



# PUMPS & SYSTEMS

*Improve Reliability, Reduce Power Consumption*



**GLENN ROGERS**  
BENG, MBA

Glenn Rogers has worked in the pump industry for more than 28 years. His experience has included senior roles in pump selection and application, system review, pump troubleshooting, contract/project management, sales and marketing and quality assurance.

Glenn has previously worked for a major pump manufacturer and currently runs a successful pump training and consulting business. He runs pump and system training courses throughout Australia on a regular basis and has run courses in South Africa, Ghana, Nigeria, Indonesia, Laos, United Arab Emirates, Singapore, Malaysia and New Zealand.

He has been running these courses in Australia for over 18 years. In that time more than 7,500 people have attended his training sessions.

Clients have included **BP, Santos, ExxonMobil, BHPBilliton, Rio Tinto, Xstrata, Queensland Alumina, Water Corporation, Yarra Valley Water, SA Water, Queensland Urban Utilities, Petronas, Singapore Petroleum, Weir Minerals, WorleyParsons, Jacobs, Arup, GHD and many more.**

Glenn also spent many years working with Singaporean and Malaysian companies on Strategy Development and Implementation. He therefore has a clear understanding of the need to make sure training has a positive impact on the bottom line.

## Course 1 - Pumping Fundamentals Course 2 - Advanced Pumping

Concise, practical training courses tailored to generate immediate benefits

Pumps are a major capital cost item, a key reliability problem and consume huge amounts of energy. For most companies the costs of owning and running pumps are much higher than they should be. A shortage of general knowledge on how to apply, specify, install and operate pumping equipment is the major reason for these high costs. These training courses are designed to address this problem.

### UPON COMPLETING THE TWO COURSES DELEGATES WILL BE ABLE TO:

- Understand how system resistance controls the pump
- Learn how to read and use a pump curve
- Learn how the flow rate impacts on pump reliability
- Design better systems and select better pumps, leading to more reliable equipment
- Learn when to use Variable Speed and when to use a Control Valve
- Understand what happens when you operate pumps in parallel or in series - why it only sometimes works
- Understand what cavitation is, why it occurs and how to avoid it
- Avoid operational problems that lead to pump failures
- Understand the key mechanical construction features that will ensure you have a reliable pump
- Know where to focus to reduce power consumption
- Correctly set up piping, install and commission pumps
- Learn why pumps vibrate and why seals and bearings fail
- Implement best practice in pump monitoring and maintenance
- Get to the root cause of pump failures and solve recurring problems

**See Booking Form For Course Dates**

#### CERTIFICATE OF COMPLETION



A certificate of completion will be issued to all delegates completing the course.

*Strategic Achievement*  
*Making Training Count*

## DAY 1 - PUMPING FUNDAMENTALS

### Introduction

Centrifugal vs Positive Displacement Pumps  
The Basic Operating Principle  
Introduction to the Pump Performance Curve

### The Selection Process

Determining the Flowrate  
Calculating System Resistance  
Understand the System Resistance Curve

#### *Workshop Exercise*

Dealing With System Changes  
Understand the Pump Curve  
Controlling the Flow - VSD vs Control Valve

### The Pump Curve

#### *Pump Selection Workshop*

Reading the Curve  
Selecting the Pump  
What is a Good/Poor Selection  
The Significance of the Best Efficiency Point  
Calculating Power Consumption

### Parallel and Series Operation

Pumps in Parallel  
Pumps in Series  
When it Works / When it Doesn't Work  
Speed Change vs Flowrate  
Impeller Diameter Changes

#### *Workshop Exercise*

### Cavitation

Cavitation  
Nett Positive Suction Head Available  
Nett Positive Suction Head Required  
How Cavitation Impacts on Pump Selection  
How High Can You Put Your Pump

#### *Workshop Exercise*

### Installation and Commissioning

Piping Set-Up  
Installation  
Commissioning  
Monitoring

## DAY 2 - ADVANCED PUMPING

### Total Cost of Ownership

Reducing Life Cycle Costs  
- Efficient System Design  
- Efficiency Pump Selection  
- Efficiency Control Method

### Mechanical Seals vs Gland Packing

How They Work  
Advantages / Disadvantages  
Reliability - Why They Fail

### Pump Mechanical Construction vs Reliability

Design Options vs Reliability  
Shaft Design / Seal Chamber Design, Bearings  
Dealing with Axial and Radial Thrust

#### *Workshop Exercise*

### Flowrate vs Reliability

Problems Operating at Low Flow  
Problems Operating at High Flow  
Vibration, Temperature, Radial Loads, Seal Failures  
Suction Specific Speed and Reliable Operation

### Purchasing Reliable Equipment

Reliability Begins With the Specification  
Reliable Hydraulic / Mechanical Selection  
Writing the Specification  
*Reviewing Bids Workshop Exercise*

### Maintenance and Monitoring

A 'Typical' Pump Overhaul  
What Else Should Get Done  
Ensuring Long Term Reliability  
What to Monitor and Why

### Troubleshooting Problems

Typical Problems and Causes  
Troubleshooting - Getting to the Root Cause  
The Troubleshooting Process

### Wear vs Performance

Loss of Performance - Pump or Systems  
Worn Clearance vs Loss of Performance

### WORKSHOPS

Our approach is to use practical exercises to aid in fully understanding the concepts being taught. This is a very practical course. You will be able to go back to your workplace and implement changes and improvements in the way your organisation deals with pumps.

### MORE INFORMATION

Check out our website or send us an email - details below.

### WHO SHOULD ATTEND

We have people attending from all industries who are working with pumps. This includes water, wastewater, mining, minerals processing, oil and gas, power generation, food and beverage processing, paper manufacture, pump manufacture, pump sales and HVAC. Attendees job roles vary from engineers to operators, to maintenance staff, and experience levels from starting out in the industry through to 40 years experience.

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