

DRILL BITS AND HYDRAULICS

DRL028

COURSE OVERVIEW

The purpose of this course will be to give the participants an in depth knowledge of the IADC Drill Bit Classification system, nomenclature, and dull grade reporting procedures. Participants will learn about the two major classes of drill bit commonly used in oilfield drilling. Participants will review drill bit design, drill bit cutting structures, and they will perform drill bit application exercises. The importance of drill bit hydraulics in the drilling process will be reviewed and use of hydraulic calculation software and applications will be highlighted. IADC specification for tricone bits, PDC bit and diamonds bits will be discussed in details.

The course also will cover the bit hydraulics, definition, fluid characterization, flow identification, hydraulic optimization criteria. Participants will learn how to calculate pressure loss in the circulation system and the bit. They will practice the calculation of the nozzle sizes for both tricone and PDC bits. Selecting the appropriate mud pump and field applications of bit optimization will be covered and practiced.

COURSE OBJECTIVES

By the end of this course, participant will be able to:

- Know the manufacture techniques of drilling bits in all
- Identify the types of bits
- Classify the bits according to IADC classifications
- Perform dull grading of the drilling bits
- Select the appropriate bit for a new well
- Decide the time to pull the bit out of hole
- Calculate pressure losses in the circulation system and the bit
- Calculate the size of the bit nozzles and design them
- Apply filed application for hydraulic optimization

WHO SHOULD ATTEND

Junior Drilling Engineers, Junior Well and Operations engineers, as well as other personnel involved in well planning and drilling.

COURSE DURATION

5 Working Days

COURSE OUTLINES

Day 1

- Pre course evaluation
- Bit Selection Criteria
 - Cost per foot
 - Specific energy
 - Record well bit
 - Dull grading
 - Idea bit
 - Bit performance optimization
 - Exercise

Day 2

- Drill Bit Types and Technology
 - Oman geologic column
 - Formation types and strengths
 - Tricone bit manufacture
 - Tricone bit technology
 - IADC tricone bit bit classification
 - Tricone bit dull grading
 - Exercise
- Fixed Cutter and IADC Drill Bit Dull Grading
 - Fixed cutter bit manufacture
 - Fixed cutter drill bit technology
 - IADC fixed cutter bit classifications
 - IADC drill bit dull grading
 - Core bit and core barrel
 - Practical dull grading exercise
 - Exercise

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Day 3

- Bit hydraulic
 - Circulation system
 - Type of fluid
 - Type of flow
 - Hydraulic properties
 - Hydraulic optimization
 - Exercise

Day 4

- Pressure Loss Calculation and Hydraulic Optimization
 - Pressure loss calculations
 - Surface pressure loss
 - Sting and annulus pressure loss
 - Bit pressure loss
 - BHHP optimization
 - IF optimization
 - Filed optimization technique
 - Exercise

Day 5

- Surge and Swab pressure
 - Meaning of surge and swab
 - Problems associated with surge and swab pressures
 - Recommended running in hole and pulling up speeds
 - Surge and swab Pressure calculations
- Post course evaluation.

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