



Model Curriculum

Belt Conveyor Maintenance

SECTOR: IRON & STEEL
**SUB-SECTOR: STEEL, SPONGE IRON, FERRO ALLOYS,
RE-ROLLERS, REFRACTORY**
OCCUPATION: MECHANICAL MAINTENANCE
REF ID: ISC/Q0904
NSQF LEVEL: 3



  

Certificate

**CURRICULUM COMPLIANCE TO
QUALIFICATION PACK – NATIONAL OCCUPATIONAL
STANDARDS**

is hereby issued by the
INDIAN IRON AND STEEL SECTOR SKILL COUNCIL
for the
MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: 'Belt Conveyor Maintenance' QP No. 'ISC/Q0904 NSQF Level 3'

Date of Issuance: **December 22nd, 2015**
Valid up to: **December 21st, 2016**

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


Authorised Signatory
(Indian Iron and Steel Sector Skill Council)



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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 ISC/Q0904		
Version No.	1.0	Version Update Date	01-04-2017
Pre-requisites to Training	Minimum qualification – 10th Pass		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Understands the assigned job of belt conveyor maintenance • Prepares for belt conveyor maintenance operation • Carries out the assigned job of belt conveyor maintenance operation • Activities specific to belt conveyor maintenance • Use basic health and safety practices at the work place • Works effectively with others 		

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

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Over view of Iron & Steel Industry</p> <p>Theory Duration (hh:mm) 04:00</p> <p>Practical Duration (hh:mm) 00:00</p> <p>Corresponding NOS Code</p>	<ul style="list-style-type: none"> • Understanding Iron & steel industry • Understanding types of Iron & Steel Industry • Understanding products of Iron & Steel industry • Activities in Iron & Steel Industry 	PPTs of Iron and steel manufacturing, 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>	<ul style="list-style-type: none"> • Understanding the Occupational health & Safety • Understand What is hazard • Documentation for Health and safety • Working at Heights, confined spaces • Remedies for fire at work place 	PPTs for OHAS related to Job Role, Display Material for PPEs related to Job Role, Safety Material



Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Corresponding NOS Code ISC/N0008		
3	5S & House keeping Theory Duration (hh:mm) 06:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code ISC/N0008	<ul style="list-style-type: none"> • Identification of bottlenecks in functioning of work place • Various methods of housekeeping both pre-work & post-work as well 	PPTs of 5S, Display Charts of 5S, Audit Checklists of 5S
4	Understands the assigned job of belt conveyor maintenance Theory Duration (hh:mm) 16:00 Practical Duration (hh:mm) 50:00 Corresponding NOS Code ISC/N0922	<ul style="list-style-type: none"> • Understand the assigned job in accordance with the instructions / checklist • Understand the engineering drawings • Seek clarifications with respect to the equipment, drawings, if any • Identify the tools and tackles that are required to carry out the assigned job 	PPTs for various types of drawings, Blue prints and respective machines Hand tools and machines, various measuring instruments
5	Prepares for belt conveyor maintenance operation Theory Duration (hh:mm) 16:00 Practical Duration (hh:mm) 50:00 Corresponding NOS Code ISC/N0923	<ul style="list-style-type: none"> • Reach the site and inspect the equipment for scheduled maintenance or defects and identify cause of problem • Prepare spares, material required for operation 	Precision measuring tools
6	Carry out belt conveyor maintenance operation Theory Duration (hh:mm) 25:00 Practical Duration (hh:mm)	<ul style="list-style-type: none"> • Conduct routine maintenance or rectify the problem, as appropriate • Conduct tests to ensure fitness • 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



Sr. No.	Module	Key Learning Outcomes	Equipment Required
	80:00 Corresponding NOS Code ISC/N0924		
7	Activities specific to Belt conveyor maintenance Theory Duration (hh:mm) 25:00 Practical Duration (hh:mm) 60:00 Corresponding NOS Code ISC/N0925	<ul style="list-style-type: none"> Inspects belt, drums, gallery area, motors, chutes, pulleys, gravity take up pulley, idlers, gear box, stands etc. prior to starting work Perform various types of jointing 	PPTs for various types of drawings, Blue prints and respective machines Hand tools and machines, various measuring instruments
8	Use basic health and safety practices at the workplace Duration (hh:mm) 06:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code ISC/N0008	<ul style="list-style-type: none"> Health and safety procedures Fire safety procedures Emergencies, rescue and first aid procedures 	PPE, Different Type of Safety Sign, First Aid Box, Safety instrument and clothing, Step Ladder, Sample Accident reports, Fire Extinguishers, Items required for fire extinguisher and fire Safety
9	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"> Ensure appropriate communication with superiors, peers and others as applicable at work place Demonstrate appropriate behaviour and etiquette at work place 	Communication skills PPTs, Posters Team management posters
	Total Duration Theory Duration 110:00 Practical Duration 280:00	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 	



Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none">PPE, Safety Sign, First Aid Box, Fire Extinguishers	

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

(This syllabus/ curriculum has been approved by [Indian Iron and Steel Sector Skills Council](#))

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

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ISC/Q0904”.
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 pass and preferably CTI/ATI cleared/ Diploma Mechanical
4a	Domain Certification	Certified for Job Role: “Belt Conveyor Maintenance” mapped to QP: “ISC/Q0904”. Minimum accepted score is 80%
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/1402”. 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



Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Belt Conveyor Maintenance
Qualification Pack	ISC/Q0904
Sector Skill Council	Indian Iron & Steel Sector Skill Council

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 60% 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 outcome (nos)	Assessment criteria	Total marks	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



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	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
	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



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	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
	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



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	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



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC4. Rectify any defects in the assemblies/sub-assemblies of the conveyor system and carry out belt train operation		10	0	10
	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



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	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
	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



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	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 environments		10	5	5
	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



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	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
	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



Assessment outcome (nos)	Assessment criteria	Total marks		Marks allocation	
		Total marks	Out of	Theory	Skills practical
	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
	Grand Total	1000	1000	280	720
	Percentage Weightage:			50%	50%
	Minimum Pass% to qualify (aggregate):			60%	