

Qualification Pack



Mud mix Assistant-Drilling Operations

QP Code: HYC/Q0106

NSQF Level: 3

Hydrocarbon Sector Skill Council
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HYC/Q0106 Mud mix Assistant-Drilling Operations

Brief Job Description

Individual at this job is responsible to maintain the flow of mud mix fluid during drilling operation, maintains the mud pumps, tanks, hoses, air compressors, generators, valves to ensure the smoothly flow of mud during drilling operation. The person at this job checks the quantity and quality of the drilling mud, sand content viscosity, specific to gravity of drilling mud mix.

Personal Attributes

The individual should have good sense of responsibility, a good organizer and time keeper. The person should have the ability to perform physical/hard work individually or in a team.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. HYC/N0106 Preparation for maintenance of the mud pump and equipment
2. HYC/N0107 Prepare and maintain the property of drilling mud fluid throughout the drilling operation
3. HYC/N9301 Working effectively in a team
4. HYC/N9302 Maintain health, safety and security procedures

Qualification Pack (QP) Parameters

Sector	Hydrocarbon
Sub-Sector	Upstream
Occupation	Exploration & Production
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO/2015 8113.0300
Minimum Educational Qualification & Experience	Grade 8 with two years of (NTC/NAC) after 8th OR Grade 10 pass OR 9th grade pass with 1 years of relevant experience OR 8th grade pass with 2 years of relevant experience
Minimum Level of Education for Training in School	NA
Pre-Requisite License or Training	NA

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Minimum Job Entry Age	18 years
Last Reviewed On	3-May-2023
Next Review Date	2-May-2026
NSQC Approval Date	3-May-2023
Version	1.0

HYC/N0106 Preparation for maintenance of the mud pump and other equipment

Description

This unit is about preparing mud pump and other equipment for drilling operation at oil or gas rig.

Scope

This unit/task covers the following:

- Prepare for operational and maintenance of mud pump and equipment
- Perform repair and maintenance of mud pump and equipment
- repairing motor/pump during breakdown, monitor motor/pump to ensure it is functional and maintain motor/pump to prevent it from any breakdown

Elements and Performance Criteria

Prepare for maintenance of mud pump and equipment

To be competent, the user/individual on the job must be able to;

- PC1. check the availability of calibrated tools or instrument, spare parts, equipment for repair and maintenance activity
- PC2. wear Personal Protective Equipment (PPE) before entering into the workplace
- PC3. carry out visual inspection for leakage, damage, etc. in Mud Tanks, Mud pumps, Standpipe, Rotary Hose, Shale Shaker, Degasser, Centrifugal Pump, Hopper, Agitator, Suction Dampener, Mud Pump Discharge line, etc.
- PC4. clean the workplace Mud Tanks, Mud pumps, Standpipe, Rotary Hose, Shale Shaker, Degasser, Centrifugal Pump, Hopper, Agitator, Suction Dampener, Mud Pump Discharge line, etc. before repair or maintenance work
- PC5. install maintenance and repair signages at the site
- PC6. report malfunctioning of equipment to shift Incharge

Perform repair and maintenance of mud pump and equipment

To be competent, the user/individual on the job must be able to;

- PC7. perform preventive, routine and non-routine maintenance and safety check to ensure proper functioning of internal combustion engines, pumps, compressors and drilling related equipment of the rig
- PC8. lubricate mud pump, compressor and other equipment before use
- PC9. coordinate with technician for repair of faulty part of pump, engine, equipment, etc.
- PC10. isolate equipment, engine or pump before starting repair activity
- PC11. perform disassembly, loading, unloading and assembly of the drilling equipment, engine, pump, etc. for repair
- PC12. Position the equipment, machinery, physical structures, or other objects for assembly or installation, using hand tools, power tools, and moving equipment
- PC13. follow material/equipment lifting and handling procedure
- PC14. reassembling broken or defective part as per SOP
- PC15. dispose waste as per waste disposal SOP
- PC16. maintain working hour report of generator, compressor, motor, pump, etc.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the basic principle of drilling
- KU2.** standard operating procedures for maintenance of machinery and equipment
- KU3.** importance of maintaining clean workplace
- KU4.** relevant health and safety requirements applicable to the work place
- KU5.** the importance of personal protective equipment used during rig operation
- KU6.** ways of efficiently managing material and water in the process
- KU7.** the difference between recyclable/reusable and waste material

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** read and interpret manufacturers' user manual
- GS2.** assess complexity and criticality of task
- GS3.** communicate effectively with team members
- GS4.** perform basic mathematical calculation
- GS5.** plan and organize the marketing activity

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC1. check the availability of calibrated tools or instrument, spare parts, equipment for repair and maintenance activity	1	2		
PC2. wear Personal Protective Equipment (PPE) before entering into the workplace	1	2		
PC3. carry out visual inspection for leakage, damage, etc. in Mud Tanks, Mud pumps, Standpipe, Rotary Hose, Shale Shaker, Degasser, Centrifugal Pump, Hopper, Agitator, Suction Dampener, Mud Pump Discharge line, etc.	1	2		
PC4. clean the workplace Mud Tanks, Mud pumps, Standpipe, Rotary Hose, Shale Shaker, Degasser, Centrifugal Pump, Hopper, Agitator, Suction Dampener, Mud Pump Discharge line, etc. before repair or maintenance work	2	1		
PC5. install maintenance and repair signages at the site	1	2		
PC6. report malfunctioning of equipment to shift incharge	1	2		
PC7. perform preventive, routine and non-routine maintenance and safety check to ensure proper functioning of internal combustion engines, pumps, compressors and drilling related equipment of the rig	2	2		
PC8. lubricate mud pump, compressor and other equipment before use	1	2		
PC9. coordinate with technician for repair of faulty part of pump, engine, equipment, etc.	2	1		
PC10. isolate equipment, engine or pump before starting repair activity	1	2		
PC11. perform disassembly, loading, unloading and assembly of the drilling equipment, engine, pump, etc. for repair	1	2		
PC12. Position the equipment, machinery, physical structures, or other objects for assembly or installation, using hand tools, power tools, and moving equipment	1	2		
PC13. follow material/equipment lifting and handling procedure	1	2		
PC14. reassembling broken or defective part as per SOP	1	2		

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PC15. dispose waste as per waste disposal SOP	2	2		
PC16. maintain working hour report of generator, compressor, motor, pump, etc.	1	2		
NOS Total	20	30	-	-

National Occupational Standards (NOS) Parameters

NOS Code	HYC/N0106
NOS Name	Preparation for maintenance of the mud pump and other equipment
Sector	Hydrocarbon
Sub-Sector	Upstream
Occupation	Exploration & Production
NSQF Level	India
Credits	3
Version	1.0
Last Reviewed Date	3-May-2023
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NSQC Clearance Date	3-May-2023

HYC/N0107 Prepare and maintain the property of drilling mud fluid throughout the drilling operation

Description

This unit is about creating drilling mud fluid for drilling for extraction of oil and gas in a rig.

Scope

This unit/task covers the following:

- Prepare for operational and maintenance of mud pump and equipment
- Perform repair and maintenance of mud pump and equipment
- repairing motor/pump during breakdown, monitor motor/pump to ensure it is functional and maintain motor/pump to prevent it from any breakdown

Elements and Performance Criteria

Prepare mud mix for drilling operation

To be competent, the user/individual on the job must be able to;

- PC1. obtain geotechnical information of the field
- PC2. design and prepare the mud mix using mud and chemical in the mud tank as per the drilling procedure and geology of drilling site
- PC3. check the fluid to establish a baseline by recording different parameters such as marsh funnel viscosity, pH, fluid density, fluid loss, yield point, plastic viscosity, etc.
- PC4. collect and check mud samples after every one hour with the baseline to detect and monitor any problem
- PC5. make necessary adjustments in the mud viscosity, mud temperature, pH balance, and chemical components as per the requirement during the drilling process,
- PC6. report any deviation in mud mix with the standard baseline to the shift incharge

Maintain mud mix flow cycle

- PC7. store mud mix in a mud tank / suction tank
- PC8. maintain the flow of mud mix from mud tank through mud pump, Standpipe and Rotary Hose to the drill Bit and returned back through Annulus /Return Line to Shaker & Mud Tanks
- PC9. remove the cuttings from the mud mix using shale shaker and hydrocyclone/ centrifugal Pump
- PC10. check the property of mud, degasify the mud mix in degasser in case of gas found in the mud mix
- PC11. store the mud mix in the mud tank which is returned back from annulus after removal of cutting and gas
- PC12. use agitator to maintain the consistency of mud mix
- PC13. maintain the flow the mud mix cycle during drilling operation

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. the basic principle of mud fluid flow operation for drilling

- KU2.** standard operating procedures of mud fluid flow
- KU3.** importance of maintaining clean workplace
- KU4.** relevant health and safety requirements applicable to the work place
- KU5.** potential hazards, risks and threats based on the nature of work
- KU6.** the importance of personal protective equipment used during rig operation
- KU7.** ways of efficiently managing material and water in the process
- KU8.** the difference between recyclable/reusable and waste material

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** read and interpret manufacturers' user manual
- GS2.** assess complexity and criticality of task
- GS3.** communicate effectively with team members
- GS4.** complete tasks efficiently and accurately within stipulated time
- GS5.** work with supervisors/team members to carry out work related tasks
- GS6.** perform basic mathematical calculation
- GS7.** plan and organize the marketing activity

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC1. obtain geotechnical information of the field	2	2		
PC2. design and prepare the mud mix using mud and chemical in the mud tank as per the drilling procedure and geology of drilling site	1	3		
PC3. check the fluid to establish a baseline by recording different parameters such as marsh funnel viscosity, pH, fluid density, fluid loss, yield point, plastic viscosity, etc.	2	2		
PC4. collect and check mud samples after every one hour with the baseline to detect and monitor any problem	1	2		
PC5. make necessary adjustments in the mud viscosity, mud temperature, pH balance, and chemical components as per the requirement during the drilling process,	2	3		
PC6. report any deviation in mud mix with the standard baseline to the shift incharge	1	2		
PC7. store mud mix in a mud tank / suction tank	2	2		
PC8. maintain the flow of mud mix from mud tank through mud pump, Standpipe and Rotary Hose to the drill Bit and returned back through Annulus /Return Line to Shaker & Mud Tanks	1	3		
PC9. remove the cuttings from the mud mix using shale shaker and hydrocyclone/ centrifugal Pump	2	2		
PC10. check the property of mud, degasify the mud mix in degasser in case of gas found in the mud mix	1	2		
PC11. store the mud mix in the mud tank which is returned back from annulus after removal of cutting and gas	2	3		
PC12. use agitator to maintain the consistency of mud mix	1	2		
PC13. maintain the flow the mud mix cycle during drilling operation	2	2		
NOS Total	20	30	-	-

National Occupational Standards (NOS) Parameters

NOS Code	HYC/N0107
NOS Name	Prepare and maintain the property of drilling mud fluid throughout the drilling operation
Sector	Hydrocarbon
Sub-Sector	Upstream
Occupation	Exploration & Production
NSQF Level	India
Credits	3
Version	1.0
Last Reviewed Date	3-May-2023
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HYC/N9301 Working effectively in a team

Description

This unit covers basic practices that improve effectiveness of working in a team in an organizational set-up

Scope

This unit/task covers the following:

- Effective team work

Elements and Performance Criteria

Effective team work

To be competent, the user/individual on the job must be able to:

- PC1. maintain clear communication with colleagues
- PC2. pass on information to colleagues in line with organisational requirements
- PC3. work in a team and support the team members
- PC4. work in ways that show respect to colleagues
- PC5. fulfil commitments made to colleagues
- PC6. inform team members timely, if timelines can't be met
- PC7. take the necessary initiatives to resolve the issues while working in team

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. the organization's policies and procedures related to team work in workplace
- KU2. the importance of effective communication and establishing good working relationships with colleagues
- KU3. Knowledge of gender concepts, issues & legislation
- KU4. the importance of creating an environment of trust and mutual respect
- KU5. the implications of own work on the work and schedule of others
- KU6. the standard practice in organisation w.r.t communication at various levels
- KU7. the instructions at individual level or at group level
- KU8. individual work responsibility and corrective measures required to complete task in time
- KU9. the importance of personal qualities like discipline and confidence to achieve success in work assigned

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1. communicate effectively in writing
- GS2. read instructions, guidelines/procedures
- GS3. communicate information effectively
- GS4. make decisions on a suitable course of action or response keeping in view resource utilization while meeting commitments
- GS5. how to plan the work to meet the deadline

- GS6. the importance of consistent and reliable services for customer satisfaction
- GS7. apply problem solving approaches in different situations
- GS8. apply balanced judgments to different situations

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Effective teamwork</i>	20	30		
PC1. maintain clear communication with colleagues	2	4	-	-
PC2. pass on information to colleagues in line with organisational requirements	3	5	-	-
PC3. work in a team and support the team members	3	4	-	-
PC4. work in ways that show respect to colleagues	3	4	-	-
PC5. fulfil commitments made to colleagues	3	5	-	-
PC6. inform team members timely, if timelines can't be met	3	4	-	-
PC7. take the necessary initiatives to resolve the issues while working in team	3	4	-	-
NOS Total	20	30	-	-

National Occupational Standards (NOS) Parameters

NOS Code	HYC/N9301
NOS Name	Working effectively in a team
Sector	Hydrocarbon
Sub-Sector	Generic
Occupation	Generic
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	3-May-2023
Next Review Date	2-May-2026
NSQC Clearance Date	3-May-2023

HYC/N9302: Maintain health, safety and security procedures

Description

This unit covers maintaining health, safety and security procedures at the workplace. This includes procedures and practices that candidates need to follow to help maintain a healthy, safe and secure work environment

Scope

This unit/task covers the following:

- Practice health and safety measures
- Follow fire safety procedures
- Follow emergencies, rescue and first-aid procedures

Elements and Performance Criteria

Practice health and safety measures

To be competent, the user/individual on the job must be able to:

- PC1.** use protective clothing/equipment for specific tasks and work conditions
- PC2.** identify documents, location and people responsible for health and safety in the workplace
- PC3.** identify possible causes of risk or accident in the workplace
- PC4.** carry out safe working practices while dealing with hazards to ensure the safety of self and others
- PC5.** lift heavy objects safely using correct procedures
- PC6.** identify common safety signs, displayed in various areas

Follow fire safety procedures

To be competent, the user/individual on the job must be able to:

- PC7.** use the various appropriate fire extinguishers on different types of fires correctly
- PC8.** follow rescue techniques applied during fire hazard
- PC9.** follow good housekeeping practice in order to prevent fire hazards
- PC10.** list issues concerning the safety in work place
- PC11.** inform fire safety department about any near-miss incidents in the work place
- PC12.** follow the applicable laws, regulations and codes as per safety standard
- PC13.** prepare written accident/incident report and share with the concerned officer/department

Follow emergencies, rescue and first-aid procedures

To be competent, the user/individual on the job must be able to:

- PC14.** provide appropriate first aid to victims in emergency situation
- PC15.** demonstrate basic techniques of bandaging
- PC16.** respond promptly and appropriately to an accident
- PC17.** perform rescue activity during an accident in real or simulated environments
- PC18.** demonstrate correct method to rescue injured people and others during an emergency

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. company's policies on personnel management and duty reporting procedure
- KU2. reporting structure within organization
- KU3. how to escalate problem
- KU4. concept of "hazards" and "risks"
- KU5. health and safety hazards commonly affecting the work environment and related precautions
- KU6. preventative and remedial actions to be taken in the case of exposure to toxic materials
- KU7. importance of using protective clothing/equipment while working
- KU8. various causes of fire
- KU9. techniques of using different types of fire extinguishers
- KU10. different materials used for extinguishing fire
- KU11. various types of safety signs and their significance

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1. communicate by writing
- GS2. read instructions, guidelines/procedures and reports
- GS3. communicate effectively and share the information efficiently
- GS4. identify and report potential sources of danger
- GS5. how to plan the work to meet the deadline
- GS6. the importance of on time services
- GS7. apply problem solving approaches in different situations
- GS8. apply balanced judgments to different situations

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Practice health and safety measures</i>	9	15		
PC1. use protective clothing/equipment for specific tasks and work conditions	1	4	-	-
PC2. identify documents, location and people responsible for health and safety in the workplace	2	1	-	-
PC3. identify possible causes of risk or accident in the workplace	1	3	-	-
PC4. carry out safe working practices while dealing with hazards to ensure the safety of self and others	2	2	-	-
PC5. lift heavy objects safely using correct procedures	1	3	-	-
PC6. identify common safety signs, displayed in various areas	2	2	-	-
<i>Follow fire safety procedures</i>	12	16		
PC7. use the various appropriate fire extinguishers on different types of fires correctly	2	2	-	-
PC8. follow rescue techniques applied during fire hazard	2	2	-	-
PC9. follow good housekeeping practice in order to prevent fire hazards	2	2	-	-
PC10. list issues concerning the safety in work place	1	3	-	-
PC11. inform fire safety department about any near-miss incidents in the work place	2	2	-	-
PC12. follow the applicable laws, regulations and codes as per safety standard	1	3	-	-
PC13. prepare written accident/incident report and share with the concerned officer/department	2	2	-	-
<i>Follow emergencies, rescue and first-aid procedures</i>	4	19		
PC14. provide appropriate first aid to victims in emergency situation	1	4	-	-

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PC15. demonstrate basic techniques of bandaging	1	4	-	-
PC16. respond promptly and appropriately to an accident	0	3	-	-
PC17. perform rescue activity during an accident in real or simulated environments	1	4	-	-
PC18. demonstrate correct method to rescue injured people and others during an emergency	1	4	-	-
NOS Total	25	50		

National Occupational Standards (NOS) Parameters

NOS Code	HYC/N9302
NOS Name	Maintain health, safety and security procedures
Sector	Hydrocarbon
Sub-Sector	Generic
Occupation	Generic
NSQF Level	4
Credits	1.5
Version	1.0
Last Reviewed Date	3-May-2023
Next Review Date	2-May-2026
NSQC Clearance Date	3-May-2023

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down the proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on the knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for the theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. To pass the Qualification Pack assessment, every trainee should score a minimum of 50% of aggregate marks to successfully clear the assessment.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Recommended Pass % aggregate for QP: 50

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
HYC/N 0106 Preparation for maintenance of the mud pump and equipment	20	30	-	-	50	30
HYC/N 0107 Prepare and maintain the property of drilling mud fluid throughout the drilling operation	20	30	-	-	50	30
HYC/N9301 Working effectively in a team	20	30	-	-	50	20
HYC/N9302 Maintain health, safety and security procedures	25	50			75	20
Total	85	140	-	-	225	100

Acronyms

NOS – National Occupational Standard(s)

OS – Occupational Standard(s)

NSQF – National Skills Qualifications Framework

QP – Qualifications Pack

KU – Knowledge and Understanding

GS – Generic Skills

SOP- Standard operating procedure

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards(OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria(PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards(NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack(QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements that together specify the technical, generic, professional and organisational specific knowledge that an individual need in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/Generic Skills(GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today’s world. These skills are typically needed in any work environment in today’s world. These skills are typically needed in any work environment. In the context of the OS, these include communication-related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.