



QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR MINING INDUSTRY

What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- 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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Introduction Qualifications Pack- Dewatering Pump Operator

SECTOR: MINING

SUB-SECTOR: Open Cast and Underground Mines

OCCUPATION: Mechanical Maintenance

REFERENCE ID: MIN/Q 0411

ALIGNED TO: NCO-2004/8163.60

A Dewatering pump operator ensures safe operation and maintenance of power driven pumps

Brief Job Description: A dewatering pump operator operates power driven pumps for pumping, storing and supplying liquids. The operator may also repair and clean, oil and grease the pump.

Personal Attributes: This job requires the incumbent to be comfortable in performing laborious work. He should be a good listener and should be good at taking and following instructions. He should be a good team player. He should be result oriented and positive in attitude.





Qualifications Pack Code	MIN/Q 0411		
Job Role	Dewatering Pump Operator		
Credits(NSQF)	TBD	Version number	1.0
Industry	Mining	Drafted on	15/12/2014
Sub-sector	Open Cast and Underground Mines	Last reviewed on	24/03/2015
Occupation	Mechanical Maintenance	Next review date	24/03/2017

Job Role	Dewatering Pump Operator
Role Description	Operates power driven pumps for pumping, storing and supplying liquids. May also repairs and clean, oil and grease
NSQF level Minimum Educational Qualification Maximum Educational Qualification	the pump 4 Class XII NA
Training (Suggested but not mandatory)	 Various pumping techniques and equipment 5S Safety Quality Management
Experience	6 months
Applicable National Occupational Standards	Compulsory: Click on the hyperlink to read/download the required NOS 1. MIN/ N 0435 (Pre operation check) 2. MIN / N 0436 (Operation of pumping systems) 3. MIN / N 0901 (Health and Safety) Optional: Not Applicable
Performance Criteria	As described in the relevant OS units



Qualifications Pack For Dewatering Pump Operator



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 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.





Qualifications Pack For Dewatering Pump Operator



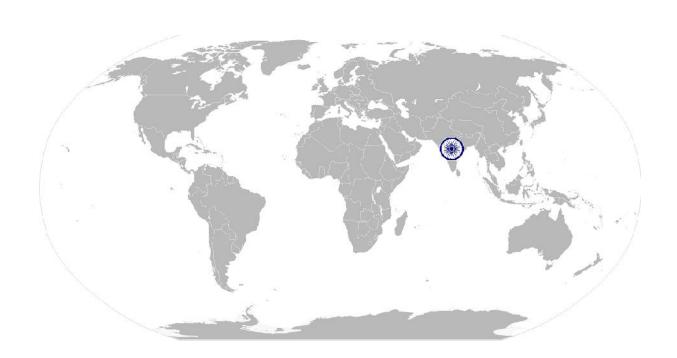
Keywords /Terms	Description
SCMS	Skill council for Mining Sector
NOS	National Occupational Standard
NSQF	National Skill Qualification Framework
NVEQF	National Vocational Educational Qualification Framework
NVQF	National Vocational Qualification Framework
OS	Occupational Standard
PC	Performance Criteria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







National Occupational Standard



Overview

This OS unit is about pre-operation check and condition monitoring of pumping equipment.







Unit Code	MIN/ N0435
Unit Title (Task)	Pre-Operation Check
Description	This OS unit is about pre-operation check and condition monitoring of pumping equipment
Scope	This unit/task covers the following: • Pre Operation Check

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

Element	Performance Criteria	
Pre-Operation Check	To be competent, the user/individual on the job must be able to:	
	PC1. Check for cracks, defects and anomalies in the pumping apparatus	
	PC2. Condition monitoring of the equipment	
	PC3. Check for condition of pumping on both suction and discharge sides	
	PC4. Check the condition of couplings in the equipment	
	PC5. Check Electrical connections, and electrical system for proper functioning	
	of the system	
	PC6. If the pump is diesel operated, then check condition of engine and ensure	
	that the pump drive is operating smoothly and as per required	
	parameters. Also check, oil level, fuel level, radiator coolant and engine	
	condition	
	PC7. Check air release valve, and prime the pump if required	

Knowledge and Understanding (K)

S S	
A. Regulatory	The user/individual on the job needs to know and understand:
context	KA1. Different types of mines and detail of the mine he is working in
(knowledge of	KA2. Mine Organisation, time keeping, need for discipline and punctuality
safety	KA3. Galleries in underground mine, dressing of roof, stable and unstable strata
guidelines	etc
specified by	KA4. Code of traffic in specific areas of mine. Significance of fences
Director	KA5. Standing orders in force at the mine. Safety in the vicinity of machinery
General of	KA6. Shot-firing and Safety regulations. How and where to take shelter
Mine Safety	KA7. Tramways and siding, Haulage rooms, Winding rooms, Boilers, Electrical Gears
(DGMS))	KA8. Duties of workmen
_	KA9. Provision of wages, working hours and accident compensation as per Mines

(







	MIN/ N 0435 Pre Operation Check	
	act	
	KA10. Knowledge of mining safety procedures	
	KA11. Impact of violation of safely procedures	
	KA12. Precautions to be taken when handling heavy equipment.	
B. Organizational	The user/individual on the job needs to know and understand:	
Context	KB1. company's policies on quality and delivery standard, safety and hazards, integrity, dress code, etc.	
	KB2. risk and impact of not following defined procedures/work instructions	
	KB3. how to assist in handover/ takeover of the equipment / work area as per	
	the instructions	
C. Technical	The user/individual on the job needs to know and understand:	
Knowledge	KC1. Basic fittings (valves, clamps, elbows, etc) in the pumping apparatus	
	KC2. Different types of pumping apparatus (reciprocating, rotary etc.) and	
	associated equipment and purposes	
	KC3. Gauges, dials, monitoring apparatus and their purpose	
	KC4. Dos and don'ts of various pumping systems as per their Standard Operating	
	Procedures (SOPs) specified by the equipment manufacturer	
	KC5. Different types of operation schedules	
	KC6. Basic pumping / operation terminology	
	KC7. Different types of valves and their functioning (stop valve, non-return valve	
	etc.)	
	KC8. Basic knowledge of power sources (driving systems) electrical systems & mechanical driving systems	
	KC9. Basic understanding of electrical systems and operation	
	KC10. The impact of various physical parameters like temperature, pressure, etc on	
	the properties of final output	
	KC11. Basic units of measurement	
	KC12. Material disposal procedure	
Skills (S)		
A. Core Skills/	Writing Skills	
Generic Skills	The user/ individual on the job needs to know and understand how to:	
	SA1. Note down observations (if any)	
	SA2. Write information documents or enter the information in logbook/ online ERP	
	systems under guidance of the supervisor	
	Reading Skills	







	The user/individual on the job needs to know and understand how to:		
	SA3. Read and interpret symbols and measurements		
	SA4. Read information documents		
	SA5. Understand and analyse the available data about the site		
	Oral Communication (Listening and Speaking skills)		
	The user/individual on the job needs to know and understand how to:		
	SA6. Discuss task lists, schedules and activities		
	SA7. Effectively communicate		
	SA8. Attentively listen with full attention and comprehend the information given		
	by various sources about the site		
B. Professional Skills	Use of tools and machines		
	The user/individual on the job needs to know and understand how to:		
	SB1. Identify tools, equipment and procedures required for installing piping		
	fixtures and fittings		
	SB2. Operating and maintaining tools and equipment		
	Plan and Organize		
	The user/individual on the job needs to know and understand how to:		
	SB3. Plan and organize the work order and jobs		
	SB4. Organize all process manuals so that sorting/ accessing information is		
	easy		
	Judgment and Critical Thinking		
	The user/individual on the job needs to know and understand how to:		
	SB5. Use common sense and make judgments during day to day basis		
	SB6. Use reasoning skills to identify and resolve basic problems		
	SB7. Use intuition to detect any potential problems which could arise		
	Desire to learn and take initiatives		
	The user/individual on the job needs to know and understand how to:		
	SB8. Follow instructions and work on areas of improvement identified		
	SB9.Complete the assigned tasks with minimum supervision		
	SB10.Complete the job within timelines and quality norms		
	Problem Solving and Decision making		





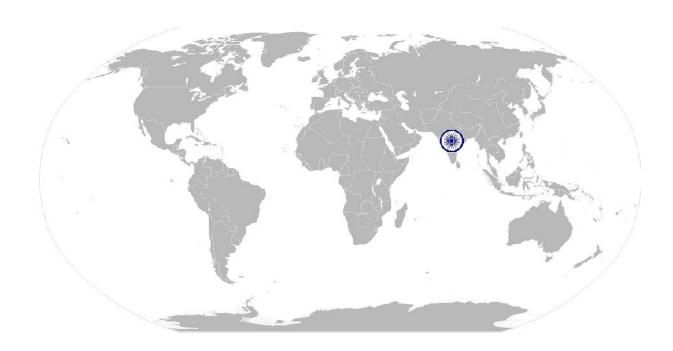


The user/individual on the job needs to know and understand how to:

SB11.Detect problems in day to day tasks

SB12.Discuss possible solution with the supervisor for problem solving

SB13. Make decisions in emergency conditions



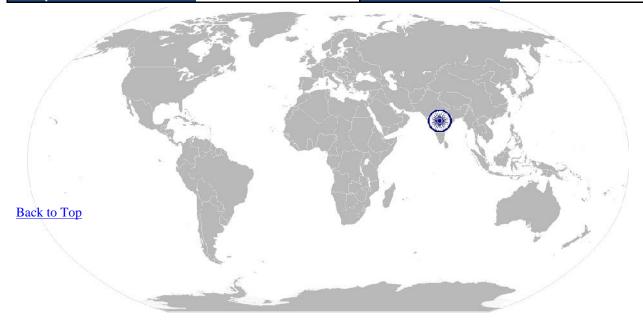






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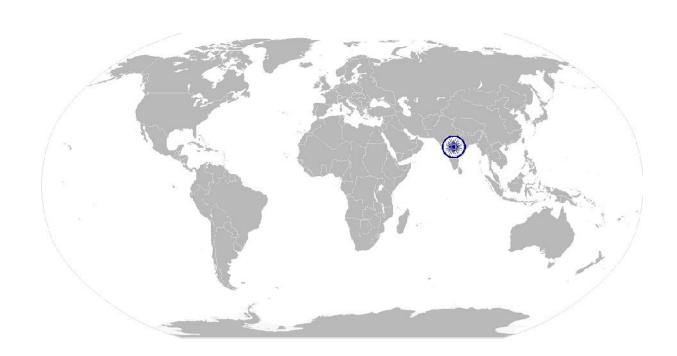
NOS Code	MIN/N 0435	MIN/N 0435	
Credits(NSQF)	TBD	Version number	1.0
Sector	Mining	Drafted on	15/12/2014
Sub-sector	Open Cast and Underground Mines	Last reviewed on	24/03/2015
Occupation	Mechanical Maintenance	Next review date	24/03/2017







National Occupational Standard



Overview

This unit is about operation of pumping systems in commercial setups.



National Occupational Standard



MIN/ N 0436 Operation of Pumping Systems

Unit Code	MIN/ N 0436
Unit Title (Task)	Operation of Pumping Systems
Description	This OS unit is about operation of pumping systems in commercial and institutional setups
Scope	This unit/task covers the following:
	Operation
	Operate pump
	Perform basic maintenance

Performance Criteria	
Element	Performance Criteria
Operate pump	PC1. Operate pump systems properly
	PC2. Ensure operation of the pump with full efficiency to improve output gain
	PC3. Continuously monitor sound, vibration, temperature and other related
	parameters to ensure that the pump is operating smoothly
	PC4. Maintain input/output parameters as required
	PC5. Record parameters (electrical, mechanical) in prescribed log books as
	required and maintain a watch on consumption of power in the pump to
	detect cases of overload, under load etc.
	PC6. Take defined action in case of overload/under load when the load
	parameters are above/below the specified limits
Perform basic maintenance	PC7. Regular fuel filling in diesel pumps
	PC8. Ensure that there is no condition present which leads to overheating, and
	provide adequate ventilation to the system
	PC9. Take necessary steps to prevent water entry in the electrical parts of
	pumping apparatus
	PC10. Sound check of pumps and motors
	PC11. Conduct regular oiling of couplings and other moving components of the
	equipment
Knowledge and Unde	rstanding (K)







A.	Regulatory	MIN/ N 0436 Operation of Pumping Systems The user/individual on the job needs to know and understand:
	context	KA1. Different types of mines and detail of the mine he is working in
	(knowledge of	KA2. Mine Organisation, time keeping, need for discipline and punctuality
	safety	KA3. Galleries in underground mine, dressing of roof, stable and unstable strata
	guidelines	etc
	specified by	KA4. Code of traffic in specific areas of mine. Significance of fences
	Director	KA5. Standing orders in force at the mine. Safety in the vicinity of machinery
	General of	KA6. Shot-firing and Safety regulations. How and where to take shelter
	Mine Safety	KA7. Tramways and siding, Haulage rooms, Winding rooms, Boilers, Electrical Gears
	(DGMS))	KA8. Duties of workmen
		KA9. Provision of wages, working hrs and accident compensation as per Mines
		act
		KA10. Knowledge of mining safety procedures
		KA11. Impact of violation of safely procedures
		KA12. Precautions to be taken when handling heavy equipment.
		KA13. Refresher training as per fourth schedule MVTR (1966) within one month of
		joining duties following absence from duties for a period exceeding one year.
В.	Organizational	The user/individual on the job needs to know and understand:
	Context	KB1. Company's policies on: quality and delivery standard, safety and hazards,
		integrity, dress code, etc.
		KB2. Risk and impact of not following defined procedures/work instructions
		KB3. How to handover/ takeover of the operation duties as per the instructions
C.	Technical	The user/individual on the job needs to know and understand:
	Knowledge	KC1. Basics of pumping systems and pumping systems monitoring devices
		KC2. Dos and donts of various pumping systems as per their Standard Operating
		Procedures (SOPs) specified by the equipment manufacturer
		KC3. Different types of operation schedules
		KC4. Basic pumping / operation terminology
		KC5. Units of measurement
CI :H	L (S) [O 1]	material
	s (S) [Optional]	
A.	Core Skills/	Writing Skills







Generic Skills	The user/ individual on the job needs to know and understand how to:				
Generic Skiiis					
	SA1. Note down observations (if any)				
	SA2. Write information documents or enter the information in logbook/ online ERP				
	systems under guidance of the supervisor				
	Reading Skills				
	The user/individual on the job needs to know and understand how to:				
	SA3. Read and interpret symbols and measurements				
	SA4. Read information documents				
	SA5. Understand and analyse the available data about the site				
	Oral Communication (Listening and Speaking skills)				
	The user/individual on the job needs to know and understand how to:				
	SA6. Discuss task lists, schedules and activities				
	SA7. Effectively communicate				
	SA8. Attentively listen with full attention and comprehend the information given				
	by various sources about the site				
B. Professional	Use of tools and machines				
Skills	The user/individual on the job needs to know and understand how to:				
	SB1. identify tools, equipment and procedures required for installing piping				
	fixtures and fittings				
	SB2. Operating and maintaining tools and equipment				
	Plan and Organize				
	The user/individual on the job needs to know and understand how to:				
	SB3. Plan and organize the work order and jobs				
	SB4. Organize all process manuals so that sorting/ accessing information is				
	easy				
	Judgment and Critical Thinking				
	The user/individual on the job needs to know and understand how to:				
	SB5. Use common sense and make judgments during day to day basis				
	SB6. Use reasoning skills to identify and resolve basic problems				
	SB7. Use intuition to detect any potential problems which could arise				
	Desire to learn and take initiatives				







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

SB8. Follow instructions and work on areas of improvement identified

SB9. Complete the assigned tasks with minimum supervision

SB10.Complete the job within timelines and quality norms

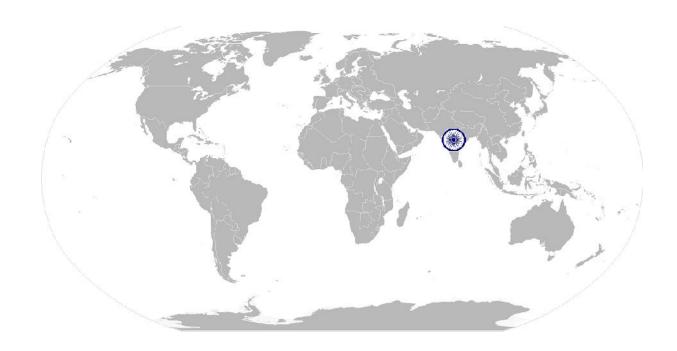
Problem Solving and Decision making

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

SB11.Detect problems in day to day tasks

SB12.Discuss possible solution with the supervisor for problem solving

SB13.Make decisions in emergency conditions









NOS Version Control

NOS Code	MIN/N 0436	MIN/N 0436				
Credits(NSQF)	TBD	Version number	1.0			
Sector	Mining	Drafted on	15/12/2014			
Sub-sector	Open Cast and Underground Mines	Last reviewed on	23/03/2015			
Occupation	Mechanical Maintenance	Next review date	23/03/2017			









National Occupational Standard



Overview

This unit is about health and safety measures critical in mines



National Occupational Standard



MIN/ N 0901 Health and Safety

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	c) w.r.t. the Scope				
Element	Performance Criteria				
	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				
Safety, Security	PC4. Comply with safety regulations and procedures in case of fire hazard.				
and	PC5. Operate various grades of fire extinguers.				
Administrative	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.				







MIN/ N 0901 Health and Safety

Knowledge and Understanding (K)					
A. Regulatory	The user/individual on the job needs to know and understand:				
context (knowledge	KA1. Benching in quarries, Dressing of overhangs, undercuts, Fencing				
of safety guidelines	KA2. First aid and Hygiene				
specified by Director	KA3. Code of traffic in specific areas of mine. Significance of fences				
General of Mine	KA4. Standing orders in force at the mine. Safety in the vicinity of machinery				
Safety (DGMS))	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.				



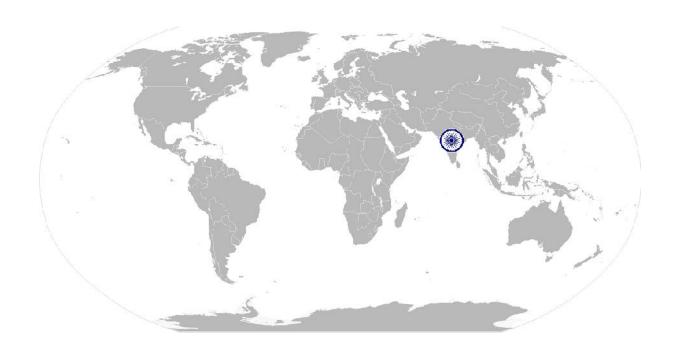




MIN/ N 0901 Health and Safety

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



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CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Dewatering Pump Operator

Qualification Pack MIN/Q 0411

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 A	llocation
		Total Mark (100)	Out Of	Theory	Skills Practical
1. MIN/ N 0435 (Pre operation check)	PC1. Check for cracks, defects and anomalies in the pumping apparatus	35	5	3	2
	PC2. Condition monitoring of the equipment		5	3	2
	PC3. Check for condition of pumping on both suction and discharge sides		5	2	3
	PC4. Check the condition of couplings in the equipment		5	2	3

					·
	PC5. Check Electrical connections, and electrical system for proper functioning of the system		5	2	3
	PC6. If the pump is diesel operated, then check condition of engine and ensure that the pump drive is operating smoothly and as per required parameters. Also check, oil level, fuel level, radiator coolant and engine condition		5	2	3
	PC7. Check air release valve, and prime the pump if required		5 35	3	2
2. MIN / N 0436 (Operation of pumping systems)	PC1. Operate pump systems properly	Total 35	3	2	18
	PC2. Ensure operation of the pump with full efficiency to improve output gain		3	2	1
	PC3. Continuously monitor sound, vibration, temperature and other related parameters to ensure that the pump is operating smoothly		3	2	1
	PC4. Maintain input/output parameters as required		3	2	1
	PC5. Record parameters (electrical, mechanical) in prescribed log books as required and maintain a watch on consumption of power in the pump to detect cases of overload, under load etc.		3	2	1

	PC6. Take defined action in case of overload/under load when the load parameters are above/below the specified limits		3	2	1
	PC7. Regular fuel filling in diesel pumps		3	2	1
	PC8. Ensure that there is no condition present which leads to overheating, and provide adequate ventilation to the system		3	2	1
	PC9. Take necessary steps to prevent water entry in the electrical parts of pumping apparatus		3	2	1
	PC10. Sound check of pumps and motors		3	2	1
	PC11. Conduct regular oiling of couplings and other moving components of the equipment		2	1	1
		Total	35	23	12
3. MIN / N 0901 (Health and Safety)	PC1. Comply with occupational health and safety regulations adopted by the employer.	30	3	2	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		3	2	1

	Total	30	20	10
manufacturer's instructions for care and safe operation of the equipment.		3	2	1
PC10. Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection PC11. Follow the		3	2	1
PC9. Identify characteristics of post-blast fumes and take necessary precautions.		3	2	1
PC8. Deal with misfires as per statutory requirement		2	1	1
PC7. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS.		2	1.5	0.5
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	1.5	0.5
PC5. Operate various grades of fire extinguishers.		3	2	1
PC4. Comply with safety regulations and procedures in case of fire hazard.		3	2	1