



# Model Curriculum

## Reversing System Maintenance

**SECTOR: IRON & STEEL**  
**SUB-SECTOR: STEEL**

**OCCUPATION: Coke Making**  
**REF ID: ISC/Q0204**  
**NSQF LEVEL: 2**



# 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: **Reversing System Maintenance** OP No. ISC/Q0204 NSQF Level 2

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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# REVERSING SYSTEM MAINTENANCE

## CURRICULUM / SYLLABUS

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

<b>Program Name</b>	<b>Reversing System Maintenance</b>		
<b>Qualification Pack Name &amp; Reference ID.</b>	<b>Reversing System Maintenance ISC/Q0204</b>		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	25-03-2015
<b>Pre-requisites to Training</b>	Minimum qualification – Class 10th Pass		
<b>Training Outcomes</b>	<b>After completing this programme, participants will be able to:</b> <ul style="list-style-type: none"> <li>• Understand and carry out the assigned job of inspection/ monitoring of reversing winch system and its operation</li> <li>• Use basic health and safety practices at workplace</li> <li>• Works effectively with others</li> </ul>		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Reversing System Maintenance” Qualification Pack issued by “Indian Iron & Steel Sector Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<b>Over view of Iron &amp; Steel Industry</b>  <b>Theory Duration</b> (hh:mm) 04:00 <b>Practical Duration</b> (hh:mm) 00:00  <b>Corresponding NOS Code</b>	<ul style="list-style-type: none"> <li>• Understanding Iron &amp; steel industry</li> <li>• Understanding types of Iron &amp; Steel Industry</li> <li>• Understanding products of Iron &amp; Steel industry</li> <li>• Activities in Iron &amp; Steel Industry</li> </ul>	PPTs of Iron and steel manufacturing, Charts showing the same
2	<b>Occupational, Health and Safety (OHAS)</b>  <b>Theory Duration</b> (hh:mm) 12:00 <b>Practical Duration</b> (hh:mm)	<ul style="list-style-type: none"> <li>• Understanding the Occupational health &amp; Safety</li> <li>• Understand What is hazard</li> <li>• Documentation for Health and safety</li> <li>• Working at Heights, confined spaces</li> <li>• Remedies for fire at work place</li> </ul>	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
	25:00 <b>Corresponding NOS Code</b> ISC/N0008		
3	<b>5S &amp; House keeping</b>  <b>Theory Duration</b> (hh:mm) 15:00  <b>Practical Duration</b> (hh:mm) 25:00  <b>Corresponding NOS Code</b> ISC/N0004	<ul style="list-style-type: none"> <li>• Identification of bottlenecks in functioning of work place</li> <li>• Various methods of housekeeping both pre-work &amp; post-work as well</li> </ul>	PPTs of 5S, Display Charts of 5S, Audit Checklists of 5S
4	<b>Understand and carry out the assigned job of inspection/ monitoring of reversing winch system and its operation</b>  <b>Theory Duration</b> (hh:mm) 35:00  <b>Practical Duration</b> (hh:mm) 104:00  <b>Corresponding NOS Code</b> <b>ISC/N0209</b>	<ul style="list-style-type: none"> <li>• Understand &amp; carry out the assigned job of inspection of reversing and its centralised lubrication system</li> <li>• Understand the importance of proper functioning of the system and continuous monitoring for uninterrupted operation</li> <li>• Record the inspection data and informing supervisor</li> </ul>	PPTs for various types of drawings, Blue prints, Hydraulic cylinders, electro-mechanical winch system, pneumatic system, Hand tools and lifting machines, various measuring instruments
5	<b>Use basic health and safety practices at the workplace</b>  <b>Duration</b> (hh:mm) 15:00  <b>Practical Duration</b> (hh:mm) 25:00  <b>Corresponding NOS Code</b> <b>ISC/N0008</b>	<ul style="list-style-type: none"> <li>• Health and safety procedures</li> <li>• Fire safety procedures</li> <li>• Emergencies, rescue and first aid procedures</li> </ul>	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
6	<b>Work effectively with</b>	<ul style="list-style-type: none"> <li>• Ensure appropriate communication with</li> </ul>	Communication



Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<b>others</b> <b>Duration</b> (hh:mm) 15:00 <b>Practical Duration</b> (hh:mm) 25:00 <b>Corresponding NOS Code</b> <b>ISC/N0009</b>	superiors, peers and others as applicable at work place <ul style="list-style-type: none"><li>• Demonstrate appropriate behaviour and etiquette at work place</li></ul>	skills PPTs, Posters Team management posters
	<b>Total Duration</b> <b>Theory Duration</b> <b>96:00</b> <b>Practical Duration</b> <b>204:00</b>	<b>Unique Equipment Required:</b> <ul style="list-style-type: none"><li>• Mechanical Drawings, Blueprints,</li><li>• Basic Tools and Equipment's,</li><li>• measuring tools&amp; precision measurement tools,</li><li>• Assembling tools</li><li>• Material and Equipment for cleaning, lifting machines</li><li>• PPE, Safety Sign, First Aid Box, Fire Extinguishers</li></ul>	

Grand Total Course Duration: **300Hours, 0 Minutes**

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



## Trainer Prerequisites for Job role: “Reversing System Maintenance” mapped to Qualification Pack: “ISC/Q0204”

Sr. No.	Area	Details
1	<b>Description</b>	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ISC/Q0204”.
2	<b>Personal Attributes</b>	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	<b>Minimum Educational Qualifications</b>	Min. ITI Fitter pass and preferably CTI/ATI cleared/ Diploma Mechanical
4a	<b>Domain Certification</b>	Certified for Job Role: “Reversing System Maintenance” mapped to QP: “ISC/Q0204”. Minimum accepted score is 80%
4b	<b>Platform Certification</b>	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/1402”. Minimum accepted score is 80%
5	<b>Experience</b>	Min. 5 years industry experience and minimum 2 years’ experience as Trained or un trained for same Job Role/ Trade



## Annexure: Assessment Criteria

<b>Assessment Criteria</b>	
<b>Job Role</b>	<b>Reversing System Maintenance</b>
<b>Qualification Pack</b>	<b>ISC/Q0204</b>
<b>Sector Skill Council</b>	<b>Indian Iron &amp; Steel Sector Skill Council</b>

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
<b>ISC/N0209: Understand and carry out the assigned job of inspection/ monitoring of reversing winch system and its operation</b>	PC1. Interpret the checklist for regular inspection of nozzle, orifice, flapper, damper, reversing cock etc.	<b>750</b>	<b>40</b>	<b>10</b>	<b>30</b>
	PC2. Carry out inspection of lubrication system reservoir (grease), lubrication pump, motor timer, reversing valve and nipples		<b>40</b>	<b>10</b>	<b>30</b>
	PC3. Carry out inspection of hydraulic cylinder for coke oven gas/waste gas		<b>40</b>	<b>10</b>	<b>30</b>
	PC4. Carry out inspection of pull rod stroke of hydraulic cylinders		<b>45</b>	<b>10</b>	<b>35</b>
	PC5. Carry out inspection of accumulator		<b>40</b>	<b>10</b>	<b>30</b>





Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC6. Carry out inspection of chain links, ropes, tie rods, sprockets and spindles		45	10	35
	PC7. Carry out inspection of ammeter functioning for electro-mechanical winch system		45	10	35
	PC8. Carry out cleaning activity of nozzle, orifice etc.		45	10	35
	PC9. Seek clarification if any from supervisor		45	10	35
	PC10. Monitor the reversing cycle, reversing time and pause time		45	10	35
	PC11. Monitor the functioning of low pressure relay		45	10	35
	PC12. Monitor hydraulic cylinder functioning for coke oven gas/waste gas		45	10	35
	PC13. Monitor/adjust pull rod stroke of hydraulic cylinders		45	10	35
	PC14. Monitor functioning for electro-mechanical winch system		45	10	35
	PC15. Ensure in case of power failure operation of reversing winch by accumulator (hydraulic winch)/pneumatic system (electro-mechanical winch)		40	10	30
	PC16. Monitor flow after any cleaning activity and record		40	10	30
	PC17. Record the inspection and monitoring data in appropriate checklist		30	10	20
	PC18. Inform supervisor for repair/replacement/maintenance as appropriate for any equipment/parts of the reversing system		30	10	20
	<b>NOS Total Marks</b>	<b>Total</b>	<b>750</b>	<b>180</b>	<b>570</b>



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
<b>ISC/N0008: Use basic health and safety practices at the workplace</b>	PC1. Use protective clothing/equipment for specific tasks and work conditions	<b>150</b>	<b>10</b>	<b>5</b>	<b>5</b>
	PC2. State the name and location of people responsible for health and safety in the workplace		<b>5</b>	<b>0</b>	<b>5</b>
	PC3. State the names and location of documents that refer to health and safety in the workplace		<b>1</b>	<b>0</b>	<b>1</b>
	PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace		<b>9</b>	<b>5</b>	<b>4</b>
	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		<b>10</b>	<b>5</b>	<b>5</b>
	PC6. State location of general health and safety equipment in the workplace		<b>5</b>	<b>0</b>	<b>5</b>
	PC7. Inspect for faults, set up and safely use steps and ladders in general use		<b>5</b>	<b>0</b>	<b>5</b>
	PC8. Work safely in and around trenches, elevated places and confined areas		<b>5</b>	<b>0</b>	<b>5</b>
	PC9. Lift heavy objects safely using correct procedures		<b>5</b>	<b>0</b>	<b>5</b>
	PC10. Apply good housekeeping practices at all times		<b>1</b>	<b>0</b>	<b>1</b>
	PC11. Identify common hazard signs displayed in various areas		<b>6</b>	<b>5</b>	<b>1</b>



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	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 environments		10	5	5
	PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments		5	0	5



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	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		5	0	5
	PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible		9	5	4
	PC26. Demonstrate correct method to move injured people and others during an emergency		1	0	1
	<b>NOS Total Marks</b>	<b>Total</b>	<b>150</b>	<b>45</b>	<b>105</b>
<b>ISC/N0009: Work effectively with others</b>	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	<b>100</b>	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



Assessment outcome (nos)	Assessment criteria	Total marks	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
	<b>NOS Total Marks</b>	<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>
	<b>Grand Total</b>	<b>1000</b>	<b>1000</b>	<b>255</b>	<b>745</b>
	<b>Percentage Weightage:</b>			<b>50%</b>	<b>50%</b>
	<b>Minimum Pass% to qualify (aggregate):</b>			<b>60%</b>	