



Process Control Engineer - Basic Oxygen Furnace (BOF)

QP Code: ISC/Q1401

Version: 1.0

NSQF Level: 6

Indian Iron & Steel Sector Skill Council || Plot no.B-7, Action Area-III, 5th Floor, Room no.509, Near Hazra Kalibari, Opposite Uni World City, New Town, Kolkata, West Bengal
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ISC/Q1401: Process Control Engineer - Basic Oxygen Furnace (BOF)

Brief Job Description

The individual in this role coordinate and monitor the operation of Basic Oxygen Furnace (BOF) and its associated functions.

Personal Attributes

The person should be patient, organized, and team-oriented and have the ability to work for long hours in adverse conditions. They must be able to plan and priorities tasks effectively and have an eye for detail and quality.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [ISC/N0008: Use basic health and safety practices at the workplace](#)
2. [ISC/N0009: Work effectively with others](#)
3. [ISC/N1401: Perform and control BOF operation](#)
4. [DGT/VSQ/N0103: Employability Skills \(90 Hours\)](#)

Qualification Pack (QP) Parameters

Sector	Iron and Steel
Sub-Sector	Steel
Occupation	Steel Making
Country	India
NSQF Level	6
Credits	22
Aligned to NCO/ISCO/ISIC Code	NCO-2015/NIL



Qualification Pack



Minimum Educational Qualification & Experience	<p>B.E./B.Tech (in Metallurgy/ Mechanical/ Chemical/Material Science)</p> <p>OR</p> <p>Pursuing 4th year UG (in case of 4-year UG with honours/ honours with research) (Metallurgy/ Mechanical/ Chemical/Material Science))</p> <p>OR</p> <p>Completed 3 year UG degree (in relevant subject with 1 year experience in steel making)</p> <p>OR</p> <p>12th grade pass with 1 year NTC plus 1year NAC/CITS (with 2 years of experience in steel making)</p> <p>OR</p> <p>12th grade Pass (with 4 years of experience in steel making)</p> <p>OR</p> <p>Previous relevant Qualification of NSQF Level (Level 5 with 4 years of experience in steel making)</p>
Minimum Level of Education for Training in School	12th Class
Pre-Requisite License or Training	NA
Minimum Job Entry Age	21 Years
Last Reviewed On	NA
Next Review Date	NA
NSQC Approval Date	
Version	1.0



ISC/N0008: Use basic health and safety practices at the workplace

Description

This OS unit is about following safety and adopting sustainable practices for optimising use of resources.

Scope

The scope covers the following :

- Maintain safe and secure working environment
- Emergencies, rescue and first aid procedures
- Health and hygiene
- Housekeeping and waste management
- Material and energy conservation

Elements and Performance Criteria

Maintain safe and secure working environment

To be competent, the user/individual on the job must be able to:

- PC1.** identify hazardous activities and the possible causes of risks or accidents in the workplace
- PC2.** follow safe working practices while dealing with hazards to ensure safety of self and others
- PC3.** use appropriate protective clothing/equipment for specific tasks and work
- PC4.** follow appropriate safety practices while working in and around trenches, elevated places and confined areas
- PC5.** lift heavy objects safely using correct procedures
- PC6.** carry out routine check of the machine for identifying potential hazards
- PC7.** report any identified breaches in health, safety and security policies and procedures to the designated person

Emergencies, rescue and first aid procedures

To be competent, the user/individual on the job must be able to:

- PC8.** use appropriate type of fire extinguisher
- PC9.** apply appropriate rescue techniques during fire hazard
- PC10.** provide appropriate first aid procedure to victims wherever required eg.in case of bleeding, burns, choking, electric shock etc.
- PC11.** follow emergency procedures such as raising alarm, safe evacuation etc.
- PC12.** attend safety training and fire drills to respond promptly during an emergency

Health and hygiene

To be competent, the user/individual on the job must be able to:

- PC13.** follow regular cleaning and disinfection practices at work place using appropriate techniques and materials
- PC14.** follow hand hygiene practices at work place using appropriate techniques and materials
- PC15.** report regarding the contagious illness of self or people in close contact
- PC16.** avoid contact with ill people and self-isolate in a similar situation

Housekeeping and waste management

To be competent, the user/individual on the job must be able to:

- PC17.** follow the fundamentals of 5S for housekeeping
- PC18.** ensure good housekeeping in order to prevent hazards and accidents
- PC19.** store the material, tools and equipment in the correct location and in good condition
- PC20.** segregate waste into different categories
- PC21.** identify recyclable, non-recyclable and hazardous waste
- PC22.** dispose non-recyclable, recyclable and reusable waste appropriately at identified location

Material and energy conservation

To be competent, the user/individual on the job must be able to:

- PC23.** identify ways to optimize usage of material in various tasks/activities/processes
- PC24.** check for spills/leakages in various tasks/activities/processes
- PC25.** plug spills/leakages and escalate to appropriate authority if unable to rectify
- PC26.** check if the equipment/machine is functioning normally before commencing work and rectify wherever required
- PC27.** ensure electrical equipment and appliances are properly connected and turned off when not in use

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organisation procedures for health, safety and security, individual role and responsibilities in this context
- KU2.** the organisation's emergency procedures for different emergency situations and the importance of following the same
- KU3.** evacuation procedures for workers and visitors
- KU4.** how and when to report hazards
- KU5.** potential hazards, risks and threats based on the nature of work
- KU6.** preventative and remedial actions to be taken in case of exposure to toxic material
- KU7.** various types of fire extinguisher
- KU8.** various types of safety signs and their meaning
- KU9.** appropriate first aid treatment relevant to different condition e.g. bleeding, minor burns, eye injuries etc.
- KU10.** relevant standards, procedures and policies related to 5S followed in the company
- KU11.** the various materials used and their storage norms
- KU12.** efficient utilisation of material and water
- KU13.** basics of electricity and prevalent energy efficient devices
- KU14.** common practices of conserving electricity
- KU15.** categorisation of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics
- KU16.** usage of different colors of dustbins
- KU17.** waste management techniques



Qualification Pack



Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** read safety instructions/guidelines
- GS2.** modify work practices to improve them
- GS3.** ask for clarifications from superior about the job requirement
- GS4.** work with supervisors/team members to carry out work related tasks
- GS5.** complete tasks efficiently and accurately within stipulated time
- GS6.** inform/report to concerned person in case of any problem
- GS7.** make timely decisions for efficient utilization of resources
- GS8.** write reports such as accident report, in at least English/regional language
- GS9.** be punctual and utilize time efficiently

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain safe and secure working environment</i>	10	14	-	6
PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace	2	2	-	1
PC2. follow safe working practices while dealing with hazards to ensure safety of self and others	2	3	-	1
PC3. use appropriate protective clothing/equipment for specific tasks and work	1	2	-	1
PC4. follow appropriate safety practices while working in and around trenches, elevated places and confined areas	2	1	-	-
PC5. lift heavy objects safely using correct procedures	1	2	-	1
PC6. carry out routine check of the machine for identifying potential hazards	1	2	-	1
PC7. report any identified breaches in health, safety and security policies and procedures to the designated person	1	2	-	1
<i>Emergencies, rescue and first aid procedures</i>	6	9	-	5
PC8. use appropriate type of fire extinguisher	1	1	-	1
PC9. apply appropriate rescue techniques during fire hazard	1	2	-	1
PC10. provide appropriate first aid procedure to victims wherever required eg.in case of bleeding, burns, choking, electric shock etc.	2	2	-	1
PC11. follow emergency procedures such as raising alarm, safe evacuation etc.	1	2	-	1
PC12. attend safety training and fire drills to respond promptly during an emergency	1	2	-	1
<i>Health and hygiene</i>	2	6	-	2
PC13. follow regular cleaning and disinfection practices at work place using appropriate techniques and materials	1	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. follow hand hygiene practices at work place using appropriate techniques and materials	1	2	-	1
PC15. report regarding the contagious illness of self or people in close contact	-	1	-	-
PC16. avoid contact with ill people and self-isolate in a similar situation	-	1	-	-
<i>Housekeeping and waste management</i>	7	12	-	5
PC17. follow the fundamentals of 5S for housekeeping	2	3	-	2
PC18. ensure good housekeeping in order to prevent hazards and accidents	1	2	-	-
PC19. store the material, tools and equipment in the correct location and in good condition	1	2	-	-
PC20. segregate waste into different categories	1	2	-	1
PC21. identify recyclable, non-recyclable and hazardous waste	1	1	-	1
PC22. dispose non-recyclable, recyclable and reusable waste appropriately at identified location	1	2	-	1
<i>Material and energy conservation</i>	5	9	-	2
PC23. identify ways to optimize usage of material in various tasks/activities/processes	1	2	-	-
PC24. check for spills/leakages in various tasks/activities/processes	1	2	-	1
PC25. plug spills/leakages and escalate to appropriate authority if unable to rectify	1	2	-	1
PC26. check if the equipment/machine is functioning normally before commencing work and rectify wherever required	1	2	-	-
PC27. ensure electrical equipment and appliances are properly connected and turned off when not in use	1	1	-	-
NOS Total	30	50	-	20



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National Occupational Standards (NOS) Parameters

NOS Code	ISC/N0008
NOS Name	Use basic health and safety practices at the workplace
Sector	Iron and Steel
Sub-Sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory
Occupation	Mechanical Maintenance, Raw Material Handling , Product Quality Control, Refractory Maintenance, Furnace Operation, Fitter, Cold Rolling Mill Operations, Electrical Maintenance, Mechanical Maintenance
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	NA
Next Review Date	31/03/2025
NSQF Clearance Date	31/03/2022



ISC/N0009: Work effectively with others

Description

This OS unit is about communicating with colleagues/superiors and others, either in own work group or in other work groups within organisation.

Scope

The scope covers the following :

- Communicate effectively with colleagues and others
- Interact with supervisor
- Follow appropriate behaviour at work place

Elements and Performance Criteria

Communicate effectively with colleagues and others

To be competent, the user/individual on the job must be able to:

- PC1.** coordinate with colleagues to share work, as per the workload in order to achieve team goals
- PC2.** maintain clear communication with colleagues and others, wherever needed, through all means i.e. face-to-face, telephonic or written
- PC3.** adjust communication styles to reflect gender and persons with disability (PwD) sensitivity
- PC4.** respect all colleagues and co-workers
- PC5.** resolve conflicts by communicating with colleagues and other departments

Interact with supervisor

To be competent, the user/individual on the job must be able to:

- PC6.** identify work requirements by receiving instructions from reporting supervisor
- PC7.** escalate problems to supervisors that cannot be handled
- PC8.** report the completed work
- PC9.** interact with the reporting supervisor about any possible hazards and safety concerns

Follow appropriate behaviour at work place

To be competent, the user/individual on the job must be able to:

- PC10.** extend help to people with Disability (PwD) at workplace, if required
- PC11.** empathize with people with disability
- PC12.** adopt a gender neutral behavior
- PC13.** adopt responsible and disciplined behaviours at the workplace

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the importance of effective communication and establishing good working relationships with colleagues and supervisor
- KU2.** different methods of communication as per the circumstances



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- KU3.** importance of teamwork in organization and individual success
- KU4.** various components of effective communication
- KU5.** barriers to effective communication
- KU6.** common reasons for interpersonal conflict
- KU7.** what constitutes disciplined behaviour for a working professional
- KU8.** gender concepts, issues & legislation
- KU9.** organisational policies and procedures related to gender equality
- KU10.** challenges faced by PWD and the ways to help them overcome the same

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** read instructions/guidelines/procedures
- GS2.** listen effectively and orally communicate information
- GS3.** ask for clarification and advice from the concerned person
- GS4.** maintain positive and effective relationships with colleagues
- GS5.** evaluate the possible solution(s) to the problem
- GS6.** spot and communicate potential areas of disruptions in the work process and report the same
- GS7.** complete written work with attention to detail
- GS8.** check that the work meets customer requirements

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Communicate effectively with colleagues and others</i>	13	20	-	9
PC1. coordinate with colleagues to share work, as per the workload in order to achieve team goals	3	5	-	2
PC2. maintain clear communication with colleagues and others, wherever needed, through all means i.e. face-to-face, telephonic or written	5	7	-	3
PC3. adjust communication styles to reflect gender and persons with disability (PwD) sensitivity	3	4	-	2
PC4. respect all colleagues and co-workers	1	2	-	1
PC5. resolve conflicts by communicating with colleagues and other departments	1	2	-	1
<i>Interact with supervisor</i>	8	14	-	6
PC6. identify work requirements by receiving instructions from reporting supervisor	2	3	-	1
PC7. escalate problems to supervisors that cannot be handled	2	3	-	2
PC8. report the completed work	2	3	-	1
PC9. interact with the reporting supervisor about any possible hazards and safety concerns	2	5	-	2
<i>Follow appropriate behaviour at work place</i>	9	16	-	5
PC10. extend help to people with Disability (PwD) at workplace, if required	2	4	-	2
PC11. empathize with people with disability	2	4	-	1
PC12. adopt a gender neutral behavior	2	4	-	1
PC13. adopt responsible and disciplined behaviours at the workplace	3	4	-	1



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	30	50	-	20



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National Occupational Standards (NOS) Parameters

NOS Code	ISC/N0009
NOS Name	Work effectively with others
Sector	Iron and Steel
Sub-Sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory
Occupation	Mechanical Maintenance, Raw Material Handling , Product Quality Control, Refractory Maintenance, Furnace Operation, Fitter, Operations, Coke Making, Mechanical Maintenance
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	NA
Next Review Date	31/03/2025
NSQC Clearance Date	31/03/2022



ISC/N1401: Perform and control BOF operation

Description

This OS unit is about performing preparatory activities, BOF operation and post operation activities.

Scope

The scope covers the following :

- Manage preparatory activities for BOF operation
- Perform BOF operations
- Perform post BOF operation activities

Elements and Performance Criteria

Manage preparatory activities for BOF operation

To be competent, the user/individual on the job must be able to:

- PC1.** obtain the required information and work completed in previous shift from logbook, discussions etc. and take handover from the previous shift operator by following organizational procedures
- PC2.** ensure availability of sufficient quantity of material (hot metal, lime, dololime, scrap, iron ore or any other material), machinery, consumables and tools required for smooth running of the operation and achieving production target
- PC3.** ensure that work area is clean and free of any obstacle or encumbrance
- PC4.** check the condition of BOF convertor, movement of top lance, functioning of bottom plugs, oxygen and argon pressure, lance cooling system etc. as per SOP before starting the operation of new heat
- PC5.** ensure that all safety measures, interlocks, alarms are working and in conformance with the safe operation of BOF converter
- PC6.** check the BOF gas holder for the availability of space for storing BOF gas in it
- PC7.** coordinate with other departments such as oxygen plant for oxygen, gas distribution network for argon gas, blast furnace for hot metal etc. for arranging the production requirements and smooth operation of BOF process
- PC8.** ensure that team is checking the temperature and quantity of hot metal received from blast furnace / Corex for BOF operation
- PC9.** monitor that sampler is taking the sample of hot metal and other materials and sending it to lab for quality and chemical composition analysis by following organizational procedure
- PC10.** analyse the observations of quality check and chemical composition analysis report and set the process parameters of BOF in accordance with it

Perform BOF operations

To be competent, the user/individual on the job must be able to:

- PC11.** use appropriate Personal Protective Equipment (PPE) for safe working in work area
- PC12.** feed the hot metal, solid charge (i.e. scrap, iron ore or any other material) and flux (lime and dololime) in the BOF converter as per SOP/WI

- PC13.** ensure that appropriate quantity of solid charge and flux is added with hot metal in the BOF converter as per SOP
- PC14.** calculate the oxygen requirement and time of blow on the basis of quantity of hot metal for blowing operation
- PC15.** adjust the lance height and start oxygen blow at predetermined flow rate and pressure
- PC16.** operate the BOF converter and perform blowing operation by following SOP/WI
- PC17.** take the sample of liquid steel, measure the temperature of bath and send the sample for chemical composition analysis to lab by following organizational procedures
- PC18.** analyse the chemical composition and if required, decide re-blowing operation again till the required composition is achieved
- PC19.** calculate the amount of oxygen to be reblown; if required, based on the sample analysis and temperature of bath
- PC20.** check that ladle is cleaned and appropriate temperature of ladle is maintained as per SOP
- PC21.** check that ladle is placed in tapping pit before starting the tapping of liquid steel
- PC22.** perform tapping operation to tap the liquid steel in the ladle through tap hole after getting the required composition of the steel and temperature as per the ladle condition and add ferroalloys and other additives as per SOP
- PC23.** perform slagging operation to collect the slag in the slag pot after completion of tapping operation

Perform post BOF operation activities

To be competent, the user/individual on the job must be able to:

- PC24.** inspect the BOF converter for any damage to the refractory lining, perform slag coating on refractory before taking the charge for the next heat
- PC25.** update and maintain shift log of production and prepare production and other reports
- PC26.** record all instructions received from higher authorities in the instruction book and all incidents in the occurrence book
- PC27.** inform concerned authority in case of any abnormalities observed during execution of work

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant standards and procedures followed in the company
- KU2.** basic process of BOF
- KU3.** material i.e. hot metal, lime, dolomite, scrap, iron ore or any other material required for BOF process
- KU4.** SOP as recommended by competent authority of the organisation
- KU5.** normal running characteristics of equipment
- KU6.** how to check BOF converter for lining details, erosion of lining etc.
- KU7.** how to check lance for movement, height and speed of travel
- KU8.** how to check lance cooling system for leakage at maximum designed flow rate and pressure of water
- KU9.** amount of gas already present, maximum holding capacity, gas leakage system in BOF gas holder and gas analysis for percentage Carbon monoxide (CO)



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- KU10.** impact of operating parameters i.e. lance height, argon and oxygen pressure, oxygen flow rate, oxygen blow time etc. on product quality
- KU11.** effect of quality of hot metal and charge material on the process
- KU12.** how to calculate quantity of solid charge and flux needed to be mixed with hot metal
- KU13.** how to calculate oxygen requirement
- KU14.** different operations i.e. feeding, blowing, tapping, slagging etc. of BOF process
- KU15.** procedure of feeding hot metal, solid charge and flux in the BOF converter
- KU16.** procedure of operating BOF converter
- KU17.** how to measure temperature of bath
- KU18.** chemical composition of steel and slag
- KU19.** ladle furnace and continuous casting process
- KU20.** how the quality parameters of liquid steel affect downstream process - productivity, quality and cost point of view
- KU21.** how to calculate slag generated and correlate with capacity of slag pot
- KU22.** post BOF operation activities i.e. inspection, reporting etc
- KU23.** impact of eroded refractory lining on BOF operation
- KU24.** emergency procedures and safety measures such as gas safety, hot metal handling safety etc. associated with BOF operation

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** read work instructions, equipment manuals and process documents
- GS2.** communicate the process requirements to the supervisor and co-workers
- GS3.** attentively listen and comprehend the information given by the supervisor/team members
- GS4.** write work related information in English/regional language
- GS5.** recognise a workplace problem and take suitable action
- GS6.** plan and organise work according to the work requirements
- GS7.** complete the assigned tasks with minimum supervision
- GS8.** report to the supervisor or deal with a colleague individually, depending on the type of concern

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Manage preparatory activities for BOF operation</i>	11	13	-	6
PC1. obtain the required information and work completed in previous shift from logbook, discussions etc. and take handover from the previous shift operator by following organizational procedures	1	1	-	-
PC2. ensure availability of sufficient quantity of material (hot metal, lime, dolomite, scrap, iron ore or any other material), machinery, consumables and tools required for smooth running of the operation and achieving production target	1	1	-	1
PC3. ensure that work area is clean and free of any obstacle or encumbrance	1	1	-	-
PC4. check the condition of BOF convertor, movement of top lance, functioning of bottom plugs, oxygen and argon pressure, lance cooling system etc. as per SOP before starting the operation of new heat	1	2	-	1
PC5. ensure that all safety measures, interlocks, alarms are working and in conformance with the safe operation of BOF converter	1	2	-	1
PC6. check the BOF gas holder for the availability of space for storing BOF gas in it	1	1	-	1
PC7. coordinate with other departments such as oxygen plant for oxygen, gas distribution network for argon gas, blast furnace for hot metal etc. for arranging the production requirements and smooth operation of BOF process	1	1	-	1
PC8. ensure that team is checking the temperature and quantity of hot metal received from blast furnace / Corex for BOF operation	1	1	-	-
PC9. monitor that sampler is taking the sample of hot metal and other materials and sending it to lab for quality and chemical composition analysis by following organizational procedure	1	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. analyse the observations of quality check and chemical composition analysis report and set the process parameters of BOF in accordance with it	2	2	-	1
<i>Perform BOF operations</i>	19	26	-	12
PC11. use appropriate Personal Protective Equipment (PPE) for safe working in work area	1	1	-	-
PC12. feed the hot metal, solid charge (i.e. scrap, iron ore or any other material) and flux (lime and dolomite) in the BOF converter as per SOP/WI	2	3	-	1
PC13. ensure that appropriate quantity of solid charge and flux is added with hot metal in the BOF converter as per SOP	2	2	-	1
PC14. calculate the oxygen requirement and time of blow on the basis of quantity of hot metal for blowing operation	2	2	-	1
PC15. adjust the lance height and start oxygen blow at predetermined flow rate and pressure	1	2	-	2
PC16. operate the BOF converter and perform blowing operation by following SOP/WI	3	4	-	2
PC17. take the sample of liquid steel, measure the temperature of bath and send the sample for chemical composition analysis to lab by following organizational procedures	1	2	-	1
PC18. analyse the chemical composition and if required, decide re-blowing operation again till the required composition is achieved	1	2	-	1
PC19. calculate the amount of oxygen to be reblown; if required, based on the sample analysis and temperature of bath	2	1	-	1
PC20. check that ladle is cleaned and appropriate temperature of ladle is maintained as per SOP	1	2	-	1
PC21. check that ladle is placed in tapping pit before starting the tapping of liquid steel	1	1	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. perform tapping operation to tap the liquid steel in the ladle through tap hole after getting the required composition of the steel and temperature as per the ladle condition and add ferroalloys and other additives as per SOP	1	2	-	1
PC23. perform slagging operation to collect the slag in the slag pot after completion of tapping operation	1	2	-	-
<i>Perform post BOF operation activities</i>	5	6	-	2
PC24. inspect the BOF converter for any damage to the refractory lining, perform slag coating on refractory before taking the charge for the next heat	2	3	-	2
PC25. update and maintain shift log of production and prepare production and other reports	1	1	-	-
PC26. record all instructions received from higher authorities in the instruction book and all incidents in the occurrence book	1	1	-	-
PC27. inform concerned authority in case of any abnormalities observed during execution of work	1	1	-	-
NOS Total	35	45	-	20



Qualification Pack



National Occupational Standards (NOS) Parameters

NOS Code	ISC/N1401
NOS Name	Perform and control BOF operation
Sector	Iron and Steel
Sub-Sector	Steel
Occupation	Steel Making
NSQF Level	6
Credits	16
Version	1.0
Next Review Date	NA



DGT/VSQ/N0103: Employability Skills (90 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

To be competent, the user/individual on the job must be able to:

- PC1.** understand the significance of employability skills in meeting the current job market requirement and future of work
- PC2.** identify and explore learning and employability relevant portals
- PC3.** research about the different industries, job market trends, latest skills required and the available opportunities

Constitutional values - Citizenship

To be competent, the user/individual on the job must be able to:

- PC4.** recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.
- PC5.** follow environmentally sustainable practices

Becoming a Professional in the 21st Century

To be competent, the user/individual on the job must be able to:

- PC6.** recognize the significance of 21st Century Skills for employment
- PC7.** practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life



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PC8. adopt a continuous learning mindset for personal and professional development

Basic English Skills

To be competent, the user/individual on the job must be able to:

PC9. use basic English for everyday conversation in different contexts, in person and over the telephone

PC10. read and understand routine information, notes, instructions, mails, letters etc. written in English

PC11. write short messages, notes, letters, e-mails etc. in English

Career Development & Goal Setting

To be competent, the user/individual on the job must be able to:

PC12. identify career goals based on the skills, interests, knowledge, and personal attributes

PC13. prepare a career development plan with short- and long-term goals

Communication Skills

To be competent, the user/individual on the job must be able to:

PC14. follow verbal and non-verbal communication etiquette while communicating in professional and public settings

PC15. use active listening techniques for effective communication

PC16. communicate in writing using appropriate style and format based on formal or informal requirements

PC17. work collaboratively with others in a team

Diversity & Inclusion

To be competent, the user/individual on the job must be able to:

PC18. communicate and behave appropriately with all genders and PwD

PC19. escalate any issues related to sexual harassment at workplace according to POSH Act

Financial and Legal Literacy

To be competent, the user/individual on the job must be able to:

PC20. identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.

PC21. carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook

PC22. identify common components of salary and compute income, expenses, taxes, investments etc

PC23. identify relevant rights and laws and use legal aids to fight against legal exploitation

Essential Digital Skills

To be competent, the user/individual on the job must be able to:

PC24. operate digital devices and use their features and applications securely and safely

PC25. carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.

PC26. display responsible online behaviour while using various social media platforms

PC27. create a personal email account, send and process received messages as per requirement

PC28. carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications

PC29. utilize virtual collaboration tools to work effectively



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Entrepreneurship

To be competent, the user/individual on the job must be able to:

- PC30.** identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research
- PC31.** develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion
- PC32.** identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

Customer Service

To be competent, the user/individual on the job must be able to:

- PC33.** identify different types of customers and ways to communicate with them
- PC34.** identify and respond to customer requests and needs in a professional manner
- PC35.** use appropriate tools to collect customer feedback
- PC36.** follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

To be competent, the user/individual on the job must be able to:

- PC37.** create a professional Curriculum vitae (Résumé)
- PC38.** search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively
- PC39.** apply to identified job openings using offline /online methods as per requirement
- PC40.** answer questions politely, with clarity and confidence, during recruitment and selection
- PC41.** identify apprenticeship opportunities and register for it as per guidelines and requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** need for employability skills and different learning and employability related portals
- KU2.** various constitutional and personal values
- KU3.** different environmentally sustainable practices and their importance
- KU4.** Twenty first (21st) century skills and their importance
- KU5.** how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up
- KU6.** importance of career development and setting long- and short-term goals
- KU7.** about effective communication
- KU8.** POSH Act
- KU9.** Gender sensitivity and inclusivity
- KU10.** different types of financial institutes, products, and services
- KU11.** components of salary and how to compute income and expenditure
- KU12.** importance of maintaining safety and security in offline and online financial transactions
- KU13.** different legal rights and laws
- KU14.** different types of digital devices and the procedure to operate them safely and securely
- KU15.** how to create and operate an e- mail account



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- KU16.** use applications such as word processors, spreadsheets etc.
- KU17.** how to identify business opportunities
- KU18.** types and needs of customers
- KU19.** how to apply for a job and prepare for an interview
- KU20.** apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** read and write different types of documents/instructions/correspondence in English and other languages
- GS2.** communicate effectively using appropriate language in formal and informal settings
- GS3.** behave politely and appropriately with all to maintain effective work relationship
- GS4.** how to work in a virtual mode, using various technological platforms
- GS5.** perform calculations efficiently
- GS6.** solve problems effectively
- GS7.** pay attention to details
- GS8.** manage time efficiently
- GS9.** maintain hygiene and sanitization to avoid infection

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Introduction to Employability Skills</i>	1	1	-	-
PC1. understand the significance of employability skills in meeting the current job market requirement and future of work	-	-	-	-
PC2. identify and explore learning and employability relevant portals	-	-	-	-
PC3. research about the different industries, job market trends, latest skills required and the available opportunities	-	-	-	-
<i>Constitutional values – Citizenship</i>	1	1	-	-
PC4. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC5. follow environmentally sustainable practices	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	1	3	-	-
PC6. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC7. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
PC8. adopt a continuous learning mindset for personal and professional development	-	-	-	-
<i>Basic English Skills</i>	3	4	-	-
PC9. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC11. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
<i>Career Development & Goal Setting</i>	1	2	-	-
PC12. identify career goals based on the skills, interests, knowledge, and personal attributes	-	-	-	-
PC13. prepare a career development plan with short- and long-term goals	-	-	-	-
<i>Communication Skills</i>	2	2	-	-
PC14. follow verbal and non-verbal communication etiquette while communicating in professional and public settings	-	-	-	-
PC15. use active listening techniques for effective communication	-	-	-	-
PC16. communicate in writing using appropriate style and format based on formal or informal requirements	-	-	-	-
PC17. work collaboratively with others in a team	-	-	-	-
<i>Diversity & Inclusion</i>	1	1	-	-
PC18. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC19. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	2	3	-	-
PC20. identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.	-	-	-	-
PC21. carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC23. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
<i>Essential Digital Skills</i>	3	5	-	-
PC24. operate digital devices and use their features and applications securely and safely	-	-	-	-
PC25. carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.	-	-	-	-
PC26. display responsible online behaviour while using various social media platforms	-	-	-	-
PC27. create a personal email account, send and process received messages as per requirement	-	-	-	-
PC28. carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications	-	-	-	-
PC29. utilize virtual collaboration tools to work effectively	-	-	-	-
<i>Entrepreneurship</i>	2	3	-	-
PC30. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC31. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC32. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
<i>Customer Service</i>	1	2	-	-
PC33. identify different types of customers and ways to communicate with them	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC34. identify and respond to customer requests and needs in a professional manner	-	-	-	-
PC35. use appropriate tools to collect customer feedback	-	-	-	-
PC36. follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship & Jobs</i>	2	3	-	-
PC37. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC38. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC39. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC40. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC41. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	20	30	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0103
NOS Name	Employability Skills (90 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	5
Credits	3
Version	1.0
Last Reviewed Date	NA
Next Review Date	17/05/2023
NSQC Clearance Date	17/11/2022

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) (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 center (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.
6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

Minimum Aggregate Passing % at QP Level : 70

(Please note: Every Trainee should score a minimum aggregate passing percentage as specified above, to



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successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ISC/N0008.Use basic health and safety practices at the workplace	30	50	-	20	100	10
ISC/N0009.Work effectively with others	30	50	-	20	100	10
ISC/N1401.Perform and control BOF operation	35	45	-	20	100	70
DGT/VSQ/N0103.Employability Skills (90 Hours)	20	30	-	-	50	10
Total	115	175	-	60	350	100



Qualification Pack



Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training



Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.



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Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.