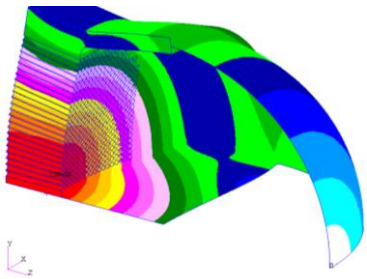
MATRIX | ENGINEERS OF INNOVATION

Design Verifiers

OUR SERVICE FOCUS

For Engineering Managers, Safety Managers and Inspection Engineers concerned about the safe operation of your plant and its equipment, Matrix are expert providers of Level 3 Fitness for Service (FFS) assessments. Matrix are familiar with the latest codes and non-linear finite element analysis (FEA) approach to verification. Matrix also have advanced computational fluid dynamics (CFD) and fluid structure interaction (FSI) capabilities for the development of fluid related loads.



SERVICE / SUMMARY

Detailed structural analysis of static equipment using FEA, including static strength, buckling, vibration, fatigue assessment and fitness for service assessment (API 579-1/ASME FFS-1 and BS7910). Non-linear capability to account for complex effects such as contact and material plasticity. Advanced CFD including multiphase flows, heat transfer (conduction, convection and radiation), phase change (boiling, condensation and flashing), reacting flows (combustion), and fluid structure interaction.

- Specialists in Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD) and Fitness for Service Assessment (FFS)
- Fatigue assessment of metallic components
- Design by rule for pressure vessels, silos, tanks and piping to all relevant codes
- Specialists in seismic loading to a collection of recognised NZ and international codes
- Advanced analysis problems, e.g. parts in contact, bolted and welded connections, heat transfer, radiation and multiphase fluid dynamics
- Proven seamless collaboration with engineering teams over the years

PROBLEMS / SOLUTIONS

Matrix provides solutions for pressure vessel engineers needing to check code compliance.

Problem	Solution
I've completed a Level 1/Level 2 FFS assessment myself, where can I obtain a Level 3 assessment?	Matrix can provide Level 3 FFS compliance checks for pressure vessels, tanks and silos.
Does the plant have to shut down and repair that crack or can it wait until the asset owners next planned shutdown?	Matrix can perform crack growth analyses to provide answers in a timely manner.
How do I avoid paying for costly analysis software, staff training and retainment?	Matrix prides itself on offering value for money and its ability to partner with our customers to achieve results.
If a failure occurs in service, how do I identify the root cause and avoid further problems?	Significant expertise in fracture mechanics, fitness for service assessments (analysis of damaged parts) and fatigue assessment

CUSTOMERS / EXPERIENCE

- FFS assessments completed for key plant asset owners in New Zealand and abroad
- Expansive knowledge of the relevant codes both local and international
- Familiar with the pressure vessel, tank and piping codes
- Most analyses reviewed by design verifiers both in NZ and offshore
- Reports to verification authorities of a high standard and high level of acceptability

OUR TEAM

Meet our highly qualified and experienced engineering analysts:

Don Campbell, BSc, BE(Hons), PhD, CMEngNZ, CPEng (Mech), IntPE, NAFEMS Adv Reg Analyst, 45 yrs exp
James Hamilton, BE(Hons), PhD, CMEngNZ, CPEng (Mech), IntPE, composites & non-linear FEA, 20 yrs exp
Kava Crosson-Elturan, BE(Hons), (Mech, Purdue), numerical simulation FEA/CFD, physics-driven design, 18 yrs exp
Guido Quesada, MSME, ASME, FEA, advanced Abaqus instructor, pipe joints, product development, 23 yrs exp
James Cheng, BE(Mech), ME(Mech), fracture mech, press vessel design, plastic injection moulding, 18 yrs exp

ABOUT MATRIX

Matrix provides solutions for engineering design and information management. New Zealand's first and largest team dedicated to engineering computing, supporting the process of innovation for over 35 years. Visit www.matrix.co.nz.