



Model Curriculum

Belt Conveyor Maintenance

SECTOR: Mining
SUB-SECTOR: Mining Operations
OCCUPATION: MECHANICAL MAINTENANCE
REF ID: MIN/ISC/Q0904, V1.0
NSQF LEVEL: 3



Certificate

COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

SKILL COUNCIL FOR MINING SECTOR

for

MODEL CURRICULUM

Complying to National Occupational Standards of

Job Role/ Qualification Pack: "**Belt Conveyor Maintenance**" 'QP No. '**MIN/ISC/Qoqo4, NSQF Level 3**'

Date of Issuance: December 1st, 2020
Valid up to*: March 31st, 2021

*Valid up to the next review date of the Qualification Pack or the
'Valid up to' date mentioned above (whichever is earlier)

Authorized Signatory
(Skill Council for Mining Sector)



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Belt Conveyor Maintenance

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Belt Conveyor Maintenance”, in the “Iron & Steel” Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	Belt Conveyor Maintenance		
Qualification Pack Name & Reference ID.	Belt Conveyor Maintenance MIN/ISC/Q0904		
Version No.	1.0	Version Update Date	
Pre-requisites to Training	Minimum qualification – 10th Pass		
Training Outcomes	After completing this programme, participants will be able to: <ul style="list-style-type: none">• Interpret drawings and specifications to carry out the job of belt conveyor maintenance• Prepares for belt conveyor maintenance operation• Carry out the assigned job of belt conveyor maintenance• Identify work related challenges and resolve the same specific to belt conveyor maintenance• Practice basic health and safety at workplace• Prepare daily work reports• Work effectively with teams and groups		

This course encompasses 6 out of 6 National Occupational Standards (NOS) of “Belt Conveyor Maintenance” Qualification Pack issued by “Skill Council for Mining Sector”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Overview of Mining Industry</p> <p>Theory Duration (hh:mm) 08:00</p> <p>Practical Duration (hh:mm) 00:00</p> <p>Corresponding NOS Code Bridge Module</p>	<ul style="list-style-type: none"> Define the mining industry in India based on geographical location, category of industry (small, medium and large), etc. List various types of mines & mining methods. 	PPTs of Mining, Charts showing the same
2	<p>Occupational, Health and Safety (OHAS)</p> <p>Theory Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 10:00</p> <p>Corresponding NOS Code ISC/N0008</p>	<ul style="list-style-type: none"> Identify workplace hazards and ways to prevent them Follow safe work practices Prepare documents related to health and safety Practice working at height, and movement of man and material in confined spaces State the operating parameters for the use of portable firefighting equipment Demonstrate the actions to be taken in the event of a fire at work place Outline checks to ensure that fire safety equipment is serviceable and safe to use 	<p>PPTs for OHAS related to Job Role, Display Material for PPEs related to Job Role, Safety Material.</p> <p>Type of Safety Sign, First Aid Box, Step Ladder, Sample Accident reports, Fire Extinguishers, Items required for fire extinguisher and fire safety</p>
3	<p>5S & House keeping</p> <p>Theory Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 10:00</p> <p>Corresponding NOS Code ISC/N0008</p>	<ul style="list-style-type: none"> Define housekeeping at workplace List the housekeeping activities to be carried out on the shop floor Define 5S and its application on shop floor Apply 5S for optimum utilization of space available on the shop floor Practice safe lifting of materials and machine components manually or by using fork lift, chain pulley, etc. Define various methods of refractory lining and bricks 	PPTs and videos, Display Charts, Audit Checklists, Cue Cards, 5S Charts
4	<p>Understands the assigned job of belt conveyor maintenance</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration</p>	<ul style="list-style-type: none"> Interpret engineering drawings to ensure correct limits, tolerance and fits of equipment components Interpret the product drawing and plan the sequence of belt maintenance operations Describe the assigned job in accordance with the instructions / checklist 	<p>PPTs for various types of drawings, Blue prints and respective machines</p> <p>Hand tools and machines, various measuring instruments</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	(hh:mm) 50:00 Corresponding NOS Code ISC/N0922	<ul style="list-style-type: none"> Seek clarifications from senior colleagues with respect to the equipment, drawings Identify tools, tackles & equipment required to perform the operation Check the operational condition of tools and equipment 	
5	Prepares for belt conveyor maintenance operations Theory Duration (hh:mm) 16:00 Practical Duration (hh:mm) 50:00 Corresponding NOS Code ISC/N0923	<ul style="list-style-type: none"> Inspect belt, drums, gallery area, motors, chutes, pulleys, gravity take up pulley, idlers, gear box, stands etc. prior to starting work Check the working condition and functionality of conveyor belt Prepare list of activities as per the sequence of operations to be carried out Identify appropriate tools needed for maintenance operations Prepare the list of spare parts required for completion of job and receive them Prepare spare parts, material required for operation Ensure that tools match the desired specifications 	Work Plan, Engineering drawing, belt layout drawing, hand tools, Knives, skivers etc.
6	Carry out belt conveyor maintenance operation Theory Duration (hh:mm) 21:00 Practical Duration (hh:mm) 100:00 Corresponding NOS Code ISC/N0924	<ul style="list-style-type: none"> Describe various types of maintenance operations Create maintenance plan with support of senior technician for routine maintenance or to rectify the operational problem Identify the right tools needed for carrying out maintenance operations Identify worn and faulty components for maintenance or replacement Carry out minor maintenance activities such as adjustment and alignments of belts, drive slacks, guards and fixing of loose nuts and bolts, machine covers, etc. Carry out major maintenance activities as per the findings during the inspection Perform various types of conveyor belt joints Communicate to supervisor about completion of work 	PPTs for various types of drawings, Blue prints and respective machines Hand tools and machines, various measuring instruments, Conveyor belt maintenance kit
7	Activities specific to Belt conveyor maintenance Theory Duration (hh:mm)	<ul style="list-style-type: none"> Inspect belt, drums, gallery area, motors, chutes, pulleys, gravity take up pulley, idlers, gear box, stands etc. prior to starting work after completion of maintenance work 	PPTs for various types of drawings, Blue prints and respective machines

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	21:00 Practical Duration (hh:mm) 60:00 Corresponding NOS Code ISC/N0925	<ul style="list-style-type: none"> Conduct tests to ensure fitness of conveyor belt Describe the process of belt changing (holding the belt, replacing the damage belt, cold & hot vulcanising, belt tensioning etc.) Demonstrate various techniques of joint preparation e.g. mechanical (fastening) and vulcanizing (cold and hot) Maintain the daily log work book for completed assignments Communicate the other personnel about work completion and resuming of belt operations Create the list of discarded material to be handed over to stores 	Hand tools and machines, various measuring instruments
8	Work effectively with others Duration (hh:mm) 06:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code ISC/N0009	<ul style="list-style-type: none"> Define various forms of communication at the workplace Demonstrate effective communication while speaking Discuss grievances and issues that may arise between co-workers and identify ways to resolve them Follow grooming practices to look presentable Explain the importance of team work and team dynamics Explain the importance of ethical behaviour in your day-to-day work State the importance of discipline in life and apply the same at the workplace 	Communication skills PPTs, Posters Team management posters
	Total Duration Theory Duration 100:00 Practical Duration 290:00	Unique Equipment Required: <ul style="list-style-type: none"> Mechanical Drawings, Blueprints, Basic Tools and Equipment's, Measuring tools & precision measurement tools, Assembling tools Lubricant and coolant Material and Equipment for cleaning, Bearing pulling, lifting machines PPE, Safety Sign, First Aid Box, Fire Extinguishers Conveyor belt maintenance kit 	

Grand Total Course Duration: **390 Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by [Skill Council for Mining Sector](#))

Trainer Prerequisites for Job role: “Belt Conveyor Maintenance” mapped to Qualification Pack: “MIN/ISC/Q0904 V1.0”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “MIN/ISC/Q0904”, V 1.0”
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	Min. ITI Fitter pass and preferably CTI/ATI cleared/ Diploma Mechanical/ B.E - Mechanical
4a	Domain Certification	Certified for Job Role: “Belt Conveyor Maintenance” mapped to QP: “MIN/ISC/Q0904, V1.0”. Minimum accepted score is 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 is 80%
5	Experience	Min. 5 years industry experience and minimum 2 years’ experience as Trained or un trained for same Job Role/ Trade for ITI pass out
		Min. 3 years industry experience and minimum 1 years’ experience as Trained or un trained for same Job Role/ Trade for Diploma pass out
		Min. 2 years industry experience and minimum 1 years’ experience as Trained or un trained for same Job Role/ Trade for B.E Mechanical pass out

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Belt Conveyor Maintenance
Qualification Pack	MIN/ISC/Q0904, V1.0
Sector Skill Council	Skill Council for Mining Sector

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 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 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.

NOSs	PCs	Total Marks 1000	Out of	Marks allocation	
				Theory	Skills practical
ISC/N0922: Understands the assigned job of belt conveyor maintenance	PC1. Interpret the checklist and understand the job requirements	300	20	5	15
	PC2. Plan, as appropriate to carry out the job		20	5	15
	PC3. Understand sections, views, scale of measurement used in the drawing		30	10	20
	PC4. Understand the symbols used in the drawings		30	10	20
	PC5. Understand other specifications and identify the sequence of activities required to assemble the machine		30	10	20
	PC6. Read and interpret engineering drawings to ensure correct limits, tolerance and fits of equipment components		30	10	20
	PC7. Identify any clarifications that he/she wants to seek with respect to the given drawing		25	5	20

NOSs	PCs	Total Marks 1000	Out of	Marks allocation	
				Theory	Skills practical
	PC8. Recognize whom to contact for clarifications on the engineering design		20	5	15
	PC9. Escalate the concern to the supervisor or shift-in-charge, if needed		25	10	15
	PC10. Identify tools, tackles & equipment required to perform the operation		30	10	20
	PC11. Ask helper to carry tools required to the desired work site		20	5	15
	PC12. Report to stores / supervisor in case of non-availability of tools & tackles or stock-out		20	5	15
	NOS Total Marks	Total	300	90	210
ISC/N0923: Prepares for belt conveyor maintenance operation	PC1. Reach the site with desired tools, tackles and equipment	100	15	5	10
	PC2. Identify the root cause of the problem, if any		20	5	15
	PC3. Prepare the list of spares required for completion of job and receive them		15	5	10
	PC4. Ensure that tools match the desired specifications		20	5	15
	PC5. Ensure tools and equipment required for assembly are free from physical damage and ready for operation		15	5	10
	PC6. Report damaged / defective components of equipment as per the escalation matrix		15	5	10
	NOS Total Marks	Total	100	30	70
ISC/N0924: Carry out belt conveyor maintenance operation	PC1. Dismantle the equipment, as needed	250	25	5	20
	PC2. Correct the defect in the part or replace the defective part		25	5	20

NOSs	PCs	Total Marks 1000	Out of	Marks allocation	
				Theory	Skills practical
	PC3. Assemble the parts according to the drawings, as required		25	5	20
	PC4. Fasten mechanical components/ subassemblies together using screws, bolts, and collars using hand/ power tools		20	5	15
	PC5. Set and adjust linkages, tensions and clearances of assembled components to specifications using fixed gauges and hand tools		20	5	15
	PC6. Re-assemble the parts post correcting the defect		20	5	15
	PC7. Ensure alignment of parts and with the engineering drawings		20	5	15
	PC8. Check vibrations to ensure they are within desired limits		25	5	20
	PC9. Test the machine to ensure it is fit to use before handover		25	10	15
	PC10. Record the test results in the prescribed format of the organization		15	5	10
	PC11. Ensure all activities are complete according to checklist		15	5	10
	PC12. Communicate to supervisor on completion of given job in case of any deviations from checklist		15	5	10
	NOS Total Marks	Total	250	65	185
ISC/N0925: Activities specific to Belt conveyor maintenance	PC1. Understand the conveyor system and working principle	100	15	5	10
	PC2. Inspect belt, drums, gallery area, motors, chutes, pulleys, gravity take up pulley, idlers, gear box, stands etc. prior to starting work		10	5	5
	PC3. Detect any defects in the functioning of any assemblies		10	0	10
	PC4. Rectify any defects in the assemblies/sub-assemblies of the		10	0	10

NOSs	PCs	Total Marks 1000	Out of	Marks allocation	
				Theory	Skills practical
	conveyor system and carry out belt train operation				
	PC5. Carry out trial of the equipment to ensure fitness and check alignment of machine		10	5	5
	PC6. Report to the supervisor in case of any problem that has to be escalated		5	0	5
	PC7. Understand various techniques of joint preparation e.g. mechanical (fastening) and vulcanizing (cold and hot)		15	5	10
	PC8. Perform the jointing activity, as required		10	0	10
	PC9. Understand the process of belt changing (holding the belt, replacing the damage belt, cold & hot vulcanising, belt tensioning etc.)		15	0	15
	NOS Total Marks	Total	100	20	80
ISC/N0008: Use basic health and safety practices at the workplace	PC1. Use protective clothing/equipment for specific tasks and work conditions	150	10	5	5
	PC2. State the name and location of people responsible for health and safety in the workplace		5	0	5
	PC3. State the names and location of documents that refer to health and safety in the workplace		1	0	1
	PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace		9	5	4
	PC5. Carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		10	5	5

NOSs	PCs	Total Marks 1000	Out of	Marks allocation	
				Theory	Skills practical
	PC6. State location of general health and safety equipment in the workplace		5	0	5
	PC7. Inspect for faults, set up and safely use steps and ladders in general use		5	0	5
	PC8. Work safely in and around trenches, elevated places and confined areas		5	0	5
	PC9. Lift heavy objects safely using correct procedures		5	0	5
	PC10. Apply good housekeeping practices at all times		1	0	1
	PC11. Identify common hazard signs displayed in various areas		6	5	1
	PC12. Retrieve and/or point out documents that refer to health and safety in the workplace		4	0	4
	PC13. Use the various appropriate fire extinguishers on different types of fires correctly		9	5	4
	PC14. Demonstrate rescue techniques applied during fire hazard		10	5	5
	PC15. Demonstrate good housekeeping in order to prevent fire hazards		1	0	1
	PC16. Demonstrate the correct use of a fire extinguisher		4	0	4
	PC17. Demonstrate how to free a person from electrocution		5	0	5
	PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		10	5	5
	PC19. Demonstrate basic techniques of bandaging		5	0	5
	PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated		10	5	5

NOSs	PCs	Total Marks 1000	Out of	Marks allocation	
				Theory	Skills practical
	environments				
	PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments		5	0	5
	PC22. Administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		5	0	5
	PC23. Demonstrate the artificial respiration and the CPR Process		5	0	5
	PC24. Participate in emergency procedures		4	0	4
	PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible		10	5	5
	PC26. Demonstrate correct method to move injured people and others during an emergency		1	0	1
	NOS Total Marks	Total	150	45	105
ISC/N0009: Work effectively with others	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	100	10	5	5
	PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	5	5
	PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand		10	0	10
	PC4. Display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	5	5

NOSs	PCs	Total Marks 1000	Out of	Marks allocation	
				Theory	Skills practical
	PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	5	5
	PC6. Display appropriate communication etiquette while working		10	0	10
	PC7. Display active listening skills while interacting with others at work		10	0	10
	PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	5	5
	PC9. Demonstrate responsible and disciplined behaviors at the workplace		15	5	10
	PC10. Escalate grievances and problems to		5	0	5
	NOS Total Marks	Total	100	30	70