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REIMAGINE FUTURE

Qualification Pack



HEMM Mechanic

U/G Metal/ Opencast/ U/G Coal

QP Code: MIN/Q3202

Version: 2.0

NSQF Level: 4

Skill Council for Mining Sector || FIMI House, B-311, Okhla Industrial Area, Phase-I
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MIN/Q3202: HEMM Mechanic

Brief Job Description

The HEMM mechanic is responsible for diagnoses, repairs, overhauls and services of Heavy Earth Moving Machinery (HEMM) to keep them in good running order. Also carries out repairs and maintenance of internal combustion engines and the various components of a Heavy Earth Moving Machine like transmission, torque converter, power train, final drive, compressor, hydraulic systems and operational control systems etc. also maintains all the relevant records, draws requirements of consumables and spare parts.

Personal Attributes

This job requires the individual to demonstrate strong work ethics, an ability to communicate courteously with co-workers, and must be good with following instructions of the supervisor.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [MIN/N3206: Diagnose HEMM for repair requirement](#)
2. [MIN/N3207: Carry out service, repair and maintenance activities](#)
3. [DGT/VSQ/N0102: Employability Skills \(60 Hours\)](#)

Electives (mandatory to select at least one):

Elective 1: U/G Metal

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

Elective 2: Opencast

1. [MIN/N1703: Follow Health, Safety, and Environmental Guidelines for opencast mines \(Including Mine Vocational Training Rule\)](#)

Elective 3: U/G Coal

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



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Qualification Pack (QP) Parameters

Sector	Mining
Sub-Sector	Engineering Services
Occupation	Mechanical Services
Country	India
NSQF Level	4
Credits	21
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7233.1500
Minimum Educational Qualification & Experience	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. HEMM Mechanic with minimum education as 5th Grade pass with 2 years relevant experience)
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	Preferable Heavy Motor Vehicle Driving License
Minimum Job Entry Age	20 Years
Last Reviewed On	NA
Next Review Date	17/11/2025
NSQC Approval Date	17/11/2022
Version	2.0
Reference code on NQR	2022/MIN/SCMS/06980
NQR Version	1



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Remarks:

Total Notional Duration: 450 Hours = Domain Theory Duration: 90 Hours+ Domain Practical Duration: 150 Hours + Domain OJT (Mandatory) Duration: 150 Hours + Employability Skills Duration: 60 Hours



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MIN/N3206: Diagnose HEMM for repair requirement

Description

This unit is about diagnosing faults in HEMM and troubleshooting problems.

Scope

The scope covers the following :

- Identify and diagnose operational faults

Elements and Performance Criteria

Identify and diagnose operational faults

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

- PC1.** conduct scheduled, routine examination methods and assessments against Equipment specifications to identify wear, damage, corrosion, inadequate fluid levels, leaks, wear, security problems and general condition and serviceability
- PC2.** review complaint sheet, log book and history sheet of the equipment and identify repair requirements
- PC3.** recognize original equipment manufacturers' specifications and follow standard operating procedure set out for preventive maintenance and diagnosing faults
- PC4.** use diagnostic procedures as defined in the troubleshooting checklist prepared by the equipment manufacturer
- PC5.** use diagnostic tools as required to assess the problem including using on board diagnostic tools like digital tools and devices, use of pressure gauges, filler gauges, callipers and condition monitoring devices and tools to obtain equipment data and compare the same with standards to detect faults in the system
- PC6.** check and make adjustments to clearances, gaps, settings, alignment, pressures, tension, speeds and oil levels relevant to the engine area, transmission area, chassis area, final drive, electrical circuitry and body (including valves, ignition, fuel system and emissions, brakes, transmission, lights, final drive, hydraulic system, tyres/tracks, steering and body and chassis fittings)
- PC7.** check routine service components and materials, including oil seals, filters, drive belts, wiper blades, brake linings and pads, linkages, bearings, lubricants and fluids
- PC8.** recognise and record any damage to equipment's components and units outside normal service items
- PC9.** check lubricant levels and identify codes and grades of lubricants to be used for specific components of HEMM
- PC10.** dismantle specific components and assemblies, needing attention, to locate and identify faults
- PC11.** report malfunctions or repair requirements observed in equipment's beyond what is mentioned in the complaint sheet

Knowledge and Understanding (KU)



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The individual on the job needs to know and understand:

- KU1.** job-specific documents e.g. daily maintenance checklist and importance of the same
- KU2.** risk and impact of not following defined procedures/work instructions
- KU3.** the hierarchy for reporting identified problems
- KU4.** cost of equipment and loss for the company that results from damage of equipment
- KU5.** implications of delays in the process
- KU6.** handover and takeover procedures of the machine according to company's SOP
- KU7.** safety guidelines specified by Directorate General of Mines Safety (DGMS) specific to HEMM mechanic
- KU8.** different types of mines and detail of the mine one is working in
- KU9.** benching in quarries, dressing of overhangs, undercuts, fencing
- KU10.** importance of first aid and hygiene
- KU11.** code of practice in specific areas of the mine
- KU12.** standing orders in force at the mine
- KU13.** importance of safety in the vicinity of machinery
- KU14.** about shot-firing / blasting related safety regulations including taking shelter during blasting
- KU15.** duties of workmen under the Mines Act-1952
- KU16.** provision of compensation and working hours, leaves, etc. as per Mines Act-1952
- KU17.** the outcome of violation of safety procedures
- KU18.** emergency response /disaster management plan prepared by the organization
- KU19.** the basic technology used in and functioning of various components and aggregates of the Equipment including engines and fuel system, cooling system, air supply systems, emission and exhaust system, ignition systems, clutch assembly, clutch operating system, gearbox (manual and automatic) / transmission, torque converter, drivelines and hubs, drive-train assembly and transmission systems (manual, automatic etc.), steering system, suspension system, brake system, tyres and wheels (including wheel alignment), tracks and power train up to final drive, in case of crawling equipment, batteries and power storage system, power-generating/transmission systems (including charging and interlocking systems), electrical wire harness, lighting, ignition, electronic and air-conditioning systems, electronic systems including active and passive safety, electronic control unit. hydraulic and pneumatic systems, various lubrication systems
- KU20.** tools used to assess and confirm technical faults that cannot be determined through a visual inspection, including use of (but not limited to) pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tyre pressure gauges, measuring equipment (Vernier callipers, micrometre, feeler gauges, multi-meter, flow meter, temp gauge, dial gauge etc.), condition Monitoring Systems for temperature, vibration, sound etc.
- KU21.** various sources of information available for assessing service and repair requirements of the vehicle including diagnostic displays, visual inspections, test drives, vehicle/equipment manufacturer specifications, standard operating procedures for diagnosis, equipment log books and history sheets, complaint register / sheet

Generic Skills (GS)

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



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- GS1.** note down observations (if any)
- GS2.** read and interpret symbols and readings
- GS3.** read information documents
- GS4.** discuss task lists, schedules and activities
- GS5.** effectively communicate, listen and comprehend the information given by various sources about the site
- GS6.** make decisions pertaining to the concerned area of work
- GS7.** plan and organize the work order and tasks
- GS8.** organize all operation and service manuals so that sorting/ accessing information is easy
- GS9.** detect problems in day to day tasks
- GS10.** discuss a possible solution with the supervisor for problem solving
- GS11.** make decisions in emergency conditions
- GS12.** follow instructions and work on areas of improvement identified
- GS13.** complete the assigned tasks timely
- GS14.** use reasoning skills to identify and resolve basic problems
- GS15.** analyze and detect any potential problems which could arise during operation
- GS16.** respect persons with disabilities
- GS17.** explain the importance of gender-sensitization at the work site
- GS18.** state basic laws, acts and provisions defined for Persons with Disability (PwD) by the statutory bodies

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Identify and diagnose operational faults</i>	30	70	-	-
PC1. conduct scheduled, routine examination methods and assessments against Equipment specifications to identify wear, damage, corrosion, inadequate fluid levels, leaks, wear, security problems and general condition and serviceability	3	6	-	-
PC2. review complaint sheet, log book and history sheet of the equipment and identify repair requirements	3	7	-	-
PC3. recognize original equipment manufacturers' specifications and follow standard operating procedure set out for preventive maintenance and diagnosing faults	3	6	-	-
PC4. use diagnostic procedures as defined in the troubleshooting checklist prepared by the equipment manufacturer	2	6	-	-
PC5. use diagnostic tools as required to assess the problem including using on board diagnostic tools like digital tools and devices, use of pressure gauges, filler gauges, callipers and condition monitoring devices and tools to obtain equipment data and compare the same with standards to detect faults in the system	3	7	-	-
PC6. check and make adjustments to clearances, gaps, settings, alignment, pressures, tension, speeds and oil levels relevant to the engine area, transmission area, chassis area, final drive, electrical circuitry and body (including valves, ignition, fuel system and emissions, brakes, transmission, lights, final drive, hydraulic system, tyres/tracks, steering and body and chassis fittings)	2	6	-	-
PC7. check routine service components and materials, including oil seals, filters, drive belts, wiper blades, brake linings and pads, linkages, bearings, lubricants and fluids	3	6	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC8. recognise and record any damage to equipment's components and units outside normal service items	3	7	-	-
PC9. check lubricant levels and identify codes and grades of lubricants to be used for specific components of HEMM	3	6	-	-
PC10. dismantle specific components and assemblies, needing attention, to locate and identify faults	2	7	-	-
PC11. report malfunctions or repair requirements observed in equipment's beyond what is mentioned in the complaint sheet	3	6	-	-
NOS Total	30	70	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	MIN/N3206
NOS Name	Diagnose HEMM for repair requirement
Sector	Mining
Sub-Sector	Engineering Services
Occupation	Mechanical Services
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	27/01/2022
Next Review Date	17/11/2025
NSQF Clearance Date	17/11/2022

Qualification Pack

MIN/N3207: Carry out service, repair and maintenance activities

Description

This OS unit is about performing HEMM repairs and maintenance operation for activities that need to be carried out during a shift.

Scope

The scope covers the following :

- Carry out service, repair and maintenance activities

Elements and Performance Criteria

Carry out service, repair and maintenance activities

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

- PC1.** follow OEM recommended procedure and checklist for routine servicing
- PC2.** confirm tasks to be carried out with superior for non-routine service or repair
- PC3.** obtain the correct spare parts, lubricants, tools and other materials required
- PC4.** calibrate, align and adjust settings, alignment, pressures, tension, speeds and levels relevant to engine and aggregates, transmission system, load bearing arms and structure, safety devices and components installed, electrical and electronic components and other components (including valves, ignition, fuel systems and emissions, brakes, transmission, lights, tyres, tracks, hydraulic systems, steering and body/chassis fittings)
- PC5.** identify and change components requiring change due to continuous wear and tear including fuel, oil and air filters, drive belts, braking system components, drive train components, oil seals, bearings and bushes etc.
- PC6.** ensure disposal of materials in accordance with the organization's policies
- PC7.** refill correct grade of coolants, lubricants and other fluids as per OEM guidelines
- PC8.** follow the various precautions to be taken to avoid damage to the vehicle and its components
- PC9.** record all service and repairs carried out and ensure completeness of tasks assigned before releasing vehicle for the next procedure
- PC10.** follow standard operating procedures for using workshop tools and equipment
- PC11.** ensure all workshop tools, equipment and workstations are adequately maintained by carrying out scheduled checks, calibration and timely repairs

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** job-specific documents e.g. daily maintenance checklist and importance of the same
- KU2.** risk and impact of not following defined procedures/work instructions
- KU3.** the hierarchy for reporting identified problems



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- KU4.** cost of equipment and loss for the company that results from damage of equipment
- KU5.** implications of delays in the process
- KU6.** handover and takeover procedures of the machine according to company's SOP
- KU7.** safety guidelines specified by Directorate General of Mines Safety (DGMS) specific to HEMM mechanic
- KU8.** different types of mines and detail of the mine one is working in
- KU9.** benching in quarries, dressing of overhangs, undercuts, fencing
- KU10.** importance of first aid and hygiene
- KU11.** code of practice in specific areas of the mine
- KU12.** standing orders in force at the mine
- KU13.** importance of safety in the vicinity of machinery
- KU14.** about shot-firing / blasting related safety regulations including taking shelter during blasting
- KU15.** duties of workmen under the Mines Act-1952
- KU16.** provision of compensation and working hours, leaves, etc. as per Mines Act-1952
- KU17.** the outcome of violation of safety procedures
- KU18.** emergency response /disaster management plan prepared by the organization
- KU19.** basic technology used in and functioning of various components and aggregates of the Equipment including engines and fuel system (diesel, petrol, electrical etc.), cooling system, air supply systems, emission and exhaust system, ignition systems, clutch assembly, clutch operating system, gearbox (manual and automatic), drivelines and hubs, drive-train assembly and transmission systems (manual, automatic etc.), steering system, suspension system, braking system, tyres and wheels (includi
- KU20.** selecting the standard materials for the job such as seals, sealants, fittings, gaskets, joints, fasteners etc. as per manufacturers specification
- KU21.** how to carry out routine maintenance including checking vehicle condition against OEM specifications to identify damage, corrosion, wear and tear, fluid levels, leaks and other problems in serviceability
- KU22.** how to carry out routine maintenance including make adjustments to settings, alignment, pressures, tension, speeds and levels relevant to engine and aggregates, steering system, clutch and brake assembly, transmission system, wheels and axle or track system, electrical and electronic components, other components
- KU23.** the type and quality of components specified by the OEM for use as replacement parts
- KU24.** the grade of lubricants specified by the OEM for use
- KU25.** typical causes and symptoms of operational faults and failures of a vehicle corrective action to be taken for common engine and aggregate system faults and failures
- KU26.** faults and failures that necessitate replacement of components and other units
- KU27.** how to dispose off replaced components in accordance with safety, health and environmental policies and regulations

Generic Skills (GS)

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

- GS1.** note down observations (if any)



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- GS2.** read and interpret symbols and readings
- GS3.** read information documents
- GS4.** discuss task lists, schedules and activities
- GS5.** effectively communicate, listen and comprehend the information given by various sources about the site
- GS6.** make decisions pertaining to the concerned area of work
- GS7.** plan and organize the work order and tasks
- GS8.** organize all operation and service manuals so that sorting/ accessing information is easy
- GS9.** detect problems in day to day tasks
- GS10.** discuss a possible solution with the supervisor for problem solving
- GS11.** make decisions in emergency conditions
- GS12.** follow instructions and work on areas of improvement identified
- GS13.** complete the assigned tasks timely
- GS14.** use reasoning skills to identify and resolve basic problems
- GS15.** analyze and detect any potential problems which could arise during operation
- GS16.** respect persons with disabilities
- GS17.** explain the importance of gender-sensitization at the work site
- GS18.** state basic laws, acts and provisions defined for Persons with Disability (PwD) by the statutory bodies

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Carry out service, repair and maintenance activities</i>	30	70	-	-
PC1. follow OEM recommended procedure and checklist for routine servicing	3	6	-	-
PC2. confirm tasks to be carried out with superior for non-routine service or repair	3	7	-	-
PC3. obtain the correct spare parts, lubricants, tools and other materials required	3	7	-	-
PC4. calibrate, align and adjust settings, alignment, pressures, tension, speeds and levels relevant to engine and aggregates, transmission system, load bearing arms and structure, safety devices and components installed, electrical and electronic components and other components (including valves, ignition, fuel systems and emissions, brakes, transmission, lights, tyres, tracks, hydraulic systems, steering and body/chassis fittings)	5	15	-	-
PC5. identify and change components requiring change due to continuous wear and tear including fuel, oil and air filters, drive belts, braking system components, drive train components, oil seals, bearings and bushes etc.	2	5	-	-
PC6. ensure disposal of materials in accordance with the organization's policies	2	5	-	-
PC7. refill correct grade of coolants, lubricants and other fluids as per OEM guidelines	3	5	-	-
PC8. follow the various precautions to be taken to avoid damage to the vehicle and its components	3	5	-	-
PC9. record all service and repairs carried out and ensure completeness of tasks assigned before releasing vehicle for the next procedure	2	5	-	-
PC10. follow standard operating procedures for using workshop tools and equipment	2	5	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. ensure all workshop tools, equipment and workstations are adequately maintained by carrying out scheduled checks, calibration and timely repairs	2	5	-	-
NOS Total	30	70	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	MIN/N3207
NOS Name	Carry out service, repair and maintenance activities
Sector	Mining
Sub-Sector	Engineering Services
Occupation	Mechanical Services
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	27/01/2022
Next Review Date	17/11/2025
NSQC Clearance Date	17/11/2022



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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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- 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>	1	1	-	-
PC1. identify employability skills required for jobs in various industries	-	-	-	-
PC2. identify and explore learning and employability portals	-	-	-	-
<i>Constitutional values - Citizenship</i>	1	1	-	-
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	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	2	4	-	-
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	-	-	-	-
<i>Basic English Skills</i>	2	3	-	-
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	-	-	-	-
<i>Career Development & Goal Setting</i>	1	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
<i>Communication Skills</i>	2	2	-	-
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
<i>Diversity & Inclusion</i>	1	2	-	-
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	2	3	-	-
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	-	-	-	-
<i>Essential Digital Skills</i>	3	4	-	-
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	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Entrepreneurship</i>	2	3	-	-
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	-	-	-	-
<i>Customer Service</i>	1	2	-	-
PC26. identify different types of customers	-	-	-	-
PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
PC28. follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship & Jobs</i>	2	3	-	-
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	-	-	-	-
NOS Total	20	30	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0102
NOS Name	Employability Skills (60 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	NA
Next Review Date	17/11/2025
NSQC Clearance Date	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>	24	42	-	17
PC1. undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work	-	2	-	2
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	1	3	-	-
PC3. operate various types of fire extinguishers to control different types of fire at a worksite when required	1	4	-	1
PC4. 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	-	-
PC5. take precaution against occupational health hazards (like dust, water, mine gases etc.) due to U/G working environment	1	2	-	1
PC6. use self-rescue apparatus, appropriately when required	-	4	-	1
PC7. follow appropriate emergency response procedure during emergency such as fire, water inrush, fall of ground etc.	1	2	-	1
PC8. follow precautions against U/G electrical appliances	2	2	-	2
PC9. follow appropriate Standard Operating Procedure while working near any isolated and sealed off area of the mine	2	2	-	1
PC10. follow appropriate safety practices while traveling on U/G haul roads, incase of post blast fumes and misfire	2	4	-	-
PC11. 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
PC12. identify the working ventilation district from line diagram of ventilation circuit to direct air to the working face	1	1	-	-
PC13. follow Safety Management Plan (SMP) and Emergency Management Plan (EMP)	1	-	-	-
PC14. follow gas detecting alarm signal on leakage of inflammable gases and laid out procedure to ensure safety	1	2	-	1
PC15. follow process for reporting any unsafe act/condition in work area to the concerned person	-	2	-	1
PC16. use underground mine communication system	-	1	-	-
PC17. ensure positive isolation near the work place if applicable	1	1	-	1
PC18. use appropriate PPE as per the requirement	2	4	-	2
PC19. maintain hand hygiene by washing hands with alcohol based sanitisers/soap	1	1	-	1
PC20. disinfect the machine/tools before and after work/task	1	1	-	-
PC21. maintain hygiene at the work site	1	1	-	1
PC22. report any symptoms of illness to the shift-incharge	1	-	-	-
PC23. identify six directional hazards at workplace and take decisions accordingly	2	-	-	-
<i>Follow environmental guidelines</i>	6	8	-	3
PC24. identify the environmental impact of mining related operations and follow steps to reduce those impact	1	2	-	-
PC25. follow the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery	-	1	-	-
PC26. 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
PC27. ensure that the subgrade ore is carried out to surface and stacked separately at the earmarked place	1	-	-	1
PC28. ensure the productivity of the machine for material/fuel conservation	1	1	-	-
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	1	1	-	1
PC30. follow the "5-S" practice at work site like cleaning oil from ground (to avoid soil from getting damaged), etc.	1	2	-	1
NOS Total	30	50	-	20



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National Occupational Standards (NOS) Parameters

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



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MIN/N1703: Follow Health, Safety, and Environmental Guidelines for opencast mines (Including Mine Vocational Training Rule)

Description

This unit is about adhering to health, safety and environmental guidelines at the Open Cast Mines while executing various tasks, maintenance and operations.

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.** comply with safety, health, and security-related regulations/guidelines at the opencast mine
- PC2.** follow the safety instructions given by the workman's inspector
- PC3.** follow adequate safety while working at haul roads, heights, overburden dumps, sump area, stockyard, near moving parts, etc.
- PC4.** take safety precautions while working on sites (sub-station, workshop etc.), with equipment, and conducting welding and cutting operations
- PC5.** follow appropriate Safe Operating Procedure (SOP) while dealing with explosives
- PC6.** respond promptly and appropriately to an accident/ incident or an emergency situation, within limits of the role and responsibility
- PC7.** provide first aid to an injured person
- PC8.** operate various types of fire extinguishers to control different types of fire at a worksite when required
- PC9.** use appropriate PPE as per the requirement
- PC10.** maintain hand hygiene by washing hands with alcohol based sanitisers/soap
- PC11.** disinfect the machine/tools before and after work/task
- PC12.** maintain hygiene at the work site
- PC13.** report any symptoms of illness to the shift-incharge

Follow Environmental guidelines

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

- PC14.** identify the environmental impact of related opencast mining operations
- PC15.** 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
- PC16.** ensure not to mix topsoil with waste in day to day tasks
- PC17.** ensure that HEMM is washed at the designated location



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- PC18.** ensure the productivity of the machine for material/fuel conservation
- PC19.** follow the mineral conservation practices specified by the organization in accordance with MCDR-2017 (Mineral Conservation and Development Rules)
- PC20.** assist supervisor for reducing environmental impact caused due to related mining operations

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** about various environmental awareness program related to mining, organized by the various government bodies/company
- KU2.** safety guidelines specified by Directorate General of Mine Safety (DGMS)
- KU3.** basic mining terminologies and definitions
- KU4.** means of access and egress from the mines, location of workshop, haul roads and working face including dump yards
- KU5.** duties of workers under The Mines act-1952
- KU6.** working hours and accident compensation as per The Mines act-1952
- KU7.** about precautions to be taken when handling heavy equipment
- KU8.** various problems/incidents likely to occur
- KU9.** hierarchy of the reporting
- KU10.** machine operation, condition of the machine and worksite
- KU11.** proper documents specific to the machine
- KU12.** role of workmen inspector, safety committee and internal safety organization
- KU13.** the process of top soil removal and management
- KU14.** mine sump and pumping system of the mines
- 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.** 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.
- KU18.** shot-firing / blasting related safety regulations including taking shelter during blasting
- KU19.** emergency response /disaster management plan prepared by the organization
- KU20.** signages, mining area-specific signs, and other safety and emergency signals
- KU21.** the outcome of violation of safety procedures
- KU22.** basic personal and workplace hygiene
- KU23.** importance of sensitization towards different genders and PWD (Persons with Disabilities)

Generic Skills (GS)

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

- GS1.** fill up documentation applicable to one's role



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- GS2.** make decisions on the concerned area of work
- GS3.** read and interpret manuals, health, and safety instructions, memos, etc.
- GS4.** plan and organize the work order and jobs
- GS5.** use reasoning skills to identify and resolve fundamental problems
- GS6.** complete the assigned tasks timely



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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>	20	34	-	15
PC1. comply with safety, health, and security-related regulations/guidelines at the opencast mine	2	2	-	1
PC2. follow the safety instructions given by the workman's inspector	1	3	-	1
PC3. follow adequate safety while working at haul roads, heights, overburden dumps, sump area, stockyard, near moving parts, etc.	3	3	-	1
PC4. take safety precautions while working on sites (sub-station, workshop etc.), with equipment, and conducting welding and cutting operations	1	3	-	1
PC5. follow appropriate Safe Operating Procedure (SOP) while dealing with explosives	2	3	-	2
PC6. respond promptly and appropriately to an accident/ incident or an emergency situation, within limits of the role and responsibility	2	3	-	1
PC7. provide first aid to an injured person	2	3	-	1
PC8. operate various types of fire extinguishers to control different types of fire at a worksite when required	1	3	-	1
PC9. use appropriate PPE as per the requirement	2	4	-	2
PC10. maintain hand hygiene by washing hands with alcohol based sanitisers/soap	1	2	-	1
PC11. disinfect the machine/tools before and after work/task	1	2	-	1
PC12. maintain hygiene at the work site	1	1	-	1
PC13. report any symptoms of illness to the shift-incharge	1	2	-	1
<i>Follow Environmental guidelines</i>	10	16	-	5



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. identify the environmental impact of related opencast mining operations	2	2	-	1
PC15. 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	2	-	1
PC16. ensure not to mix topsoil with waste in day to day tasks	2	2	-	1
PC17. ensure that HEMM is washed at the designated location	2	2	-	1
PC18. ensure the productivity of the machine for material/fuel conservation	1	3	-	-
PC19. follow the mineral conservation practices specified by the organization in accordance with MCDR-2017 (Mineral Conservation and Development Rules)	1	3	-	1
PC20. assist supervisor for reducing environmental impact caused due to related mining operations	1	2	-	-
NOS Total	30	50	-	20



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Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MIN/N1703
NOS Name	Follow Health, Safety, and Environmental Guidelines for opencast mines (Including Mine Vocational Training Rule)
Sector	Mining
Sub-Sector	Mining Operation
Occupation	HSE Functions, , Exploration, Mineral Estimation, Planning, Mine Surveying, Drilling/Cutting, Shot firing/Blasting, Loading and Hauling - Opencast, Specialized Operations, Electrical Services, Mechanical Services, Instrumentation and Control Systems, Ore Processing
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	30/06/2022
Next Review Date	17/11/2025
NSQC Clearance Date	17/11/2022

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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- 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>	24	43	-	14
PC1. follow preventive measures against firedamp, whitedamp, blackdamp etc.	1	1	-	-
PC2. use the flame safety lamp for detecting the methane gas as per Standard Operating Procedure (SOP)	-	1	-	-
PC3. undertake "The Take-5 (Personal Risk Assessment)" before commencement of any work	1	1	-	1
PC4. 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
PC5. ensure that oil, grease, canvas or other inflammable material are stored in fire-proof receptacle	-	1	-	-
PC6. ensure that every instrument, apparatus and equipment are DGMS approved before these are used	1	1	-	-
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	3	3	-	-
PC8. provide first aid to an injured person	1	2	-	1
PC9. follow safety precautions against spontaneous heating of the coal	1	1	-	-
PC10. operate various types of fire extinguishers to control different types of fire at worksite, if required	-	2	-	-
PC11. ensure that no person is traveling/working/staying under unsupported roof	1	-	-	-
PC12. 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

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

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC27. ensure positive isolation near the work place if applicable	1	1	-	-
PC28. use appropriate Personal Protective Equipment (PPE) as per the requirement	2	2	-	1
PC29. maintain hand hygiene by washing hands with alcohol based sanitisers/soap	-	1	-	-
PC30. disinfect the machine/tools before and after work/task	1	1	-	-
PC31. maintain hygiene at the work site	1	1	-	-
PC32. report any symptoms of illness to the shift-incharge	1	1	-	-
PC33. identify six directional hazards at workplace and take decisions accordingly	-	1	-	1
<i>Follow environmental guidelines</i>	6	7	-	6
PC34. identify the environmental impact of mining related operations and follow steps to reduce those impact	1	1	-	1
PC35. follow the mineral conservation practices in U/G mining operations to achieve optimum ore or mineral recovery	1	1	-	1
PC36. ensure that the stowing practices produce minimum disturbance to the surface	1	1	-	-
PC37. ensure that the subgrade coal is carried out to surface and stacked separately at the earmarked place	1	1	-	1
PC38. ensure the productivity of the machine for material/fuel conservation	1	1	-	1
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	-	1	-	1
PC40. 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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National Occupational Standards (NOS) Parameters

NOS Code	MIN/N1704
NOS Name	Follow Health, Safety, and Environmental guidelines for underground coal mines (Including Mine Vocational Training Rule and Mine Rescue Rule)
Sector	Mining
Sub-Sector	Mining Operation
Occupation	HSE Functions, Mine Surveying, Drilling/Cutting, Shot firing/Blasting, Loading and Hauling - Underground, Specialized Operations, Electrical Services, Mechanical Services
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	30/06/2022
Next Review Date	17/11/2025
NSQC Clearance Date	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 the 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 the theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.



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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/N3206.Diagnose HEMM for repair requirement	30	70	-	-	100	30
MIN/N3207.Carry out service, repair and maintenance activities	30	70	-	-	100	40
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	10
Total	80	170	-	-	250	80

Elective: 1 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	20
Total	30	50	-	20	100	20

Elective: 2 Opencast



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National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
MIN/N1703.Follow Health, Safety, and Environmental Guidelines for opencast mines (Including Mine Vocational Training Rule)	30	50	-	20	100	20
Total	30	50	-	20	100	20

Elective: 3 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	20
Total	30	50	-	20	100	20



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Acronyms

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

Qualification Pack

Glossary

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



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