



## Gas Well Deliquification - GWD

**Discipline:** Production and Completions Engineering

**Level:** Intermediate

**Duration:** 5 days

As gas wells deplete, the velocity in the tubing drops and eventually liquids from the well and from condensation begin to accumulate in the tubing. This increase of liquids in the tubing adds back pressure on the formation, which in turn reduces flow or even stops flow all together. The course introduces this problem and discusses how to recognize liquid loading as opposed to other possible well problems. The course will then cover the various methods of solving the problem of liquid loading, showing how to apply the various solutions and the advantages and disadvantages of each method. Solution methods include use of surfactants, velocity strings, compression, use of plunger lift, various other pumping methods, gas lift, and the injection of fluids below a packer so gas can flow up the annulus. The attendee should be able to recognize the problem of liquid loading and have a good idea of which methods can solve the problem and select the best method/s for solution after attending the course. There are about 400,000 gas wells in the USA and most are liquid loaded. Solving this problem may on the average increase production by ~40% per well. The course will consist of slide presentations, example problems, and discussion. Some films will be shown. Effects of deviated or horizontal well applications on all methods are discussed.

### **Designed For:**

Engineers, field technicians, field supervisors, and others who select, design, install, evaluate, or operate artificial lift systems for use in dewatering gas wells.

### **You Will Learn:**

How To

- Maximize gas production using optimized dewatering techniques
- Recognize liquid loading in a gas well using field symptoms, critical velocity, and nodal analysis
- Recognize the advantages and disadvantages of various methods of liquid removal

- Install and troubleshoot several methods
- Understand economics of each method covered

**Course Content:**

- Recognize symptoms of liquid loading in gas wells
- Critical velocity
- Systems nodal analysis
- Sizing tubing
- Compression
- Plunger lift
- Use of foam to deliquefy gas wells
- Hydraulic pumps
- Use of beam pumps to deliquefy gas wells
- Gas lift
- Electrical submersible pumps
- Progressive cavity pumps
- Other methods to attack liquid loading problems