



Water Environment Association of Texas Collections Committee Webinar

TCEQ CEU Application

- Date: May 10, 2017 – 12:00PM
- Provider: WEAT Collections Committee
- Speaker (s): David E. Shank, PE, BCEE – Burgess & Niple
James Mansfield – Pump Solutions, Inc.
- Webinar Title: Collection Systems Pumping: Why Pumps Break and How to Diagnose Pump Performance Issues in the Field
- Area of Interest: Wastewater
- Presentation 1: 50 Ways to Break a Pump
- Presentation 1 Synopsis: 50 Ways to Break a Pump takes a lighthearted, yet serious, look at failed pumps and pump systems the author has encountered over his 40-year career. This case-study based presentation examines things that can—and have—gone wrong. Sources of failures described include cavitation, pump curve/system curve errors, use and misuse of VFDs, control logic problems, mismatched pumps, wetwell problems, power problems, construction problems, and other miscellaneous failures. With a one half hour time allocation the presentation will be fast paced to make it through approximately a dozen and a half failures.
- Speaker 1 Bio: Mr. David Shank joined Burgess & Niple in 1991 and is the firm's Utility Infrastructure Technical Leader. He provides technical direction to key projects and quality control for water and wastewater projects firm-wide. His background includes 39 years' experience as a civil/sanitary consulting engineer and water and wastewater treatment equipment manufacturer. He has been involved in a variety of preliminary investigations, process designs, detailed facility designs, financial studies, and a full range of construction phase services. Mr. Shank is board certified by the American Academy of Environmental Engineers in water supply/wastewater. He holds a Bachelor of Science degree in Civil Engineering from Ohio Northern University, a Master of Science degree in Sanitary Engineering from The Georgia Institute of Technology, and an MBA in Finance from Georgia State University. Mr. Shank has been a member of the NCEES Environmental PE Exam preparation committee for 23 years and just completed a 4 year term as chairman of this group responsible for writing the national Environmental PE Examination. Mr. Shank is a Life Member of AWWA and has been a member of WEF for 40 years. In 2010 the Ohio WEA awarded Mr. Shank their Lifetime Engineering Achievement Award.

During his career, Mr. Shank has designed dozens of pumping facilities with a combined capacity in excess of 1,000 MGD with individual stations ranging in size from 11 gpm to 330 MGD. He has been responsible for the design of over 400 MGD of treatment facilities. His largest project in Texas was as Project Manager and Chief Process Engineer for the expansion of Houston's Southwest WWTP from 38 MGD average capacity to its current hydraulic capacity of 270 MGD.

Learning Objective 1: The objective of the first presentation is to assist designers to avoid problems; operators to recognize problems; and for both operators and designers to better understand the solutions when problems are encountered.

Presentation 2: Diagnosing a Pump's Performance in the Field

Presentation 2 Synopsis: A pump can tell you a whole lot about how it is performing if you know what to look for. Operators and engineers can diagnose a pump's performance using the information available to them in the field such as amperage readings, pump curves, noise, discharge pressures, and flow measurements. This information can help indicate whether a pump is clogged or ragged-up, has a leaking check valve, a closed isolation valve, too much clearance in the wear rings, is experiencing cavitation, or suffering from some other type of performance issue.

Speaker 2 Bio: Mr. Mansfield joined Pump Solutions, Inc. in 2008 after graduating from Texas A&M University with an Industrial Distribution Degree from the College of Engineering. Pump Solutions, Inc. is a Municipal Equipment Distributor with three offices in Texas to support sales, service, parts, and repair capabilities for our customers. Their main focus is water and waste water pumps, controls, pumping packages, polymer concrete wet wells, odor control, and other equipment represented for the municipal industry.

At Pump Solutions, Inc. Mr. Mansfield has worked in the office and field with engineers, contractors, service technicians, and municipalities. He has been responsible for and assisted in engineering of hundreds of new pump station or modifying existing pump stations on many different size water and wastewater pump applications. Some well-known projects in this scope include Waller Creek Tunnel, Formula 1 Race Track, San Antonio River Walk, SAWS Desalination Plant, and many others.

Mr. Mansfield has been a member of AWWA, WEAT, and Austin Contractors and Engineers Association (ACEA). Since that time, he has served different positions and most recently was the President of the Capital Area Chapter of AWWA in 2015. In 2013, he was awarded the Maverick Award through WEAT and AWWA. This award is given to one Young Professional per year for exemplifying exceptional qualities in volunteerism, Community Involvement, Leadership, and Outstanding Service in the water supply field.

Learning Objective 2: The objective of the second presentation is to provide a discussion on the common issues and troubles pumps experience in the real world and an overview of the type of information that can be collected in the field to help determine whether an issue exists and what the issue is most likely related to.

Comprehensive Questions:

1. When designing or operating a pump station with variable static head and VFD drives, what range of operating conditions must be considered?
 - a. Max & Min static head at full speed
 - b. Max & Min static head at minimum speed
 - c. At all points within the trapezoid defined by these four points
2. In successful pump station design, NPSHR must always be greater than NPSHA.
 - a. True
 - b. False
3. What is the likely failure mode of a pump as the operating point moves far to the right end of the curve?
 - a. Power draw usually exceeds the motor rating and the motor burns out
 - b. Pump “deadheads” and may begin to overheat. May result in a seal failure.
 - c. Pump has insufficient NPSHA. May result in clogging of pump.
4. If a pump station does not provide sufficient capacity, the best solution is to always add additional pumps?
 - a. True
 - b. False
5. When a pump is clogged or ragged up, will the amps on the motor be higher or lower than normal?
 - a. Higher
 - b. Lower
 - c. Depends on the location of debris
6. Which of the following are needed to estimate the TDH of a pump in the field?
 - a. Tape measure and Pressure gage
 - b. Flow meter
 - c. All of the above
7. What are the keys for a successful and operational frame mounted pump or vertical turbine pump?
 - a. Alignment
 - b. Levelness
 - c. Pipe Strain
 - d. All of the above

**Correct answers to the questions are highlighted in yellow!

IMPORTANT: Technical presentations are intended to inform and teach members about product updates, new processes or techniques, explain or present designs or construction challenges, etc. While the presenter’s company may be the source of this information, these presentations are NOT intended to be and should avoid being a “sales pitch” or “commercial” for their company or product. We ask that all presenters keep this in mind and make their presentations in a professional manner.