

WellSHARP Drilling-Driller



Surface Drilling Well Control Course Outline IADC



4 DAYS

DRILLER

Prior to Day 1 or Beginning Day 1

- Provide students with study guide that covers up to 150 similar IADC WellSharp questions
- Encourage students to aggressively study the guide during non-class hours
- Paper delivery at this time; electronic delivery in the near future

Drilling, Workover, Completion Plan –

- Awareness level
- Well work objectives
- Frac gradients, kick tolerance, pore pressures
- Casing and cementing program
- Drilling fluids program
- Barrier management

Well Control Concepts

- Well control terminology
- Formation characteristics
- Pressure, force, area
- HP and gradient
- U-tube
- Pump pressure
- Pressure and equivalent mud weights
- Surge and swab pressures
- ECD and bottomhole pressure
- Capacities, displacements and strokes
- Formation stresses and strengths
- MASP
- MAASP and MAMW
- Ballooning
- Gas behavior
- Well control in high angle wells
- Tapered drillstring

Mud and Pit Management

- Functions and types of wellbore fluids
- Fluid density measuring techniques
- Potential contaminants and their effects, including temperature
- Pit management
- Pre-recorded Data
- Slow circulating rates
- Volumes and strokes
- Killsheet

Causes of Kicks

- Abnormal formation fluid pressure
- Mud weight and contamination by formation fluids
- Improper mud weight control at surface
- Loss of circulation
- Tripping and improper hole fill
- Running/ pulling liners and casing
- Barrier failure

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

Well Control Drills

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

Kick Detection

- Well flow with pumps off
- Pit gain
- Flow return rate increase

Shut-in Procedures and Verification

- Drilling
- Tripping
- Out of hole
- Running casing and cementing
- Wireline
- Shut-in methods
- Blind and blind shear rams
- Diverting

Post Shut-in Monitoring and Activities

- Kick log
- Gas migration
- Trapped pressure
- Handling ballooning
- Bumping the float
- Line-up

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Well Control Methods

- Principles of constant bottomhole pressure methods
- Pre-kill planning meeting
- Pump startup procedure
- Driller's method
- Wait and weight
- Kill problems
- Stripping
- Volumetric method
- Lube and bleed

Casing and Cementing Considerations

- Procedures when running or pulling casing
- Cement waiting time
- Monitoring the well during and after cementing ops
- Cement testing procedure – positive and negative

Risk Management

- Managing change during a well kill

Equipment

- Diverters
- Equipment alignment and stack configuration
- BOP stack, stack valves and wellhead components
- Manifolds, piping and valves
- Drillstring valves
- Instrumentation and auxiliary well control equipment
- Gas detection equipment
- BOP closing unit and control panels
- Function and pressure tests
- Monitoring equipment failures/ erroneous readings
- Mud-gas separator
- Control chokes (manual, hydraulic)
- Stripping and trip tanks
- Rules and regulations

Controlling Pressure

- Pressure
- Reason for Control
- Kick vs. Blowout
- Controlling Pressure
- Purpose of Drilling Fluid
- Function
- Main Components
- Weighting Agents

Purpose of the Blowout Preventer

- Function
- Main Components
- Operation

Kick Prevention

- Well Planning
- Kick Prevention Practices

Kick Monitoring and Detection

- Instrumentation
- Crew Response

Shut-in Procedure

Well Control Methods

Questions and Answers

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