

Well Control Course Outline IADC

Interactive Study Tools

- Provide students with over 600 pages of pre-course study materials at wildwell.com
- Provide students with study guide that covers up to 150 interactive well control questions and answers.
- Provide students with a 50 question test to determine their well control knowledge gaps.

Preliminary Items

- Safety: escape routes, muster points, etc.
- Discussion of special needs
- Introductions
- Class paperwork

SURFACE:

Serious Well Control Problem From the Wild Well Library

- Students form teams
- Team discussion of the potential well control problem
- Simulator exercise demonstrating the well control challenge
- Return to class to discuss the challenge

Well Control Course Objectives

- Formations, pore pressure, fracture gradients
- Killsheet, kick detection, flow checks, well shut-in, and gas behavior
- Well control methods
- Well control equipment (barriers, BOPs, manifolds, accumulator, etc.)
- Completing the well and post-completion activity
- Final well control simulation: from kick to kill, with a complication
- Assessments: skills and written

Formations, Pore Pressure, Fracture Gradient

- Formation structure
 - Porosity
 - Permeability
- Fracture gradients, kick tolerance, pore pressures
 - Related formulas/math (hydrostatic pressure, the U tube, force, MAASP, etc.)
 - Equivalent mud weight
 - Kick tolerance
 - Pore pressure vs. fracture gradient (drilling margin/window)
- Simulator exercise demonstrating a FIT; discussion of LOT (if needed, depending upon class knowledge level)
- Discuss casing and cementing program
- Discuss drilling fluids program

Barriers

- Philosophy and operation of barrier systems
- Number of barriers for safe operation
- Testing barriers

Shallow Gas, Water Flows and Tophole Drilling

- Definitions and causes of pressure in tophole formations
- Causes of underbalance tophole
- Diverting practices
- Tophole drilling practices and causes of kicks

Abnormal Pressure Warning Signs

- Abnormal pressure
- Shaker evidence
- Changes in mud properties
- Changes in drilling data/parameters

Killsheet, Kick Detection, Flow Checks, Well Shut-in, and Gas Behavior

- Related formulas/math (capacities/volumes, strokes, circulation times, etc.)
- Causes of kicks
- Kick signs
 - Overt kick signs
 - Pre-kick signs
- Flow-check procedures
- Shut-in procedures
 - Hard shut-in
 - Soft shut-in
 - Shut-in challenges
- Paper killsheet with preliminary well data
 - Well data, volume calculations
 - Discuss the importance of a killsheet
- Simulator exercises demonstrating hard and soft shut-in
 - Kick detection and shut-in
 - Students complete killsheet with simulator well data (or instructor-given data)
 - Discussion of killsheet calculations:
 - What do they mean? (if needed) Discussion of IADC WellSharp rounding rules
- Gas behavior
 - While drilling
 - In horizontal wells
 - While shut-in

Well Control Methods

- Review of related formulas/math (capacities/volumes, strokes, circulation times, kill mud, MAASP, ICP, FCP, etc.)
- Wait and Weight Method
 - Discussion of Wait and Weight
 - Techniques
 - Skills (pump startup, step-down chart, gauge use, lag time, etc.)
 - Simulator exercise
- Driller's Method
 - Discussion of Driller's Method
 - Techniques
 - Skills (pump startup, capturing pressure after first circulation, lag time, etc.)
 - Simulator exercise



4.5 DAYS

SUPERVISOR

Well Control Course Outline IADC

- Volumetric and Lube and Bleed
 - Discussion of Volumetric Method
 - Formulas
 - Understanding the process and technique
 - Skills (use of electronic killsheet or paper graph, managing gas migration)
- Simulator exercise
- Discussion of Lube and Bleed

Stripping Pipe Under Pressure

- Discussion of technique
- Skills (annular pressure, speed of strip, managing wellbore pressures via volumetric method)
- Simulator exercise

Bullhead Method – Discussion and simulator exercise if time allows

Discussion of study guide questions

Well Control Drills

- Pit drills
- Trip drills
- Stripping drills
- Choke drills
- Early response and empowerment to act

Completing the well and post-completion activity: short discussion

- Completions
- Differences between drilling and workover

Final simulator exercise (if time allows)

- Abnormal lateral well and kick detection
- Kill the well with Wait and Weight Method

Discussion

- Ballooning wells vs. kicking wells
- Fingerprinting

Discussion of Study Guide Questions

Skills Assessment

SUBSEA:

Learning Objectives

- Subsea well control concepts
- Pre-recorded data
- Well control methods
- Kick awareness
- Barriers
- Kick detection
- Tophole drilling and shallow gas
- Shut-in procedures
- Risk management

Subsea Well Control Concepts

- Downhole pressures
- Downhole temperatures

Pre-Recorded Data

- Choke-line friction pressure (CLFP)
- Subsea killsheet
- Subsea simulation
 - Kick detection
 - Well shut-in
 - Killsheet data

Well Control Methods

- Driller's Method
- Wait & Weight Method
- Pump startup
- Sweeping the stack
- Risk of gas in riser

Kick Awareness

- Ballooning
- Riser margin
- Swabbing and surging

Barriers

- Subsea BOP stacks
- Lower marine riser package (LMRP)
- Risers
- Valves
- Connectors
- Control systems

Kick Detection – Review Of Warning Signs

Tophole Drilling And Shallow Gas

Shut-In Procedures

Risk Management

- Emergency disconnect system (EDS)
- Emergency backup system
- ROV intervention
- Riser gas

Computer-Based Wellsharp Exam



4.5 DAYS

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