QUALIFICATIONS PACK - OCCUPATIONAL STANDARD FOR MINING INDUSTRY

What are Occupational Standard(OS)?

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

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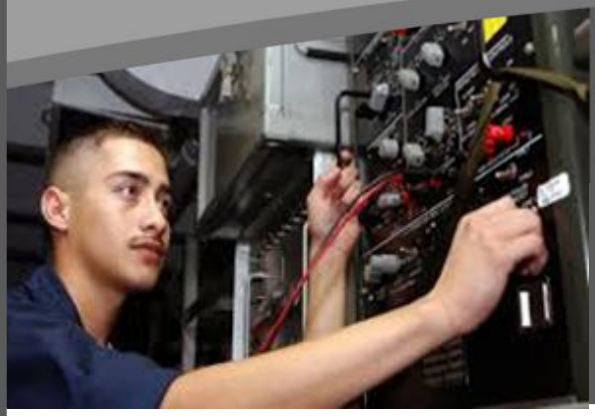


Contents

Introduction

Qualifications Pack- Mine Electrician

SECTOR: MINING
SUB-SECTOR: Underground and Open Cast Mines
OCCUPATION: Electrical Maintenance
REFERENCE ID: MIN/Q 0416
ALIGNED TO: NCO-2004/7137.15

An Electrician ensures the end to end management of both electrical substations and electrical equipment

Brief Job Description: Mine Electrician ensures installation, use, operations and maintenance of the electrical substations and electrical equipment and electrical supply. The role holder also ensures that all the electrical systems and machinery work is in accordance with relevant specifications.

Personal Attributes: This job requires skills in reading, writing and communication skills, ability to plan and prioritize, quality consciousness, safety orientation, Physique to sustain strenuous conditions, Ability to use fingers, hands and feet with ease to complete the assigned task (Dexterity), high precision and sensitivity to problem solving and sensitivity towards safety for self and equipment.

Job Details

Qualification Pack Code	**MIN/ Q0416**		
Job Role	**Mine Electrician**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Industry	**Mining**	**Drafted on**	**15/12/2014**
Sub-sector	**Underground and Open Cast Mines**	**Last reviewed on**	**24/03/2015**
Occupation	**Electrical Maintenance**	**Next review date**	**24/03/2017**

Job Role	**Mine Electrician**
Role Description	Responsible for O&M of electrical substation, supply and electrical equipment
NSQF level **Minimum Educational Qualification** **Maximum Educational Qualification**	4 ITI/ Higher Secondary NA
Training	**Mandatory** 1. Competency certification required for HT/LT electricians and electrical supervisors **Suggested** 1. Latest electrical switchgear, equipment, systems and technologies 2. Safety
Experience	2-3 years of experience including O&M of electrical supply/substation and equipment
Applicable National Occupational Standards	**Compulsory:** **Click on the hyperlink to read/download the required NOS** 1. MIN/ N 0446 (Understand job requirements and related processes) 2. MIN/ N 0447 (Install the electrical supply/ sub-station and equipment) 3. MIN/ N 0448 (O&M of electrical supply/ sub-station and equipment) 4. MIN / N 0901 (Health and Safety) **Optional:** Not Applicable
Performance Criteria	As described in the relevant OS units

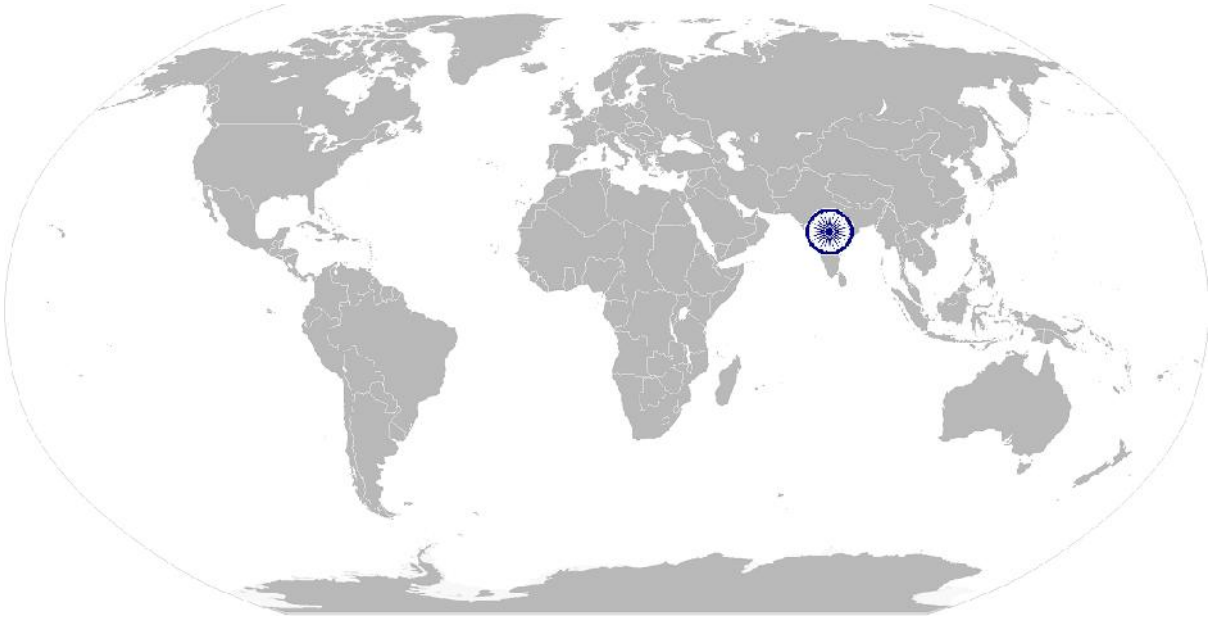
Definitions

Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
Job Role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
OS	OS specify the standard of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding they need to meet that standard consistently. Occupational Standard are applicable both in the Indian and global contexts.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
NOS	NOS are Occupational Standard which apply uniquely in the Indian context.
Qualification Pack Code	Qualification Pack Code is a unique reference code that identifies a qualification pack.
Qualification Pack	Qualification Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A Qualification Pack is assigned a unique qualification pack code.
Unit Code	Unit Code is a unique identifier for an Occupational Standard , which is denoted by an 'N'
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
Organizational Context	Organizational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills or Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.

Acronyms

Keywords /Terms	Description
SCMS	Skill council for Mining Sector
NOS	National Occupational Standard
NSQF	National Skill Qualification Framework
NVEQF	National Vocational Educational Qualification Framework
NVQF	National Vocational Qualification Framework
OS	Occupational Standard
PC	Performance Criteria
QP	Qualification Pack
SSC	Sector Skill Council

National Occupational Standard



Overview

This unit is about understanding the job requirement and the activities & equipment associated with the process to complete the job requirement.

MIN/ N 0446

Understand job requirements and related processes

National Occupational Standard

Unit Code	**MIN/ N0446**
Unit Title (Task)	**Understand job requirements and related processes**
Description	This OS unit is about understanding the job requirement, what processes need to be executed, what equipment will be used and what is the required output considering the standard specified
Scope	This unit/task covers the following: • Understand the work related requirements • Arrange the electrical equipment to conduct the processes

Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Understand the work and the process requirements	PC1. Understand the work (work output) required from the job and discuss the same with the supervisor PC2. Understand the electrical layout PC3. Refer all work instruction/ related documents to understand requirements from electrical substations/ electrical equipment/ electrical wiring or fixtures PC4. Understand the specifications for various systems within electrical substations/ transmission of electricity/ use/ operation of electrical equipment/ electrical wiring or fixtures as mentioned in the Work Instruction/ SOP/ Control Diagrams PC5. Prepare sketches or follow blueprints to determine the location of wiring or equipment and to ensure conformance to safety codes
Arrange for the machinery/ equipment/ materials to be installed	PC6. Identify the electrical equipment requirements as per the specifications in the work instructions for installation of electrical substations/ electrical equipment/ electrical wiring or fixtures PC7. Ensure that the required electrical equipment is procured from the store or vendor before starting the process

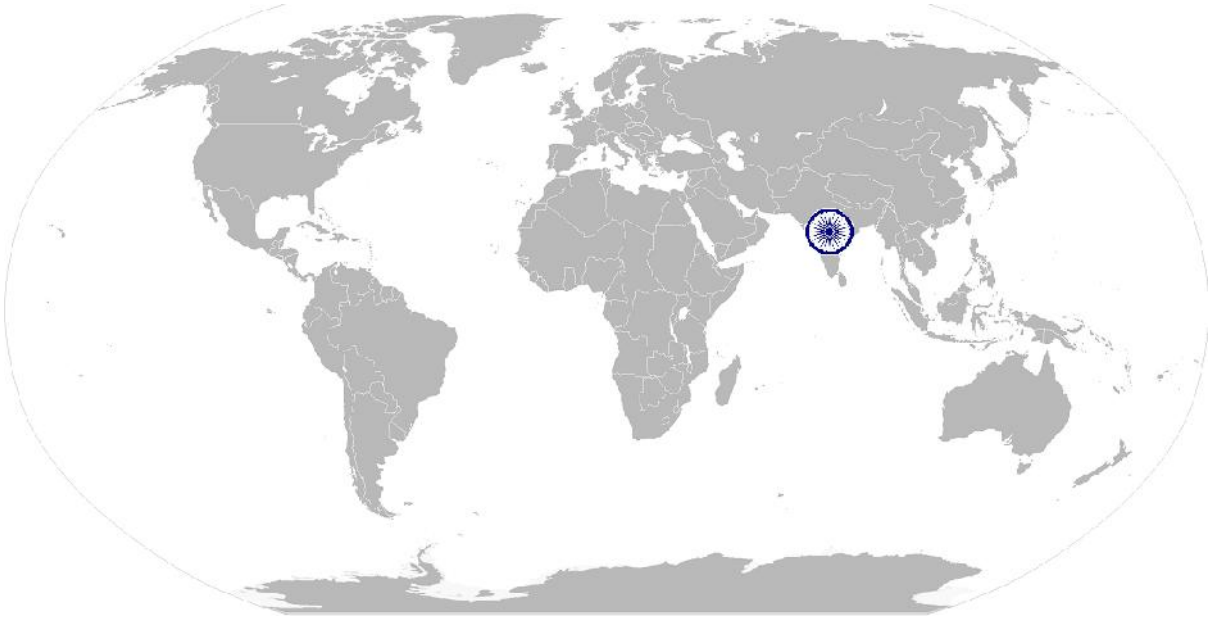
Knowledge and Understanding (K)	
A. **Regulatory context** (knowledge of safety	The user/individual on the job needs to know and understand: KA1. Different types of mines and detail of the mine he is working in KA2. Mine Organisation, time keeping, need for discipline and punctuality KA3. Benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and

guidelines specified by Director General of Mine Safety (DGMS))	Hygiene KA4. Standing orders in force at the mine. Safety in the vicinity of machinery KA5. Shot-firing and Safety regulations. How and where to take shelter KA6. Duties of workmen KA7. Provision of wages, working hours and accident compensation as per Mines act KA8. Knowledge of mining safety procedures KA9. Impact of violation of safely procedures
B. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KB1. relevant standard and procedures followed in the company KB2. different types of electrical requirements at the mine KB3. processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
C. Technical Knowledge	The user/individual on the job needs to know and understand: KC1. different electrical units/specifications like wattage, resistance, voltage, frequency, current, Kwh, electrical systems and their specifications etc KC2. Knowledge of sketches and circuit diagrams for the electrical systems installation KC3. Knowledge of different types of tools and electrical equipment KC4. Knowledge of different types of measuring equipment and techniques KC5. knowledge of statutory provisions under relevant electrical laws and rules prescribed by relevant authority KC6. hazards and safety aspects involved, and usage of relevant PPEs KC7. Knowledge of working at height KC8. Knowledge of positive isolation KC9. Knowledge of fire precautions KC10.Knowledge of rules made by central electricity regulatory authority KC11. Introduction to various types of HEMM and other machines used KC12. Various types of motors (AC & DC) and their uses. KC13. Various types of transformers, cooling of transformers, transformers oil, protective devices and the common causes of trouble.

	KC14. Cables and conductors, their classification, construction, insulation types. KC15. Location of faults in cables. KC16. Circuit breakers, their types and causes of faults. KC17. Fuse, their classifications and their requirement in electrical circuits. KC18. Cable jointing, soldering, insulating etc. KC19. Generators, their classification, characteristics. KC20. Earthing, its purpose and various methods of earthing. KC21. Sub-stations, their specifications, various methods of earthing. KC22. Electrical circuit diagram of various HEMM and their study. KC23. Electronics in control system and their types. KC24. Details of diodes, transistors, thyristors, and their checking. KC25. Indian Electrical Rules and the applicable chapters for mines.
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. note down observations (if any) related to electrical systems and share the same with the supervisor SA2. note down the data for the respective shifts in the log sheets/ online systems as per applicability in the organization SA3. write requisitions to internal customers on the requirement of apparatus, tools etc.
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA4. read and interpret control diagrams SA5. read and interpret symbols and measurements instruments SA6. read equipment manuals and process documents to understand the equipments and processes better SA7. read internal information sent by other teams
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA8. discuss task lists, schedules, and work-loads with co-workers

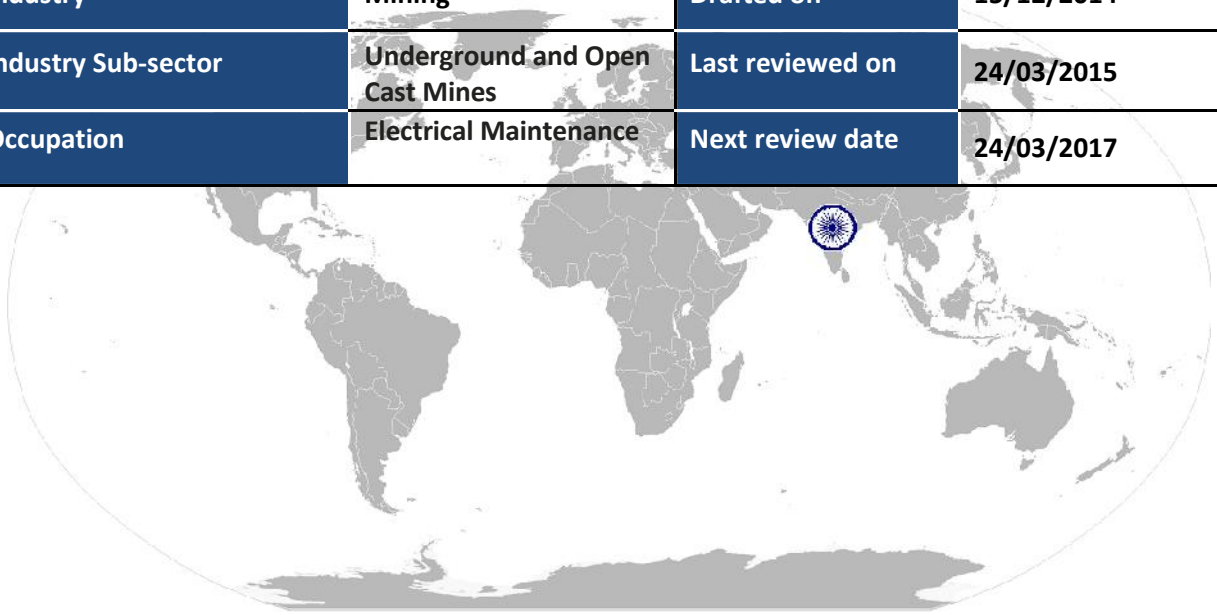
	SA9. effectively communicate with the team members SA10. question internal customers/ supervisor appropriately in order to understand the nature of the problem and make a diagnosis SA11. attentively listen with full attention and comprehend the information given by the speaker
B. Professional Skills	**Plan and Organize**
	The user/individual on the job needs to know and understand how to: SB1. plan and organize the work instruction and jobs received from the internal customers SB2. organize all process/ equipment manuals so that sorting out information is fast SB3. support the supervisor in scheduling tasks for helper grade
	Judgment and Critical Thinking
	The user/individual on the job needs to know and understand how to: SB4. use common sense and make judgments during day to day basis SB5. use reasoning skills to identify and resolve basic problems SB6. use intuition to detect any potential problems which could arise during operations
	Desire to learn and take initiatives
	The user/individual on the job needs to know and understand how to: SB7. follow instructions and work on areas of improvement identified SB8. complete the assigned tasks with minimum supervision SB9. complete the job defined by the supervisor within the timelines and quality norms
	Problem Solving and Decision making
	The user/individual on the job needs to know and understand how to: SB10. detect problems in day to day tasks SB11. support supervisor in using specific problem solving techniques and detailing out the problems SB12. discuss possible solution with the supervisor for problem solving SB13. make decisions in emergency conditions in case the supervisor is not

	available(as per the authority matrix defined by the organization)



NOS Version Control

NOS Code	MIN/N 0446		
Credits(NSQF)	TBD	Version number	1.0
Industry	Mining	Drafted on	15/12/2014
Industry Sub-sector	Underground and Open Cast Mines	Last reviewed on	24/03/2015
Occupation	Electrical Maintenance	Next review date	24/03/2017



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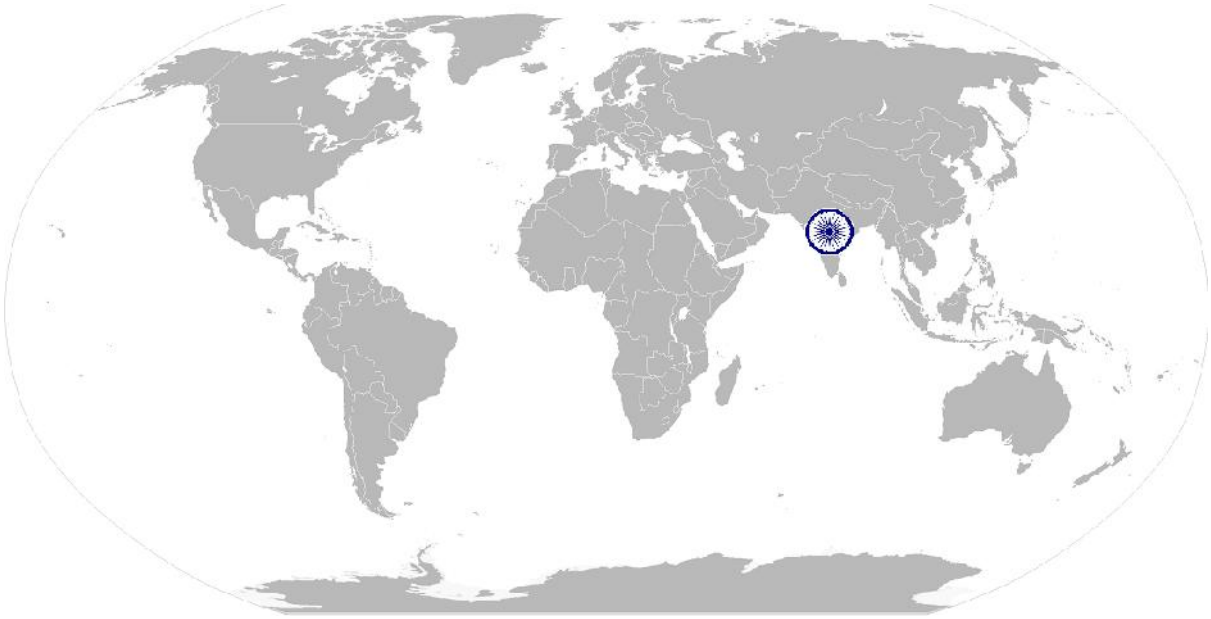


Overview

This unit is about installation for electrical supply/ substations and for electrical electrical equipment.

NOS
National Occupational Standard

MIN/ N 0447

Install the electrical supply/ sub-station and equipment

National Occupational Standard

Unit Code	**MIN/ N0447**
Unit Title (Task)	**Install the electrical supply/ sub-station and equipment**
Description	This OS unit is about installing, operating and maintaining the required electrical systems for both substation machinery and electrical equipment as per the required specifications and industry standard
Scope	This unit/task covers the following: • Install the electrical supply system and electrical equipment

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

Element	Performance Criteria
Installation of the electrical supply system and machinery	PC1. Install the required electrical supply systems including transformers, generators, circuit breakers, isolators, bus bars, measuring equipment for voltage, current, power, energy, frequency, RPM, wiring, fuses, earthing, switchboard, control panels, relays etc. as per the required specifications. PC2. Install required electrical equipment like motors, fans, lighting, ACs, heaters, compressors, pumps etc. Install and commission other mining machinery. PC3. Conduct a test process to ensure the performance of installed electrical equipment as per the defined specifications PC4. Make modifications in the parameters (by selecting the right program from the machine control system) if required and ensure alignment with the prescribed standard PC5. Ensure the setting up of the parameters of electrical equipment.

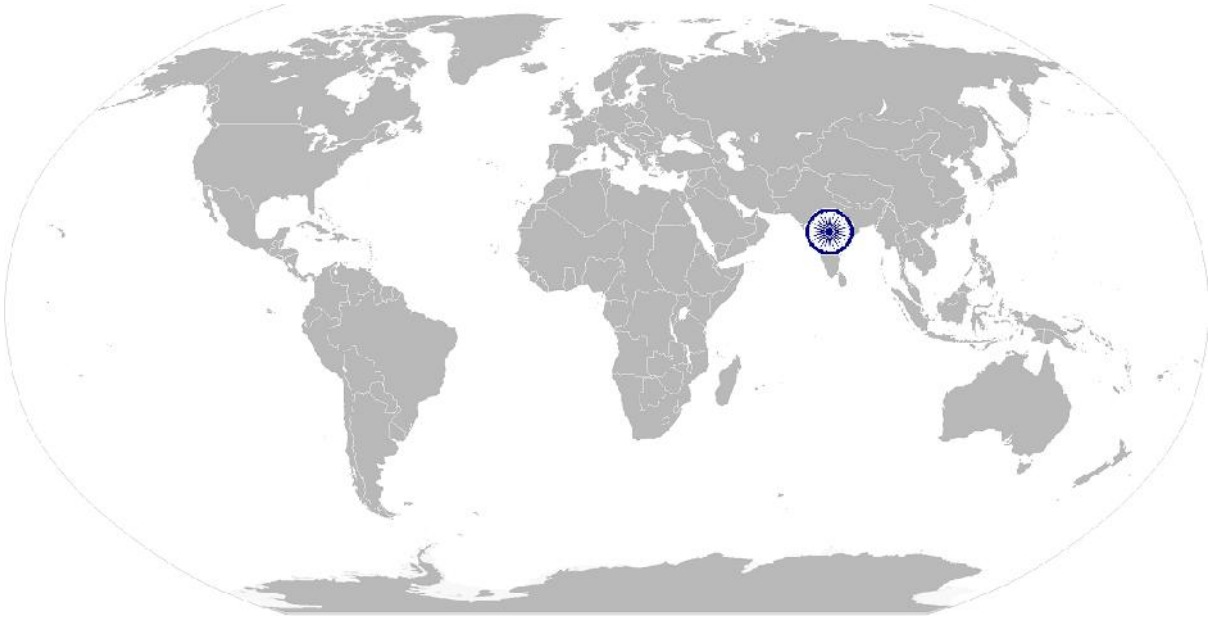
Knowledge and Understanding (K)

A. **Regulatory context** (knowledge of safety guidelines specified by Director General of	The user/individual on the job needs to know and understand: KA1. Different types of mines and detail of the mine he is working in KA2. Mine Organisation, time keeping, need for discipline and punctuality KA3. Benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and Hygiene KA4. Standing orders in force at the mine. Safety in the vicinity of machinery KA5. Shot-firing and Safety regulations. How and where to take shelter KA6. Duties of workmen KA7. Provision of wages, working hours and accident compensation as per

Mine Safety (DGMS))	Mines act KA8. Knowledge of mining safety procedures KA9. Impact of violation of safely procedures
B. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KB1. relevant standard and procedures followed in the company KB2. different types of electrical requirements at the mine KB3. processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
C. Technical Knowledge	The user/individual on the job needs to know and understand: KC1. different electrical units/specifications like wattage, resistance, voltage, frequency, current, Kwh, electrical systems and their specifications etc KC2. sketches and engineering drawings for the electrical systems installation KC3. different types of tools and machinery KC4. hazards and safety aspects involved and usage of relevant PPEs KC5. Electrical defects and how they are generated, how they can be prevented KC6. effect of operators work on quality at in house and at customers, how to improve customers satisfaction KC7. working of electrical supply system and machines
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	**Writing Skills** The user/ individual on the job needs to know and understand how to: SA1. note down observations (if any) related to electrical systems and share the same with the supervisor SA2. note down the production data for the respective shifts in the log sheets/ online ERP as per applicability in the organization SA3. write drawings to internal customers on the requirement of equipment, hand tools etc SA4. write log book in terms of output quantity, set up parameters, machine setting parameters and loss details etc SA5. note measurements, equipment panel readings for various process

	parameters in the required reporting formats
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA6. read and interpret engineering/ wiring drawing and sketches SA7. read equipment manuals and process documents to understand the equipments and processes better SA8. read instructions especially safety instructions especially symbols while using the equipments SA9. read internal drawings send by internal customers (other functions within the organization)
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA10. discuss task lists, schedules, and work-loads with co-workers SA11. question internal customers/ supervisor appropriately in order to understand the nature of the problem and make a diagnosis
B. Professional Skills	**Plan and Organize**
	The user/individual on the job needs to know and understand how to: SB1. plan and organize the work instruction and jobs received from the internal customers SB2. plan and organize the design documents received from internal customers SB3. organize all process/ equipment manuals so that sorting out information is fast SB4. organize apparatus etc in an orderly manner at proper designated areas
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB5. finalize the optimum levels of physical parameters so that the output meets the prescribed standard
	Problem solving
	The user/individual on the job needs to know and understand how to: SB6. think through the problem, evaluate the possible solution and suggest the

	best possible solution to the problem SB7. identify immediate or temporary solutions to resolve delays



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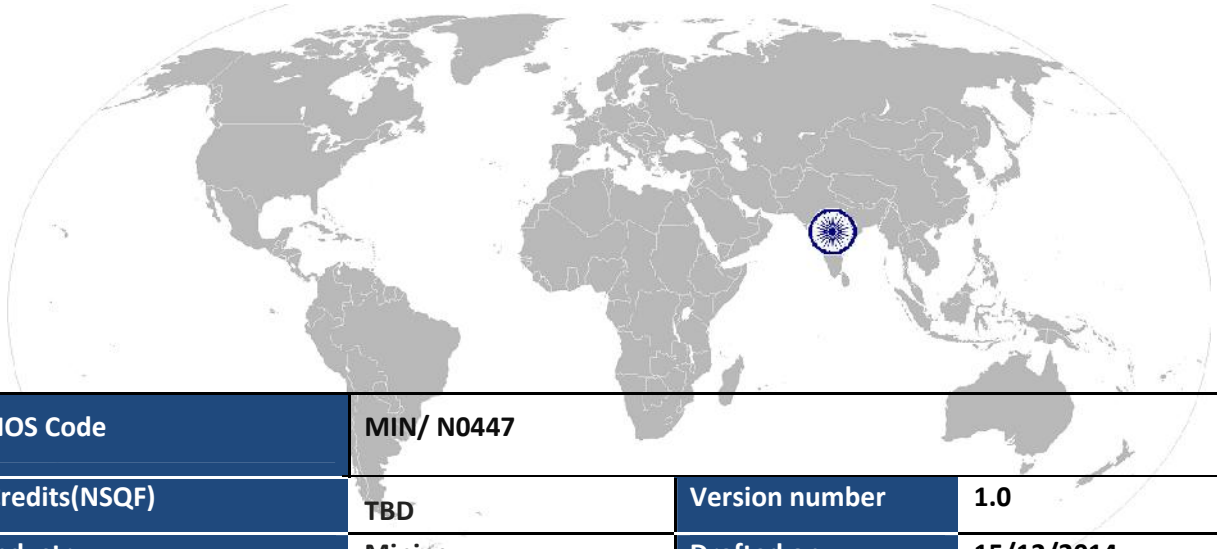

NOS Code	**MIN/ N0447**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Industry	**Mining**	**Drafted on**	**15/12/2014**
Industry Sub-sector	**Underground and Open Cast Mines**	**Last reviewed on**	**24/03/2015**
Occupation	**Electrical Maintenance**	**Next review date**	**24/03/2017**

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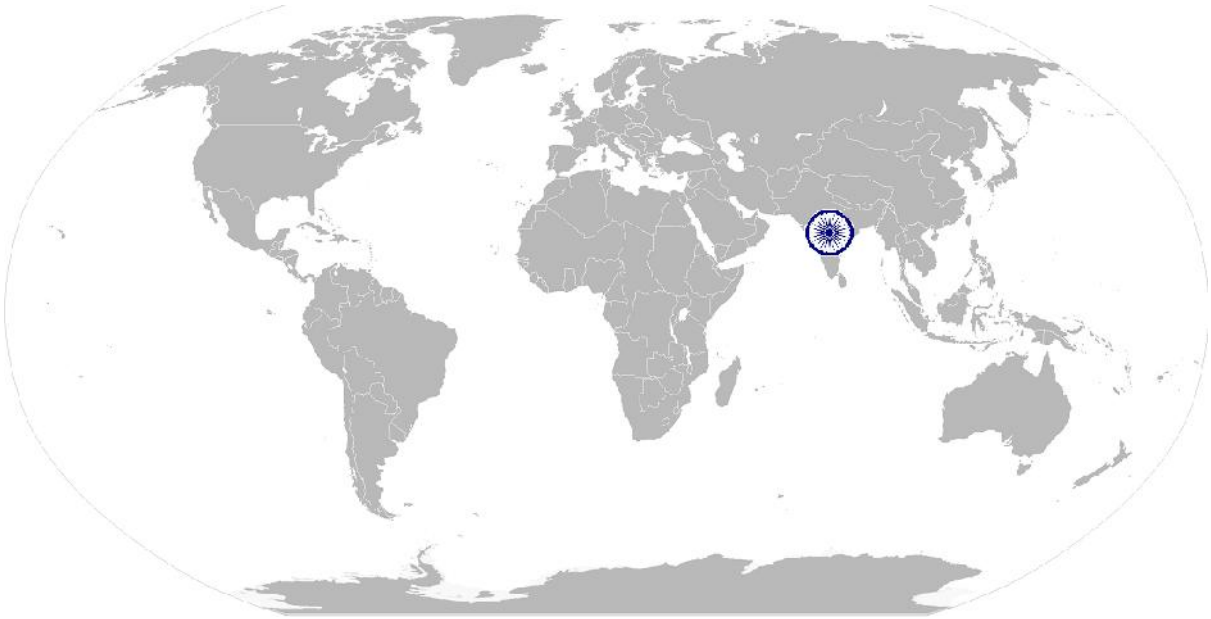


Overview

This unit is about O&M for electrical supply/ substations and for electrical equipment.

MIN/ N 0448 O&M of the electrical supply/ sub-station and equipment

National Occupational Standard

Unit Code	MIN/ N 0448
Unit Title (Task)	O&M for electrical supply/substation and equipment
Description	O&M for electrical supply/ substations and equipment
Scope	This unit/task covers the following: • Conduct the actual operations and maintenance procedures

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

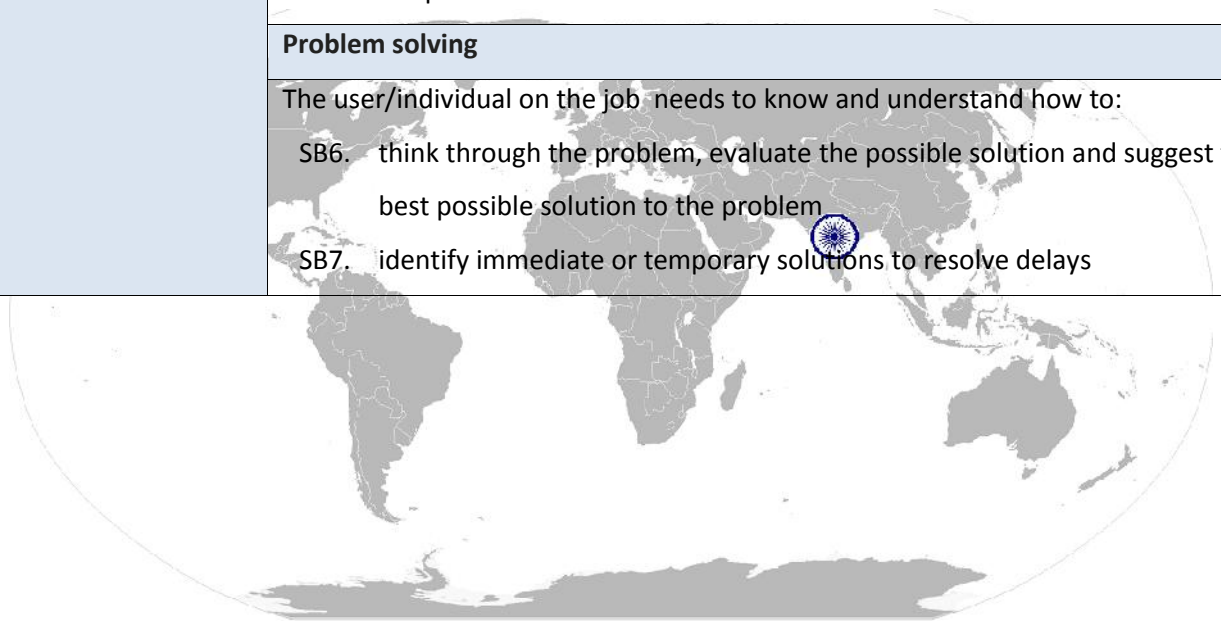
Element	Performance Criteria
Conduct the actual operations and maintenance	Electrical Substation/ supply system PC1. Run the installed electrical equipment in the substation and the electric system to generate and distribute the electricity to the entire mine area with back-ups and redundancies. PC2. Repair and maintain the different electrical equipment as per manufacturers guidelines, SOPs, and as per the statutory requirements (if any) PC3. Carry out predictive, preventive and break down maintenance for generators, transformers, circuit breakers, isolators, bus bars, control panels, switchboards, wiring, protective relays etc. Adhere to the maintenance schedule as guided by electrical supervisors. PC4. Inspect electrical equipment to identify electrical risks, hazards, defects, or the need for adjustment or repair, and to ensure compliance with relevant statutes. PC5. Diagnose malfunctioning systems, apparatus, or components, using test equipment and hand tools to locate the cause of a breakdown and correct the problem. PC6. Test electrical systems or continuity of circuits in electrical wiring, equipment, or fixtures, using testing devices, such as ohmmeters, voltmeters, ammeters, energy meters, or oscilloscopes, to ensure compatibility and safety of system. PC7. Conduct all the tests and checks required for safe operation of the electrical equipment as per the statute. PC8. Operate and maintain the electrical equipment and maintain records as per the statutory requirements.

Knowledge and Understanding (K)

A. **Regulatory context** (knowledge of safety guidelines specified by Director General of Mine Safety (DGMS))	The user/individual on the job needs to know and understand: KA1. Different types of mines and detail of the mine he is working in KA2. Mine Organisation, time keeping, need for discipline and punctuality KA3. Benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and Hygiene KA4. Standing orders in force at the mine. Safety in the vicinity of machinery KA5. Shot-firing and Safety regulations. How and where to take shelter KA6. Duties of workmen KA7. Provision of wages, working hours and accident compensation as per Mines act KA8. Knowledge of mining safety procedures KA9. Impact of violation of safely procedures
B. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KB1. relevant standard and procedures followed in the company KB2. different types of electrical requirements at the mine KB3. processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution KB4. quality norms prescribed by the organization
C. Technical Knowledge	The user/individual on the job needs to know and understand: KC1. Basic principles of electrical energy, usage, operation and maintenance KC2. different electrical specifications KC3. sketches and circuit drawings for the electrical systems KC4. different types of tools and electrical equipment KC5. Electrical hazards and safety aspects involved and usage of relevant PPEs KC6. Statutory requirements for respective electrical systems required KC7. Electrical defects/malfunctions and how they are generated, how they can be prevented KC8. effect of operators work on quality and outcomes, how to improve stakeholder satisfaction KC9. working of electrical systems and machines KC10. Knowledge of DG, mobile lighting equipment, high mast etc. KC11. Installation and handling of safety devices KC12. Knowledge of PLC, RLC, ECM etc. (Logic controls)

	KC13. Knowledge of Illumination survey and standard
Skills (S) [Optional]	
C. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. note down observations (if any) related to electrical systems and share the same with the supervisor SA2. note down the production data for the respective shifts in the log sheets/ online ERP as per applicability in the organization SA3. write drawings to internal customers on the requirement of apparatus, hand tools etc SA4. write log book in terms of output quantity, set up parameters, machine setting parameters and loss details etc SA5. note measurements, equipment panel readings for various process parameters in the required reporting formats
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA6. read and interpret control diagrams and sketches SA7. read equipment manuals and process documents to understand the equipments and processes better SA8. read instructions especially safety instructions especially symbols while using the equipment in the mining area SA9. read internal drawings, SOPs, machine/ equipment manufacturer's recommendations
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA10. discuss task lists, schedules, and work-loads with co-workers SA11. question internal customers/ supervisor appropriately in order to understand the nature of the problem and make a diagnosis
D. Professional Skills	**Plan and Organize**

	The user/individual on the job needs to know and understand how to: SB1. plan and organize the work instruction and jobs received from the internal customers SB2. plan and organize the design documents SB3. organize all process/ equipment manuals so that sorting out information is fast SB4. organize apparatus etc in an orderly manner at proper designated areas
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB5. finalize the optimum levels of physical parameters so that the output meets the prescribed standard
	Problem solving
	The user/individual on the job needs to know and understand how to: SB6. think through the problem, evaluate the possible solution and suggest the best possible solution to the problem SB7. identify immediate or temporary solutions to resolve delays



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NOS Code	**MIN/ N 0448**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Industry	**Mining**	**Drafted on**	**15/12/2014**
Industry Sub-sector	**Underground and Open Cast Mines**	**Last reviewed on**	**24/03/2015**
Occupation	**Electrical Maintenance**	**Next review date**	**24/03/2017**

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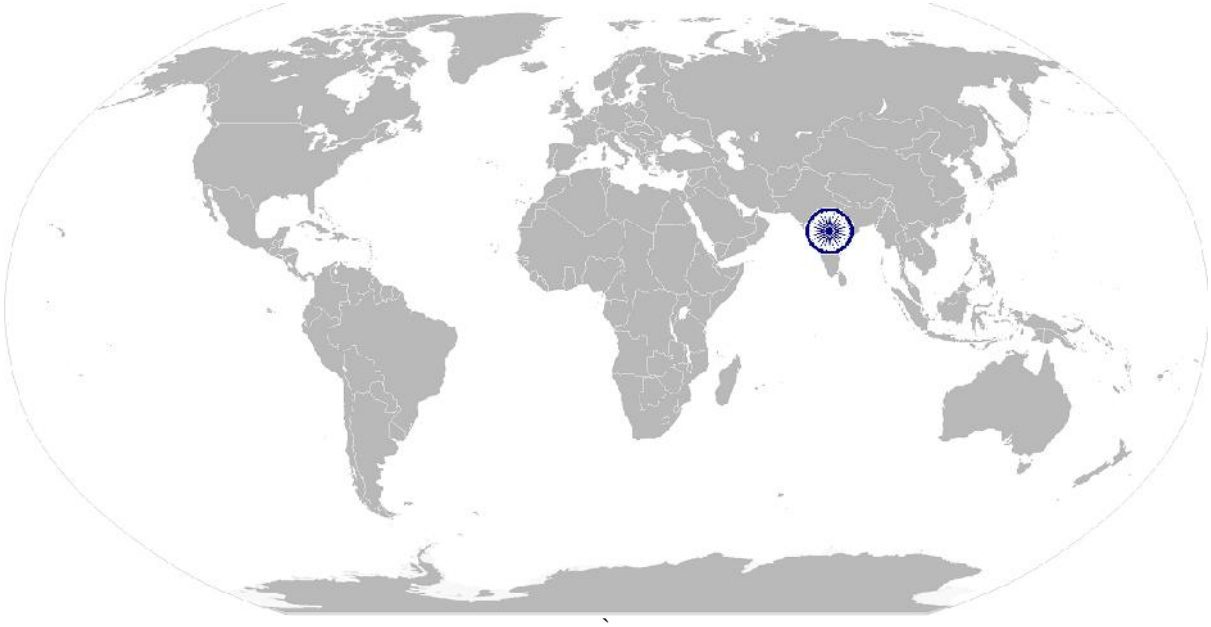


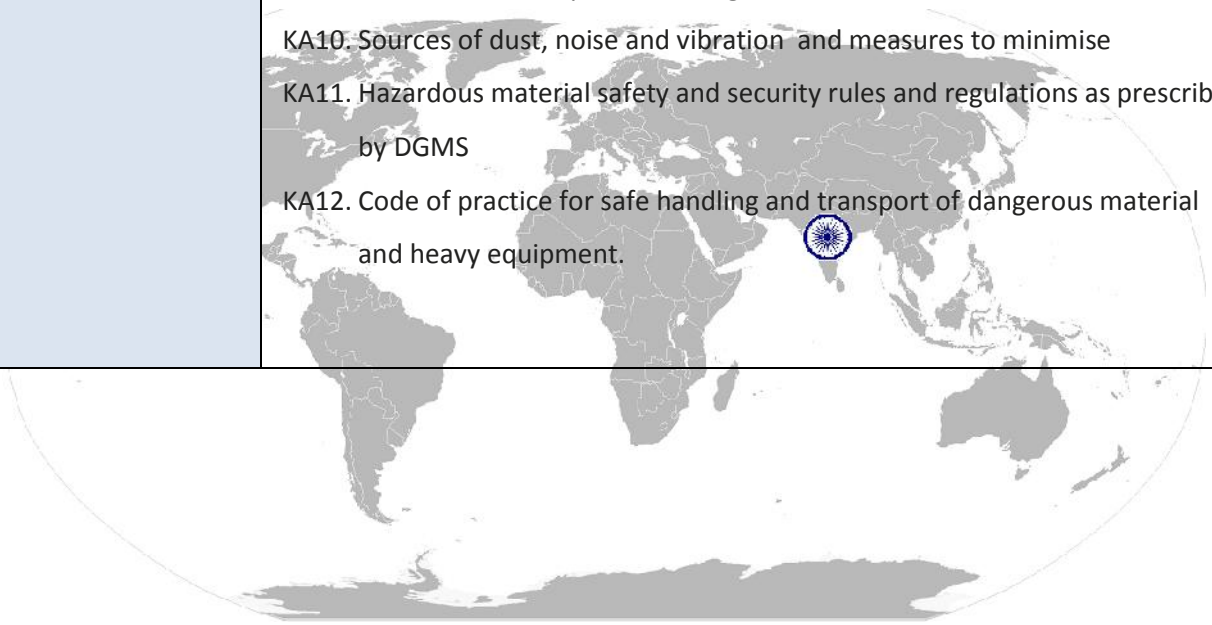
Overview

This unit is about health and safety measures critical in mines

National Occupational Standard

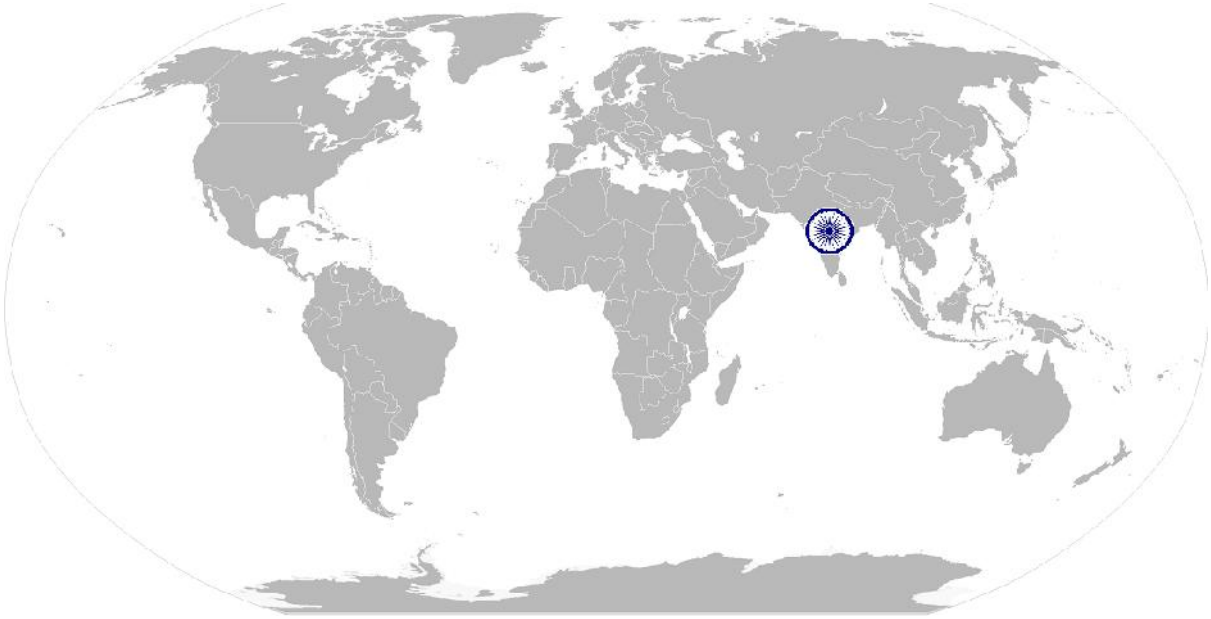
Unit Code	MIN/N 0901
Unit Title (Task)	**Health and Safety**
Description	This unit is about health and safety measures critical in mines
Scope	This OS unit/task covers the following: • Health and safety measures critical in mines
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Safety, Security and Administrative	To be competent, the user/individual on the job must be able to: PC1. Comply with occupational health and safety regulations adopted by the employer. PC2. Follow mining operations procedures with respect to materials handling and accidents PC3. Follow the correct safety steps in case of accident or major failure PC4. Comply with safety regulations and procedures in case of fire hazard. PC5. Operate various grades of fire extinguishers. PC6. Work responsibly and as safe and careful as possible so as not to put the health and safety of self or others at risk, including members of the public PC7. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS. PC8. Deal with misfires as per statutory requirement PC9. Identify characteristics of post-blast fumes and take necessary precautions. PC10. Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection PC11. Follow the manufacturer's instructions for care and safe operation of the equipment.

Knowledge and Understanding (K)	
A. **Regulatory context** (knowledge of safety guidelines specified by Director General of Mine Safety (DGMS))	The user/individual on the job needs to know and understand: KA1. Benching in quarries, Dressing of overhangs, undercuts, Fencing KA2. First aid and Hygiene KA3. Code of traffic in specific areas of mine. Significance of fences KA4. Standing orders in force at the mine. Safety in the vicinity of machinery KA5. Shot-firing and Safety regulations. How and where to take shelter KA6. Knowledge of mining safety procedures KA7. Impact of violation of safety procedures KA8. Locally prepared Emergency Preparedness / Disaster Management Plan. KA9. Environmental impact of mining KA10. Sources of dust, noise and vibration and measures to minimise KA11. Hazardous material safety and security rules and regulations as prescribed by DGMS KA12. Code of practice for safe handling and transport of dangerous material and heavy equipment.



NOS Version Control

NOS Code	MIN/N 0901		
Credits(NSQF)	TBD	Version number	1.0
Sector	Mining	Drafted on	15/12/2014
Sub-sector	Underground and Open Cast Mines	Last reviewed on	24/03/2015
Occupation	Electrical Maintenance	Next review date	24/03/2017



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CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Mine Electrician

Qualification Pack MIN/ Q0416

Sector Skill Council Mining

Guidelines for Assessment

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

				Marks Allocation	
		Total Mark (100)	Out Of	Theory	Skills Practical
1. MIN/ N 0446(Understand job requirements and related processes)	PC1. Understand the work (work output) required from the job and discuss the same with the supervisor	25	4	2.5	1.5
	PC2. Understand the electrical layout		4	2.5	1.5
	PC3. Refer all work instruction/ related documents to understand requirements from electrical substations/ electrical equipment/ electrical wiring or fixtures		4	2	2
	PC4. Understand the specifications for various systems within electrical substations/ transmission of electricity/ use/ operation of electrical equipment/ electrical wiring or fixtures as mentioned in the Work Instruction/ SOP/ Control Diagrams		4	2.5	1.5

	PC5. Prepare sketches or follow blueprints to determine the location of wiring or equipment and to ensure conformance to safety codes		3	1.5	1.5
	PC6. Identify the electrical equipment requirements as per the specifications in the work instructions for installation of electrical substations/ electrical equipment/ electrical wiring or fixtures		3	1.5	1.5
	PC7. Ensure that the required electrical equipment is procured from the store or vendor before starting the process		3	1.5	1.5
		Total	**25**	**14**	**11**
2. MIN/ N 0447(Install the electrical supply/ sub-station and equipment)	PC1. Install the required electrical supply systems including transformers, generators, circuit breakers, isolators, bus bars, measuring equipment for voltage, current, power, energy, frequency, RPM, wiring, fuses, earthing, switchboard, control panels, relays etc. as per the required specifications.	**25**	5	3	2
	PC2. Install required electrical equipment like motors, fans, lighting, ACs, heaters, compressors, pumps etc. Install and commission other mining machinery.		5	3	2
	PC3. Conduct a test process to ensure the performance of installed electrical equipment as per the defined specifications		5	3	2
	PC4. Make modifications in the parameters (by selecting the right program from the machine control system) if required and ensure alignment with the prescribed standard		5	3	2
	PC5. Ensure the setting up of the parameters of electrical equipment.		5	3	2
		Total	**25**	**15**	**10**
3. MIN/ N 0448(O&M of electrical supply/ sub-station and equipment)	PC1. Run the installed electrical equipment in the substation and the electric system to generate and distribute the electricity to the	**25**	3	2	1

	entire mine area with back-ups and redundancies.				
	PC2. Repair and maintain the different electrical equipment as per manufacturers guidelines, SOPs, and as per the statutory requirements (if any)		3	2	1
	PC3. Carry out predictive, preventive and break down maintenance for generators, transformers, circuit breakers, isolators, bus bars, control panels, switchboards, wiring, protective relays etc. Adhere to the maintenance schedule as guided by electrical supervisors.		4	2	2
	PC4. Inspect electrical equipment to identify electrical risks, hazards, defects, or the need for adjustment or repair, and to ensure compliance with relevant statutes.		3	2	1
	PC5. Diagnose malfunctioning systems, apparatus, or components, using test equipment and hand tools to locate the cause of a breakdown and correct the problem.		3	2	1
	PC6. Test electrical systems or continuity of circuits in electrical wiring, equipment, or fixtures, using testing devices, such as ohmmeters, voltmeters, ammeters, energy meters, or oscilloscopes, to ensure compatibility and safety of system.		3	2	1
	PC7. Conduct all the tests and checks required for safe operation of the electrical equipment as per the statute.		3	2	1
	PC8. Operate and maintain the electrical equipment and maintain records as per the statutory requirements.		3	2	1
		Total	**25**	**16**	**9**
4. MIN/ N0901 (Health and Safety)	PC1. Comply with occupational health and safety regulations adopted by the employer.	**25**	2	1	1
	PC2. Follow mining operations procedures with respect to materials handling and accidents		3	2	1

	PC3. Follow the correct safety steps in case of accident or major failure		2	1	1
	PC4. Comply with safety regulations and procedures in case of fire hazard.		2	1	1
	PC5. Operate various grades of fire extinguishers.		3	2	1
	PC6. Work responsibly and as safe and careful as possible so as not to put the health and safety of self or others at risk, including members of the public		2	1	1
	PC7. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS.		3	2	1
	PC8. Deal with misfires as per statutory requirement		2	1.5	0.5
	PC9. Identify characteristics of post-blast fumes and take necessary precautions.		2	1.5	0.5
	PC10. Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection		2	1	1
	PC11. Follow the manufacturer's instructions for care and safe operation of the equipment.		2	1	1
		Total	**25**	**15**	**10**