



QUALIFICATIONS PACK - OCCUPATIONAL STANDARD FOR MINING INDUSTRY

What are Occupational Standard (OS)?

- Solution 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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Introduction

Qualifications Pack-Strata Monitoring Operator

SECTOR: MINING

SUB-SECTOR: Underground Mines

OCCUPATION: Mining Operations

REFERENCE ID: MIN/Q 0435

ALIGNED TO: NCO-2004/NIL

A Strata Monitoring Operator reports observations specific to strata.

Brief Job Description: This role is responsible for conducting end to end activities of monitoring the strata and report any movements/ other observations pertinent to strata in order to take required actions.

Personal Attributes: Technical knowledge of strata monitoring, ability to plan and prioritize, quality consciousness, sensitivity to problem solving, quick decision making, safety orientation, reading, writing and communication skills, Dexterity and high precision, ability to use internal ERP systems







Qualification Pack Code	MIN/ Q 0435		
Job Role		Strata Monitoring Operator	
Credits(NSQF)	TBD	Version number	1.0
Industry	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

Job Role	Strata Monitoring
Role Description	This role is responsible for conducting end to end activities of monitoring the strata and report any movements/ other observations pertinent to strata in order to take required actions
NSQF level Minimum Educational Qualification Maximum Educational Qualification	4 Class XII NA
Training (Suggested but not mandatory)	 Different Meter Readings and Strata Monitoring techniques used in organizations 5S and Safety aspects Problem Solving Techniques Quality Management Systems
Experience	2-3 years in mining
Applicable National Occupational Standards	Compulsory: Click on the hyperlink to read/download the required NOS 1. MIN/ N 0499 (Provide support in equipment installation) 2. MIN/ N 0500 (Conduct strata monitoring operations) 3. MIN/ N 0901 (Health and Safety) Optional: Not Applicable
Performance Criteria	As described in the relevant OS units





Qualifications Pack for Strata Monitoring 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 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.





Qualifications Pack for Strata Monitoring Operator

Acronyms

1	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







Overview

This unit is about providing required support in installation of the strata monitoring equipment in the mine





MIN/ N0499 Provide support in equipment installation

	MIN/ N0499 Provide support in equipment installation Corporation
Unit Code	MIN/ N0499
Unit Title (Task)	Provide support in equipment installation
Description	This OS unit is about providing required support in installation of the strata monitoring equipment in the mine
Scope	This unit/task covers the following: • Support for strata monitoring equipment installation
Performance Criteria (I	PC) w.r.t. the Scope
Element	Performance Criteria
Support in strata monitoring equipment installation	 PC1. Understand the requirements for strata monitoring i.e. Surface or Sub Surface PC2. In case of sub surface, finalize the kind of structures to be created for equipment installation i.e. bores/ flat jacks atc basis the type of equipment to be placed in them PC3. Finalize the dimensions of the structure as per the dimensions of the equipment PC4. Assemble the equipment together with its various components PC5. Conduct a check on workability of the equipment PC6. Install the assembled equipment in the designed structures
Knowledge and Under	standing (K) w.r.t. the scope
Element	Knowledge and Understanding
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. Benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and
guidelines	Hygiene
specified by	KA4. Standing orders in force at the mine. Safety in the vicinity of machinery
Director	KA5. Shot-firing and Safety regulations. How and where to take shelter
General of	KA6. Duties of workmen
Mine Safety	KA7. Provision of wages, working hours and accident compensation as per
(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. processes like Strata Monitoring, Procurement, Store management, inventory management, quality management and key contact points for query resolution





MIN/ N0499 Provide support in equipment installation

C. Technical Knowledge	The user/individual on the job needs to know and understand: KC1. different types of strata monitoring equipment and structures like bore hole, extensometer, inclinometer, flat jack, GPS & Radar, etc KC2. various dimensions including diameter, height, surface area, etc KC3. mechanism of strata movement namely sliding, crushing, sheers, water monitoring etc KC4. hazards and safety aspects involved in strata monitoring activities and usage of relevant PPEs
Skills (S) [Optional]	
Element	Skills
Element 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 the strata monitoring SA2. write information documents to internal departments/ internal teams or enter the information in 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 equipment manuals and process documents to understand the equipment and processes better SA4. read internal information documents sent by internal teams Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. discuss task lists, schedules and activities with the supervisor SA6. effectively communicate with the team members SA7. question the supervisor in order to understand the nature of the problem and to clarify queries SA8. 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 order and jobs received from the Operator SB2. organize all process/ equipment manuals so that sorting/ accessing information is easy SB3. support the supervisor in scheduling tasks for helper and assistant supervisor 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 timelines and quality norms







MIN/ N0499 Provide support in equipment installation

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)







MIN/ N0499 Provide support in equipment installation

NOS Version Control

NOS Code	MIN/ N0499		
Credits(NSQF)	TBD	Version number	1.0
Industry	Mining	Drafted on	15/12/2014
Industry Sub-sector	Underground Mines	Last reviewed on	24/03/2015
Occupation	Mining Operations	Next review date	24/03/2017

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National Occupational Standard®

Overview

This unit is about conducting strata monitoring operations including reading the strata monitoring meters, generating reports and analysing possible impact







Unit Code	MIN/ N0500
Unit Title (Task)	Conduct Strata Monitoring Operations
Description	This OS unit is about conducting strata monitoring operations including reading the strata monitoring meters, generating reports and analysing possible impact
Scope	This unit/task covers the following: • Conducting the strata monitoring operations
Performance Criteria (PC) w.r.t. the Scope	

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

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Element	Performance Criteria
Conduct strata monitoring operations	PC1. Conduct a check on the working of strata monitoring equipment and identify the inconsistencies in the observations; Rectify the same taking adequate measures
	PC2. Read the equipment/ meters which are primarily hydraulic pressure or pneumatic pressure systems or electrical systems through electric resistance strain gauge, vibrating wire and self-inductance.
	PC3. Most commonly monitored variables include Movement (using surveying methods, surface devices such as crack gauges and tape extensometers, borehole devices such as rod extensometers or inclinometers); Rock stresses (absolute stress or stress change from borehole devices); Pressure, Load and Strain on ground support devices (e.g., load cells); Seismic events and Blast vibrations
	PC4. Finalize the frequency of the data measurement basis the meter readings which reflect severity of the strata load/ movement and the need to monitor the same
	PC5. Enter the observed data in the record books and sign the same
	PC6. Analyze the result statement and report the same to the supervisor for further analysis
	PC7. Provide requisite support to the supervisor in analysing the data from the strata monitoring meters and finalizing the course of action to be taken

Knowledge and Understanding (K) w.r.t. the scope

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Element	Knowledge and Understanding
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 guidelines	KA3. Benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and
specified by	Hygiene
Director General	KA4. Standing orders in force at the mine. Safety in the vicinity of machinery
of Mine Safety	KA5. Shot-firing and Safety regulations. How and where to take shelter
(DGMS))	KA6. Duties of workmen
	KA7. Provision of wages, working hours and accident compensation as per
	Mines act







	KA8. Knowledge of mining safety procedures
B. Organizational Context (Knowledge of the company / organization and its processes)	KA9. Impact of violation of safely procedures The user/individual on the job needs to know and understand: KB1. relevant standard and procedures followed in the company KB2. processes like Strata Monitoring, 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 types of strata monitoring equipment and structures like bore hole, extensometer, inclinometer, flat jack, GPS & Radar, etc KC2. various dimensions including diameter, height, surface area, etc KC3. mechanism of strata movement namely sliding, crushing, sheers, water monitoring etc KC4. various analysis pertinent to strata movement and strata load KC5. hazards and safety aspects involved in ore processing activities, and usage of relevant PPEs
Skills (S) w.r.t. the scope	Televalitities
Element	Skills
A. Core Skills/ Generic	Writing Skills
•	The user/ individual on the job needs to know and understand how to:
skills	SA1. document information from the sketches and engineering drawings
	SA2. prepare draft drawings for the final output product
	SA3. note down observations (if any) related to the fire fighting process
	SA4. write information documents to internal departments/ internal teams or
	SA5. enter the information in online ERP systems under guidance of the supervisor
	Reading Skills
	The user/individual on the job needs to know and understand how to:
	SA6. read and interpret engineering drawing and sketches
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MIN/ N0500 Conduct Strata Monitoring Operations					
	Analytical Thinking				
	The user/individual on the job needs to know and understand how to: SB3. identify the strengths and weakness of various process				
	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				
	Desire to learn and take initiatives				
	The user/individual on the job needs to know and understand how to:				
	SB6. follow instructions and work on areas of improvement identified				
	complete the assigned tasks with minimum supervision				
	SB7. complete the job defined by the supervisor within the timelines and quality norms				
	SB8. take self initiatives in driving small projects with the supervisor like operation				
	improvement, training of helpers and assistant operators, 5S, Kaizen etc				







NOS Version Control

NOS Code	MIN/ N0500		
Credits(NSQF)	TBD	Version number	1.0
Industry	Mining	Drafted on	15/12/2014
Industry Sub-sector	Underground Mines	Last reviewed on	24/03/2015
Occupation	Mining Operations	Next review date	24/03/2017

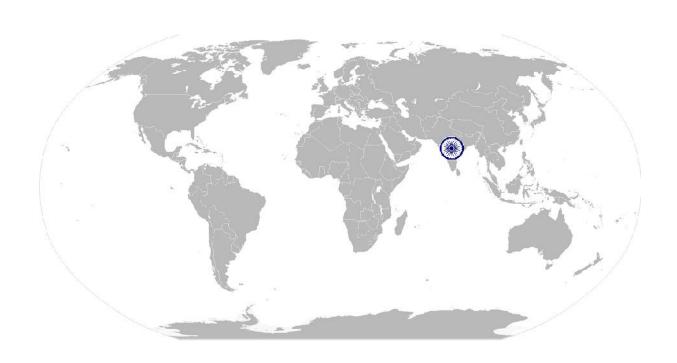
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National Occupational Standard



Overview

This unit is about health and safety measures critical in mines







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 extinguishers.		
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.		







Knowledge and Under	standing (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.







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 Mines	Last reviewed on	24/03/2015
Occupation	Mining Operations	Next review date	24/03/2017



CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Strata Monitoring Operator

Qualification Pack MIN/ Q 0435

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		llocation
		Total Mark (100)	Out Of	Theory	Skills Practical
1. MIN/ N 0499 (Provide support in equipment installation)	PC1. Understand the requirements for strata monitoring i.e. Surface or Sub Surface	35	6	3	3
	PC2. In case of sub surface, finalize the kind of structures to be created for equipment installation i.e. bores/ flat jacks etc basis the type of equipment to be placed in them		5	3	2
	PC3. Finalize the dimensions of the structure as per the dimensions of the equipment		6	3	3
	PC4. Assemble the equipment together with its various components		6	3	3
	PC5. Conduct a check on workability of the equipment		6	3	3
	PC6. Install the assembled equipment in the designed structures		6	4	2

		Total	35	19	16
2. MIN/ N 0500	PC1. Conduct a check on	35			
(Conduct strata	the working of strata				
monitoring operations)	monitoring equipment and		_	_	_
	identify the inconsistencies		5	3	2
	in the observations; Rectify				
	the same taking adequate				
	measures				
	PC2. Read the equipment/				
	meters which are primarily				
	hydraulic pressure or				
	pneumatic pressure systems		5	3	2
	or electrical systems through				
	electric resistance strain				
	gauge, vibrating wire and				
	self-inductance.				
	PC3. Most commonly monitored variables include				
	Movement (using surveying methods, surface devices				
	such as crack gauges and				
	tape extensometers, borehole				
	devices such as rod				
	extensometers or				
	inclinometers); Rock stresses		5	3	2
	(absolute stress or stress				
	change from borehole				
	devices); Pressure, Load and				
	Strain on ground support				
	devices (e.g., load cells);				
	Seismic events and Blast				
	vibrations				
	PC4. Finalize the frequency				
	of the data measurement				
	basis the meter readings				
	which reflect severity of the		5	3	2
	strata load/ movement and				
	the need to monitor the same				
	PC5. Enter the observed				
	data in the record books and		_	2	2
	sign the same		5	3	2
	<u> </u>				
	PC6. Analyze the result				
	statement and report the		5	3	2
	same to the supervisor for				
	further analysis PC7. Provide requisite				
	support to the supervisor in				
	analysing the data from the				
	strata monitoring meters and		5	3	2
	finalizing the course of				
	_				
	action to be taken				

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		2	1.5	0.5
	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		3	2	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		3	2	1
	PC9. Identify characteristics of post-blast fumes and take necessary precautions.		3	2	1
	PC10. Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection		3	2	1
	PC11. Follow the manufacturer's instructions for care and safe operation of the equipment.		2	1.5	0.5
		Total	30	20	10