



Principles and Operation of Centrifugal Pumps

DURATION

5 days

CONTACT HOURS

30

LEVEL

Intermediate

FEE PER DELEGATE

US\$1,500

Operating a pump where the system curve actually puts it, which is usually not where it was selected for.

Most pump problems are system problems. A pump selected for a duty it never sees runs off its curve, and the symptoms arrive as cavitation, seal failure, high vibration or a bearing life measured in months. Throttling a discharge valve to control flow, running two pumps in parallel without checking the curve, and a suction arrangement that never had the NPSH available are the usual causes, and none of them is fixed by replacing the pump. This week works from the curve outward: what the pump will do, what the system is asking of it, and what the gap does.

Available as classroom, live online, in house.

Who it is for

Operators and operations engineers responsible for pumped systems, maintenance and rotating equipment technicians and engineers, and reliability staff investigating repeat failures.

What you will be able to do

- Read a pump curve and locate the actual operating point on it.
- Calculate NPSH available and compare it against required, with margin.
- Diagnose cavitation, recirculation and dry running from their symptoms.
- Assess a control method against throttling, recirculation and speed change.
- Trace a repeat seal or bearing failure to the operating point that causes it.

The outline

DAY 1

How a centrifugal pump behaves

Head, flow and the curve, and what the impeller sets · Efficiency, best efficiency point, and the cost of running away from it · Affinity laws, and what changes with speed and diameter · Power, and the duty at which the motor is sized

DAY 2

The system decides the duty

Static and friction head, and building the system curve · Where curve meets curve, and why it moves · Series and parallel operation, checked rather than assumed · Valves, strainers and the resistance nobody counted

DAY 3

Suction and cavitation

NPSH available, calculated from the actual arrangement · NPSH required, and the margin to hold · Cavitation and suction recirculation, told apart · Vapour pressure, temperature and the fluid being pumped

DAY 4

Mechanical consequences

Seals, and the operating conditions that destroy them · Bearings, lubrication and load from off curve running · Axial and radial thrust, and where it goes · Vibration as a symptom of a hydraulic cause

DAY 5

Operating and controlling

Throttling, recirculation and variable speed, compared on cost · Minimum flow, and what happens below it · Starting, stopping and switching duty · Monitoring that would show the duty point drifting

What you leave with

- A system curve for one of the delegate's own pumped systems, with the duty point marked.
- An NPSH assessment with the available margin calculated.
- A failure analysis linking one repeat failure to its operating cause.

Published dates

DATES	WHERE	FEE
23 to 27 November 2026	Nairobi, Kenya	US\$1,500
30 November 2026 to 4 December 2026	Kampala, Uganda	US\$1,500
7 to 11 December 2026	Gaborone, Botswana	R15,000
14 to 18 December 2026	Dubai, United Arab Emirates	US\$1,500

Fees are per delegate and cover travel and accommodation arranged by the delegate. Registration fees are separate.

Register or ask a question

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