



Skill Council For Mining Sector



## Qualification Pack



# Jumbo Drill Operator

Electives: U/G Coal/ U/G Metal

QP Code: MIN/Q1203

Version: 3.0

NSQF Level: 4

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## Qualification Pack

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### MIN/Q1203: Jumbo Drill Operator

#### Brief Job Description

A Jumbo Drill operator is responsible for the operation of a single/double/multi boom jumbo drilling rig for underground mine development and installation of roof and side support. Jumbo drill operator requires the knowledge of layout of mine workings, cross-sectional dimensions of working face, drilling and blasting pattern and design, roof and side support plan as per approved SSR (Systematic Support Rule), operation and maintenance module of jumbo drill machine. Individual will be a major contributor in increasing and enhancing the productivity of machine and manpower safety at workplace.

#### Personal Attributes

This job requires the individual to concentrate on the job at hand and complete it efficiently and effectively without any accidents. Diligence and hardworking are the desired attributes for individuals performing this role. He must also demonstrate strong work ethics, an ability to communicate courteously with coworkers and must be good with following instructions of supervisor.

#### Applicable National Occupational Standards (NOS)

##### Compulsory NOS:

1. [MIN/N1208: Prepare Jumbo drill machine for operation](#)
2. [MIN/N1209: Perform Operations on Jumbo Drill](#)
3. [MIN/N1210: Perform routine maintenance and troubleshooting on the jumbo drill machine](#)
4. [DGT/VSQ/N0102: Employability Skills \(60 Hours\)](#)

##### Electives(mandatory to select at least one):

###### Elective 1: U/G Coal

This unit is about adhering to health, safety and environmental guidelines in Underground Coal Mines (UCM) during execution of various tasks, and operations and maintenance.

1. [MIN/N1704: Follow Health, Safety, and Environmental guidelines for underground coal mines \(Including Mine Vocational Training Rule and Mine Rescue Rule\)](#)

###### Elective 2: U/G Metal

This unit is about adhering to health, safety and environmental guidelines in Underground Metalliferous Mines (UMM) during execution of various tasks, and operations and maintenance.



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1. [MIN/N1702: Follow Health, Safety and Environmental guidelines for Underground Metalliferous Mines \(UMM\) \(Including Mine Vocational Training Rule and Mine Rescue Rule\)](#)

### Qualification Pack (QP) Parameters

<b>Sector</b>	Mining
<b>Sub-Sector</b>	Mining Operation
<b>Occupation</b>	Drilling/Cutting
<b>Country</b>	India
<b>NSQF Level</b>	4
<b>Credits</b>	21
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/8111.0100, NCO-2015/8111.0200
<b>Minimum Educational Qualification &amp; Experience</b>	8th grade pass plus 2-year NTC plus 1 Year NAC OR 8th pass plus 1-year NTC plus 1-Year NAC plus CITS OR 10th grade pass and pursuing continuous schooling OR 10th grade pass (with 2 years relevant experience) OR Previous relevant Qualification of NSQF Level (3.0 Jr. Jumbo Operator with minimum education as 5th Grade pass with 2 years relevant experience)
<b>Minimum Level of Education for Training in School</b>	
<b>Pre-Requisite License or Training</b>	NA
<b>Minimum Job Entry Age</b>	20 Years
<b>Last Reviewed On</b>	NA
<b>Next Review Date</b>	17/11/2025
<b>NSQC Approval Date</b>	17/11/2022



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<b>Version</b>	3.0
<b>Reference code on NQR</b>	2022/MIN/SCMS/06984
<b>NQR Version</b>	1

### Remarks:

Total Notional Duration: 510 Hours = Domain Theory Duration: 120 Hours+ Domain Practical Duration: 150 Hours + Domain OJT (Mandatory) Duration: 180 Hours + Employability Skills Duration: 60 Hours



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### MIN/N1208: Prepare Jumbo drill machine for operation

#### Description

This unit is about preparing the machine for drilling operations.

#### Scope

The scope covers the following :

- Conducting pre-operation checks to ensure jumbo drilling rig is safe to use

#### Elements and Performance Criteria

*Conduct pre-operation checks to ensure jumbo drilling rig is safe to use*

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

- PC1.** prioritize and schedule work required by the department
- PC2.** perform minor repairs, such as changing striker bars, couplings, water tubes and hose clamps
- PC3.** check various controls, gauges, warning lamp and other safety devices, to ensure drilling equipment is in safe operating condition
- PC4.** ensure that crown blocks are mounted securely
- PC5.** check all hose connections are in order, in case of a compress air drill
- PC6.** perform visual checks to detect cracks, wear and tear or any damage that could result in structural weakness
- PC7.** apply grease to all greasing pins and pivot points
- PC8.** check under carriage and superstructure in the drill
- PC9.** clear the drilling site of other mine workers to avoid any accidents
- PC10.** follow the manufacturer's instructions which apply to the care and safe operation of the drill
- PC11.** keep footplates and steps clean and free from mud, dirt and oil
- PC12.** conduct prestart check including oil level, coolant level, air pressure, air leakages, etc.
- PC13.** check earthing of drill machine and other safety aspects such as fire, etc.
- PC14.** ensure working area is safe for personnel and equipment to perform work such as ensuring electrical installations and other services are clear of the drilling area
- PC15.** check ground conditions at the face and implement ground control measures, according to site requirements
- PC16.** record all activities in maintenance logbook before starting the drill
- PC17.** inform supervisor of problems that are beyond scope of his role

#### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** different types of mines and detail of the mine a person is working in



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- KU2.** mine organisation, time keeping, need for discipline and punctuality
- KU3.** benching in quarries, dressing of overhangs, undercuts, fencing, first aid and hygiene
- KU4.** code of traffic in specific areas of mine and significance of fences
- KU5.** standing orders in force at the mine
- KU6.** shot-firing and safety regulations
- KU7.** tramways and siding, haulage rooms, winding rooms, boilers, electrical gears
- KU8.** duties of workmen
- KU9.** provision of wages, working hours and accident compensation as per Mines act
- KU10.** technical problems that may arise in jumbo during the operation
- KU11.** mining safety procedures
- KU12.** impact of violation of safety procedures
- KU13.** refresher training as per fourth schedule MVTR (1966) within one month of joining duties following absence from duties for a period exceeding one year
- KU14.** job specific documents e.g. daily maintenance checklist and importance of the same
- KU15.** risk and impact of not following defined Standard Operating Procedure (SOP)
- KU16.** escalation matrix for reporting identified problems
- KU17.** cost of equipment and loss for the company that results from damage of equipment
- KU18.** all direct /indirect cost of accidents to the company
- KU19.** systematic supprot rule (SSR) and emergency management plan (EMP)
- KU20.** specifications of jumbo drilling rig and its specific use
- KU21.** proper use and care of machine and cables, picks, bits, sharpening, shaping, etc.
- KU22.** specification and details of jumbo drills used in mines
- KU23.** instrument panel, various controls their location and operation
- KU24.** lubrication of jumbo drilling rig
- KU25.** various levers and switches in order to operate the drill properly
- KU26.** different types of drill bits and their uses
- KU27.** common terminology vis-à-vis jumbo drilling
- KU28.** precautions against falls/gas/coal dust
- KU29.** routine checks essential before starting operations
- KU30.** operation of large jumbos single/ double boom
- KU31.** signage, mining area signs and other safety and emergency signals
- KU32.** interlocking of drill safety aspects etc.
- KU33.** construction and operation of different assemblies and sub-assemblies

### Generic Skills (GS)

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

- GS1.** note down observations (if any)
- GS2.** write information documents or enter the information in online Enterprise Resource Planning (ERP) systems under guidance of the supervisor



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- GS3.** read and interpret symbols and measurements
- GS4.** read information documents
- GS5.** analyse the available information about the site
- GS6.** read mine plans and specifications for underground mining
- GS7.** discuss task lists, schedules and activities
- GS8.** effectively communicate
- GS9.** comprehend the information given by various sources about the sites
- GS10.** communicate with surveyors, geologists, and engineers to optimise drill patterns and metres
- GS11.** use common sense and make judgments during day to day basis
- GS12.** use intuition to detect any potential problems which could arise
- GS13.** complete the assigned tasks with minimum supervision
- GS14.** complete the job within timelines and quality norms
- GS15.** detect problems in day to day tasks
- GS16.** discuss possible solution with the supervisor for problem solving
- GS17.** make decisions in emergency conditions



## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Conduct pre-operation checks to ensure jumbo drilling rig is safe to use</i>	30	50	-	20
<b>PC1.</b> prioritize and schedule work required by the department	1	2	-	1
<b>PC2.</b> perform minor repairs, such as changing striker bars, couplings, water tubes and hose clamps	1	3	-	1
<b>PC3.</b> check various controls, gauges, warning lamp and other safety devices, to ensure drilling equipment is in safe operating condition	2	3	-	2
<b>PC4.</b> ensure that crown blocks are mounted securely	2	3	-	2
<b>PC5.</b> check all hose connections are in order, in case of a compress air drill	2	3	-	2
<b>PC6.</b> perform visual checks to detect cracks, wear and tear or any damage that could result in structural weakness	2	3	-	1
<b>PC7.</b> apply grease to all greasing pins and pivot points	2	3	-	1
<b>PC8.</b> check under carriage and superstructure in the drill	2	3	-	1
<b>PC9.</b> clear the drilling site of other mine workers to avoid any accidents	2	3	-	1
<b>PC10.</b> follow the manufacturer's instructions which apply to the care and safe operation of the drill	2	3	-	1
<b>PC11.</b> keep footplates and steps clean and free from mud, dirt and oil	1	3	-	1
<b>PC12.</b> conduct prestart check including oil level, coolant level, air pressure, air leakages, etc.	2	3	-	1
<b>PC13.</b> check earthing of drill machine and other safety aspects such as fire, etc.	2	3	-	1



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC14.</b> ensure working area is safe for personnel and equipment to perform work such as ensuring electrical installations and other services are clear of the drilling area	2	3	-	1
<b>PC15.</b> check ground conditions at the face and implement ground control measures, according to site requirements	2	3	-	1
<b>PC16.</b> record all activities in maintenance logbook before starting the drill	1	3	-	1
<b>PC17.</b> inform supervisor of problems that are beyond scope of his role	2	3	-	1
<b>NOS Total</b>	<b>30</b>	<b>50</b>	<b>-</b>	<b>20</b>



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### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	MIN/N1208
<b>NOS Name</b>	Prepare Jumbo drill machine for operation
<b>Sector</b>	Mining
<b>Sub-Sector</b>	Mining Operation
<b>Occupation</b>	Drilling/Cutting
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	27/01/2022
<b>Next Review Date</b>	17/11/2025
<b>NSQC Clearance Date</b>	17/11/2022



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## Qualification Pack

### MIN/N1209: Perform Operations on Jumbo Drill

#### Description

This unit is about performing operation using a Jumbo machine

#### Scope

The scope covers the following :

- Performing operation

#### Elements and Performance Criteria

##### *Performing operation*

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

- PC1.** follow plans to determine location, spacing, depth and angle of holes
- PC2.** assess ground conditions at the work area, sounding, scaling and washing-down face
- PC3.** implement ground control according SSR
- PC4.** mark up the faces in accordance with geological, statutory and survey specifications
- PC5.** drill a number of drive drill patterns using a mechanised hydraulic or electric Jumbo drill to suit conditions of the drive
- PC6.** install the ground support except cable bolts and shotcrete
- PC7.** install the mine services when required
- PC8.** ensure all necessary precautions are adhered to before towing the drill to a distant site
- PC9.** ensure that the OEM prescribed limit for angles of inclination are followed during setting up of drill
- PC10.** complete daily reports on equipment and workplace and submit written and verbal reports to the supervisor
- PC11.** work with technical and supervisory staff in quality and safety initiatives
- PC12.** place guards at all entrances to the blast and blast according to project standards and remove the guards after blastings
- PC13.** assist with other aspects of the operation such as mine services, long hole drill, loading/mucking, when required
- PC14.** check for Audio Video (AV) alarm
- PC15.** reduce downtime and wastages
- PC16.** communicate with hand signals and coded sounds of horns
- PC17.** demonstrate caution against hazards of machine in operation
- PC18.** use life line extended from the base as the team proceeds

#### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:



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- KU1.** different types of mines and detail of the mine he is working in
- KU2.** mine organization, time keeping, need for discipline and punctuality
- KU3.** benching in quarries, dressing of overhangs, undercuts, fencing, first aid and hygiene
- KU4.** mine instruction plan, hole design line, gradient and profile
- KU5.** code of traffic in specific areas of mine and significance of fences
- KU6.** standing orders in force at the mine
- KU7.** shot-firing and safety regulations
- KU8.** tramways and siding, haulage rooms, winding rooms, boilers, electrical gears
- KU9.** duties of workmen
- KU10.** technical problems that may arise
- KU11.** provision of wages, working hours and accident compensation as per Mines act
- KU12.** mining safety procedures
- KU13.** impact of violation of safety procedures
- KU14.** precautions to be taken when handling explosives
- KU15.** refresher training as per fourth schedule MVTR (1966) within one month of joining duties following absence from duties for a period exceeding one year
- KU16.** types of documentation in organization e.g. daily maintenance checklist and importance of the same
- KU17.** risk and impact of not following defined procedures/work instructions
- KU18.** rules and regulations of mine as per standard operating procedure (SOP)
- KU19.** risk and impact of not following company's SOP
- KU20.** escalation matrix for reporting identified problems
- KU21.** duties and responsibilities associated with his job role as per the employer
- KU22.** cost of delays to the company
- KU23.** direct /indirect cost of accidents to the company
- KU24.** locally prepared emergency response /disaster management plan
- KU25.** commitment to working safely while ensuring the safety of others
- KU26.** general knowledge about single/ double boom jumbo drilling rig, diesel engines, electric motors and compressors
- KU27.** hard rock mining
- KU28.** various levers and switches in order to operate the drill properly
- KU29.** drilling pattern and sequence of operations
- KU30.** different types of drill bits and their uses
- KU31.** common terminology vis-à-vis jumbo drillings
- KU32.** operation of different assemblies and sub-assemblies such as under- carriage, compressors, hydraulic/pneumatic systems.
- KU33.** drill safety devices fitted on compressors
- KU34.** correct sequence of operation of different levers
- KU35.** transmissions of compressed air from compressor to drill head
- KU36.** selection of proper rotation speed and effect of excessive speeds on bit life
- KU37.** specification of single/ double boom jumbo drilling rig used in mines



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- KU38.** instrument panel, various controls their location and operation
- KU39.** lubrication system of drills
- KU40.** drill hole design and impact of poor drill hole design on blasting
- KU41.** fly rocks and air-blast
- KU42.** inclined hole, azimuth, deviation, dip
- KU43.** safety during drilling, marching and other operations
- KU44.** dangers from loose house joints and defective Houses
- KU45.** understanding of survey prints and layouts.
- KU46.** signage, mining area signs and other safety and emergency signals
- KU47.** wet cutting, drilling method, drilling pattern
- KU48.** dangers from cutting/ drilling in stone band
- KU49.** slope failures, joint spacing, caving
- KU50.** fleeting of ore cutting machine on gradient
- KU51.** understanding of ground support plans
- KU52.** electrical and mechanical knowledge of jumbo rigs
- KU53.** dust extraction system and water injection system
- KU54.** Connection Flow Monitors

## Generic Skills (GS)

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

- GS1.** note down observations (if any)
- GS2.** write information documents or enter the information in online ERP systems under guidance of the supervisor
- GS3.** read and interpret symbols and measurements
- GS4.** read information documents
- GS5.** understand and analyse the available data about the site
- GS6.** demonstrated ability to read mine plans and specifications for underground mining
- GS7.** discuss task lists, schedules and activities
- GS8.** effectively communicate
- GS9.** listen carefully to comprehend the information given by various sources about the sites
- GS10.** communicate with surveyors, geologists, and engineers to optimise drill patterns and metres
- GS11.** lead the underground team with a positive can do attitude
- GS12.** use common sense and make judgments during day to day basis
- GS13.** use intuition to detect any potential problems which could arise
- GS14.** follow instructions and work on areas of improvement identified
- GS15.** complete the assigned tasks with minimum supervision
- GS16.** complete the job within timelines and quality norms
- GS17.** detect problems in day to day tasks
- GS18.** discuss possible solution with the supervisor for problem solving



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**GS19.** make decisions in emergency conditions

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Performing operation</i>	<b>30</b>	<b>50</b>	-	<b>20</b>
<b>PC1.</b> follow plans to determine location, spacing, depth and angle of holes	2	3	-	1
<b>PC2.</b> assess ground conditions at the work area, sounding, scaling and washing-down face	2	3	-	1
<b>PC3.</b> implement ground control according SSR	2	3	-	2
<b>PC4.</b> mark up the faces in accordance with geological, statutory and survey specifications	2	3	-	2
<b>PC5.</b> drill a number of drive drill patterns using a mechanised hydraulic or electric Jumbo drill to suit conditions of the drive	2	3	-	1
<b>PC6.</b> install the ground support except cable bolts and shotcrete	1	3	-	1
<b>PC7.</b> install the mine services when required	1	3	-	1
<b>PC8.</b> ensure all necessary precautions are adhered to before towing the drill to a distant site	1	3	-	1
<b>PC9.</b> ensure that the OEM prescribed limit for angles of inclination are followed during setting up of drill	1	3	-	1
<b>PC10.</b> complete daily reports on equipment and workplace and submit written and verbal reports to the supervisor	1	3	-	1
<b>PC11.</b> work with technical and supervisory staff in quality and safety initiatives	1	3	-	1
<b>PC12.</b> place guards at all entrances to the blast and blast according to project standards and remove the guards after blastings	2	3	-	1
<b>PC13.</b> assist with other aspects of the operation such as mine services, long hole drill, loading/mucking, when required	2	2	-	1





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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. check for Audio Video (AV) alarm	2	2	-	1
PC15. reduce downtime and wastages	2	2	-	1
PC16. communicate with hand signals and coded sounds of horns	2	2	-	1
PC17. demonstrate caution against hazards of machine in operation	2	3	-	1
PC18. use life line extended from the base as the team proceeds	2	3	-	1
<b>NOS Total</b>	<b>30</b>	<b>50</b>	<b>-</b>	<b>20</b>



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### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	MIN/N1209
<b>NOS Name</b>	Perform Operations on Jumbo Drill
<b>Sector</b>	Mining
<b>Sub-Sector</b>	Mining Operation
<b>Occupation</b>	Drilling/Cutting
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	27/01/2022
<b>Next Review Date</b>	17/11/2025
<b>NSQC Clearance Date</b>	17/11/2022

## Qualification Pack

# MIN/N1210: Perform routine maintenance and troubleshooting on the jumbo drill machine

## Description

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

## Scope

The scope covers the following :

- Routine maintenance in accordance with the manufacturer's recommendations and company procedures
- Basic diagnostics and Troubleshooting

## Elements and Performance Criteria

### *Routine maintenance in accordance with the manufacturer's recommendations and company procedures*

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

- PC1.** track machine operating hours (drilling hours and engine hours) to assess the right service schedule
- PC2.** clean air filter dust bowls
- PC3.** clean footplates, pedals and steps free from mud, dirt, ice and snow
- PC4.** drain water and sediment /fuel separatorss
- PC5.** replenish coolants, lubricants and fluids
- PC6.** grease all greasing pins and pivot points
- PC7.** check battery levels and condition of the terminals and carrying out minor adjustments if required
- PC8.** check and maintain the tyre rims, air pressure, wheel nuts and treads.
- PC9.** check structural safety of the machine
- PC10.** complete timely and legibly daily/weekly maintenance sheets
- PC11.** perform routine inspections on equipment

### *Troubleshooting*

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

- PC12.** ensure the machine is on firm and level ground before attempting to carry out any maintenance activity.
- PC13.** ensure that no maintenance task on the engine is performed when running or still hot.
- PC14.** ensure proper Lock out and Tag out scenario to avoid any untoward incident triggered due to unknowingly operation of machine / system under maintenance
- PC15.** complete timely and legibly defect sheets as provided by the company
- PC16.** prepare communication materials, manuals and other written materials related to technical issues, programs or systems

## Knowledge and Understanding (KU)



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## Qualification Pack

The individual on the job needs to know and understand:

- KU1.** different types of mines and detail of the mine he is working in
- KU2.** mine organization, time keeping, need for discipline and punctuality
- KU3.** benching in quarries, dressing of overhangs, undercuts, fencing, first aid and hygiene
- KU4.** code of traffic in specific areas of mine and significance of fences
- KU5.** standing orders in force at the mine
- KU6.** shot-firing and safety regulations
- KU7.** tramways and siding, haulage rooms, winding rooms, boilers, electrical gears
- KU8.** duties of workmen
- KU9.** Provision of wages, working hours and accident compensation as per Mines act
- KU10.** mining safety procedures
- KU11.** respond to complex technical problems, making decisions that are guided by policies
- KU12.** impact of violation of safety procedures
- KU13.** precautions to be taken when handling explosives
- KU14.** refresher training as per fourth schedule MVTR (1966) within one month of joining duties following absence from duties for a period exceeding one year
- KU15.** types of documentation in organization e.g. daily maintenance checklist and importance of the same
- KU16.** risk and impact of not following defined procedures/work instructions
- KU17.** rules and regulations of mine as per standard operating procedure (SOP)
- KU18.** risk and impact of not following company's SOP
- KU19.** escalation matrix for reporting identified problems
- KU20.** commitment to working safely while ensuring the safety of others
- KU21.** established policies, practices and procedures
- KU22.** operation of different assemblies and sub-assemblies such as under- carriage, compressors, hydraulic/pneumatic systems
- KU23.** specification and details of jumbo drills used in mines
- KU24.** instrument panel, various controls their location and operation
- KU25.** lubrication of drills
- KU26.** various levers and switches in order to operate the drill properly
- KU27.** drilling pattern and sequence of operations
- KU28.** different types of drill bits and their uses
- KU29.** common terminology vis-à-vis drilling
- KU30.** safety during drilling, marching and other operations
- KU31.** signage, mining area signs and other safety and emergency signals
- KU32.** wet cutting, drilling method, drilling pattern
- KU33.** dangers from cutting/ drilling in stone band
- KU34.** fleeting of ore cutting machine on gradient
- KU35.** keeping machinery reasonably free from dust
- KU36.** response to emergencies such as fire, accident, major failure etc

## Qualification Pack

### Generic Skills (GS)

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

- GS1.** note down observations (if any)
- GS2.** write information documents or enter the information in online ERP systems under guidance of the supervisor
- GS3.** read and interpret symbols and measurements
- GS4.** read information documents
- GS5.** analyze the available information about the site
- GS6.** read mine plans and specifications for underground mining
- GS7.** discuss task lists, schedules and activities
- GS8.** effectively communicate
- GS9.** comprehend the information given by various sources about the sites
- GS10.** communicate with surveyors, geologists, and engineers to optimize drill patterns and drill hole depth
- GS11.** use common sense and make judgments during day to day basis
- GS12.** use intuition to detect any potential problems which could arise
- GS13.** follow instructions and work on areas of improvement identified
- GS14.** complete the assigned tasks with minimum supervision
- GS15.** complete the job within timelines and quality norms
- GS16.** detect problems in day to day tasks
- GS17.** discuss possible solution with the supervisor for problem solving
- GS18.** make decisions in emergency conditions

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Routine maintenance in accordance with the manufacturer's recommendations and company procedures</i>	<b>22</b>	<b>35</b>	-	<b>15</b>
<b>PC1.</b> track machine operating hours (drilling hours and engine hours) to assess the right service schedule	2	4	-	2
<b>PC2.</b> clean air filter dust bowls	2	3	-	2
<b>PC3.</b> clean footplates, pedals and steps free from mud, dirt, ice and snow	2	3	-	2
<b>PC4.</b> drain water and sediment /fuel separatorss	2	3	-	2
<b>PC5.</b> replenish coolants, lubricants and fluids	2	3	-	1
<b>PC6.</b> grease all greasing pins and pivot points	2	3	-	1
<b>PC7.</b> check battery levels and condition of the terminals and carrying out minor adjustments if required	2	4	-	1
<b>PC8.</b> check and maintain the tyre rims, air pressure, wheel nuts and treads.	2	3	-	1
<b>PC9.</b> check structural safety of the machine	2	3	-	1
<b>PC10.</b> complete timely and legibly daily/weekly maintenance sheets	2	3	-	1
<b>PC11.</b> perform routine inspections on equipment	2	3	-	1
<i>Troubleshooting</i>	<b>8</b>	<b>15</b>	-	<b>5</b>
<b>PC12.</b> ensure the machine is on firm and level ground before attempting to carry out any maintenance activity.	2	3	-	1
<b>PC13.</b> ensure that no maintenance task on the engine is performed when running or still hot.	2	3	-	1
<b>PC14.</b> ensure proper Lock out and Tag out scenario to avoid any untoward incident triggered due to unknowingly operation of machine / system under maintenance	2	3	-	1



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC15.</b> complete timely and legibly defect sheets as provided by the company	1	3	-	1
<b>PC16.</b> prepare communication materials, manuals and other written materials related to technical issues, programs or systems	1	3	-	1
<b>NOS Total</b>	<b>30</b>	<b>50</b>	<b>-</b>	<b>20</b>



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### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	MIN/N1210
<b>NOS Name</b>	Perform routine maintenance and troubleshooting on the jumbo drill machine
<b>Sector</b>	Mining
<b>Sub-Sector</b>	Mining Operation
<b>Occupation</b>	Drilling/Cutting
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	27/01/2022
<b>Next Review Date</b>	17/11/2025
<b>NSQC Clearance Date</b>	17/11/2022





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## Qualification Pack

### DGT/VSQ/N0102: Employability Skills (60 Hours)

#### Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

#### Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

#### Elements and Performance Criteria

##### *Introduction to Employability Skills*

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

- PC1.** identify employability skills required for jobs in various industries
- PC2.** identify and explore learning and employability portals

##### *Constitutional values - Citizenship*

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

- PC3.** recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.
- PC4.** follow environmentally sustainable practices

##### *Becoming a Professional in the 21st Century*

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

- PC5.** recognize the significance of 21st Century Skills for employment
- PC6.** practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

##### *Basic English Skills*

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



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- PC7.** use basic English for everyday conversation in different contexts, in person and over the telephone
- PC8.** read and understand routine information, notes, instructions, mails, letters etc. written in English
- PC9.** write short messages, notes, letters, e-mails etc. in English

### *Career Development & Goal Setting*

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

- PC10.** understand the difference between job and career
- PC11.** prepare a career development plan with short- and long-term goals, based on aptitude

### *Communication Skills*

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

- PC12.** follow verbal and non-verbal communication etiquette and active listening techniques in various settings
- PC13.** work collaboratively with others in a team

### *Diversity & Inclusion*

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

- PC14.** communicate and behave appropriately with all genders and PwD
- PC15.** escalate any issues related to sexual harassment at workplace according to POSH Act

### *Financial and Legal Literacy*

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

- PC16.** select financial institutions, products and services as per requirement
- PC17.** carry out offline and online financial transactions, safely and securely
- PC18.** identify common components of salary and compute income, expenses, taxes, investments etc
- PC19.** identify relevant rights and laws and use legal aids to fight against legal exploitation

### *Essential Digital Skills*

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

- PC20.** operate digital devices and carry out basic internet operations securely and safely
- PC21.** use e- mail and social media platforms and virtual collaboration tools to work effectively
- PC22.** use basic features of word processor, spreadsheets, and presentations

### *Entrepreneurship*

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

- PC23.** identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research
- PC24.** develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion
- PC25.** identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

### *Customer Service*

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

- PC26.** identify different types of customers
- PC27.** identify and respond to customer requests and needs in a professional manner.



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**PC28.** follow appropriate hygiene and grooming standards

*Getting ready for apprenticeship & Jobs*

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

**PC29.** create a professional Curriculum vitae (Résumé)

**PC30.** search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

**PC31.** apply to identified job openings using offline /online methods as per requirement

**PC32.** answer questions politely, with clarity and confidence, during recruitment and selection

**PC33.** identify apprenticeship opportunities and register for it as per guidelines and requirements

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

**KU1.** need for employability skills and different learning and employability related portals

**KU2.** various constitutional and personal values

**KU3.** different environmentally sustainable practices and their importance

**KU4.** Twenty first (21st) century skills and their importance

**KU5.** how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

**KU6.** importance of career development and setting long- and short-term goals

**KU7.** about effective communication

**KU8.** POSH Act

**KU9.** Gender sensitivity and inclusivity

**KU10.** different types of financial institutes, products, and services

**KU11.** how to compute income and expenditure

**KU12.** importance of maintaining safety and security in offline and online financial transactions

**KU13.** different legal rights and laws

**KU14.** different types of digital devices and the procedure to operate them safely and securely

**KU15.** how to create and operate an e- mail account and use applications such as word processors, spreadsheets etc.

**KU16.** how to identify business opportunities

**KU17.** types and needs of customers

**KU18.** how to apply for a job and prepare for an interview

**KU19.** apprenticeship scheme and the process of registering on apprenticeship portal

## Generic Skills (GS)

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

**GS1.** read and write different types of documents/instructions/correspondence

**GS2.** communicate effectively using appropriate language in formal and informal settings



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## Qualification Pack

- GS3.** behave politely and appropriately with all
- GS4.** how to work in a virtual mode
- GS5.** perform calculations efficiently
- GS6.** solve problems effectively
- GS7.** pay attention to details
- GS8.** manage time efficiently
- GS9.** maintain hygiene and sanitization to avoid infection

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Introduction to Employability Skills</i>	<b>1</b>	<b>1</b>	-	-
<b>PC1.</b> identify employability skills required for jobs in various industries	-	-	-	-
<b>PC2.</b> identify and explore learning and employability portals	-	-	-	-
<i>Constitutional values - Citizenship</i>	<b>1</b>	<b>1</b>	-	-
<b>PC3.</b> recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
<b>PC4.</b> follow environmentally sustainable practices	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	<b>2</b>	<b>4</b>	-	-
<b>PC5.</b> recognize the significance of 21st Century Skills for employment	-	-	-	-
<b>PC6.</b> practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
<i>Basic English Skills</i>	<b>2</b>	<b>3</b>	-	-
<b>PC7.</b> use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
<b>PC8.</b> read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
<b>PC9.</b> write short messages, notes, letters, e-mails etc. in English	-	-	-	-
<i>Career Development &amp; Goal Setting</i>	<b>1</b>	<b>2</b>	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC10.</b> understand the difference between job and career	-	-	-	-
<b>PC11.</b> prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
<i>Communication Skills</i>	<b>2</b>	<b>2</b>	-	-
<b>PC12.</b> follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
<b>PC13.</b> work collaboratively with others in a team	-	-	-	-
<i>Diversity &amp; Inclusion</i>	<b>1</b>	<b>2</b>	-	-
<b>PC14.</b> communicate and behave appropriately with all genders and PwD	-	-	-	-
<b>PC15.</b> escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	<b>2</b>	<b>3</b>	-	-
<b>PC16.</b> select financial institutions, products and services as per requirement	-	-	-	-
<b>PC17.</b> carry out offline and online financial transactions, safely and securely	-	-	-	-
<b>PC18.</b> identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
<b>PC19.</b> identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
<i>Essential Digital Skills</i>	<b>3</b>	<b>4</b>	-	-
<b>PC20.</b> operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
<b>PC21.</b> use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
<b>PC22.</b> use basic features of word processor, spreadsheets, and presentations	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Entrepreneurship</i>	<b>2</b>	<b>3</b>	-	-
<b>PC23.</b> identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
<b>PC24.</b> develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
<b>PC25.</b> identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
<i>Customer Service</i>	<b>1</b>	<b>2</b>	-	-
<b>PC26.</b> identify different types of customers	-	-	-	-
<b>PC27.</b> identify and respond to customer requests and needs in a professional manner.	-	-	-	-
<b>PC28.</b> follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship &amp; Jobs</i>	<b>2</b>	<b>3</b>	-	-
<b>PC29.</b> create a professional Curriculum vitae (Résumé)	-	-	-	-
<b>PC30.</b> search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
<b>PC31.</b> apply to identified job openings using offline /online methods as per requirement	-	-	-	-
<b>PC32.</b> answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
<b>PC33.</b> identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
<b>NOS Total</b>	<b>20</b>	<b>30</b>	-	-



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## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	DGT/VSQ/N0102
<b>NOS Name</b>	Employability Skills (60 Hours)
<b>Sector</b>	Cross Sectoral
<b>Sub-Sector</b>	Professional Skills
<b>Occupation</b>	Employability
<b>NSQF Level</b>	4
<b>Credits</b>	2
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	17/11/2025
<b>NSQC Clearance Date</b>	17/11/2022





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## Qualification Pack

# MIN/N1704: Follow Health, Safety, and Environmental guidelines for underground coal mines (Including Mine Vocational Training Rule and Mine Rescue Rule)

## Description

This unit is about adhering to health, safety and environmental guidelines in Underground Coal Mines (UCM) during execution of various tasks, operations and maintenance.

## Scope

The scope covers the following :

- Follow work-site health and safety measures
- Follow environmental guidelines

## Elements and Performance Criteria

### *Follow work-site health and safety measures*

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

- PC1.** follow preventive measures against firedamp, whitedamp, blackdamp etc.
- PC2.** use the flame safety lamp for detecting the methane gas as per Standard Operating Procedure (SOP)
- PC3.** undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work
- PC4.** comply with safety, health and security-related regulations/guidelines at the mine e.g. SOP for material handling in underground (U/G) mine
- PC5.** ensure that oil, grease, canvas or other inflammable material are stored in fire-proof receptacle
- PC6.** ensure that every instrument, apparatus and equipment are DGMS approved before these are used
- PC7.** ensure that Armoured face conveyor (AFC) and chocks must be kept in a straight line for every cycle of operations and tightened up to the setting pressure while keeping it in full contact with the roof, applicable for longwall mining
- PC8.** provide first aid to an injured person
- PC9.** follow safety precautions against spontaneous heating of the coal
- PC10.** operate various types of fire extinguishers to control different types of fire at worksite, if required
- PC11.** ensure that no person is traveling/working/staying under unsupported roof
- PC12.** check that roof supporting is as per Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR) while undertaking work in an area
- PC13.** take precaution against occupational health hazards (like dust, water, mine gases etc.) due to U/G working environment
- PC14.** use self-rescue apparatus appropriately when required
- PC15.** follow Safety Management Plan (SMP) and Emergency Management Plan (EMP)



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- PC16.** follow precautions against U/G electrical appliances
- PC17.** take proper care against damage and accidents while loading, transporting, dismantling and erecting of roof supports
- PC18.** follow appropriate SOP while working near any isolated and sealed off area of the mine
- PC19.** ensure that the roof and the sidewalls of the mine face (or newly exposed area of the mines) have been scaled/dressed properly
- PC20.** take relevant safety precautions during depillaring operation in UCM
- PC21.** follow appropriate safety practices while traveling on U/G haul roads, incase of post blast fumes and misfire
- PC22.** follow the manufacturer's instructions for care and safe operation of mine machinery and equipment
- PC23.** identify the working ventilation district from line diagram of ventilation circuit to direct air to the working face
- PC24.** follow laid out SOP in case of alarm signal for leakage of inflammable gases
- PC25.** follow the process of reporting any unsafe act/condition in the working area to the concerned person
- PC26.** use underground mine communication system
- PC27.** ensure positive isolation near the work place if applicable
- PC28.** use appropriate Personal Protective Equipment (PPE) as per the requirement
- PC29.** maintain hand hygiene by washing hands with alcohol based sanitisers/soap
- PC30.** disinfect the machine/tools before and after work/task
- PC31.** maintain hygiene at the work site
- PC32.** report any symptoms of illness to the shift-incharge
- PC33.** identify six directional hazards at workplace and take decisions accordingly

### *Follow environmental guidelines*

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

- PC34.** identify the environmental impact of mining related operations and follow steps to reduce those impact
- PC35.** follow the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery
- PC36.** ensure that the stowing practices produce minimum disturbance to the surface
- PC37.** ensure that the subgrade coal is carried out to surface and stacked separately at the earmarked place
- PC38.** ensure the productivity of the machine for material/fuel conservation
- PC39.** follow the process for collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines
- PC40.** follow the "5-S" practice at work site like cleaning oil from ground (to avoid soil from getting damaged), etc.

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:



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- KU1.** safety guidelines specified by Directorate General of Mine Safety (DGMS)
- KU2.** duties and rights of workers
- KU3.** selection process of person for rescue training
- KU4.** about Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR)
- KU5.** isolation and sealed off area of the mine
- KU6.** various types of gases available in the mine and their effects; and their control measures
- KU7.** self-rescue apparatus and their uses
- KU8.** provision of medical examination (Initial Medical Examination (IME) & Periodical Medical Examination (PME)) of a person employed, as per Mines Rules 1955
- KU9.** importance of first aid and hygiene
- KU10.** about different types of machineries used in U/G mines
- KU11.** different types of supporting system used in U/G mines as per SSP and SSR
- KU12.** about precautions to be taken when handling heavy equipment
- KU13.** various problems/incidents likely to occur
- KU14.** role of Internal Safety Organization, safety committee, workman's inspector and DGMS
- KU15.** about mine safety standard including light illumination level, noise levels, dust level, pollutants, etc at the work-site
- KU16.** common sources of pollution in the mines and ways to minimize it
- KU17.** various types of fire extinguishers
- KU18.** safety equipment like safety shoes, safety belt, tight fit clothing, hand gloves, safety goggles, Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots, ear plugs, Face Mask, etc.
- KU19.** shot-firing / blasting related safety regulations including taking shelter during blasting
- KU20.** mining area-specific signs, and other safety and emergency signals
- KU21.** the outcome of violation of safety procedures
- KU22.** Take-5 (Personal Risk Assessment) training (DGMS Tech. circulars 2/2014)
- KU23.** hazardous material safety, security rules and regulations
- KU24.** safety appliances and rescue equipment
- KU25.** importance and use of various communication system used in UG mines
- KU26.** importance of positive isolation at working site
- KU27.** safety and occupational health policy of organisation
- KU28.** six directional hazard identification process
- KU29.** basic personal and workplace hygiene
- KU30.** importance of FAB (Fresh Air Base)
- KU31.** basic provisions in Mines Creche Rules, 1966 (MCR) for any females employed in the mines
- KU32.** about basic safety regulations of Coal Mines Regulation, 2017 (CMR)
- KU33.** types of stone dust barrier and its importance
- KU34.** coal dust explosion and its preventive measures
- KU35.** classification of coal mines as per the degree of gassiness of coal seams such as first degree, second degree, and third-degree mines
- KU36.** precautions as per the gassiness of the coal mines



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## Qualification Pack

- KU37.** use of flame safety lamp and its parts
- KU38.** about coal mines occupational disease such as pneumoconiosis or 'black lung' and their preventive measures
- KU39.** Standard of Ventilation as per the section 153 of the CMR 2017
- KU40.** Standard of Lighting as per the section 178 of the CMR 2017
- KU41.** the roles, duties and responsibilities of rescue team members, rescue room and rescue station and how to contact them in case of emergency
- KU42.** the correct steps for conducting any rescue work as per Mine Rescue Rule (MRR)
- KU43.** importance of taking shelter at the miner's station during blasting operation
- KU44.** importance of sensitization towards different genders and persons with disabilities (PWD)
- KU45.** importance of following infection control policies, '5-S' practices, and waste management
- KU46.** importance of water/material/energy conservation and management
- KU47.** importance of SMP and EMP, prepared by the organization, as per DGMS guideline

## Generic Skills (GS)

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

- GS1.** fill up documentation applicable to one's role
- GS2.** make decisions on the concerned area of work
- GS3.** read basic English language
- GS4.** read and interpret manuals, health, and safety instructions, memos, etc.
- GS5.** use the digital information from a machine
- GS6.** plan and organize the work order and tasks
- GS7.** use basic applications of the computer
- GS8.** use reasoning skills to identify and resolve fundamental problems
- GS9.** complete the assigned tasks timely

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Follow work-site health and safety measures</i>	<b>24</b>	<b>43</b>	-	<b>14</b>
<b>PC1.</b> follow preventive measures against firedamp, whitedamp, blackdamp etc.	1	1	-	-
<b>PC2.</b> use the flame safety lamp for detecting the methane gas as per Standard Operating Procedure (SOP)	-	1	-	-
<b>PC3.</b> undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work	1	1	-	1
<b>PC4.</b> comply with safety, health and security-related regulations/guidelines at the mine e.g. SOP for material handling in underground (U/G) mine	1	1	-	1
<b>PC5.</b> ensure that oil, grease, canvas or other inflammable material are stored in fire-proof receptacle	-	1	-	-
<b>PC6.</b> ensure that every instrument, apparatus and equipment are DGMS approved before these are used	1	1	-	-
<b>PC7.</b> ensure that Armoured face conveyor (AFC) and chocks must be kept in a straight line for every cycle of operations and tightened up to the setting pressure while keeping it in full contact with the roof, applicable for longwall mining	3	3	-	-
<b>PC8.</b> provide first aid to an injured person	1	2	-	1
<b>PC9.</b> follow safety precautions against spontaneous heating of the coal	1	1	-	-
<b>PC10.</b> operate various types of fire extinguishers to control different types of fire at worksite, if required	-	2	-	-
<b>PC11.</b> ensure that no person is traveling/working/staying under unsupported roof	1	-	-	-
<b>PC12.</b> check that roof supporting is as per Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR) while undertaking work in an area	-	2	-	1

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC13.</b> take precaution against occupational health hazards (like dust, water, mine gases etc.) due to U/G working environment	-	1	-	1
<b>PC14.</b> use self-rescue apparatus appropriately when required	-	2	-	-
<b>PC15.</b> follow Safety Management Plan (SMP) and Emergency Management Plan (EMP)	1	2	-	1
<b>PC16.</b> follow precautions against U/G electrical appliances	2	2	-	1
<b>PC17.</b> take proper care against damage and accidents while loading, transporting, dismantling and erecting of roof supports	1	2	-	-
<b>PC18.</b> follow appropriate SOP while working near any isolated and sealed off area of the mine	1	1	-	1
<b>PC19.</b> ensure that the roof and the sidewalls of the mine face (or newly exposed area of the mines) have been scaled/dressed properly	1	1	-	-
<b>PC20.</b> take relevant safety precautions during depillaring operation in UCM	-	2	-	1
<b>PC21.</b> follow appropriate safety practices while traveling on U/G haul roads, incase of post blast fumes and misfire	1	1	-	-
<b>PC22.</b> follow the manufacturer's instructions for care and safe operation of mine machinery and equipment	-	1	-	1
<b>PC23.</b> identify the working ventilation district from line diagram of ventilation circuit to direct air to the working face	-	1	-	1
<b>PC24.</b> follow laid out SOP in case of alarm signal for leakage of inflammable gases	1	1	-	-
<b>PC25.</b> follow the process of reporting any unsafe act/condition in the working area to the concerned person	-	1	-	1
<b>PC26.</b> use underground mine communication system	-	1	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC27.</b> ensure positive isolation near the work place if applicable	1	1	-	-
<b>PC28.</b> use appropriate Personal Protective Equipment (PPE) as per the requirement	2	2	-	1
<b>PC29.</b> maintain hand hygiene by washing hands with alcohol based sanitisers/soap	-	1	-	-
<b>PC30.</b> disinfect the machine/tools before and after work/task	1	1	-	-
<b>PC31.</b> maintain hygiene at the work site	1	1	-	-
<b>PC32.</b> report any symptoms of illness to the shift-incharge	1	1	-	-
<b>PC33.</b> identify six directional hazards at workplace and take decisions accordingly	-	1	-	1
<i>Follow environmental guidelines</i>	<b>6</b>	<b>7</b>	-	<b>6</b>
<b>PC34.</b> identify the environmental impact of mining related operations and follow steps to reduce those impact	1	1	-	1
<b>PC35.</b> follow the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery	1	1	-	1
<b>PC36.</b> ensure that the stowing practices produce minimum disturbance to the surface	1	1	-	-
<b>PC37.</b> ensure that the subgrade coal is carried out to surface and stacked separately at the earmarked place	1	1	-	1
<b>PC38.</b> ensure the productivity of the machine for material/fuel conservation	1	1	-	1
<b>PC39.</b> follow the process for collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines	-	1	-	1
<b>PC40.</b> follow the "5-S" practice at work site like cleaning oil from ground (to avoid soil from getting damaged), etc.	1	1	-	1



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	30	50	-	20





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## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	MIN/N1704
<b>NOS Name</b>	Follow Health, Safety, and Environmental guidelines for underground coal mines (Including Mine Vocational Training Rule and Mine Rescue Rule)
<b>Sector</b>	Mining
<b>Sub-Sector</b>	Mining Operation
<b>Occupation</b>	HSE Functions, Mine Surveying, Drilling/Cutting, Shot firing/Blasting, Loading and Hauling - Underground, Specialized Operations, Electrical Services, Mechanical Services
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	30/06/2022
<b>Next Review Date</b>	17/11/2025
<b>NSQC Clearance Date</b>	17/11/2022



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## Qualification Pack

# MIN/N1702: Follow Health, Safety and Environmental guidelines for Underground Metalliferous Mines (UMM) (Including Mine Vocational Training Rule and Mine Rescue Rule)

## Description

This unit is about adhering to health, safety and environmental guidelines in Underground Metalliferous Mines (UMM) during the execution of various tasks and operations and maintenance.

## Scope

The scope covers the following :

- Follow work-site health and safety measures
- Follow environmental guidelines

## Elements and Performance Criteria

### *Follow work-site health and safety measures*

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

- PC1.** undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work
- PC2.** comply with safety, health and security-related regulations/guidelines at the mine e.g. follow Standard Operating Procedure (SOP) for material handling in underground (U/G) mine
- PC3.** operate various types of fire extinguishers to control different types of fire at a worksite when required
- PC4.** check that roof supporting is as per Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR) while undertaking work in an area
- PC5.** take precaution against occupational health hazards (like dust, water, mine gases etc.) due to U/G working environment
- PC6.** use self-rescue apparatus, appropriately when required
- PC7.** follow appropriate emergency response procedure during emergency such as fire, water inrush, fall of ground etc.
- PC8.** follow precautions against U/G electrical appliances
- PC9.** follow appropriate Standard Operating Procedure while working near any isolated and sealed off area of the mine
- PC10.** follow appropriate safety practices while traveling on U/G haul roads, incase of post blast fumes and misfire
- PC11.** follow the manufacturer's instructions for care and safe operation of mine machinery and equipment
- PC12.** identify the working ventilation district from line diagram of ventilation circuit to direct air to the working face
- PC13.** follow Safety Management Plan (SMP) and Emergency Management Plan (EMP)
- PC14.** follow gas detecting alarm signal on leakage of inflammable gases and laid out procedure to ensure safety



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- PC15.** follow process for reporting any unsafe act/condition in work area to the concerned person
- PC16.** use underground mine communication system
- PC17.** ensure positive isolation near the work place if applicable
- PC18.** use appropriate PPE as per the requirement
- PC19.** maintain hand hygiene by washing hands with alcohol based sanitisers/soap
- PC20.** disinfect the machine/tools before and after work/task
- PC21.** maintain hygiene at the work site
- PC22.** report any symptoms of illness to the shift-incharge
- PC23.** identify six directional hazards at workplace and take decisions accordingly

### *Follow environmental guidelines*

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

- PC24.** identify the environmental impact of mining related operations and follow steps to reduce those impact
- PC25.** follow the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery
- PC26.** ensure that the stowing practices produce minimum disturbance to the surface
- PC27.** ensure that the subgrade ore is carried out to surface and stacked separately at the earmarked place
- PC28.** ensure the productivity of the machine for material/fuel conservation
- PC29.** follow the process for collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines
- PC30.** follow the "5-S" practice at work site like cleaning oil from ground (to avoid soil from getting damaged), etc.

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** safety guidelines specified by Directorate General of Mine Safety (DGMS)
- KU2.** duties and rights of workers
- KU3.** selection process of person for rescue training
- KU4.** about Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR)
- KU5.** isolation and sealed off area of the mine
- KU6.** various types of gases found in the mine and their effect
- KU7.** self-rescue apparatus and their uses
- KU8.** provision of medical examination (IME & PME) of person employed as per Mines Rules 1955
- KU9.** importance of first aid and hygiene
- KU10.** about different types of machinery used in U/G mines
- KU11.** different types of supporting systems used in U/G mines as per SSP and SSR
- KU12.** about precautions to be taken when handling heavy equipment
- KU13.** various problems/incidents likely to occur
- KU14.** role of Internal Safety Organization, safety committee, workman's inspector and DGMS



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- KU15.** about mine safety standard including light illumination level, noise levels, dust level, pollutants, etc at the work-site
- KU16.** common sources of pollution in the mines and ways to minimize it
- KU17.** various types of fire extinguishers
- KU18.** safety equipment like safety shoes, safety belt, tight fit clothing, hand gloves, safety goggles, Gas Detector, Safety Lamp, Self-Contained Breathing Apparatus, gum boots, ear plugs, Face Mask, etc.
- KU19.** shot-firing / blasting related safety regulations including taking shelter during blasting
- KU20.** emergency response /disaster management plan prepared by the organization as per DGMS guideline
- KU21.** mining area-specific signs, and other safety and emergency signals
- KU22.** the outcome of violation of safety procedures
- KU23.** Take-5 (Personal Risk Assessment) training (DGMS Tech. circulars 2/2014)
- KU24.** rules and regulations for safety and security while handling hazardous materials
- KU25.** safety appliances and rescue equipment
- KU26.** importance and use of various communication system used in UG mines
- KU27.** importance of positive isolation at working site
- KU28.** safety and occupational health policy of organisation
- KU29.** six directional hazard identification process
- KU30.** basic personal and workplace hygiene
- KU31.** importance of FAB (Fresh Air Base)
- KU32.** basic provisions in Mines Creche Rules, 1966 (MCR) for females employed in the mines
- KU33.** the role and responsibilities of rescue room and rescue station and how to contact them in case of emergency
- KU34.** importance of taking shelter at the miner's station during blasting operation
- KU35.** importance of sensitization towards different genders and persons with disabilities (PWD)
- KU36.** importance of following infection control policies, '5-S' practices, and waste management
- KU37.** importance of water/material/energy conservation and management
- KU38.** importance of SMP and EMP, prepared by the organization, as per DGMS guideline

## Generic Skills (GS)

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

- GS1.** fill up documentation applicable to one's role
- GS2.** make decisions on the concerned area of work
- GS3.** read basic English language
- GS4.** read and interpret manuals, health, and safety instructions, memos, etc.
- GS5.** use the digital information from machine
- GS6.** use basic applications of a computer
- GS7.** plan and organize the work order and tasks
- GS8.** use reasoning skills to identify and resolve fundamental problems



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## Qualification Pack

**GS9.** complete the assigned tasks timely

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Follow work-site health and safety measures</i>	<b>24</b>	<b>42</b>	-	<b>17</b>
<b>PC1.</b> undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work	-	2	-	2
<b>PC2.</b> comply with safety, health and security-related regulations/guidelines at the mine e.g. follow Standard Operating Procedure (SOP) for material handling in underground (U/G) mine	1	3	-	-
<b>PC3.</b> operate various types of fire extinguishers to control different types of fire at a worksite when required	1	4	-	1
<b>PC4.</b> check that roof supporting is as per Systematic Support Plan (SSP) and approved Systematic Support Rules (SSR) while undertaking work in an area	1	1	-	-
<b>PC5.</b> take precaution against occupational health hazards (like dust, water, mine gases etc.) due to U/G working environment	1	2	-	1
<b>PC6.</b> use self-rescue apparatus, appropriately when required	-	4	-	1
<b>PC7.</b> follow appropriate emergency response procedure during emergency such as fire, water inrush, fall of ground etc.	1	2	-	1
<b>PC8.</b> follow precautions against U/G electrical appliances	2	2	-	2
<b>PC9.</b> follow appropriate Standard Operating Procedure while working near any isolated and sealed off area of the mine	2	2	-	1
<b>PC10.</b> follow appropriate safety practices while traveling on U/G haul roads, incase of post blast fumes and misfire	2	4	-	-
<b>PC11.</b> follow the manufacturer's instructions for care and safe operation of mine machinery and equipment	1	2	-	1

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC12.</b> identify the working ventilation district from line diagram of ventilation circuit to direct air to the working face	1	1	-	-
<b>PC13.</b> follow Safety Management Plan (SMP) and Emergency Management Plan (EMP)	1	-	-	-
<b>PC14.</b> follow gas detecting alarm signal on leakage of inflammable gases and laid out procedure to ensure safety	1	2	-	1
<b>PC15.</b> follow process for reporting any unsafe act/condition in work area to the concerned person	-	2	-	1
<b>PC16.</b> use underground mine communication system	-	1	-	-
<b>PC17.</b> ensure positive isolation near the work place if applicable	1	1	-	1
<b>PC18.</b> use appropriate PPE as per the requirement	2	4	-	2
<b>PC19.</b> maintain hand hygiene by washing hands with alcohol based sanitisers/soap	1	1	-	1
<b>PC20.</b> disinfect the machine/tools before and after work/task	1	1	-	-
<b>PC21.</b> maintain hygiene at the work site	1	1	-	1
<b>PC22.</b> report any symptoms of illness to the shift-incharge	1	-	-	-
<b>PC23.</b> identify six directional hazards at workplace and take decisions accordingly	2	-	-	-
<i>Follow environmental guidelines</i>	<b>6</b>	<b>8</b>	-	<b>3</b>
<b>PC24.</b> identify the environmental impact of mining related operations and follow steps to reduce those impact	1	2	-	-
<b>PC25.</b> follow the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery	-	1	-	-
<b>PC26.</b> ensure that the stowing practices produce minimum disturbance to the surface	1	1	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC27.</b> ensure that the subgrade ore is carried out to surface and stacked separately at the earmarked place	1	-	-	1
<b>PC28.</b> ensure the productivity of the machine for material/fuel conservation	1	1	-	-
<b>PC29.</b> follow the process for collecting, storing and disposing of the hazardous material and waste (like used oil, lubricant, battery, etc.) in compliance with worksite guidelines	1	1	-	1
<b>PC30.</b> follow the "5-S" practice at work site like cleaning oil from ground (to avoid soil from getting damaged), etc.	1	2	-	1
<b>NOS Total</b>	<b>30</b>	<b>50</b>	<b>-</b>	<b>20</b>





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## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	MIN/N1702
<b>NOS Name</b>	Follow Health, Safety and Environmental guidelines for Underground Metalliferous Mines (UMM) (Including Mine Vocational Training Rule and Mine Rescue Rule)
<b>Sector</b>	Mining
<b>Sub-Sector</b>	Mining Operation
<b>Occupation</b>	HSE Functions, Mine Surveying, Drilling/Cutting, Shot firing/Blasting, Loading and Hauling - Underground, Specialized Operations, Electrical Services, Mechanical Services
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	30/06/2022
<b>Next Review Date</b>	17/11/2025
<b>NSQC Clearance Date</b>	17/11/2022

## Assessment Guidelines and Assessment Weightage

### Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ 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 Element/ PC.
2. The assessment for the theory part will be based on 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 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.



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## Qualification Pack

6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.

7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

### Minimum Aggregate Passing % at QP Level : 70

(Please note: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

## Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
MIN/N1208.Prepare Jumbo drill machine for operation	30	50	-	20	100	15
MIN/N1209.Perform Operations on Jumbo Drill	30	50	-	20	100	25
MIN/N1210.Perform routine maintenance and troubleshooting on the jumbo drill machine	30	50	-	20	100	25
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	10
<b>Total</b>	<b>110</b>	<b>180</b>	<b>-</b>	<b>60</b>	<b>350</b>	<b>75</b>

Elective: 1 U/G Coal

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
MIN/N1704.Follow Health, Safety, and Environmental guidelines for underground coal mines (Including Mine Vocational Training Rule and Mine Rescue Rule)	30	50	-	20	100	25
<b>Total</b>	<b>30</b>	<b>50</b>	<b>-</b>	<b>20</b>	<b>100</b>	<b>25</b>



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Elective: 2 U/G Metal

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
MIN/N1702.Follow Health, Safety and Environmental guidelines for Underground Metalliferous Mines (UMM) (Including Mine Vocational Training Rule and Mine Rescue Rule)	30	50	-	20	100	25
<b>Total</b>	<b>30</b>	<b>50</b>	<b>-</b>	<b>20</b>	<b>100</b>	<b>25</b>



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## Qualification Pack

### Acronyms

<b>NOS</b>	National Occupational Standard(s)
<b>NSQF</b>	National Skills Qualifications Framework
<b>QP</b>	Qualifications Pack
<b>TVET</b>	Technical and Vocational Education and Training

## Qualification Pack

### Glossary

<b>Sector</b>	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.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	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.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	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.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	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.
<b>Scope</b>	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.



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<b>Knowledge and Understanding (KU)</b>	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
<b>Organisational Context</b>	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.
<b>Technical Knowledge</b>	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
<b>Core Skills/ Generic Skills (GS)</b>	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.
<b>Electives</b>	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.
<b>Options</b>	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.