

QUALIFICATIONS PACK - OCCUPATIONAL STANDARD FOR MINING INDUSTRY



Contents

1. [Introduction and Contacts.....Page.1](#)
2. [Qualifications Pack.....Page.2](#)
3. [Glossary of Key TermsPage.3](#)
4. [OS Units.....Page.5](#)

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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Introduction

Qualifications Pack- Ventilation Adequacy Checker/Fan Operator

SECTOR: MINING

SUB-SECTOR: Underground Mines

OCCUPATION: Mining Operations

REFERENCE ID: MIN/Q 0421

ALIGNED TO: NCO-2004/NIL

A ventilation adequacy checker ensures operation of ventilation apparatus to provide adequate ventilation inside the mine

Brief Job Description: Fan operator/ Main Mechanical Ventilator operates the main ventilating fan of the mine kept for the supply of adequate quantity of air needed to ventilate the entire mine. He will attend, maintain and operate the fan assigned for operation and to report any defect/malfunctioning to competent person/supervisor/engineer/Ventilation Officer (VO)

Personal Attributes: This job requires technical knowledge of about different gases and their reactions. The individual need to be physically fit to withstand working in a underground environment and respond to the needs and requirement of the tasks.

Job Details

| | | | |
|-------------------------|--|------------------|------------|
| Qualification Pack Code | MIN/Q 0421 | | |
| Job Role | Ventilation Adequacy Checker/ Fan 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 | Ventilation Adequacy Checker |
| Role Description | The role of fan operator/ Main Mechanical Ventilator is to operate the main ventilating fan of the mine kept for the supply of adequate quantity of air needed to ventilate the entire mine. |
| NSQF level | 4 |
| Minimum Educational Qualification | Class X |
| Maximum Educational Qualification | NA |
| Training (Suggested but not mandatory) | 1. Various techniques of ventilation/ fan operation and related principles of ventilation 2. Safety 3. Quality Management |
| Experience | 1 – 10 years |
| Applicable National Occupational Standards | Compulsory: Click on the hyperlink to read/download the required NOS 1. MIN/ N0459 (Pre Operation check) 2. MIN/ N0460 (Operation and Running of ventilation management system) 3. MIN / N 0901 (Health and Safety) Optional: Not Applicable |
| Performance Criteria | As described in the relevant OS units |

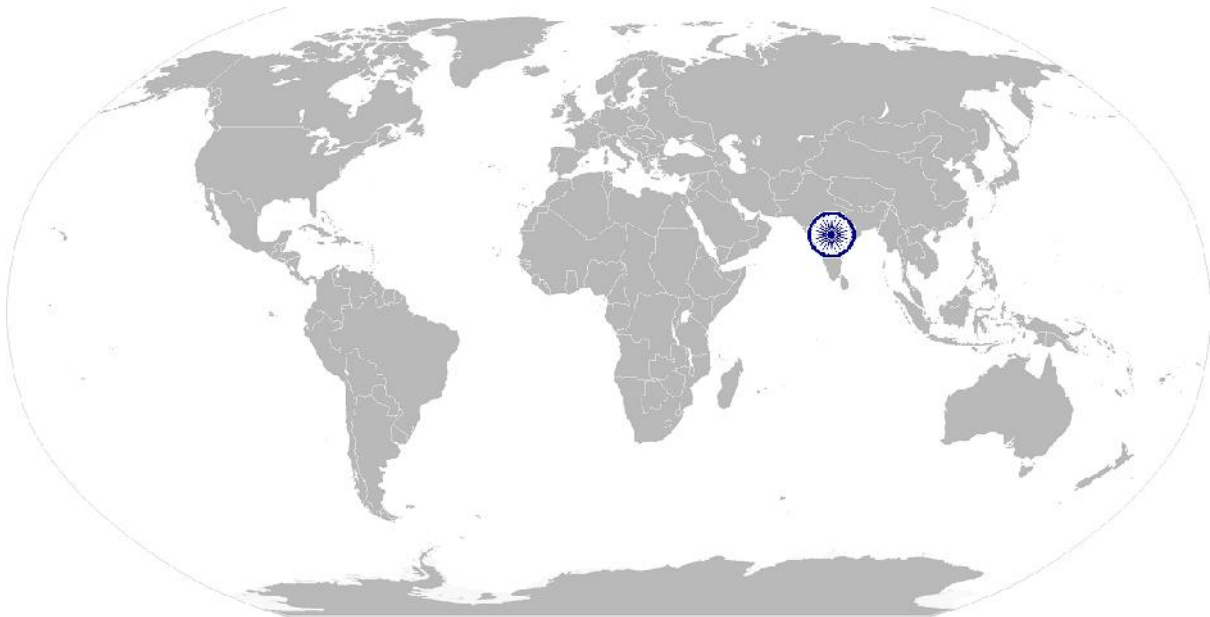
Qualification Pack For Ventilation Adequacy Checker

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 pre operation check of ventilation Management methods in underground mine

| | |
|---|--|
| Unit Code | MIN/ N0459 |
| Unit Title (Task) | Pre Operation Check |
| Description | This OS unit is about pre operation check of Ventilation Management methods in underground mine |
| Scope | This unit/task covers the following: <ul style="list-style-type: none"> Perform pre-operation check |
| Performance Criteria (PC) w.r.t. the Scope | |
| Element | Performance Criteria |
| Perform pre-operation check | <p>PC1. Examine the general physical condition of the main mechanical ventilator frame, blades, motor and water gauze.</p> <p>PC2. Ensure proper functioning of electrical and mechanical systems of the fan and the motor.</p> <p>PC3. Check initial water gauze at the start of the shift.</p> <p>PC4. Observe the amperage of the motor used to operate the fan.</p> <p>PC5. Check the condition of the electrical connections.</p> <p>PC6. Observe occurrence of any discrepancy and report to the concerned official/supervisor by the fan operator</p> <p>PC7. Perform general housekeeping/cleanliness of the fan house.</p> |
| Knowledge and Understanding (K) w.r.t. the scope | |
| A. Regulatory context (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. Different types of mines and detail of the mine he is working in</p> <p>KA2. Mine organization, time keeping, need for discipline and punctuality</p> <p>KA3. Galleries in underground mine, dressing of roof, stable/ 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> |

| | |
|---|--|
| B. Organizational Context (Knowledge of the company / organization and its processes) | <p>The user/individual on the job needs to know and understand:</p> <p>KB1. Relevant standards and procedures followed in the company</p> |
| C. Technical Knowledge | <p>The user/individual on the job needs to know and understand:</p> <p>KC1. Operation and monitoring of the site's remote atmospheric monitoring system</p> <p>KC2. Carrying out basic maintenance and arrange for calibration of the system</p> <p>KC3. Operation and maintenance of portable gas monitoring instruments in including recording, calibration, charging, and making it fit to use</p> <p>KC4. Electrical motors and principles of fan operation</p> <p>KC5. Basic understanding of 3-phase electricity supply (including star and delta modes) and operation</p> <p>KC6. Carrying out mine airflow measurements and results interpretation</p> <p>KC7. Carrying out auxiliary fan airflow measurements as defined in the VMP and in accordance with regulation 31 of the HSE Mining (Underground) Regulations 1999</p> |
| Skills (S) [Optional] | |
| Element A. Core Skills/ Generic Skills | Writing Skills |
| | <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. Note down observations (if any)</p> <p>SA2. Write information documents or enter the information in online ERP systems under guidance of the supervisor</p> |
| | Reading Skills |
| | <p>The user/individual on the job needs to know and understand how to:</p> <p>SA3. Read and interpret symbols and measurements</p> <p>SA4. Read information documents</p> <p>SA5. Understand and analyse the available data about the site</p> |
| | Oral Communication (Listening and Speaking skills) |
| | <p>The user/individual on the job needs to know and understand how to:</p> |

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|-------------------------------|---|
| | <p>SA6. Discuss task lists, schedules and activities</p> <p>SA7. Effectively communicate</p> <p>SA8. Attentively listen with full attention and comprehend the information given by various sources about the site</p> |
| B. Professional Skills | Plan and Organize |
| | <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</p> <p>SB2. Organize all process manuals so that sorting/ accessing information is easy</p> |
| | Judgment and Critical Thinking |
| | <p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. Use common sense and make judgments during day to day basis</p> <p>SB4. Use reasoning skills to identify and resolve basic problems</p> <p>SB5. Use intuition to detect any potential problems which could arise</p> |
| | Desire to learn and take initiatives |
| | <p>The user/individual on the job needs to know and understand how to:</p> <p>SB6. Follow instructions and work on areas of improvement identified</p> <p>SB7. Complete the assigned tasks with minimum supervision</p> <p>SB8. Complete the job within timelines and quality norms</p> |
| | Problem Solving and Decision making |
| | <p>The user/individual on the job needs to know and understand how to:</p> <p>SB9. Detect problems in day to day tasks</p> <p>SB10. Discuss possible solution with the supervisor for problem solving</p> <p>SB11. Make decisions in emergency conditions</p> |

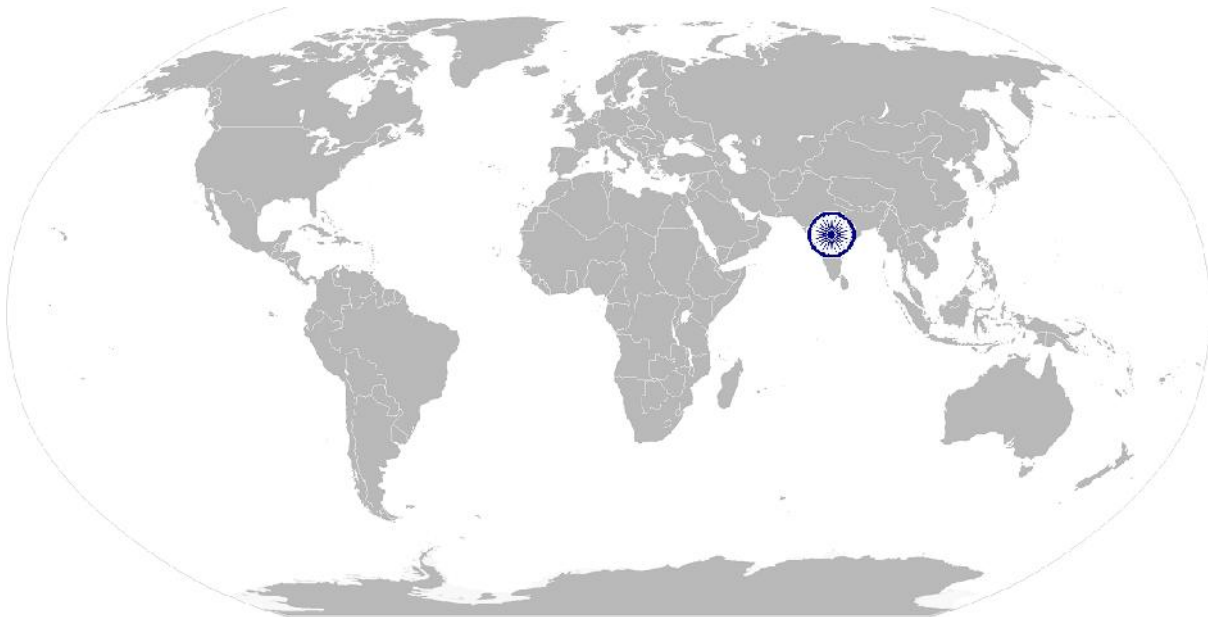
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|----------------------------|--------------------------|-------------------------|-------------------|
| NOS Code | MIN/ N0459 | | |
| Credits(NSQF) | TBD | Version number | 1.0 |
| Industry | Mining | Drafted on | 15/12/2014 |
| Industry Sub-sector | Underground Mines | Last reviewed on | 24/03/2015 |
| Occupation | Mining Operations | Next review date | 24/03/2017 |

[Back to Top](#)

National Occupational Standard



Overview

This unit is about operation and running of the ventilation management systems

MIN/ N0460 Operation & running of ventilation management system

National Occupational Standard

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| Unit Code | MIN/ N0460 |
| Unit Title (Task) | Operation & running of ventilation management system |
| Description | This OS unit is about operation and running of Ventilation Management methods in underground mine |
| Scope | <p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Operation & Running |
| Performance Criteria (PC) w.r.t. the Scope | |
| Element | Performance Criteria |
| Operation & Running | <p>PC1. Keep the ventilator running at the speed fixed by the manager.</p> <p>PC2. Examine the machinery and observe the pressure-recorded or water gauge and the speed-indicator at intervals of not more than one hour, and shall, enter the readings of the indicator in a bound-paged book kept for the purpose at the fan-house.</p> <p>PC3. Report to the superior, any stoppage of, damage to, or defect or derangement in the machinery, or any unusual variation in the water-gauge or other indicators; shall also immediately report to him any unusual circumstances in regard to mine ventilation which may come to his notice.</p> <p>PC4. Where the ventilator is continuously operated, shall not leave his post until received by a duly appointed substitute.</p> <p>PC5. Maintenance and Records:</p> <ul style="list-style-type: none"> • Speed recording • Water gauze recording • Running hours • Number of hours the fan has been stopped during the shift with reason • Ampere reading of the motor used for the operation of fan |
| Knowledge and Understanding (K) w.r.t. the scope | |
| A. Regulatory context (knowledge of safety) | <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 organization, time keeping, need for discipline and punctuality</p> <p>KA3. Galleries in underground mine, dressing of roof, stable and unstable strata</p> |

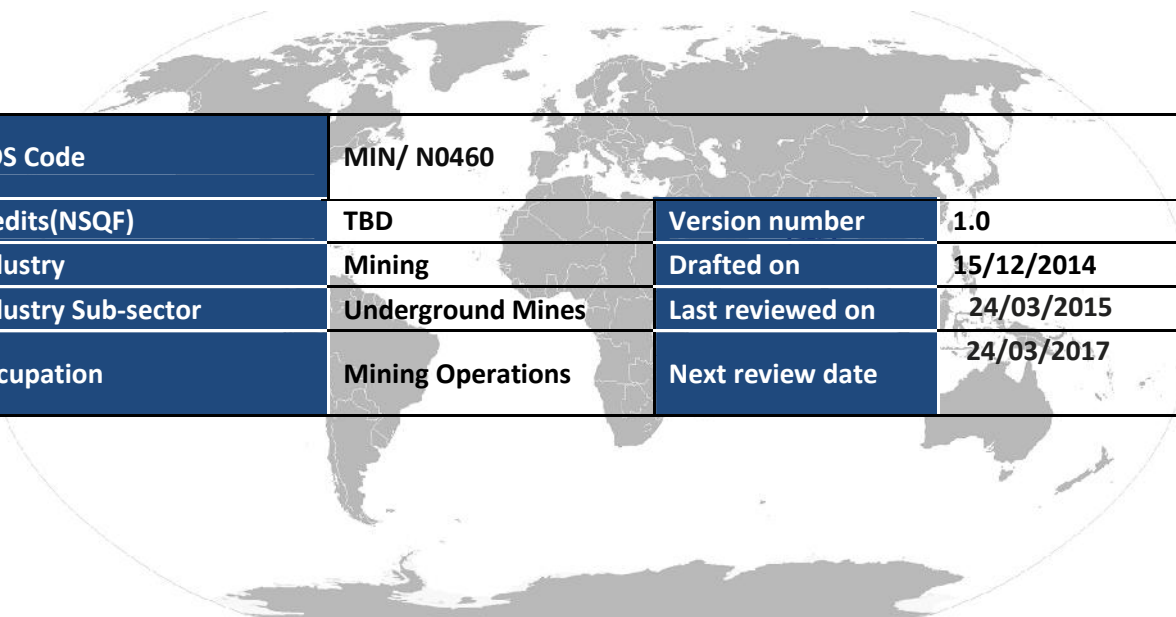
MIN/ N0460 Operation & running of ventilation management system

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| guidelines specified by Director General of Mine Safety (DGMS)) | <p>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> |
| B. Organizational Context (Knowledge of the company / organization and its processes) | <p>The user/individual on the job needs to know and understand:</p> <p>KB1. Relevant standards and procedures followed in the company</p> |
| C. Technical Knowledge | <p>The user/individual on the job needs to know and understand:</p> <p>KC1. The water gauge required for the efficient operation of the fan.</p> <p>KC2. The speed prescribed by the manager.</p> <p>KC3. Basic electrical and mechanical system of the fan.</p> <p>KC4. The appropriate ampere at which the fan motor should run.</p> |
| Skills (S) [Optional] | |
| Element | Writing Skills |
| A. Core Skills/ Generic Skills | <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. Note down observations (if any)</p> <p>SA2. Write information documents or enter the information in online ERP systems under guidance of the supervisor</p> |
| | Reading Skills |
| | <p>The user/individual on the job needs to know and understand how to:</p> <p>SA3. Read and interpret symbols and measurements</p> <p>SA4. Read information documents</p> <p>SA5. Understand and analyse the available data about the site</p> |
| | Oral Communication (Listening and Speaking skills) |
| | <p>The user/individual on the job needs to know and understand how to:</p> |
| | |

MIN/ N0460 Operation & running of ventilation management system

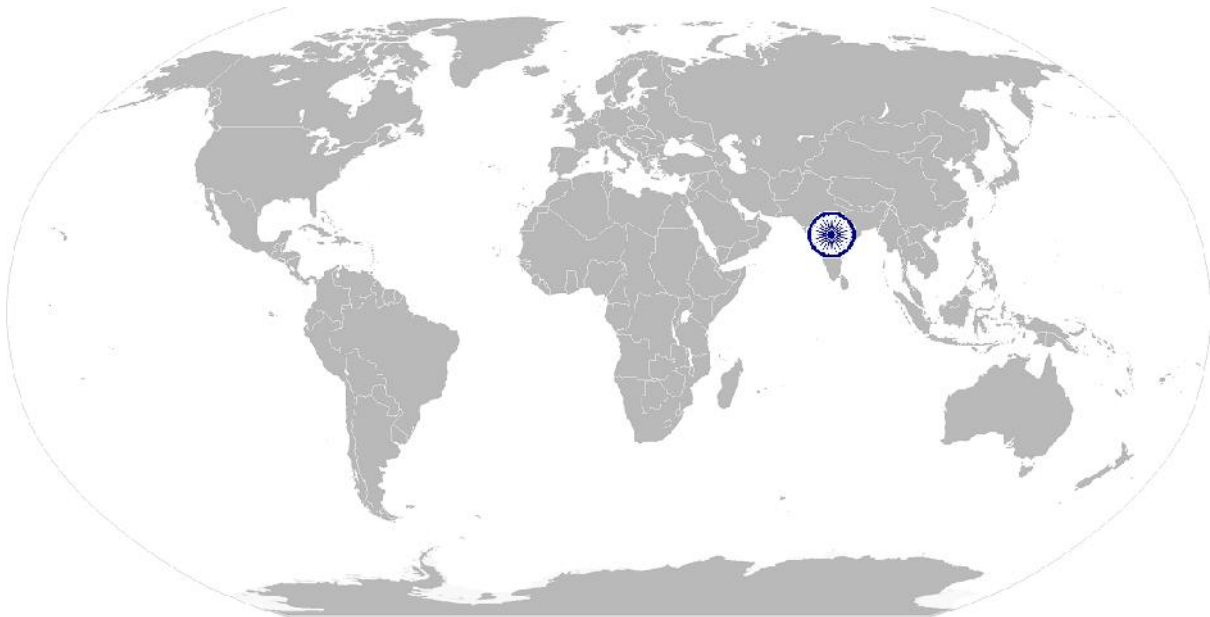
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|-------------------------------|---|
| | <p>SA6. Discuss task lists, schedules and activities</p> <p>SA7. Effectively communicate</p> <p>SA8. Attentively listen with full attention and comprehend the information given by various sources about the site</p> |
| B. Professional Skills | Plan and Organize |
| | <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</p> <p>SB2. Organize all process manuals so that sorting/ accessing information is easy</p> |
| | Judgment and Critical Thinking |
| | <p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. Use common sense and make judgments during day to day basis</p> <p>SB4. Use reasoning skills to identify and resolve basic problems</p> <p>SB5. Use intuition to detect any potential problems which could arise</p> |
| | Desire to learn and take initiatives |
| | <p>The user/individual on the job needs to know and understand how to:</p> <p>SB6. Follow instructions and work on areas of improvement identified</p> <p>SB7. Complete the assigned tasks with minimum supervision</p> <p>SB8. Complete the job within timelines and quality norms</p> |
| | Problem Solving and Decision making |
| | <p>The user/individual on the job needs to know and understand how to:</p> <p>SB9. Detect problems in day to day tasks</p> <p>SB10. Discuss possible solution with the supervisor for problem solving</p> <p>SB11. Make decisions in emergency conditions</p> |

MIN/ N0460 Operation & running of ventilation management system

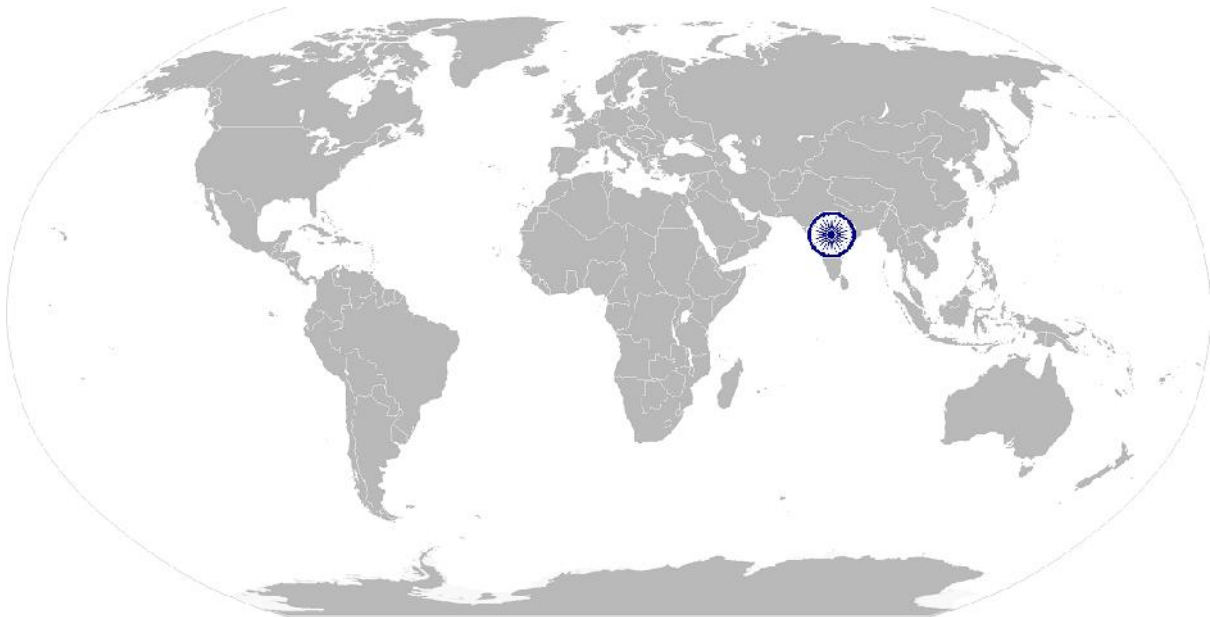
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|---------------------|-------------------|------------------|------------|
| NOS Code | MIN/ N0460 | | |
| Credits(NSQF) | TBD | Version number | 1.0 |
| Industry | Mining | Drafted on | 15/12/2014 |
| Industry Sub-sector | Underground Mines | Last reviewed on | 24/03/2015 |
| Occupation | Mining Operations | Next review date | 24/03/2017 |

[Back to top](#)



National Occupational Standard



Overview

This unit is about health and safety measures critical in mines

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|-----------|------------|
| Unit Code | MIN/N 0901 |
|-----------|------------|

| Unit Title (Task) | Health and Safety |
|--|---|
| Description | This unit is about health and safety measures critical in mines |
| Scope | <p>This OS unit/task covers the following:</p> <ul style="list-style-type: none"> Health and safety measures critical in mines |
| Performance Criteria (PC) w.r.t. the Scope | |
| Element | Performance Criteria |
| Safety, Security and Administrative | <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> |

Knowledge and Understanding (K)

| | |
|--|--|
| <p>A. Regulatory context (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> <ul style="list-style-type: none"> KA1. Galleries in underground mine, dressing of roof, stable and unstable strata etc. 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. Knowledge of mining safety procedures KA6. Impact of violation of safety procedures KA7. Locally prepared Emergency Preparedness / Disaster Management Plan. KA8. Environmental impact of mining KA9. Sources of dust, noise and vibration and measures to minimise KA10. Hazardous material safety and security rules and regulations as prescribed by DGMS KA11. Code of practice for safe handling and transport of dangerous material and heavy equipment. |
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|----------------------|--------------------------|-------------------------|-------------------|
| NOS Code | MIN/N 0901 | | |
| Credits(NSQF) | TBD | Version number | 1.0 |
| Sector | Mining | | 15/12/2014 |
| Sub-sector | Underground Mines | | 24/03/2015 |
| Occupation | Mining Operations | | 24/03/2017 |
| | | Drafted on | |
| | | Last reviewed on | |
| | | Next review date | |



[Back to top](#)

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Ventilation Adequacy Checker/ Fan Operator

Qualification Pack MIN/Q 0421

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/ N0459 (Pre Operation check) | PC1. Examine the general physical condition of the main mechanical ventilator frame, blades, motor and water gauze. | 35 | 5 | 3 | 2 |
| | PC2. Ensure proper functioning of electrical and mechanical systems of the fan and the motor. | | 5 | 3 | 2 |
| | PC3. Check initial water gauze at the start of the shift. | | 5 | 3 | 2 |
| | PC4. Observe the amperage of the motor used to operate the fan. | | 5 | 3 | 2 |
| | PC5. Check the condition of the electrical connections. | | 5 | 3 | 2 |
| | PC6. Observe occurrence of any discrepancy and report to the concerned official/ supervisor by the fan operator | | 5 | 3 | 2 |

| | | | | | |
|---|---|--------------|-----------|-----------|-----------|
| | PC7. Perform general housekeeping/cleanliness of the fan house. | | 5 | 3 | 2 |
| | | Total | 35 | 21 | 14 |
| 2. MIN/ N0460 (Operation and Running of ventilation management system) | PC1. Keep the ventilator running at the speed fixed by the manager. | 35 | 7 | 3 | 4 |
| | PC2. Examine the machinery and observe the pressure-recorded or water gauge and the speed-indicator at intervals of not more than one hour, and shall, enter the readings of the indicator in a bound-paged book kept for the purpose at the fan- house. | | 7 | 4 | 3 |
| | PC3. Report to the superior, any stoppage of, damage to, or defect or derangement in the machinery, or any unusual variation in the water-gauge or other indicators; shall also immediately report to him any unusual circumstances in regard to mine ventilation which may come to his notice. | | 7 | 4 | 3 |
| | PC4. Where the ventilator is continuously operated, shall not leave his post until received by a duly appointed substitute. | | 7 | 4 | 3 |
| | PC5. Maintenance and Records: Speed recording Water gauze recording Running hours Number of hours the fan has been stopped during the shift with reason Ampere reading of the motor used for the operation of fan" | | 7 | 4 | 3 |
| | | Total | 35 | 19 | 16 |
| 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 | | 3 | 2 | 1 |

| | | | | | |
|--|---|--------------|-----------|-----------|-----------|
| | respect to materials handling and accidents | | | | |
| | PC3. Follow the correct safety steps in case of accident or major failure | | 3 | 2 | 1 |
| | PC4. Comply with safety regulations and procedures in case of fire hazard. | | 3 | 2 | 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 | 1.5 | 0.5 |
| | PC7. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS. | | 2 | 1.5 | 0.5 |
| | PC8. Deal with misfires as per statutory requirement | | 2 | 1 | 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. | | 3 | 2 | 1 |
| | | Total | 30 | 20 | 10 |