Qualification Pack

Cold Chain Specialist (Green Engineering)

QP Code: LSC/Q9202

Version: 1.0

NSQF Level: 6

Logistics Sector Skill Council || No. 480 A, 7th Floor, Khivraj Complex II, Anna Salai, Nandanam
Chennai-600035 || email:hari@lsc-india.com

Contents

Qualification Pack

LSC/Q9202: Cold Chain Specialist (Green Engineering)

Brief Job Description

The individual at work manages sustainability in cold chain by analyzing data related to energy use, identifying inefficiencies and implementing ways towards sustainability. The person is also responsible for maintaining equipment for temperature and storage conditions, undertaking water and effluent treatment in the plant and managing control systems of the refrigeration system components.

Personal Attributes

The job requires the individual to have high concentration for long periods of time, excellent vision, high stamina, good hand eye coordination and ability to work in cold temperatures for long duration.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. LSC/N9201: Implement energy efficiency and greening aspects in the cold storage
2. LSC/N9202: Oversee modified atmosphere requirements for the products
3. LSC/N9203: Undertake water treatment and conservation
4. LSC/N9204: Manage the renewed engineering system with greening aspects in cold storage
5. LSC/N9901: Maintain food and personnel safety, health and hygiene in cold storage plant
6. DGT/VSQ/N0103: Employability Skills (90 Hours)

Qualification Pack (QP) Parameters

Sector	Logistics
Sub-Sector	Cold Chain Logistics Solutions
Occupation	Engineering, Sustainability
Country	India
NSQF Level	6
Credits	20

Qualification Pack

Aligned to NCO/ISCO/ISIC Code	NCO-2015/1324
Minimum Educational Qualification & Experience	Completed 4 year UG program (In Mechanical/ Electrical/ Electronics/ Refrigeration Engineering/ Food Technology/ Pharma/ Relevant trade)) with 1 Year of experience in cold storage operations OR Diploma (Completed 2-year diploma (after 12th Grade) in Mechanical/ Electrical/ Electronics/ Refrigeration Engineering/ Food Technology/ Pharma/ Relevant trade) with 3 Years of experience in cold storage operations OR Previous relevant Qualification of NSQF Level (5.5) with 2 Years of experience in cold storage operations OR Previous relevant Qualification of NSQF Level (5) with 3 Years of experience in cold storage operations
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	23 Years
Last Reviewed On	NA
Next Review Date	15/03/2027
NSQC Approval Date	15/03/2024
Version	1.0
Reference code on NQR	QG-06-TW-02192-2024-V1-LSC
NQR Version	1.0

LSC/N9201: Implement energy efficiency and greening aspects in the cold storage

Description

This OS unit is about analyzing energy usage in various processes of the cold chain, identifying areas to improve efficiency and undertake measures for the same.

Scope

The scope covers the following :

- Analyse data related to energy usage
- Identify inefficiencies in energy consumption and ways to fix them
- Implement ways to minimize energy inefficiencies

Elements and Performance Criteria

Analyse data related to energy usage

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

PC1. identify parameters impacting energy usage

PC2. perform correlation between energy consumption and the parameters identified to impact energy usage

PC3. monitor electrical energy consumption, temperature, Relative Humidity (RH) and air pressure

PC4. define threshold for parameters in energy consumption

PC5. check all thermostat set points

PC6. evaluate costs and benefits of re-piping the facilities

PC7. perform thermographic inspection to analyse cold areas where there is poor insulation

Identify inefficiencies in energy consumption and ways to fix them

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

PC8. separate energy consumption of refrigeration system from the energy used by the whole plant

PC9. identify the quantum of undercooling and overcooling during the analysis period

PC10. identify the impact of weather conditions on the energy consumed

PC11. explore ways to control lighting by daylight sensors and occupancy sensors

PC12. identify ways to adjust chiller or refrigeration equipment to achieve better performance

PC13. look for ways to promote renewable energy by utilizing bio-waste to generate biogas, wherever possible

PC14. improve evaporator performance by looking for ways to reduce fan motor horsepower

Implement ways to minimize energy inefficiencies

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

PC15. use eco-friendly refrigerants with minimal global warming potential of ozone depleting substances

PC16. ensure to pick air cooled condenser or evaporative condenser based on the refrigerant used, size of the system and availability of water

PC17. achieve optimal energy usage conditions for the chiller

PC18. improve part-load performance for evaporators, condensers and compressors

PC19. reduce refrigeration load by checking under-floor heating, insulation levels, warehouse doors usage

PC20. reduce load in lighting of the warehouse, by using high efficiency lighting (sodium lights or high frequency fluorescents)

PC21. choose energy-efficient lighting and recommend installing skylights, LEDs with sensors (intelligent occupancy sensors, motion sensors, heat maps), etc.

PC22. ensure that Lighting Power Density (LPD) does not exceed the required

PC23. recommend replacing smart appliances instead of traditional high power consuming standard devices, e.g., HVAC

PC24. use machinery and equipment like MHE that runs on electric or alternative clean energy

PC25. employ automatic refrigerant leak detection systems

PC26. reduce heat load by improving insulation and reducing air leakage

PC27. select low power consumed per ton of refrigeration, while upgrading evaporator units

PC28. upgrade to high efficiency condenser units, sensor-controlled ventilation systems etc.

PC29. use sliding doors instead of traditional freezer doors, which are better insulated, require low maintenance, reduce frost build up, thereby reducing overall energy consumption

PC30. use energy efficient PVC strip curtains for the cold storage doors or air curtains, to reduce air exchange during door openings

PC31. ensure that the floor heaters are working properly and well protected for the deep freezers

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. minimum acceptable standards for energy efficiency required by the company

KU2. corporate policy regarding methods of calculating contribution to global warming

KU3. how to undertake yearly energy audits on the plant

KU4. organizational policies and guidelines

KU5. reporting structure

KU6. communication with relevant people in the organization to take their buy-in for energy optimizing activities

KU7. refrigerant usage with its relevant safety and security procedures

KU8. procedures to follow during system emergency issues

KU9. roles and responsibilities of labourers in the cold storage area

KU10. how to measure electrical energy consumed, temperature, relative humidity and air pressure

KU11. how to regularly collect data regarding temperature set point, discharge and suction pressure, operating hours of the chiller etc

KU12. relation between carbon emissions and refrigerant leaks

KU13. how to analyse what proportion of energy is used for each of the following - chiller/refrigeration, warehouse lighting, dock and freezer doors, battery charging, freezer floor heating, maintenance activities, storage and reefer vehicles
KU14. application of refrigeration for different types of products
KU15. characteristics of the products dealt with
KU16. cold storage and transport requirement conditions for products dealt with
KU17. various data acquisition systems available for plant refrigeration
KU18. the principles of cooling system design, carbon dioxide cascading, defrost system and purgers (for air and water)
KU19. the harmful effects of frost and ways to keep it out of the refrigerated spaces
KU20. types of refrigeration compressors available
KU21. how to perform thermal profile by collection of data from temperature sensors
KU22. how to record ambient conditions
KU23. how to alert in case of critical deviations in energy usage
KU24. chiller operations, compressor sequencing, and capacity regulation
KU25. how precooling of condenser air in air cooled system increases energy efficiency
KU26. collecting operational parameters for refrigeration equipment and/or chiller used
KU27. under-floor heating system to know how pump and heating is controlled
KU28. usage of occupancy sensor and daylight sensor
KU29. different techniques to control defrosting
KU30. selection of accessories and tools required for various activities
KU31. parameters of global sustainability
KU32. significance of CO_2 emissions and its impact on global warming
KU33. knowledge about material footprint per capita and material footprint per GDP
KU34. keep updated about the initiatives taken by the government and various organisations for sustainability
KU35. legislative requirements and organisational procedures for waste management and disposal
KU36. parameters and data required for material and energy audit

Generic Skills (GS)

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

GS1. read about energy consumption patterns by different processes in cold chain
GS2. read about energy efficiency improvement techniques
GS3. read safety instructions
GS4. note down energy consumption
GS5. prepare report on the efficacy of energy efficiency techniques employed
GS6. communicate to the workers, on the precautions to be taken regarding energy inefficiencies in the cold chain
GS7. interact with other employees to work efficiently
GS8. choose from multiple energy saving alternatives in the plant functioning

GS9. decide on the priority of tasks planned
GS10. plan and organize incremental targets towards achieving energy efficiency
GS11. plan resources by selecting, training, and ensuring discipline amongst them
GS12. spot origins of process disruptions
GS13. re-schedule tasks in case of delays or requirements by other departments in the organization
GS14. interpret equipment and process diagrams to identity which components can work more efficiently
GS15. analyze relation between energy consumed and plant parameters
GS16. analyze time series data, regarding temperature, humidity or air pressure
GS17. analyze critical recurring issues and identify measures to solve the same
GS18. use acquired knowledge to trace inefficiencies in the process
GS19. plan and prioritize tasks based on the implications of the energy inefficiencies

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Analyse data related to energy usage	**6**	**12**	**-**	**3**
PC1. identify parameters impacting energy usage	0.5	1	-	-
PC2. perform correlation between energy consumption and the parameters identified to impact energy usage	1	1	-	1
PC3. monitor electrical energy consumption, temperature, Relative Humidity (RH) and air pressure	1	2	-	-
PC4. define threshold for parameters in energy consumption	1	2	-	-
PC5. check all thermostat set points	0.5	2	-	-
PC6. evaluate costs and benefits of re-piping the facilities	1	2	-	1
PC7. perform thermographic inspection to analyse cold areas where there is poor insulation	1	2	-	1
Identify inefficiencies in energy consumption and ways to fix them	**7**	**14**	**-**	**2**
PC8. separate energy consumption of refrigeration system from the energy used by the whole plant	1	2	-	-
PC9. identify the quantum of undercooling and overcooling during the analysis period	1	2	-	-
PC10. identify the impact of weather conditions on the energy consumed	1	2	-	-
PC11. explore ways to control lighting by daylight sensors and occupancy sensors	1	2	-	1
PC12. identify ways to adjust chiller or refrigeration equipment to achieve better performance	1	2	-	-
PC13. look for ways to promote renewable energy by utilizing bio-waste to generate biogas, wherever possible	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. improve evaporator performance by looking for ways to reduce fan motor horsepower	1	2	-	1
Implement ways to minimize energy inefficiencies	**17**	**34**	**-**	**5**
PC15. use eco-friendly refrigerants with minimal global warming potential of ozone depleting substances	1	2	-	-
PC16. ensure to pick air cooled condenser or evaporative condenser based on the refrigerant used, size of the system and availability of water	1	2	-	-
PC17. achieve optimal energy usage conditions for the chiller	1	2	-	1
PC18. improve part-load performance for evaporators, condensers and compressors	1	2	-	1
PC19. reduce refrigeration load by checking under-floor heating, insulation levels, warehouse doors usage	1	2	-	-
PC20. reduce load in lighting of the warehouse, by using high efficiency lighting (sodium lights or high frequency fluorescents)	1	2	-	1
PC21. choose energy-efficient lighting and recommend installing skylights, LEDs with sensors (intelligent occupancy sensors, motion sensors, heat maps), etc.	1	2	-	-
PC22. ensure that Lighting Power Density (LPD) does not exceed the required	1	2	-	-
PC23. recommend replacing smart appliances instead of traditional high power consuming standard devices, e.g., HVAC	1	2	-	-
PC24. use machinery and equipment like MHE that runs on electric or alternative clean energy	1	2	-	-
PC25. employ automatic refrigerant leak detection systems	1	2	-	1
PC26. reduce heat load by improving insulation and reducing air leakage	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC27. select low power consumed per ton of refrigeration, while upgrading evaporator units	1	2	-	-
PC28. upgrade to high efficiency condenser units, sensor-controlled ventilation systems etc.	1	2	-	1
PC29. use sliding doors instead of traditional freezer doors, which are better insulated, require low maintenance, reduce frost build up, thereby reducing overall energy consumption	1	2	-	-
PC30. use energy efficient PVC strip curtains for the cold storage doors or air curtains, to reduce air exchange during door openings	1	2	-	-
PC31. ensure that the floor heaters are working properly and well protected for the deep freezers	1	2	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	LSC/N9201
NOS Name	Implement energy efficiency and greening aspects in the cold storage
Sector	Logistics
Sub-Sector	Cold Chain Logistics Solutions
Occupation	Engineering, Sustainability
NSQF Level	6
Credits	3
Version	2.0
Last Reviewed Date	15/03/2024
Next Review Date	15/03/2027
NSQC Clearance Date	15/03/2024

LSC/N9202: Oversee modified atmosphere requirements for the products

Description

This OS is about preparing, maintaining and monitoring cold room, container and equipment for modified atmosphere requirements of various products.

Scope

The scope covers the following :

- Prepare and monitor cold room or container for modified atmosphere storage
- Prepare and maintain equipment for modified atmosphere conditions
- Monitor and report modified atmosphere conditions

Elements and Performance Criteria

Prepare and monitor cold room or container for modified atmosphere storage

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

PC1. maintain temperature ranges ideal for the products stored or transported

PC2. maintain concentration of oxygen, carbon dioxide, nitrogen and ethylene as per the commodities stored

PC3. consider product heat and set ventilation to control cooling and carbon dioxide level

PC4. monitor composition of gases regularly and accurately

PC5. monitor for chilling injury symptoms on the products

PC6. ensure to keep the room or container sealed

PC7. ensure proper sanitation to avoid conditions which favours thriving of pathogenic microorganisms

Prepare and maintain equipment for modified atmosphere conditions

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

PC8. assign a resource to maintain records of refrigeration equipment

PC9. operate nitrogen generator with its controls and fan blowers

PC10. regularly sample air parameters in the cold chamber to check the conditions

PC11. monitor when to stop the system and replenish the cold chamber with fresh air when required

PC12. ensure to retrofit container with purge port assembly, when they contain perishable products and transported, to make it suitable for modified atmosphere use

PC13. prepare absorbers and adsorbers of oxygen, carbon dioxide, ethylene and water

Monitor and report modified atmosphere conditions

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

PC14. ensure that legal requirements are followed while collecting, moving or

PC15. prepare documentation regarding modified atmospheric conditions maintained for different products

PC16. ensure that maintenance records of relevant equipment and cleaning records in the modified atmosphere storage area are made

PC17. report any faults in the readings of required modified atmosphere requirements

PC18. quantify extended storability of the products dealt with

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organizational policies and guidelines

KU2. reporting structure

KU3. refrigerant usage with its relevant safety and security procedures

KU4. procedures to follow during emergency issues

KU5. roles and responsibilities of labourers in the cold storage area

KU6. accessories and tools required for maintaining modified atmosphere

KU7. typical ratios of different gases used in modified atmosphere requirements for different types of products

KU8. importance of having modified atmosphere to control shelf life of various products

KU9. different types of processes used to attain modified atmosphere requirements

KU10. different types of equipments required in modified atmosphere storage and packing

KU11. methods to alter atmosphere, like, controlled atmosphere, modified atmosphere, fresh air exchange, and packaging solutions

KU12. benefits and detrimental effects of modified atmosphere on products

KU13. storage requirements of various types of products

KU14. common commodities which require modified atmosphere

KU15. key physical and chemical stages in natural ripening of perishable products

KU16. how environmental conditions like cold room temperature and humidity affect life cycle of products

KU17. timescales of ripening and how to control them, in case of fresh produce ripening

KU18. how the condition of one product is affected by the presence of other products handled alongside in the cold chain

KU19. exposure of products to ethylene with regards to its respiration rate and ripening

KU20. methods for assessing product quality stored in modified atmosphere conditions

KU21. relation between product respiration rate and atmospheric composition

KU22. effects of modified atmospheric conditions on the skin colour, firmness, texture of the products

KU23. relation between metabolism rate and variations in temperature, relative humidity and oxygen levels

KU24. parameters of global sustainability

KU25. significance of CO_2 emissions and its impact on global warming

KU26. knowledge about material footprint per capita and material footprint per GDP

KU27. the initiatives taken by the government and various organisations for sustainability

KU28. legislative requirements and organisational procedures for waste management and disposal

KU29. parameters and data required for material and energy audit

Generic Skills (GS)

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

GS1. process required for different types of products

GS2. read equipment manual to handle its operation

GS3. read documents regarding modified atmosphere concepts

GS4. read safety instructions

GS5. write down process parameters in modified atmospheric conditions

GS6. write observations related to the process

GS7. communicate all the activities required to be done to the subordinates

GS8. listen to the queries and clarify doubts

GS9. communicate any issue that may arise in the modified atmosphere process to the concerned technical solver

GS10. interact frequently with other employees to work efficiently

GS11. decide on the priority of tasks

GS12. plan routine checks to ensure modified atmosphere conditions are maintained

GS13. organize tasks and allocate labour resources for the process to maintain modified atmosphere

GS14. organize activities based on budgeting constraints

GS15. enforce exact modified atmosphere storage and hygiene conditions as per the products handled for the organization or for its customers

GS16. solve any work related problems that workers may face

GS17. handle allotment of tasks to workers in case of staff shortage or delays in activities

GS18. interpret process flowcharts for modified atmosphere required for different products

GS19. analyze critical recurring issues and identify measures to solve the same

GS20. identify ways to minimize chilling symptoms seen on the products

GS21. use acquired knowledge to trace issues in the process

GS22. understand mathematical models relating respiration of various commodities and atmospheric composition

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare and monitor cold room or container for modified atmosphere storage	**14**	**22**	**-**	**3**
PC1. maintain temperature ranges ideal for the products stored or transported	2	3	-	-
PC2. maintain concentration of oxygen, carbon dioxide, nitrogen and ethylene as per the commodities stored	2	3	-	-
PC3. consider product heat and set ventilation to control cooling and carbon dioxide level	2	3	-	-
PC4. monitor composition of gases regularly and accurately	2	3	-	-
PC5. monitor for chilling injury symptoms on the products	2	3	-	1
PC6. ensure to keep the room or container sealed	2	3	-	1
PC7. ensure proper sanitation to avoid conditions which favours thriving of pathogenic microorganisms	2	4	-	1
Prepare and maintain equipment for modified atmosphere conditions	**11**	**20**	**-**	**4**
PC8. assign a resource to maintain records of refrigeration equipment	2	3	-	-
PC9. operate nitrogen generator with its controls and fan blowers	2	3	-	1
PC10. regularly sample air parameters in the cold chamber to check the conditions	2	3	-	-
PC11. monitor when to stop the system and replenish the cold chamber with fresh air when required	2	3	-	1
PC12. ensure to retrofit container with purge port assembly, when they contain perishable products and transported, to make it suitable for modified atmosphere use	2	4	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. prepare absorbers and adsorbers of oxygen, carbon dioxide, ethylene and water	1	4	-	1
Monitor and report modified atmosphere conditions	**5**	**18**	**-**	**3**
PC14. ensure that legal requirements are followed while collecting, moving or	1	4	-	1
PC15. prepare documentation regarding modified atmospheric conditions maintained for different products	1	4	-	1
PC16. ensure that maintenance records of relevant equipment and cleaning records in the modified atmosphere storage area are made	1	4	-	-
PC17. report any faults in the readings of required modified atmosphere requirements	1	3	-	1
PC18. quantify extended storability of the products dealt with	1	3	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	LSC/N9202
NOS Name	Oversee modified atmosphere requirements for the products
Sector	Logistics
Sub-Sector	Cold Chain Logistics Solutions
Occupation	Engineering, Sustainability
NSQF Level	6
Credits	3
Version	2.0
Last Reviewed Date	15/03/2024
Next Review Date	15/03/2027
NSQC Clearance Date	15/03/2024

LSC/N9203: Undertake water treatment and conservation

Description

This OS unit is about undertaking and monitoring water and effluent treatment program in the plant

Scope

The scope covers the following :

- Undertake water and effluent treatment program in the plant
- Monitor performance of the water and effluent treatment
- Implement water conservation

Elements and Performance Criteria

Undertake water and effluent treatment program in the plant

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

PC1. ensure that the water treatment programme consists of controlling water circulation, chemical feed and routine monitoring

PC2. ensure that treated water is used on the product, to avoid the threat of external pathogens spoiling them

PC3. verify water treatment system compatibility with the plant operations

PC4. explore options to collect water from evaporator units, if they have defrost unit, and provide them to condenser or cooling tower

PC5. ensure to maintain condenser tubes clean after water treatment

PC6. identify treated effluent and tweak its treatment, if it is not as per the specification

Monitor performance of the water and effluent treatment

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

PC7. record information and document necessary details for generating programme efficacy report

PC8. monitor remedial engineering works

PC9. confirm that the treatment areas are hygienic and safe

PC10. investigate faults and errors and take corrective actions

PC11. train operators for water and effluent treatment procedures employed

PC12. monitor overfeed or underfeed of water treatment chemicals

PC13. inspect chemical feed system to check for leaks

Implement water conservation

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

PC14. find cost effective ways for treatment and recycle of COD (Chemical Oxygen Demand) wastewater

PC15. explore possibility of rainwater harvesting in case there is large roof surfaces for the cold storage plant

PC16. develop processes to maintain and have zero wastage/ emission or net-positive water footprint by implementing ways to conserve and reuse water, e.g., installing automated/sensor-enabled water faucets, integrating sensors with IoT for transmission, installing low-flow faucets and toilets, fixing leaks promptly, optimising water-intensive processes, installing sewage water treatment plants etc.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. importance of having water and effluent treatment programme in accordance with the operating procedures of the company

KU2. compliance and site specific requirements of the water and effluent treatment programme that should be in accordance with

KU3. how to wear protective gear while handling or overseeing water and effluent treatment

KU4. corrective actions that can be taken in accordance with company procedures

KU5. organizational policies and guidelines

KU6. reporting structure

KU7. refrigerant usage with its relevant safety and security procedures

KU8. safety procedures in using chemicals for the treatment

KU9. procedures to follow during emergency maintenance and repair issues

KU10. procedures for safe transport and disposal of waste materials

KU11. importance of effective water treatment for efficient and reliable refrigeration system operation

KU12. water related problems that can happen in the cold store plant, like corrosion and microbiological growth

KU13. how to make a risk assessment for work tasks in the cold chain where water or effluent is generated

KU14. different types of treatment systems available for water waste and effluent

KU15. concepts of microbiology and water chemistry which applies to effluent treatment

KU16. how to do legionella (bacteria) risk assessment

KU17. how to take measures to prevent cross contamination of various products dealt with in the cold chain

KU18. how to plan and record performance monitoring for the programme

KU19. how to determine feasible recovery rate for recycling of water

KU20. primary and secondary treatment methods of effluent waters

KU21. application of refrigeration for different types of products

KU22. usage of ozone in tertiary treatment to remove odour, colour and micro organisms in sewage water

KU23. harmful effects of overfeeding and underfeeding water treatment chemicals

KU24. methods of treating wastewater and recycling of water

KU25. parameters of global sustainability

KU26. significance of CO_2 emissions and its impact on global warming

KU27. knowledge about material footprint per capita and material footprint per GDP
KU28. the initiatives taken by the government and various organisations for sustainability
KU29. legislative requirements and organisational procedures for waste management and disposal
KU30. parameters and data required for material and energy audit

Generic Skills (GS)

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

GS1. read water and effluent treatment standards and procedures
GS2. read safety instructions
GS3. how to make documentation regarding water and effluent treatment activities
GS4. communicate to workers clearly about the requirements in water and effluent treatment activities
GS5. interact frequently with other employees to work efficiently
GS6. mentor all the workers under supervision to increase operational effectiveness
GS7. decide on the extent of water and effluent treatment done, based on the hygiene requirements and the products
GS8. plan maintenance activities as per standard requirements and manufacturer's instructions
GS9. plan equipment service based on its working condition
GS10. enforce storage and hygiene conditions as per the products handled for the organization or for its customers
GS11. ensure to solve operating problems as per best practices
GS12. re-schedule tasks in case of delays or requirements by other departments in the organization
GS13. interpret schematic diagrams of the treatment procedures
GS14. analyze efficacy of the treatment programme employed
GS15. find ways to reduce sewer costs
GS16. analyze critical recurring issues and identify measures to solve the same
GS17. interpret outputs from the water and effluent treatment programs applied
GS18. use acquired knowledge to trace faults in the process

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Undertake water and effluent treatment program in the plant	**10**	**29**	**-**	**4**
PC1. ensure that the water treatment programme consists of controlling water circulation, chemical feed and routine monitoring	1	5	-	-
PC2. ensure that treated water is used on the product, to avoid the threat of external pathogens spoiling them	1	5	-	-
PC3. verify water treatment system compatibility with the plant operations	2	5	-	1
PC4. explore options to collect water from evaporator units, if they have defrost unit, and provide them to condenser or cooling tower	2	5	-	1
PC5. ensure to maintain condenser tubes clean after water treatment	2	5	-	1
PC6. identify treated effluent and tweak its treatment, if it is not as per the specification	2	5	-	1
Monitor performance of the water and effluent treatment	**14**	**28**	**-**	**5**
PC7. record information and document necessary details for generating programme efficacy report	2	4	-	1
PC8. monitor remedial engineering works	2	4	-	-
PC9. confirm that the treatment areas are hygienic and safe	2	4	-	1
PC10. investigate faults and errors and take corrective actions	2	4	-	-
PC11. train operators for water and effluent treatment procedures employed	2	4	-	1
PC12. monitor overfeed or underfeed of water treatment chemicals	2	4	-	1
PC13. inspect chemical feed system to check for leaks	2	4	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Implement water conservation	**6**	**3**	**-**	**1**
PC14. find cost effective ways for treatment and recycle of COD (Chemical Oxygen Demand) wastewater	2	1	-	-
PC15. explore possibility of rainwater harvesting in case there is large roof surfaces for the cold storage plant	2	1	-	1
PC16. develop processes to maintain and have zero wastage/ emission or net-positive water footprint by implementing ways to conserve and reuse water, e.g., installing automated/sensor-enabled water faucets, integrating sensors with IoT for transmission, installing low-flow faucets and toilets, fixing leaks promptly, optimising water-intensive processes, installing sewage water treatment plants etc.	2	1	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	LSC/N9203
NOS Name	Undertake water treatment and conservation
Sector	Logistics
Sub-Sector	Cold Chain Logistics Solutions
Occupation	Engineering, Sustainability
NSQF Level	6
Credits	3
Version	2.0
Last Reviewed Date	15/03/2024
Next Review Date	15/03/2027
NSQC Clearance Date	15/03/2024

LSC/N9204: Manage the renewed engineering system with greening aspects in cold storage

Description

This OS unit is about managing engineering system for the cold chain.

Scope

The scope covers the following :

- Manage control system for the main components of refrigeration system
- Identify the need for revamping existing facilities for energy saving
- Prepare documentation regarding management of engineering system

Elements and Performance Criteria

Manage control system for the main components of refrigeration system

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

PC1. automate the operation of evaporators, condensers and compressors as much as possible

PC2. minimize the power consumption for evaporators, condensers and compressors combined

PC3. control evaporators when the cold room has attained desired temperature

PC4. ensure that hydraulic oil is adapted to the temperatures operated at the cold store

Identify the need for revamping existing facilities for energy saving

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

PC5. identify different components of engineering system employed which needs to be checked at regular intervals

PC6. plan and schedule the frequency with which each component in the facility needs to be examined

PC7. analyse pressure drop between condenser and evaporator, to check if it crosses two pounds

PC8. examine insulated pipes which show signs of corrosion or frost appearances

PC9. examine corroded parts to analyse and decide regarding the need for re-insulation or maintenance

Prepare documentation regarding management of engineering system

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

PC10. record information and document regarding operations of evaporators, condensers and compressors

PC11. document power consumption of refrigeration system at regular intervals

PC12. record observations made in the analysis of existing facilities and the needs identified for its revamp

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organizational policies and guidelines
KU2. reporting structure
KU3. refrigerant usage with its relevant safety and security procedures
KU4. procedures to follow during emergency system issues
KU5. roles and responsibilities of labourers in the cold storage area
KU6. control system handling procedures for refrigeration equipment
KU7. procedures for safe transport and disposal of waste materials
KU8. cost and energy consumption of various equipment used in the organization
KU9. importance of control method for refrigeration system
KU10. mechanism of simple vapour compression refrigeration system and air refrigeration system
KU11. types of evaporators and factors affecting its heat transfer capacity
KU12. types of compressors, and the parameters for its working, like discharge pressure, suction pressure, compression ratio, compressor capacity and volumetric efficiency
KU13. types and working of condensers, and factors affecting its capacity
KU14. application of refrigeration for different types of products
KU15. working of hand operated expansion valve
KU16. different process freezing techniques like contact freezing and air blast freezing
KU17. that a facility needs a re-piping if pressure drop between condenser and evaporator crosses two pounds
KU18. how to check pressure drop by using pressure gauges
KU19. types, properties and thickness of insulation requirements
KU20. parameters of global sustainability
KU21. significance of CO2 emissions and its impact on global warming
KU22. knowledge about material footprint per capita and material footprint per GDP
KU23. the initiatives taken by the government and various organisations for sustainability
KU24. legislative requirements and organisational procedures for waste management and disposal
KU25. parameters and data required for material and energy audit

Generic Skills (GS)

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

GS1. read about equipment engineering and understand its working
GS2. read and comprehend technical documents regarding mechanics and hydraulic aspects of cold chain engineering
GS3. read safety instructions
GS4. note down problems in the system
GS5. write down process notes regarding observations in mechanics and hydraulics of all equipments used
GS6. make analytical document or report regarding existing engineering systems
GS7. communicate and seek inputs from workers regarding working of various components
GS8. communicate to workers clearly about the requirements in managing control systems

GS9. communicate technical knowledge regarding equipment functioning

GS10. listen and understand all queries or doubts the workers have in mechanics or hydraulic aspects of cold chain engineering

GS11. resolve emergency situations in system functioning

GS12. plan training activities

GS13. organize practical learning techniques

GS14. plan maintenance activities as per standard requirements and manufacturer's instructions

GS15. plan equipment service based on its working condition

GS16. help solve all queries or difficulties faced by trainees

GS17. re-schedule tasks in case of delays or requirements by other departments in the organization

GS18. handle allotment of tasks to workers in case of staff shortage or delays in activities

GS19. interpret equipment diagram and information to identity how each component is engineered to work

GS20. analyze critical recurring issues and identify measures to solve the same

GS21. assess working condition of various equipments

GS22. plan activities to minimize effects on normal working of the organization

GS23. optimize working of control systems in refrigeration equipment

GS24. use acquired knowledge to trace technical errors in the plant

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Manage control system for the main components of refrigeration system	**12**	**20**	**-**	**3**
PC1. automate the operation of evaporators, condensers and compressors as much as possible	3	5	-	1
PC2. minimize the power consumption for evaporators, condensers and compressors combined	3	5	-	-
PC3. control evaporators when the cold room has attained desired temperature	3	5	-	1
PC4. ensure that hydraulic oil is adapted to the temperatures operated at the cold store	3	5	-	1
Identify the need for revamping existing facilities for energy saving	**12**	**25**	**-**	**4**
PC5. identify different components of engineering system employed which needs to be checked at regular intervals	3	5	-	-
PC6. plan and schedule the frequency with which each component in the facility needs to be examined	3	5	-	1
PC7. analyse pressure drop between condenser and evaporator, to check if it crosses two pounds	2	5	-	1
PC8. examine insulated pipes which show signs of corrosion or frost appearances	2	5	-	1
PC9. examine corroded parts to analyse and decide regarding the need for re-insulation or maintenance	2	5	-	1
Prepare documentation regarding management of engineering system	**6**	**15**	**-**	**3**
PC10. record information and document regarding operations of evaporators, condensers and compressors	2	5	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. document power consumption of refrigeration system at regular intervals	2	5	-	1
PC12. record observations made in the analysis of existing facilities and the needs identified for its revamp	2	5	-	1
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	LSC/N9204
NOS Name	Manage the renewed engineering system with greening aspects in cold storage
Sector	Logistics
Sub-Sector	Cold Chain Logistics Solutions
Occupation	Engineering, Sustainability
NSQF Level	6
Credits	3
Version	2.0
Last Reviewed Date	15/03/2024
Next Review Date	15/03/2027
NSQC Clearance Date	15/03/2024

LSC/N9901: Maintain food and personnel safety, health and hygiene in cold storage plant

Description

This OS unit is about complying with safety, health and hygiene at the workplace to have a hazard-free environment and avoid downtime

Scope

The scope covers the following :

- Take precautionary measures to avoid work hazards
- Follow standard health, safety and hygiene procedures

Elements and Performance Criteria

Take precautionary measures to avoid work hazards

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

PC1. assess the various health, safety and environmental hazards in the cold storage

PC2. take necessary steps to eliminate or minimize the hazards

PC3. analyze the causes of accidents at the workplace

PC4. take preventive measures to avoid risk of cold burns and other injury due to contact with hot surfaces, gas, fire, hot fluids/ liquids, etc.

PC5. ensure the employees have access to first aid kit when needed

PC6. ensure to use personal protective equipment and safety gear such as gloves, jacket, footwear etc. for loading and unloading material in cold rooms to protect themselves from hypothermia, frostbite etc

PC7. ensure to display safety signs at places where necessary for people to be cautious

PC8. use rubber mats in the places where floors are constantly wet

PC9. ensure electrical precautions such as insulated clothing, adequate equipment insulation, dry work area, switch off the power supply when not required, etc

PC10. display emergency exit plan at prominent places and have emergency assembly area earmarked as a grid for easy counting of on duty associates and workers.

PC11. unplug the control panel, compressor, condensor etc before performing maintenance

PC12. report to the superior on any problems and hazards identified

PC13. install fire alarms (electrical/manual) in cold store/deep freeze and keep other safety devices like hammer/mallet in the storage area

Follow standard health, safety and hygiene procedures

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

PC14. maintain appropriate ventilation in the cold rooms to avoid unacceptable accumulation of heat, condensation or odours

PC15. check and review the cold storage areas frequently

PC16. stack items in an organized way and use safe lifting techniques to reduce risk of injuries from handling procedures at the storage areas

PC17. ensure no sign of pest infestation and install rodent traps, fly glues and insectocutors wherever needed

PC18. follow hygiene & sanitation standards of Government bodies like FSSAI, APEDA and /or EIA or importing countries like FAO, EU standards

PC19. use effective loading and unloading systems

PC20. proper stock rotation (First in First out) to be practiced

PC21. segregate damaged/non-conforming products from other products to designate area for appropriate disposition

PC22. fumigate containers depending upon product and contamination or as per customers requirement

PC23. avoid smoking, spitting, eating etc near food storage area

PC24. ensure reefers are covered, clean, free from pest infestation & other contaminants

PC25. dispose cold storage plant waste in the designated areas safely as per companys policies and rules

PC26. ensure to be safe while handling machines (generator, compressor, condenser etc.), gas (ammonia) and chemicals (ethylene, refrigerants etc.)

PC27. keep the floors free from oil, water and grease to avoid slippery surface

PC28. cut nails regularly and avoid applying nail paint. Avoid wearing bangles, rings, and chains in cold storage

PC29. wash hands with soap solution and dry under a dryer as they enter for duty or after using wash room

PC30. periodic examination of protective devices, pressure vessels and pipelines, and parts of pipework by a competent person to prevent defect that may give rise to danger

PC31. ensure workers suffering from abscess, boils etc. should be relieved from food handling

PC32. develop personal hygiene habits like brushing teeth, taking shower every day, wearing clean and tidy clothes after ironing etc.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. company's HR policies on personnel management

KU2. company's reporting structure

KU3. occupational health and safety standards

KU4. cold storage plant inspection checklist

KU5. companys sanitary standard operating procedures

KU6. procedures to follow during emergency maintenance issues

KU7. technical standards for design and construction of cold storages: Bureau of Indian standards (BIS), International standard (ISO) etc.

KU8. the purpose and usage of protective gears such as gloves , jackets etc. while working

KU9. use of first aid at workplace

KU10. cold storage order, 1980
KU11. food safety and standards act, 2006
KU12. reporting procedure or heirarchy for signs of damage and potential hazards
KU13. methods to minimize accidental risks
KU14. safe storage and handling of chemicals like refrigerants, ammonia, ethylene etc.
KU15. loading and unloading systems
KU16. standard operating procedure for safety drills and equipment maintenance
KU17. operation of machines: compressor, condenser, evaporator etc.
KU18. emergency procedures to be followed in case of an mishap such as fire, accidents, etc. and communication of safety instructions to subordinate staff
KU19. emergency responses in case of malfunctioning of refrigeration equipment as a whole or its components like evaporator, condenser or compressor
KU20. solid, liquid and gaseous waste disposal, treatment norms and equipment
KU21. necessary action to be taken for the hazards identified
KU22. knowledge of Quality systems like BRC, FSSAI, ISO, FSSC, HACCP etc.

Generic Skills (GS)

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

GS1. read and interpret the relevant organisation policies, procedures and diagrams that identify health, safety and safe environmental practices.
GS2. read job sheets, company policy documents and information displayed at the workplace for health, safety and environment.
GS3. read notes/comments from the senior
GS4. fill up documentation related to health, safety and environmental standards, if required
GS5. verbally report health, safety and environmental hazards and poor organisation practice.
GS6. communicate to the supervisor about the work health, safety and environmental issues
GS7. receive instructions from supervisor on minimizing the risks
GS8. communicate with co-workers about the precautions to be taken for hazards free work
GS9. take preventive measures for the identified hazards
GS10. select appropriate hand tools and personal protection equipment
GS11. identify first aid needs in case of an injury
GS12. formalize and display evacuation plan at strategic locations
GS13. ensure targeted product delivery by practicing stipulated standards of occupational health safety and environmental measures
GS14. take care of personal and equipment protection
GS15. identify the hazards and suggest possible solutions
GS16. use safety equipment such as fire extinguisher during fire accidents
GS17. store tools in a safe way
GS18. analyse the seriousness of the hazards
GS19. evolve smooth workflow by avoiding hazards at workplace

GS20. evaluate and apply the possible solutions for the hazards, as necessary
GS21. take care of personal and equipment protection
GS22. identify the hazards and suggest possible solutions
GS23. use safety equipment such as fire extinguisher during fire accidents
GS24. store tools in a safe way
GS25. analyse the seriousness of the hazards
GS26. evolve smooth workflow by avoiding hazards at workplace
GS27. evaluate and apply the possible solutions for the hazards, as necessary

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Take precautionary measures to avoid work hazards	**12**	**23**	**-**	**6**
PC1. assess the various health, safety and environmental hazards in the cold storage	0.5	1	-	-
PC2. take necessary steps to eliminate or minimize the hazards	1	2	-	1
PC3. analyze the causes of accidents at the workplace	0.5	1	-	-
PC4. take preventive measures to avoid risk of cold burns and other injury due to contact with hot surfaces, gas, fire, hot fluids/ liquids, etc.	1	2	-	1
PC5. ensure the employees have access to first aid kit when needed	1	2	-	-
PC6. ensure to use personal protective equipment and safety gear such as gloves, jacket, footwear etc. for loading and unloading material in cold rooms to protect themselves from hypothermia, frostbite etc	1	2	-	1
PC7. ensure to display safety signs at places where necessary for people to be cautious	1	2	-	-
PC8. use rubber mats in the places where floors are constantly wet	0.5	2	-	1
PC9. ensure electrical precautions such as insulated clothing, adequate equipment insulation, dry work area, switch off the power supply when not required, etc	2	2	-	-
PC10. display emergency exit plan at prominent places and have emergency assembly area earmarked as a grid for easy counting of on duty associates and workers.	1	2	-	-
PC11. unplug the control panel, compressor, condensor etc before performing maintenance	0.5	1	-	-
PC12. report to the superior on any problems and hazards identified	1	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. install fire alarms (electrical/manual) in cold store/deep freeze and keep other safety devices like hammer/mallet in the storage area	1	2	-	1
Follow standard health, safety and hygiene procedures	**18**	**37**	**-**	**4**
PC14. maintain appropriate ventilation in the cold rooms to avoid unacceptable accumulation of heat, condensation or odours	0.5	1	-	-
PC15. check and review the cold storage areas frequently	0.5	2	-	-
PC16. stack items in an organized way and use safe lifting techniques to reduce risk of injuries from handling procedures at the storage areas	1	2	-	-
PC17. ensure no sign of pest infestation and install rodent traps, fly glues and insectocutors wherever needed	1	2	-	1
PC18. follow hygiene & sanitation standards of Government bodies like FSSAI, APEDA and /or EIA or importing countries like FAO, EU standards	1	2	-	-
PC19. use effective loading and unloading systems	1	2	-	-
PC20. proper stock rotation (First in First out) to be practiced	1	2	-	-
PC21. segregate damaged/non-conforming products from other products to designate area for appropriate disposition	1	2	-	1
PC22. fumigate containers depending upon product and contamination or as per customers requirement	1	2	-	-
PC23. avoid smoking, spitting, eating etc near food storage area	1	2	-	-
PC24. ensure reefers are covered, clean, free from pest infestation & other contaminants	1	2	-	1
PC25. dispose cold storage plant waste in the designated areas safely as per companys policies and rules	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC26. ensure to be safe while handling machines (generator, compressor, condenser etc.), gas (ammonia) and chemicals (ethylene, refrigerants etc.)	1	2	-	1
PC27. keep the floors free from oil, water and grease to avoid slippery surface	1	2	-	-
PC28. cut nails regularly and avoid applying nail paint. Avoid wearing bangles, rings, and chains in cold storage	1	2	-	-
PC29. wash hands with soap solution and dry under a dryer as they enter for duty or after using wash room	1	2	-	-
PC30. periodic examination of protective devices, pressure vessels and pipelines, and parts of pipework by a competent person to prevent defect that may give rise to danger	1	2	-	-
PC31. ensure workers suffering from abscess, boils etc. should be relieved from food handling	1	2	-	-
PC32. develop personal hygiene habits like brushing teeth, taking shower every day, wearing clean and tidy clothes after ironing etc.	1	2	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	LSC/N9901
NOS Name	Maintain food and personnel safety, health and hygiene in cold storage plant
Sector	Logistics
Sub-Sector	Cold Chain Logistics Solutions
Occupation	Cold Chain Operations
NSQF Level	5.5
Credits	1
Version	2.0
Last Reviewed Date	15/03/2024
Next Review Date	15/03/2027
NSQC Clearance Date	15/03/2024

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

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

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
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
Introduction to Employability Skills	**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	-	-	-	-
Constitutional values – Citizenship	**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	-	-	-	-
Becoming a Professional in the 21st Century	**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	-	-	-	-
Basic English Skills	**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	-	-	-	-
Career Development & Goal Setting	**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	-	-	-	-
Communication Skills	**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	-	-	-	-
Diversity & Inclusion	**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	-	-	-	-
Financial and Legal Literacy	**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	-	-	-	-
Essential Digital Skills	**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	-	-	-	-
Entrepreneurship	**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	-	-	-	-
Customer Service	**1**	**2**	**-**	**-**
PC33. identify different types of customers and ways to communicate with them	-	-	-	-

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	-	-	-	-
Getting ready for apprenticeship & Jobs	**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**	**-**	**-**

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	31/08/2021
Next Review Date	31/08/2024
NSQC Clearance Date	31/08/2021

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) 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 this criterion.

5. To pass the Qualification Pack, every trainee should score a minimum of 70% for NSQF level 4 & above job roles and 50% for NSQF level 1 to 3 job roles.

6. In case of unsuccessful completion, the trainee may seek re-assessment 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 successfully clear the Qualification Pack assessment.)

Minimum Passing % at NOS Level: 70

(**Please note**: A Trainee must score the minimum percentage for each NOS separately as well as on the QP as a whole.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
LSC/N9201.Implement energy efficiency and greening aspects in the cold storage	30	60	-	10	100	20
LSC/N9202.Oversee modified atmosphere requirements for the products	30	60	-	10	100	15
LSC/N9203.Undertake water treatment and conservation	30	60	-	10	100	20
LSC/N9204.Manage the renewed engineering system with greening aspects in cold storage	30	60	-	10	100	15
LSC/N9901.Maintain food and personnel safety, health and hygiene in cold storage plant	30	60	-	10	100	15
DGT/VSQ/N0103.Employability Skills (90 Hours)	20	30	-	-	50	15
Total	**170**	**330**	**-**	**50**	**550**	**100**

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.
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.