

## QUALIFICATIONS PACK - OCCUPATIONAL STANDARD FOR MINING INDUSTRY



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### 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
- 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-Compressor Operator

**SECTOR:** MINING

**SUB-SECTOR:** Open cast and Underground Mines

**OCCUPATION:** Mechanical Maintenance

**REFERENCE ID:** MIN/Q 0415

**ALIGNED TO:** NCO-2004/163.30

A Compressor operator ensures execution of power driven air compressor to drive equipment

**Brief Job Description:** Compressor operator operates and services power driven air compressor which generates and supplies compressed air to drive pneumatic tools, hoists and other mechanical equipment

**Personal Attributes:** This job requires the technical knowledge of gas/ liquid compression, ability to plan and prioritize, quality consciousness, sensitivity to problem solving, quick decision making, safety orientation, Reading, writing and communication skills, high precision, ability to use internal ERP systems

Job Details	<b>Qualifications Pack Code</b>	MIN/ Q0415		
	<b>Job Role</b>	Compressor Operator		
	<b>Credits(NSQF)</b>	TBD	<b>Version number</b>	1.0
	<b>Industry</b>	Mining	<b>Drafted on</b>	15/12/2014
	<b>Sub-sector</b>	Open cast and Underground Mines	<b>Last reviewed on</b>	24/03/2015
	<b>Occupation</b>	Mechanical Maintenance	<b>Next review date</b>	24/03/2017

<b>Job Role</b>	<b>Compressor Operator</b>
<b>Role Description</b>	Operate and service, power driven air compressor which generates and supplies compressed air to drive pneumatic tools, hoists and other mechanical equipment
<b>NSQF level</b>	4
<b>Minimum Educational Qualification</b>	Class XII
<b>Maximum Educational Qualification</b>	NA
<b>Training</b> (Suggested but not mandatory)	<ol style="list-style-type: none"> <li>1. Different Compression techniques used in organizations</li> <li>2. 5S and Safety aspects</li> <li>3. Problem Solving Techniques</li> <li>4. Quality Management Systems</li> </ol>
<b>Experience</b>	6 months
<b>Applicable National Occupational Standards</b>	<p><b>Compulsory:</b> Click on the hyperlink to read/download the required NOS</p> <ol style="list-style-type: none"> <li>1. MIN/ N 0443 (<a href="#">Understand processes and equipment requirement to complete the task</a>)</li> <li>2. MIN/ N 0444 (<a href="#">Prepare the machine and auxiliaries</a>)</li> <li>3. MIN/ N 0445 (<a href="#">Conduct the operation of compressor</a>)</li> <li>4. MIN / N 0901 (<a href="#">Health and Safety</a>)</li> </ol> <p><b>Optional</b> Not Applicable</p>
<b>Performance Criteria</b>	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	

MIN/ N 0443 Understand processes and equipment requirement to complete the task

# National Occupational Standard



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## Overview

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

MIN/ N 0443 Understand processes and equipment requirement to complete the task

National Occupational Standard	<b>Unit Code</b>	MIN/ N0443
	<b>Unit Title (Task)</b>	Understand process and equipment requirement to complete the task
	<b>Description</b>	This OS unit is about understanding the job requirement, what processes need to be executed, what equipment will be used for the project and what is the required output considering the standard specified
	<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>Understand the compression related process and output requirements as well as equipment to be deployed</li> </ul>
	<b>Performance Criteria (PC) w.r.t. the Scope</b>	
	<b>Element</b>	<b>Performance Criteria</b>
	<b>Understand the compression requirements, equipment and parameters to be set for the process</b>	<p>PC1. Understand the right compression methodology and should be conversant with use, operation and maintenance process to be adopted as per defined Standard Operating Procedures specified by the equipment manufacturer and statutory requirements</p> <p>PC2. Understand the various compression parameters like temperature, pressure, process cycle time etc before starting the process, as mentioned in the Work Instructions/ SOP manual</p> <p>PC3. Be fully conversant with the use, operation and maintenance of the compressor/ machine provided for operation and required output</p> <p>PC4. Understand the different components and safety features fitted in the machine</p> <p>PC5. Be conversant with safety hazards in the compression process and should also be conversant with precautionary measures against the safety hazards</p> <p>PC6. Understand the material required and the equipment availability for executing the activity</p>
	<b>Knowledge and Understanding (K) w.r.t. the scope</b>	
	<b>Element</b>	<b>Knowledge and Understanding</b>
	<b>A. Regulatory context (knowledge of</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Different types of mines and detail of the mine he is working in</p> <p>KA2. Mine Organisation, time keeping, need for discipline and punctuality</p>

**MIN/ N 0443** Understand processes and equipment requirement to complete the task

<p><b>safety guidelines specified by Director General of Mine Safety (DGMS))</b></p>	<p>KA3. Galleries in underground mine, dressing of roof, stable and unstable strata etc</p> <p>KA4. Standing orders in force at the mine. Safety in the vicinity of machinery</p> <p>KA5. Duties of workmen</p> <p>KA6. Provision of wages, working hours and accident compensation as per Mines act</p> <p>KA7. Knowledge of mining safety procedures</p> <p>KA8. Impact of violation of safely procedures</p>
<p><b>B. Organizational Context</b> (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. relevant standard and procedures followed in the company</p> <p>KB2. processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution</p>
<p><b>C. Technical Knowledge</b></p>	<p>The user/individual on the job needs to know and understand:</p> <p>KC1. different types of compression processes (reciprocating, rotary etc. )and associated equipment</p> <p>KC2. Different types of valves and their functioning (stop valve, non-return valve etc.)</p> <p>KC3. Gauges, dials, monitoring apparatus and their purpose</p> <p>KC4. Basic knowledge of power sources (driving systems) electrical systems &amp; mechanical driving systems Basic understanding of electrical systems and operation</p> <p>KC5. Impact of various physical parameters like temperature, pressure, etc on the properties of final output</p> <p>KC6. Hazards and safety aspects involved in compression activities and usage of relevant PPEs</p>
<p><b>Skills (S) [Optional]</b></p>	

**MIN/ N 0443** Understand processes and equipment requirement to complete the task

Element	Skills
<b>Element</b>  <b>A. Core Skills/</b>  <b>Generic Skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to:  SA1. note down observations (if any) related to the compression process  SA2. write information documents to internal departments/ internal teams or enter the information in online ERP systems
	<b>Reading Skills</b>
	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
<b>B. Professional Skills</b>	<b>Oral Communication (Listening and Speaking skills)</b>
	The user/individual on the job needs to know and understand how to:  SA5. discuss task lists, schedules and activities  SA6. effectively communicate with the team members  SA7. question 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>Plan and Organize</b>
<b>B. Professional Skills</b>	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 in scheduling tasks
	<b>Judgment and Critical Thinking</b>
<b>B. Professional Skills</b>	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



MIN/ N 0443 Understand processes and equipment requirement to complete the task

	<b>Desire to learn and take initiatives</b>
	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 within timelines and quality norms
	<b>Problem Solving and Decision making</b>
	The user/individual on the job needs to know and understand how to: SB10. detect problems in day to day tasks SB11. support in using specific problem solving techniques and detailing out the problems SB12. discuss possible solution for problem solving SB13. make decisions in emergency conditions (as per the authority matrix defined by the organization)

MIN/ N 0443 Understand processes and equipment requirement to complete the task

## NOS Version Control

<b>NOS Code</b>	MIN/N 0443		
<b>Credits(NSQF)</b>	TBD	<b>Version number</b>	1.0
<b>Sector</b>	Mining	<b>Drafted on</b>	15/12/2014
<b>Sub-sector</b>	Open cast and Underground Mines	<b>Last reviewed on</b>	24/03/2015
<b>Occupation</b>	Mechanical Maintenance	<b>Next review date</b>	24/03/2017

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# National Occupational Standard



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## Overview

This unit is about preparing the machine and auxiliary apparatus like compressor engines, pumps, and auxiliary equipment.

MIN/ N 0444 Prepare Machine and Auxiliaries

<b>Unit Code</b>	<b>MIN/ N 0444</b>
<b>Unit Title (Task)</b>	<b>Prepare the machine and auxiliary apparatus</b>
<b>Description</b>	This OS unit is about preparing the machine and auxiliary apparatus like compressor engines, pumps, and auxiliary equipment
<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Conduct pre-operation check</li> <li>• Set up the equipment</li> </ul>
<b>Performance Criteria (PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Conduct pre-operation check</b>	<p>PC1. Ensure correct oil level, status of the receiver with safety valve, air gauge and condition of the drain cock/water trap, distribution system etc.</p> <p>PC2. Check for cracks, defects and anomalies in the compression apparatus</p> <p>PC3. Perform condition monitoring of the equipment as specified by the equipment manufacturer</p> <p>PC4. Check for condition of piping on both suction and discharge sides</p> <p>PC5. Check the condition of couplings in the equipment</p> <p>PC6. Check electrical connections, and electrical system for proper functioning of the system</p> <p>PC7. If the compressor 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</p> <p>PC8. Check for risk of any fire, bursting and collapse or production of any noxious gases</p> <p>PC9. Understand the material required and the equipment availability for executing the activity</p> <p>PC10. Guide for the required material and tools before the start of the operations</p>
<b>Set-up the equipment</b>	<p>PC11. Ensure the cleaning of the machine and its auxiliaries (compressor engines, accessories and auxiliary equipment) before initiation of the process, as mentioned in the Work Instructions/ Standard Operating Procedures(SOP)</p>



MIN/ N 0444 Prepare Machine and Auxiliaries

	<p>PC12. Conduct necessary housekeeping around the work area to minimize risk of any mishap –e.g. fire, slippage etc.</p> <p>PC13. Setup the apparatus as per the selected process and the internal SOPs/ Work Instructions and the setting standard for the machine</p>
<b>Knowledge and Understanding (K) w.r.t. the scope</b>	
<b>Element</b>	<b>Knowledge and Understanding</b>
<p><b>A. Regulatory context (knowledge of safety guidelines specified by Director General of Mine Safety (DGMS))</b></p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Different types of mines and detail of the mine he is working in</p> <p>KA2. Mine Organisation, time keeping, need for discipline and punctuality</p> <p>KA3. Galleries in underground mine, dressing of roof, stable and unstable strata etc</p> <p>KA4. Standing orders in force at the mine. Safety in the vicinity of machinery</p> <p>KA5. Duties of workmen</p> <p>KA6. Provision of wages, working hours and accident compensation as per Mines act</p> <p>KA7. Knowledge of mining safety procedures</p> <p>KA8. Impact of violation of safely procedures</p>
<p><b>B. Organizational Context (Knowledge of the company / organization and its processes)</b></p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. relevant standard and procedures followed in the company</p> <p>KB2. processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution</p>
<p><b>C. Technical Knowledge</b></p>	<p>The user/individual on the job needs to know and understand:</p> <p>KC1. different types of compression processes (reciprocating, rotary etc. )and associated equipment</p> <p>KC2. Different types of valves and their functioning (stop valve, non-return valve etc.)</p> <p>KC3. Basic knowledge of power sources (driving systems) electrical systems &amp; mechanical driving systems Basic understanding of electrical systems and operation</p> <p>KC4. the impact of various physical parameters like temperature, pressure, etc on</p>

MIN/ N 0444 Prepare Machine and Auxiliaries

	<p>the properties of final output</p> <p>KC5. basic principles of safety and 5S around the work area</p>
<b>Skills (S) w.r.t. the scope</b>	
<b>Element</b>	<b>Skills</b>
<b>A. Core Skills/ Generic skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to: <ul style="list-style-type: none"> <li>SA1. note down observations (if any) related to the process</li> <li>SA2. write information documents to internal departments/ internal teams or</li> <li>SA3. enter the information in online ERP systems</li> </ul>
	<b>Reading Skills</b>
	The user/individual on the job needs to know and understand how to: <ul style="list-style-type: none"> <li>SA4. read equipment manuals and process documents to understand the equipment and processes better</li> <li>SA5. read internal information documents sent by internal teams</li> </ul>
	<b>Oral Communication (Listening and Speaking skills)</b>
The user/individual on the job needs to know and understand how to: <ul style="list-style-type: none"> <li>SA6. discuss task lists, schedules and activities</li> <li>SA7. effectively communicate with the team members</li> <li>SA8. question in order to understand the nature of the problem and to clarify queries</li> <li>SA9. attentively listen with full attention and comprehend the information given by the speaker</li> </ul>	
<b>B. Professional Skills</b>	<b>Plan and Organize</b>
	The user/individual on the job needs to know and understand how to: <ul style="list-style-type: none"> <li>SB1. plan and organize the work order and jobs received from the Operator</li> <li>SB2. organize all process/ equipment manuals so that sorting/ accessing information is easy</li> </ul>
	<b>Analytical Thinking</b>
The user/individual on the job needs to know and understand how to: <ul style="list-style-type: none"> <li>SB3. visualize the final job product after understanding the given drawing/ sketches</li> </ul>	



MIN/ N 0444 Prepare Machine and Auxiliaries

	<p>SB4. co relate the type of job output required with the welding methodology to be used</p> <p>SB5. identify the strengths and weakness of various compression processes</p>
	<p><b>Judgment and Critical Thinking</b></p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB6. use common sense and make judgments during day to day basis</p> <p>SB7. use reasoning skills to identify and resolve basic problems</p>
	<p><b>Desire to learn and take initiatives</b></p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB8. follow instructions and work on areas of improvement identified complete the assigned tasks with minimum supervision</p> <p>SB9. complete the job defined within the timelines and quality norms</p> <p>SB10. take self initiatives in driving small projects like operation improvement, training of helpers and assistant operators, 5S, Kaizen etc</p>



## NOS Version Control

<b>NOS Code</b>	MIN/N 0444		
<b>Credits(NSQF)</b>	TBD	<b>Version number</b>	1.0
<b>Sector</b>	Mining	<b>Drafted on</b>	15/12/2014
<b>Sub-sector</b>	Open cast and Underground Mines	<b>Last reviewed on</b>	24/03/2015
<b>Occupation</b>	Mechanical Maintenance	<b>Next review date</b>	24/03/2017

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MIN/ N 0445 Conduct the operation of compressor

# National Occupational Standard



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## Overview

**MIN/ N 0445** Conduct the operation of compressor

**This unit is about conducting the operation of the compressor as per the given work order and the standard specified by the organization**

National Occupational Standard	<b>Unit Code</b>	<b>MIN/ N 0445</b>
	<b>Unit Title (Task)</b>	<b>Operate the compression apparatus as per the work order and the specified standard</b>
	<b>Description</b>	This QP is about conducting Compression Operation as per the methodology selected and the Standard Operating Procedures defined by the Organization and the requirement of the work order
	<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>Operate compressor</li> <li>Perform basic maintenance process</li> </ul>
	<b>Performance Criteria (PC) w.r.t. the Scope</b>	
	<b>Element</b>	<b>Performance Criteria</b>
<b>Operate compressor</b>	<p>PC1. Check for operation of core equipment like compressor engines, accessories and auxiliary and safety equipment as per setup documentation and conduct preliminary operation when fully satisfied with the physical check</p> <p>PC2. Feed gas/air in the compressor as per the defined schedule or as per requirements raised by users of compressed gas/air</p> <p>PC3. Monitor meters and pressure gauges to determine consumption rate variations, temperatures, and pressures.</p> <p>PC4. Adjust valves and equipment to obtain specified performance.</p> <p>PC5. Read gas meters, and maintain records of the amounts of gas received and dispensed from holders.</p> <p>PC6. Record instrument readings and operational changes in operating logs/records/report books.</p>	

**MIN/ N 0445** Conduct the operation of compressor

	<p>PC7. Move controls and turn valves to start compressor engines, accessories, and auxiliary equipment.</p> <p>PC8. Turn knobs or switches to regulate pressures</p> <p>PC9. Clean, lubricate, and adjust equipment, and replace filters and gaskets, using hand tools</p> <p>PC10. Keep the supervisor informed of any inconsistency in the process, quality issues etc so that the same can be dealt immediately</p>
<b>Perform basic maintenance</b>	<p>PC11. Ensure that proper ventilation around the equipment is maintained and no overheating occurs</p> <p>PC12. Monitor condition of equipment by noticing variations in sound, vibration and other parameters</p> <p>PC13. Inform machine setter/ engineer/ supervisor to make modifications in the parameters in case any deformation/malfunctioning is observed outcomes and the prescribed standard</p>

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

Element	Knowledge and Understanding
<p><b>A. Regulatory context</b> (knowledge of safety guidelines specified by Director General of Mine Safety (DGMS))</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Different types of mines and detail of the mine he is working in</p> <p>KA2. Mine Organisation, time keeping, need for discipline and punctuality</p> <p>KA3. Galleries in underground mine, dressing of roof, stable and unstable strata etc</p> <p>KA4. Standing orders in force at the mine. Safety in the vicinity of machinery</p> <p>KA5. Duties of workmen</p> <p>KA6. Provision of wages, working hours and accident compensation as per Mines act</p> <p>KA7. Knowledge of mining safety procedures</p> <p>KA8. Impact of violation of safely procedures</p>

**MIN/ N 0445** Conduct the operation of compressor

<p><b>B. Organizational</b></p> <p><b>Context</b> (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. relevant manufacturing standard and procedures followed in the company</p> <p>KB2. processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution</p> <p>KB3. quality norms and standard prescribed in the Quality Manual by the organization for welding</p>
<p><b>C. Technical</b></p> <p><b>Knowledge</b></p>	<p>The user/individual on the job needs to know and understand:</p> <p>KC1. different types of compression processes and associated equipment</p> <p>KC2. various National and International standard, and statutory provisions, laws and bylaws related to compressed gases handling in Mining sector in India</p> <p>KC3. basic physical/chemical properties of gases</p> <p>KC4. basic knowledge of power sources (driving systems) electrical systems &amp; mechanical driving systems</p> <p>KC5. different types of defects/malfunctioning and their impact on the operating processes</p> <p>KC6. potential health and safety hazards and related Safety</p> <p>KC7. precautions to be undertaken during the process</p>
<b>Skills (S) w.r.t. the scope</b>	
<b>Elements</b>	<b>Skills</b>
<p><b>A. Core Skills/ Generic Skills</b></p>	<p><b>Writing Skills</b></p>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. note measurements, equipment panel readings for various process parameters in the required reporting formats</p>
	<p><b>Reading Skills</b></p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA2. read equipment manuals and process documents to understand</p>

	<p><b>MIN/ N 0445</b> Conduct the operation of compressor the equipment and processes better</p> <p>SA3. read internal information documents send by internal customers (other functions within the organization) the equipment</p> <p>SA4. read parameter reading on various types of monitoring panels</p> <p><b>Oral Communication (Listening and Speaking skills)</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. discuss task lists, schedules and activities</p> <p>SA6. effectively communicate with the team members Question in order to understand the nature of the problem and to clarify queries</p> <p>SA7. attentively listen with full attention and comprehend the information given by the speaker</p>
<p><b>B. Professional Skills</b></p>	<p><b>Plan and Organize</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan and organize the work order and jobs received</p> <p>SB2. organize all process/ equipment manuals so that sorting/ accessing information is easy</p> <p>SB3. support in scheduling tasks</p> <p><b>Judgment and Critical Thinking</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. use common sense and make judgments during day to day basis</p> <p>SB5. use reasoning skills to identify and resolve basic problems</p> <p>SB6. use intuition to detect any potential problems which could arise during operations</p> <p><b>Desire to learn and take initiatives</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. follow instructions and work on areas of improvement identified</p> <p>SB8. complete the assigned tasks with minimum supervision</p> <p>SB9. complete the job defined within the timelines and quality norms</p> <p><b>Problem Solving and Decision making</b></p>

**MIN/ N 0445** Conduct the operation of compressor

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

- SB10. how to detect problems in day to day activities
- SB11. support in using specific problem solving techniques and detailing out the problems
- SB12. discuss possible solution for problem solving
- SB13. make decisions in emergency conditions ( as per the authority matrix defined by the organization)
- SB14. support in problem solving using specific problem solving techniques

**Quality Consciousness**

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

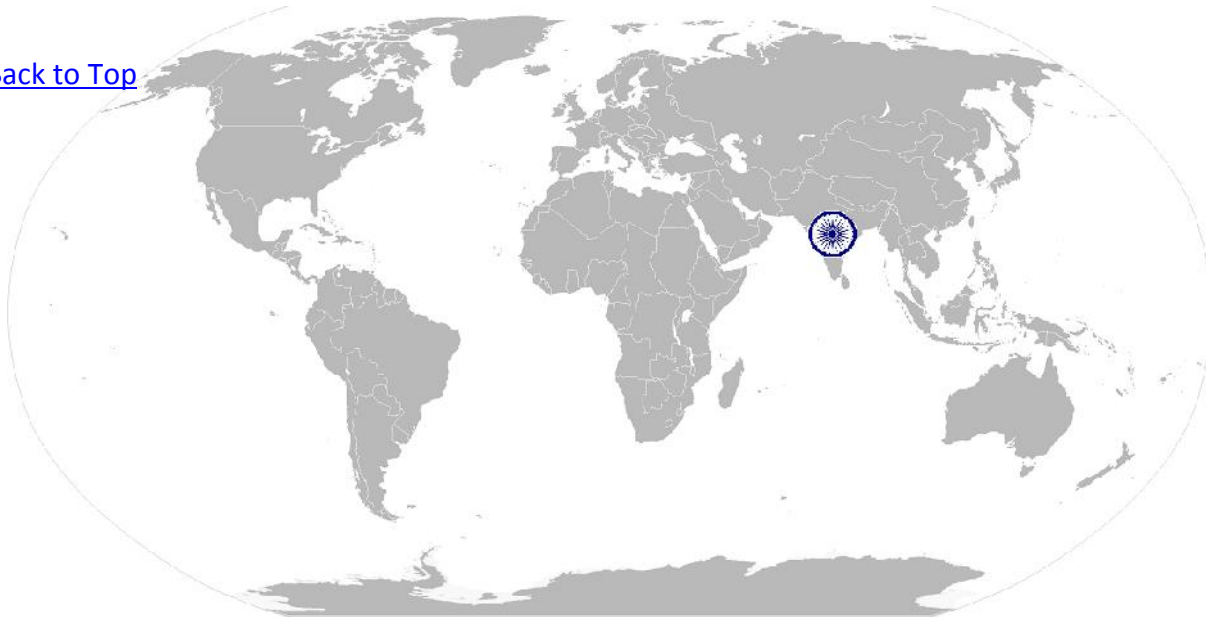
- SB15. guide in maintaining the quality
- SB16. quality Standard as described in the internal Quality Manual
- SB17. relate the impact of various processes and parameters the product quality

MIN/ N 0445 Conduct the operation of compressor

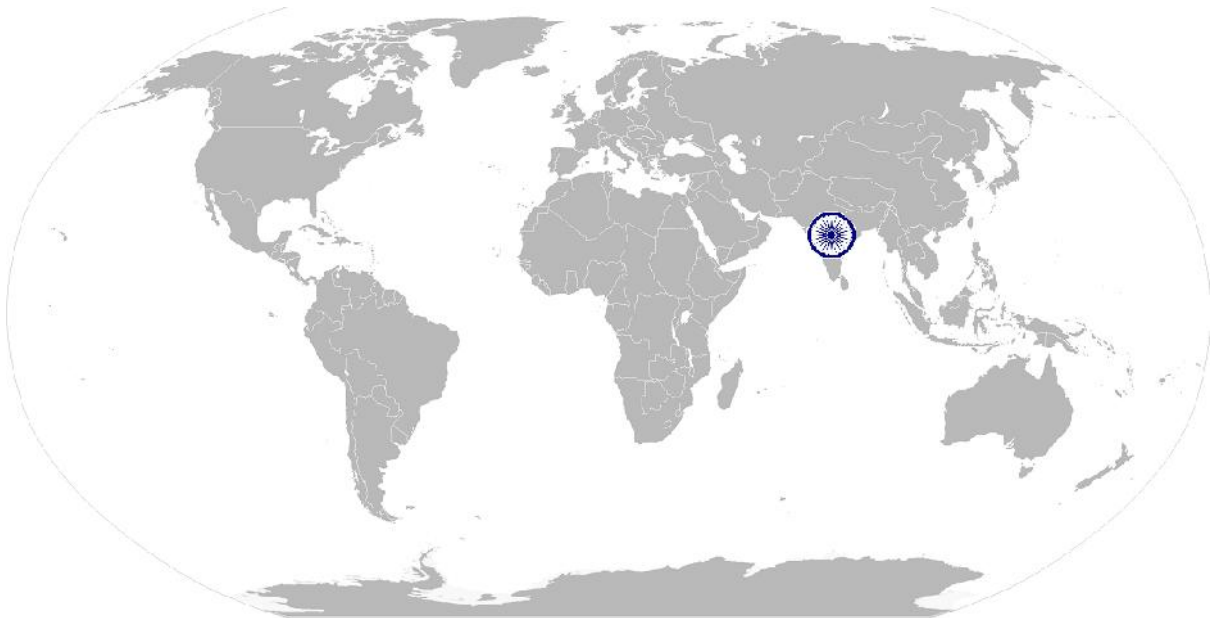
### NOS Version Control

<b>NOS Code</b>	MIN/N 0445		
<b>Credits(NSQF)</b>	TBD	<b>Version number</b>	1.0
<b>Sector</b>	Mining	<b>Drafted on</b>	15/12/2014
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<b>Occupation</b>	Mechanical Maintenance	<b>Next review date</b>	24/03/2017

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# National Occupational Standard



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## Overview

This unit is about health and safety measures critical in mines



**MIN/ N 0901 Health and Safety**

<b>National Occupational Standard</b>	<b>Unit Code</b>	<b>MIN/N 0901</b>
	<b>Unit Title (Task)</b>	<b>Health and Safety</b>
	<b>Description</b>	This unit is about health and safety measures critical in mines
	<b>Scope</b>	This OS unit/task covers the following: <ol style="list-style-type: none"> <li>1. Health and safety measures critical in mines</li> </ol>
	<b>Performance Criteria (PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>	
<b>Safety, Security and Administrative</b>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. Comply with occupational health and safety regulations adopted by the employer.</p> <p>PC2. Follow mining operations procedures with respect to materials handling and accidents</p> <p>PC3. Follow the correct safety steps in case of accident or major failure</p> <p>PC4. Comply with safety regulations and procedures in case of fire hazard.</p> <p>PC5. Operate various grades of fire extinguishers.</p> <p>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</p> <p>PC7. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS.</p> <p>PC8. Deal with misfires as per statutory requirement</p> <p>PC9. Identify characteristics of post-blast fumes and take necessary precautions.</p> <p>PC10. Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection</p> <p>PC11. Follow the manufacturer’s instructions for care and safe operation of the equipment.</p>	

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<b>Knowledge and Understanding (K)</b>	
<b>A. Regulatory context</b> (knowledge of safety guidelines specified by Director General of Mine Safety (DGMS))	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Galleries in underground mine, dressing of roof, stable and unstable strata etc</p> <p>KA2. First aid and Hygiene</p> <p>KA3. Code of traffic in specific areas of mine. Significance of fences</p> <p>KA4. Standing orders in force at the mine. Safety in the vicinity of machinery</p> <p>KA5. Knowledge of mining safety procedures</p> <p>KA6. Impact of violation of safety procedures</p> <p>KA7. Locally prepared Emergency Preparedness / Disaster Management Plan.</p> <p>KA8. Environmental impact of mining</p> <p>KA9. Sources of dust, noise and vibration and measures to minimise</p> <p>KA10. Hazardous material safety and security rules and regulations as prescribed by DGMS</p> <p>KA11. Code of practice for safe handling and transport of dangerous material and heavy equipment.</p>

## NOS Version Control

NOS Code	MIN/N 0901		
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

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## CRITERIA FOR ASSESSMENT OF TRAINEES

**Job Role** Compressor Operator

**Qualification Pack** MIN/ Q0415

**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

		Total Mark (100)	Out Of	Marks Allocation	
				Theory	Skills Practical
1. MIN/ N 0443(Understand processes and equipment requirement to complete the task)	PC1. Understand the right compression methodology and should be conversant with use, operation and maintenance process to be adopted as per defined Standard Operating Procedures specified by the equipment manufacturer and statutory requirements	<b>15</b>	3	2	1
	PC2. Understand the various compression parameters like temperature, pressure, process cycle time etc before starting the process, as mentioned in the Work Instructions/ SOP manual		3	2	1
	PC3. Be fully conversant with the use, operation and maintenance of the compressor/ machine provided for operation and required output		3	2	1
	PC4. Understand the different components and safety features fitted in the machine		2	1	1

	PC5. Be conversant with safety hazards in the compression process and should also be conversant with precautionary measures against the safety hazards		2	1	1
	PC6. Understand the material required and the equipment availability for executing the activity		2	1	1
		<b>Total</b>	<b>15</b>	<b>9</b>	<b>6</b>
2. MIN/ N 0444(Prepare the machine and auxiliaries)	PC1. Ensure correct oil level, status of the receiver with safety valve, air gauge and condition of the drain cock/water trap, distribution system etc.	<b>30</b>	2	1	1
	PC2. Check for cracks, defects and anomalies in the compression apparatus		3	1.5	1.5
	PC3. Perform condition monitoring of the equipment as specified by the equipment manufacturer		2	1	1
	PC4. Check for condition of piping on both suction and discharge sides		2	1.5	0.5
	PC5. Check the condition of couplings in the equipment		2	1.5	0.5
	PC6. Check electrical connections, and electrical system for proper functioning of the system		3	2	1
	PC7. If the compressor 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		2	1	1
	PC8. Check for risk of any fire, bursting and collapse or production of any noxious gases		2	1.5	0.5
	PC9. Understand the material required and the equipment availability for executing the activity		2	1.5	0.5

	PC10. Guide for the required material and tools before the start of the operations		2	1.5	0.5
	PC11. Ensure the cleaning of the machine and its auxiliaries (compressor engines, accessories and auxiliary equipment) before initiation of the process, as mentioned in the Work Instructions/ Standard Operating Procedures (SOP)		3	1.5	1.5
	PC12. Conduct necessary housekeeping around the work area to minimize risk of any mishap –e.g. fire, slippage etc.		2	1	1
	PC13. Setup the apparatus as per the selected process and the internal SOPs/ Work Instructions and the setting standard for the machine		3	1.5	1.5
		<b>Total</b>	<b>30</b>	<b>18</b>	<b>12</b>
3. MIN/ N 0445 (Conduct the operation of compressor)	PC1. Check for operation of core equipment like compressor engines, accessories and auxiliary and safety equipment as per setup documentation and conduct preliminary operation when fully satisfied with the physical check	<b>30</b>	2	1.5	0.5
	PC2. Feed gas/air in the compressor as per the defined schedule or as per requirements raised by users of compressed gas/air		3	1.5	1.5
	PC3. Monitor meters and pressure gauges to determine consumption rate variations, temperatures, and pressures.		2	1.5	0.5
	PC4. Adjust valves and equipment to obtain specified performance.		3	1.5	1.5
	PC5. Read gas meters, and maintain records of the amounts of gas received and dispensed from holders.		2	1	1
	PC6. Record instrument readings and operational changes in operating logs/records/report books.		2	1.5	0.5

	PC7. Move controls and turn valves to start compressor engines, accessories, and auxiliary equipment.		3	1.5	1.5
	PC8. Turn knobs or switches to regulate pressures		2	1	1
	PC9. Clean, lubricate, and adjust equipment, and replace filters and gaskets, using hand tools		3	1.5	1.5
	PC10. Keep the supervisor informed of any inconsistency in the process, quality issues etc so that the same can be dealt immediately		2	1.5	0.5
	PC11. Ensure that proper ventilation around the equipment is maintained and no overheating occurs		2	1	1
	PC12. Monitor condition of equipment by noticing variations in sound, vibration and other parameters		2	1.5	0.5
	PC13. Inform machine setter/ engineer/ supervisor to make modifications in the parameters in case any deformation/malfunctioning is observed outcomes and the prescribed standard		2	1.5	0.5
		<b>Total</b>	<b>30</b>	<b>18</b>	<b>12</b>
4. MIN/ N0901 (Health and Safety)	PC1. Comply with occupational health and safety regulations adopted by the employer.	<b>25</b>	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
		<b>Total</b>	<b>25</b>	<b>15</b>	<b>10</b>