Service Company Equipment Operator
Wireline Well Control

Curriculum, Course Delivery Requirements,
and Related Learning Objectives

Form WSP-02-WI-WL-EO
Revision 0
17 August 2017

Contents

1.0 Overview of Service Company Equipment Operator Wireline Well Control

This course curriculum is designed for service company equipment operators who are primarily responsible for the wireline operational processes of well control. This curriculum identifies a body of knowledge and a set of job skills that can be used to provide well control training for wireline operations personnel.

This curriculum incorporates Core Training Modules, Sub-Modules, Learning Topics, and Learning Objectives and Assessments.

Recommended Attendees: IADC recommends that this course is attended by equipment operators who are primarily responsible for the wireline operational processes of well control. Examples of these positions or job roles are listed in the table below.

Company Personnel Type	Positions
Wireline Company Personnel	Field Engineers (Cased Hole/Open Hole/Pipe Recovery/Production Logging/TCP)
	Senior Field Engineer (CH/OH/PR/PL/TCP)

Acceptable Delivery Methods: Instructor-led training for the initial and repeat delivery of this course is required. Demonstration is required to be incorporated into the course content delivery. See the relevant cross-reference document regarding content delivery requirements for specific learning objectives.

To the maximum extent possible, use scenarios to bring attention to specific topics. IADC also requires a "blended" approach to (multiple strategies for) content delivery and a variety of techniques that appeal to different types of learners (e.g., visual, auditory, kinesthetic). These strategies will also help engage trainees in the learning process and will help improve learning and retention.

Minimum Course Length: Thirty-two (32) classroom hours are required for teaching the Wireline curriculum. Course length excludes the knowledge assessment time (3.5 hours).

Course Curriculum Notes: The curriculum that follows includes five components: Training Modules, Sub-Modules, Learning Topics, AIM, and Learning Objectives and Assessment Guidelines.

AIM: The AIM letters indicate the level of knowledge and skills required at the job level:

A = Awareness of Learning Topic

I = Implements Learning Topic at this job level; needs an increased level of knowledge because they may have to take action of some task related to the topic.

M = Mastery of Learning Topics at this job level; needs a full knowledge because they have to take action, perhaps unsupervised, of some task related to the topic.

Learning Topics**:** This section provides guidance for instructors on what the trainee should learn.

Learning Objectives and Assessment Guidelines**:** This section defines what trainees should be able to do at the conclusion of the training and provides some examples of how to meet the objectives.

Assessment Notes: Questions on the Knowledge Assessment will be graded as a cumulative score. To pass the course, the trainee must earn at least a 70% score.

2.0 Curriculum

2.1 Risk Awareness and Management

Module Name: 2.1 Risk Awareness and Management			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Potential Impacts of a Well Control Event	A	Risks associated with completion and well intervention operations	Describe potential risks of pore pressure prediction being incorrect and resulting in well control risk (e.g., completing a new reservoir).
	I		Identify potential well control problems that could occur during completion and well intervention operations.
Live/Dead Well	M	Differences between 'live' and 'dead' well	Define 'live' well.
	M		Define 'dead' well.
Risk Management	I	Systematic risk management	List the four principles of systematic risk management (i.e., identify, quantify, mitigate and control risk).
Pre-job Communication	I	Pre-job communications	Explain the importance of communicating operational plan details, risks, and responsibilities.
Handover for Tour and Hitch Change	I	Handover for Tour and Hitch change to minimize risks	Explain the importance of a good handover for tour and hitch change.
	I		Identify key components that need to be addressed during a handover for tour and hitch changes (e.g., current well status, barrier envelope, and communication of responsibilities).
Safety Margin Selection	A	Safety Margin Risks a. Safety margins in Well Kill Operations b. Dangers of using minimal safety margins	Describe the criteria used to develop a safety margin.
	A		Explain the dangers of using minimal safety margins during a well kill (i.e., safety margins applied to tubular integrity, casing integrity, wellhead rating).
Bridging Documents	A	Purpose and Importance of Bridging Documents	Explain the purpose and importance of a well control bridging document (i.e., to assure all parties have the same information; to resolve well control issues between different parties (which well control practices will be followed); to handle specific issues in relation to a particular well/environment or legislative regime).

Module Name: 2.1 Risk Awareness and Management			
Sub-Modules	**AIM**	**Learning Topics** **The instructor will impart knowledge on:**	**Learning Objectives and Assessment Guidelines** **The attendee will be able to:**
Emergency Procedures	A	Purpose and Importance of Establishing and Following Emergency Procedures for Rig BOP	Determine situations that require emergency procedures be activated and action(s) to secure the well (if applicable) (i.e., an uncontrolled BOP leak; 'broaching' at surface; potential vessel collision; bad weather; drive-off; toxic gas; fire).
	A		Explain when a company should initiate the emergency action plan and assure crew members are aware of their roles and responsibilities for evacuation.
Pressure Control Equipment/Barrier Envelope Considerations	I	Equipment Requirements	Define Maximum Allowable Working Pressure (MAWP).
	I		Identify the working pressure component (e.g., schematic or description).
	I	Installation of rings, flanges and connections	Describe characteristics and best practice for installing a ring gasket.
	I	Load Bearing Considerations	Identify wireline equipment that requires anchoring to withstand maximum expected forces during operations (e.g., wireline units, sheaves).
	I		Identify wireline equipment that requires lifting certifications (e.g., slings, shackles, lubricator clamps).
	A		Identify considerations when determining if a wellhead or tree bending stress analysis is required.
	I		Identify environmental factors that can influence well control operations/rig-up (e.g., sea state, wind speed, air temperature, static electricity situation).

2.2 Well Control Principles & Calculations

Module Name: 2.2 Well Control Principles & Calculations			
Sub-Modules	**AIM**	**Learning Topics** **The instructor will impart knowledge on:**	**Learning Objectives and Assessment Guidelines** **The attendee will be able to:**
Pressure Fundamentals	M	Pressure	Define pressure.

Module Name: 2.2 Well Control Principles & Calculations			
Sub-Modules	**AIM**	**Learning Topics** **The instructor will impart knowledge on:**	**Learning Objectives and Assessment Guidelines** **The attendee will be able to:**
	M	Types of pressure a. Hydrostatic pressure b. Applied Pressures 1. Surface pressure a. SITP b. Annulus Pressure 2. Pump Pressure 3. ECDs (Equivalent Circulating Densities) 4. Trapped Pressure 5. Swab/surge c. Formation pressure d. Differential pressure e. Fracture pressure f. Bottomhole pressure 1. Balanced 2. Underbalanced 3. Overbalanced	Define hydrostatic pressure.
	M		Calculate hydrostatic pressure.
	M		Explain the effects of fluid level change on hydrostatic pressure.
	M		Identify the different types of applied pressures.
	M		Explain shut-in pressures.
	M		Explain the effects of trapped pressure (e.g., above and below the packer or plug).
	M		Explain the differences between swab and surge.
	M		Calculate formation pressure.
	M		Discuss situations where differential pressure exists in the wellbore (e.g., across sliding sleeve; perforating; above/below packers; wireline plugs).
	M		Define fracture pressure.
	M		Define Bottomhole pressure (to include applied pressure).
	M		Explain the difference between overbalanced and underbalanced pressure.
	M		Calculate equivalent fluid weight equal to formation pressure (kill fluid).
	M		Calculate gradient for different density of liquid and gases.
	M		Calculate well gradient from formation pressure and surface pressure.
	M		Calculate bottomhole pressure with at least one well bore with two different densities and surface pressure.
	M	Maximum Anticipated Surface Pressure (MASP)	Define MASP (reference WellSharp Definitions document).
	M	Forces from Applied Pressure	Calculate the effective force with a given pressure over a certain area.
	M		Calculate net force effects due to trapped pressure.
	M	Kill Mud Weight (Equivalent static fluid density) a. Definition b. Pressures expressed as an equivalent fluid weight	Define (equivalent static fluid density).
	M		Calculate (equivalent static fluid density) with temperature effects.

Module Name: 2.2 Well Control Principles & Calculations			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
	M	U-tube principles	Demonstrate understanding of the U-tube concept.
Principles	A	Tubing Collapse and Casing Burst	Explain why applied casing pressure is needed (e.g., prevent packers from unseating, seal units from being pumped out of Polished Bore Receptacle (PBRs), basis point for monitoring, limit differential pressure, prevent failures).
	A		Explain why applied casing pressure can lead to tubing collapse or casing burst.
Well Data Information	M	Well Data Question Form	Explain the importance of gathering and verifying well information (e.g., bottom hole/formation pressure, MASP, fluid and fluid level, wellhead pressure).
	M		Given well data, complete a well data question form.
	M		Read and interpret Wellbore profile/ schematic and effects/constraints on intervention operation.
	M		Explain the importance of deviation survey when performing intervention operations in deviated wells (i.e., Cerberus, Tool Planner).
	M		Explain the importance of review/research on previous well history information.
Pre-recorded Well Information	I	Well configuration a. Top and bottom of perforations b. Packer/Tool locations c. Tubing dimensions, lengths and strengths	Demonstrate how to document pre-recorded data significant to well control situations (e.g., perforation interval, packer locations, tubing strengths, safe working pressures).
	I		Demonstrate how to document the wellbore profile including depths (MD/TVD), lengths, strengths, capacities, displacements, and safe working pressures.
Secured Well Conditions	I	Wellhead/Well Control Stack/Christmas tree valves	Explain the purpose of functioning the casing valve prior to Intervention operations.
	I		Explain the purpose of functioning the tree wing valve prior to Intervention operations.
	A		Explain the importance of a procedural lock-out on a remote actuated tree valve.

Module Name: 2.2 Well Control Principles & Calculations			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
	I		Explain the importance of closing the tree master valve last.

2.3 Barriers

Module Name: 2.3 Barriers			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Philosophy and Operation of Barrier Systems	M	Barriers and barrier envelope	Define the term “barrier” (reference WellSharp Definitions document).
	M		Define the term “barrier envelope” (reference WellSharp Definitions document).
	M		List the requirements for a component to be considered a barrier (i.e., once it is tested; when it is in contact with well fluids).
	M		Describe the function of wireline pressure control equipment in the barrier envelope (e.g., stuffing box, lubricator, wireline valve, pump-in sub).
	M	Purpose of barriers during completions and well interventions	Explain how barriers are used to maintain well integrity for completions and well interventions.
Types of Barriers	M	Mechanical barriers	Define mechanical barrier.
	M		List examples of mechanical barriers.
	M		Explain the validation needed to be a mechanical barrier.
	M	Fluid barriers	Define fluid barrier.
	M		Explain what is required for a fluid to be considered a barrier (i.e., continuously observe the height and the ability to add fluid).
	M		List the types of fluid barriers.
	M		Explain the limitations of fluid barriers (e.g., It is only a barrier for a certain period of time after circulation stops).
Levels of Barriers	M	Operational Shut-in Hierarchy	Discuss the hierarchy of operations for Pressure Control Equipment (PCE).
	M	Primary and Secondary Barriers and Emergency Closure	Explain what primary barriers are.
	M		Explain what secondary barriers are.

Module Name: 2.3 Barriers			
Sub-Modules	**AIM**	**Learning Topics** **The instructor will impart knowledge on:**	**Learning Objectives and Assessment Guidelines** **The attendee will be able to:**
	M		Explain what emergency closures are.
	M	Minimum number of barriers required for safe operations	Explain why a minimum number of barriers are required for safe operations. (Refer to industry recommendations for minimum number of barriers to be in place for specific operations).
Barrier Management	M	Testing mechanical barriers	Explain positive pressure and negative/inflow pressure barrier tests (e.g., increase differential pressure across a barrier in either direction).
	I		Identify the reference sources for mechanical barrier test criteria (e.g., the well program, operations manuals, industry standards, technical specifications from equipment manufacturers, integrity testing, and regulatory agency).
	M		Explain the importance of documenting mechanical barrier testing.
	M		Explain the importance of the test pressure and time period to validate mechanical barrier.
	M		Explain the action to take if there is a test failure of a mechanical well barrier/element (i.e., retest, reinstall, or install additional barrier).
	A	Validating fluid barriers	Explain the importance of monitoring the fluid volume at surface (e.g., open top tanks).
	M		Explain the importance of fluid density measurements as it applies to well design.
	A		Identify conditions that would lead to settling of solids in the fluid.
	M		Explain how crystallization affects a fluid barrier (e.g., changes fluid density).
	M		Explain the action to take if there is a test failure of a fluid barrier/element (e.g., shut-in well, change out fluid, install mechanical barrier).
	M	Detecting a failed barrier	Explain how a failed primary barrier can be detected (e.g., from the flow from the well; through losses to the well; an increase in surface pressure when shut in).
	M		Explain how a failed secondary barrier can be detected (e.g., pressure loss; detectable leaks at surface).

Module Name: 2.3 Barriers			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
	M		Explain how a failed emergency closure can be detected (e.g., blowout, uncontrolled flow).
Primary Barrier	M	Stuffing Box/Pack Off/Grease Injection	Explain the purpose of the stuffing box/pack off/grease injection as an external primary barrier.
Secondary Barrier	M	Wireline Valve	Explain how the Wireline valve acts as a secondary barrier.
Emergency Closures	M	Rig BOP (Annular, Blind, Shear)	Explain how the Rig BOP acts as an emergency closure.
	A		Identify procedures for the use of a rig BOP emergency closure.
	M	Wireline Shear Seal Valve	Explain when a wireline shear seal valve would be used as an emergency closure.
	M	Christmas tree	Explain the use and limitations of the tree when used as an emergency closure.
Decision Tree	M	Barrier Hierarchy	Discuss the decision tree in emergency BOP operations.
	M		Explain the action to take upon detection of a failed primary barrier.
	M		Explain the action to take upon detection of a failed secondary barrier.
	M		Explain the action to take upon detection of a failed emergency closure.

2.4 Influx Fundamentals

Module Name: 2.4 Influx Fundamentals			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Influx	I	Causes of an influx	Explain why reduction in hydrostatic pressures can cause an influx.
	I		Explain why failure to keep hole full can cause an influx.
	I		Explain why swabbing the well can cause an influx in cased/open hole.
	I		Explain why lost circulation can cause an influx.
Influx Detection	I	Possible Indicators of an Unplanned Influx	Identify possible indicators of an influx (e.g., change in surface pressures, changes in string weight).
	I		Identify the necessity of timely response to one or more possible influx indicators.

Module Name: 2.4 Influx Fundamentals			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Importance of Influx Management in Open Hole Operations	M	Managing Risk	Describe the importance of mud properties in relation to influx management (e.g., mud weight, viscosity, water loss).
	M	Consequences of not managing influx	Identify or describe potential consequences of improper or untimely response to influx indicators (e.g., extreme changes in operating pressures, possible release of gas, pollution, potential for fire, loss of life, equipment resources).

2.5 Gas Characteristics and Behavior

Module Name: 2.5 Gas Characteristics and Behavior			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Pressure and Volume Relationship (Boyles Law)	M	Relationship between pressure and volume of a gas in the wellbore	Explain the relationship between gas pressure and gas volume (e.g., the Boyle's Law concept to explain the pressure/volume relationship with most expansion close to surface).
	M		Calculate new volume or pressure from original volume or pressure change using Boyle's Law.

2.6 Completion and Workover Fluids

Module Name: 2.6 Completion and Workover Fluids			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Completion and Workover Fluids	I	Purpose of fluid	Describe the purpose and characteristics of fluids that make them suitable for workover and completions (e.g., compatibility with the zone; pressure control).
	I	Purpose of packer fluid	Describe the purpose of packer fluid in a completion.
	A	Corrosion	Explain how corrosion is inhibited through the use of workover/completion fluids.

Module Name: 2.6 Completion and Workover Fluids			
Sub-Modules	**AIM**	**Learning Topics** **The instructor will impart knowledge on:**	**Learning Objectives and Assessment Guidelines** **The attendee will be able to:**
	A	Environmental concerns	Describe how the composition of the workover/completion fluid could affect the environment.
	A		Explain the importance of managing the returns and assessing possible well fluids prior to discharge.
Liquids	I	Brine requirements	Explain why a different brine combination may be needed based on density requirements.
Fluid Properties	I	Density	Define density.
	I	Viscosity	Define viscosity.
	I	pH	Define pH.
	I		Describe pH in relationship to density and viscosity (e.g., direct effect on viscosity, no effect on density).
	I	Crystallization point	Define the low temperature point of brine and describe how it is related to crystallization (e.g., ambient temperature to downhole temperature, density).
	I	Saturation	Describe brine saturation and how it relates to crystallization and maximum fluid weight.
	I	Temperature and pressure	Discuss the effects of temperature on brine weight (e.g., surface temperature vs downhole temperature).
Fluid Flow Behavior	I	Viscosity	Define the relationship between viscosity and frictional pressure losses.
	I	Flow rates	Describe frictional pressure loss changes due to flow rate.
	I	Frictional pressure losses	Describe frictional pressure loss changes due to downhole restrictions.
	I	Fluid flowpath geometry (wellbore/coiled tubing)	Describe frictional pressure loss changes due to well geometry.
	I	Flowpath restrictions (wellbore, downhole tools)	Describe frictional pressure loss changes due to downhole tools.
Fluid Types	A	Oil based fluids	Describe the applications where oil based fluids may be used.
	A	Base oil	Identify an application where base oil is used in a completion.

Module Name: 2.6 Completion and Workover Fluids			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
	A	Water based fluids	Identify acceptable types of water based fluids that may be used in a workover/completion fluid (e.g., clear brines, muds, salt saturated brines, gels/gel pills, stimulation fluids – acids, calcium carbonate systems, packer fluids).
	A	Gases	Identify acceptable types of gases that may be used in a workover/completion fluid (e.g., CO_2, N_2).

2.7 General Overview of Surface and Subsurface Wellbore Equipment

Module Name: 2.7 General Overview of Surface and Subsurface Wellbore Equipment			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Christmas Tree	I	Components	Identify the key Christmas tree components.
	M	Purpose and Function of the Christmas Tree	Explain the function of the Christmas Tree and how they work with particular emphasis on: • Master, swab and flow line valves • Wireline cutting ability • The Surface Safety Valve (SSV) • Control line pressure versus tubing pressure
Blowout Preventer Stacks and Components	M	Preventer Equipment	Identify the function of key Well Control Stack components.
	M		Describe the major components and operating principles of well control closing and locking mechanisms.
	I		Identify flow path(s) used in well control operations.
	M		Analyze correct and incorrect make-up of gaskets of specific types of connections.
	M		Explain and record closing time tests for rams and annular.
	I		Identify HCR and manual choke and kill line valves.
	M	Annular BOPs	Explain the functionality and limitations of annular BOPs.
	M		Describe components that may be well pressure assisted to affect a seal on closure.

Module Name: 2.7 General Overview of Surface and Subsurface Wellbore Equipment			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
	I	Rubber goods	Identify types of rubber goods used in different applications (e.g., oil H_2S, high-temp, neoprene, nitrile, aflas, chemical compatibility chart for rubber and synthetics).
	I	OEM Replacement Parts	Identify the importance of using originally manufactured components.
	M	Shear or Cutter rams	Explain the functionality and limitations of shear rams.
	M		Identify non-shearables and non-sealables (e.g., production packer, gravel pack screen-in liners, cast iron retainers, bridge plugs).
	M	Blind/Shear rams	Explain the functionality and limitations of blind rams and blind/shear rams.
	M		Identify non-shearables and non-sealables (e.g., production packer, gravel pack screen-in liners, cast iron retainers, bridge plugs).
Workstring and Production Tubing	I	Tubular Integrity	Identify tubing ratings (e.g., burst, collapse, torsion, tensile, buckling, connection type).
	I	Operational Hazards	Identify possible tubing failure (e.g., washouts, corrosion, H_2S).
Completion Equipment	M	Surface Controlled Sub-Surface Safety Valve (SCSSV)	Explain the functionality and how a failure of a Surface controlled sub-surface safety valve (SCSSV) can contribute to a well control incident.
	M		Recognize and describe the advantages/disadvantages of retrieving methods for surface controlled subsurface safety valves (SCSSVs).
	M		Explain how a failure of the lock-out device in a surface controlled Sub-Surface Safety Valve (SCSSV) can result in a well control incident.
	I	Sub-surface safety valves (SSSVs)	Describe the difference between the sub-surface safety valves (SSSV) and the surface controlled sub-surface safety valve (SCSSV).
	I	Packers	Describe the primary function, types, restrictions, applications and positioning of packers.
	I	Landing nipples and tubing plugs	Describe the primary function, types, restrictions, applications and positioning of landing nipples and tubing plugs.
	I	Sliding sleeves and ported nipples	Describe the primary function and design of the sliding sleeves as communication devices (e.g., production, circulation).
	M		Describe the primary function and design of the ported nipples as communication devices (e.g., production, circulation).

Module Name: 2.7 General Overview of Surface and Subsurface Wellbore Equipment			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
	I	Gas Lift Valve	Describe the primary function of side pocket mandrels, either with a working valve (gas lift, circulation and chemical injection) or with a dummy valve installed.

2.8 Procedures

Module Name: 2.8 Procedures			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Calculations	M	Pulling a gas lift valve or Opening sliding sleeve	Calculate the pressure applied to the tubing needed to balance the wellbore at a gas lift mandrel before pulling a gas lift valve.
	M		Calculate the pressure applied to the tubing needed to balance the wellbore before opening the sliding sleeve.
Wireline Open Hole Operations	M	Conditioning the Wellbore	Describe the importance of bottom-up circulation prior to conducting open-hole operations (e.g., primary logging run, subsequent operations, dipmeter, formation sampling tool (FST), and sidewall coring).
Pre-operating Procedures	M	Drift/Gauge Runs	Describe the importance of drift/gauge runs before other cased hole/completion operations (i.e., dummy run).
Rigging Up and Deployment Into Well	M	Pressure Control Equipment	Identify potential problems with space-out and configuration when positioning wireline valves (e.g., slick line set on onshore jobs, back pressure valve).
	A	Rig up/down	Describe rig up/down procedures for pressure related components.
	I	Tool string deployment	Describe and discuss how to deploy a tool string in pressured environments (e.g., calculation of string buoyancy and deployment).
Well Control Drills	M	Procedure for Well Control Drills	Describe the procedure for securing the well.
	M		Describe the procedure for securing the well after shearing wireline.

2.9 Reasons for Wireline Operations

Module Name: 2.9 Reasons for Wireline Operations			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Wireline Operations	A	Types of wireline operations	Describe wireline operations (e.g., cased hole, open hole, slick line, braided line, conductor line).
Reasons for Wireline Operations	A	Open hole logging	Identify reasons for open hole logging (e.g., quantifying depth perimeters, calculating wellbore volumes, and identify productive formation).
	I		List potential well control problems that could occur during open hole operations.
	I	Cased hole logging/perforating	Identify reasons for cased hole logging/perforating (e.g., correlation, test for cement bond, and perforating).
	I		List potential well control problems that could occur during cased hole logging/perforating operations.
	A	Slick line/memory production logging	Identify reasons for slick line/memory production logging (e.g., setting and pulling flow control devices, real time measurement (MPLT), and gas lift valve change).
	I		List potential well control problems that could occur during slick line/production logging operations.
Pressure Control Equipment Selection	M	Identification	Describe the different identification types for pressure control equipment selection (e.g., color coding, banding requirements, certificate of conformance, and sweet or sour).
	M		Describe how the identification of pressure control equipment impacts well control (e.g., sweet service background concentration is 0.00011-0.00033; sour service background concentration is greater than 0.00033-OSHA; API RP55 D.1.1.1).

2.10 Surface Equipment

Module Name: 2.10 Surface Equipment			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**

		The instructor will impart knowledge on:	The attendee will be able to:
Types of Wireline	A	Slickline	Identify types of slickline (i.e. coated and non-coated).
	A		Describe uses of different types of slickline.
	A		Describe the limitations of slickline.
	A		Describe wire handling and management procedures for slickline (e.g., wire management process).
	A	Braided line	Identify types of braided line.
	A		Describe uses of different types of braided line.
	A		Describe limitations of braided line.
	A		Describe wire handling and management procedures for braided line.
	A	Electric line	Identify types and describe uses of different types of electric line.
	A		Describe uses of different types of electric line.
	A		Describe limitations of electric line.
	A		Describe wire handling and management procedures for electric line.
Components of Wireline Units	A	Reel/drum	Identify and describe drum function and configuration (e.g., conventional and closed-loop drive).
	I	Brakes	Identify and describe brake functions and configuration (e.g., air brakes, banded brakes, hydraulic, and disk).
	A	Measurement devices a. Weight indicator b. Depth indicator c. Spooling guide	Identify various measurement device components (e.g., conventional and digital).
	I		Describe the function and configuration of various measurement device components (e.g., conventional and digital).
	A		Describe the typical maintenance of various measurement device components.
	I	Power packs a. Pressure control unit b. Hydraulic/Pneumatic/Mechanical	Identify and describe pressure control unit power pack functions and configuration.
	I		Identify and describe hydraulic/pneumatic/mechanical power pack functions and configuration (e.g., water, diesel and hydraulic).
	A	Operator Console/Cabin	Identify and describe the functions of the operator console/cabin.
	I	Sheaves/Pulleys	Identify and describe sheave/pulley function and configuration (e.g., top sheave, API Spec 9A, API RP 9B).
	A		Describe when to replace, prior to failure, failed component.

Module Name: 2.10 Surface Equipment			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
	A	Ancillary equipment a. Crane b. Pressure test equipment c. Mast trailer/truck d. Turn around sheave (TAS)	Identify and describe use and function of ancillary equipment.
Safety Systems and Emergency Shutdown Devices (ESDs)	A	Alarm systems	Describe general functions of safety systems applicable to wireline operations.
	I	ESD	Describe the functions of shut down devices.
	I		Explain the best practice placement of and responsibility for initiating ESD function.

2.11 Subsurface Equipment

Module Name: 2.11 Subsurface Equipment			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Plugs	I	Type of Plug	Identify types of plug which hold pressure from above.
	I		Identify types of plug which hold pressure from below.
	I		Identify types of plug which hold pressure from above and below.
	M	Service Ratings	Explain the effect of sweet or sour/H_2S wellbore conditions on performance of plug and elastomers.
	M		Identify the pressure rating of the plug when pressure testing from above.
	M		Identify the pressure rating of the plug when pressure testing from below.
	M		Explain the effect of different manufacturing materials and the effect it has on pressure rating of plugs.
	M	Differential Pressure	Calculate potential pressure differentials across plugs.
	I	Equalizing Sub	Identify types of equalizing subs.
Packers	A	Types of Packers	Identify types of packers and their uses (e.g., production, sump).

Module Name: 2.11 Subsurface Equipment			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Completion Equipment	A	Gas lift mandrels and valves	Describe the primary function of side pocket mandrels, either with a working valve (e.g., gas lift, circulation, and chemical injection) or with a dummy valve installed.
	I	Bridge Plugs	Describe the primary function, types, restrictions, applications and positioning of bridge plugs (e.g., retrievable, non-retrievable, inflatable, expandable).

2.12 Wireline Pressure Control Equipment

Module Name: 2.12 Wireline Pressure Control Equipment			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Control Heads	A	Line Wiper	Identify and describe general functions of line wiper and its use.
	M	Stuffing Box/Pack off a. Manual b. Hydraulic	Identify and describe general functions of stuffing boxes and their use.
	M		Recognize critical seals and parts that are exposed to pressure and/or may fail through wear and be able to explain requirements for replacing it.
	I		Determine if a stuffing box would seal if the wire were not present (ball check present, yes/no).
	I		Describe how to regain a seal on the wire following a leak.
	M		Discuss applied forces associated with the use of stuffing boxes.
	M		Describe operational limits of stuffing box/pack-off.
	M		Identify potential well control risks when using stuffing boxes.
	M	Grease Injection Head	Identify and describe general functions of grease injection and its use.
	M		Recognize critical seals and parts that are exposed to pressure and/or may fail through wear and be able to explain requirements for replacing it.
	M		Identify grease/lubricant to be used based on type of job and anticipated pressure.

Module Name: 2.12 Wireline Pressure Control Equipment			
Sub-Modules	**AIM**	**Learning Topics** **The instructor will impart knowledge on:**	**Learning Objectives and Assessment Guidelines** **The attendee will be able to:**
	I		Describe how to regain the seal on the wire once the seal has been lost (e.g., operational integrity, best practices).
	A		Describe operational limits of grease injection head in relation to the assembly (e.g., industry accepted 20% above MASP).
	M		Identify potential well control risks when using grease injection.
	M		Discuss the relationship of flow tubes as it relates to fluid and pressure requirements (e.g., Couette's Flow Equation).
	I	Chemical Injection Sub	Describe general functions of chemical injection sub and its use.
	I		Recognize critical seals and parts that are exposed to pressure and/or may fail through wear and be able to explain requirements for replacing it.
	M		Identify potential well control risks when using a chemical injection sub.
	I	Head Catcher	Identify and describe general functions of head catcher and its use.
	I		Recognize critical parts that may fail through wear and be able to explain requirements for replacing it.
	M		Identify potential well control risks when using head catcher.
	M	Lubricator (with Needle Valves)	Identify and describe general functions of lubricator (with Needle valves) and its use.
	M		Recognize critical seals and parts that are exposed to pressure and/or may fail through wear and be able to explain requirements for replacing it.
	M		Identify potential well control risks when using lubricator (with Needle valves).
	I	Bleed-off Sub	Identify and describe general functions of bleed-off sub and its use.
	M		Identify potential well control risks when using bleed-off sub.
	I	Tool trap	Identify and describe general functions of tool trap and its use.
	M		Identify potential well control risks when using tool trap.
	I	Quick test sub	Identify and describe general functions of quick test sub and its use.

Module Name: 2.12 Wireline Pressure Control Equipment			
Sub-Modules	**AIM**	**Learning Topics** **The instructor will impart knowledge on:**	**Learning Objectives and Assessment Guidelines** **The attendee will be able to:**
	I		Recognize critical seals and parts that are exposed to pressure and/or may fail through wear and be able to explain requirements for replacing it (e.g., elastomers and hydraulic quick connect).
	M		Identify potential well control risks when using quick test sub.
	A	Wireline Valves (Manual vs. Hydraulic)	Describe the differences between manual and hydraulic wireline valves.
	M	Wireline Valves (Conductor/Braided line rams) a. Line rams b. Shear seal rams	Identify and describe the function of conductor/braided line rams in wireline valves.
	M		Identify and describe the function of shear seal rams in wireline valves when using conductor/braided line rams.
	M		Describe the configuration of the wireline valves when using conductor/braided line rams, including inverted rams.
	M		Recognize critical seals and parts that are exposed to pressure and/or may fail through wear and be able to explain requirements for replacing it.
	M		Describe how to inspect/assess the extent of any damage to the conductor/braided line ram equipment and the correct action to take.
	M		Describe operating principles (i.e. closing and operating sequences, well pressure assistance on the closure, operating pressures, lining up and hydraulic connections).
	M		Describe operational limits such as maximum shear capacity.
	M		Identify potential well control risks when using conductor/braided line rams in wireline valves.
	M	Wireline Valves (Slick line) a. Line rams b. Shear seal rams	Identify and describe the function of slick line rams in wireline valves.
	M		Identify and describe the function of shear seal rams in wireline valves when using slick line.
	M		Describe the configuration of the wireline valves when using slick line.
	M		Recognize critical seals and parts that are exposed to pressure and/or may fail through wear and be able to explain requirements for replacing it.

Module Name: 2.12 Wireline Pressure Control Equipment			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
	M		Describe how to inspect/assess the extent of any damage to the slick line ram equipment and the correct action to take.
	M		Describe operating principles (i.e. closing and operating sequences, well pressure assistance on the closure, operating pressures, lining up and hydraulic connections).
	M		Describe operational limits such as maximum shear capacity.
	M		Identify potential well control risks when using slick line in wireline valves.
	I	Pump-in Sub	Describe the configuration of the wireline valves when using pump-in sub.
	M		Identify critical seals and parts that are exposed to pressure and/or may fail through wear and be able to explain requirements for replacing it.
	M	Lubricator Extension (Riser)	Describe the configuration of the wireline valves when using lubricator extension (riser).
	M		Identify critical seals and parts that are exposed to pressure and/or may fail through wear and be able to explain requirements for replacing it.
	M		Identify potential well control risks when using lubricator extension (riser).
	M	Wireline Shear Seal	Describe the purpose of a wireline shear seal.
	M		Describe the placement of a wireline shear seal.
	M		Recognize critical seals and parts that are exposed to pressure and/or may fail through wear and be able to explain requirements for replacing it.
	M		Identify potential well control risks when using a wireline shear seal.
PCE Equipment	I	Hoses and Connections	Identify different types of connections (e.g., NPT vs high pressure fitting, high pressure swivel joint-other operations).
	I		Identify the possible consequences of incorrect make-up or mismatched connections.
	I		Explain the importance of inspection and verification of the proper connections and pressure rating.

2.13 Special Situations

Module Name: 2.13 Special Situations			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Blockages and Trapped Pressure in Tubing/Wellbore	I	Effect of blockages in retaining trapped pressure	Identify types of blockages (i.e., sand bridges, paraffin, tubing plugs).
	I		Identify potential well control complications with trapping pressure below blockages.
Blockages and Restricted Access in Tubing/Wellbore	A	Effect of blockages in impeding the ability to run tool string in or out of the wellbore	Describe where paraffin / asphaltenes / scaling is encountered and problems caused (i.e., commonly found in older oil producing wells; prevent tools from being run in to and out of the hole; plug up valves and surface equipment).
Hydrates	I	Effect of Hydrates while Circulating	Define hydrates.
	I		Explain how hydrates can complicate well control.
	I		Identify preventive measures to inhibit hydrate formation.
H_2S considerations	I	Effect of H_2S on Well Control Methodology	Define H_2S and equipment limitations based on H_2S concentration (e.g., 0.00011-0.00033 ppm is typical background concentration).
	I		Describe additional procedures, precaution and supplemental safety equipment necessary, fluid scavengers, inhibitors while operating in an H_2S environment.
	I		Describe equipment addition, limitations, modification or replacement necessary to work in an H_2S environment (i.e., tubular or wireline embrittlement and seals).
	I		Explain safety considerations on safely bringing H_2S to the surface.
Operations with Specific Well Control Concerns	M	Pressure Calculation Exceeding MASP	Describe and discuss conditions where pressure calculations exceed MASP (e.g., perforating, fracturing, energized fluids).
Complication with Hydraulic Fracturing Operations	M	Pressure Limits Created by Hydraulic Fracturing Operations	Describe or discuss how MASP can be exceeded during well intervention operations being influenced by nearby hydraulic fracturing operations (e.g., SIMOPS).
Drilling Operations	I	Rig-up Complications	Identify and describe basic drilling rig components and functions relevant to wireline operations.
	I		Describe wireline and logging well control considerations.

Module Name: 2.13 Special Situations			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
	I		Describe and discuss the potential complications of wireline operations rigged up on a drilling rig's well control system (e.g., connection from wireline control to BOP stacks, free standing tubular, PCE requirements).
Wireline Shear Seals	I	Cutting Wireline with Shear Seal	Identify circumstances where shearing/cutting the wireline may be required (e.g., leak at connection between production tree and wireline valves).
	I		Discuss why using shear seal ram is a method of last resort and the consequences of using shear seal ram.
Fishing Wireline	I	Retrieving Wireline	Identify tools and pressure control considerations necessary for successful fishing operations (e.g., size of fish, size of lubricator, length of lubricator, redundant wireline valves, proper rams for fishing wire and wire size being fished).
	I		Describe the differences between fishing with wireline in pressured and non-pressured environment.
Well Control Action Drills	I	Various Action Drills	List the various action drills to be performed prior to wireline operations (e.g., loss of primary well barrier for braided or conductor line, loss of primary well barrier for slick line, loss of power to unit, leak above secondary barrier, leak below secondary barrier).

2.14 Organizing a Well Control Operation

Module Name: 2.14 Organizing a Well Control Operation			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Personnel Assignments	M	Roles and Responsibilities	Describe required personnel assignments during a well control operation.
Pre-Recorded Information	I	Pre-recorded information	Describe locations of pre-recorded information, collection process, and where supervisor will keep well documentation.

Module Name: 2.14 Organizing a Well Control Operation			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Plan Responses to Anticipated Well Control Scenarios	I	Emergency Response Plan	Explain the importance of the emergency response plan for all well operations.
Communications Responsibilities	I	Planning and outlining routine well control responsibilities	Describe the lines of communication and the roles of personnel, including the importance of pre-job on site planning meetings and tour safety meetings.
	I		Describe how equipment and personnel would be organized to recover a situation, once the well is safely shut in.

2.15 Testing

Module Name: 2.15 Testing			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Pressure and Function Tests	I	Purpose	Explain the reason for pressure testing equipment for integrity upon rig-up or when a system component is replaced, repaired, or decoupled.
	M	Maximum safe working pressures of well control equipment	Identify the maximum safe working pressure for a given set of well control equipment.
	I		List reasons for de-rating the maximum safe working pressure of well control equipment (e.g., temperature, erosion, corrosion).
	I	Low Pressure and High Pressure Testing	Discuss the importance of low pressure testing in advance of high pressure testing (e.g., API 53ST and 30 CFR 250.617).
BOP Testing	I	Requirements for pressure testing	Given details of specific equipment and operation, describe pressure testing procedures.
	I	Performing pressure tests	Demonstrate procedures to pressure test a valve or BOP function.
Testing of Completion Equipment	I	Packers	Discuss the negative pressure test of a packer.
	I	Deep-set Plug	Discuss the pressure test of a deep-set plug.

Module Name: 2.15 Testing			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
	I	Pressure Testing	Identify the needs for pressure testing of pressure control equipment prior to intervention operations.
	M		Explain the need for documentation of pressure testing.

2.16 Government, Industry and Company Rules, Order and Policies

Module Name: 2.16 Government, Industry and Company Rules, Orders and Policies			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Incorporate by Reference	A	API and ISO recommended practices, standards and bulletins pertaining to well control	Describe or identify appropriate industry standard or recommended practice pertaining to job being completed (e.g., API 505, zones and classes).
	A	Regional and/or local regulations where required	Describe or identify appropriate regional government regulations pertaining to job being completed.
	A	Company/operator specific requirements where required	Describe or identify appropriate company or operator specific requirements pertaining to job being completed.

2.17 Ancillary Considerations

Module Name: 2.17 Ancillary Considerations			
Sub-Modules	**AIM**	**Learning Topics**	**Learning Objectives and Assessment Guidelines**
		The instructor will impart knowledge on:	**The attendee will be able to:**
Gas Detection	A	Purpose and location	Describe the functions of gas detectors.
	A		Identify the location of gas detectors.
Fluid-Gas Separators	A	Operating parameters	Explain the operating parameters (e.g., maximum operating pressure, vent line diameter, u-tube height; and potential dangers and action to take if overloaded).
Wellhead Control Panel	I	Operation of Control Panel	Describe the function of the emergency shutdown (ESD) on the control panel and accumulator requirements.