



2KG TRAINING

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## PUMP EFFICIENCY AND RELIABILITY WORKSHOP

**Presenter:** Harry Rosen

### ABOUT THE PRESENTER: HARRY ROSEN



Harry Rosen has recently been appointed as an International Pump Expert for the United Nations Industrial Development Organisation (UNIDO) delivering expert pump training programmes in South Africa, Indonesia, Thailand and Philippines. He has also recently been involved in the 'Train the Trainer' programme, whereby a group of pump experts have been selected to be developed as pump trainers themselves.

Harry has 23 years experience in the pumping industry, and his company TAS Online is an international market leader in engineering software and consulting services for both users and manufacturers of pumps

Through the development and roll out of its TAS PumpMonitor software, his company's products and expertise are well known and accepted by major pump users such as Anglo American, Gold Fields and Harmony Gold. Harry has carried out system assessments at bulk water plants, industrial facilities, mining process plants, and underground mining operations.

For the last 5 years, Harry has been personally presenting a 2 day workshop on improving the efficiency and reliability of pumping systems, drawing on his wealth of experience. The workshop has been supported by Eskom and the National Energy Efficiency Agency as a valuable tool to help industry achieve their targeted 15% savings in electricity

Harry studied at Wits University and qualified with a Bsc Mech Eng in 1987, receiving his Pr Eng in 1992. He is past chairman of the SA Institution of Mechanical Engineering, Central Branch and was instrumental in setting up the first International Pump User Conference (IPUC) which was held in Johannesburg in 2005. Every 2 years since then IPUC has brought together the world's experts in energy efficient pumping systems, regularly attracting over 180 delegates and 20 world class speakers.

**Number of days:** 3

**Cost:** \$2100

**CPD Points:** 3

## AIM OF THE COURSE

Pumps are at the heart of industry and consume 15% of the world's electricity output, rising to 30% if we include their effect on the overall system. Due to neglect and inefficiencies, much of this electricity is wasted – turned into heat, vibration and noise rather than producing throughput. Well managed and maintained pumps can drastically reduce overall process energy consumption, but instead they continue to be overlooked, leading to continuous breakdowns and compromising overall system reliability.

2KG Training have designed a course to help engineers and technicians better understand how optimising both existing and new pumping systems will lead to reduced life cycle costs, major reductions in energy usage and improved reliability :

- Improve pump efficiency levels by 10-20%
- Optimise the entire pumping system and achieve overall efficiency savings of 30%-50%
- Reduce pump MPTBF and improve overall system reliability

## WHO CAN BENEFIT FROM THIS WORKSHOP

Plant Engineers, Consulting Engineers, Maintenance Managers, Instrumentation Technicians, Pump Operators, Mechanical Foremen and Process Engineers.

## COURSE OUTLINE

A brief overview of centrifugal pump operation and the benefits of improved efficiency

Pump and system interaction and the total cost of ownership

Understanding NPSH and the effects of cavitation

Scope and opportunities for pump system optimisation

Improving the performance of existing pumping systems

Designing more efficient pumping systems

## TOPIC

<b>Pumping system energy audit</b>	<ul style="list-style-type: none"> <li>- Step by step instructions on how to go about performing your own pump audit</li> <li>- Based on material supplied under licence by the US Hydraulic Institute and Europump, including a comprehensive Pre-screening Guide and Pump Audit Sheets</li> <li>- Highlight problem areas such as oversized pumps, cavitating or badly worn pumps, misapplied pumps, pumping systems with bypass flow, throttled control valves to provide fixed or variable flow rates, pumps with high maintenance requirements, noisy pumps or valves etc.</li> </ul>
<b>Identifying the appropriate remedial action</b>	<ul style="list-style-type: none"> <li>- Understand the pumping system requirements, Pump selection considerations, Pumping in series and parallel, Mechanical throttling and flow control, Variable speed drive applications, Electric motor selection considerations, Maintain pumping system efficiency</li> </ul>
<b>Reducing pumping costs through pump system and motor analysis</b>	<ul style="list-style-type: none"> <li>- Each user will receive a copy of the Pump Motor Optimisation Tool (PMOT) developed by Eskom DSM and provided free of charge to end users who wish to optimise their pumping systems</li> <li>- Select the optimum pipe size, length and material, select types of fittings available, liquid type and optimize pump efficiency.</li> <li>- Installing EFF1 energy efficient motors and the benefits of variable speed drives vs throttling</li> </ul>

## TOPIC BY SESSION

<b>Session One – Background and LCC Guidelines</b>	<ol style="list-style-type: none"> <li>1) Overview of Centrifugal Pump Operation</li> <li>2) Overview of Life Cycle Costing</li> </ol>
<b>Session Two – Pumping System Energy Audit</b>	<ol style="list-style-type: none"> <li>3) Pre screening guide and pump audit sheets</li> <li>4) System imbalance calculations</li> <li>5) Performance audits: Instrumentation   Condition monitoring   Pump Performance Monitoring</li> </ol>
<b>Session Three – Pump System Design</b>	<ol style="list-style-type: none"> <li>6) Pipeline Analysis and Design: Theoretical analysis   Pipeline analysis software</li> <li>7) Understanding NPSH and Cavitation</li> <li>8) Pump Selection Considerations: Selecting energy efficient pumps   Life cycle costing analysis</li> <li>9) Electric Motor Selection Considerations</li> </ol>
<b>Session Four – Remedial Actions</b>	<ol style="list-style-type: none"> <li>10) Understanding Pump System Requirements: Match the pump to the system   Affinity laws and trimming impellers</li> <li>11) Variable Flow Requirements</li> <li>12) Parallel pumping</li> <li>13) VSD applications</li> <li>14) Mechanical seals</li> <li>15) Maintain Pump System Efficiency</li> </ol>