



Model Curriculum

Conveyor Operation and Maintenance

SECTOR: IRON & STEEL
**SUB-SECTOR: STEEL, SPONGE IRON, FERRO ALLOYS,
RE-ROLLERS, REFRACTORY**
OCCUPATION: Mechanical Maintenance
REF ID: ISC/Q0902
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: Conveyor Operation OP No. ISC/Q0902 NSQF Level 3
and Maintenance

Date of issuance: **December 22nd, 2015**

Valid up to: **December 21st, 2016**

Authorised Signatory
(Indian Iron and Steel Sector Skill Council)

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



TABLE OF CONTENTS

1. Curriculum	04
2. Trainer Prerequisites	07
3. Annexure: Assessment Criteria	08

CONVEYOR OPERATION AND MAINTENANCE

CURRICULUM / SYLLABUS

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

Program Name	Conveyor Operation and Maintenance		
Qualification Pack Name & Reference ID.	Conveyor Operation and Maintenance ISC/Q0902		
Version No.	1.0	Version Update Date	30-12-2014
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"> • Inspection of total conveyor system along with operating equipments • Start conveyor belt operation • Perform basic maintenance and troubleshooting on conveyor belt system • Carry out reporting and documentation • Use basic health and safety practices at the workplace • Work effectively with others 		

This course encompasses 6 out of 6 National Occupational Standards (NOS) of “Conveyor Operation and 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</p>	<ul style="list-style-type: none"> • Understanding the Occupational health & Safety • Understand What is hazard • Documentation for Health and safety 	PPTs for OHAS related to Job Role, Display Material for PPEs



Sr. No.	Module	Key Learning Outcomes	Equipment Required
	(hh:mm) 08:00 Practical Duration (hh:mm) 12:00 Corresponding NOS Code ISC/N0008	<ul style="list-style-type: none"> Working at Heights, confined spaces Remedies for fire at work place 	related to Job Role, Safety Material
3	5S & House keeping Theory Duration (hh:mm) 08:00 Practical Duration (hh:mm) 16:00 Corresponding NOS Code ISC/N0004	<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	Inspection of total conveyor system along with operating equipments Theory Duration (hh:mm) 17:00 Practical Duration (hh:mm) 49:00 Corresponding NOS Code ISC/N0915	<ul style="list-style-type: none"> Conduct pre-operation checks to ensure the Conveyor Belt System is safe for operation Record details of checking and maintenance activities 	PPTs for various types of drawings, Blue prints, driving motor, pulleys Hand tools and lifting machines, various measuring instruments
5	Start conveyor belt operation Duration (hh:mm) 15:00 Practical Duration (hh:mm) 49:00 Corresponding NOS Code ISC/N0916	<ul style="list-style-type: none"> Start the conveyor belt in no load condition Load the conveyor gradually by opening the bunker gates as required Discharge the material in conveyor chutes by proper adjustment of deflector plate, gate and after feeding equipments 	Precision measuring tools, pulleys, driving motor, lifting tools etc. marking tools



Sr. No.	Module	Key Learning Outcomes	Equipment Required
6	<p>Perform basic maintenance and troubleshooting on conveyor belt system</p> <p>Theory Duration (hh:mm) 33:00</p> <p>Practical Duration (hh:mm) 100:00</p> <p>Corresponding NOS Code ISC/N0917</p>	<ul style="list-style-type: none"> Routine maintenance as per daily check schedule/troubleshooting, periodical maintenance as per company procedures/guidelines Major conveyor system maintenance including belt changing during major shutdown of production unit 	<p>PPTs for various types of drawings, Blue prints, driving motor, pulleys Hand tools and lifting machines, various measuring instruments</p>
7	<p>Carry out reporting and documentation</p> <p>Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code ISC/N0949</p>	<ul style="list-style-type: none"> Reporting of data/problem/incidents etc. Ensuring Recording and Documentation Ensuring Information Security 	<p>Safety instrument and clothing, Step Ladder, Sample Accident reports</p>
8	<p>Use basic health and safety practices at the workplace</p> <p>Duration (hh:mm) 05:00</p> <p>Practical Duration (hh:mm) 18:00</p> <p>Corresponding NOS Code ISC/N0008</p>	<ul style="list-style-type: none"> Health and safety procedures Fire safety procedures Emergencies, rescue and first aid procedures 	<p>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</p>
9	<p>Work effectively with others</p> <p>Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 18:00</p>	<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 	<p>Communication skills PPTs, Posters Team management posters</p>



Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Corresponding NOS Code ISC/N0009		
	Total Duration Theory Duration 108:00 Practical Duration 282:00	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 	

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: “Conveyor Operation and Maintenance” mapped to Qualification Pack: “ISC/Q0902”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ISC/Q0902”.
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
4a	Domain Certification	Certified for Job Role: “Conveyor Operation and Maintenance” mapped to QP: “ISC/Q0902”. 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	Conveyor Operation and Maintenance
Qualification Pack	ISC/Q0902
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/N0915: Inspection of total conveyor system along with operating equipments	PC1. Adhere to time limits given by supervisor	250	15	5	10
	PC2. Check oil levels of gear box and prime movers with couplers, driving pulleys		15	5	10
	PC3. Check driving pulleys with lagging		15	5	10
	PC4. Check the belt conveyor for any damages and belt joints		15	5	10
	PC5. Check condition of conveying and return side idlers		15	5	10
	PC6. Check the cleanliness of conveyor gallery and conveyor deck		15	5	10



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC7. Check position of gravity pulleys		15	5	10
	PC8. Check feeding chutes with wire plates		15	5	10
	PC9. Check operation of gates		15	5	10
	PC10. Check all shuttle belts with trolley etc.		15	5	10
	PC11. Check the level of bunkers to be filled		15	5	10
	PC12. Apply grease to all bearings		15	5	10
	PC13. Ensure the raw material stock at bunker and yard		15	5	10
	PC14. Keep all conveyor gallery and stair cases clean and free from mud, spillage and other foreign materials		15	5	10
	PC15. Ensure proper illumination of all work area/transfer chutes		15	5	10
	PC16. Check all safety switches as per schedule		5	0	5
	PC17. Report defects precisely to the supervisor if beyond scope of his role		5	0	5
	PC18. Maintain a checking/maintenance logbook to record all activities performed before starting the conveyor system		15	5	10
	NOS Total Marks	Total	250	80	170
ISC/N0916: Start conveyor belt operation	PC1. Study the log book and organize the job according to requirement	200	10	5	5



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC2. Inspect the worksite to identify cleanliness of the conveyor gallery, walkway and stair cases		5	0	5
	PC3. Start the conveyor on no-load condition using the pushbutton switch for conveyor sequence operation		10	0	10
	PC4. Adjust feeding mechanism for optimum loading of conveyor.		10	0	10
	PC5. Ensure the main bunker is filled up to the required level for safe operation		15	5	10
	PC6. Ensure after filling to specific volume of main bunker the transit bunkers gates to be closed slowly for emptying out the belt		15	5	10
	PC7. Adhere to time limits given by supervisor		15	5	10
	PC8. Perform in-operation visual checks on bunker level depending on the requirement for smooth operation.		15	5	10
	PC9. Select and use the right type of operation for proper feeding of the conveyor belt.		10	0	10
	PC10. Ensure that conveyor gallery and walkway are free from all hazards for starting the belt operation.		10	0	10
	PC11. Utilize judiciously various communicating devices available in the conveyor gallery and control cabin.		15	5	10



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC12. Ensure that the belt operation is safe from all hazards by raising appropriate signal/alarm		10	0	10
	PC13. Ensure that the dust extraction/suppression system is working properly during the belt operation.		15	5	10
	PC14. Ensure that the conveyor belt is emptied out before stopping		10	0	10
	PC15. Ensure that hot material does not come in contact with conveyor belt		10	0	10
	PC16. Ensure that no other persons move on the conveyor gallery other than the operators		15	5	10
	PC17. Inform supervisor of any problems while operating the Conveyor Belt		10	0	10
	NOS Total Marks	Total	200	40	160
ISC/N0917: Perform basic maintenance and troubleshooting on conveyor belt system	PC1. Understand proper operating/loading of conveyor belt to assess the right maintenance schedule	150	10	5	5
	PC2. Clean conveyor gallery and walkway		10	0	10
	PC3. Clean stair cases, hand railings for safe movement		10	0	10
	PC4. Drain tail end pulley pits/pumping accommodated water from the pits to avoid belt slippage		10	0	10
	PC5. Repair damaged belt joints, repair belt cuts/replace damaged portion of conveyor belt		10	0	10



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC6. Grease all bearings, maintain lubrication oil level of all gear boxes		10	5	5
	PC7. Check all driving couplings and replace damaged components		10	0	10
	PC8. Check and replace damaged idlers, skirt plates, wear plates etc.		10	0	10
	PC9. Complete timely and legibly daily/weekly maintenance sheets as provided by the company		10	5	5
	PC10. Ensure the conveyor belt is in good condition for operation		10	5	5
	PC11. Ensure all operating equipment are in healthy condition for smooth operation		10	0	10
	PC12. Ensure all pulley laggings are in good condition		10	0	10
	PC13. Ensure that all bunker gates are in operating condition for proper operation		10	5	5
	PC14. Assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel		10	5	5
	PC15. Complete timely and legibly daily/weekly defect sheets		10	0	10
	NOS Total Marks	Total	150	30	120



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
ISC/N0949: Carry out reporting and documentation	PC1. Report data/problems/incidents as applicable in a timely manner	150			
			15	5	10
	PC2. Report to the appropriate authority as laid down by the company		15	5	10
	PC3. Follow reporting procedures as prescribed by the company		15	5	10
	PC4. Identify documentation to be completed relating to one's role		15	5	10
	PC5. Record details accurately an appropriate format		15	5	10
	PC6. Complete all documentation within stipulated time according to company procedure		10	0	10
	PC7. Ensure that the final document meets with the requirements of the persons who requested it or make any amendments accordingly		20	5	15
	PC8. Make sure documents are available to all appropriate authorities to inspect		15	5	10
	PC9. Respond to requests for information in an appropriate manner whilst following organizational procedures		15	5	10
	PC10. Inform the appropriate authority of requests for information received		15	5	10
	NOS Total Marks	Total	150	45	105
ISC/N0008: Use basic health and safety practices at the workplace	PC1. Use protective clothing/equipment for specific tasks and work conditions	150	9	4	5



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC2. State the name and location of people responsible for health and safety in the workplace		6	1	5
	PC3. State the names and location of documents that refer to health and safety in the workplace		2	1	5
	PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace		8	4	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		6	1	5
	PC6. State location of general health and safety equipment in the workplace		6	1	5
	PC7. Inspect for faults, set up and safely use steps and ladders in general use		6	1	5
	PC8. Work safely in and around trenches, elevated places and confined areas		6	1	5
	PC9. Lift heavy objects safely using correct procedures		6	1	5
	PC10. Apply good housekeeping practices at all times		2	1	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		5	1	4



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC13. Use the various appropriate fire extinguishers on different types of fires correctly		9	4	5
	PC14. Demonstrate rescue techniques applied during fire hazard		8	4	4
	PC15. Demonstrate good housekeeping in order to prevent fire hazards		2	1	1
	PC16. Demonstrate the correct use of a fire extinguisher		6	1	5
	PC17. Demonstrate how to free a person from electrocution		6	1	5
	PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		8	3	5
	PC19. Demonstrate basic techniques of bandaging		6	1	5
	PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		7	2	5
	PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments		6	1	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		6	1	5



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC23. Demonstrate the artificial respiration and the CPR Process		6	1	5
	PC24. Participate in emergency procedures		6	1	5
	PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible		4	1	3
	PC26. Demonstrate correct method to move injured people and others during an emergency		2	1	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



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	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
	Grand Total	1000	1000	270	730
	Percentage Weightage:			50%	50%
	Minimum Pass% to qualify (aggregate):			60%	