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 – Rig Mounted Drill Operator

SECTOR: MINING

SUB-SECTOR: Industrial Minerals

OCCUPATION: Mining/Quarrying Operations

REFERENCE ID: MIN/Q 0402

ALIGNED TO: NCO-2004/8111.40

Brief Job Description: A rig mounted drill operator drives and operates a drill machine which is a self-propelled machine used to drill shallow as well as deep holes in the soil and rock for blasting or for quarry operations. The holes are caused by crushing under percussion and/or by drill bit rotation causing abrasion. The drill operates on pneumatic hydraulic system and uses compressed air as power source. Operating a drill is a specialized task that can be safely performed only with adequate training and experience. Drill operators are also responsible for performing basic maintenance on the machine.

Personal Attributes: This job requires the individual to concentrate on the job at hand and complete it efficiently and effectively without any accidents so diligence and hard-working are desired attributes for individuals performing this role. He must also demonstrate strong work ethics, an ability to communicate courteously with co-workers, and must be good with following instructions of the supervisor.

1
# Qualifications Pack For Drill Operator

<table>
<thead>
<tr>
<th>Qualifications Pack Code</th>
<th>MIN/Q 0402</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Role</td>
<td>Rig Mounted Drill Operator</td>
</tr>
<tr>
<td></td>
<td>This job role is applicable in both national and international scenarios</td>
</tr>
<tr>
<td>Credits(NVEQF/NVQF/NSQF)</td>
<td>TBD</td>
</tr>
<tr>
<td>[OPTIONAL]</td>
<td></td>
</tr>
<tr>
<td>Sector</td>
<td>Mining</td>
</tr>
<tr>
<td></td>
<td>Drafted on 01/02/2014</td>
</tr>
<tr>
<td>Sub-sector</td>
<td>Industrial Minerals</td>
</tr>
<tr>
<td></td>
<td>Last reviewed on 24/03/2014</td>
</tr>
<tr>
<td>Occupation</td>
<td>Mining/Quarrying Operations</td>
</tr>
<tr>
<td></td>
<td>Next review date 24/03/2015</td>
</tr>
</tbody>
</table>

## Job Role

### Rig Mounted Drill Operator

<table>
<thead>
<tr>
<th>Role Description</th>
<th>Drives and operates a drill machine which is a self-propelled machine used to drill shallow as well as deep holes in the soil and rock for blasting or for quarry operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVEQF/NVQF level</td>
<td>Level 4</td>
</tr>
<tr>
<td>Minimum Educational Qualifications*</td>
<td>Class XII</td>
</tr>
</tbody>
</table>
| Mandatory Training | 1. Technical and gallery training as per first schedule, Mining Vocational Training Rules (MVTR) 1966.  
2. Refresher training if absent from mines for a period of one year or more before re-employment.  
3. Heavy Commercial Vehicle Driving License |
| Experience | No experience necessary |

## Applicable National Occupational Standards (NOS)

### Compulsory:

1. MIN/N 0404 ([Prepare Drill](#))  
2. MIN/N 0405 ([Perform Drill Operations](#))  
3. MIN/N 0406 ([Perform basic maintenance and troubleshooting on Drill](#))  
4. MIN/N 0407 ([Carry Out Reporting and Logging](#))  
5. MIN/N 0901 ([Health and Safety](#))

## Performance Criteria

As described in the relevant OS units
<table>
<thead>
<tr>
<th>Keywords /Terms</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector</td>
<td>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.</td>
</tr>
<tr>
<td>Sub-sector</td>
<td>Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.</td>
</tr>
<tr>
<td>Occupation</td>
<td>Occupation is a set of job roles, which perform similar/related set of functions in an industry.</td>
</tr>
<tr>
<td>Function</td>
<td>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.</td>
</tr>
<tr>
<td>Job Role</td>
<td>Job role defines a unique set of functions that together form a unique employment opportunity in an organization.</td>
</tr>
<tr>
<td>OS</td>
<td>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.</td>
</tr>
<tr>
<td>Performance Criteria</td>
<td>Performance Criteria are statements that together specify the standard of performance required when carrying out a task.</td>
</tr>
<tr>
<td>NOS</td>
<td>NOS are Occupational Standards which apply uniquely in the Indian context.</td>
</tr>
<tr>
<td>Qualifications Pack Code</td>
<td>Qualifications Pack Code is a unique reference code that identifies a qualifications pack.</td>
</tr>
<tr>
<td>Qualifications Pack</td>
<td>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.</td>
</tr>
<tr>
<td>Unit Code</td>
<td>Unit Code is a unique identifier for an Occupational Standard, which is denoted by an ‘N’.</td>
</tr>
<tr>
<td>Unit Title</td>
<td>Unit Title gives a clear overall statement about what the incumbent should be able to do.</td>
</tr>
<tr>
<td>Description</td>
<td>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.</td>
</tr>
<tr>
<td>Knowledge and</td>
<td>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.</td>
</tr>
<tr>
<td>Understanding</td>
<td></td>
</tr>
<tr>
<td>Organizational</td>
<td>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.</td>
</tr>
<tr>
<td>Context</td>
<td></td>
</tr>
<tr>
<td>Technical Knowledge</td>
<td>Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.</td>
</tr>
<tr>
<td>Core Skills or Generic Skills</td>
<td>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.</td>
</tr>
</tbody>
</table>
Overview

This unit is about preparing the Drill for activities that need to be carried out during a shift
<table>
<thead>
<tr>
<th>Unit Code</th>
<th>MIN/N 0404</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Title(Task)</td>
<td>Prepare Drill</td>
</tr>
<tr>
<td>Description</td>
<td>This unit is about preparing the Drill for activities that need to be carried out during a shift</td>
</tr>
<tr>
<td>Scope</td>
<td>This OS unit/task covers the following:</td>
</tr>
<tr>
<td></td>
<td>1. Conducting pre-operation checks to ensure the Drill is safe to use.</td>
</tr>
<tr>
<td></td>
<td>2. Recording details of checking and maintenance</td>
</tr>
<tr>
<td>Performance Criteria (PC) w.r.t. the Scope</td>
<td>Performance Criteria</td>
</tr>
<tr>
<td>Element</td>
<td>To be competent, the user/individual on the job must be able to:</td>
</tr>
<tr>
<td>Pre-operation checks</td>
<td>PC1. Adhere to time limits given by supervisor</td>
</tr>
<tr>
<td></td>
<td>PC2. Check various controls, gauges, warning lamp and other safety devices</td>
</tr>
<tr>
<td></td>
<td>PC3. Ensure that crown blocks are mounted securely.</td>
</tr>
<tr>
<td></td>
<td>PC4. Check all hose connections are in order, if using a compress air drill</td>
</tr>
<tr>
<td></td>
<td>PC5. Check that drilling equipment is in safe operating condition.</td>
</tr>
<tr>
<td></td>
<td>PC6. Perform visual checks to detect cracks, wear and tear or any damage that could result in structural weakness</td>
</tr>
<tr>
<td></td>
<td>PC7. Visually inspects to detect cracks or fractures in welded joints.</td>
</tr>
<tr>
<td></td>
<td>PC8. Apply grease to all greasing pins and pivot points</td>
</tr>
<tr>
<td></td>
<td>PC9. Check under carriage and superstructure in the drill.</td>
</tr>
<tr>
<td></td>
<td>PC10. The drilling site is clear of other mine workers to avoid any accidents.</td>
</tr>
<tr>
<td></td>
<td>PC11. Follow the manufacturer’s instructions which apply to the care and safe operation of the Drill.</td>
</tr>
<tr>
<td></td>
<td>PC12. Keep footplates and steps clean and free from mud, dirt and oil</td>
</tr>
<tr>
<td>Recording details</td>
<td>PC13. Maintain a checking/maintenance logbook to record all activities performed before starting the Drill</td>
</tr>
<tr>
<td></td>
<td>PC14. Inform supervisor of problems that are beyond scope of his role.</td>
</tr>
<tr>
<td>Knowledge and Understanding (K)</td>
<td>The user/individual on the job needs to know and understand:</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Regulatory context</td>
<td>KA1. Different types of mines and detail of the mine he is working in</td>
</tr>
<tr>
<td>(knowledge of safety guidelines specified by Director General of Mine Safety (DGMS))</td>
<td>KA2. Mine Organisation, time keeping, need for discipline and punctuality</td>
</tr>
<tr>
<td></td>
<td>KA3. Benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and Hygiene</td>
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<td>KA4. Code of traffic in specific areas of mine. Significance of fences</td>
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<td>KA5. Standing orders in force at the mine. Safety in the vicinity of machinery</td>
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<td>KA6. Shot-firing and Safety regulations. How and where to take shelter</td>
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<td></td>
<td>KA7. Tramways and siding, Haulage rooms, Winding rooms, Boilers, Electrical Gears</td>
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<tr>
<td></td>
<td>KA8. Duties of workmen under Mines act</td>
</tr>
<tr>
<td></td>
<td>KA9. Provision of wages, working hours and accident compensation as per Mines act</td>
</tr>
<tr>
<td></td>
<td>KA10. Knowledge of mining safety procedures</td>
</tr>
<tr>
<td></td>
<td>KA11. Outcome of violation of safely procedures</td>
</tr>
<tr>
<td></td>
<td>KA12. Precautions to be taken when handling explosives</td>
</tr>
<tr>
<td></td>
<td>KA13. Refresher training as per fourth schedule MVTR (1966) within one month of joining duties following absence from duties for a period exceeding one year.</td>
</tr>
<tr>
<td>B. Organizational Context (Knowledge of organization processes)</td>
<td>The user/individual on the job needs to know and understand:</td>
</tr>
<tr>
<td></td>
<td>KB1. Job specific documents e.g. daily maintenance checklist and importance of the same</td>
</tr>
<tr>
<td></td>
<td>KB2. Risk and impact of not following defined procedures/work instructions</td>
</tr>
<tr>
<td></td>
<td>KB3. Escalation matrix for reporting identified problems</td>
</tr>
<tr>
<td></td>
<td>KB4. Cost of equipment and loss for the company that results from damage of equipment</td>
</tr>
<tr>
<td></td>
<td>KB5. All direct /indirect cost of accidents to the company</td>
</tr>
<tr>
<td></td>
<td>KB6. Implications of delays in process to the company</td>
</tr>
<tr>
<td></td>
<td>KB7. Locally prepared emergency response /disaster management plan.</td>
</tr>
</tbody>
</table>
### A. Core Skills/ Generic Skills

**Writing Skills**
The user/individual on the job needs to know and understand how to:

- **SA1.** Fill out check-list /activity logbooks detailing maintenance activities conducted
- **SA2.** Fill out administrative forms

**Reading Skills**
The user/individual on the job needs to know and understand how to:

- **SA3.** Read operators’ manual
- **SA4.** Read and understand pre-operation checklist/ activity logbook
- **SA5.** Read and comprehend banners /signage

**Oral Communication (Listening and Speaking skills)**
The user/individual on the job needs to know and understand how to:

- **SA6.** Communicate with supervisors and peers in a proper manner adhering to the values of respect for individual

**Integrity**
The user/individual on the job needs to know and understand how to:

- **SA7.** Maintain integrity with respect to company property and time
- **SA8.** Resolve difficulties in relationships with colleagues amicably.

**Motivation**
The user/individual on the job needs to know and understand how to:

- **SA9.** Take responsibility for completing one’s own work assignment

### B. Technical Knowledge

The user/individual on the job needs to know and understand:

- **KC1.** Different types of drills and their specific use.
- **KC2.** Proper use and care of machine and cables, picks, bits, sharpening, shaping etc.
- **KC3.** Specification and details of blast hole drills used in open-cast mines
- **KC4.** Instrument panel, various controls their location and operation
- **KC5.** Lubrication of drills
- **KC6.** Various levers and switches in order to operate the Drill properly
- **KC7.** Different types of drill bits and their uses
- **KC8.** Common terminology vis-à-vis drilling
- **KC9.** Precautions against falls/gas/coal dust
- **KC10.** Routine checks essential before starting drill operations
- **KC11.** Common troubles and remedies.
- **KC12.** Signage, mining area signs and other safety and emergency signals
- **KC13.** Response to emergencies such as fire, accident, major failure etc.
## B. Professional Skills

### Reliability

The user/individual on the job needs to know and understand how to:

- **SA11.** Avoid absenteeism
- **SA12.** Work in a disciplined environment
- **SA13.** Be punctual

### Time Management

The user/individual on the job needs to know and understand how to:

- **SB1.** Prioritize and execute tasks within the scheduled time limits

### Analytical Thinking

The user/individual on the job should be able to:

- **SB2.** Suggest methods to avoid accidents/errors while operating Drill
- **SB3.** Identify possible ways to improve operational efficiency

### Organizational Skills

The user/individual on the job needs to know and understand how to:

- **SB4.** Be a team player and achieve collective goals
- **SB5.** Concentrate on task at hand and complete it without errors

### Fault Diagnostic and Maintenance

The user/individual on the job needs to know and understand how to:

- **SB6.** Check for damage in Drill components e.g. various pneumatic parts, compressor, drill bit and mechanical parts
# NOS Version Control

<table>
<thead>
<tr>
<th>NOS Code</th>
<th>MIN/N 0404</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits (NVEQF/NVQF/NSQF)</td>
<td>Level 4</td>
</tr>
<tr>
<td>Sector</td>
<td>Mining</td>
</tr>
<tr>
<td>Sub-sector</td>
<td>Industrial Minerals</td>
</tr>
<tr>
<td>Occupation</td>
<td>Mining/Quarrying Operations</td>
</tr>
</tbody>
</table>

Back to QP
Overview

This unit is about performing drilling operation using a rig mounted drill machine
<table>
<thead>
<tr>
<th>Description</th>
<th>This unit is about performing drilling operation using a rig mounted drill machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope</td>
<td>This OS unit/task covers the following:</td>
</tr>
<tr>
<td></td>
<td>1. Travelling of the drill by Tramming or Towing</td>
</tr>
<tr>
<td></td>
<td>2. Positioning and mounting the drill</td>
</tr>
<tr>
<td></td>
<td>3. Perform drilling operation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance Criteria (PC) w.r.t. the Scope</th>
<th>Performance Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travelling the drill</td>
<td>To be competent, the user/individual on the job must be able to:</td>
</tr>
<tr>
<td></td>
<td>PC1. Plan and organize the job according to given instructions</td>
</tr>
<tr>
<td></td>
<td>PC2. Organise daily consumables according to the day’s plan</td>
</tr>
<tr>
<td></td>
<td>PC3. Operate propelling motor control levers to smoothly move the drill machine in</td>
</tr>
<tr>
<td></td>
<td>all four directions.</td>
</tr>
<tr>
<td></td>
<td>PC4. Ensure all necessary precautions are adhered to before towing the drill to a</td>
</tr>
<tr>
<td></td>
<td>distant site.</td>
</tr>
<tr>
<td></td>
<td>PC5. Raise drill guide to 1.5m above ground level and make it horizontal to prevent</td>
</tr>
<tr>
<td></td>
<td>any damage in transit.</td>
</tr>
<tr>
<td></td>
<td>PC6. Ensure that the OEM prescribed limit for angles of inclination are followed</td>
</tr>
<tr>
<td></td>
<td>during tramming and setting up of drills.</td>
</tr>
<tr>
<td></td>
<td>PC7. Ensure a stable base for mounting the drill</td>
</tr>
<tr>
<td></td>
<td>PC8. Avoid accidental fall of drill rod / hammer / bit in the drilled blast hole</td>
</tr>
<tr>
<td></td>
<td>PC9. Adjust the tracks by methodically manipulating the positions of oscillation</td>
</tr>
<tr>
<td></td>
<td>cylinder valve and hydraulic track valve.</td>
</tr>
<tr>
<td>Perform drilling</td>
<td>PC10. Follow drill depth plans and ensure quality of holes by dipping and re-drilling</td>
</tr>
<tr>
<td></td>
<td>before leaving drill area</td>
</tr>
<tr>
<td></td>
<td>PC11. Ensure that the highest level of quality is consistently maintained</td>
</tr>
<tr>
<td></td>
<td>PC12. Ensure all associated products (couplings/rods etc) are used to their maximum</td>
</tr>
<tr>
<td></td>
<td>potential, while ensuring their sustainability</td>
</tr>
<tr>
<td></td>
<td>PC13. Reduce downtime and wastage</td>
</tr>
<tr>
<td></td>
<td>PC14. Demonstrate caution against hazards of drill machine in operation.</td>
</tr>
</tbody>
</table>
## A. Regulatory context
(knowledge of safety guidelines specified by Director General of Mine Safety (DGMS))

The user/individual on the job needs to know and understand:

- **KA1.** Different types of mines and detail of the mine he is working in
- **KA2.** Mine Organisation, time keeping, need for discipline and punctuality
- **KA3.** Benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and Hygiene
- **KA4.** Code of traffic in specific areas of mine. Significance of fences
- **KA5.** Standing orders in force at the mine. Safety in the vicinity of machinery
- **KA6.** Shot-firing and Safety regulations. How and where to take shelter
- **KA7.** Tramways and siding, Haulage rooms, Winding rooms, Boilers, Electrical Gears
- **KA8.** Duties of workmen under Mines act
- **KA9.** Provision of wages, working hours and accident compensation as per Mines act
- **KA10.** Knowledge of mining safety procedures
- **KA11.** Outcome of violation of safely procedures
- **KA12.** Precautions to be taken when handling explosives
- **KA13.** 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. Organizational Context
(Knowledge of the organization and its processes)

The user/individual on the job needs to know and understand:

- **KB1.** Types of documentation in organization e.g. daily maintenance checklist and importance of the same
- **KB2.** Risk and impact of not following defined procedures/work instructions
- **KB3.** Rules and regulations of mine as per standard operating procedure (SOP)
- **KB4.** Risk and impact of not following company’s SOP
- **KB5.** Escalation matrix for reporting identified problems
- **KB6.** The duties and responsibilities associated with his job role as per the employer
- **KB7.** Cost of delays to the company
- **KB8.** Direct /Indirect cost of accidents to the company
- **KB9.** Locally prepared emergency response /disaster management plan.
<table>
<thead>
<tr>
<th>C. Technical Knowledge</th>
<th>The user/individual on the job needs to know and understand:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KC1. General Knowledge about Drilling Machines. Diesel Engines, Electric Motors and compressors</td>
</tr>
<tr>
<td></td>
<td>KC2. Different types of drills and their specific use.</td>
</tr>
<tr>
<td></td>
<td>KC3. Various levers and switches in order to operate the Drill properly</td>
</tr>
<tr>
<td></td>
<td>KC4. Drilling pattern and sequence of operations.</td>
</tr>
<tr>
<td></td>
<td>KC5. Different types of drill bits and their uses</td>
</tr>
<tr>
<td></td>
<td>KC6. Common terminology vis-à-vis drilling</td>
</tr>
<tr>
<td></td>
<td>KC7. Operation of different assemblies and sub-assemblies such as under-carriage, compressors, hydraulic/pneumatic systems.</td>
</tr>
<tr>
<td></td>
<td>KC8. Drill safety devices fitted on compressors</td>
</tr>
<tr>
<td></td>
<td>KC9. Correct sequence of operation of different levers.</td>
</tr>
<tr>
<td></td>
<td>KC10. Transmissions of compressed air from compressor to Drill head.</td>
</tr>
<tr>
<td></td>
<td>KC11. Selection of proper rotation speed and effect of excessive speeds on bit life</td>
</tr>
<tr>
<td></td>
<td>KC12. Specification and details of blast hole drills used in open-cast mines</td>
</tr>
<tr>
<td></td>
<td>KC13. Instrument panel, various controls their location and operation</td>
</tr>
<tr>
<td></td>
<td>KC14. Lubrication system of drills</td>
</tr>
<tr>
<td></td>
<td>KC15. Drill hole design and impact of poor drill hole design on blasting</td>
</tr>
<tr>
<td></td>
<td>KC16. Understanding of fly rocks and air-blast</td>
</tr>
<tr>
<td></td>
<td>KC17. Inclined hole, azimuth, deviation, dip</td>
</tr>
<tr>
<td></td>
<td>KC18. Safety during drilling, marching and other operations</td>
</tr>
<tr>
<td></td>
<td>KC19. Dangers from loose house joints and defective Houses.</td>
</tr>
<tr>
<td></td>
<td>KC20. Comply with all company Quality, Health, Safety and Environment policies and procedures</td>
</tr>
<tr>
<td></td>
<td>KC21. Signage, mining area signs and other safety and emergency signals</td>
</tr>
<tr>
<td></td>
<td>KC22. Wet cutting, drilling method, drilling pattern</td>
</tr>
<tr>
<td></td>
<td>KC23. Dangers from cutting/drilling in stone band</td>
</tr>
<tr>
<td></td>
<td>KC24. Slope failures, Joint spacing, Caving</td>
</tr>
<tr>
<td></td>
<td>KC25. Fleeting of ore cutting machine on gradient</td>
</tr>
<tr>
<td></td>
<td>KC27. Applicable regulations</td>
</tr>
<tr>
<td>Skills (S)</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>A. Core Skills/ Generic Skills</strong></td>
<td></td>
</tr>
<tr>
<td>Reading Skills</td>
<td></td>
</tr>
<tr>
<td>The user/individual on the job needs to know and understand how to:</td>
<td></td>
</tr>
<tr>
<td>SA1. Read schedule given by supervisor</td>
<td></td>
</tr>
<tr>
<td>SA2. Read and adhere to signage as per standard mining nomenclature</td>
<td></td>
</tr>
<tr>
<td>SA3. Read operators’ manuals</td>
<td></td>
</tr>
<tr>
<td>Oral Communication (Listening and Speaking skills)</td>
<td></td>
</tr>
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<td>SB7. Ensure adequate knowledge sharing with supervisors and subordinates</td>
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</table>
### Drill operations

The user/individual on the job needs to know and understand how to:

**SB8.** Operate propelling motor control levers to smoothly move the drill machine in all four directions.

**SB9.** Ensure all necessary precautions are adhered to before towing the drill to a distant site.

**SB10.** Ensure that the highest level of quality is consistently maintained

**SB11.** Ensure all associated products (couplings/rods etc) are used to their maximum potential

### Fault Diagnostic and Maintenance

The user/individual on the job needs to know and understand how to:

**SB12.** Check for damage in Drill components e.g. drill tool, pneumatic sub-assembly.
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### Sector
Mining

### Sub-sector
Industrial Minerals

### Occupation
Mining/Quarrying Operations

[Back to QP](#)
National Occupational Standard

Overview

This unit is about performing routine maintenance and troubleshooting on the Drill.
### Unit Title(Task)

**Perform routine maintenance and troubleshooting on the Drill**

### Description

This unit is about performing routine maintenance and troubleshooting tasks on the Drill

### Scope

This OS unit/task covers the following:

1. Routine maintenance in accordance with the manufacturer’s recommendations and company procedures
2. Basic diagnostics and Troubleshooting

### Performance Criteria (PC) w.r.t. the Scope

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<td>To be a competent Drill operator, the individual on the job must also be able to:</td>
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<td>PC1. Track machine operating hours to assess the right service schedule.</td>
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<tr>
<td></td>
<td>PC2. Clean air filter dust bowls</td>
</tr>
<tr>
<td></td>
<td>PC3. Clean footplates, pedals and steps free from mud, dirt, ice and snow</td>
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<tr>
<td></td>
<td>PC4. Drain water and sediment /fuel separators</td>
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<tr>
<td></td>
<td>PC5. Replenish coolants, lubricants and fluids</td>
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<tr>
<td></td>
<td>PC6. Grease all greasing pins and pivot points</td>
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<td></td>
<td>PC7. Check battery levels and condition of the terminals and carrying out minor adjustments if required.</td>
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<tr>
<td></td>
<td>PC8. Check and maintain the tyre rims, air pressure, wheel nuts and treads.</td>
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<tr>
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<td>PC9. Check structural safety of the drill machine.</td>
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<tr>
<td></td>
<td>PC10. Complete timely and legibly daily/weekly maintenance sheets</td>
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<tr>
<td><strong>Troubleshooting</strong></td>
<td>PC11. Ensure the machine is on firm and level ground before attempting to carry out any maintenance activity.</td>
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<td></td>
<td>PC12. Ensure that no maintenance task on the engine is performed when running or still hot.</td>
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<td>PC13. Ensure proper Lock out and Tag out scenario to avoid any untoward incident triggered due to unknowingly operation of machine / system under maintenance</td>
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<tr>
<td></td>
<td>PC14. Assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel</td>
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<td>PC15. Complete timely and legibly defect sheets as provided by the company</td>
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### Knowledge and Understanding (K)

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<td>KA1. Different types of mines and detail of the mine he is working in</td>
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<td>KA2. Mine Organisation, time keeping, need for discipline and punctuality</td>
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<td>KA3. Benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and Hygiene</td>
</tr>
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<td>KA4. Code of practice in specific areas of mine. Significance of fences</td>
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<td>KA5. Standing orders in force at the mine. Safety in the vicinity of machinery</td>
</tr>
<tr>
<td></td>
<td>KA6. Shot-firing and Safety regulations. How and where to take shelter</td>
</tr>
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<td></td>
<td>KA7. Tramways and siding, Haulage rooms, Winding rooms, Boilers, Electrical Gears</td>
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<td></td>
<td>KA8. Duties of workmen under Mines act</td>
</tr>
<tr>
<td></td>
<td>KA9. Provision of wages and working hours as per Mines act</td>
</tr>
<tr>
<td></td>
<td>KA10. Knowledge of mining safety procedures</td>
</tr>
<tr>
<td></td>
<td>KA11. Outcome of violation of safely procedures</td>
</tr>
<tr>
<td></td>
<td>KA12. Precautions to be taken when handling explosives</td>
</tr>
<tr>
<td></td>
<td>KA13. Refresher training as per fourth schedule MVTR (1966) within one month of joining duties following absence from duties for a period exceeding one year</td>
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<table>
<thead>
<tr>
<th>B. Organizational Context</th>
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<tr>
<td>(Knowledge of the company/organization and its processes)</td>
<td>KB1. Types of documentation in organization e.g. daily maintenance checklist and importance of the same</td>
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<td></td>
<td>KB2. Risk and impact of not following defined procedures/work instructions</td>
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<td>KB3. Rules and regulations of mine as per standard operating procedure (SOP)</td>
</tr>
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<td></td>
<td>KB4. Risk and impact of not following company’s SOP</td>
</tr>
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<td></td>
<td>KB5. Escalation matrix for reporting identified problems</td>
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<th>B. Technical Knowledge</th>
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<td>KC1. Different types of drills and their specific use</td>
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<td>KC2. Operation of different assemblies and sub-assemblies such as undercarriage, compressors, hydraulic/pneumatic systems.</td>
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<td></td>
<td>KC3. Specification and details of blast hole drills used in open-cast mines</td>
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<td></td>
<td>KC4. Instrument panel, various controls their location and operation</td>
</tr>
<tr>
<td></td>
<td>KC5. Lubrication of drills</td>
</tr>
<tr>
<td></td>
<td>KC6. Various levers and switches in order to operate the Drill properly</td>
</tr>
</tbody>
</table>
**KC7.** Drilling pattern and sequence of operations.

**KC8.** Different types of drill bits and their uses

**KC9.** Common terminology vis-à-vis drilling

**KC10.** Safety during drilling, marching and other operations

**KC11.** comply with all company Quality, Health, Safety and Environment policies and procedures

**KC12.** Signage, mining area signs and other safety and emergency signals

**KC13.** Wet cutting, drilling method, drilling pattern

**KC14.** Dangers from cutting/drilling in stone band,

**KC15.** Fleet of ore cutting machine on gradient

**KC16.** Keeping machinery reasonably free from dust.

**KC17.** Response to emergencies such as fire, accident, major failure etc

<table>
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<th>Skills (S)</th>
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<tr>
<td><strong>A. Core Skills/</strong></td>
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<td><strong>Reading Skills</strong></td>
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<td>The user/individual on the job needs to know and understand how to:</td>
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<tr>
<td><strong>SA1.</strong> Read schedule given by supervisor</td>
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<tr>
<td><strong>SA2.</strong> Read and adhere to signage as per standard mining nomenclature</td>
</tr>
<tr>
<td><strong>SA3.</strong> Read operators’ manuals</td>
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**Oral Communication (Listening and Speaking skills)**

| The user/individual on the job needs to know and understand how to: |
| **SA4.** Communicate with supervisors and peers |

**Integrity**

| The user/individual on the job needs to know and understand how to: |
| **SA5.** Maintain integrity with respect to company property and time |
| **SA6.** Communicate with supervisors and peers in a proper manner adhering to the values of respect for individual |
| **SA7.** Resolve any difficulties in relationships with colleagues or get help from an appropriate person, in a way that preserves goodwill and trust |

**Motivation**

| The user/individual on the job needs to know and understand how to: |
| **SA8.** Take responsibility for completing one’s own work assignment |
| **SA9.** Take initiative to enhance/learn skills in one’s area of work |
| **SA10.** Reflect and act upon one’s learning from experience |
### B. Professional Skills

#### Reliability

The user/individual on the job needs to know and understand how to:

- SA11. Avoid absenteeism
- SA12. Work in a disciplined environment
- SA13. Be punctual

#### Analytical Thinking

The user/individual on the job needs to know and understand how to:

- SB1. Suggest methods to avoid accidents/errors while operating Drill
- SB2. Identify possible ways to improve operational efficiency

#### Time Management

The user/individual on the job needs to know and understand how to:

- SB3. Prioritize and execute tasks within the scheduled time limits

#### Organizational Skills

The user/individual on the job needs to know and understand how to:

- SB4. Adjust according to capacity and manpower needs during peak and non-peak hours
- SB5. Be a team player and achieve collective goals
- SB6. Concentrate on task at hand and complete it without errors
- SB7. Ensure adequate knowledge sharing with supervisors and subordinates

#### Drill Operations

The user/individual on the job needs to know and understand how to:

- SB8. Perform driving operations such as forward, reverse, ‘U’ turn, tight spot maneuvering, etc.
- SB9. Select and use the correct combination of levers to operate the Drill.

#### Fault Diagnostic and Maintenance

The user/individual on the job needs to know and understand how to:

- SB11. Check for damage in Drill components e.g. engine components, tracks, hydraulic arms, Blade, parking break, main horn, etc.
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National Occupational Standard

Overview

This unit is about reporting and documentation
**Unit Code** | MIN/N 0407  
---|---  
**Unit ID (Task)** | Carry out reporting and documentation  
**Description** | This unit is about carrying out reporting and documentation  
**Scope** | This unit/task covers the following:  
1. Reporting of problem/incidents etc.  
2. Reporting and Documentation  

| Performance Criteria (PC) w.r.t. the Scope |  
|---|---  
| **Element** | Performance Criteria  
| Reporting | To be competent, the user/individual on the job must be able to:  
PC1. Report problems/incidents as applicable in a timely manner  
PC2. Report to the appropriate authority as laid down by the employer  
PC3. Follow reporting procedures as prescribed by the employer  
| Recording and Documentation | PC4. Identify documentation to be completed relating to one’s role  
PC5. Record details accurately using the appropriate format  
PC6. Complete all documentation within stipulated time.  
PC7. Make sure documents are available to all appropriate authorities to inspect  
| Knowledge and Understanding (K) | The user/individual on the job needs to know and understand:  
KA1. Different types of mines and detail of the mine he is working in  
KA2. Commonly used mining terminology - Benches (width, height etc.), haul roads (width, gradient), stability of slopes, over hang, under cut, high side etc.  
KA3. Code of traffic in specific areas of mine. Significance of fences  
KA4. Duties of workmen under Mines act  
KA5. Provision of wages, working hours and accident compensation as per Mines act  
KA6. Knowledge of mining safety procedures  
KA7. Outcome of violation of safely procedures  
KA8. Precautions to be taken when handling heavy equipment.  

### B. Organizational Context (Knowledge of the organization and its processes)

The user/individual on the job needs to know and understand:

- KB1. Types of documentation in organization e.g. daily maintenance checklist and importance of the same
- KB2. Risk and impact of not following defined procedures/work instructions
- KB3. Rules and regulations of mine as per standard operating procedure

### Skills (S)

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<td>SA1. Fill up documentation applicable to one’s role</td>
<td>SA2. Read English and/or vernacular language with few pauses and a constant speed</td>
<td>SA6. Express statements or information clearly so that others can hear and understand</td>
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<td>SA3. Read and understand manuals, health and safety instructions,</td>
<td>SA7. Participate in and understand the main points of simple discussions</td>
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<td>SA8. Respond appropriately to any queries</td>
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<td>SA9. Communicate with supervisor</td>
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National Occupation Standards

Overview

This unit is about health and safety measures critical in open-cast mines
### Unit Title (Task)
Health and Safety

### Description
This unit is about health and safety measures critical in open-cast mines.

### Scope
This OS unit/task covers the following:
1. Health and safety measures critical for all personnel in open-cast mines

### Performance Criteria (PC) w.r.t. the Scope

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<td>PC2. Follow mining operations procedures with respect to materials handling and accidents.</td>
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<td>PC3. Follow the correct safety steps in case of fire, accident, major failure.</td>
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<td>PC4. Work responsibly and carefully so as not to put the health and safety of self or others at risk.</td>
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<td>PC5. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS.</td>
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<td>PC6. Comply with safety regulations and procedures in case of fire hazard.</td>
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<td>PC7. Operate various grades of fire extinguishers.</td>
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<td>PC8. 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.</td>
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<td>PC9. Demonstrate careful practices in handling explosives and heavy machinery.</td>
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<td>PC10. Identify characteristics of post-blast fumes and take necessary precautions.</td>
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### Knowledge and Understanding (K)

<table>
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<td>KA3. Code of practice in specific areas of mine. Significance of fences</td>
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<td>KA4. Standing orders in force at the mine. Safety in the vicinity of machinery</td>
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<td>KA6. Knowledge of mining safety procedures</td>
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<td>KA7. Outcome of violation of safety procedures</td>
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<td>KA9. Environmental impact of mining</td>
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<td>KA10. Sources of dust, noise and vibration and measures to minimise</td>
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<td>KA11. Hazardous material safety and security rules and regulations as prescribed by DGMS</td>
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### List of Abbreviations

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<th>Description</th>
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<td>National occupation standards</td>
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<td>Qualification pack</td>
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<td>National vocational education qualifications framework</td>
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<td>NSQF</td>
<td>National skills qualifications framework</td>
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<td>Heavy earth moving machinery</td>
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<td>DGMS</td>
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<td>Performance Criteria</td>
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<td>Federation of Indian mineral industries</td>
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