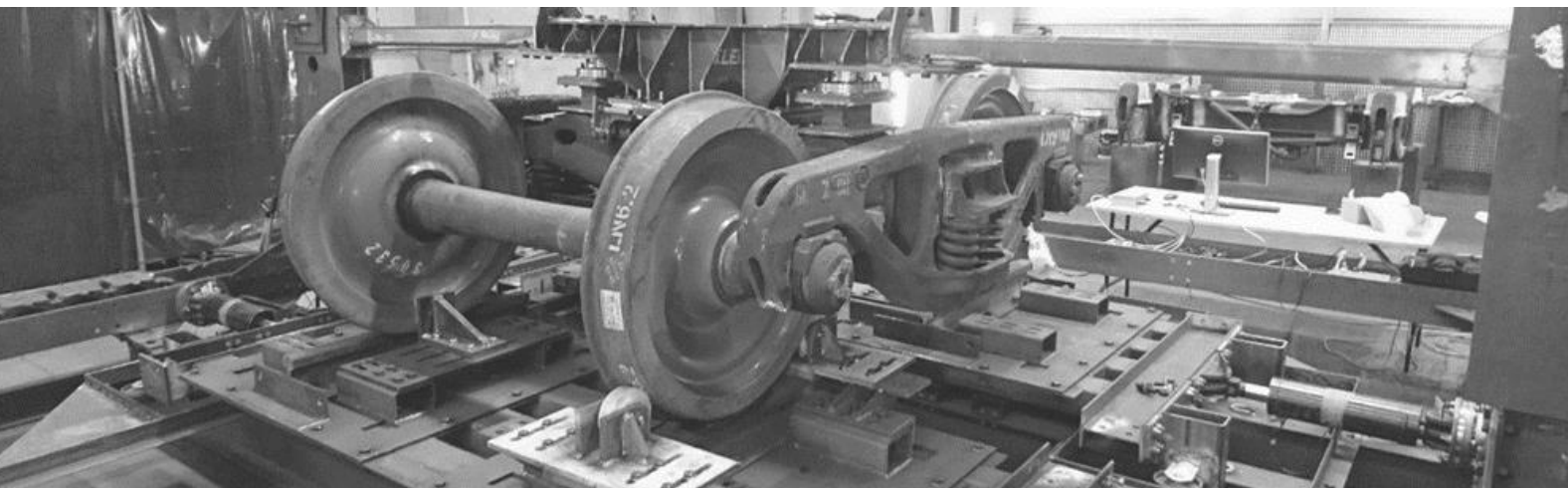
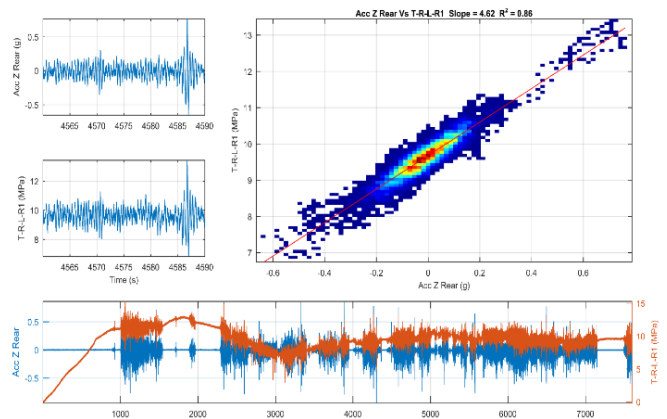
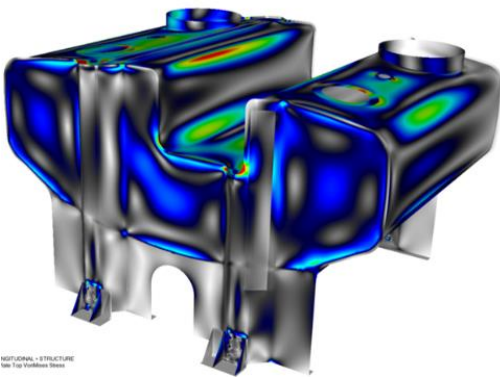
Other Capabilities:

Applied Mechanics and Design Validation

Test, Measurement and Analysis

Our experience and capability in designing and executing test programs, coupled with industry leading data analysis and design verification methods provides a valuable tool used to gather real data and provide informative and reliable solutions. These capabilities include:

- Static and dynamic strain gauging of rail, mining and heavy industry vehicles and equipment, including telemetry systems for rotating machinery
- Rail vehicle dynamics, commissioning & compliance testing including twist tests, ride performance and hunting evaluations.
- High speed thermal measurements
- Material and mechanical component coupon testing
- FEA/CFD correlation and design verifications
- Advanced data analysis, handling of large data sets, and the development and application of machine learning algorithms including machine vision.
- Integrating measurement with analytic and numeric models for validation

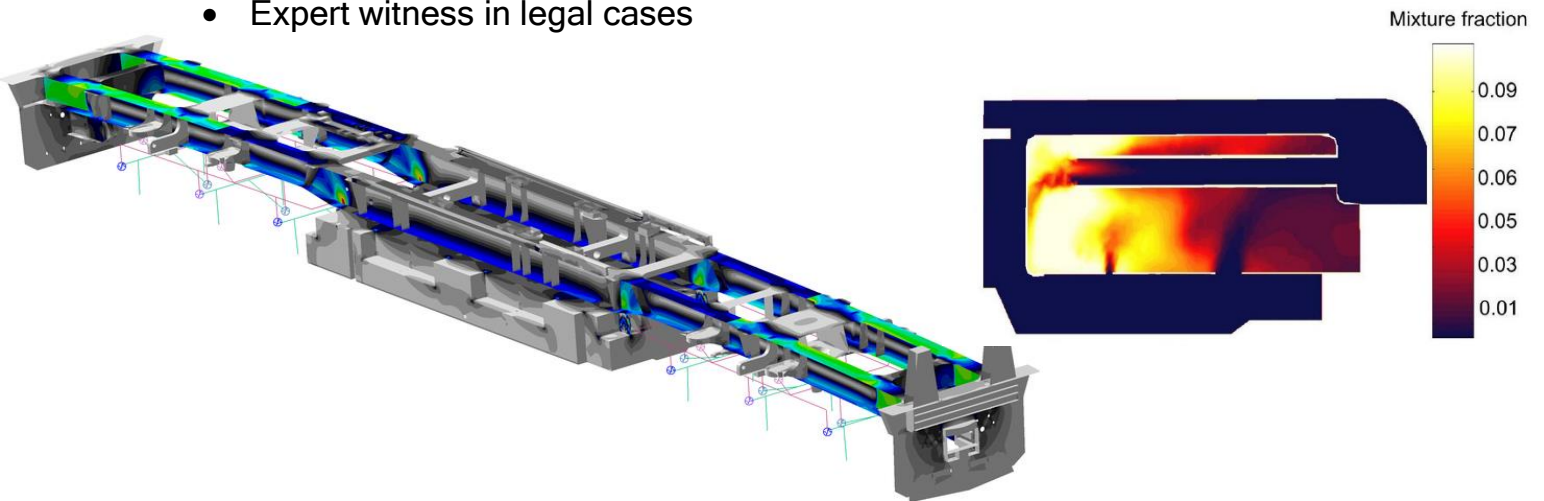


Failure Investigations

For situations of unexpected equipment and structural damage or failure, EngAnalysis personnel have extensive troubleshooting and design rectification experience including root cause source analysis. For the case of complex loadings, EngAnalysis use a data-driven approach to mechanical design and analysis, utilising field measurements to establish operational load cases and constraints to the simulation model, minimising the number of assumptions and unknowns. The complimentary skill sets within the team of field testing, computational modelling and design allows for a full-service approach to investigations including design rectifications.

Our expertise include:

- Fatigue cracking investigation and repair/modification development
- Cast, fabricated and forged component failure analysis and investigation
- Investigation into root cause of excessive or unusual component wear
- Determination of inspection regimes for structures subject to fatigue damage
- Contribution of track conditions to rail vehicle and component fatigue life
- Expert witness in legal cases



Structural Health Monitoring

Structural Health Monitoring is about making asset management decisions based on hard data; measuring the right things and providing useful data and appropriate analysis allows for:

- Asset life-time prediction/extension
- Effective scheduled maintenance
- Early fault detection
- Real-time notification and data visualization

EngAnalysis provide full turn-key Structural Health Monitoring solutions from system design and sensor selection through deployment to real time monitoring services, with event/alarm notifications.

Our experience ranges from development of robust systems for gather data to inform asset management decisions, through to complex integration of measurements and digital twin models to fully understand the loading environment, structural response, and damage/deterioration trend, allowing for comprehensive management of critical assets.

Measurement and Analysis Systems Design

While the majority of the services and solutions we provide are bespoke, for truly 'out of the box' unique problems or developing a product solution, our team excels. With such a wide range of experience and education, our team's power of innovation and comprehensive problem solving is unparalleled.

Covering inhouse expertise from electronics hardware and firmware development, through mechanical and structural analysis software development, to cloud server and database operation we have all aspects of product development covered.

Our team is well equipped to manage projects through all project lifecycle stages from concept to closeout.



Technology Platform

Hardware Independence

EngAnalysis operate a hardware independent technology platform. We integrate all types of sensor technologies, and external (PLC, SCADA, etc) and cloud sources.

Data Integrity

We take data integrity as seriously as your asset integrity. We combine detailed system design, data processing, a secure private network along with secure and backed-up cloud services to ensure you data is secure.

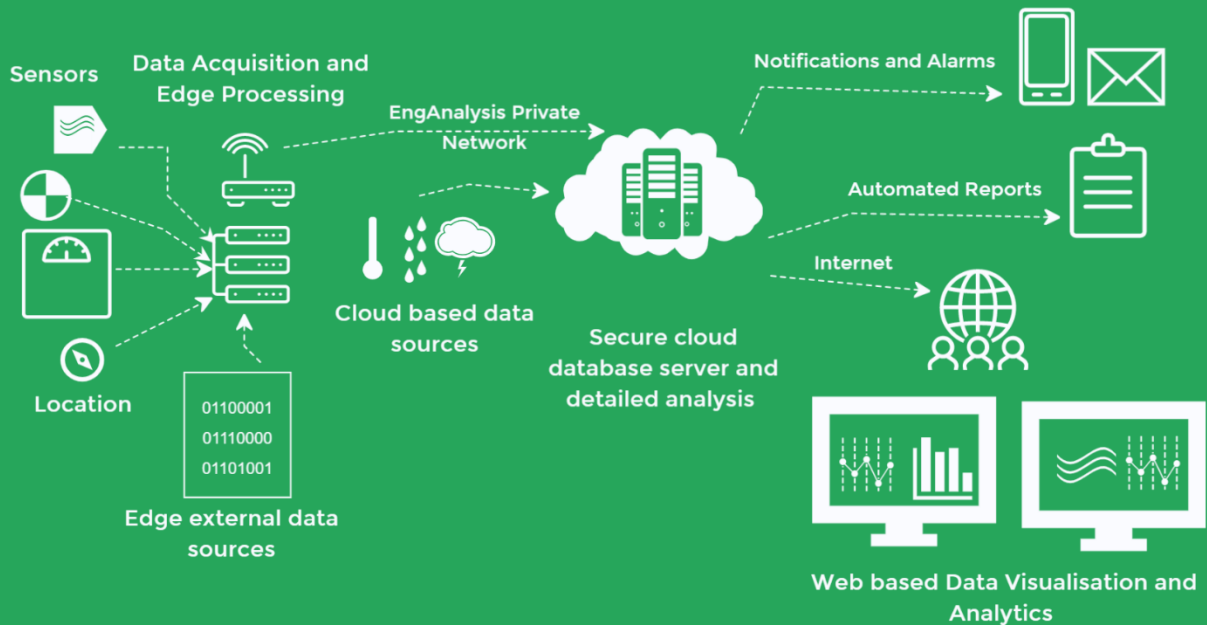
Analysis Anywhere

Our flexible architecture allows for data processing both on the edge and in the cloud, enabling our systems to be lean, fast and appropriate for task.

Data Analytics

Big data or any data is useless if it can't answer a question. EngAnalysis provide lean data, bespoke data portals and visualisations, automated reporting and notifications with answers you can understand and act on.

From Sensor to Visualisation



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