

# Basic Pipeline Hydraulics I - Operators

(2.5 days)

## Day One

### Quiz

#### **Fluid Properties and Flow**

1. Specific and API Gravity
2. Viscosity
3. Vapor Pressure (real and true v.p.)
4. Temperature
5. Fluid Types: Laminar, Turbulent, and Transition

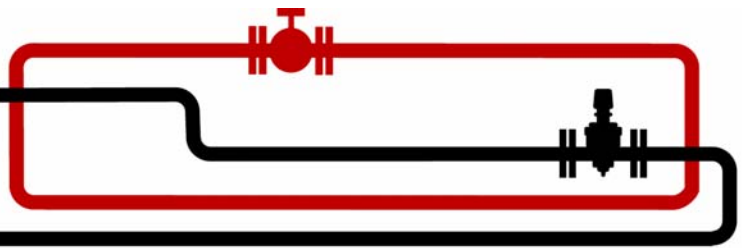
#### **Steady State Flow Analysis**

1. Pressure Drop and Pressure Loss Formulas
  - a. Discuss Formulas
  - b. Pipe Diameter and Roughness
  - c. Estimating Pressure Loss-Reynolds Number
  - d. System Curves
  - e. Turbulent and Transition Flow

#### **Hydraulics Gradients**

1. General Description
2. Stripping and Injecting
3. MAOP
4. Relief Systems
5. Surge Protection
6. Hydraulic Balance and Stations Required





## Day Two

### Hydraulic Problem Class Exercise

#### Pumps and Pump Operation

1. Pump Types / Characteristic
2. Pumps and MAOP
3. Controls for Pumps / Stations

## Day Three

### Valves

1. Types
2. Control Valves; Throttling
3. Proper Operation
4. Emergency and Safety Procedures

### Class Exercise

### Multiple Station Operation

### Review and Quiz

### Closing Exercises

**By attending GCI's Pipeline Hydraulics I class, you'll discover more about:**

- Fluid properties and flows
- Steady state flow analysis
- Hydraulic gradients
- Hydraulic problem-solving exercises
- Proper operation of valves

Cost: \$900

