Pipe Tech 4.24.17 Syllabus

Time: 40-80 hours

Maximum Class Size: 12

Prerequisites: Contact Field Foreman or OQ Coordinator

Course Description: This 17-part Pipeline Technology program is a comprehensive overview of the pipeline industry. It is a flexible program in which individual topics can be combined to provide the targeted training requested by our contractors. The individual topics include: General Safety and Knowledge, Warehouse, Line Locating, Fence Crew, Clearing Crew, Environmental Protection, Grade Crew and Ditch Crew, Rock Ditch Crew, Skid Crew, Mainline Activities, Coating Crew, Lowering-in and Tie-in Crews, Crossing Roads and Rivers, Testing Crew, Cleanup and Restoration, Specialty Work and Existing Pipeline. This course is a combination of classroom and hands-on training and can lead to Operator Qualification testing. Note: This course contains content formerly included in the following individual modules: Back End Pipeline Work, Front End Pipeline Work, Pipe Handling in the Trench, Pipeline Coating Crew and Pipeline Specialty.

Standards Addressed:

DOT PHMSA 49 CFR 192 Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety standards

Goals/Objectives/Student Learning Outcomes:

- Define the term “the spread”
- Name the chain of command on the pipeline
- List seven employee obligations
- Name three general hazards and/or precautions associated with working on a pipeline
- Explain the commonsense approach to hazard recognition
- Define what a “pinch point” is
- List five pieces of Personal Protective Equipment (PPE) commonly used on pipeline projects
- Give the minimum clearance between overhead power lines and any part of a crane or load
- Explain the use of “goal posts”
- Name two causes of trench failures or cave-ins
- List the three main protective systems used to protect against cave-ins
- Identify the weakest soil type, and describe how it affects the slope of the trench walls
- Explain the difference between shoring and shielding
- Specify at what height a walkway over a trench bottom requires handrails
- Identify one of the hazards of confined spaces
- Explain the effects of water accumulation in the trench
- Name the type of information found on Safety Data Sheets (SDS)
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- Explain why there must be a controlled access area set up when the device used to x-ray welds is in use
- Explain why hooking and unhooking mud mats is dangerous
- Name at least four actions you can take to prevent heat stress
- Name at least four actions you can take to prevent cold stress
- Show proper lifting techniques
- Name the most commonly injured part of the back, and explain why it is so frequently injured
- Explain the two main purposes of a warehouse
- Describe on task that the Construction Craft Laborers (CCLs) perform during the setup of a jobsite warehouse
- List and describe three ongoing tasks that CCLs do at a warehouse
- Describe the process of setting up a storage trailer
- Describe how to safety unload pipe being delivered to a job
- State what a staging area is and what it is used for
- Describe the proper steps involved in preparing drinking water for a crew
- Explain what a berm is and what it is used for
- Explain why “good housekeeping” and organization are important
- List three hazards of warehouse work
- Explain the main task of the Line Locating Crew
- Paraphrase the main sequence of steps the Line Locating Crew goes through to locate an underground line
- List three hazards of rupturing an underground utility line
- Name three steps that are taken before excavation begins
- Tell what “One-Call” systems are and what purpose they serve
- Identify five indicators from records or from the field that may signal the presence of an underground utility
- Tell what an alignment sheet is and what information it provides
- Be able to identify the meanings of at least five of the nine color-coded surface markings
- List two common types of temporary markers
- Explain what an M-Scope is and what it is used for
- Explain what pot-holing is
- Tell what probing is
- Demonstrate the process of probing and potholing an underground utility line
- Tell what a protective barrier is
- List at least three signs you may see during potholing that may indicate an underground line is nearby
- Tell what a hydro-vac is and what it is used for
- Tell why it is important to inspect the coating of uncovered lines
- List the information that should be listed on temporary markings that are installed after a “find”
- List at least four things that the CCL do during the Line Locating process
- Describe the main task of the Fence Crew
- Identify one thing you need to do before clearing brush
- Describe a situation where existing fence is saved for reuse
- Describe a gap
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- Demonstrate the ability to build a temporary gap, including the use of a power auger and construction of an H-brace
- Explain the general sequence used to build a straight gap
- Explain the general sequence used to build an angled gap.
- Describe the power auger and what it is used for
- Explain how to properly open and close a gap
- Explain why it is important to close a gap securely
- Identify the personal protective equipment (PPE) commonly worn by the Fence Crew
- Describe the general work of the Clearing Crew
- List three tasks performed by CCLs on the Clearing Crew
- Tell why it is important that all work remain within the limits of the right-of-way (ROW)
- Describe what point of intersection (PI) is and where it is used
- List four observable signs to help recognize the ROW
- Describe the most common type of marking device
- List five colors of flagging and tell what they stand for
- Explain two of the considerations that must be considered during controlled burning operations
- Explain why operating chippers can be dangerous, and list six safety procedures to help minimize this risk
- List three things a swamper does while assisting heavy equipment operators on the Clearing Crew
- Describe the type of work done by the Environmental Crew
- List three reasons why environmental protection is important
- List three types of erosion control methods
- Explain the purpose of a silt fence
- Demonstrate how to correctly install and dismantle a silt fence
- List two types of ditch breaks and where they are used
- Identify three common hazards of environmental protection work
- Describe the general work of the Grade Crew
- Explain why grading the Right-of-Way (ROW) is important
- List two specific tasks of the Grade Crew
- List at least one role of a CCL on a Grade Crew
- Describe the role of a swamper
- List three important precautions that he Grade Crew should observe
- Explain the main job of the Ditch Crew
- Describe what a soft plug and a hard plug are
- List one task that must be completed when excavating a ditch in a wet area
- List two types of heavy equipment commonly used for excavating the ditch
- List three duties of CCLs on Ditch Crews
- Explain what offset stakes are and what they are used for
- List two do’s and don’ts when guiding an equipment operator
- Tell why it is important to open and close gaps properly
- Identify the risks experienced by the Ditch Crew that results in the most injuries and fatalities each year
- List two methods of preventing cave-ins
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- State at what ditch depth cave-in prevention measures become required
- Describe the main task of the Rock Ditch Crew
- Describe two tasks of the Drill Crew
- Describe two tasks of the Powder Crew
- Describe the main task of the Matting Crew
- List two common types of heavy equipment used when matting
- List three hazards associated with working on the Rock Ditch Crew
- List the main methods used to clean an area and announce an upcoming blast
- List three tasks of the Rock Ditch Crew that required additional training
- Explain the main task of a Skid Crew
- Tell what a skid is and what it is used for
- Explain why it is important to keep the pipe up off the ground
- Explain why proper spacing of skids on the ROW is important
- Identify four common configurations of skids: stacked, slide, crib/pig pen, and crotch
- Demonstrate the ability to build safe and secure support structures out of skids
- Explain the reason for adding padding to skids and list common padding materials
- List five activities done during the mainline activities phase of pipeline construction
- State the methods for protecting and securing pipe for hauling
- Identify two of the common materials used to pad skids
- Explain when and why you need to double up pipe joints when stringing them along the ROW
- Name two markings written on the pipe by the bending engineer and his or her helpers
- Describe the process of rigging the pipe and putting it through the bending machine
- Identify two common types of bends
- Give the reason for rolling seams when setting up pipe in preparation for welding
- Explain what carry-back is and what you should do if you lose it
- State the reason why special PPE is required when working near the end-facing machine
- Describe the hazard associated with weld X-ray equipment used to inspect welds on a pipeline project
- Define nightcaps
- Explain why the coating on the pipeline is important
- State why proper sandblasting is important to the coating process
- Give a definition for a “sand pot”
- Demonstrate the process of setting up sandblasting equipment
- Demonstrate how to use a sandblaster to prepare a pipe for the application of coating materials
- Name three of the basic maintenance duties you will perform on sandblasting equipment
- Describe the required PPE for sandblasting with silica sand
- List the three types of epoxy coatings, and demonstrate how to apply them
- Demonstrate how to apply a shrink sleeve
- Explain the two types of tape, and demonstrate the methods for applying them
- Give a brief explanation of what a Safety Data Sheet (SDS) is
- Demonstrate how to jeep the pipe
- Describe and demonstrate three patching methods for repairing holidays
- Identify four hazards of working on the Coating Crew
- Define dewatering
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- Demonstrate how to set up a 3” gas-powered water pump
- Describe, in general, what a CCL will be doing to maintain water pumps
- Describe ditch soil conditions what may adversely affect pipe coating
- State the minimum depth of soil that is required for bedding material
- Explain how to rig a pipe for lowering-in using a roller cradle
- Describe how to rig a pipe for lowering-in using a lowering-in sling
- Describe the need and requirements for protecting the pipe and coating during placement (lowering-in)
- Explain how skids are used in the trench during lowering-in
- Describe how to prevent damage to coating during backfill operations
- Explain why there is a CCL assigned to perform fire watch during the tie-in process
- Define a pup joint
- Explain what a bell hole is
- Give a brief explanation of why zinc ribbon is placed in the ditch along both sides of the pipeline
- Describe how to verify pipeline wall thickness and location
- Demonstrate how to CAD-weld test leads onto a pipe
- Describe how to select a location for an exothermic weld (CAD-weld), the exothermic weld size, and the appropriate furnace/mold
- Describe the final steps associated with test lead installation as part of the cathodic protection system
- Describe the difference between a cradle auger boring machine and a track auger boring machine
- Explain what a “deadman” is and how it is used when boring with a cradle auger boring machine
- Explain what a slurry is and how it is used when boring or drilling
- Describe the process, when using horizontal directional drilling, of obtaining the appropriately sized hold for the pipe being used
- List three hazards associated with boring under roads

Classroom Rules and Procedures

- All classes begin at 6:30 am and end at 3:00 pm
- Upon entering classroom, all participants must sign in and be seated by 6:30 am
- Class will consist of a combination of lecture, video, demonstration, coached group exercises, individual exercises and assessment.

Classroom Rules and Procedures-continued:

- Students are required to report to class ready to work and maintain the provided PPE

Textbooks/Readings/Materials

- LIUNA Pipeline Technology Participant Guide
- LIUNA Pipeline Technology Instructor Guide
- LIUNA Pipeline Technology Student Handout Packet
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• Pipeline Technology Exit Exam A or B
• Pipeline Technology Exit Exam Answer Sheet
• DVDs: Introduction to Pipeline, Pipeline Warehouse, Pipeline Fencing, Pipeline Clearing, Pipeline Environmental Crew, Pipeline Grading, Pipeline Ditching, Pipeline Rock Ditch Crew, Pipe Hauling and Stringing, Pipe Bending, Pipeline Lay and Weld Crew, Pipeline Lowering-In, Pipeline Tie-Ins, Pipeline CAD Welding, Pipeline Boring
• Pipeline Technology PowerPoint
• Two packs of 3 x 3 sticky notes

Tools/Equipment/Other Materials:

• Tensioner and sealer for metal banding
• Tin ships
• Metal scissors
• Fabric strap and ratchet
• Chain binder, and binder bar
• Rolls of metal banding
• Seals (2 per participant)
• Loose material to be secures
• Equipment to secure material (e.g., truck, pallets, trailer, etc.)
• Claw hammer
• Handheld post hole diggers
• Power auger post hole diggers
• Spade head shovels
• Pliers or wire-cutting tools
• Saws
• 100’ measuring tapes (cloth type)
• Sledgehammer
• Utility knife
• Rolls of barbed wire (one roll for each group)
• 4” or 6” diameter fence posts
• #9 wire
• 2” x 2” x 4’ wooden laths or metal stays
• 16d galvanized nails
• Fencing staples
• Flagging tape
• Disposable bags
• Plastic shovels
• Squeegees
• HEPA vacuum
• Disposable coveralls
• Respirators
• 2” duct tape
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- Rolling scaffold with guardrail
- Lighting (string or halogen if needed)
- Extension cords
- High flow pump or picture of high flow pump
- Plastic cassette
- Filter
- Electric fan to demonstrate aggressive sampling
- Materials to demonstrate the different sampling techniques (e.g. powder)
- 10” x 10” gauze pads to demonstrate wipe sampling
- Powder and other materials to simulate asbestos and other contaminants
- Chainsaw
- All chainsaw-specific PPE
- Fuel (mixed)
- Bar and chain oil
- Logs or timber (each participant will need to make two different types of cuts)
- Shovels (4-6 or more)
- Sledgehammer to drive stakes
- Stapler to fasten silt fence fabric to stakes
- 50’ section of silt fence fabric
- 10 grade stakes
- Knife (to cut fence fabric)
- 50-100 skids
- 8-10 strips of padding material (either fiberboard or carpet remnants)
- 5 rolls of masking tape
- Markers
- 2 large bags of pipe cleaners
- 1 ream of why copy paper
- 6-8 glue sticks
- 1 package of straw
- 1 package of tinfoil sheets

Personal Protective Equipment:
- 12 pairs of gloves
- 12 pairs of safety glasses
- 20 pairs of earplugs
- 12 hard hats

Course Requirements:

To receive credit for the course, participants must:

- Be present for full forty to eighty hours
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- Participate in all classroom exercises
- Pass a written exam
- Pass hands-on exams

Course Policies

- Participants must be on-time and ready to work.
- Participants must return from breaks on-time.
- Participants must participate in each exercise and assignment
- Participants who are on “light duty” are not allowed to take this course due to the physically demanding requirements.

Assessment and Grading

Participants will be assessed on the following:

- All written exams must be passed with a score of 80% or above.
- All hands-on exercises are graded on performance and participation. They are pass/fail and must be passed with a score of 80% or above.

Safety

Failure to maintain and use PPE may result in dismissal from the course.