

## QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR LOGISTICS SECTOR

### Contents

1. Introduction and Contacts..... P1
2. Qualifications Pack..... P2
3. Glossary of Key Terms ..... P3
4. OS Units..... P5
5. Nomenclature for QP & OS..... P39
6. Assessment Criteria for each NOS.... P41



### What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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### Introduction

## Qualifications Pack: Refrigeration Equipment Maintenance Specialist

**SECTOR:** LOGISTICS

**SUB-SECTOR:** Cold Chain Logistics

**OCCUPATION:** Maintenance

**REFERENCE ID:** LSC/Q9101

**ALIGNED TO:** NCO-2015/ NIL

The Refrigeration Equipment Maintenance Specialist is responsible for planning and monitoring maintenance of refrigeration equipment, handling its service and repair and training plant engineers to perform maintenance tasks.

**Brief Job Description:** The individual at work prepares refrigeration equipment maintenance schedule checklist and monitors its preventive maintenance. The person is also responsible to oversee service and repair of cold chain equipment like condenser, compressor and evaporators, provide manpower and material resources to maintenance technicians, train plant engineers on handling and maintenance of refrigeration equipment.

**Personal Attributes:** The job requires the individual to have good eye sight, good physical fitness, be vigilant, have ability to work in low temperature environment for long duration and willingness to work by wearing protective gear.

Job Details

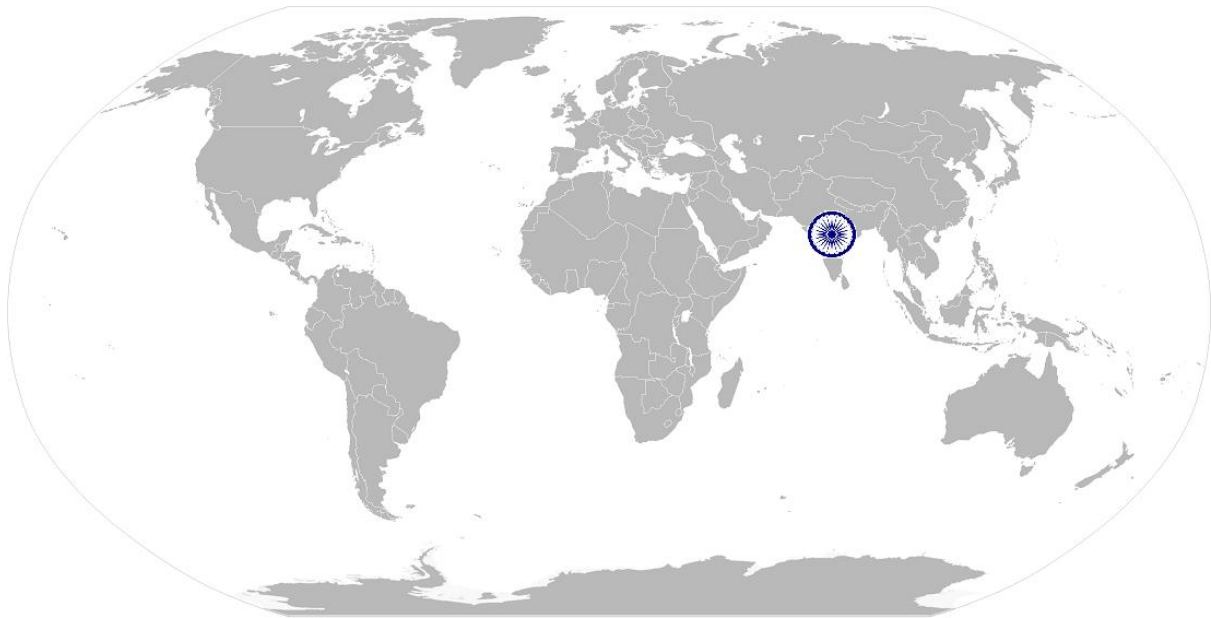
<b>Qualifications Pack Code</b>	<b>LSC/Q9101</b>		
<b>Job Role</b>	<b>Refrigeration Equipment Maintenance Specialist</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Sector</b>	<b>Logistics</b>	<b>Drafted on</b>	<b>10/08/16</b>
<b>Sub-sector</b>	<b>Cold Chain Logistics</b>	<b>Last reviewed on</b>	<b>11/01/17</b>
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<b>NSQC Clearance on</b>	<b>NA</b>		

<b>Job Role</b>	<b>Refrigeration Equipment Maintenance Specialist</b> <b>Also known as 'Maintenance Head or Officer'</b>
<b>Role Description</b>	Planning and monitoring maintenance of refrigeration equipment, handling its service and repair and training plant engineers to perform maintenance tasks
<b>NSQF</b>	5
<b>Minimum Educational Qualifications</b>	ITI/Diploma
<b>Maximum Educational Qualifications</b>	Engineering graduate
<b>Training (Mandatory)</b>	HAZMAT training
<b>Minimum Job Entry Age</b>	25 years
<b>Experience</b>	Minimum preferable 5 years in cold room operations
<b>Applicable National Occupational Standards (NOS)</b>	<p><b>Compulsory:</b></p> <ol style="list-style-type: none"> <li><a href="#">LSC/N9101 Plan the maintenance of refrigeration equipment</a></li> <li><a href="#">LSC/N9102 Monitor the maintenance of refrigeration equipment</a></li> <li><a href="#">LSC/N9103 Oversee service and repair refrigeration equipment</a></li> <li><a href="#">LSC/N9104 Undertake training for plant engineers</a></li> <li><a href="#">LSC/N9901 Maintain food and personnel safety, health and hygiene in cold storage plant</a></li> <li><a href="#">LSC/N9902 Communicate effectively with colleagues and clients</a></li> </ol> <p><b>Optional:</b></p> <ol style="list-style-type: none"> <li>NA</li> </ol>
<b>Performance Criteria</b>	As described in the relevant OS units

Keywords /Terms	Description
Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Organisational Context	Organisational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Scope	Scope is the 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 the quality of performance required.
Sector	Sector is a conglomeration of different business operations having similar businesses 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.
Sub-functions	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.

Acronyms	Keywords /Terms	Description
	NSQF	National Skills Qualifications Framework
	QP	Qualifications Pack
	OS	Occupational Standards
	OH&S	Occupational Health and Safety
	PPE	Personal Protective Equipment
	HR	Human Resources

# National Occupational Standard



## Overview

This unit is about planning and preparing maintenance schedules as per requirements, and manage resources accordingly.

**LSC/N9101**

**Plan the maintenance of refrigeration equipment**

National Occupational Standard

<b>Unit Code</b>	<b>LSC /N9101</b>
<b>Unit Title (Task)</b>	<b>Plan the maintenance of refrigeration equipment</b>
<b>Description</b>	This OS unit is about planning and preparing maintenance schedules as per requirements, and manage resources accordingly
<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Prepare preventive maintenance schedule checklist for main refrigeration equipment components</li> <li>• Manage manpower resources for maintenance</li> <li>• Handle supply of materials to the maintenance technicians</li> </ul> <p><b>Range:</b> compressor, condenser, evaporator, temperature and humidity sensor</p>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Preparing preventive maintenance schedule checklist</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC1. prepare work programme and schedules for maintenance of evaporator, condenser and compressor</p> <p>PC2. prioritize maintenance as per legislative laws, organization requirements, resources, and environment</p> <p>PC3. plan electrical system maintenance at least once in five years as per the Institute of Electrical and Electronics Engineers Code of Practice</p> <p>PC4. plan to check evaporators for defrosting and coil surface for dust accumulation</p> <p>PC5. ensure to check electrical connections for corroded terminals</p> <p>PC6. ensure that the maintenance plan checks oil safety and high pressure controls of compressor units</p> <p>PC7. record the schedules for preventive maintenance</p> <p>PC8. plan activities so as to minimize disruption to normal working</p> <p>PC9. ensure to schedule seasonal maintenance</p> <p>PC10. make contingency plans for emergency situations regarding working of the equipment</p>
<b>Managing manpower resources for maintenance</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC11. identify resources for maintenance based on the skills required</p> <p>PC12. allocate resources for each maintenance activity</p> <p>PC13. make contingency plans for variations in labour availability</p>
<b>Handling supply of materials to the maintenance technicians</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC14. provide checklists for maintenance activities</p> <p>PC15. provide information on priority and deadlines for the tasks, so that losses are minimized</p> <p>PC16. provide necessary tools, components and protective gear to carry out maintenance activities</p>
<b>Knowledge and Understanding (K)</b>	

**LSC/N9101**

**Plan the maintenance of refrigeration equipment**

<p><b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)</p>	<p>The individual on the job needs to know and understand:</p> <p>KA1. organizational policies and guidelines</p> <p>KA2. reporting structure</p> <p>KA3. communication with relevant people in the organization to take their buy-in for maintenance schedule</p> <p>KA4. organization safety and security procedures of refrigerant usage</p> <p>KA5. procedures to follow during emergency maintenance issues</p> <p>KA6. formats for maintenance checklists used in the organization</p> <p>KA7. roles and responsibilities of labourers in the cold storage area</p> <p>KA8. problems that may arise to different departments in the organization due to maintenance activities and their solutions</p>
<p><b>B. Technical Knowledge</b></p>	<p>The individual on the job needs to know and understand:</p> <p>KB1. importance of prior planning for maintenance of refrigeration equipment</p> <p>KB2. finalization requirements for maintenance</p> <p>KB3. Preparation of preventive maintenance schedules and checklists</p> <p>KB4. optimal temperature and humidity conditions required for various products handled by cold chain, for example,          Marine products: -18 to -21 degrees          Fruits and vegetables: -1 to 15 degrees; 95% to 98% RH; 65% to 75% RH for onion and garlic; 40% to 50% RH for beans, dry fruits and vegetables          Dairy: -20 to +4 degrees          Dry fruits: 4 to 10 degrees          Pharma - chemicals and vaccines: - 4 to 10 degrees</p> <p>KB5. product specific hygiene requirements</p> <p>KB6. extent of ethylene production by each product and sensitivity of ethylene exposure to products</p> <p>KB7. how to prioritize activities in maintenance scheduling</p> <p>KB8. necessary resources for each activity</p> <p>KB9. safety standards and precautions to be ensured</p> <p>KB10. procedures for isolating electrical systems (wiring to the equipment) safely</p> <p>KB11. bonding of electrical system to the components after repair</p> <p>KB12. selection of accessories and tools required for maintenance</p>
<p><b>Skills (S)</b></p>	
<p><b>A. Core Skills/ Generic Skills</b></p>	<p><b>Reading Skills</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA1. read equipment manual and understand its working</p> <p>SA2. read safety instructions</p> <p>SA3. read legislative laws concerning equipment maintenance</p> <p>SA4. read and understand equipment manufacturer's maintenance instructions</p> <p><b>Writing Skills</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA5. prepare maintenance schedules in the format followed by the organization</p>

**LSC/N9101**

**Plan the maintenance of refrigeration equipment**

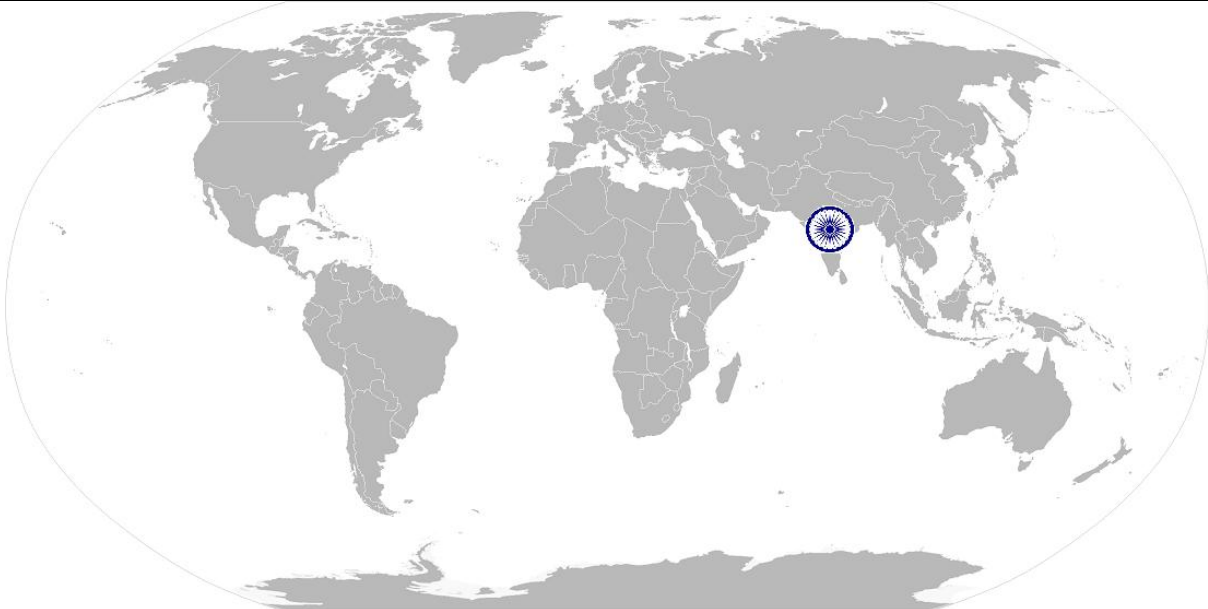
	<b>Oral Communication (Listening and Speaking skills)</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA6. communicate to workers clearly about the requirements in maintenance activities</p> <p>SA7. communicate to other departments like operations, packing and dispatch, quality check, admin and finance which get impacted due to equipment maintenance activities</p>
<b>B. Professional Skills</b>	<b>Decision Making</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. decide on priorities of activities planned</p> <p>SB2. consider relative costs and benefits of multiple solutions</p> <p>SB3. resolve emergency situations in equipment functioning</p>
	<b>Plan and Organize</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. plan maintenance activities as per standard requirements and manufacturer's instructions</p> <p>SB5. plan equipment service based on its working condition</p> <p>SB6. plan resources by selecting, training, and ensuring discipline amongst them</p>
	<b>Customer Centricity</b>
	Not Applicable
	<b>Problem Solving</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. re-schedule tasks in case of delays or requirements by other departments in the organization</p> <p>SB8. handle allotment of tasks to workers in case of staff shortage or delays in activities</p>
	<b>Analytical Thinking</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB9. interpret equipment diagram and information to identify which components need maintenance</p> <p>SB10. assess working condition of refrigeration equipment</p> <p>SB11. plan activities to minimize effects on normal working of the organization</p> <p>SB12. interpret electrical system diagrams</p>
	<b>Critical Thinking</b>
<p>The user/individual on the job needs to know and understand how to:</p> <p>SB13. identify faults in the refrigerant equipment working</p> <p>SB14. use reasoning to identify alternative solutions</p> <p>SB15. assign criticality to the equipment problem, to plan and prioritize maintenance or repair tasks</p>	



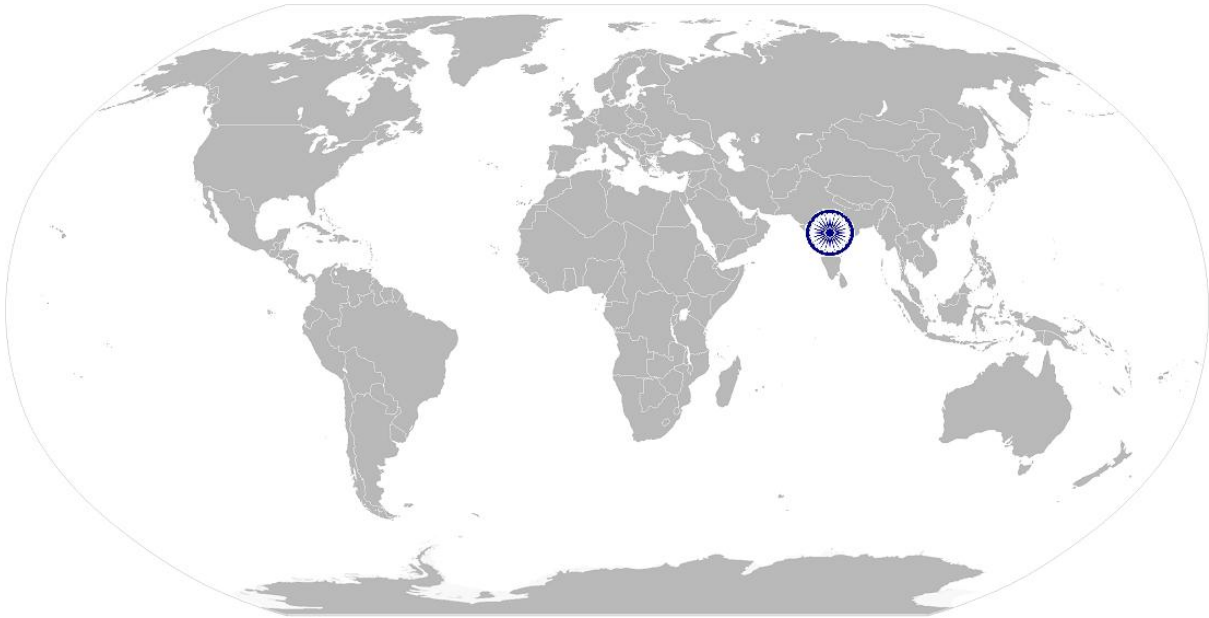
## LSC/N9101 Plan the maintenance of refrigeration equipment

### NOS Version Control

<b>NOS Code</b>	<b>LSC/N9101</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
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<b>Industry Sub-sector</b>	<b>Cold chain logistics</b>	<b>Last reviewed on</b>	<b>11/01/17</b>
<b>Occupation</b>	<b>Maintenance</b>	<b>Next review date</b>	<b>11/01/20</b>



# National Occupational Standard



## Overview

This unit is about monitoring maintenance activities of refrigeration equipment to ensure that they are completed as per the plan.

**LSC/N9102**

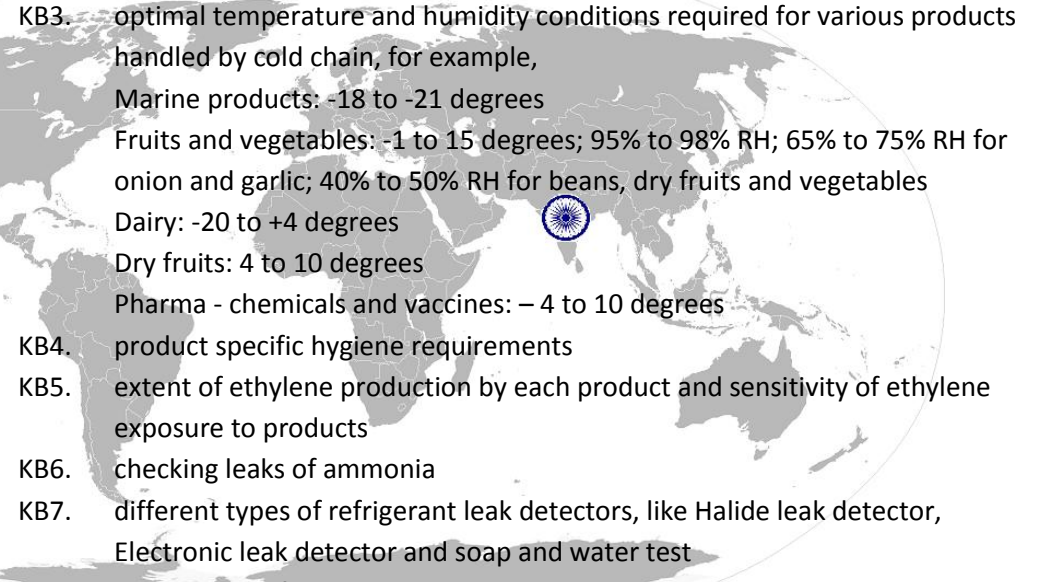
**Monitor maintenance of refrigeration equipment**

National Occupational Standard

<b>Unit Code</b>	<b>LSC /N9102</b>
<b>Unit Title (Task)</b>	<b>Monitor maintenance of refrigeration equipment</b>
<b>Description</b>	This OS unit is about monitoring maintenance activities of refrigeration equipment to ensure that they are completed as per the plan
<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Ensure maintenance activities are completed as per time, budget and quality</li> <li>• Ensure maintenance records are up-to-date</li> <li>• Co-ordinate regularly with the workforce</li> </ul> <p><b>Range:</b> compressor, condenser, evaporator, temperature and humidity sensor</p>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Ensuring maintenance activities are completed as per time, budget and quality</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC1. inspect regularly to ensure maintenance activities are done as per quality requirements</p> <p>PC2. inspect regularly to ensure maintenance activities are completed timely</p> <p>PC3. inspect regularly to ensure maintenance activities are done within the costs planned</p> <p>PC4. ensure that the quality of the products stored under refrigeration is not harmed while equipment components are being checked</p> <p>PC5. ensure that there is safe discharge of ammonia, so that excess refrigerant is discharged safely (not inside cold room and away from work area)</p> <p>PC6. ensure to keep drains in the cold area free of debris</p> <p>PC7. ensure to check operations of door seals regularly</p> <p>PC8. monitor the sequence of activities as per the schedule</p> <p>PC9. ensure workers are using protective gear during maintenance or repair</p> <p>PC10. ensure workers leave the area safe and clean after performing maintenance activities</p> <p>PC11. ensure that the equipment is calibrated correctly before use</p>
<b>Ensuring maintenance records are up-to-date</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC12. assign a resource to maintain records of refrigeration equipment maintenance activities regularly</p> <p>PC13. conduct regular checks on maintenance log to see if it is current</p> <p>PC14. instruct concerned person to update records if it is not latest</p> <p>PC15. report to all concerned people in the organization in case the schedule cannot be met</p>
<b>Co-ordinating regularly with the workforce</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC16. carry out walk around inspection regularly to monitor activities of subordinates</p> <p>PC17. communicate with workers as often as needed to ensure maintenance schedule is followed</p> <p>PC18. allocate parallel tasks to handle different components of refrigeration equipment like evaporator, compressor and condenser, wherever possible</p>

**LSC/N9102**

**Monitor maintenance of refrigeration equipment**

	PC19. observe the work efficiency of the workforce and identify training needs wherever necessary
<b>Knowledge and Understanding (K)</b>	
<p><b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)</p>	<p>The individual on the job needs to know and understand:</p> <p>KA1. organizational policies and guidelines</p> <p>KA2. reporting structure</p> <p>KA3. organization safety and security procedures of refrigerant usage</p> <p>KA4. procedures to follow during emergency maintenance issues</p> <p>KA5. roles and responsibilities of labourers in the cold storage area</p> <p>problems that may arise to different departments in the organization due to maintenance activities and their solutions</p>
<p><b>B. Technical Knowledge</b></p>	<p>The individual on the job needs to know and understand:</p> <p>KB1. Recording and documenting maintenance activities and data</p> <p>KB2. legal requirements involved in preparing relevant documents</p> <p>KB3. optimal temperature and humidity conditions required for various products handled by cold chain, for example,             Marine products: -18 to -21 degrees            Fruits and vegetables: -1 to 15 degrees; 95% to 98% RH; 65% to 75% RH for onion and garlic; 40% to 50% RH for beans, dry fruits and vegetables            Dairy: -20 to +4 degrees            Dry fruits: 4 to 10 degrees            Pharma - chemicals and vaccines: - 4 to 10 degrees</p> <p>KB4. product specific hygiene requirements</p> <p>KB5. extent of ethylene production by each product and sensitivity of ethylene exposure to products</p> <p>KB6. checking leaks of ammonia</p> <p>KB7. different types of refrigerant leak detectors, like Halide leak detector, Electronic leak detector and soap and water test</p> <p>KB8. monitoring refrigerants used</p> <p>KB9. how to prioritize activities in maintenance scheduling</p> <p>KB10. necessary resources for each activity</p> <p>KB11. safety standards and precautions to be ensured</p> <p>KB12. applications and effects of different refrigerants</p> <p>KB13. methods for safe usage of refrigerants</p> <p>KB14. relation between refrigeration gas pressure present and the temperature maintained</p> <p>KB15. methods for safe disposal of obsolete equipment or its components</p> <p>KB16. calculation of machine productivity</p> <p>KB17. calculation of expenditures, monitoring variances in the budget for meeting financial standards</p> <p>KB18. how to review maintenance activities</p>
<b>Skills (S)</b>	

**LSC/N9102**

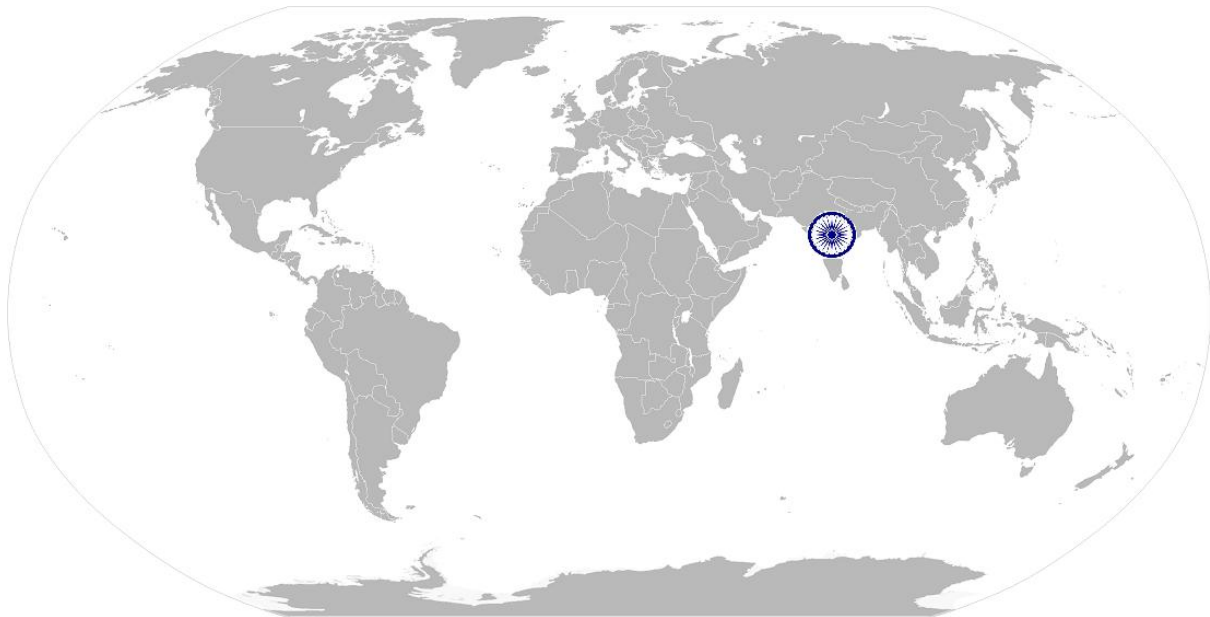
**Monitor maintenance of refrigeration equipment**

<b>A. Core Skills/ Generic Skills</b>	<b>Reading Skills</b>
	The user/individual on the job needs to know and understand how to: SA1. read equipment manual and understand its working SA2. read maintenance budgeting records SA3. read safety instructions
	<b>Writing Skills</b>
	The user/individual on the job needs to know and understand how to: SA4. fill maintenance checklists as per completion of activities SA5. do documentation regarding maintenance log SA6. prepare document or report regarding finance, workforce or equipment performance as required by the Management
	<b>Oral Communication (Listening and Speaking skills)</b>
	The user/individual on the job needs to know and understand how to: SA7. communicate to workers clearly about the requirements in maintenance activities SA8. communicate any delays or changes in maintenance schedule with workers and other concerned departments like Operations, Packing and Dispatch, Quality Check, Admin and Finance which get impacted due to equipment maintenance activities SA9. communicate with workers to ensure discipline in completing maintenance activities
	<b>B. Professional Skills</b>
	<b>Decision Making</b>
	The user/individual on the job needs to know and understand how to: SB1. decide how to resolve emergency situations in equipment functioning SB2. plan routine checks to ensure maintenance schedule is on track
	<b>Plan and Organize</b>
	The user/individual on the job needs to know and understand how to: SB3. plan equipment service based on its working condition SB4. organize activities based on budgeting constraints
	<b>Customer Centricity</b>
	The user/individual on the job needs to know and understand how to: SB5. enforce storage and hygiene conditions as per the products handled for the organization or for its customers
	<b>Problem Solving</b>
	The user/individual on the job needs to know and understand how to: SB6. re-schedule tasks in case of delays or requirements by other departments in the organization SB7. handle allotment of tasks to workers in case of staff shortage or delays in activities SB8. ability to resolve any conflicts that may arise between workers
	<b>Analytical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB9. interpret equipment diagram and information to identify which components

**LSC/N9102**

**Monitor maintenance of refrigeration equipment**

	<p>need maintenance</p> <p>SB10. assess working condition of refrigeration equipment</p> <p>SB11. take initiatives to improve work process in equipment maintenance by taking feedback from the workers</p>
	<p><b>Critical Thinking</b></p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB12. identify faults in the refrigerant equipment working</p> <p>SB13. assess criticality of the equipment problem, to prioritize maintenance or repair tasks</p> <p>SB14. keep track of verifiable sources for maintenance schedules and records made,</p>

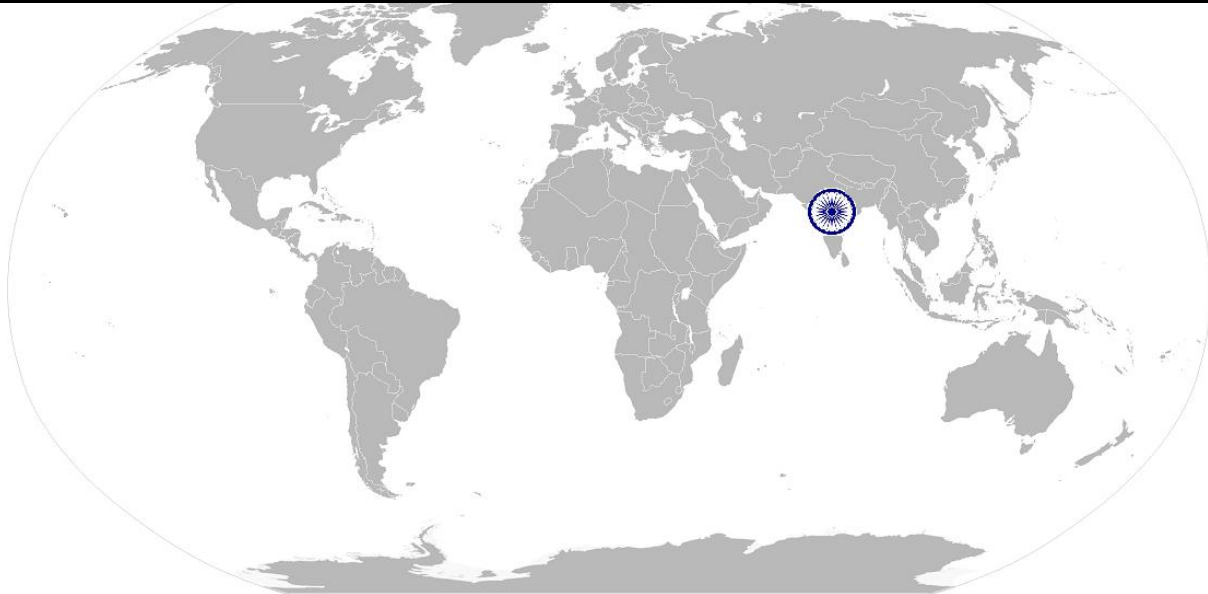


**LSC/N9102**

**Monitor maintenance of refrigeration equipment**

**NOS Version Control**

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<b>Occupation</b>	<b>Maintenance</b>	<b>Next review date</b>	<b>11/01/20</b>



# National Occupational Standard



## Overview

This unit is about overseeing service and repair needs of the refrigeration equipment and ensuring that it is working as required.



**LSC/N9103                      Oversee service and repair of refrigeration equipment**

National Occupational Standard

<b>Unit Code</b>	<b>LSC/N9103</b>
<b>Unit Title (Task)</b>	<b>Oversee service and repair of refrigeration equipment</b>
<b>Description</b>	This OS unit is about overseeing service and repair needs of the refrigeration equipment and ensuring that it is working as required
<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Identify servicing as per refrigeration equipment manufacturer's instructions</li> <li>• Troubleshoot the refrigeration equipment used</li> <li>• Record performance of refrigeration equipment</li> </ul> <p><b>Range:</b> compressor, condenser, evaporator, temperature and humidity sensor</p>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Identifying servicing as per equipment manufacturer's instructions</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC1. plan types of maintenance activities based on manufacturer's instructions</p> <p>PC2. plan the frequency of maintenance activities</p> <p>PC3. consider industry level standard practices while planning maintenance</p> <p>PC4. understand procedures while removing or replacing an evaporator or a compressor</p>
<b>Troubleshooting the refrigeration equipment used</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC5. carry out tests or checks regularly to ensure system is working as required</p> <p>PC6. check for freezer insulation degradation by observing compressor duty cycle, condensation or presence of ice</p> <p>PC7. check operation of defrost system and thermostat</p> <p>PC8. plan repairs limited to thermostats, electrical systems, start relays and defrost timers as much as possible</p> <p>PC9. avoid repairs to the cooling system, if they are uneconomical, and consider replacement of components</p> <p>PC10. inspect cold store ceiling panel suspension rods and also their attachments at least once a year</p> <p>PC11. check discharge pressure and suction pressure in control system and make adjustments if necessary</p> <p>PC12. ensure that service or repair activities follow hygiene procedures</p> <p>PC13. trace faults in the components of refrigeration system when it arises</p> <p>PC14. test the working of the equipment, after service or repair</p> <p>PC15. ensure that the equipment is calibrated correctly before using</p>
<b>Recording performance of refrigeration equipment</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC16. maintain records of service and repair of refrigeration, electrical system, equipment components</p> <p>PC17. analyze the records to arrive at the performance of refrigerated equipment in terms of operating efficiency, downtime and conformity to the requirements</p>
<b>Knowledge and Understanding (K)</b>	

## LSC/N9103 **Oversee service and repair of refrigeration equipment**

<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. organizational policies and guidelines</p> <p>KA2. reporting structure</p> <p>KA3. refrigerant usage with its relevant safety and security procedures</p> <p>KA4. procedures to follow during emergency maintenance and repair issues</p> <p>KA5. problems that may arise to different departments in the organization due to maintenance activities and their solutions</p>
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. operating principles of refrigeration equipment used based on the product type</p> <p>KB2. working of refrigeration equipment components</p> <p>KB3. industry standards or regulations related to servicing of refrigeration equipments</p> <p>KB4. how to rectify faulty equipment. Faults can include compressor failure, improper temperature controls for the products or restricted refrigerant</p> <p>KB5. checking leaks of ammonia</p> <p>KB6. monitoring refrigerants used</p> <p>KB7. relation between refrigeration gas pressure present and the temperature maintained</p> <p>KB8. recording maintenance activities performed so that it can help in analysis later</p> <p>KB9. type of hazards that can be encountered while performing service or repair activities</p> <p>KB10. bonding of electrical system to the components after repair</p> <p>KB11. analysing performance results to recommend and implement changes</p> <p>KB12. managing process for bringing in new equipment or its components</p>
<b>Skills (S)</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Reading Skills</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. read and understand work related documents</p> <p>SA2. read equipment manual and understand its working</p> <p>SA3. read safety instructions</p>
	<b>Writing Skills</b>
	<p>The user/ individual on the job needs to know and understand:</p> <p>SA4. filling of maintenance checklists as per completion of activities</p> <p>SA5. documentation regarding maintenance log</p> <p>SA6. preparation of reports for management regarding machine performance</p> <p>SA7. documenting details regarding faulty components</p>
	<b>Oral Communication (Listening and Speaking skills)</b>

**LSC/N9103**
**Oversee service and repair of refrigeration equipment**

	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA8. communicate to workers clearly about the requirements in maintenance activities</p> <p>SA9. communicate to other departments like Operations, Packing and Dispatch, Quality Check, Admin and Finance which get impacted due to equipment maintenance activities</p> <p>SA10. mentor all the workers under supervision to increase operational effectiveness</p>
<b>B. Professional Skills</b>	<b>Decision Making</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB1. consider relative costs and benefits of repair and replacement of a refrigeration equipment component</p> <p>SB2. resolve emergency situations in equipment functioning</p> <p>SB3. decide between repair or replacement of equipment or its components</p>
	<b>Plan and Organize</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB4. plan maintenance activities as per standard requirements and manufacturer's instructions</p> <p>SB5. plan equipment service based on its working condition</p>
	<b>Customer Centricity</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB6. enforce storage and hygiene conditions as per the products handled for the organization or for its customers</p>
	<b>Problem Solving</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB7. re-schedule tasks in case of delays or requirements by other departments in the organization</p> <p>SB8. resolve problems in equipment's working by deciding appropriate repair needs</p>
	<b>Analytical Thinking</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB9. interpret equipment diagram and information to identify which components need maintenance</p> <p>SB10. assess working condition of refrigeration equipment</p> <p>SB11. evaluate reliability of the refrigeration equipment</p>
	<b>Critical Thinking</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB12. identify faults in the refrigerant equipment working</p> <p>SB13. assess criticality of the equipment problem, to prioritize maintenance or repair tasks</p>

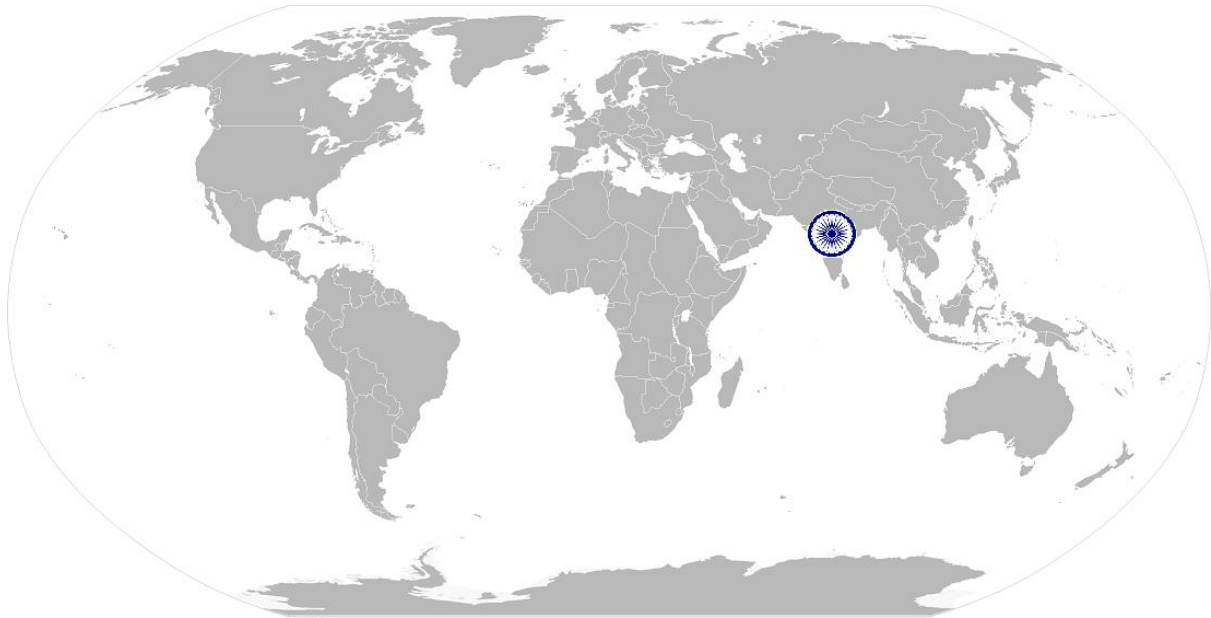
## LSC/N9103      **Oversee service and repair of refrigeration equipment**

### NOS Version Control

<b>NOS Code</b>	<b>LSC/N9103</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Logistics</b>	<b>Drafted on</b>	<b>10/08/16</b>
<b>Industry Sub-sector</b>	<b>Cold chain logistics</b>	<b>Last reviewed on</b>	<b>11/01/17</b>
<b>Occupation</b>	<b>Maintenance</b>	<b>Next review date</b>	<b>11/01/20</b>



# National Occupational Standard



## Overview

This unit is about undertaking training activities for plant engineers.

**LSC/N9104**

**Undertake training for plant engineers**

National Occupational Standard

<b>Unit Code</b>	<b>LSC/N9104</b>
<b>Unit Title (Task)</b>	<b>Undertake training for plant engineers</b>
<b>Description</b>	This OS unit is about undertaking training activities for plant engineers.
<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Train on handling refrigerant fluids safely</li> <li>• Train on maintenance of refrigeration equipment (for plant engineers as well as reefer vehicle operators)</li> </ul> <p><b>Range:</b> compressor, condenser, evaporator, temperature and humidity sensor</p>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Training on handling refrigerant fluids safely</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC1. train plant engineers to follow safety procedures while handling refrigerants</p> <p>PC2. provide information on hazardous effects of refrigerants to the environment</p> <p>PC3. train them to ensure refrigerant leaks do not enter work areas or closed room</p>
<b>Training on maintenance of refrigeration equipment (for plant engineers as well as reefer vehicle operators)</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC4. train plant engineers on complying with procedures and practices to maintain refrigeration equipment</p> <p>PC5. teach them procedures while removing or replacing an evaporator, condenser or compressor</p> <p>PC6. provide maintenance history details of the refrigeration equipment, to help in familiarizing with the routine requirements</p> <p>PC7. sensitize plant engineers on energy consumption of refrigeration equipment</p> <p>PC8. provide information on dismantling refrigeration components to trace faults</p> <p>PC9. train plant engineers to inspect the components in need of repair or service</p> <p>PC10. teach plant engineers to reinstate components into the refrigeration equipment</p> <p>PC11. train plant engineers to understand control circuit diagrams of the refrigeration system</p> <p>PC12. train plant engineers on usage of appropriate tools and techniques while handling repairs of evaporators, condensers or compressors</p> <p>PC13. train plant engineers on undertaking numerical calculations or data entry mechanisms required for the activities</p> <p>PC14. train them on emergency responses in case of malfunctioning of refrigeration equipment as a whole or its components like evaporator, condenser or compressor</p>
<b>Knowledge and Understanding (K)</b>	

**LSC/N9104**
**Undertake training for plant engineers**

<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	KA1. organizational policies and guidelines KA2. reporting structure KA3. organization safety and security procedures of refrigerant usage KA4. procedures to follow during emergency maintenance issues KA5. roles and responsibilities of labourers in the cold storage area KA6. knowledge of transport department procedures KA7. understand procedures for safe transport and disposal of waste materials after maintenance KA8. costs and energy consumption of refrigeration equipment used in the organization
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> KB1. operating principles of refrigeration equipment used based on the product type KB2. working of refrigeration equipment components KB3. mechanics and hydraulics KB4. techniques to dismantle equipment and analyse defects KB5. recording maintenance activities performed so that it can help in analysis later KB6. type of hazards that can be encountered while performing maintenance activities KB7. optimal temperature and humidity conditions required for various products handled by cold chain, for example, Marine products: -18 to -21 degrees Fruits and vegetables: -1 to 15 degrees; 95% to 98% RH; 65% to 75% RH for onion and garlic; 40% to 50% RH for beans, dry fruits and vegetables Dairy: -20 to +4 degrees Dry fruits: 4 to 10 degrees Pharma - chemicals and vaccines: – 4 to 10 degrees KB8. product specific hygiene requirements KB9. extent of ethylene production by each product and sensitivity of ethylene exposure to products KB10. relation between refrigeration gas pressure present and the temperature maintained KB11. activities involved in loading and unloading from reefer vehicles KB12. importance of maintaining temperatures for products in reefer vehicles even after docking KB13. monitoring temperature and humidity conditions inside reefer vehicles during driving KB14. different types of refrigerant leak detectors, like Halide leak detector, Electronic leak detector and soap and water test

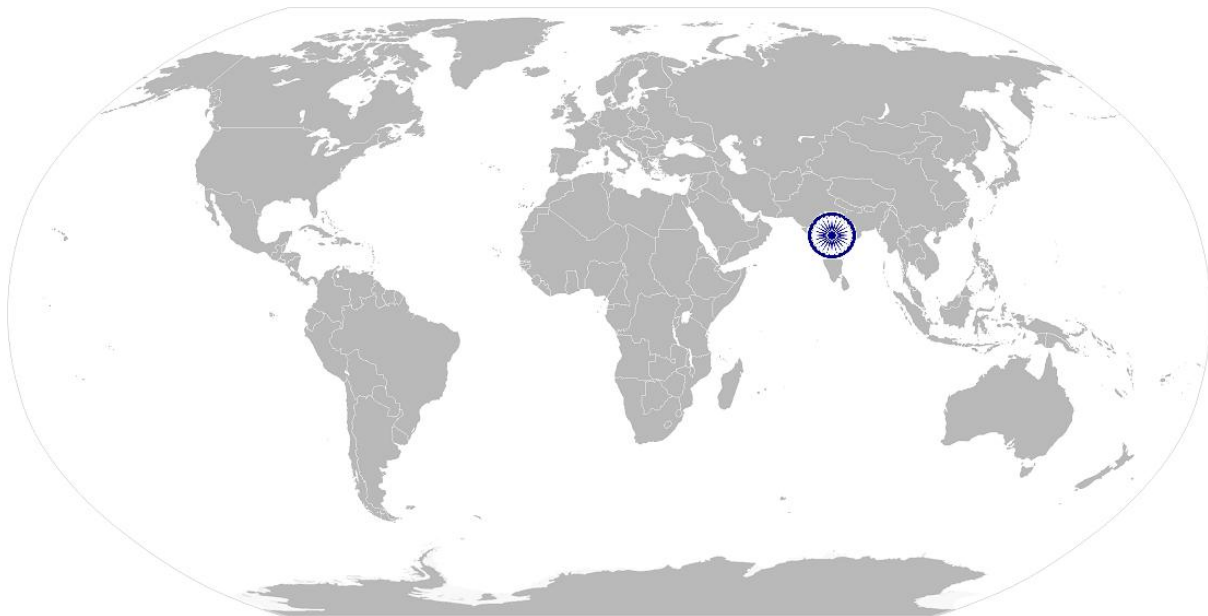
**LSC/N9104**
**Undertake training for plant engineers**

	KB15. hygiene requirements to ensure one product does not affect another product in terms of smell, or ethylene emission
<b>Skills (S)</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Reading Skills</b>
	The user/ individual on the job needs to know and understand how to: SA1. read technical documents regarding refrigeration equipment and update job role knowledge SA2. read equipment manual and understand its working SA3. read safety instructions
	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand: SA4. filling of maintenance checklists as per completion of activities SA5. documentation regarding maintenance log SA6. documenting details regarding faulty components
	<b>Oral Communication (Listening and Speaking skills)</b>
The user/ individual on the job needs to know and understand how to: SA7. communicate to trainees clearly about the requirements in maintenance activities SA8. communicate clearly the expectations from the plant engineer's job role SA9. communicate technical knowledge regarding equipment functioning SA10. listen and understand all queries or doubts the trainees have during the training	
<b>B. Professional Skills</b>	<b>Decision Making</b>
	The user/ individual on the job needs to know and understand how to: SB1. decide training modules combined with practical exposure SB2. resolve emergency situations in equipment functioning
	<b>Plan and Organize</b>
	The user/ individual on the job needs to know and understand how to: SB3. plan training activities SB4. organize practical learning techniques SB5. plan to train plant engineers all maintenance activities as per standard requirements and equipment manufacturer's instructions
	<b>Customer Centricity</b>
	Not Applicable
<b>Problem Solving</b>	
The user/ individual on the job needs to know and understand how to: SB6. help solve all queries or difficulties faced by trainees SB7. re-schedule tasks in case of delays or requirements by other departments in the organization SB8. handle allotment of tasks to workers in case of staff shortage or delays in activities	



**LSC/N9104**
**Undertake training for plant engineers**

	<b>Analytical Thinking</b>
	The user/ individual on the job needs to know and understand how to:
	SB9. interpret equipment diagram and information to identify which components need maintenance
	SB10. assess working condition of refrigeration equipment
	SB11. plan activities to minimize effects on normal working of the organization
	<b>Critical Thinking</b>
	The user/ individual on the job needs to know and understand how to:
	SB12. identify faults in the refrigerant equipment working
	SB13. plan training modules as per the criticality of the maintenance activities and experience of the plant engineer



**LSC/N9104**
**Undertake training for plant engineers**

## NOS Version Control

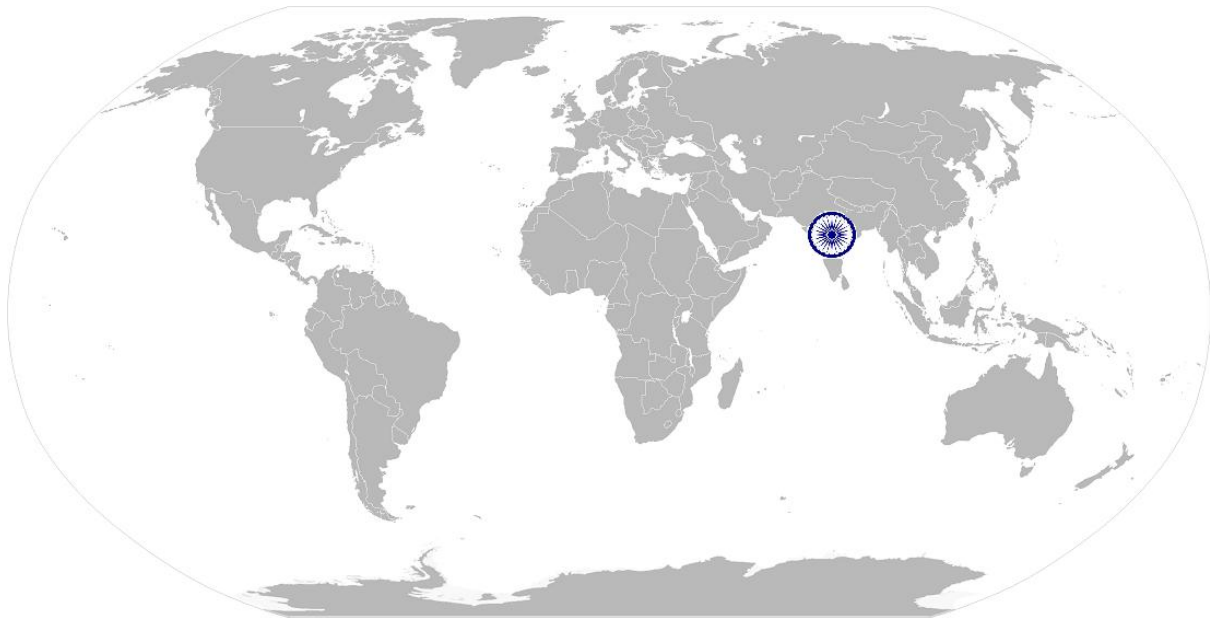
<b>NOS Code</b>	<b>LSC/N9104</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Logistics</b>	<b>Drafted on</b>	<b>10/08/16</b>
<b>Industry Sub-sector</b>	<b>Cold chain logistics</b>	<b>Last reviewed on</b>	<b>11/01/17</b>
<b>Occupation</b>	<b>Maintenance</b>	<b>Next review date</b>	<b>11/01/20</b>



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

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# National Occupational Standard



## Overview

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

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

National Occupational Standard

<b>Unit Code</b>	<b>LSC/N9901</b>
<b>Unit Title (Task)</b>	<b>Maintain food and personnel safety, health and hygiene in cold storage plant</b>
<b>Description</b>	This OS unit is about complying with safety, health and hygiene at the workplace to have a hazard-free environment and avoid downtime
<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>• Take precautionary measures to avoid work hazards</li> <li>• Follow standard health, safety and hygiene procedures</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Taking precautionary measures to avoid work hazards</b>	To be competent, the user/ individual must be able to: <ul style="list-style-type: none"> <li>PC1. assess the various health, safety and environmental hazards in the cold storage</li> <li>PC2. take necessary steps to eliminate or minimize the hazards</li> <li>PC3. analyze the causes of accidents at the workplace</li> <li>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.</li> <li>PC5. ensure the employees have access to first aid kit when needed</li> <li>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</li> <li>PC7. ensure to display safety signs at places where necessary for people to be cautious</li> <li>PC8. use rubber mats in the places where floors are constantly wet</li> <li>PC9. ensure electrical precautions such as insulated clothing, adequate equipment insulation, dry work area, switch off the power supply when not required, etc</li> <li>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.</li> <li>PC11. unplug the control panel, compressor, condensor etc before performing maintenance</li> <li>PC12. report to the superior on any problems and hazards identified</li> <li>PC13. install fire alarms (electrical/manual) in cold store/deep freeze and keep other safety devices like hammer/mallet in the storage area</li> </ul>
<b>Following standard health, safety and hygiene procedures</b>	To be competent, the user/individual must be able to: <ul style="list-style-type: none"> <li>PC14. maintain appropriate ventilation in the cold rooms to avoid unacceptable accumulation of heat, condensation or odours</li> <li>PC15. check and review the cold storage areas frequently</li> <li>PC16. stack items in an organized way and use safe lifting techniques to reduce risk of injuries from handling procedures at the storage areas</li> <li>PC17. ensure no sign of pest infestation and install rodent traps, fly glues and insectocutors wherever needed</li> <li>PC18. follow hygiene &amp; sanitation standards of Government bodies like FSSAI, APEDA and /or EIA or importing countries like FAO, EU standards after PC 20</li> </ul>

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

	<p>PC19. use effective loading and unloading systems</p> <p>PC20. proper stock rotation (First in First out) to be practised</p> <p>PC21. segregate damaged/ non-conforming products from other products to designate area for appropriate disposition</p> <p>PC22. fumigate containers depending upon product and contamination or as per customers' requirement</p> <p>PC23. avoid smoking, spitting, eating etc near food storage area</p> <p>PC24. ensure reefers are covered, clean, free from pest infestation &amp; other contaminants</p> <p>PC25. dispose cold storage plant waste in the designated areas safely as per company's policies and rules</p> <p>PC26. ensure to be safe while handling machines(generator, compressor, condensor etc), gas (ammonia) and chemicals(ethylene, refrigerants etc)</p> <p>PC27. keep the floors free from oil, water and grease to avoid slippery surface</p> <p>PC28. cut nails regularly and avoid applying nail paint. Avoid wearing bangles, rings, and chains in cold storage</p> <p>PC29. wash hands with soap solution and dry under a dryer as they enter for duty or after using wash room</p> <p>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</p> <p>PC31. ensure workers suffering from abscess, boils etc should be relieved from food handling</p> <p>PC32. develop personal hygiene habits like brushing teeth, taking shower everybody, wearing clean and tidy clothes after ironing etc</p>
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	The individual on the job needs to know and understand: <ul style="list-style-type: none"> <li>KA1. company's HR policies on personnel management</li> <li>KA2. company's reporting structure</li> <li>KA3. occupational health and safety standards</li> <li>KA4. cold storageplant inspection checklist</li> <li>KA5. company's sanitary standard operating procedures</li> <li>KA6. procedures to follow during emergency maintenance issues</li> <li>KA7. technical standards for design and construction of cold storages: Bureau of Indian standards(BIS), International standard(ISO) etc</li> </ul>
<b>B. Technical Knowledge</b>	The individual on the job needs to know and understand: <ul style="list-style-type: none"> <li>KB1. the purpose and usage of protective gears such as gloves , jackets etc. while working</li> <li>KB2. use of first aid at workplace</li> <li>KB3. cold storage order 1980</li> <li>KB4. food safety and standards act 2006</li> <li>KB5. reporting procedure or heirarchy for signs of damage and potential hazards</li> </ul>

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

	KB6. methods to minimize accidental risks KB7. safe storage and handling of chemicals like refrigerants, ammonia, ethylene etc KB8. loading and unloading systems KB9. standard operating procedure for safety drills and equipment maintenance KB10. operation of machines: compressor, condenser, evaporator etc KB11. emergency procedures to be followed in case of a mishap such as fire, accidents, etc. and communication of safety instructions to subordinate staff KB12. emergency responses in case of malfunctioning of refrigeration equipment as a whole or its components like evaporator, condenser or compressor KB13. solid, liquid and gaseous waste disposal, treatment norms and equipment KB14. necessary action to be taken for the hazards identified KB15. knowledge of Quality systems like BRC, FSSAI, ISO, FSSC, HACCP etc
<b>Skills (S)</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Reading Skills</b>
	The user/individual on the job needs to know and understand how to: SA1. read and interpret the relevant organisation policies, procedures and diagrams that identify health, safety and safe environmental practices. SA2. read job sheets, company policy documents and information displayed at the workplace for health, safety and environment. SA3. read notes/comments from the senior
	<b>Writing Skills</b>
	The user/individual on the job needs to know and understand how to: SA4. fill up documentation related to health, safety and environmental standards, if required
	<b>Oral Communication (Listening and Speaking skills)</b>
The user/individual on the job needs to know and understand how to: SA5. verbally report health, safety and environmental hazards and poor organisation practice. SA6. communicate to the supervisor about the work health, safety and environmental issues SA7. receive instructions from supervisor on minimizing the risks SA8. communicate with co-workers about the precautions to be taken for hazards free work	
<b>B. Professional Skills</b>	<b>Decision Making</b>
	The user/individual on the job needs to know and understand how to: SB1. take preventive measures for the identified hazards SB2. select appropriate hand tools and personal protection equipment SB3. identify first aid needs in case of an injury
	<b>Plan and Organize</b>
The user/individual on the job needs to know and understand how to:	

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

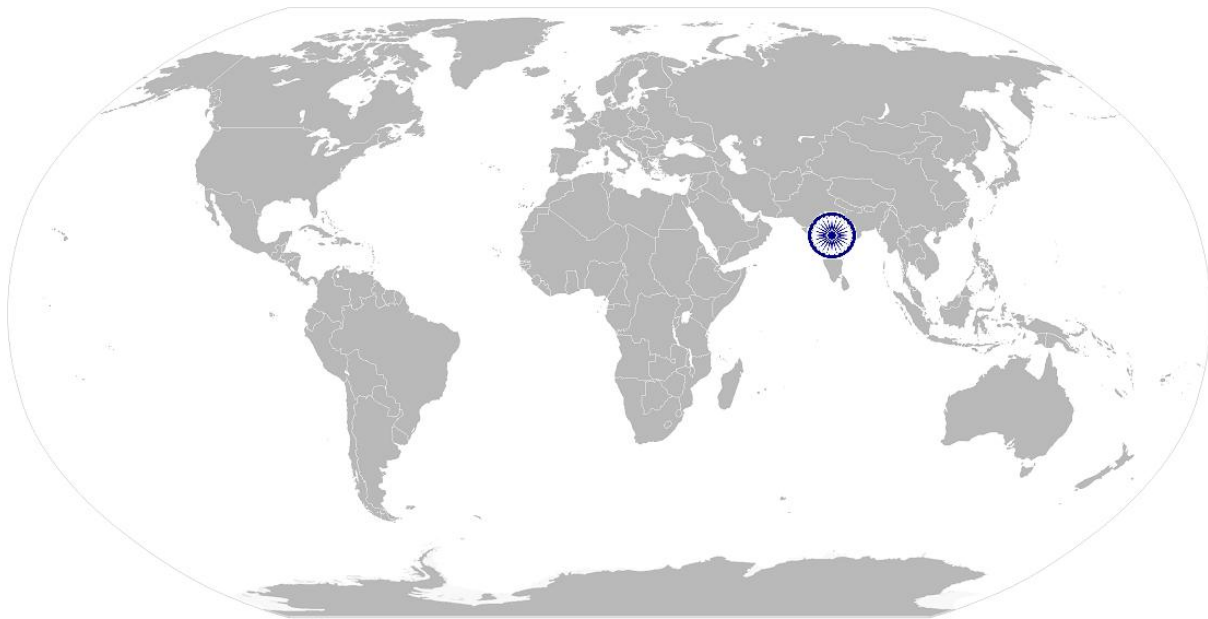
	SB4. formalize and display evacuation plan at strategic locations
	<b>Customer Centricity</b>
	The user/ individual on the job needs to know and understand how to: SB5. ensure targeted product delivery by practicing stipulated standards of occupational health safety and environmental measures
	<b>Problem Solving</b>
	The user/individual on the job needs to know and understand how to: SB6. take care of personal and equipment protection SB7. identify the hazards and suggest possible solutions
	<b>Analytical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB8. use safety equipment such as fire extinguisher during fire accidents SB9. store tools in a safe way SB10. analyse the seriousness of the hazards
	<b>Critical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB11. evolve smooth workflow by avoiding hazards at workplace SB12. evaluate and apply the possible solutions for the hazards, as necessary



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

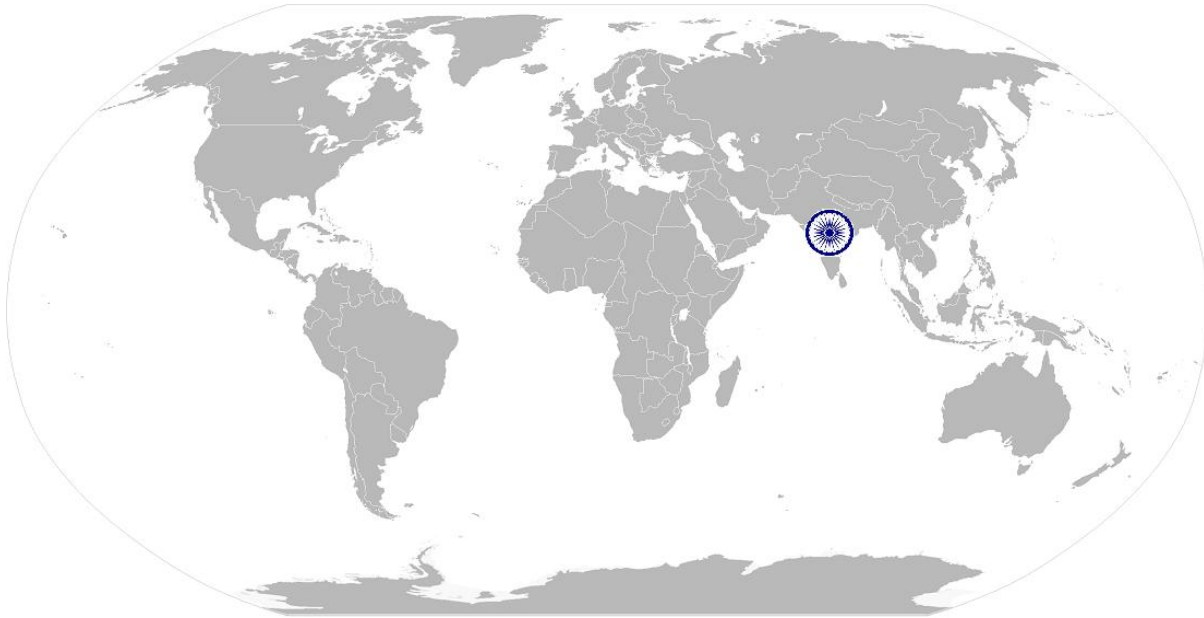
**NOS Version Control**

<b>NOS Code</b>	<b>LSC/N9901</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Logistics</b>	<b>Drafted on</b>	<b>08/08/16</b>
<b>Industry Sub-sector</b>	<b>Cold chain logistics</b>	<b>Last reviewed on</b>	<b>11/01/17</b>
<b>Occupation</b>	<b>Maintenance</b>	<b>Next review date</b>	<b>11/01/20</b>





# National Occupational Standard



## Overview

This unit is about coordinating and communicating effectively with seniors, colleagues and clients to achieve a smooth workflow.

**LSC/N9902**
**Communicate effectively with colleagues and clients**

National Occupational Standard

<b>Unit Code</b>	<b>LSC/N9902</b>
<b>Unit Title (Task)</b>	<b>Communicate effectively with colleagues and clients</b>
<b>Description</b>	This OS unit is about coordinating and communicating effectively with seniors, colleagues and clients to achieve a smooth workflow
<b>Scope</b>	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> <li>• Interact with seniors</li> <li>• Communicate with colleagues</li> <li>• Communicate effectively with clients</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Interacting with seniors</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC1. understand the work output requirements, targets, performance indicators and incentives</p> <p>PC2. deliver quality work on time and report any anticipated reasons for delays</p> <p>PC3. escalate unresolved problems or complaints to the relevant superior</p> <p>PC4. communicate project progress proactively to the superior</p> <p>PC5. receive feedback on work standards</p> <p>PC6. document the completed work schedule and handover to the superior</p>
<b>Communicating with colleagues</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC7. exhibit trust, support and respect to all the colleagues in the workplace</p> <p>PC8. aim to achieve hassle free cold chain operation</p> <p>PC9. help and assist colleagues with information and knowledge</p> <p>PC10. seek assistance from the colleagues when required</p> <p>PC11. identify the potential and existing conflicts with the colleagues and resolve</p> <p>PC12. pass on essential information to other colleagues on timely basis</p> <p>PC13. maintain the etiquette, use polite language, demonstrate responsible and disciplined behaviors to the colleagues</p> <p>PC14. interact with colleagues from different departments: ripening chamber, cold storage, transport, packhouse etc to effectively carry out the work among the team and understand the nature of their work</p> <p>PC15. put team over individual goals and multi task or share work where necessary supporting the colleagues</p> <p>PC16. highlight any errors of colleagues, help to rectify and ensure quality output</p> <p>PC17. work with cooperation, coordination, communication and collaboration, with shared goals and supporting each others performance</p>
<b>Communicating effectively with clients</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC18. ask relevant questions to the client and identify their needs</p> <p>PC19. possess strong knowledge on market and cold chain operation</p> <p>PC20. brief the client clearly on potential costs and challenges involved in the cold chain industry</p> <p>PC21. communicate with the client in a polite, professional and friendly manner</p>

**LSC/N9902**
**Communicate effectively with colleagues and clients**

	<p>PC22. build effective but impersonal relationship with the client</p> <p>PC23. ensure the appropriate language and tone are used with clients</p> <p>PC24. listen actively and have a two way communication</p> <p>PC25. be sensitive to the gender, cultural and social differences such as modes of greeting, formality, etc.</p> <p>PC26. understand the client expectations correctly and provide the appropriate products and services</p> <p>PC27. understand the client dissatisfaction and address or escalate their complaints effectively</p> <p>PC28. maintain a positive, sensible and cooperative manner all time</p> <p>PC29. ensure to maintain a proper body language, dress code, gestures and etiquettes towards the client</p> <p>PC30. avoid interrupting the client while they talk</p> <p>PC31. ensure to avoid negative questions and statements to the client</p> <p>PC32. inform the client on any issues or problems before hand and also on the developments involving them</p> <p>PC33. ensure to respond back to the client immediately for their voice messages, e-mails, apps, etc.</p> <p>PC34. develop good rapport with the client and promote other products and services</p> <p>PC35. seek feedback from the client on their understanding to what was discussed</p> <p>PC36. explain the terms and conditions clearly</p>
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	<p>The individual on the job needs to know and understand:</p> <p>KA1. vision, mission and values of the company</p> <p>KA2. business and performance of the company</p> <p>KA3. company's policies on personnel management, effective team work at workplace</p> <p>KA4. company's HR policies</p> <p>KA5. company's reporting structure</p> <p>KA6. company's documentation policy</p> <p>KA7. company's customer profile</p> <p>KA8. occupational health and safety standards</p> <p>KA9. company's policy on business ethics and code of conduct</p>
<b>B. Technical Knowledge</b>	<p>The individual on the job needs to know and understand:</p> <p>KB1. methods for effective communication with various categories of people and the different departments in the organization</p> <p>KB2. significance of team coordination and productivity targets of the organisation</p> <p>KB3. how to record the job activity as required on various types of documents</p> <p>KB4. how to use computer or smartphone to communicate effectively and productively</p> <p>KB5. significance of helping colleagues with specific issues and problems</p> <p>KB6. importance of meeting quality and time standards as a team</p>

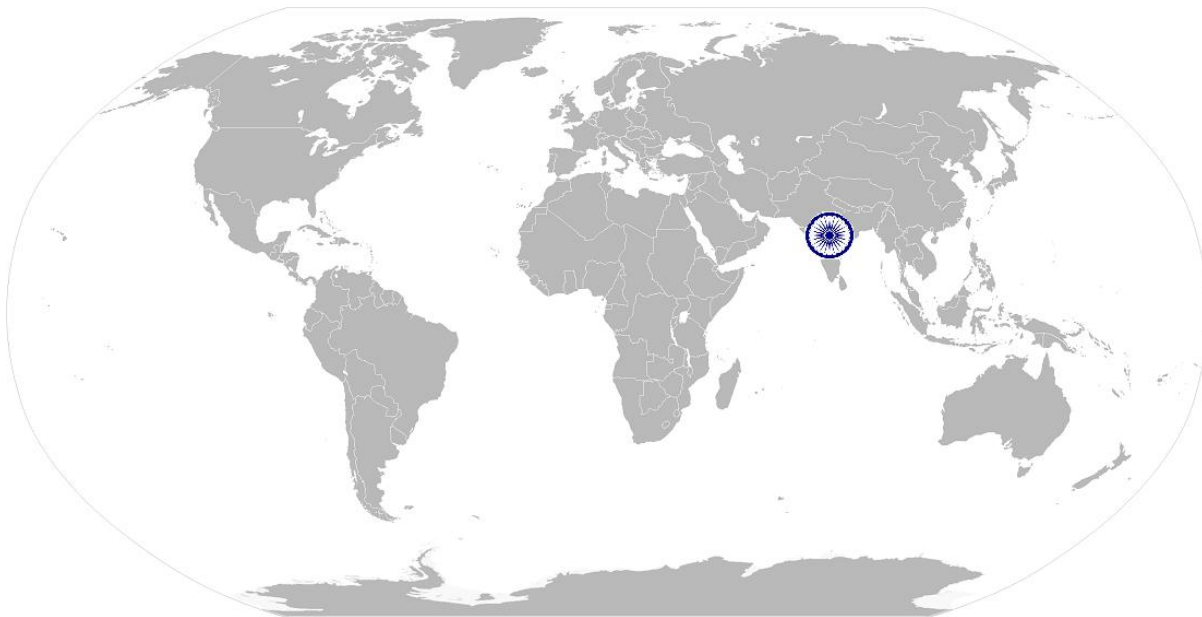
**LSC/N9902**
**Communicate effectively with colleagues and clients**

	KB7. how to practice effective listening and talking KB8. effective use of voice tone and pitch for communication KB9. how to demonstrate ethics and convey discipline to the clients KB10. how to build effective working relationship with mutual trust and respect within the team KB11. importance of dealing with grievances effectively and in time
<b>Skills (S)</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Reading Skills</b>
	The user/ individual on the job needs to know and understand how to: SA1. read job sheets, company policy documents and information displayed at the workplace SA2. read notes/comments from the senior
	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to: SA3. fill up documentation pertaining to job requirement
	<b>Oral Communication (Listening and Speaking skills)</b>
	The user/ individual on the job needs to know and understand how to: SA4. interact with team members to work efficiently SA5. communicate effectively with seniors to achieve smooth workflow SA6. communicate effectively with the clients to build a good rapport with them SA7. use language that the client or colleague understands SA8. use the communication systems of the company, e.g., telephone, fax, public announcement systems SA9. E-mail and use Internet for communicating SA10. use of audio-visual aids to communicate complex issues
<b>B. Professional Skills</b>	<b>Decision Making</b>
	The user/ individual on the job needs to know and understand how to: SB1. spot and communicate potential areas of disruptions to work process and report the same SB2. report to supervisor and deal with a colleague individually, depending on the type of concern
	<b>Plan and Organize</b>
	The user/ individual on the job needs to know and understand how to: SB3. plan communication strategy in order to avoid conflicts and work disruption
	<b>Customer Centricity</b>
	The user/ individual on the job needs to know and understand how to: SB4. practice patient listening, careful talking and paraphrasing in order to avoid misunderstanding
<b>Problem Solving</b>	
	The user/ individual on the job needs to know and understand how to: SB5. coordinate with different departments and multi-task as necessary

**LSC/N9902**

**Communicate effectively with colleagues and clients**

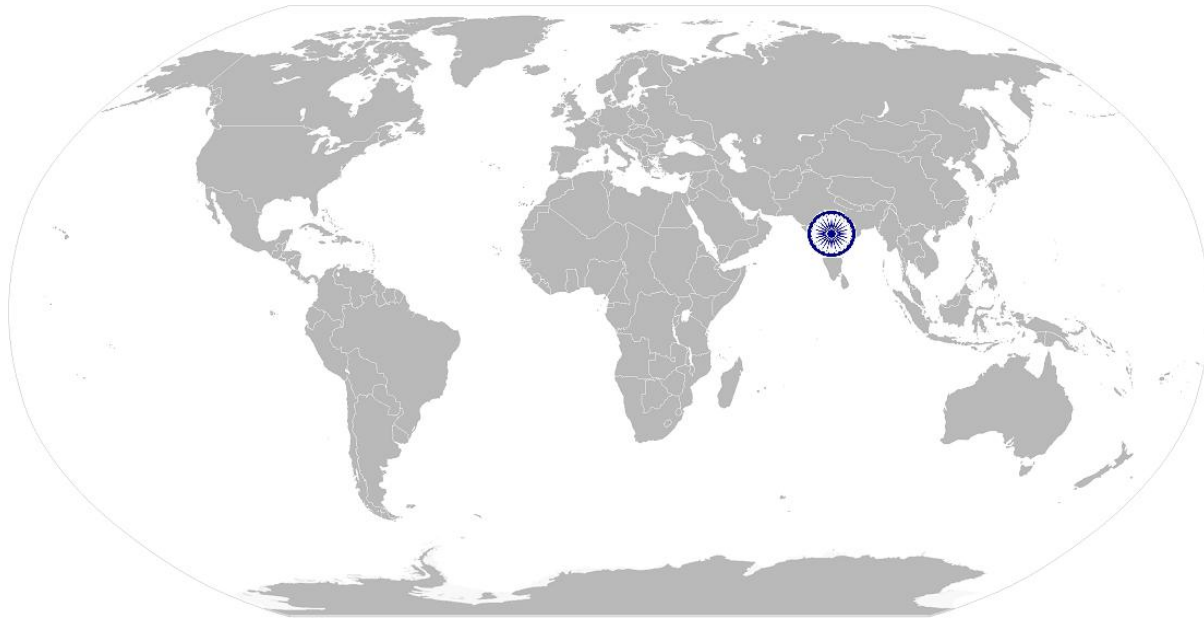
	SB6. contribute to quality of team work and achieve smooth workflow
	SB7. share work load as required
	SB8. delegate work in consultation with senior or as necessary instead of allowing work to pile up
	<b>Analytical Thinking</b>
	The user/ individual on the job needs to know and understand how to: SB9. resolve recurring inter-personal conflicts by clear and two-way dialogue
<b>Critical Thinking</b>	
The user/ individual on the job needs to know and understand how to: SB10. improve work processes by interacting with others and adopting best practices	



## LSC/N9902      Communicate effectively with colleagues and clients

### NOS Version Control

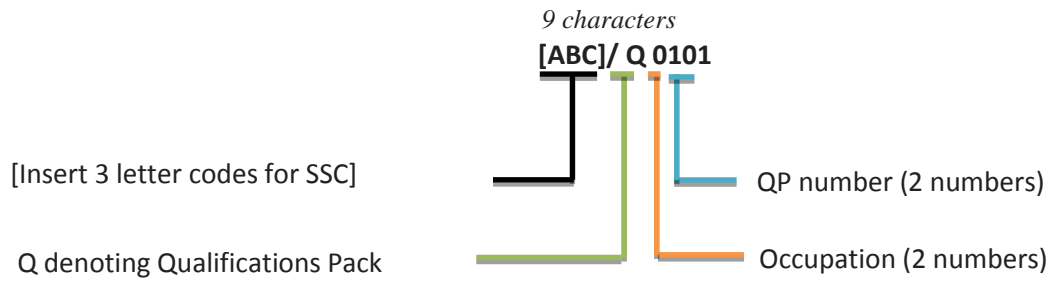
<b>NOS Code</b>	<b>LSC/N9902</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Logistics</b>	<b>Drafted on</b>	<b>08/08/16</b>
<b>Industry Sub-sector</b>	<b>Cold chain logistics</b>	<b>Last reviewed on</b>	<b>11/01/17</b>
<b>Occupation</b>	<b>Maintenance</b>	<b>Next review date</b>	<b>11/01/20</b>



## Annexure

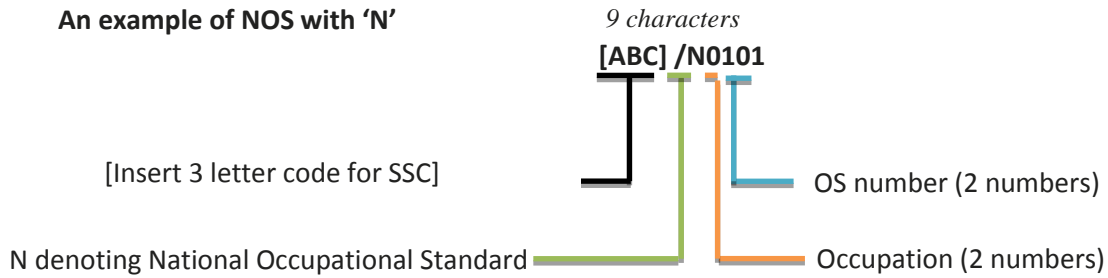
### Nomenclature for QP and NOS

#### Qualifications Pack



#### Occupational Standard

##### An example of NOS with 'N'



[Back to top...](#)

The following acronyms/codes have been used in the nomenclature above:

<b>Sub-sector</b>	<b>Range of Occupation numbers</b>
Land Transportation	11,14
Shipping Transportation	12,14
Air Transportation	13
Warehousing Storage	21,23
Warehouse Packaging	22,23
Courier and Mail Services	30
Shipping / Port Operation	46 – 60
Air cargo operation	61 – 75
EXIM logistics	76 – 85
Cold Chain Logistics	86 - 95
Generic Occupations	96 – 99

<b>Sequence</b>	<b>Description</b>	<b>Example</b>
<b>Three letters</b>	Industry name	LSC
<b>Slash</b>	/	/
<b>Next letter</b>	Whether <b>QP</b> or <b>NOS</b>	Q / N
<b>Next two numbers</b>	Occupation code	01
<b>Next two numbers</b>	OS number	01



## CRITERIA FOR ASSESSMENT OF TRAINEES

**Job Role** Refrigeration Equipment Maintenance Specialist

**Qualification Pack** LSC/Q9101

**Sector Skill Council** Logistics

### Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training 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 criteria
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack

	<b>Performance Criteria</b>	<b>Total Marks (300)</b>	<b>Out of</b>	<b>Theory</b>	<b>Skills Practical</b>
<b>LSC/N9101 Plan the maintenance of refrigeration equipment</b>	PC1. prepare work programme and schedules for maintenance of evaporator, condenser and compressor	50	4	1	3
	PC2. prioritize maintenance as per legislative laws, organization requirements, resources, and environment		3	1	2
	PC3. plan electrical system maintenance at least once in five years as per the Institute of Electrical and Electronics Engineers Code of Practice		3	1	2
	PC4. plan to check evaporators for defrosting and coil surface for dust accumulation		4	1	3
	PC5. ensure to check electrical connections for corroded terminals		3	1	2
	PC6. ensure that the maintenance plan checks oil safety and high pressure controls of compressor units		3	1	2
	PC7. record the schedules for preventive maintenance		3	1	2
	PC8. plan activities so as to minimize disruption to normal working		3	1	2
	PC9. ensure to schedule seasonal maintenance		3	1	2

	Performance Criteria	Total Marks (300)	Out of	Theory	Skills Practical
	PC10. make contingency plans for emergency situations regarding working of the equipment		3	1	2
	PC11. identify resources for maintenance based on the skills required		3	1	2
	PC12. allocate resources for each maintenance activity		4	1	3
	PC13. make contingency plans for variations in labor availability		3	1	2
	PC14. provide checklists for maintenance activities; provide necessary tools, components and protective gear to carry out maintenance activities		5	1	4
	PC15. provide information on priority and deadlines for the tasks, so that losses are minimized		3	1	2
	<b>POINTS</b>		<b>50</b>	<b>15</b>	<b>35</b>
	<b>TOTAL POINTS</b>				<b>50</b>

	Performance Criteria	Total Marks (300)	Out of	Theory	Skills Practical
<b>LSC/N9102 Monitor maintenance of refrigeration equipment</b>	PC1. inspect regularly to ensure maintenance activities are done as per quality requirements	50	3	1	2
	PC2. inspect regularly to ensure maintenance activities are completed timely		3	1	2
	PC3. inspect regularly to ensure maintenance activities are done within the costs planned		3	1	2
	PC4. ensure that the quality of the products stored under refrigeration is not harmed while equipment components are being checked		4	1	3
	PC5. ensure that there is safe discharge of ammonia, so that excess refrigerant is discharged safely (not inside cold room and away from work area)		4	1	3
	PC6. ensure to keep drains in the cold area free of debris; ensure to check operations of door seals regularly		4	1	3
	PC7. monitor the sequence of activities as per the schedule		3	1	2
	PC8. ensure workers are using protective gear during maintenance or repair; ensure workers leave the area safe and clean after performing maintenance activities		5	1	4
	PC9. ensure that the equipment is		3	1	2

	Performance Criteria	Total Marks (300)	Out of	Theory	Skills Practical
	calibrated correctly before use				
	PC10. assign a resource to maintain records of refrigeration equipment maintenance activities regularly		2	1	1
	PC11. conduct regular checks on maintenance log to see if it is current; instruct concerned person to update records if it is not latest		3	1	2
	PC12. report to all concerned people in the organization in case the schedule cannot be met		3	1	2
	PC13. carry out walk around inspection regularly to monitor activities of subordinates; communicate with workers as often as needed to ensure maintenance schedule is followed		4	1	3
	PC14. allocate parallel tasks to handle different components of refrigeration equipment like evaporator, compressor and condenser, wherever possible		3	1	2
	PC15. observe the work efficiency of the workforce and identify training needs wherever necessary		3	1	2
	<b>POINTS</b>		<b>50</b>	<b>15</b>	<b>35</b>
	<b>TOTAL POINTS</b>				<b>50</b>

	Performance Criteria	Total Marks (300)	Out of	Theory	Skills Practical
<b>LSC/N9103 Oversee service and repair of refrigeration equipment</b>	PC1. plan types of maintenance activities based on manufacturer's instructions; plan the frequency of maintenance activities	50	4	1	3
	PC2. consider industry level standard practices while planning maintenance		3	2	1
	PC3. understand procedures while removing or replacing an evaporator or a compressor		3	1	2
	PC4. carry out tests or checks regularly to ensure system is working as required		4	1	3
	PC5. check for freezer insulation degradation by observing compressor duty cycle, condensation or presence of ice; check operation of defrost system and thermostat		4	1	3
	PC6. plan repairs limited to thermostats, electrical systems, start relays and defrost timers as much as possible; avoid repairs to the cooling system, if		4	1	3

	<b>Performance Criteria</b>	<b>Total Marks (300)</b>	<b>Out of</b>	<b>Theory</b>	<b>Skills Practical</b>
	they are uneconomical, and consider replacement of components				
	PC7. inspect cold store ceiling panel suspension rods and also their attachments at least once a year		3	1	2
	PC8. check discharge pressure and suction pressure in control system and make adjustments if necessary		4	1	3
	PC9. ensure that service or repair activities follow hygiene procedures		4	1	3
	PC10. trace faults in the components of refrigeration system when it arises		4	1	3
	PC11. test the working of the equipment, after service or repair		3	1	2
	PC12. ensure that the equipment is calibrated correctly before using		4	1	3
	PC13. maintain records of service and repair of refrigeration, electrical system, equipment components		3	1	2
	PC14. analyze the records to arrive at the performance of refrigerated equipment in terms of operating efficiency, downtime and conformity to the requirements		3	1	2
	<b>POINTS</b>		<b>50</b>	<b>15</b>	<b>35</b>
	<b>TOTAL POINTS</b>				<b>50</b>

	<b>Performance Criteria</b>	<b>Total Marks (300)</b>	<b>Out of</b>	<b>Theory</b>	<b>Skills Practical</b>
<b>LSC/N9104 Undertake training for plant engineers</b>	PC1. train plant engineers to follow safety procedures while handling refrigerants	50	4	1	3
	PC2. provide information on hazardous effects of refrigerants to the environment		4	1	3
	PC3. train them to ensure refrigerant leaks do not enter work areas or closed room		3	1	2
	PC4. train plant engineers on complying with procedures and practices to maintain refrigeration equipment		3	1	2
	PC5. teach them procedures while removing or replacing an evaporator, condenser or compressor		4	1	3
	PC6. provide maintenance history details of the refrigeration equipment, to help in familiarizing with the routine requirements		3	1	2

	<b>Performance Criteria</b>	<b>Total Marks (300)</b>	<b>Out of</b>	<b>Theory</b>	<b>Skills Practical</b>
	PC7. sensitize plant engineers on energy consumption of refrigeration equipment		3	1	2
	PC8. provide information on dismantling refrigeration components to trace faults		4	1	3
	PC9. train plant engineers to inspect the components in need of repair or service		4	1	3
	PC10. teach plant engineers to reinstate components into the refrigeration equipment		3	1	2
	PC11. train plant engineers to understand control circuit diagrams of the refrigeration system		4	1	3
	PC12. train plant engineers on usage of appropriate tools and techniques while handling repairs of evaporators, condensers or compressors		4	1	3
	PC13. train plant engineers on undertaking numerical calculations or data entry mechanisms required for the activities		3	1	2
	PC14. train them on emergency responses in case of malfunctioning of refrigeration equipment as a whole or its components like evaporator, condenser or compressor		4	2	2
	<b>POINTS</b>		<b>50</b>	<b>15</b>	<b>35</b>
	<b>TOTAL POINTS</b>			<b>50</b>	

	<b>Performance Criteria</b>	<b>Total Marks (300)</b>	<b>out of</b>	<b>Theory</b>	<b>Practical</b>
<b>LSC/N9901 Maintain food and personnel safety, health and hygiene in cold storage plant</b>	PC1. assess the various health, safety and environmental hazards in the cold storage; take necessary steps to eliminate or minimize the hazards; analyze the causes of accidents at the workplace; take preventive measures to avoid risk of burns and other injury due to contact with hot surfaces, gas, fire, hot fluids/ liquids, etc	50	5	2	3
	PC2. ensure the employees have access to first aid kit when needed; 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;		2	1	1

*Qualifications Pack For Refrigeration Equipment Maintenance Specialist*

<p>PC3. ensure to display safety signs at places where necessary for people to be cautious; use rubber mats in the places where floors are constantly wet; ensure electrical precautions such as insulated clothing, adequate equipment insulation, dry work area, switch off the power supply when not required, etc; practice correct emergency procedures: operating fire extinguishers, emergency exits, etc; unplug the control panel, compressor, condensor etc before performing maintenance; report to the superior on any problems and hazards identified</p>	5	2	3
<p>PC4. install fire alarms (electrical/manual) in cold store/deep freeze and keep other safety devices like hammer/mallet in the storage area</p>	3	1	2
<p>PC5. maintain appropriate ventilation in the cold rooms to avoid unacceptable accumulation of heat, condensation or odours; check and review the cold storage areas frequently</p>	5	2	3
<p>PC6. stack items in an organized way and use safe lifting techniques to reduce risk of injuries from handling procedures at the storage areas; use effective loading and unloading systems; proper stock rotation (First in First out) to be practised; segregate damaged/ non-conforming products from other products to designate area for appropriate disposition</p>	5	2	3
<p>PC7. ensure no sign of pest infestation and install rodent traps, fly glues and insectocutors wherever needed; follow hygiene &amp; sanitation standards of Government bodies like FSSAI, APEDA and /or EIA or importing countries like FAO, EU standards; fumigate containers depending upon product and contamination or as per customers' requirement</p>	5	2	3
<p>PC8. avoid smoking, spitting, eating etc near food storage area; cut nails regularly and avoid applying nail paint. Avoid wearing bangles, rings, and chains in cold storage; develop personal hygiene habits like brushing teeth, taking shower everyday, wearing clean and tidy clothes after ironing etc; wash hands with soap solution and dry under a dryer as they enter for duty or after</p>	2	1	1

	using wash room				
PC9.	ensure reefers are covered, clean, free from pest infestation & other contaminants		3	1	2
PC10.	dispose cold storage plant waste in the designated areas safely as per company's policies and rules		5	2	3
PC11.	ensure to be safe while handling machines(generator, compressor, condensor etc), gas (ammonia) and chemicals(ethylene, refrigerants etc); keep the floors free from oil, water and grease to avoid slippery surface		3	1	2
PC12.	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		5	2	3
PC13.	ensure workers suffering from abscess, boils etc should be relieved from food handling		2	1	1
	<b>POINTS</b>		<b>50</b>	<b>20</b>	<b>30</b>
	<b>TOTAL POINTS</b>			<b>50</b>	

	Performance Criteria	Total Marks (300)	out of	Theory	Practical
<b>LSC/N9902</b> <b>Communicate effectively with colleagues and clients</b>	PC1. understand the work output requirements, targets, performance indicators and incentives	50	4	2	2
	PC2. deliver quality work on time and report any anticipated reasons for delays; escalate unresolved problems or complaints to the relevant superior; receive feedback on work standards; document the completed work schedule and handover to the superior		4	2	2
	PC3. exhibit trust, support and respect to all the colleagues in the workplace		3	1	2
	PC4. aim to achieve hassle free cold chain operation		4	2	2
	PC5. help and assist colleagues with information and knowledge; seek assistance from the colleagues when required ; pass on essential information to other colleagues on timely basis; highlight any errors of colleagues, help to rectify and ensure quality output		3	1	2
	PC6. identify the potential and existing conflicts with the colleagues and resolve		4	1	3
	PC7. maintain the etiquette, use polite language, demonstrate responsible and		3	1	2

*Qualifications Pack For Refrigeration Equipment Maintenance Specialist*

	disciplined behaviors to the colleagues			
	PC8. interact with colleagues from different departments: ripening chamber, cold storage, transport, packhouse etc to effectively carry out the work among the team and understand the nature of their work; put team over individual goals and multi task or share work where necessary supporting the colleagues; work with cooperation, coordination, communication and collaboration, with shared goals and supporting each others performance	3	1	2
	PC9. ask relevant questions to the client and identify their needs; brief the client clearly on potential costs and challenges involved in the cold chain industry	4	2	2
	PC10. possess strong knowledge on market and cold chain operation	4	2	2
	PC11. communicate with the client in a polite, professional and friendly manner; build effective but impersonal relationship with the client; ensure the appropriate language and tone are used with clients; listen actively and have a two way communication; be sensitive to the gender, cultural and social differences such as modes of greeting, formality, etc.; maintain a positive, sensible and cooperative manner all time ; ensure to maintain a proper body language, dress code, gestures and etiquettes towards the client; avoid interrupting the client while they talk	6	2	4
	PC12. understand the client expectations correctly and provide the appropriate products and services; understand the client dissatisfaction and address or escalate their complaints effectively; ensure to avoid negative questions and statements to the client; ensure to respond back to the client immediately for their voice messages, e-mails, apps, etc. ; develop good rapport with the client and promote other products and services; inform the client on any issues or problems before hand and also on the developments involving them; seek feedback from the client on their understanding to what was discussed	6	2	4
	PC13. explain the terms and conditions clearly	2	1	1
	<b>POINTS</b>	<b>50</b>	<b>20</b>	<b>30</b>
	<b>TOTAL POINTS</b>		<b>50</b>	



	<b>GRAND TOTAL</b>	<b>300</b>			
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