QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR MINING INDUSTRY

Contents

What are Occupational Standards (OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack - Mine Driller (Exploration)

SECTOR: MINING

SUB-SECTOR: Exploration & Resource Management

OCCUPATION: Exploration Drilling

REFERENCE ID: MIN/Q0101

ALIGNED TO: NCO-2015/ 8111.0200

Brief Job Description: Mine Driller (Exploration) is fully responsible for effective drilling operation using the drilling rig. He carries out the drilling operation and ensure collection of cores and storage as per advice of Geologist.
Exploration drilling aims to identify the location/Depth and quality and quantity of a mineral. Exploration drilling is used in the mining industry to probe the contents of known ore deposits and potential sites. By extracting a small diameter core of rock from the ore-body, geologists can analyze the core by chemical assay and conduct petrologic, structural and mineralogical studies of the rock.

Personal Attributes: This job requires the individual to be fully knowledgeable and capable of managing the drilling machine operation independently. He needs to lead and guide his support team. Hard work, strong work ethics and courteous behavior to co-worker are highly required. He should also be physically active, have good eye sight and not suffer from any deafness or color blindness.

Job Details

Qualifications Pack Code	**MIN/Q0101**		
Job Role	**Mine Driller (Exploration)**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Sector	**Mining**	**Drafted on**	**08/08/2016**
Sub-sector	**Exploration & Resource Management**	**Last reviewed on**	**27/09/2016**
Occupation	**Exploration Drilling**	**Next review date**	**26/09/2019**
NSQC Clearance on	**DD/MM/YYYY**		

Job Details

Job Role	**Mine Driller (Exploration)**
Role Description	Manage and conduct drilling operation at exploration site as specified by Geophysicist & Exploration team.
NSQF level	4
Minimum Educational Qualifications **Maximum Educational Qualifications**	Diploma in Mechanical B.E. / B. Tech.
Training **(Suggested but not mandatory)**	1. OEM training on difference type of drilling machines - rotary, percussive/Rotary percussive/ hydro static. 2. OEM Training on drilling machine service requirement, critical assemblies and sub-assemblies, common equipment failure.
Minimum Job Entry Age	20 years.
Experience	Desirable minimum 2 years' experience as drilling assistant.
Applicable National Occupational Standards (NOS)	**Compulsory:** 1. MIN/N0101: Worksite identification and inspection. 2. MIN/N0102: Pre-operation check and Drilling operation 3. MIN/N0103: Routine check and maintenance. 4. MIN/N0901: Comply with Worksite Health and safety **Optional:** N.A.
Performance Criteria	As described in the relevant OS units

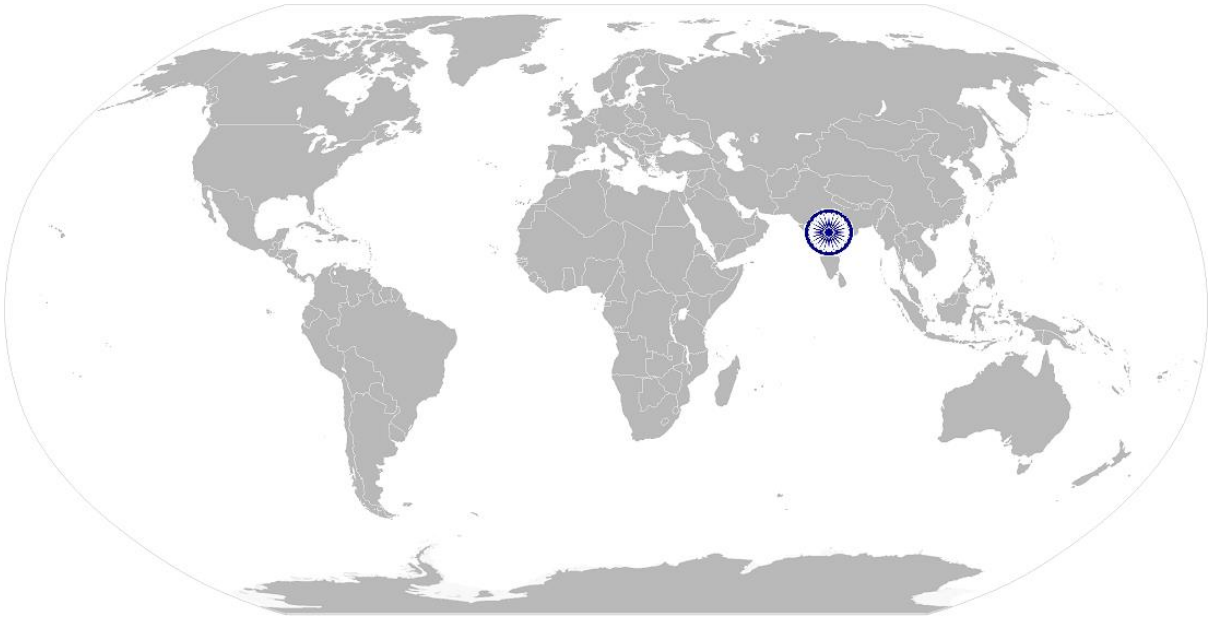
Definitions

Keywords/Terms	Description
Sector	Sector is a conglomeration of different business operations having similar businesses 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.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
Job Role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
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 they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
NOS	NOS are Occupational Standards which apply uniquely in the Indian context.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Qualifications Pack	Qualifications Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification 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.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
Organizational Context	Organizational Context includes the way the organization 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 or Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working 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.

Acronyms

Keywords/Terms	Description
SCMS	Skill Council for Mining Sector
NOS	National Occupational Standards
NSQF	National Skill Qualification Framework
NVEQF	National Vocational Educational Qualification Framework
NVQF	National Vocational Qualification Framework
OS	Occupational Standard
PC	Performance Criteria
QP	Qualification Pack
SSC	Sector Skill Council
HEMM	Heavy Earth Moving Machinery
OEM	Original Equipment Manufacturer
DGMS	Director General of Mining Safety

National Occupational Standard



Overview

This unit provides performance criteria, knowledge and understanding and skill and ability for activities that need to be carried out to prepare the worksite and get the drill pad functional.

Unit Code	MIN/ N 0101
Unit Title (Task)	Worksite identification and inspection.
Description	This unit deals with preparation and inspection of the worksite and gets the drill pad functional.
Scope	This unit/task covers the following- • Checking for Preparation of drill site and supports. • Positioning and mounting the drill rig.

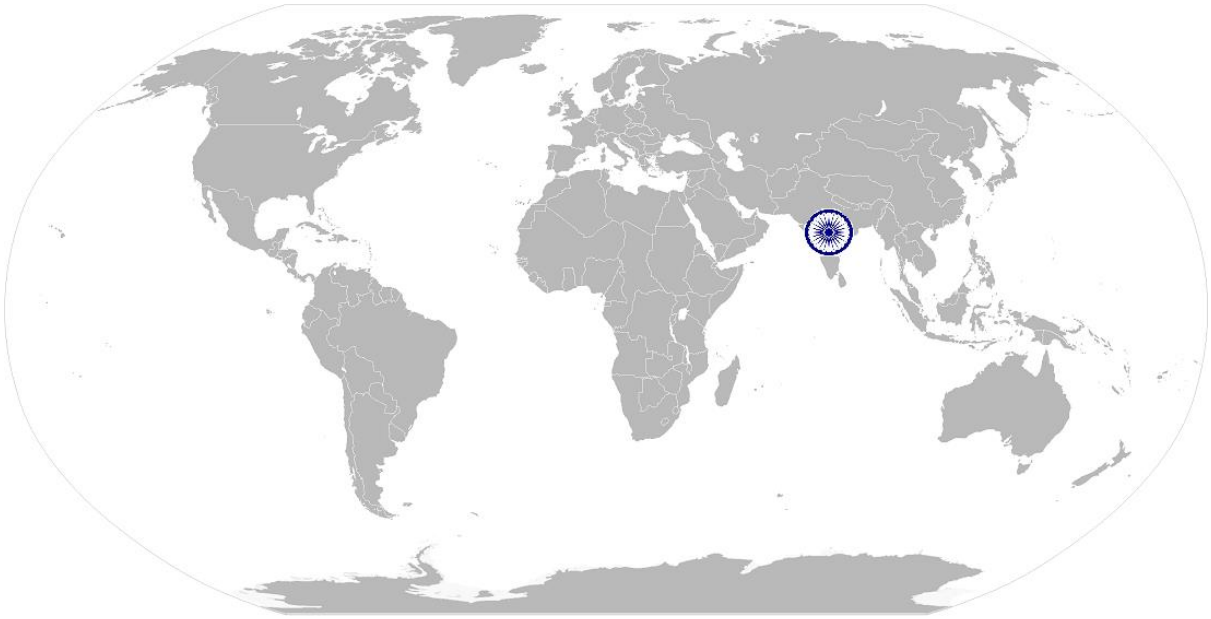
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Checking for Preparation of drill site and supports	To be competent, the user/individual on the job must be able to – PC1. Check that the tracks to the camp and work sites are suitable for drilling, support and emergency vehicle access. PC2. Check that the prepared ground or constructed pad is level, stable and load bearing. PC3. Check that supply of water and haulage of water is arranged. PC4. Ensure that Sumps have been constructed to contain all drilling fluids and drilling mud etc. and are barricaded to prevent inadvertent access. PC5. Check and ensure that, edge protection is in place for the drill site. PC6. Follow the recommendations of the original equipment manufacturer (OEM) for rig movement. Ensure that the OEM prescribed limit for angles of inclination are followed during movement and setting up of drills. PC7. To ensure that the drill rig and service vehicles are positioned and set-up to minimize exposure of personnel to drilling hazards. Erect safety signs/barriers. PC8. To organize place for spares, fuels, daily consumables, and proper place for indexing and storing cores.
Positioning and mounting the drill rig	PC9. Check drilling machine positioning as per survey plan. PC10. Ensure electrical and communication lines are laid properly.

Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand- KA1. The organization procedure and guideline related to remote area working. KA2. The performance standard and procedure for exploration drilling followed by the company. Standing orders in force at the mine or exploration area. KA3. Safety in the vicinity of machinery. KA4. Incident Reporting and daily reporting structure in the site.

	KA5. Contact person in case of emergency. KA6. Process of indenting spare parts and raising requirement of consumables and parts. KA7. Process of storage and disposals of waste material and used components. KA8. Duties of workmen under Mines act. KA9. Provision of wages and working hours as per Mines act. KA10. Knowledge of mining safety procedures. KA11. Refresher training as per fourth schedule MVTR (1966) within one month of joining duties following absence from duties for a period exceeding one year.
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. General knowledge about different types of drill machines that are commonly used- • Rotary. • Percussive. • Rotary Percussive. • Hydrostatic. KB2. Knowledge of machine operational parameters like Power requirements, tank level, alarms, pumps, monitors. KB3. Knowledge of required density of muds based on strata. KB4. Know right lubricants for drives, gearboxes, chain and sprocket drives and greasing points. KB5. Know the right set of tools and tackles required for fit outs and removals of pipes, cores and regular scheduled maintenance. KB6. Procedure of acquisitions of tools and tackles from store and return policies. KB7. Knowledge of common causes and breakdown and have basic knowledge of the technicalities of drill machines. KB8. Ability to analyze and identify the causes of breakdown. KB9. Knowledge about different type of drill bits, its expected life in terms of meter age. KB10. Nomenclature of different types of hole diameters. KB11. Drilling time line plan, sampling plan and review mechanism with site supervisor and geophysics and geologist. KB12. Safety precaution to be observed at site and enforcing recommended measures.
Skills (S)	
A. Core Skills/	**Writing Skills**

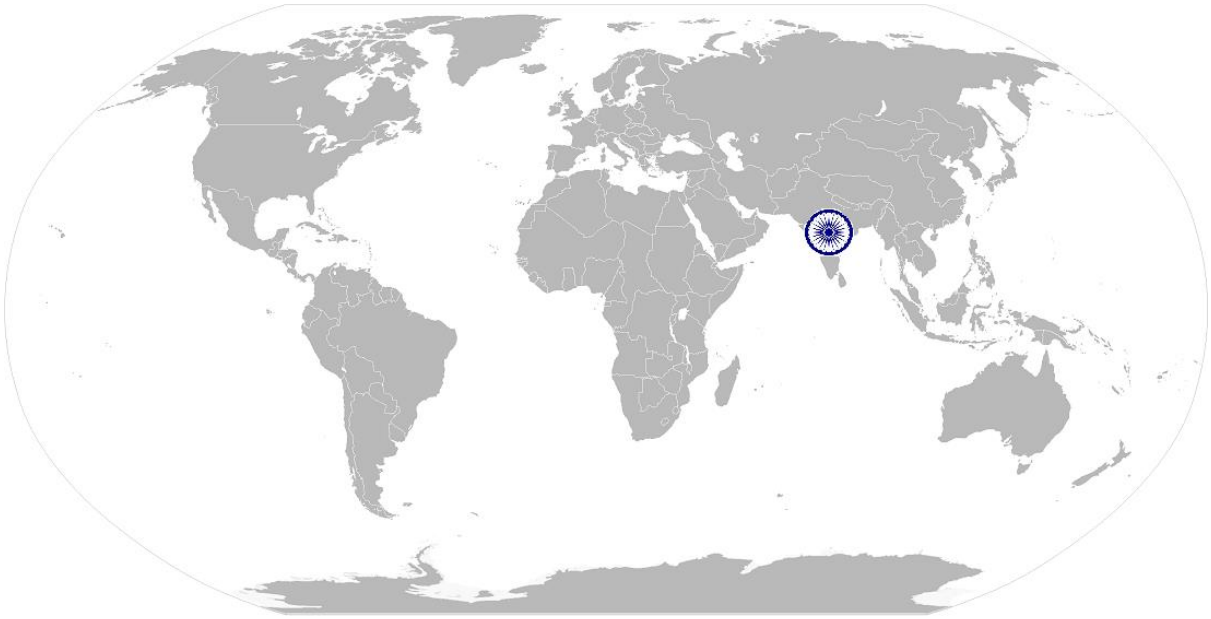
Generic Skills	The user/ individual on the job needs to know and understand how to: SA1. Maintain log book. SA2. Raise spare parts indent after checking parts number from OEM catalogues. SA3. Note gauge and meter readings. SA4. Create notes or work documents for Fitter or Technician or Supervisor for further action on the machine.
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA5. Able to read the survey drilling plan. . SA6. Understand the standard terminologies in drilling and surveying. SA7. Able to read out the Drill machine OEM manuals, instructions and directions. SA8. Read internal memos and circulars, safety instructions. SA9. Read equipment manual and process documents, check lists given by the Equipment manufacturers.
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA10. Able to communicate clearly and scientifically with supervisors and senior. SA11. Able to communicate with the site engineers and geophysicists. SA12. Effectively understand about operational requirements. SA13. Answer queries or explain problems related to machine operation to Technicians, Supervisor, Fitters and others. SA14. Effectively communicate and assign tasks to team members, Technicians and others. SA15. Attentively listen to communication from Operator, Technicians and other team members.
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. Take on the spot decision on machine drill bit replacements and other parameters change.
	Plan and Organize
	The user/individual on the job needs to know and understand: SB2. Basic work site planning, time planning and team work allocation.
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB3. Interact with internal customers like samplers.
	Problem Solving

	The user/individual on the job needs to know and understand how to: SB4. Logically analyze machine problems SB5. Do failure analyses like fish bone technique.
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB6. Use reasoning skills to identify and resolve basic problems. SB7. Use intuition to detect any potential problems which could arise.
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB8. Use reasoning skills to identify and resolve basic problems. SB9. Use intuition to detect any potential problems which could arise.



NOS Version Control:

NOS Code	MIN/N0101		
Credits(NSQF)	TBD	Version number	1.0
Sector	Mining	Drafted on	08/08/2016
Sub-sector	Exploration & Resource Management	Last reviewed on	27/09/2016
Occupation	Exploration Drilling	Next review date	26/09/2019



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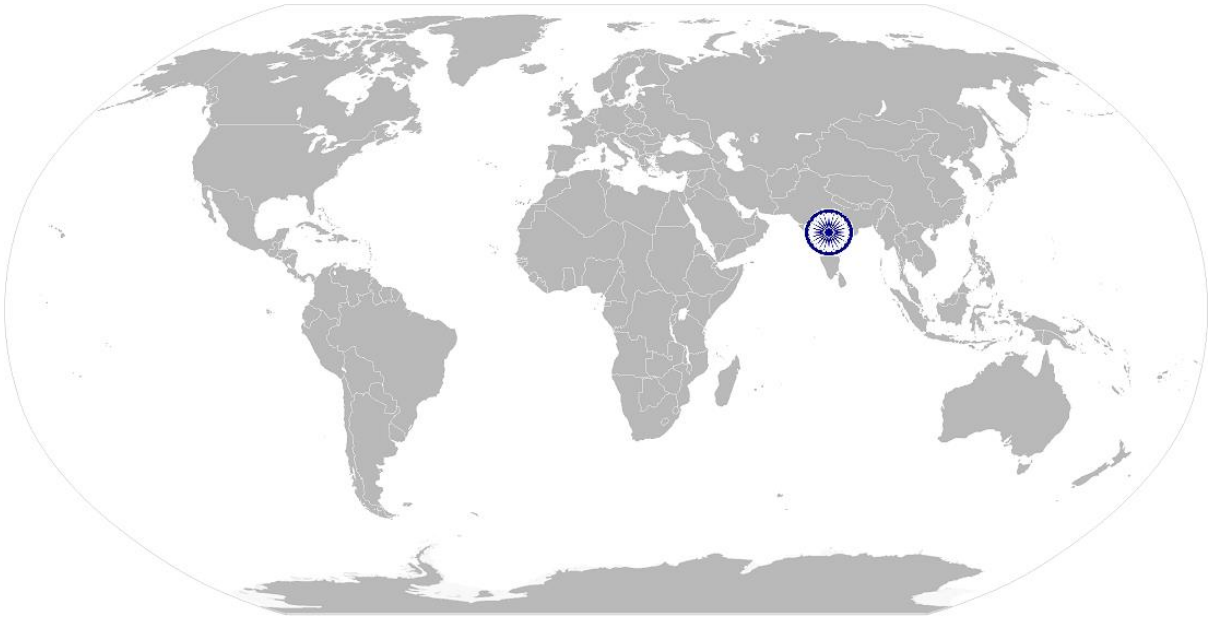
National Occupational Standard



Overview

This unit covers the preparation of drilling plan, everyday / shift wise check of the drill and ancillaries and supports before starting operation of the drill machine at exploration area and then carries out the drilling operation as per the agreed plan and timeline.

MIN/N0102 **Pre-operational checks and drilling operation**

National Occupational Standard

Unit Code	**MIN/N 0102**
Unit Title (Task)	Pre-operational checks and drilling operation.
Description	This unit covers the drilling plan preparation, pre-operation checks and regular drilling operation as per agreed plan.
Scope	This unit/task covers the following: • Drill work schedule and planning. • Conducting pre-operation checks to ensure the Drill is safe to use. • Perform the drill operation and reporting.

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Drill work schedule and planning	To be competent, the user/individual on the job must be able to: PC1. Understand the drilling plan from the Geologist. Understand drill site information for efficient operation, to receive idea about Likely stratigraphy /geology/type of rock to be encountered etc. PC2. To prepare the drilling plan based on type strata and type of drilling machine (Rotary/percussive, hydro static). To plan between core drilling and non-core drilling. PC3. Allocate judicious time limit. PC4. When designing a drilling program, assess the likelihood (e.g. using geological or hydrological data) of intersecting gas-bearing strata. Implement procedures for monitoring and managing hazardous gases released during drilling, and ensure workers are trained in their application.
Conducting pre-operation checks to ensure the Drill is safe to use.	PC5. Carry out pre-operations check as per OEM checklist. PC6. Visually check the undercarriage and super structures of the drill. PC7. Check all controls, gauges, warning lamp and other safety devices. PC8. Check that all electrical supply, hydraulic lines, water lines, pneumatic lines etc. are mounted securely and without any leakages. PC9. Ensure that crown blocks are mounted securely. PC10. Check that pipe hoists are functioning properly. PC11. Check that 'mud pump' is functional and mud pits are ready. PC12. Lubricate and grease as required for pins and pivot points. PC13. Keep footplates and steps clean and free from mud, dirt and oil.

Perform the drill operation and reporting.	PC14. Follow drilling plan and ensure quality core samples. PC15. Ensure core samples are collected from the core tubes, stored and catalogued properly. Ensure that Core traces and racks are arranged and indexed properly. PC16. Ensure all machine consumables and spares (drill bits / compressed air / couplings/ rods etc) are used to their maximum potential, Reduce downtime and wastage. PC17. Update the log book with the operation details and any servicing and further works to be done.
Knowledge and Understanding (K)	
B. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand- KA1. The organization procedure and guideline related to remote area working. KA2. The performance standard and procedure for exploration drilling followed by the company. Standing orders in force at the mine. Safety in the vicinity of machinery. KA3. Incident Reporting and daily reporting structure in the site. KA4. Contact person in case of emergency. KA5. Process of indenting spare parts and raising requirement of consumables and parts. KA6. Process of storage and disposals of waste material in eco-friendly way. KA7. Duties of workmen under Mines act. KA8. Provision of wages and working hours as per Mines act. KA9. Knowledge of mining safety procedures. KA10. Refresher training as per fourth schedule MVTR (1966) within one month of joining duties following absence from duties for a period exceeding one year.
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. General knowledge about different types of drill machines that are commonly used- • Rotary. • Percussive. • Rotary Percussive. • Hydrostatic. KB2. Knowledge of machine operational parameters like Power requirements, tank level, air parameters, alarms, pumps, monitors. KB3. Know right lubricants for drives, gearboxes, chain and sprocket drives and greasing points. KB4. Know the right set of tools and tackles required for fit outs and removals of pipes, cores and regular scheduled maintenance. KB5. Knowledge for operating in special situations. Like-Drilling through fractured zone, loose and exceptionally hard strata.

	KB6. Knowledge of common causes and breakdown and have basic knowledge of the technicalities of drill machines. KB7. Ability to analyze and identify the causes of breakdown. KB8. Knowledge about different type of drill bits, its expected life in terms of meter age. KB9. Nomenclature of different types of hole diameters. KB10. Drilling time line plan, sampling plan and review mechanism with site supervisor and geophysics and geologist). KB13. Safety precaution to be observed at site and enforcing recommended measures.
Skills (S)	
C. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. Maintain log book. SA2. Raise spare parts indent after checking parts number from OEM catalogues. SA3. Note gauge and meter readings. SA4. Create notes or work documents for Fitter or Technician or Supervisor for further action on the machine.
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA5. Able to read the survey drilling plan. . SA6. Understand the standard terminologies in drilling and surveying. SA7. Able to read out the Drill machine OEM manuals, instructions and directions. SA8. Read internal memos and circulars, safety instructions. SA9. Read equipment manual and process documents, check lists given by the Equipment manufacturers.
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA10. Able to communicate clearly and scientifically with supervisors and senior. SA11. Able to communicate with the site engineers and geophysicists. SA12. Effectively understand about operational requirements. SA13. Answer queries or explain problems related to machine operation to Technicians, Supervisor, Fitters and others. SA14. Effectively communicate and assign tasks to team members, Technicians and others. SA15. Attentively listen to communication from Operator, Technicians and other team members.
D. Professional	**Decision Making**

MIN/N0102 **Pre-operational checks and drilling operation**

Skills	The user/individual on the job needs to know and understand how to: SB1. Take on the spot decision on machine drill bit replacements and other parameters change.
	Plan and Organize
	The user/individual on the job needs to know and understand: SB2. Basic work site planning, time planning and team work allocation.
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB3. Interact with internal customers like samplers.
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB4. Logically analyze machine problems SB5. Do failure analyses like fish bone technique.
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB6. Use reasoning skills to identify and resolve basic problems. SB7. Use intuition to detect any potential problems which could arise.
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB8. Use reasoning skills to identify and resolve basic problems. SB9. Use intuition to detect any potential problems which could arise.

NOS Version Control:

NOS Code	MIN/N0102		
Credits(NSQF)	TBD	Version number	1.0
Sector	Mining	Drafted on	08/08/2016
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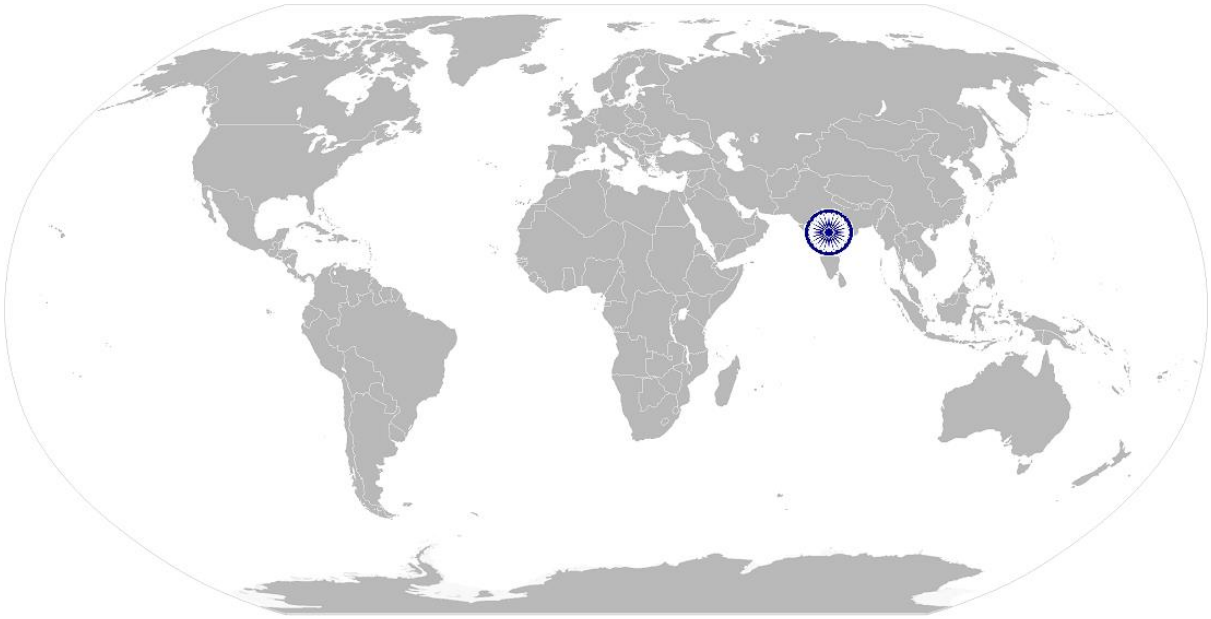

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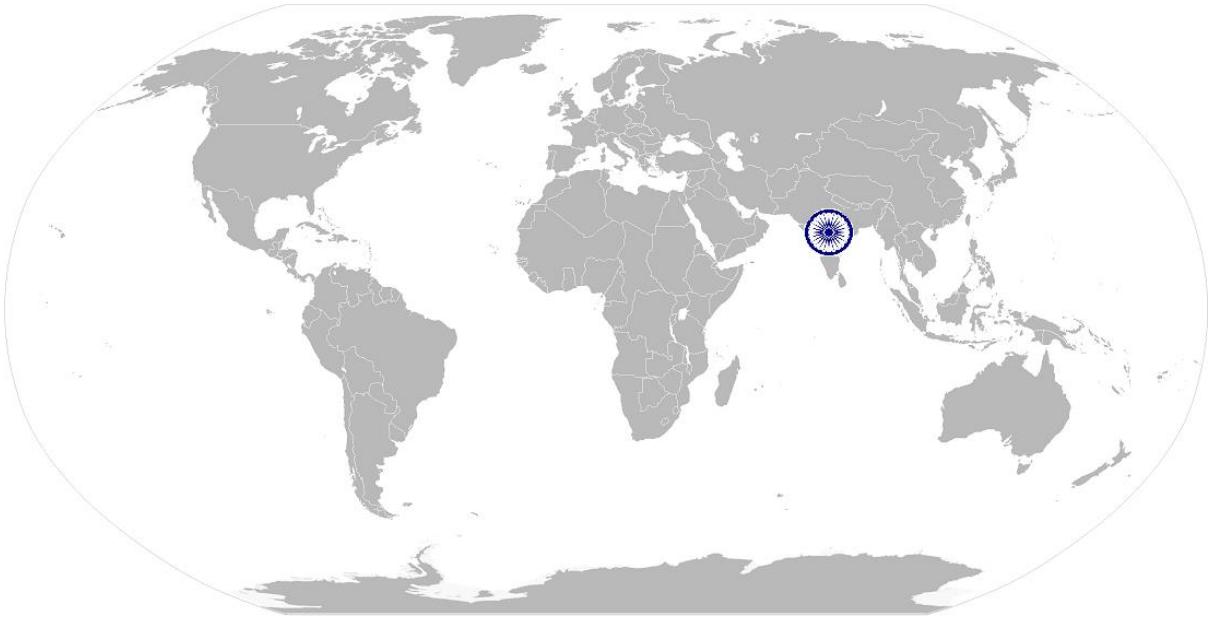
National Occupational Standard



Overview

This unit is about carrying out regular inspection and checks, periodic maintenance and minor repair of the equipment in case of breakdown or as required on the basis of inspection finding or log sheet report

MIN/N0103 **Routine check and Maintenance**

National Occupational Standard

Unit Code	MIN/N0103
Unit Title (Task)	Routine check and maintenance
Description	This unit is about performing routine check, carrying out minor repair / maintenance and troubleshooting of the Drill.
Scope	This OS unit/task covers the following: • Routine inspection and periodic maintenance. • Repairing the fault / breakdowns.

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Routine inspection and periodic maintenance	To be competent, the user/individual on the job must be able to: PC1. Carry out preliminary & visual checks. Observe any unusual noise, vibration, leak, spillage, accumulation etc. and seek corrective measures. PC2. To check gauges, indicators, and sensor are fully functional and inform Technician and Fitters for any major repair. PC3. Track machine operating hours to assess the right service schedule and notify technician. PC4. Help Mechanic or technician to change the consumables like filters, gear oil, seals as per prescribed schedule, clean air filter dust bowls etc. PC5. Replace drill bits when required. PC6. Check proper functioning of mud pumps, ancillary services like hydraulic, pneumatic etc. Check for any leakage / damaged hoses. Drain water and sediment /fuel separators. PC7. Replenish coolants, lubricants and fluids. Check battery levels and condition of the terminals and carrying out cleaning / top ups if required. PC8. Carry out required lubrication, greasing and oil change as required. PC9. Clean footplates, pedals and steps free from mud, dirt, ice and snow. PC10. Update daily/routine maintenance sheets.
Repairing the fault / breakdown	PC11. To ensure proper disposal of waste material and broken parts at appropriate place. PC12. Check the machine parameters before restart of the machine operation. PC13. Assess when the problem is beyond his competence and report the problem to Technicians / Site engineer. PC14. Update the log book with works carried out and further works to be done.

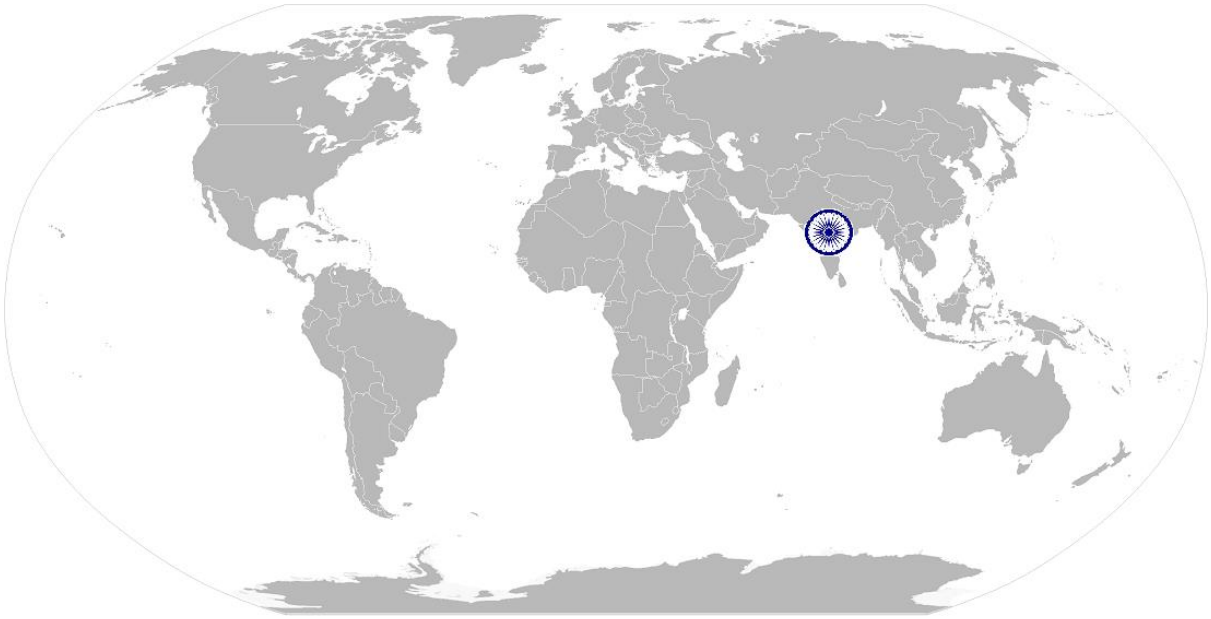
Knowledge and Understanding (K)	
C. Organizational Context (Knowledge of the company /	The user/individual on the job needs to know and understand: KA1. The organization procedure and guideline related to remote area working. KA2. The performance standard and procedure for exploration drilling followed

organization and its processes	by the company. Standing orders in force at the mine. Safety in the vicinity of machinery. KA3. Incident Reporting and daily reporting structure in the site. KA4. Contact person in case of emergency. KA5. Process of indenting spare parts and raising requirement of consumables and parts. KA6. Process of storage and disposals of waste material in eco-friendly way. KA7. Duties of workmen under Mines act. KA8. Provision of wages and working hours as per Mines act. KA9. Knowledge of mining safety procedures.
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. Knowledge of machine operational parameters like Power requirements, tank level, air parameters, alarms, pumps, monitors. KB2. Know right lubricants for drives, gearboxes, chain and sprocket drives and greasing points. KB3. Know the right set of tools and tackles required for fit outs and removals of pipes, cores and regular scheduled maintenance. KB4. Knowledge of common causes and breakdown and have basic knowledge of the technicalities of drill machines. KB5. Ability to analyze and identify the causes of breakdown. KB6. Knowledge about different type of drill bits, its expected life in terms of meter age. KB7. Safety precaution to be observed at site and enforcing recommended measures.
Skills (S)	
E. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. Maintain log book. SA2. Raise spare parts indent after checking parts number from OEM catalogues. SA3. Note gauge and meter readings. SA4. Create notes or work documents for Fitter or Technician or Supervisor for further action on the machine.
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA5. Able to read the survey drilling plan. SA6. Understand the standard terminologies in drilling and surveying. SA7. Able to read out the Drill machine OEM manuals, instructions and directions. SA8. Read internal memos and circulars, safety instructions. SA9. Read equipment manual and process documents, check lists given by the Equipment manufacturers.
	Oral Communication (Listening and Speaking skills)

	The user/individual on the job needs to know and understand how to: SA10. Able to communicate clearly and scientifically with supervisors and senior. SA11. Able to communicate with the site engineers and geophysicists. SA12. Effectively understand about operational requirements. SA13. Answer queries or explain problems related to machine operation to Technicians, Supervisor, Fitters and others. SA14. Effectively communicate and assign tasks to team members, Technicians and others.
F. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. Take on the spot decision on machine drill bit replacements and other parameters change.
	Plan and Organize
	The user/individual on the job needs to know and understand: SB2. Basic work site planning, time planning and team work allocation.
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB3. Interact with internal customers like samplers.
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB4. Logically analyze machine problems SB5. Do failure analyses like fish bone technique.
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB6. Use reasoning skills to identify and resolve basic problems. SB7. Use intuition to detect any potential problems which could arise.
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB10.Use reasoning skills to identify and resolve basic problems. SB11.Use intuition to detect any potential problems which could arise.

NOS Version Control:

NOS Code	MIN/N0103		
Credits(NSQF)	TBD	Version number	1.0
Sector	Mining	Drafted on	08/08/2016
Sub-sector	Exploration & Resource Management	Last reviewed on	27/09/2016
Occupation	Exploration Drilling	Next review date	26/09/2019



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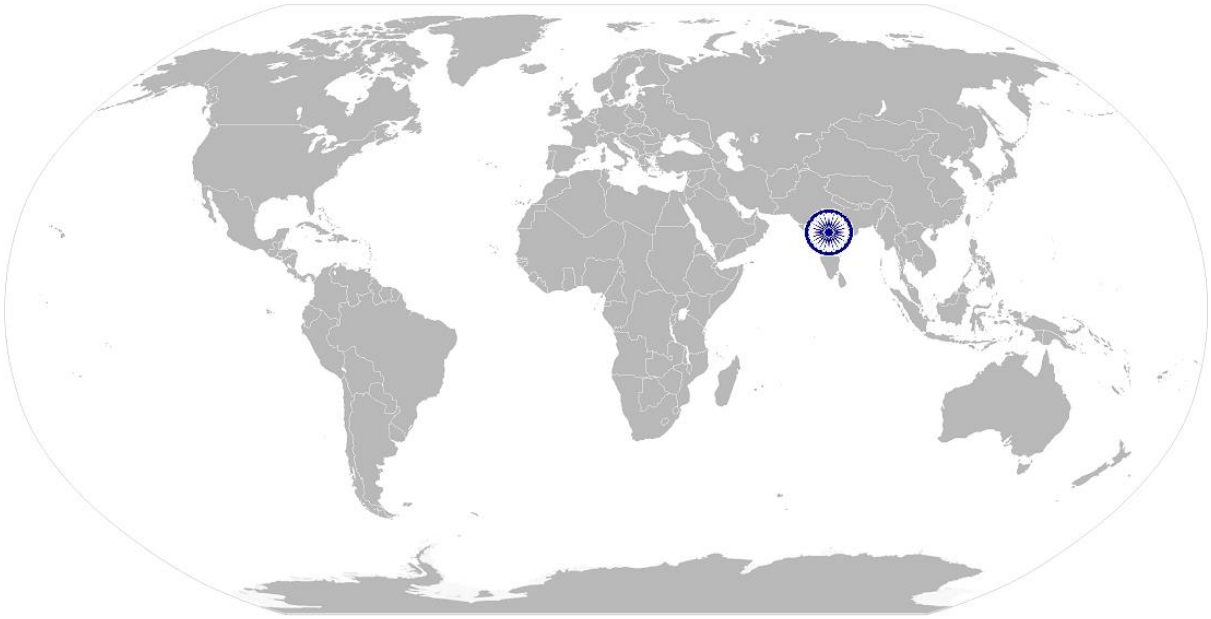
National Occupational Standard



Overview

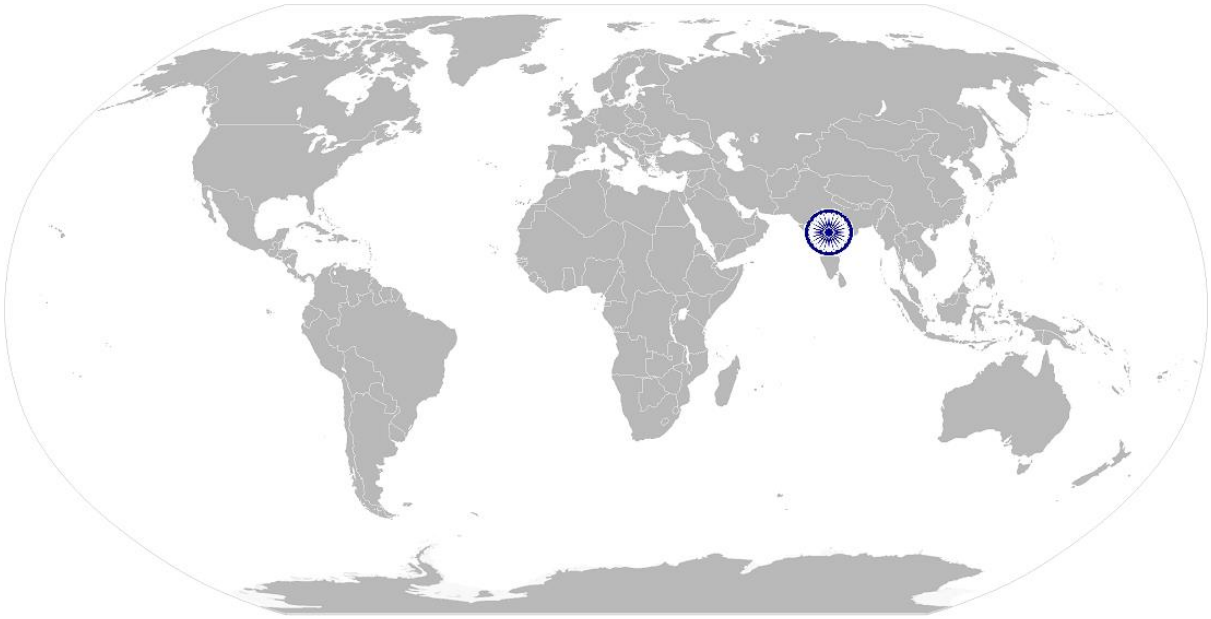
This unit is about adhering to health and safety requirements at the worksite.

Unit Code	MIN/N0901
Unit Title (Task)	Health & Safety.
Description	This unit provides the information regarding worksite health and safety.
Scope	This unit is about adhering to health and safety requirements at the worksite during equipment operations.

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Safety, Security and Administrative	To be competent, the user/individual on the job must be able to PC1. Comply with safety, health, security and environment related regulations/ guidelines at the work site. PC2. Use Personal Protective Equipment (PPE) and other safety gear such as seat belt, body protection, respiratory protection, eye protection, ear protection and hand protection. PC3. Follow safety measures during operations to ensure that the health and safety of self or others (including members of the public) is not at risk. PC4. Carry out operations as per the manufacturer's and worksite related health and safety guidelines. PC5. Handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines. PC6. Follow safety regulations and procedures with regard to worksite hazards and risks. PC7. Operate various grades of fire extinguishers, as applicable. PC8. Support in administering basic first aid and report to concerned team members, as required, in case of an accident. PC9. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility. PC10. Record and report details related to operations, incidents or accidents, as applicable PC11. Follow the manufacturer's instructions for care and safe operation of the equipment.

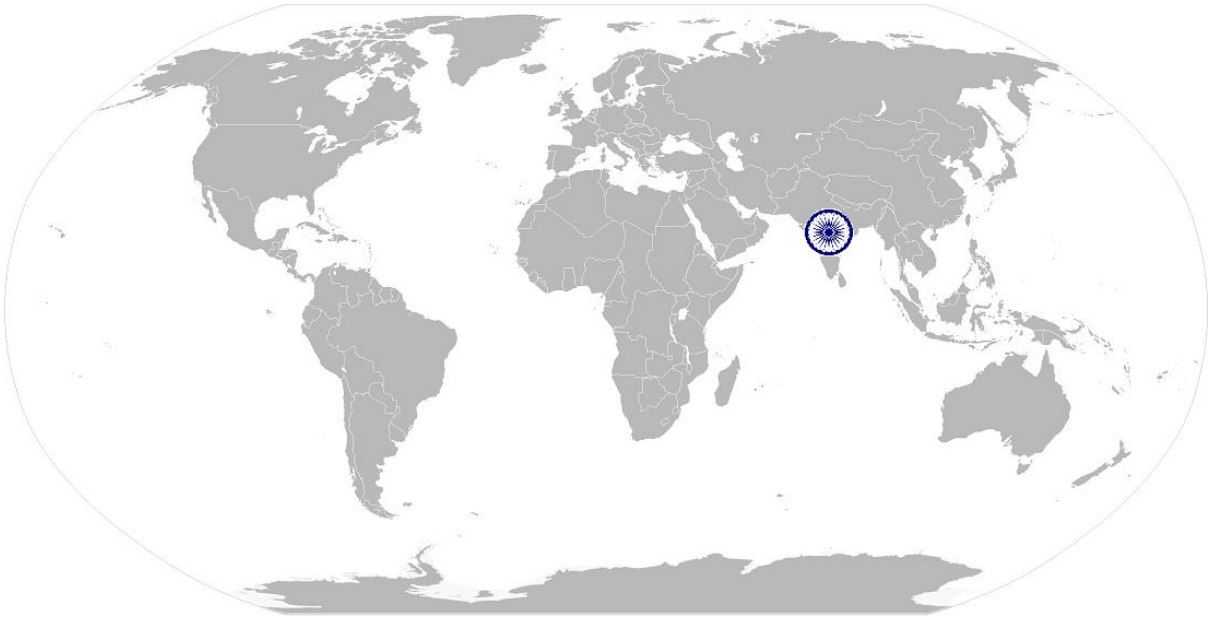
Knowledge and Understanding (K)	
Regulatory Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. Benching in quarries, dressing of overhangs, undercuts, fencing. KA2. First aid and Hygiene. KA3. Code of traffic in specific areas of mine. Significance of fences. KA4. Standing orders in force at the mine. Safety in the vicinity of Machinery. KA5. Shot-firing and Safety regulations. How and where to take shelters? Knowledge of mining safety procedures. KA6. Outcome of violation of safety procedures. KA7. Locally prepared Emergency Preparedness / Disaster Management Plan.

	KA8. Process for reporting any unsafe act/condition in work area which may endanger his or his colleague's life. KA9. Environmental impact of mining. KA10. Sources of dust, noise and vibration and measures to minimize. KA11. Hazardous material safety and security rules and regulations as prescribed by DGMS.
Technical Knowledge	The user/individual on the job needs to know and understand: KB1. In-depth knowledge of operation of the drilling machines. KB2. Technical and gallery training as per first schedule, Mining Vocational Training Rules (MVTR) 1966. KB3. Refresher training as per first schedule, Mining Vocational Training Rules (MVTR) 1966. if absent from mines for a period of One year or more before re-employment.



NOS Version Control

NOS Code	MIN/N0901		
Credits(NSQF)	TBD	Version number	1.0
Sector	Mining	Drafted on	08/08/2016
Sub-sector	Exploration & Resource Management	Last reviewed on	27/09/2016
Occupation	Exploration Drilling	Next review date	26/09/2018



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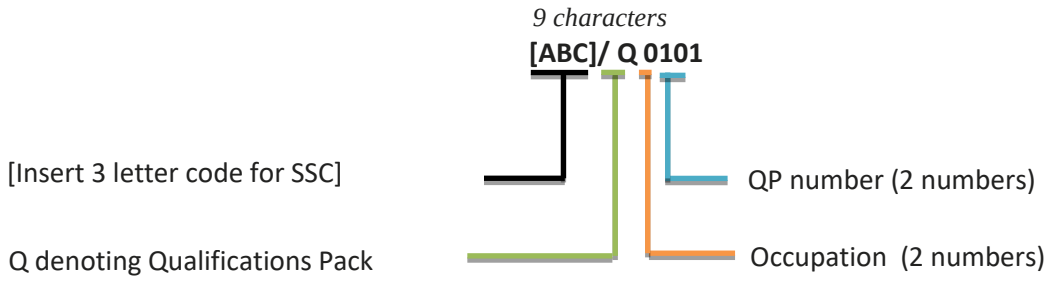
Annexure

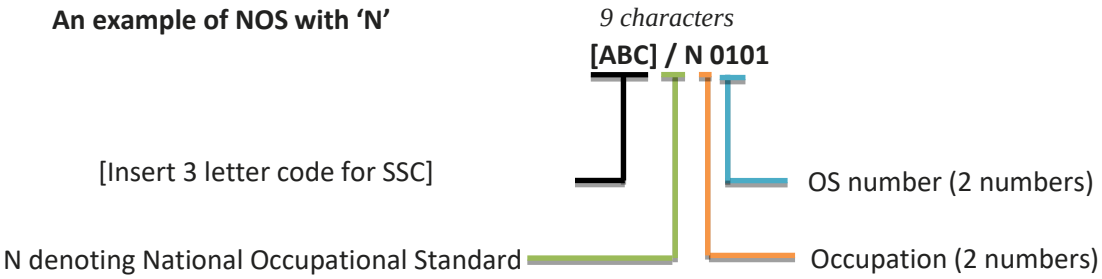
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



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The following acronyms/codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Exploration & Resource Management	**01 to 50**
Mining Operations	**01 to 80**
Engineering Services	**01 to 60**
Mineral Beneficiation	**01 to 80**

Sequence	Description	Example
Three letters	Industry name	MIN
Slash	/	/
Next letter	Whether **Q**P or **N**OS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Mine Driller (Exploration)

Qualification Pack MIN/Q0101

Sector Skill Council MINING

Guidelines for Assessment

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 proportion of marks for Theory and Skills Practical for each PC
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack

				Marks Allocation	
Assessment outcomes	Assessment Criteria for outcomes	Total Mark (100)	Out Of	Theory	Skills Practical
			100	**30**	**70**
1. MIN/N0101: Worksite identification and inspection	PC1.Check that the tracks to the camp and work sites are suitable for drilling, support and emergency vehicle access.	25	2	1	1
	PC2.Check that the prepared ground or constructed pad is level, stable and load bearing.		3	1	2
	PC3.Check that supply of water and haulage of water is arranged.		2	0	2
	PC4. Ensure that Sumps have been constructed to contain all drilling fluids and drilling mud etc. and are barricaded to prevent inadvertent access.		2	0	2
	PC5. Check and ensure that, edge protection is in place for the drill site.		3	1	2
	PC6.Follow the recommendations of the original equipment manufacturer (OEM) for rig movement. Ensure that the OEM prescribed limit for angles of inclination are followed during movement and setting up of drills.		3	1	2

	PC7.To ensures that the drill rig and service vehicles are positioned and set-up to minimize exposure of personnel to drilling hazards. Erect safety signs/barriers.		3	1	2
	PC8.To organizes place for spares, fuels, daily consumables, and proper place for indexing and storing cores.		3	0	3
	PC9.Check drilling machine positioning as per survey plan.		2	1	1
	P10.Ensure electrical and communication lines are laid properly.		2	1	1
		Total	**25**	**7**	**18**
2. MIN/N0102: Pre-operation check and Drilling operation (including reporting).	PC1. Understand the drilling plan from the Geologist. Understand drill site information for efficient operation, to receive idea about Likely stratigraphy /geology/type of rock to be encountered etc.	35	2	1	1
	PC2. To prepare the drilling plan based on type strata and type of drilling machine (Rotary/percussive, hydro static). To plan between core drilling and non-core drilling.		3	1	2
	PC3. Allocate judicious time limit.		3	1	2
	PC4. When designing a drilling program, assess the likelihood (e.g. using geological or hydrological data) of intersecting gas-bearing strata. Implement procedures for monitoring and managing hazardous gases released during drilling, and ensure workers are trained in their application		1	1	0
	PC5. Carry our pre-operations check as per OEM checklist.		3	1	2
	PC6. Visually check the undercarriage and super structures of the drill.		2	0	2
	PC7. Check all controls, gauges, warning lamp and other safety devices.		2	0	2
	PC8. Check that all electrical supply, hydraulic lines, water lines, pneumatic lines etc. are mounted securely and without any leakages.		2	0	2
	PC9.Ensure that crown blocks are mounted securely.		2	0	2
	PC10. Check that pipe hoists are functioning properly.		2	0	2
	PC11. Check that 'mud pump' is functional and mud pits are ready.		2	0	2
	PC12.Lubricate and grease as required for pins and pivot points.		2	1	1
	PC13. Keep footplates and steps clean and free from mud, dirt and oil.		1	0	1
	PC14. Follow drilling plan and ensure quality core samples.		2	1	1
	PC15. Ensure core samples are collected from the core tubes, stored and catalogued properly. Ensure that Core		3	1	2

	traces and racks are arranged and indexed properly.				
	PC16. Ensure all machine consumables and spares (drill bits / compressed air / couplings/ rods etc.) are used to their maximum potential, Reduce downtime and wastage.		2	1	1
	PC17. Update the log book with the operation details and any servicing and further works to be done.		1	1	0
		Total	**35**	**10**	**25**
3. MIN/N0103 Routine check and maintenance on the Drill Rig	PC1. Carry out preliminary & visual checks. Observe any unusual noise, vibration, leak, spillage, accumulation etc. and seek corrective measures.	20	2	1	1
	PC2. To check gauges, indicators, and sensor are fully functional and inform Technician and Fitters for any major repair.		2	0	2
	PC3. Track machine operating hours to assess the right service schedule and notify technician.		2	0	2
	PC4. Help Mechanic or technician to change the consumables like filters, gear oil, seals as per prescribed schedule, Clean air filter dust bowls etc.		2	0	2
	PC5. Replace drill bits when required.		2	0	2
	PC6. Check proper functioning of mud pumps, ancillary services like hydraulic, pneumatic etc. Check for any leakage / damaged hoses. Drain water and sediment /fuel separators.		1	1	0
	PC7. Replenish coolants, lubricants and fluids. Check battery levels and condition of the terminals and carrying out cleaning / top ups if required.		1	0	1
	PC8. Carry out required lubrication, greasing and oil change as required.		1	0	1
	PC9. Clean footplates, pedals and steps free from mud, dirt, ice and snow.		1	0	1
	PC10. Update daily/routing maintenance sheets.		1	1	0
	PC11. To ensure proper disposal of waste material and broken parts at appropriate place.		1	1	0
	PC12. Check the machine parameters before restart of the machine operation.		1	1	0
	PC13. Assess when the problem is beyond his competence and report the problem to Technicians / Site engineer.		1	1	0
	PC14. Update the log book with works carried out and further works to be done.		2	0	2
		Total	**20**	**6**	**14**
4. MIN/N0901 Health and safety	PC1. Comply with occupational health and safety regulations adopted by the employer.	**20**	2	1	1
	PC2. Follow mining operations procedures with respect		2	1	1

	to materials handling and accidents.				
	PC3. Follow the correct safety steps in case of accident or major failure.		2	1	1
	PC4. Comply with safety regulations and procedures in case of fire hazard.		2	0	2
	PC5. Operate various grades of fire extinguishers.		2	1	1
	PC6. Work responsibly and as safe and careful as possible so as not to put the health and safety of self or others at risk, including members of the public		2	1	1
	PC7. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS.		2	0	2
	PC8. Deal with misfires as per statutory requirement		1	1	0
	PC9. Identify characteristics of post-blast fumes and take necessary precautions.		2	1	1
	PC10. Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection.		1	0	2
	PC11. Follow the manufacturer's instructions for care and safe operation of the equipment.		1	0	1
		Total	**20**	**7**	**13**