

# QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR MINING INDUSTRY

## What are Occupational Standard (OS)?

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



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## Introduction

### Qualifications Pack- Mining Shot Firer or Blaster

**SECTOR:** MINING

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

**OCCUPATION:** Mining Operations

**REFERENCE ID:** MIN/Q 0428

**ALIGNED TO:** NCO-2004/7112.90

A Mining Shot Firer uses detonation and explosives to demolish structures and clear obstacles and large earth masses.

**Brief Job Description:** Shotfirer assembles, positions and detonates explosives to break or dislodge rock and soil or to demolish structures. (refer to MMR 1960/ MVTR) In open cast mining operation, shotfirer uses larger amounts of explosives to clear masses of earth in open areas. Numerous smaller blasts are often detonated together to create a larger force. In tunnelling and underground mining operation, shotfirer uses small amounts of explosives to blast through rock underground. Generally, small blasts are detonated in a sequence to minimise the force and decrease the possibility of unwanted damage.

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

Job Details	<b>Qualifications Pack Code</b>	MIN/ Q 0428		
	<b>Job Role</b>	Shot Firer/ Blaster		
	<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>	Mining Operations	<b>Next review date</b>	24/03/2017

<b>Job Role</b>	<b>Blaster</b>
<b>Role Description</b>	This role assembles, positions and detonates explosives to break or dislodge rock and soil or to demolish structures and is solely responsible for transport and use of Explosives; observance of statutory provisions of CMR 1957 or MMR 1961 and any directives issued thereunder; Charging, Stemming (with suitable stemming material) and firing of each shots and also for any misfire and its dealing procedure; Proper Warning and sheltering of Persons and for any Secondary Blasting
<b>NSQF level</b> <b>Minimum Educational Qualification</b> <b>Maximum Educational Qualification</b>	<b>4</b> Class X and statutory certificate NA
<b>Training</b> (Suggested but not mandatory)	<ol style="list-style-type: none"> <li>Holder of statutory “Gas Testing Certificate “ in case of Gassy Coal Mines. In all other Case – Not required</li> <li>Latest Blasting techniques and materials</li> <li>Safety and 5S</li> </ol>
<b>Experience</b>	2-3 years of experience as explosive carrier
<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>MIN/ N0479 (<a href="#">Receive and Handle Explosive Materials On-Site</a>)</li> <li>MIN/ N0480 (<a href="#">Charge Blast Holes, Blast to Specification and deal with misfires</a>)</li> <li>MIN/ N0901 (<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

# National Occupational Standard



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## Overview

This unit is about demonstrate competence to carry out preparatory activities for Blasting. This unit covers receiving explosive materials from store and/or delivery vehicle, handling explosive materials on site, determining blast requirements and designing and arranging authorization for blast specification.

MIN/ N0479 Receive and Handle Explosive Materials On-Site

<b>Unit Code</b>	<b>MIN/ N 0479</b>
<b>Unit Title (Task)</b>	<b>Receive and Handle Explosive Materials On-Site</b>
<b>Description</b>	This unit is about demonstrate competence to receive and handle explosive materials. This unit covers receiving explosive materials from store and/or delivery vehicle, handling explosive materials on site, determining blast requirements and designing and arranging authorization for blast specification.
<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>• Receive and handle explosive materials on-site</li> <li>• Determine the blasting requirements</li> <li>• Design and arrange for authorization of the blast specification</li> </ul>
<b>Working Conditions</b>	<ul style="list-style-type: none"> <li>• able to work in confined spaces, including underground</li> <li>• may also be required to work in remote areas where conditions can be hot, wet, dirty and dusty.</li> <li>• Need to wear protective clothing such as hard hats, safety boots and other safety equipment.</li> <li>• may be required to work shifts</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Receive and Handle Explosive Materials On-Site</b>	<p>PC1. Obtain all explosive materials correctly and check conformity with the requirements of the blasting specification.</p> <p>PC2. Complete the records accurately and make them available to authorised persons.</p> <p>PC3. Handle the explosive materials and move safely in accordance with operational and organisational procedures and relevant legislation requirements.</p> <p>PC4. Contain all explosive materials safely and securely and take precautions to avoid any loss or damage.</p> <p>PC5. Separate the explosives and detonators and handle them in conformity with operational and organisational rules and procedures and in accordance with relevant legislation.</p> <p>PC6. Apply the approved routes when transporting explosive materials.</p> <p>PC7. Display relevant danger notices in conformity with operational and organisational rules and procedures and with relevant legislation.</p>
<b>Determine the blasting requirements</b>	<p>PC8. Understand the location and area for blasting and requirements to conform with the overall development plans of the site</p> <p>PC9. Understand the quality and extent of mineral materials for removal and confirm with the relevant persons (e.g. manager; explosives supervisor; blasting team; contractors: geotechnical specialist) and the operational requirements</p> <p>PC10. Survey the geological makeup of the ground and mineral strata visually and evaluate for matching with the specified requirements</p>

**MIN/ N0479 Receive and Handle Explosive Materials On-Site**

	<p>PC11. Identify the geological anomalies of the blast site visually and take into account in the blast design</p> <p>PC12. Collect and record the dimensional information in accordance with the blast specification requirements</p> <p>PC13. Ensure that the output of the blast is confirmed to meet with the site requirements</p> <p>PC14. Determine the extent of the blast from the production requirements, the fragmentation and geological makeup of the ground and mineral strata, face provision and availability and drill size</p> <p>PC15. Understand the effects of a blast on plant, buildings, external features and the surrounding environment</p> <p>PC16. Understand the drill plan</p> <p>PC17. Identify the potential hazards and danger sources and record in the blast specification</p> <p>PC18. Carry out the work to approved procedures and practices and in compliance with statutory requirements</p>
<p><b>Design and arrange for authorization of the blast specification</b></p>	<p>PC19. collect information from previous blasts at the site and examine and evaluate information in determining the blast design</p> <p>PC20. analyse constraints and capabilities of plant and equipment used for moving and processing mineral materials and factor the same in the blast design</p> <p>PC21. determine types of explosive materials, method of initiation and blasting system and clearly stipulate in accordance with operational and organisation rules and procedures and compliance with legislative requirements</p> <p>PC22. ensure rules and procedures for the storing, transporting and handling of explosives are clearly established which comply with legislative requirements</p> <p>PC23. Ensure that requirements for safety and security of the blast operations are clearly identified and communicated</p> <p>PC24. Obtain authorisation of the blast specification in accordance with operational and organisational rules and procedures and comply with legislative requirements</p> <p>PC25. Communicate the agreed upon blast specifications to concerned stakeholders, in accordance with operational and organisational rules and procedures and comply with legislative requirements</p>
<p><b>Knowledge and Understanding (K)</b></p>	
<p><b>A. Regulatory context (knowledge of safety guidelines specified by Director</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. Benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and Hygiene</p> <p>KA4. Standing orders in force at the mine. Safety in the vicinity of machinery</p> <p>KA5. Shot-firing and Safety regulations. How and where to take shelter</p> <p>KA6. Duties of workmen</p>

**MIN/ N0479 Receive and Handle Explosive Materials On-Site**

<p><b>General of Mine Safety (DGMS))</b></p>	<p>KA7. Provision of wages, working hours and accident compensation as per Mines act</p> <p>KA8. Knowledge of mining safety procedures</p> <p>KA9. 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 standards and procedures followed in the company</p> <p>KB2. different types of electrical requirements at the mine</p> <p>KB3. 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. the types and range of explosive materials, their strength and characteristics (to include explosives; detonating devices; blasting agents; blasting accessories)</p> <p>KC2. types of initiating systems</p> <p>KC3. effects on blast performance of variations in blast specification</p> <p>KC4. the approved procedures and practices in the context of the operations, the work activity and the workplace environment to include organisational; environmental; regulatory; emergency; operational.)</p> <p>KC5. the responsibilities of blaster and relevant others under the health and safety statutory requirements.</p> <p>KC6. the relevant legislation associated to the handling and movement of explosives.</p> <p>KC7. how to recognise detonator types and delays.</p> <p>KC8. the operational and organisational procedures and practices for handling and transport of explosives.</p> <p>KC9. the requirements for checking explosives type and condition.</p> <p>KC10. the reasons for, and location of, specified routes to be used when transporting explosive materials.</p> <p>KC11. understanding of relevant geotechnical information at the blast site</p> <p>KC12. digging/loading capability of blast site loading equipment</p> <p>KC13. strength and formation of mineral strata</p> <p>KC14. the potential dangers/ hazards during transportation.</p> <p>KC15. the safety procedures when loading and unloading explosive materials.</p> <p>KC16. the manufacturers' recommendations for handling explosives and detonators.</p> <p>KC17. the relevant legislation associated to the transport of explosives.</p> <p>KC18. the dangers associated with environmental conditions.</p> <p>KC19. the dangers of induced currents from external sources.</p>



MIN/ N0479 Receive and Handle Explosive Materials On-Site

Skills (S) [Optional]	
Element	Skills
<b>Element</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: SA1. note down observations (if any) SA2. write information documents or enter the information in online ERP systems under guidance of the supervisor
	<b>Reading Skills</b>
	The user/individual on the job needs to know and understand how to: SA3. read and interpret symbols and measurements SA4. read information documents SA5. understand and analyse the available data about the site
	<b>Oral Communication (Listening and Speaking skills)</b>
<b>B. Professional Skills</b>	The user/individual on the job needs to know and understand how to: SA6. discuss task lists, schedules and activities SA7. effectively communicate SA8. attentively listen with full attention and comprehend the information given by various sources about the site
	<b>Plan and Organize</b>
	The user/individual on the job needs to know and understand how to: SB1. plan and organize the work order and jobs SB2. organize all process manuals so that sorting/ accessing information is easy
	<b>Judgment and Critical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB3. use common sense and make judgments during day to day basis SB4. use reasoning skills to identify and resolve basic problems SB5. use intuition to detect any potential problems which could arise
	<b>Desire to learn and take initiatives</b>
	The user/individual on the job needs to know and understand how to: SB6. follow instructions and work on areas of improvement identified SB7. complete the assigned tasks with minimum supervision SB8. complete the job 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: SB9. detect problems in day to day tasks SB10. discuss possible solution with the supervisor for problem solving SB11. make decisions in emergency conditions

MIN/ N0479 Receive and Handle Explosive Materials On-Site

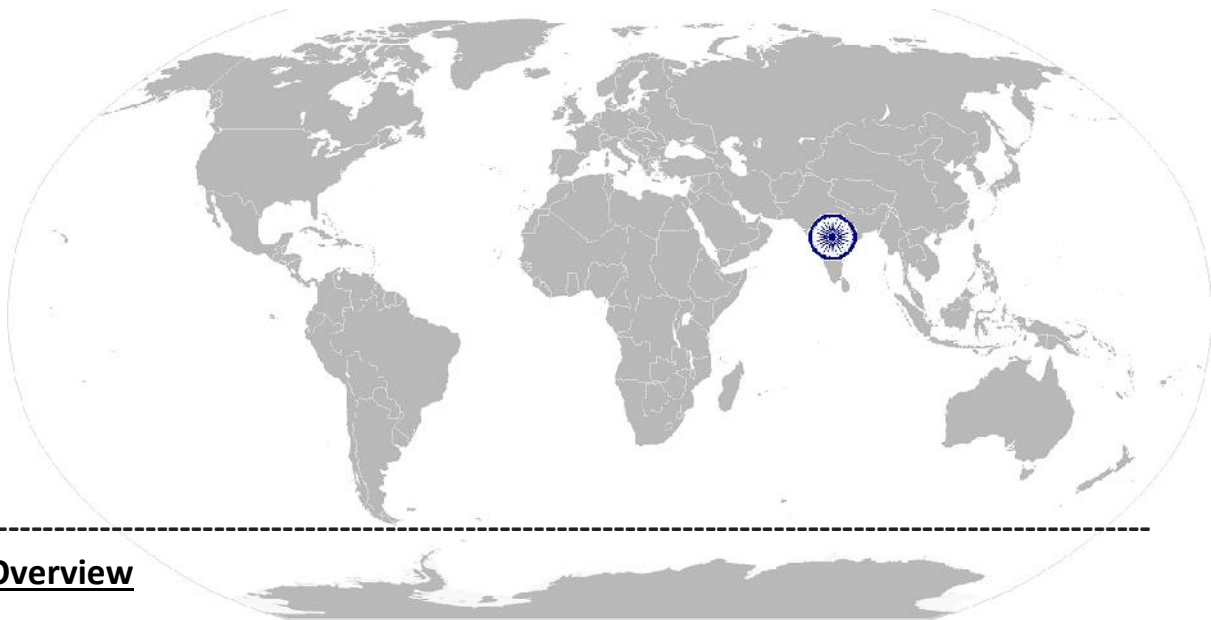
**NOS Version Control**

<b>NOS Code</b>	MIN/ N0479		
<b>Credits(NSQF)</b>	TBD	<b>Version number</b>	1.0
<b>Industry</b>	Mining	<b>Drafted on</b>	15/12/2014
<b>Industry Sub-sector</b>	Open Cast and Underground Mines	<b>Last reviewed on</b>	24/03/2015
<b>Occupation</b>	Mining Operations	<b>Next review date</b>	24/03/2017



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## Overview

The unit covers checking blast sites prior to charging by checking the setting out and profiling of the drill holes, finalising the blast specifications and confirming the charge. Preparing the explosive materials and charging blast holes with the explosive materials. completing and checking the initiation circuit, clearing and securing the danger zone, sounding warning and fire blast and inspecting blast site after detonation. This unit also deals with misfires by identifying type and position of misfire, taking remedial action with misfires and recovering explosive materials

## MIN/ N0480 Charge Blast Holes, Blast to Specification and deal with misfires

<b>Unit Code</b>	<b>MIN/ N 0480</b>
<b>Unit Title (Task)</b>	<b>Charge Blast Holes, Blast to Specification and deal with misfires</b>
<b>Description</b>	This OS unit is about demonstrating competence to charge blast holes and blasting to specification. The unit covers checking blast sites prior to charging by checking the setting out and profiling of the drill holes, finalising the blast specifications and confirming the charge. Preparing the explosive materials and charging blast holes with the explosive materials. completing and checking the initiation circuit, clearing and securing the danger zone, sounding warning and fire blast and inspecting blast site after detonation. This unit also deals with misfires by identifying type and position of misfire, taking remedial action with misfires and recovering explosive materials
<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>• Charging blast holes to specification</li> <li>• Blasting to specification</li> <li>• Dealing with misfires</li> </ul>
<b>Performance Criteria (PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Charging blast holes to specification</b>	<p>PC1. Check each blast hole is checked for condition, dimension, angle, inclination and direction, as appropriate, to ensure it is suitable for charging to the blast specification.</p> <p>PC2. Identify, record and report any variations to the blasting specification and confirm with the appropriate persons.</p> <p>PC3. Prepare the required quantities of explosives in accordance with the blast specification</p> <p>PC4. Check the explosives to ensure they conform, in quantity and type, to the blasting specification.</p> <p>PC5. Charge the blast holes in accordance with the blasting specification</p> <p>PC6. Place detonators and primers accurately in conformity with the blasting specification</p> <p>PC7. Identify and report the variations between the specification and the actual conditions at the time of charging in conformity with operational and organizational rules and procedures</p> <p>PC8. Return the explosive materials which are surplus to requirements to store and correctly package and label and maintain the records</p> <p>PC9. Interpret and implement the approved procedures and practices for disposal of surplus materials</p>
<b>Blasting to specification</b>	<p>PC10. Connect the ignition system for the explosive accurately in conformity with the blast specification</p> <p>PC11. Protect the connections against adverse environmental conditions, premature ignition and mechanical damage</p> <p>PC12. Implement operational safety procedures whilst preparing the initiation circuit and connecting the ignition system in conformity with approved procedures and practices</p> <p>PC13. Check the ignition system and initiation sequences thoroughly in accordance with operational and organizational rules and procedures and relevant legislation</p>

**MIN/ N0480 Charge Blast Holes, Blast to Specification and deal with misfires**

	<p>PC14. Clear and secure the specified danger zone effectively in compliance with operational and organizational rules and procedures and the blast specification</p> <p>PC15. Provide clear notification to public of intention to fire the explosive</p> <p>PC16. Maintain security of exploder in compliance with relevant explosives regulations, operational and organizational rules and procedures</p> <p>PC17. Fire the explosive when all safety precautions have been taken and verified</p> <p>PC18. Inspect the blast area (including where applicable, the face, crest and pile) thoroughly in accordance with site rules and operational procedures</p> <p>PC19. Provide the all clear on satisfaction that the area is safe and the blasting operation is complete</p> <p>PC20. Record the type and quantity of explosive materials and means of initiation in accordance with organizational and operational procedures</p>
<b>Blast to specification</b>	<p>PC21. Recognize misfires correctly and communicate to appropriate person(s)</p> <p>PC22. Clearly mark the located misfire in accordance with operational and organisational rules and procedures</p> <p>PC23. Secure the exclusion zone in conformity with operational and organisational rules and procedures</p> <p>PC24. Record and report the method of dealing with the misfire clearly and accurately in accordance with operational and organisational procedures</p> <p>PC25. Secure the area of recovery for unexploded explosive and isolate until recovery has been carried out and the area made safe</p> <p>PC26. Ensure that the method of recovery used for unexploded charges minimises the risk of accidental initiation and is in conformity with operational and organisational rules and procedures for misfires</p> <p>PC27. Ensure that explosives and detonating devices are recovered and disposed of correctly and safely</p>
<b>Knowledge and Understanding (K)</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. Benching in quarries, Dressing of overhangs, Undercuts, Fencing, First aid and Hygiene</p> <p>KA4. Standing orders in force at the mine. Safety in the vicinity of machinery</p> <p>KA5. Shot-firing and Safety regulations. How and where to take shelter</p> <p>KA6. Duties of workmen</p> <p>KA7. Provision of wages, working hours and accident compensation as per Mines act</p> <p>KA8. Knowledge of mining safety procedures</p> <p>KA9. Impact of violation of safely procedures</p>

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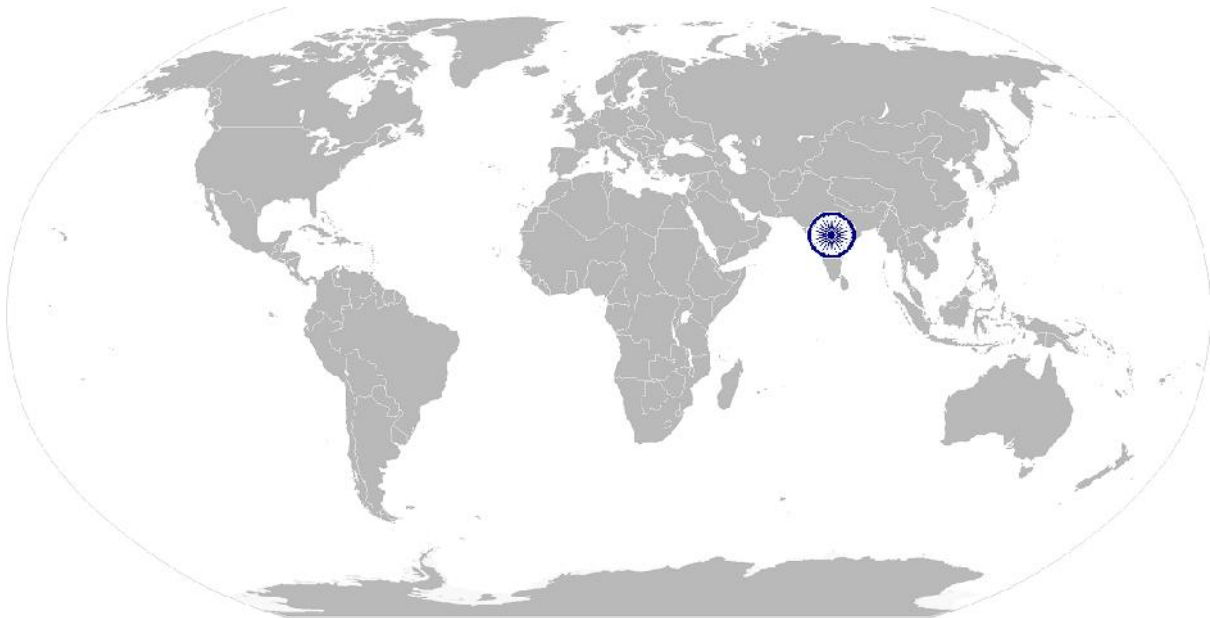
<p><b>B. Organizational Context</b> (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> <li>KB1. relevant standards and procedures followed in the company</li> <li>KB2. different types of electrical requirements at the mine</li> <li>KB3. processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution</li> </ul>
<p><b>C. Technical Knowledge</b></p>	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> <li>KC1. the types and range of explosive materials, their strength and characteristics (to include explosives; detonating devices; blasting agents; blasting accessories.)</li> <li>KC2. Types of initiating systems</li> <li>KC3. types of detonating devices and explosives used.</li> <li>KC4. delayed detonators and how the delay is created.</li> <li>KC5. how to identify and deal with faults that cannot be rectified</li> <li>KC6. types of approved circuit testers</li> <li>KC7. initiation sequences for blasting patterns and the possible effects on the time delay period between individual charges</li> <li>KC8. blast patterns</li> <li>KC9. circuit testing for electrical initiation</li> <li>KC10. types of initiation and premature ignitions</li> <li>KC11. types and uses of blasting/shotfiring equipment</li> <li>KC12. Causes of and dangers from flyrock</li> <li>KC13. warning systems deployed at the blast site (e.g. site radio; siren; flags; hand signals; warning signs.)</li> <li>KC14. the issues likely to arise from the blast operation</li> <li>KC15. recognition of various types of misfires and relevant action to be taken</li> <li>KC16. hazards associated with misfires and unexploded charges</li> <li>KC17. reasons for post blast slippage of ground and its effects</li> <li>KC18. dangerous effects of fumes created by blasting</li> <li>KC19. acceptable conditions for the post blast area (including when applicable face, crest, pile, area.)</li> <li>KC20. Understand the monitoring process for recordings of ground vibration/air over pressure</li> <li>KC21. hazards associated with misfires and unexploded charges</li> <li>KC22. systematic testing to reveal location of faults in a circuit</li> <li>KC23. recognition of undisturbed ground and indications of unfired charges after blasting</li> <li>KC24. calibration requirements for exploders</li> <li>KC25. Marking of misfires</li> <li>KC26. Types, causes and avoidance of misfires</li> <li>KC27. safe methods of handling and disposal of explosive materials recovered from the site</li> <li>KC28. desensitisation of bulk/loose grain explosives</li> <li>KC29. the approved procedures and practices in the context of the operations, the work activity and the workplace environment to include organisational; environmental; regulatory; emergency; operational.)</li> <li>KC30. the responsibilities of blaster and relevant others under the health and safety statutory requirements.</li> </ul>

**MIN/ N0480 Charge Blast Holes, Blast to Specification and deal with misfires**

	<p>KC31.the relevant legislation associated to the handling and movement of explosives.</p> <p>KC32.how to recognise detonator types and delays.</p> <p>KC33.the operational and organisational procedures and practices for handling and transport of explosives.</p> <p>KC34.the requirements for checking explosives type and condition.</p> <p>KC35.the dangers of induced currents from external sources</p> <p>KC36. Precautions for blasting as per weather conditions</p> <p>KC37. Various kinds of the blasting hazards</p> <p>KC38. Free face and its importance</p> <p>KC39. Environmental effects of blasting Ground vibration and flying fragments. Need to control and precautions to be taken. Muffle blasting.</p> <p>KC40. Misfire sockets and blown-outs, dealing with misfires.</p> <p>KC41. Checking and clearing of choked holes before charging/loading.</p> <p>KC42. Use of LOX, ANFO Blasting by bulk loading system, etc.,</p> <p>KC43. Charging of hole in watery strata, hot strata and in bad weather.</p>
<b>Skills (S) [Optional]</b>	
<b>Element</b>	<b>Skills</b>
<b>Element</b> <b>A. Core Skills/ Generic Skills</b>	<p><b>Writing Skills</b></p> <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> <p><b>Reading Skills</b></p> <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> <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>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>B. Professional Skills</b>	<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</p> <p>SB2. organize all process manuals so that sorting/ accessing information is easy</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>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> <p><b>Desire to learn and take initiatives</b></p>

**MIN/ N0480 Charge Blast Holes, Blast to Specification and deal with misfires**

	The user/individual on the job needs to know and understand how to: SB6. follow instructions and work on areas of improvement identified SB7. complete the assigned tasks with minimum supervision SB8. complete the job 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: SB9. detect problems in day to day tasks SB10. discuss possible solution with the supervisor for problem solving SB11. make decisions in emergency conditions





MIN/ N0480 Charge Blast Holes, Blast to Specification and deal with misfires

## NOS Version Control

<b>NOS Code</b>	MIN/ N0480		
<b>Credits(NSQF)</b>	TBD	<b>Version number</b>	1.0
<b>Industry</b>	Mining	<b>Drafted on</b>	15/12/2014
<b>Industry Sub-sector</b>	Open Cast and Underground Mines	<b>Last reviewed on</b>	24/03/2015
<b>Occupation</b>	Mining Operations	<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/ N0901 Health and Safety

National Occupational Standard

<b>Unit Code</b>	MIN/N 0901
<b>Unit Title (Task)</b>	Health and Safety
<b>Description</b>	This unit is about health and safety measures critical in mines
<b>Scope</b>	This OS unit/task covers the following: <ul style="list-style-type: none"> <li>Health and safety measures critical in mines</li> </ul>
<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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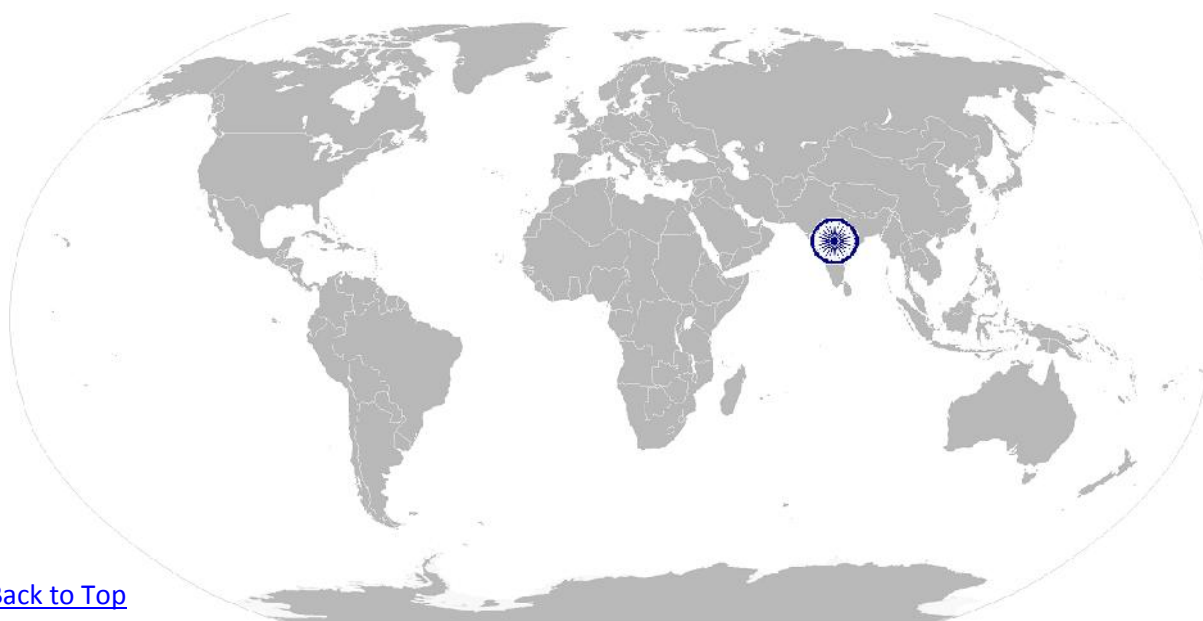
Knowledge and Understanding (K)	
<p><b>A. Regulatory context</b> (knowledge of safety guidelines specified by Director General of Mine Safety (DGMS))</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. Benching in quarries, Dressing of overhangs, undercuts, Fencing</p> <p>KA2. 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. Shot-firing and Safety regulations. How and where to take shelter</p> <p>KA6. Knowledge of mining safety procedures</p> <p>KA7. Impact of violation of safety procedures</p> <p>KA8. Locally prepared Emergency Preparedness / Disaster Management Plan.</p> <p>KA9. Environmental impact of mining</p> <p>KA10. Sources of dust, noise and vibration and measures to minimise</p> <p>KA11. Hazardous material safety and security rules and regulations as prescribed by DGMS</p> <p>KA12. Code of practice for safe handling and transport of dangerous material and heavy equipment.</p>



MIN/ N0901 Health and Safety

**NOS Version Control**

<b>NOS Code</b>	MIN/N 0901		
<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>	Mining Operations	<b>Next review date</b>	24/03/2017



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## Assessment Criteria

### CRITERIA FOR ASSESSMENT OF TRAINEES

**Job Role** Shot Firer/ Blaster

**Qualification Pack** MIN/ Q 0428

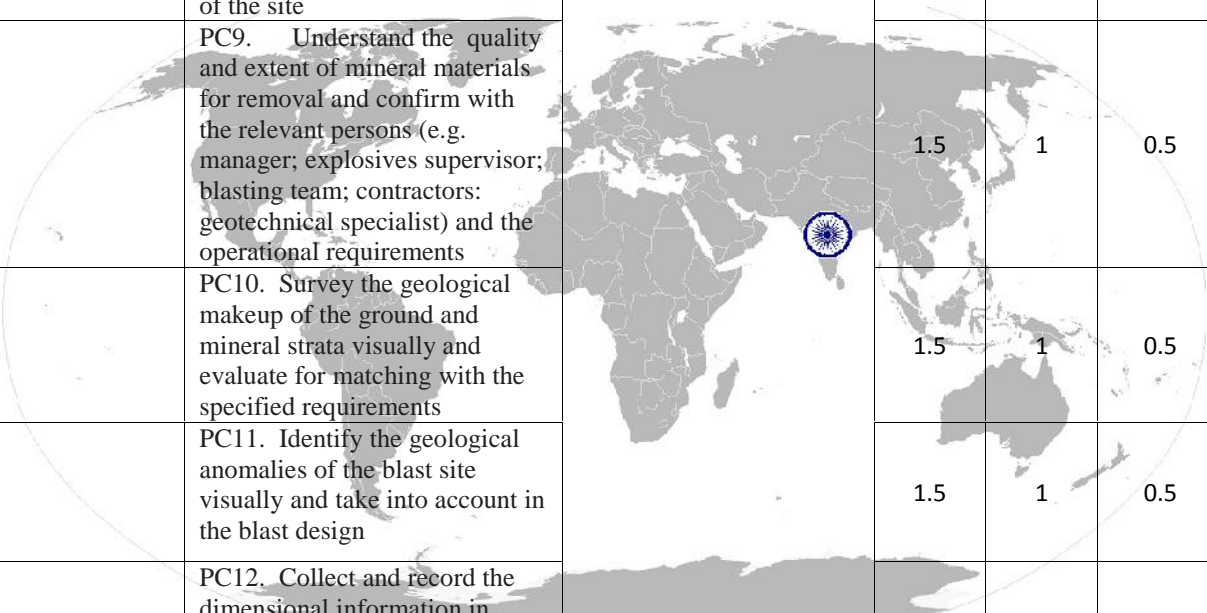
**Sector Skill Council** Mining

#### Guidelines for Assessment

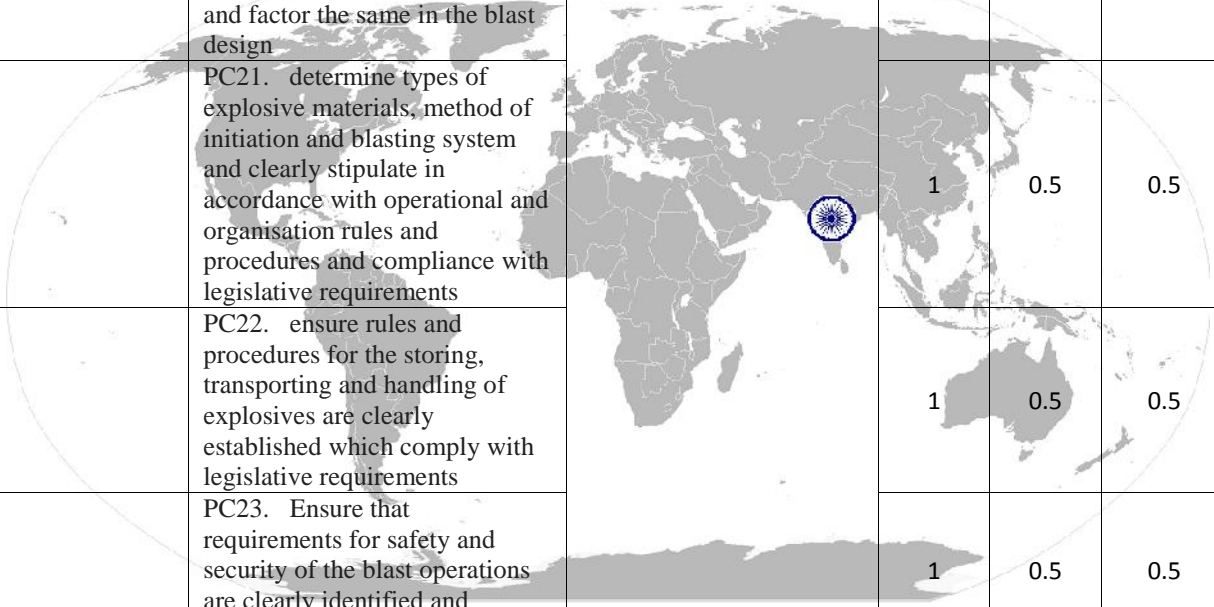
1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
2. The assessment for 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/ N0479 (Receive and Handle Explosive Materials On-Site)	PC1. Obtain all explosive materials correctly and check conformity with the requirements of the blasting specification.	<b>35</b>	1.5	1	0.5
	PC2. Complete the records accurately and make them available to authorised persons.		1	0.5	0.5
	PC3. Handle the explosive materials and move safely in accordance with operational and organisational procedures and relevant legislation requirements.		1.5	1	0.5
	PC4. Contain all explosive materials safely and securely and take precautions to avoid any loss or damage.		1.5	1	0.5

### Assessment Criteria

	PC5. Separate the explosives and detonators and handle them in conformity with operational and organisational rules and procedures and in accordance with relevant legislation.		1.5	1	0.5
	PC6. Apply the approved routes when transporting explosive materials.		1.5	0.5	1
	PC7. Display relevant danger notices in conformity with operational and organisational rules and procedures and with relevant legislation.		1.5	0.5	1
	PC8. Understand the location and area for blasting and requirements to conform with the overall development plans of the site		1.5	1	0.5
	PC9. Understand the quality and extent of mineral materials for removal and confirm with the relevant persons (e.g. manager; explosives supervisor; blasting team; contractors; geotechnical specialist) and the operational requirements		1.5	1	0.5
	PC10. Survey the geological makeup of the ground and mineral strata visually and evaluate for matching with the specified requirements		1.5	1	0.5
	PC11. Identify the geological anomalies of the blast site visually and take into account in the blast design		1.5	1	0.5
	PC12. Collect and record the dimensional information in accordance with the blast specification requirements		1	0.5	0.5
	PC13. Ensure that the output of the blast is confirmed to meet with the site requirements		1.5	0.5	1
	PC14. Determine the extent of the blast from the production requirements, the fragmentation and geological makeup of the ground and mineral strata, face provision and availability and drill size		1.5	0.5	1
	PC15. Understand the effects of a blast on plant, buildings, external features and the surrounding environment		1.5	1	0.5

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	PC16. Understand the drill plan		1.5	0.5	1
	PC17. Identify the potential hazards and danger sources and record in the blast specification		1.5	1	0.5
	PC18. Carry out the work to approved procedures and practices and in compliance with statutory requirements		1.5	0.5	1
	PC19. collect information from previous blasts at the site and examine and evaluate information in determining the blast design		1.5	1	0.5
	PC20. analyse constraints and capabilities of plant and equipment used for moving and processing mineral materials and factor the same in the blast design		1.5	1	0.5
	PC21. determine types of explosive materials, method of initiation and blasting system and clearly stipulate in accordance with operational and organisation rules and procedures and compliance with legislative requirements		1	0.5	0.5
	PC22. ensure rules and procedures for the storing, transporting and handling of explosives are clearly established which comply with legislative requirements		1	0.5	0.5
	PC23. Ensure that requirements for safety and security of the blast operations are clearly identified and communicated		1	0.5	0.5
	PC24. Obtain authorisation of the blast specification in accordance with operational and organisational rules and procedures and comply with legislative requirements		1.5	0.5	1
	PC25. Communicate the agreed upon blast specifications to concerned stakeholders, in accordance with operational and organisational rules and procedures and comply with legislative requirements		1.5	0.5	1
		<b>Total</b>	<b>35</b>	<b>18.5</b>	<b>16.5</b>



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2. MIN/ N0480 (Charge Blast Holes, Blast to Specification and deal with misfires)	PC1. Check each blast hole is checked for condition, dimension, angle, inclination and direction, as appropriate, to ensure it is suitable for charging to the blast specification.	<b>35</b>	1.5	1	0.5
	PC2. Identify, record and report any variations to the blasting specification and confirm with the appropriate persons.		1	0.5	0.5
	PC3. Prepare the required quantities of explosives in accordance with the blast specification		1.5	1	0.5
	PC4. Check the explosives to ensure they conform, in quantity and type, to the blasting specification.		1.5	1	0.5
	PC5. Charge the blast holes in accordance with the blasting specification		1.5	1	0.5
	PC6. Place detonators and primers accurately in conformity with the blasting specification		1.5	1	0.5
	PC7. Identify and report the variations between the specification and the actual conditions at the time of charging in conformity with operational and organizational rules and procedures		1.5	1	0.5
	PC8. Return the explosive materials which are surplus to requirements to store and correctly package and label and maintain the records		1	0.5	0.5
	PC9. Interpret and implement the approved procedures and practices for disposal of surplus materials		1	0.5	0.5
	PC10. Connect the ignition system for the explosive accurately in conformity with the blast specification		1.5	1	0.5
	PC11. Protect the connections against adverse environmental conditions, premature ignition and mechanical damage		1.5	1	0.5

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	PC12. Implement operational safety procedures whilst preparing the initiation circuit and connecting the ignition system in conformity with approved procedures and practices		1	0.5	0.5
	PC13. Check the ignition system and initiation sequences thoroughly in accordance with operational and organizational rules and procedures and relevant legislation		1	0.5	0.5
	PC14. Clear and secure the specified danger zone effectively in compliance with operational and organizational rules and procedures and the blast specification		1	0.5	0.5
	PC15. Provide clear notification to public of intention to fire the explosive		1	0.5	0.5
	PC16. Maintain security of exploder in compliance with relevant explosives regulations, operational and organizational rules and procedures		1	0.5	0.5
	PC17. Fire the explosive when all safety precautions have been taken and verified		1.5	1	0.5
	PC18. Inspect the blast area (including where applicable, the face, crest and pile) thoroughly in accordance with site rules and operational procedures		1.5	1	0.5
	PC19. Provide the all clear on satisfaction that the area is safe and the blasting operation is complete		1.5	1	0.5
	PC20. Record the type and quantity of explosive materials and means of initiation in accordance with organizational and operational procedures		1	0.5	0.5
	PC21. Recognize misfires correctly and communicate to appropriate person(s)		1	0.5	0.5
	PC22. Clearly mark the located misfire in accordance with operational and organisational rules and procedures		1.5	1	0.5

### Assessment Criteria

	PC23. Secure the exclusion zone in conformity with operational and organisational rules and procedures		1.5	1	0.5
	PC24. Record and report the method of dealing with the misfire clearly and accurately in accordance with operational and organisational procedures		1	0.5	0.5
	PC25. Secure the area of recovery for unexploded explosive and isolate until recovery has been carried out and the area made safe		1.5	1	0.5
	PC26. Ensure that the method of recovery used for unexploded charges minimises the risk of accidental initiation and is in conformity with operational and organisational rules and procedures for misfires		1.5	1	0.5
	PC27. Ensure that explosives and detonating devices are recovered and disposed of correctly and safely		1.5	1	0.5
		<b>Total</b>	<b>35</b>	<b>21.5</b>	<b>13.5</b>
3. MIN/ N0901 (Health and Safety)	PC1. Comply with occupational health and safety regulations adopted by the employer.		3	2	1
	PC2. Follow mining operations procedures with respect to materials handling and accidents		3	2	1
	PC3. Follow the correct safety steps in case of accident or major failure		3	2	1
	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

### Assessment Criteria

	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
		<b>Total</b>	<b>30</b>	<b>20</b>	<b>10</b>

