# Model Curriculum

## Surface Miner Operator

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| **SECTOR:** | **Mining** |
| **SUB-SECTOR:** | **Mining Operation** |
| **OCCUPATION:** | **Loading & Hauling – Opencast Mines** |
| **REF ID:** | **MIN/Q0210, V1.0** |
| **NSQF LEVEL:** | **4** |

Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

SKILL COUNCIL FOR MINING SECTOR

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/Qualification Pack: 'Surface Miner Operator' QP No. 'MIN/Q0210 NSQF Level 4'

Date of Issuance: February 10th, 2017

Valid up to*: September, 9th, 2019

* Valid up to the next review date of the Qualification Pack

Authorised Signatory
(Skill Council for Mining Sector)

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# Surface Miner Operator

**CURRICULUM / SYLLABUS**

This program is aimed at training candidates for the job of a "Surface Miner Operator", in the "Mining & Allied" Sector/Industry and aims at building the following key competencies amongst the learner.

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| **Program Name** | Surface Miner Operator | | |
| **Qualification Pack Name & Reference ID.** | MIN/Q0210 | | |
| **Version No.** | 1.0 | **Version update date** | 10.02.2017 |
| **Pre-requisites to Training** | ITI | | |
| **Training Outcomes** | **After completing this programme, participants will be able to:**<br>• Handle rock-cutting machine and directly cut the rock by rotational motion of the cutting drum minerals from near the earth's surface in open pit or strip mining operations.<br>• Cut rocks and directly discharge the minerals on dump trucks or side casted.<br>• Operate the Surface Miner Machine to recover minerals as per mine plan. | | |

This course encompasses 4 out of 4 National Occupational Standards (NOS) of "Surface Miner Operator" Qualification Pack issued by "Skill Council for Mining Sector".

| Sr. No. | Module | Key Learning Outcomes | Equipment Required |
|---|---|---|---|
| 1 | **Introduction**<br><br>**Theory Duration**<br>(hh:mm)<br>08:00<br>**Practical Duration**<br>(hh:mm)<br>15:00<br><br>**Corresponding NOS Code**<br>**Bridge Module** | • Discuss the general discipline in the class room (Do's & Don'ts)<br>• Explain the role of surface Miner Operator in mining industry<br>• Describe benching in quarries<br>• Identify dressing of overhangs, undercuts, fencing, first aid and hygiene<br>• Illustrate the standing orders in force at the mine.<br>• Practice safety in the vicinity of machinery.<br>• Characterize the shot-firing and safety regulations.<br>• Discuss the safe method for shifting the shelter & Justify location for shifting the shelter is safe & as per regulation.<br>• Apply the basic skills of communication<br>• Examine the basic reading capabilities to enable reading of signs, notices and/or cautions at site. | Projector System, Posters, Graph etc. |
| 2 | **Prepare the Surface Miner**<br><br>**Theory Duration**<br>(hh:mm)<br>15:00<br>**Practical Duration**<br>(hh:mm)<br>40:00<br><br>**Corresponding NOS Code**<br>**MIN/N0236** | • Examine for any visible damage or structural cracks etc. in the five sections (mainframe, conveying unit, drive unit, crawler unit and cutting unit) of the Surface miner.<br>• Inspect & identified all gauge and meters readings are proper and functioning correctly.<br>• Examine for any abnormal reading on the hour meter, engine temperature meter, engine rpm (Tachometer), oil pressure gauge, hydraulic pressure gauge- (system control pressure, conveyor pressure, track drive pressure), battery charging indicator, oil pressure of cutting drum, filter contamination warning lights etc.<br>• Examine for any abnormal noise or vibration.<br>• Inspect diesel engine & oil level as per correct manners.<br>• Determine that the water spray is functioning proper as per OEM guidelines.<br>• Justify that the gradient and leveling sensors are working properly; Crawler track, steered and height adjustment are set right.<br>• Inspect that the right type of cutting tools has been mounted.<br>• Validate the cutting drum for any damaged cutting tool. Detect any worn out teeth & replaced. Justify that the scraper blades are mounted properly.<br>• Examine the Slewing ring.<br>• Perform routine operation readiness works of Surface Miner machine.<br>• Justify that all regular greasing and lubrication have been done as per OEM guidelines.<br>• Justify that diesel engine dust filters cleaned / replaced.<br>• Use a checking/maintenance logbook to detail all activities conducted before starting surface miner.<br>• Instruct technician and Electricians and OEM engineer of those problems that extend beyond scope of one's role<br>• Detect any cut or damage electric cable (for Electric driven surface miners) | Surface Miner, Different size of blade, Wrench, Grease pump/gun, Oil Can, Parking wooden stopper, Hydraulic jack, Filter, Gloves, Safety shoes, Safety goggles, Safety helmet, Fire extinguisher, Types of log book, First Aid box. |

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| 3 | **Perform Surface Miner Operation**<br><br>**Theory Duration**<br>(hh:mm)<br>15:00<br><br>**Practical Duration**<br>(hh:mm)<br>61:00<br><br>**Corresponding NOS Code**<br>**MIN/N0237** | • Perform shift operation of the Surface Miner.<br>• Select mode of cutting or follow direction of mine engineer - continuous cutting Harvesting mode, Block operations with ramp cutting.<br>• Operate the machine in a safe and proper way.<br>• Justify & coordinate with helper to ensure that no unwarranted foreign materials or unauthorized person is present in the cutting area.<br>• Inspect by continuously monitor (visually) that right size of aggregates being produced in appropriate time period.<br>• Choose cutting depth based on rock characteristics and mining plan.<br>• Examine that water spray is functional all the time to ensure dust suppression.<br>• Examine for any cutting teeth damage, scrapper misalignment, conveyor functionality etc. in describe interval.<br>• Examine all console gauges and sensors and alarm messages and the hour meter, engine temperature meter, engine rpm (Tachometer), oil pressure gauge, hydraulic pressure gauges- (system control pressure, conveyor pressure, track drive pressure), battery charging indicator, oil pressure of cutting drum, filter contamination warning lights etc. in describe time interval. select corrective actions in case of any error message.<br>• Inspect the target of rock cutting is fulfill and use revise planning accordingly. | Surface Miner, Different size of blade, Wrench, Grease pump/gun, Oil Can, Parking wooden stopper, Hydraulic jack, Filter, Gloves, Safety shoes, Safety goggles, Safety helmet, Fire extinguisher, Types of log book, First Aid box. |
| 4 | **Reporting & Documentation – Surface Miner Operation**<br><br>**Theory Duration**<br>(hh:mm)<br>10:00<br><br>**Practical Duration**<br>(hh:mm)<br>25:00<br><br>**Corresponding NOS Code**<br>**MIN/N0238** | • Improve reporting of shift operation.<br>• Create documentation of problems / incidents and Report to Technicians / Operator of next shift.<br>• Record shift operation particulars, including start and end time, rock cutting output achieved, consumption of any consumables and spares and cutting tools etc., consumption of fuel etc.<br>• Use the above data accurately on log books using the appropriate format.<br>• Detect any observation on rock characteristics.<br>• Report & document any machine problem faced during operation.<br>• Prepare document and make small notes for any work to be carried out in case of breakdown or machine trouble.<br>• Report any problems/incidents during operation in a timely manner.<br>• Report safety violations and any safety hazard to the appropriate authority as lay down by the safety process.<br>• Create all documentation within stipulated time, in case of any accident.<br>• Justify that all documents are available to all appropriate authorities to inspect. | Log Book, signage diary, statutory guidelines pocket book. |
| 5 | **Comply with Workplace Health & Safety:** | • Compute all Compliance with safety, health, security and environment related regulations /guidelines at the work site. | Helmet, Dust Mask, Goggles, Ear Plug, Gloves, Reflective Jacket, Safety Belt, |

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| | **Theory Duration** (hh:mm) 15:00<br><br>**Practical Duration** (hh:mm) 46:00<br><br>**Corresponding NOS Code** **MIN/N0901** | • Make use of Personal Protective Equipment (PPE) and other safety gear such as seat belt, body protection, respiratory protection, eye protection, ear protection and hand protection.<br>• Apply safety measures during operations to ensure that the health and safety of self or others (including members of the public) is not at risk.<br>• Demonstrate all operations as per the manufacturer's and worksite related health and safety guidelines.<br>• Categorize the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines.<br>• Outline safety regulations and procedures with regard to worksite hazards and risks.<br>• Operate various grades of fire extinguishers, as applicable.<br>• Support in administering basic first aid and report to concerned team members, as required, in case of an accident.<br>• Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility.<br>• Record and report details related to operations, incidents or accidents, as applicable<br>• Define the manufacturer's instructions for care and safe operation of the equipment. | Gum Boots/ Safety shoes, Fire Extinguisher Cylinders, First Aid Box, Fire Fighting Charts, First Aid Charts |
| | **Total Duration**<br><br>**Theory Duration** 63:00<br><br>**Practical Duration** 187:00 | **Unique Equipment Required:**<br><br>Computer with Internet, LCD Projector, Pin Up Boards, White Board, Surface Miner, Different size of blade, Wrench, Grease pump/gun, Oil Can, Parking wooden stopper, Hydraulic jack, Filter, Helmet, Dust Mask, Goggles, Ear Plug, Gloves, Reflective Jacket, Safety Belt, Gum Boots/ Safety shoes, Fire Extinguisher Cylinders, First Aid Box, Fire Fighting Charts, First Aid Charts | |

Grand Total Course Duration: 250 Hours, 0 Minutes
(This syllabus/ curriculum has been approved by SSC: Skill Council for Mining Sector)

## Trainer Prerequisites for Job role: "Surface Miner Operator" mapped to Qualification Pack: "MIN/Q0210"

| Sr. No. | Area | Details |
|---|---|---|
| 1 | **Description** | To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "MIN/Q0210". |
| 2 | **Personal Attributes** | Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field. |
| 3 | **Minimum Educational Qualifications** | ITI |
| 4a | **Domain Certification** | Certified for Job Role: "Surface Miner Operator" mapped to QP: "MIN/Q0210, v1.0". Minimum accepted score as per SSC guideline is 70% |
| 4b | **Platform Certification** | Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q0102". Minimum accepted score as per SSC guideline is 80%. |
| 5 | **Experience** | For class XII / ITI - 10 years of experience of HEMM Operations or Surface Miner handling.<br>Diploma in Mechanical / Mining – 5 years<br>B.Tech. (Mechanical / Mining) – 4 Years |

## Annexure: Assessment Criteria

| Assessment Criteria for Surface Miner Operator | |
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| Job Role | Surface Miner Operator |
| Qualification Pack | MIN/Q0210 |
| 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 of the theory/knowledge will be based on written test/viva-voce or both while skill test shall be hands on practical. Behavior and attitude will be assessed while performing the task.
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training Centre (as per assessment criteria given)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training Centre based on these 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 | |
|---|---|---|---|---|---|
| **Assessment outcomes** | **Assessment Criteria for outcomes** | **Total Mark (100)** | **Out Of** | **Theory** | **Skills Practical** |
| | | | **100** | **30** | **70** |
| 1. MIN/N0236: Prepare the Surface Miner. | PC1. Check for any visible damage or structural cracks etc. in the five sections of the Surface miner -<br>(1) Mainframe.<br>(2) Conveying Unit.<br>(3) Drive Unit.<br>(4) Crawler Unit.<br>(5) Cutting Unit. | **30** | 3 | 1 | 2 |
| | PC2. Check all gauges and meters readings are proper and functioning correctly. Check for any abnormal reading on the hour meter, engine temperature meter, engine rpm (Tachometer), oil pressure gauge, hydraulic pressure gauges-(system control pressure, conveyor pressure, track drive pressure), battery charging indicator, oil pressure of cutting drum, filter contamination warning lights etc. | | 3 | 1 | 2 |
| | PC3. Check for any abnormal noise or vibration. | | 2 | 0 | 2 |
| | PC4. Check the diesel engine & oil level. | | 2 | 0 | 2 |
| | PC5. Check the water spray is functional. | | 2 | 1 | 1 |
| | PC6. Check the gradient and levelling sensors are working properly; Crawler track, steered and height adjustment are set right. | | 2 | 1 | 1 |

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| | PC7. Check the right type of cutting tools has been mounted. Check the cutting drum for any damaged cutting tool. Get the worn out teeth replaced. Check that the scraper blades are mounted properly. | | 3 | 1 | 2 |
| | PC8. Check the Slewing ring. | | 2 | 1 | 1 |
| | PC9. Check all regular greasing and lubrication have been done as per OEM guidelines. | | 3 | 1 | 2 |
| | PC10. Get diesel engine dust filters cleaned / replaced. | | 2 | 1 | 1 |
| | PC11. Maintain a checking/maintenance logbook to detail all activities conducted before starting the surface miner. | | 2 | 1 | 1 |
| | PC12. Inform Technician and Electricians and OEM engineer of those problems that extend beyond scope of one's role. | | 2 | 1 | 1 |
| | PC13. Check for any cut or damage electric cable (for Electric driven surface miners). | | 2 | 0 | 2 |
| | | **Total** | **30** | **10** | **20** |
| 2. MIN/N0237: Perform Surface Miner Operation. | PC1. Decide mode of cutting or follow direction of mine engineer –<br>i. Continuous cutting in Harvesting mode<br>ii. Block operations with ramp cutting. | **30** | 2 | 1 | 1 |
| | PC2. Plan and execute shift operation as per plan. | | 3 | 1 | 2 |
| | PC3. Operate the machine in a safe and proper way. | | 5 | 0 | 5 |
| | PC4. Coordinate with helper to ensure that no unwarranted foreign materials or unauthorised person is present in the cutting area. | | 2 | 1 | 1 |
| | PC5. Continuously monitor (visually) that right size of aggregates being produced. | | 3 | 1 | 2 |
| | PC6. Set cutting depth based on rock characteristics and mining plan. | | 3 | 1 | 2 |
| | PC7. Ensure water spray is functional all the time to ensure dust suppression. | | 3 | 1 | 2 |
| | PC8. Periodically check for any cutting teeth damage, scrapper misalignment, conveyor functionality etc. | | 3 | 0 | 3 |
| | PC9. Continuously monitor all console gauges and sensors and alarm messages and the hour meter, engine temperature meter, engine rpm (Tachometer), oil pressure gauge, hydraulic pressure gauges- (system control pressure, conveyor pressure, track drive pressure), battery charging indicator, oil pressure of cutting drum, filter contamination warning lights etc. Ensure that corrective actions are taken in case of any error message. | | 3 | 1 | 2 |
| | PC10. Check target fulfilment of rock cutting and revise planning accordingly. | | 3 | 1 | 2 |
| | | **Total** | **30** | **8** | **22** |
| 3. MIN/N0238: Reporting and Documentation- | PC1. Record shift operation particulars, including start and end time, rock cutting output achieved, consumption of any consumables and spares and cutting tools etc., consumption of fuel etc. | **20** | 3 | 1 | 2 |

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| Surface Miner Operation | PC2. Update the above data accurately on log books using the appropriate format. | | 2 | 0 | 2 |
| | PC3. Note any observation on rock characteristics, | | 2 | 1 | 1 |
| | PC4. Document any machine problem faced during operation. | | 3 | 0 | 3 |
| | PC5. Document and make small notes for any work to be carried out in case of breakdown or machine trouble. | | 2 | 0 | 2 |
| | PC6. Report any problems/incidents encountered during operation in a timely manner | | 2 | 1 | 1 |
| | PC7. Report safety violations and any safety hazard to the appropriate authority as lay down by the safety process. | | 2 | 1 | 1 |
| | PC8. In case of any accident, complete all documentation within stipulated time. | | 2 | 0 | 2 |
| | PC9 Make sure documents are available to all appropriate authorities to inspect. | | 2 | 1 | 0 |
| | | **Total** | **20** | **5** | **15** |
| 4. MIN/N0901: Worksite Health and Safety | PC1. Comply with occupational health and safety regulations adopted by the employer. | **20** | 2 | 1 | 1 |
| | PC2. Follow mining operations procedures with respect to materials handling and accidents. | | 2 | 1 | 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 | 0 | 2 |
| | PC5. Operate various grades of fire extinguishers. | | 2 | 1 | 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. | | 2 | 0 | 2 |
| | PC8. Deal with misfires as per statutory requirement | | 1 | 1 | 0 |
| | PC9. Identify characteristics of post-blast fumes and take necessary precautions. | | 2 | 1 | 1 |
| | PC10. Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection. | | 1 | 0 | 2 |
| | PC11. Follow the manufacturer's instructions for care and safe operation of the equipment. | | 1 | 0 | 1 |
| | | **Total** | **20** | **7** | **13** |
| | **QP Total** | | **100** | **30** | **70** |