

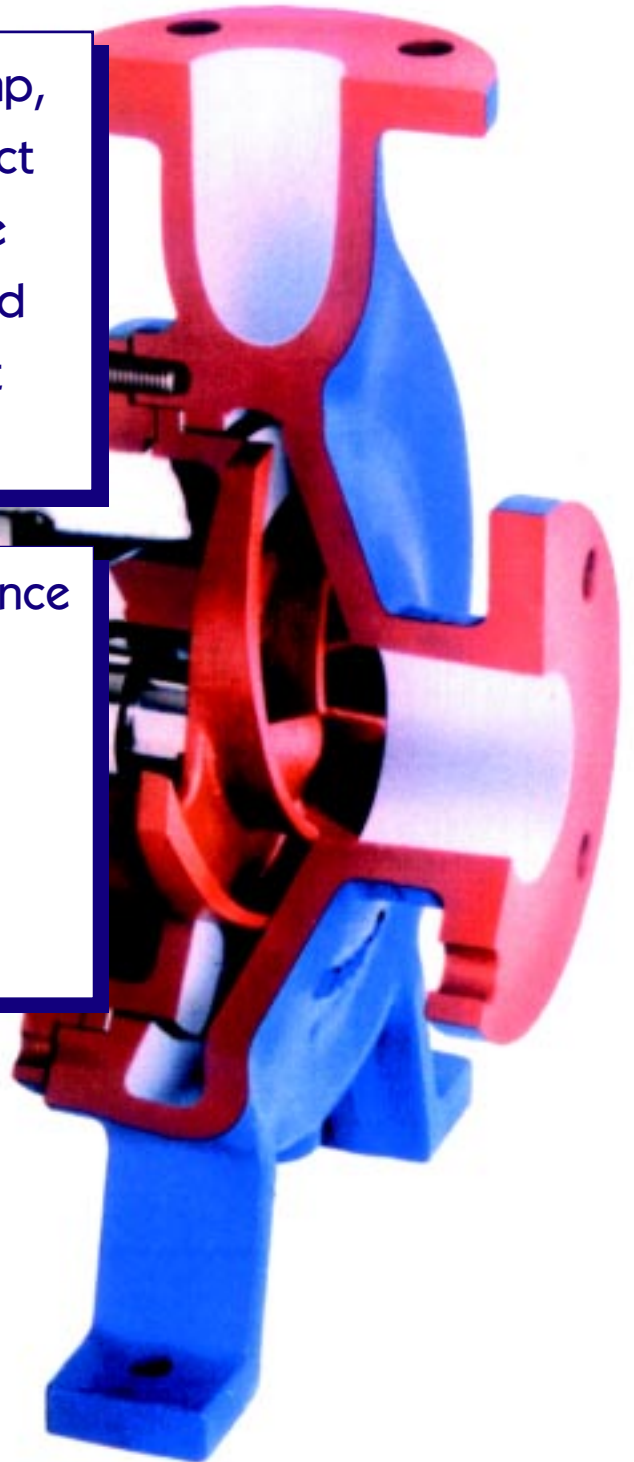
The Mackay Pump School

Pump Training with a Difference!

The Mackay Pump School is the foremost pump training program focused on teaching pump users how to prevent pump failure.

In this interactive school, learn how the Pump, the Seal, the Bearings and the System interact to create the problems that cause repetitive pump failure. As a result, you will understand how to prevent these failures instead of just changing the parts!

Thousands of design, operating and maintenance engineers and technicians, from a variety of industries world-wide, have already saved millions of dollars from this unique learning experience dedicated to the real problems of pumping.



Pump Training with a Difference!

The Mackay Pump School combines practicality with theory in such a way that any pump user can prevent pump failure and reduce the cost of pump ownership. In this school you will learn how to separate symptoms from underlying problems and how to deal with these problems.

In-House Courses

Based on the results of our unique Pump Reliability Audit, in-house courses are tailored to your specific needs and equipment. The level of expertise of program participants and their respective roles in Engineering, Operations and/or Maintenance are also taken into consideration.

Typical School Content

Pump Types & Designs
Performance Curves
Performance Corrections
Special Liquid Influences
System Curves

Parallel & Series Pumping
Cavitation & NPSH
Priming & Submergence
Efficiency & Power Draw
Shaft Deflection

Stuffing Box & Seal Chamber
Packing and Mechanical Seals
Bearings & Lubrication
Piping & Installation
Trouble Shooting

The Mackay Pump School also provides the ten pump facts that every pump specialist should know...

- what the pump was designed to do...and why it doesn't do it
- the most important troubleshooting question to ask...and when
- what cavitation really is...what it's not...and how to tell the difference
- how to extend your bearing life...and the most effective methods
- how to get the best technical support from your supplier...and where
- the most important troubleshooting tool...and when and how to use it
- the real truth about the best seal supplier...and how to identify them
- the rule of installation that most people ignore...and why some must
- the vital piece of information missing from your supplier's IOM manual
- the six solutions for every pump problem you will ever have

"Excellent, practical approach to troubleshooting and failure analysis.."

*Kevin Dix, Maintenance Supv.
Tesoro Alaska Petroleum*

"Anyone who deals with pumps should be made to attend this course."

*Mark Wachter, Maintenance Supt.
Newark Water Treatment Plant*

"A week's worth of information in 2 well spent days."

*Bryan Monich, Process Engineer
Labatt Breweries*

"This is a very informative, comprehensive session that highlights and explains major causes of premature pump system failure."

*Dan Kubley, Snr. Maintenance Engineer
Cascades Fine Paper*

A Practical Approach to Pumping

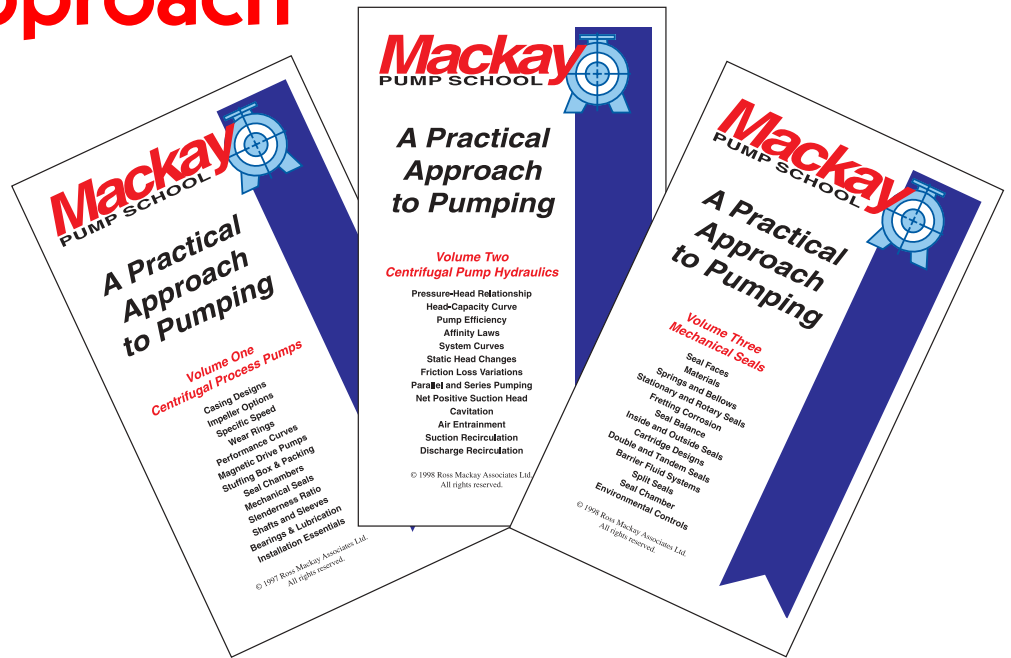
A 3-Volume Video Program

A Practical Approach to Pumping is created for Operations, Maintenance and Design Engineers and Technicians who are responsible for pump reliability. This practical guide will prove instrumental in eliminating expensive and unscheduled downtime. It explores the three vital areas of pump mechanics, system hydraulics and seal operation, integrating them to simplify root cause analysis and effective troubleshooting.

It is a valuable reference for those seeking a complete understanding of process pump design and operation. It will serve both as a pre-study program for the Mackay Pump School, or as a refresher course. Ask about our "Use and Leave" option for the Videos incorporated into your customized in-house pump school.

A Self-Directed Study Module

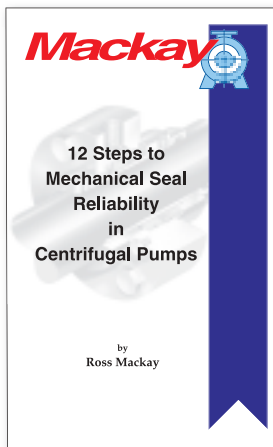
A Self-Directed Study Module is available to be used in conjunction with the videos to provide a focused learning opportunity in all areas of the pump, seals and the system. Included are a series of questions to test the ongoing comprehension of the material, and provide each student with a valuable information resource for the rest of his/her career.



Books by Ross Mackay

12 Steps to Mechanical Seal Reliability in Centrifugal Pumps

In this valuable reference, Ross Mackay has stripped away the confusion surrounding pump seals. He condenses the subject to its basics and identifies what the End User really needs to know, not only about Seals, but also about those aspects of pump and system design that directly impact Mechanical Seal performance and reliability.



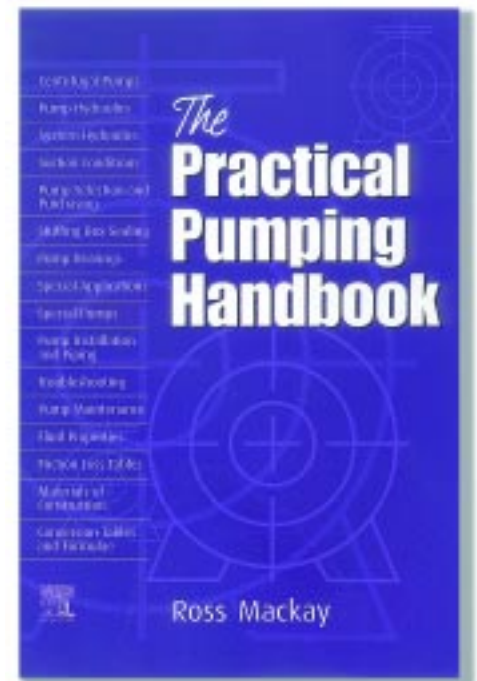
The Practical Pumping Handbook

The Practical Pumping Handbook is an important resource for all design, operating and maintenance technicians and engineers who are responsible for the improvement of pump reliability in every company that is dependent on the efficient movement of fluids.

It is a book for the office and the field—for the skilled technician, the recent graduate or the seasoned engineer who may be confronted with a repetitive or unusual pumping problem.

Although it covers theory where appropriate, its strength is in its down-to-earth and practical approach and its straight-forward use of language.

This book also incorporates the most extensive and valuable set of



reference data ever seen in any other book of its kind.

A few of the companies we've been privileged to serve

Abitibi
Agrium
Akzo Nobel
Bayer
Bowater
Coca-Cola
City of Newark, NJ
City of Toronto
Commonwealth Edison
Domtar
Dow Chemical
DuPont
Fiberglas
General Motors
Genesee County TP
IMC Phosphates
International Paper
Kodak
Labatt Breweries
Lever
Louisville G&E
Metso Paper
Nalco Canada
New York Power
North American Palladium
Ontario Hydro
Owens Corning
PCS Nitrogen
Procter & Gamble
Southern California Edison
Tampa Electric
Tesoro Alaska
TVA
Union Carbide
Weyerhaeuser

Ross Mackay

Internationally recognized as a Specialist in Pumping Reliability, Ross Mackay helps companies reduce their pump operating and maintenance costs. His unique breadth of experience in pumps, seals and pumping systems has been gained through extensive international exposure to various industries in 33 countries.



A graduate in Mechanical Engineering from Stow College of Engineering in Glasgow, Scotland, he has been associated with such companies as Weir, BWIP, Sulzer-Bingham and Chesterton for 30 years prior to starting his own company in 1990.

As a respected authority on pumps, with papers on the subject featured in leading engineering journals, Ross is also a popular speaker at major conferences.

"Outstanding! The information was well presented. Very useful data. Enriching."

*Marvin Williams, Training Specialist,
PCS Nitrogen*

"A real eye-opener. The best broad range training course I have ever attended."

*Lynn Cody Miller, Pump Mechanic,
Total Petroleum*

"This training session is an excellent summary of all aspects of pump application engineering, design, troubleshooting and maintenance."

*Philip Ponka, Project Mgr.,
Metso Paper*

"An information-packed class that should be required training for maintenance personnel and engineers in all industries."

*Darren C. Bittick, Reliability Engineer,
International Paper*

"Tremendously focused learning experience."

*Chuck Foster, Snr. Consultant
Nalco Canada*

"The most enlightening mechanical course I've ever taken."

*Paul Lofton, Maintenance Supv.
Tampa Electric*

Ross Mackay Associates Ltd.

Ross Mackay Associates Ltd. is a pump training and consulting organization dedicated to helping companies increase their pump reliability and reduce operating and maintenance costs.

Ross Mackay Associates Ltd.

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