



Smith & Loveless, Inc.

Smith & Loveless Pump School Agenda and Topics

| Section | Title | Duration |
|--------------|---|----------|
| 1 | Pump Overview | 20 |
| 2 | Priming Systems (workbook exercise) | 35 |
| <i>Break</i> | BREAK (interactive group quiz) | 10 |
| 3 | Above Ground Pump Stations – Mechanical Operation | 30 |
| 4 | Controls and Pump Features | 30 |
| 5 | How to Maintain Your Above Ground Pump Station | 65 |
| <i>Break</i> | LUNCH | 60 |
| 6 | Pump Station Troubleshooting (workbook exercise) | 40 |
| 7 | Electrical Troubleshooting | 20 |
| <i>Break</i> | BREAK (interactive group quiz) | 10 |
| 8 | Pump Hydraulics | 30 |
| 9 | Pump Curves (worksheet exercise) | 20 |
| <i>Break</i> | BREAK (interactive group quiz) | 10 |
| 10 | Underground Pump Stations | 20 |
| 11 | How to Maintain Your Underground Pump Station | 20 |

Section 1: Pump Overview

The pump overview introduces the speaker and Smith & Loveless the company. This section covers the types of pump stations, the basic components of the S&L pump, impeller functionality, CFDs, impellers, and mechanical seals.

Section 2: Priming Systems

This covers the 2 types of priming systems on S&L pumps – flooded suction and vacuum primed. The presenter covers the basic components of these priming systems. There is a workbook activity in which participants identify the components of 3 vacuum prime- systems.

Section 3: Above-Ground Pump Stations – Mechanical Operation

The basic mechanical process of an above-ground pump station is presented.

Section 4: Controls and Pump Features

This section covers the electrical equipment present in an above-ground pump station as well as the basic electrical process of an above-ground pump station. There is also an emphasis on station operating control systems about relay logic and programable logic controllers (PLCs)



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Section 5: How to Maintain Your Above-Ground Pump Station

This section covers routine maintenance procedures and schedules. Each procedure is described with a video to show each step of the process. This includes mechanical seal change, vacuum pumps, wafer check valves, motor maintenance, and more.

Section 6: Pump Station Troubleshooting with Compound Gauges

Monitoring the above-ground pump station with compound gauges allows for quick evaluation of the system's operation and when necessary quick troubleshooting. This section covers how to read the compound gauge and how to troubleshoot the issues that might arise in any pumping system. This includes a worksheet.

Section 7: Electrical Troubleshooting

This section touches on troubleshooting electrical issues, including switches, relays, starters, overload coils, and pump rotation.

Section 8: Pump Hydraulics

This section covers how to determine the pumping rate and static and total dynamic head for both above-grade and flooded suction pump stations using measurements taken at the time of pumping. There is also time devoted to examples (both good and bad) of back pressure on the pump station check valve.

Section 9: Pump Curves

This section introduces the use of pump curves when selecting a pump for design conditions. The process includes plotting the design point and determining a pumping system based on brake horsepower lines, impeller diameter lines, maximum suction lift lines, and efficiency lines. Suction and discharge line diameters are also discussed. The design condition is discussed briefly about the system curve when impeller diameters are changed.

Section 10: Underground Pump Stations

This section covers the basic operation and features of the flooded suction pump station. There is a comparison between the two pump types (vacuum primed and flooded suction).

Section 11: How to Maintain Your Underground Pump Station

This section covers the routine maintenance schedules and procedures for the flooded suction pump station. The section provides a basic list of commonly used service tools and spare parts.