

COGODR11 - SQA Unit Code D7X7 04

Prepare and run mixing and circulation systems in drilling



Overview

This unit is about the preparation and running of the circulating and mixing systems for drilling operations. This unit deals with the following:

- 1 Prepare The Circulating And Mixing Mud Systems For Use
- 2 Prepare And Maintain The Properties And Conditions Of Drilling Fluids
- 3 Monitor The Circulating System During Drilling Operations

Prepare and run mixing and circulation systems in drilling

Performance criteria

- You must be able to:*
- P1 obtained a clear specification of what is expected from the system given the planned **operations**
 - P2 confirmed the current status and available capabilities within the systems
 - P3 confirmed the types, volumes and weights of the drilling fluids currently within the system
 - P4 planned how the operational requirements can best be met from capacity and existing drilling fluids available within the system
 - P5 confirmed that the **Equipment** and utilities required are available and in the appropriate locations
 - P6 made sure that the pits tanks, lines and mixing equipment to be used are clean and free from contamination before use
 - P7 lined up the equipment to route the drilling fluid according to the planned operation
 - P8 checked that the system is functioning correctly directly after starting it up
 - P9 taken prompt action to deal with any equipment defects and deficiencies
 - P10 confirmed the system status to the appropriate persons, once satisfied it will meet operational requirements and ensured that anyone helping in the operation is adequately briefed
 - P11 keep clear and accurate records of information which may need to be passed onto others
 - P12 obtained a clear specification of the expected properties of the drilling fluids to be used in the planned operations
 - P13 confirmed the types, volumes and weights of drilling fluids currently within the system and the availability and location of the necessary **Chemicals**
 - P14 planned and agreed how best to prepare and maintain the drilling fluid in line with the anticipated operations
 - P15 safely **mixed Chemicals** at the correct rate and volumes
 - P16 accurately measured and recorded the weight and viscosity of the drilling fluid being mixed in line with sampling practices and procedures
 - P17 taken prompt action to deal with any deviations from the required properties
 - P18 recorded relevant information accurately and passed it on clearly to others when required
 - P19 kept the appropriate persons fully and accurately briefed on the status of mixing operations
 - P20 ensured that any others providing assistance are adequately briefed and their work monitored
 - P21 confirmed that returns are being received back to the active pit on beginning circulation

Prepare and run mixing and circulation systems in drilling

- P22 set the monitoring systems correctly
- P23 brought the **Circulating system** on-line when required and made sure that it functions effectively
- P24 monitored pumps and pit levels and be alert to situations which could compromise the integrity of the system and drilling operations
- P25 responded promptly and effectively to **faults and system deviations**
- P26 recorded the relevant pit volumes and pump hours accurately and at the times and frequencies stated in operating instructions
- P27 calculate, record and report losses and gains of drilling fluids accurately
- P28 worked safely in accordance with operational requirements and associated **Safe Systems of Work**

Knowledge and understanding

You need to know and understand:

- K1 what recording and reporting requirements need to be followed for general operations and for notification of unplanned events or circumstances
- K2 what are the effects on the fluid of using equipment that is dirty or contaminated
- K3 what technical advice and materials (e.g. handbooks, piping diagrams and volumetric information) are available and from whom or where this can be accessed
- K4 remedial actions need to be taken in the event of equipment failure; blockages; loss of power
- K5 what the basic maintenance requirements are of mud mixing and circulation systems
- K6 the layout and line up of the systems including pit capacities; charge pump performances; valve locations and operations line/pump routings
- K7 the operating principles of mixing systems
- K8 the safety and environmental considerations need to be taken into account in mixing chemicals
- K9 the types of drilling fluids used in drilling and completing wells
- K10 what the function is of the different chemicals used in mixing
- K11 how to take the weight and viscosity of drilling fluids and why it is important to maintain the required specifications
- K12 the operating principles of drilling fluid circulating systems and what effects start up and shut down have on active system levels
- K13 the safety and environmental considerations need to be taken into account in running the circulating system, including COSHH Manual Handling regulations and current orders relating to Deposits in Sea Exemption (e.g. SI 1985)
- K14 what limits apply to the operation of mud circulation systems and how this may be affected by harsh or severe environmental conditions
- K15 what technical advice and materials (e.g. handbooks, piping diagrams and volumetric information) are available and from whom and where these can be accessed

Additional Information

Scope/range

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

- 1 How to use 'Safe Systems of Work' processes to identify hazards and mitigate or reduce risks to as low as reasonably practicable (ALARP)
- 2 How to select, use and care for PPE (to include sight/hearing protection, coveralls, coveralls, gloves, footwear, hard hats, respirators)
- 3 The implications of statutory (e.g. HASAWA and COSHH) and organisational requirements
- 4 How to interpret operational requirements (e.g. relevant policies, procedures, instructions, codes of practice, standards, schedules)
- 5 The operating principles and functions within drilling operations of the circulating and mixing systems

The following terms in **bold** relate directly to those shown in **bold** in the Performance Statements.

- 1 **Operations** must include transfer between pits; mixing chemicals; receiving clean fluids; drilling operations; pumping a slug or pill
- 2 **Equipment** must include pits and holding tanks; charge pumps; lines and valves agitators; mud/slush pumps; mixing hoppers
- 3 **Chemicals** must include bulk (dry); sack; highly caustic or acidic; liquid excluding water; water
- 4 **Mixed Chemicals** must include the use of hoppers; barrel or diaphragm pumps
- 5 **Circulating system** must include mud pumps; charge pumps; agitators; lines and valves; pit volumes
- 6 **Fault and system deviations** must include deviations in the volume of drilling fluids; equipment failure or malfunction
- 7 **Safe Systems of Work** must include processes or systems that incorporate Hazard Identification, Risk Assessment, Permit to Work and any other associated systems.

COGODR11 - SQA Unit Code D7X7 04

Prepare and run mixing and circulation systems in drilling

Developed by Cogent

Version number 1

Date approved December 2007

Indicative review date December 2009

Validity Current

Status Original

Originating organisation Cogent

Original URN ODR11

Relevant occupations Retail and commercial enterprise; Warehouse and distribution; Process, Plant and Machine Operatives; Plant and Machine Operatives

Suite Offshore Drilling Operations

Key words Circulation, Mud, Mixing, Drilling Fluids, hoppers, barrel, diaphragm pumps, risk assessment permit to work, caustic, chemicals, acidic, slug, pill