



45<sup>TH</sup> TURBOMACHINERY & 32<sup>ND</sup> PUMP SYMPOSIA  
HOUSTON, TEXAS | SEPTEMBER 12 – 15, 2016  
GEORGE R. BROWN CONVENTION CENTER

## Short Course P4: Fundamentals of Centrifugal Pump and System Interaction

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Mike Volk is the founder and president of Volk & Associates, Inc. a consulting and training firm specializing in pumps and pump systems, [www.volkassociates.com](http://www.volkassociates.com). Founded in 1982, the company is committed to providing comprehensive consulting and training services to engineers and users of all pump types. Volk is a registered professional engineer, holds Masters of Science degrees in Mechanical Engineering and Business, and has over 35 years of practical engineering experience in the field of pumps and pump systems. Prior to founding his own firm, Volk had experience in pump system design for a large engineering consultant, held various engineering and marketing positions for a major pump company, and managed an OEM pump repair center. He is the author of *Pump Characteristics and Applications, 3<sup>rd</sup> Edition* (ISBN # 9781466563087), published by CRC Press, and has taught hundreds of pump training classes around the world.

- Are you confused by the variety of pumps? Know how to properly size pumps?
- Did you know that proper pump selection can reduce maintenance & energy costs?
- Do you understand what causes cavitation in pumps and how it can be avoided?
- Do you know how a pump responds to changes in tank level or pressure, or to corrosion build-up in pipes?
- What are the factors that should be considered in setting the minimum continuous flow rate for a pump?
- How do you deal with systems involving multiple pumps, variable speed, or viscous liquids?

Pumps are an integral part of your industry, yet engineers, operators, and maintenance technicians are seldom fully trained to handle the pump problems they encounter daily. A good understanding of proper pump application, selection, and operation, and how the pump responds to changes in the system are vital to the success of your company. Now you can learn everything you need to know about these topics at a one-day course in pump and system interaction taught by a recognized pump expert.

Topics covered in the course include:

- basic and advanced hydraulic principles
- pump selection and sizing
- pump system design and analysis
- energy savings in pump selection and operation
- effects of operating pumps away from the Best Efficiency Point
- minimum flow determination for centrifugal pumps
- computer software to design and analyze piping systems