

Model Curriculum

Assistant Support - Underground Mines

SECTOR: Mining
SUB-SECTOR: Mining Operations
OCCUPATION: Loading & Hauling - Underground
REF ID: MIN/Q0213
NSQF LEVEL: 2



  

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: **Assistant Operator –Underground Mines** QP No. **MIN/Q 0213 NSQF Level 2**

Date of Issuance: February 10th, 2017
Valid up to: September, 9th, 2019

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


Authorized Signatory
(Skill Council) for Mining Sector

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Assistant Support-Underground Mines

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Assistant Support-Underground Mines”, in the “Mining & Allied” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Assistant Support – Underground Mines		
Qualification Pack Name & Reference ID.	MIN/Q0213		
Version No.	1.0	Version update date	03-06-2017
Pre-requisites to Training	Class VIII Pass		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • assists operators and technicians in underground mines, including in haulage, conveyor operation, Drilling, coal cutting, water pump operation, SDL/LHD operation, Roof bolting and other equipment operations. • repair and maintenance of mining equipments including HEMM. • ensure the cleanliness of the equipment & worksite, carries the tools and tackles from store to required site and assist the operator and technicians in checks and operation and repair and maintenance jobs. • become well versed with Environment Health & Safety: Well versed with on-site occupational health and safety measures relating to blasting and use of personal protective equipment. • identify and use basic tools, equipment & materials: Understanding of carrying out welding of equipments. 		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Assistant Support-Underground Mines” Qualification Pack issued by “Skill Council for Mining Sector”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Introduction</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code Bridge Module</p>	<p><u>Understanding of following:</u></p> <ul style="list-style-type: none"> • About Underground Mining process. • Regulatory context specified to work in underground mines. • Specific Safety measures in underground mines. • Knowledge of risks involves in UG mines. <p>Assist in UG mines-</p> <ul style="list-style-type: none"> • Constraint for assistance, awareness of various techniques used in underground mines, including in haulage, conveyor operation, Drilling, coal cutting, water pump operation, SDL/LHD operation, Roof bolting and other equipment operations, repair and maintenance. • Ensure the cleanliness of the equipment & worksite, carries the tools and tackles from store to required site and assist the operator and technicians in checks and operation and repair and maintenance jobs. • Receive and understand directions from operator and technicians, basic knowledge of risk and work safety, and finally physique to sustain strenuous condition. • Assist Operators and Technicians in underground Mining operation, in operation of mining machinery and in servicing and maintenance of varied machinery. 	
2	<p>Getting work area ready and pre-operational checks.</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 70:00</p> <p>Corresponding NOS Code MIN/N 0243</p>	<p>This OS unit is about providing necessary assistance to operators in pre operational check of the machines and getting ready for daily operations. This unit/task covers the following:</p> <ul style="list-style-type: none"> • Getting work area or machine ready for operation, • Assisting in daily inspection and fault reporting. • Assisting to carry the right tools and other accessories. • Clean the haulage track, mining machinery and work area, • Couple / uncouple haulage tubs / carriages, • Check oil and lubricants level. • To immediately notify any unsafe material or cut wire or any such broken things to operator/technician • Carry out daily greasing and lubrication of conveyors and machine drives as per • Schedule or as directed by operator/technician. • Help replace any drill bit as per instruction from Operator / technicians. • Follow the work orders. • Assist the Operator and Technician in conducting daily inspection and check of different machines 	<p>Safety lamp, Self-contained self-rescue device, Slurry pipeline, Spreader (mining), Stacker, Stamp mill, Stedman Machine Company, Sundew (dragline), Photo analysis, Quarry tub, Road header, Rock breaker, Mining lamp, Underground Personnel Carriers, Davy lamp, Dragline excavator, Drill floor, Drilling jumbo, Headboards, Footplates, Cone setting tools.</p> <p>Helmet, gloves, harness, earplugs, goggles, node mask.</p>

		<ul style="list-style-type: none"> • Carry out preliminary & visual checks. Observe any unusual noise, vibration, leak, spillage, accumulation etc. and communicate the same to Operator / Technician / Fitter. • Check track chain bolts and give torque if required. Check belts, chains and other drive components • Take readings of meter and gauge measurements & sensor standards inform operator and technician. • Carry required tools, daily consumables and parts required during the operation to the machine • Clean the machine parts or subassemblies for technicians to carry out fault repair. • Use the tools in proper way and as per direction of operator / technician. • The individual needs to know and understand basic knowledge of different UG mine machines and their functionalities - <ul style="list-style-type: none"> ○ Haulage of tubs, coupling, decoupling etc. ○ Conveyor systems to transport rocks and minerals. ○ Drill to make hole in the coal seam, ○ Rock or Coal cutting machines. ○ Different types of pumps to drain out water from mines. ○ SDL/LHD to transport coal. ○ Machines to operate winding engine/ cage for lift and withdrawn the miner from mines. ○ Roof bolting machines operation. ○ Electrical instruments used in underground :- i) Transformers, ii) Switchgear, iii) Lighting, iv) Pump, v) Motors. ○ Gas detectors and precautions to be taken against noxious gases. • Know right lubricants for conveyors, drives, gearboxes, chain and sprocket drives and greasing points of different machines • Know the right set of tools and tackles required for Maintenance. • Procedure of acquisitions of tools and tackles from store and return policies. • Different types of jacks and lifting tackles and their capacity. 	
3	<p>Assisting in Operation and Maintenance.</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 75:00</p> <p>Corresponding NOS Code</p>	<p>Providing necessary assistance in operation, scheduled maintenance and repair in case of breakdown.</p> <p>. This unit/task covers the following:</p> <ul style="list-style-type: none"> • Assisting in daily operation. • Assisting in breakdown repair and scheduled maintenance. • Understand the basic operations of each machine in underground mines. • Follow the instruction of supervisors/operators/Technicians. • Check the machine vicinity is clear of any obstructions and no unauthorised person is present there. To notify the operator accordingly. 	<p>Safety lamp, Self-contained self-rescue device, Sepro Mineral Systems, Slurry pipeline, Spreader (mining), Stacker, Stamp mill, Stedman Machine Company, Sundew (dragline), Photo analysis, Quarry tub, Road header, Rock breaker, Mining lamp, Underground Personnel Carriers, Davy lamp, Dragline excavator,</p>

<p>MIN/N 0244</p>	<ul style="list-style-type: none"> • Switch on / off of conveyors, hoists and lifting tackles, dewatering pumps etc. as per Operator / Technicians instruction. • Do coupling and decoupling of haulage tubs and carriages as required. • Carry out regular visual checks and communicate to technician/ operator any unusual noise, vibration, leak, spillage, accumulation etc. • To take note of any alarm message during operation and report the same to Technician or Operator. • Carry the supports and other materials for timber man and roof bolter etc. • Make him available all the time to the Operator during machine operation. • Take direction from Technician and identify right machine spares, tools and tackles required for the repair and maintenance job on the machines. • To get necessary authorisation and approval from Technician and mechanic for issuance of the spare parts, replacement consumables, tool bits, support materials and other materials. • To get the items issued from store and carry right tools and tackles required to attend the breakdown or maintenance. • Follow all the work instruction from Fitter / Technician to help them in routine maintenance. • Tighten all nut bolts properly after maintenance. • Do the housekeeping of the area after maintenance. • Ensure proper disposal of worn out machine components at right place. • The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> ○ Workplace standing instructions & Procedures ○ Reporting structure. ○ Safety in the vicinity of machinery and safety policy. ○ Knowledge of mining safety procedures. ○ Reporting structure in the company. ○ Escalation matrix for reporting unresolved problem. ○ Procedure of spares issue. Location of tools. ○ Contact person in case of urgency. ○ Location and process for storing and disposing of broken parts or waste material. • The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> ○ Basic knowledge of different UG mine machines and their functionalities - ○ Haulage of tubs, coupling, decoupling etc. ○ Conveyor systems to transport rocks and minerals . ○ Drill to make hole in the coal seam, ○ Rock or Coal cutting machines. ○ Different types of pumps to drain out water from mines. ○ SDL/LHD to transport coal. ○ Machines to operate winding engine/ cage for lift and withdrawn the miner from mines. ○ Roof bolting machines operation. 	<p>Drill floor, Drilling jumbo, Headboards, Footplates, Cone setting tools. Helmet, gloves, harness, earplugs, goggles, nose mask.</p>
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		<ul style="list-style-type: none"> ○ Electrical instruments used in underground :- i) Transformers, ii) Switchgear, iii) Lighting, iv) Pump, v) Motors. ○ Gas detectors and precautions to be taken against noxious gases. ● Know right lubricants for conveyors, drives, gearboxes, chain and sprocket drives and greasing points of different machines ● Know the right set of tools and tackles required for Maintenance. ● Procedure of acquisitions of tools and tackles from store and return policies. ● Different types of jacks and lifting tackles and their capacity. 	
4	<p>Health & Safety:</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 25:00</p> <p>Corresponding NOS Code MIN/No901</p>	<ul style="list-style-type: none"> ● This unit provides the information regarding worksite health and safety. This unit is about adhering to health and safety requirements at the worksite during equipment operations. ● Comply with occupational health and safety regulations adopted by the employer. ● Follow mining operations procedures with respect to materials handling and accidents. ● Comply with safety, health, security and environment related regulations / guidelines at the work site. ● Use Personal Protective Equipment (PPE) and other safety gear such as seat belt, body protection, respiratory protection, eye protection, ear protection and hand protection. ● Follow safety measures during operations to ensure that the health and safety of self or others (including members of the public) is not at risk. ● Carry out operations as per the manufacturer's and worksite related health and safety guidelines. ● Handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines. ● Follow safety regulations and procedures with regard to worksite hazards and risks. ● Operate various grades of fire extinguishers, as applicable. ● Support in administering basic first aid and report to concerned team members, as required, in case of an accident. ● Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility. ● Record and report details related to operations, incidents or accidents, as applicable ● Follow the manufacturer's instructions for care and safe operation of the equipment. ● Awareness about benching in quarries, dressing of overhangs, undercuts, fencing. ● Uses of First aid and Hygiene. ● Awareness of Code of traffic in specific areas of mine. Significance of fences. ● Standing orders in force at the mine. Safety in the vicinity of Machinery. 	<p>Gloves, Safety shoes, Safety goggles, Safety helmet, Fire extinguisher, Types of log book, First Aid box.</p>

		<ul style="list-style-type: none"> • Shot-firing and Safety regulations. How and where to take shelters? Knowledge of mining safety procedures. • Outcome of violation of safety procedures. • Locally prepared Emergency Preparedness / Disaster Management Plan. • Process for reporting any unsafe act/condition in work area which may endanger his or his colleague's life. • Sources of dust, noise and vibration and measures to minimize. • Hazardous material safety and security rules and regulations as prescribed by DGMS. • In-depth knowledge of operation of the Jack Hammer and chipped materials flow. • Knowledge of technical and gallery training as per first schedule, Mining Vocational Training Rules (MVTR) 1966. 	
	<p>Total Duration</p> <p>Theory Duration 60:00</p> <p>Practical Duration 190:00</p>	<p>Unique Equipment Required:</p> <p>Safety lamp, Self-contained self-rescue device, Slurry pipeline, Spreader (mining), Stacker, Stamp mill, Stedman Machine Company, Sundew (dragline), Photo analysis, Quarry tub, Road header, Rock breaker, Mining lamp, Underground Personnel Carriers, Davy lamp, Dragline excavator, Drill floor, Drilling jumbo, Headboards, Footplates, Cone setting tools. Helmet, gloves, harness, earplugs, goggles, node mask.</p>	

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: “Assistant Support – Underground Mines” mapped to Qualification Pack: “MIN/Q0213”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “MIN/Q0213”.
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	Class VIII Pass
4a	Domain Certification	Statutory Certificate from Directorate General of Mines Safety (DGMS) for Job Role: “Assistant Support – Underground Mines” mapped to QP: “MIN/Q0213”. Minimum accepted score for domain certification will be 80%.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q0102”. Minimum accepted score for platform certification will be 80%.
5	Experience	Preferably 2-3 years of working experience at underground mines or maintenance work like electrical / mechanical maintenance.

Annexure: Assessment Criteria

Assessment Criteria for Assistant Support – Underground Mines	
Job Role	Assistant Support – Underground Mines
Qualification Pack	MIN/Qo213
Sector Skill Council	Mining

Sr. No.	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 50% 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.

Assessment outcomes	Assessment Criteria for outcomes	Marks Allocation			
		Total Mark	Out Of	Theory	Skills Practical
		100	100	30	70
1. MIN/N0243: Assisting in getting work area ready and pre-operational checks.	PC1. Clean the haulage track, mining machinery and work area,	35	3	1	2
	PC2. Couple / uncouple haulage tubs / carriages,		3	1	2
	PC3. Check oil and lubricants level.		1	1	2
	PC4. To immediately notify any unsafe material or cut wire or any such broken things to Operator / Technicians.		2	0	2
	PC5. Carry out daily greasing and lubrication of conveyors and machine drives as per schedule or as directed by Operator / technician.		3	1	2
	PC6. Help replace any drill bit as per instruction from Operator / technicians. Help replace any support and mesh supports etc.		3	1	2
	PC7. Follow the work orders.		2	2	0
	PC8. Assist the Operator and Technician in conducting daily inspection and check of the machine.		3	1	2

	PC9. Carry out preliminary & visual checks. Observe any unusual noise, vibration, leak, spillage, accumulation etc. and communicate the same to Operator / Technician / Fitter.		3	1	2
	PC10. Check track chain bolts and give torque if required. Check belts, chains and other drive components.		2	1	1
	PC11. Take readings of meter and gauge measurements & sensor standards and inform Operator / Technician.		2	1	1
	PC12. Carry required tools, daily consumables and parts required during the shift operation to the machine and for repair and maintenance.		2	0	2
	PC13. Clean the machine parts or subassemblies for technicians to carry out fault repair.		2	0	2
	PC14. Use the tools in proper way and as per direction of operator / technician.		2	0	2
		Total	35	11	24
2. MIN/N0244: Assisting the operator for operation and assisting technician in maintenance & repair and breakdown.	PC1. Understand the basic operations of each machine in underground mines.	45	5	3	2
	PC2. Follow the instruction of supervisors/operators/Technicians.		2	1	1
	PC3. Check the machine vicinity is clear of any obstructions and no unauthorised person is present there. To notify the operator accordingly.		2	0	2
	PC4. Switch on / off of conveyors, hoists and lifting tackles, dewatering pumps etc. as per Operator / Technicians instruction.		3	1	2
	PC5. Do coupling and decoupling of haulage tubs and carriages as required.		3	0	3
	PC6. Carry out regular visual checks and communicate to technician/ operator any unusual noise, vibration, leak, spillage, accumulation etc.		3	1	2
	PC7. To take note of any alarm message during operation and report the same to Technician or Operator.		4	1	3
	PC8. Carry the supports and other materials for timberman and roof bolter etc.		3	1	2
	PC9. Make himself available all the time to the Operator during machine operation.		2	1	1
	PC10. Take direction from Technician and identify right machine spares, tools and tackles required for the repair and maintenance job on the machines.		3	0	3
	PC11. To get necessary authorisation and approval from Technician and mechanic for issuance of the spare parts, replacement consumables, tool bits, support materials and other materials.		2	0	2

	PC12. To get the items issued from store and carry right tools and tackles required to attend the breakdown or maintenance.		2	0	2
	PC13. Follow all the work instruction from Fitter / Technician to help them in routine maintenance.		3	1	2
	PC14. Tighten all nut bolts properly after maintenance.		3	0	3
	PC15. Do the housekeeping of the area after maintenance.		2	1	1
	PC16. Ensure proper disposal of worn out machine components at right place.		3	1	2
		Total	45	12	33
3. MIN/N0901: Health & 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
	Percentage Weightage:			30%	70%
	Minimum Pass% to qualify (aggregate):			50%	