

Fabian KAICA BE(Mechanical), FIE Australia, CP Eng,
Diploma of Maintenance Management

Specialist Hydro Power Mechanical Engineer

Career summary

Fabian has over 30 years of international experience in hydropower mechanical engineering. He has been providing specialist hydropower mechanical engineering consultancy services through Acutel Consulting to clients in Australia, New Zealand, Papua New Guinea and Uganda since 2012. His hydro machine capability and expertise includes: design reviews and specifications to international standards; vibration monitoring and diagnostics; alignment and training; workshop supervision for component refurbishment; site engineering supervision for strip-down and re-assembly; weld repair methods for hydro runners and components; failure analysis utilising Root Cause Analysis (RCA) methodology; and streamlined reliability centred maintenance and failure modes identification.

In 2009 whilst employed by Hydro Tasmania, Fabian and his team were awarded an Australian Engineering Excellence Award for the achievement of World Class Hydro Machine Operation.

Fabian is a Chartered Professional Engineer and a Fellow of the Institution of Engineers Australia. He qualified with a Bachelor of Engineering (Mechanical) in 1981 from the University of Tasmania.

FOR FURTHER INFORMATION

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Personal details

Name	Fabian Kaica
Year of birth	1957
Nationality	Australian
Qualifications	Bachelor of Engineering (Mechanical), University of Tasmania, 1981 Graduate Diploma in Engineering Maintenance Management, Monash University), 1988

Fields of expertise

Hydro Plant	Hydro machine upgrade and modernisation technical management; technical specifications and design reviews; hydro machine alignment; hydro machine vibration diagnostics. Peer Technical Reviews for hydro utilities.
Asset Management	Hydro plant due diligence; formalised condition assessments; machinery root cause failure analysis; reliability centred maintenance (RCM); asset management plans and maintenance procedures.
Engineering Training	Technical Training provider for Hydro Machine Alignment, Vibration Diagnostics, Root Cause Analysis and Streamlined RCM

Professional affiliations

Fellow of the Institution of Engineers, Australia (FIEAust) (Member since 1984)
Chartered Professional Engineer (CPEng)
Member of Tasmanian Division of Institution of Engineers Australia

Countries of work

Professional Engineering Consultancy Services to Australia, New Zealand, and Papua New Guinea.

Professional experience

2012 - Now **Specialist Hydro Engineer, Acutel Consulting**

Independent hydro consulting direct to Contact Energy New Zealand, Mighty River Power New Zealand, AGL Victoria Australia, Eskom Uganda, Entura Tasmania, Alstom Australia and Quest Integrity (Australia/New Zealand). Working on sub-contract to the following companies for major hydro plant refurbishment projects and providing asset management services: Stanwell Power Queensland, Snowy Mountains, Greenstate Power NSW, Sydney Water, Melbourne Water and Origin (Eraring) Energy NSW.

2006 - 2012 **Specialist Project Engineer, Hydro Tasmania**

Technical Manager for Hydro Tasmania's Major Project engineering work on Poatina (\$86 Million) and Tungatinah Power Station Modernisation Projects (\$72 Million) – Leading the Project Engineering Group including 4 experienced engineers and 4 Graduate Engineers under training plus undergraduate engineers employed during university vacations. Achievements during this period include:

- > Successful completion (March 2010) of the Poatina Power Station Modernisation Project (4 years work) involving major replacement of machine turbines, governors, control systems, bearings and cooling water systems – 2009 Winner of the National Institution of Engineers Australia Engineering Excellence award with ALSTOM for achieving World Class Hydro Machine Operation.
- > Outcome - Successful Project Management outcomes eg Poatina #4 Machine was completed in December 2007 being \$3 Million under budget, on time and the machine availability assessed as excellent.
- > Tungatinah Modernisation Project successful design and manufacture of new turbines, bearings, governors from Europe (ALSTOM) - delivery to Tasmania January 2010 to June 2010 – Installation of completed first unit was November 2011.
- > Young Engineers Mentoring and Technical Training - Since 2006 this Project Engineering Group has been responsible for the technical coaching and mentoring of 17 Graduate Engineers and 7 Undergraduate Engineers.
- > Organiser and implementer of the Graduate Training in Root Cause Analysis Methodology last course run September 2009 – 25 Graduates involved. (Total number trained since 1999 = 145 personnel across Hydro Tasmania)
- > Continued presenter to University of Tasmania students' forum – Topic "The World of Engineering Work in Practice" – organised through Professor Chris Letchford.

2004 - 2005 **Principal Reliability Engineer, Hydro Tasmania (HT)**

Responsible for 15 personnel – including the development and implementation of advanced Reliability Engineering Tools including Condition Monitoring, Reliability Centred Maintenance, Root Cause Analysis, Lubrication Improvement (Plant Care Program) and Asset Management Plans. Achievements during this period include:

- > Successful rationalisation of HT Power Station Maintenance Plans using RCM methodology to justify required maintenance frequencies
- > Successful refinement of HT Condition Monitoring program required to improve the analysis of data and get improved proactive maintenance actions
- > Continued Training of HT engineering and operational staff in RCA and Reliability improvement techniques
- > Direct involvement in Engineering Graduate mentoring

2000 - 2004 **Senior Reliability Engineer and Senior Engineer Maintenance Systems and Improvement Group, Hydro Tasmania**

Responsible for Introduction of Reliability Centred Maintenance (RCM) Methodology into Hydro Tasmania; the Plant Care Program across Hydro Tasmania including development of an accredited training program with TAFE Tasmania for frontline maintenance personnel; and introduction of rigorous Reliability Analysis of 9 Critical Hydro Power Stations. Achievements during this period include:

- > Technical Manager for the Single Supplier Contract with Shell Australia delivering \$1 Million in benefits over 3 years to Hydro Tasmania.
- > Successful introduction of a new Hydro Tasmania Plant Care Program (lubrication and monitoring improvement) has resulted in an 85% reduction in lubrication related failures over the period 1999 to 2003
- > Hydro Traineeships program was set up with TAFE Tasmania as part of the Plant Care Program) to meet the skills requirements needed to maintain the assets into the future. Seven new Hydro Trainees have successfully completed their training in December 2003.
- > Member of Hydro Tasmania's Communications Improvement Team

1998 - 2000 **Senior Maintenance Improvement Engineer, Hydro Tasmania**

Responsible for instigation of the following Maintenance Improvement Initiatives: Condition Monitoring Project - State-wide Project Manager resulting in re-structuring of the organisation to include dedicated Condition Monitoring (CM) personnel – responsible for development of a nationally accredited CM training program for Hydro CM Analysts; Initiator of Root Cause Analysis Methodology and application to repetitive and critical hydro plant failures; Hydro Plant Formalised Condition Assessments – Methodology

developed from US Corps of Engineers procedure. This method was adopted across Hydro Tasmania to accurately document Hydro Plant Condition; Lubrication Improvement and Plant Care Initiative – exchange developed with Australian Paper and involves nationally accredited training for Hydro Tasmania fitters and maintenance assistants; Hydro Plant Mechanical Functional Testing - original job manager - aim to prove all critical hydro plant protection devices to ensure operational reliability and security; Online Monitoring – original job manager 1999/2000 – responsible for the installation of online vibration monitoring systems on the critical Gordon Power Station Hydro Units. Achievements during this period include:

- > Hydro Tasmania's Computerised Maintenance Management System (FMMS) – statewide coordinator Sept 1998 to Dec 1999.
- > Engineering Manager on the following successfully completed Hydro Machine Outages: Catagunya #1 machine outage to address vibration problem (1999); Cethana Power Scheme Condition Assessment (1999) and Meadowbank Power Scheme Condition Assessment (2000).

1995 - 1998 **Generation Division Maintenance Improvement Engineer Assets Strategy Group, Hydro Electric Corporation Tasmania**

The responsibilities of this position included: Condition Monitoring Improvement (Project Manager); Pressure Vessels Project (Project Manager); Computerised Maintenance Management System (CMMS) – resolution of hydro plant technical issues for input to CMMS. Achievements during this period include:

- > Development of Power Scheme Maintenance Plans – 27 Power Schemes (Project Manager) – defining and optimising new maintenance (PM, CM and statutory maintenance) work and frequencies
- > Development on an Intranet Based Online Documentation System (GOLDS) linked to the HEC's Computerised Maintenance Management System (FMMS) – (Project Manager)

1985 - 1995 **Senior Mechanical Maintenance Engineer Hydro Plant (Operational Maintenance), Hydro Electric Corporation**

The responsibilities of this position included research and development into: Turbine runner weld repair procedures, their ongoing development and improvement; Cavitation resistant coatings and claddings for hydro plant. Achievements during this period included: responsibility for two Kaplan Machine Turbine Overhauls - Successful completion (on time and to budget) of two Kaplan Turbine overhauls (previously never done within the Commission) involving the stripping of turbine components to replace worn blade bushes and turbine components. Timing and planning critical to reduce the amount of lost energy (i.e. cost of lost production 1990 \$10,000 per day)

1981 - 1985

Engineering Positions, State Electricity Commission Victoria

- > 2 Years Project Engineer Loy Yang A Project Team – Main Boiler Contract and Auxiliary Boiler Contract – Contract Value - \$1.8 M
- > 2 Years Commissioning Engineer Loy Yang A Unit 2 (500 MW Unit) – systems commissioned include main boiler feeder conveyors, main boiler soot blowers, briquette handling plant and main boiler pulverising fuel mills and member of Unit 2 Chemical Clean Team
- > 10 Months Loy Yang A Power Station Maintenance Engineer – boiler plant

Published Engineering Papers

AUTHORED AND PRESENTED BY FABIAN KAICA

- 2014** *McKay Creek Premature Pelton Runner Failures* – Authors T.Howard (AGL Victoria) and Fabian Kaica (Acutel Consulting) presented at the Australasian Hydro Power Engineering Exchange Conference, Hobart, Tasmania, Australia.
- 2012** *Hydro Machine Upgrades and Modernisation – A practical approach to establishing suitable reliability and maintainability from the start* – Author Fabian Kaica presented to HydroVision Conference USA Louisville Kentucky **(Voted 3rd Best Paper)**.
- 2011** *World Class Asset Management – Hydro Machine Failure Mode Database* – Author Fabian Kaica presented to HydroVision Conference Sacramento USA.
- 2011** *Establishing an effective Reliability of your assets from the Start* – Author Fabian Kaica presented to National Reliability Conference SIRF Melbourne.
- 2009** Institution of Engineers Australia Award *World Class Hydro Machine Operation Paper/Entry* – Authors Fabian Kaica and Enes Zulovic Hydro Tasmania and ALSTOM Stephen Mole and Mark Hollick **(Winner of the Tasmania and Australia Engineering Excellence Awards 2009)** – Canberra, Australia.
- 2008** *Key Learning's from Upgrade and Modernisation of a Hydro Machine - PO4* Author Fabian Kaica presented to the 12th Australasian Hydro Power Engineering Exchange in New Zealand – **(Voted 3rd Best Paper out of a pool of 30 engineering papers)**.
- 2005** *Reliability Centred Maintenance – The Truth the whole Truth and nothing but the Truth* presented to ICOMS 2005 – International Asset Management and Maintenance – – Author/Presenter Fabian Kaica.
- 2002** *Hydro Tasmania – Introduction of Reliability Centred Maintenance Methodology to improve Maintenance Strategies and Plans* – Author Fabian Kaica/Graeme Fleming – presented to the International Reliability Centred Maintenance User Conference Sydney
- 2000** *Hydro Tasmania - Lubrication Improvement Program to Improve Hydro Plant Reliability and Equipment Life* – Fabian Kaica/Leigh Smith – presented to the 9th Australasian Hydro Power Engineering Exchange in New Zealand
- 1999** *Oil Contamination Control – Hydro Plant* – Author Fabian Kaica – presented by Fabian Kaica to Monash University Condition Monitoring and Oil Contamination Control Conference – Melbourne, Australia
- 1998** *Development on an Intranet Based Online Documentation System linked to the HEC's Computerised Maintenance Management System-* Author Fabian Kaica – Presented by

Fabian Kaica to the Annual Australasian Facilities Maintenance Management System Users Conference

- 1998** *In pursuit of a Condition Based Maintenance Approach* – Fabian Kaica/David Lancaster. Presented by Fabian Kaica/David Lancaster to the Australasian 8th Hydro Power Engineering Exchange
- 1998** Case Study *Trevallyn #4 Hydro Machine Vibration Problem - Diagnosis* – Fabian Kaica – Presented by Fabian Kaica to the Australasian 8th Hydro Power Engineering Exchange
- 1993** *Monitoring Hydro Electric Generating and Pumping Plant using a Portable Vibration Analyser* - F Kaica/ CR Peacock. Presented by F. Kaica/C. Peacock to the 4th Hydro Power Engineering Exchange (Australia and New Zealand)
- 1992** *Operations and Maintenance Remote from Support Facilities* – Authors – R. Barber/F. Kaica (concerning specialised refurbishment of 3 x Bell Bay Steam Turbine Boiler Feed Pumps). Presented by R. Barber to the International Conference on Power Station Pumps and Fans (London).
- 1992** *Oil Filtration and Testing (Governor Systems)* – F. Kaica. Presented by F. Kaica to the 3rd Hydro Power Maintenance Exchange (Australia and New Zealand)