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| **Model Curriculum** **QP Name: Cold Chain Process Management Specialist****QP Code: LSC/Q9201****QP Version: 2.0** **NSQF Level: 5****Model Curriculum Version: 2.0**  |
| **­**Logistics Sector Skill Council|| Logistics Sector Skill Council, Ground Floor, Temple Tower, No.476, Anna Salai, Nandanam, Chennai, Tamil Nadu 600035 |

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# Training Parameters

|  |  |
| --- | --- |
| **Sector**  | Logistics |
| **Sub-Sector** | Cold Chain |
| **Occupation** | Projects |
| **Country** | India |
| **NSQF Level** | 5 |
| **Aligned to NCO/ISCO/ISIC Code** | NCO-2015/ NIL |
| **Minimum Educational Qualiﬁcation and Experience**  | Graduate in the relevant field OR Graduation in any field + 1 year of relevant experience OR2-year Diploma (after 12th Class) in the relevant field + 1 year of relevant experience OR Class XII + 4 years of relevant experience OR Class 10 + 2 years of ITI + 2 years of relevant experience OR Certificate-NSQF (Reefer Vehicle Operator - level 4) with 2 Years of relevant experience |
| **Pre-Requisite License or Training**  | NA |
| **Minimum Job Entry Age** | 18 |
| **Last Reviewed On**  | NA |
| **Next Review Date** | NA |
| **NSQC Approval Date** | NA |
| **QP Version**  | 2.0 |
| **Model Curriculum Creation Date** | 21-08-2022 |
| **Model Curriculum Valid Up to Date** | 21-08-2022 |
| **Model Curriculum Version**  | 2.0 |
| **Minimum Duration of the Course** | 570 |
| **Maximum Duration of the Course** | 570 |

# Program Overview

This section summarizes the end objectives of the program along with its duration.

## Training Outcomes

At the end of the program, the learner will be able to:

* Develop cold storage project plan and perform risk assessment
* Design cold storage facility layout and prepare costing details
* Implement cold storage facility construction and adhere to quality standards and timelines
* Assess and select vendor based on set evaluation criteria and manage vendor relationship
* Test and commission of cold storage facility
* Manage workplace for safe and healthy work environment by following and ensuring compliance to regulatory and safety norms
* Communicate effectively with colleagues and clients for proper information flow

## Compulsory Modules

The table lists the modules, their duration and mode of delivery.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| NOS and Module Details | TheoryDuration | PracticalDuration | On-the-Job Training Duration (Mandatory) | On-the-Job Training Duration (Recommended) | Total Duration |
| Bridge Module | **20** | **10** |  |  | **30** |
| Module 1: Introduction to Cold Chain Process Management Specialist | 20 | 10 |  |  | 30  |
| [LSC/N8601- Assess production and plan for setting-up cold storage plant](#NOS1) V1.05 | **20** | **50** | **5** |  | **75** |
| Module 2: Development of cold storage project plan  | 20 | 50 | *5* |  | 75 |
| [LSC/N8602 - Design cold storage layout and prepare project costing](#NOS2)  V2.05 | **20** | **50** | **5** |  | **75** |
| Module 3: Facility layout designs and budgetary details | 20 | 50 | 5 |  | 75 |
| [LSC/N8603 - Execute and implement cold storage project](#NOS3)  V2.05 | **20** | **50** | **4** |  | **74** |
| Module 4: Supervision of project Construction  | 20 | 50 | 4 |  | 74 |
| LSC/N8604 - Manage vendor and maintain relationship V1.03 | **20** | **50** | **4** |  | **74** |
| Module 5: Manage vendor and maintain relationship | 20 | 50 | 4 |  | 74 |
| [LSC/N8605 - Test and commission cold storage plant](#NOS5)V1.05 | **20** | **50** | **4** |  | **74** |
| Module 6: Test and commission cold storage plant | 20 | 50 | **4** |  | 74 |
| [LSC/N9901 - Maintain food and personnel safety, health and hygiene in cold storage plant](#N9901)  V1.05 | **10** | **40** | **4** |  | **54** |
| Module 7: Compliance to health, safety and security norms | 10 | 40 | 4 |  | 54 |
| [LSC/N9902- Communicate effectively with colleagues and clients](#N9902)V1.05 | **20** | **30** | **4** |  | **54** |
| Module 8: Effective Communication | 20 | 30 | 4 |  | 54 |
| Employability | **30** | **30** |  |  | **60** |
| Total Duration | **180** | **360** | **30** |  | **570** |

**Module Details**

## Module 1: Introduction to Cold Chain Process Management Specialist

***Mapped to Bridge Module***

**Terminal Outcomes:**

* Describe the basic structure and function of supply chain
* Detail the various functions of a Cold Chain Process Management Specialist

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *10:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Classify the components of supply chain and logistics sector
* Detail the various sub-sectors and the opportunities in them
* Identify various activities in cold chain, warehousing, port yard, land, ship and air transportation
* Explain job roles in cold chain
* Detail your job role as cold chain process management specialist and its interface with other job roles
* Discuss the documentation requirements in cold chain process management
 | * Demonstrate the use of evaporators, compressor etc.
* Explain the various documentation involved in cold chain maintenance operation
 |
| **Classroom Aids** |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser |
| **Tools, Equipment and Other Requirements**  |
|  |

## Module 2: Development of cold storage project plan

***Mapped to LSC/N8601, v1.0***

**Terminal Outcomes:**

* Detail the steps to be followed for development of cold storage project plan

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *40:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * List the important parameters to be considered while understanding client requirements
* Describe the process of primary and secondary research to collect data on products, seasonality of products, product demand etc
* Explain the process to assess demand and supply of products
* Discuss the procedure for selecting products based on various factors such as profitability, market demand, cost of production and transport etc
* Calculate capacity of cold storage plant to meet present and future demands
* Explain the process of preparing market research and assessment reports
* Define project milestones and timelines
* Describe project execution plan
* Explain the process of risk assessment
 | * Record client requirements on type of products, facility and services
* Analyse client requirement to check feasibility as per industry standards
* Perform primary and secondary research to collect data on products, seasonality of products, product demand etc
* Analyse data to assess demand and supply of products
* Select products based on various factors such as profitability, market demand, cost of production and transport etc
* Compute capacity of cold storage plant to meet present and future demands
* Prepare market research and assessment reports
* Set project milestones and timelines
* Develop project execution plan
* Perform risk assessment
 |
| **Classroom Aids** |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser |
| **Tools, Equipment and Other Requirements**  |
| Project Management software, MS Office, Computer, Projector, TV, Stationery, Worksheets, Statistical Tools, market survey tools, design software |

## Module 3: Facility layout design and budgetary details

***Mapped to LSC/N8602, V1.0***

**Terminal Outcomes:**

* Detail the steps to be followed for designing cold storage facility layout
* Demonstrate the process for estimating budgetary details

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *50:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Discuss the factors to be considered while assessing site and space availability for refrigeration equipment, facility of loading etc.
* Describe functional flow and movement of goods
* Explain the process of developing plan based on cold storage operations, office space requirement etc
* Explain the process of calculating product load for cold storage design
* Describe heat- load calculations for measuring ceilings, walls etc
* Explain the process of estimating cold storage plant specifications based on type of products, temperature required etc
* Determine type of products, temperature requirement etc.
* Compute cost considering OPEX and CAPEX
 | * Assess site and space availability for refrigeration equipment, facility of loading etc.
* Analyse functional flow and movement of goods
* Develop plan based on cold storage operations, office space requirement etc
* Calculate product load for cold storage design
* Perform heat- load calculations for measuring ceilings, walls etc
* Estimate cold storage plant specifications based on type of products, temperature required etc
* Calculate cost considering OPEX and CAPEX
 |
| **Classroom Aids** |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser |
| **Tools, Equipment and Other Requirements**  |
| MS Project, MS Office, Computer, Projector, TV, Stationery, Worksheets, Statistical Tools, design software such as CAD, 3D Max SketchUp, STAAD pro and CRO pro, structural software, architectural norms and standards, Budgeting tools, standards for cold storage equipment  |

## Module 4: Supervision of project construction

***Mapped to LSC/N8603, v1.0***

**Terminal Outcomes:**

* Detail the appropriate steps for supervision of project construction as per SOP

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *50:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * List the steps to be followed for preparing detailed project construction plan
* Detail activity wise project execution plan
* Explain the process of planning activities for different team members as per stage of construction
* Discuss effective allocation of resources
* Discuss the standards for consumption of raw materials
* Review timely completion of activities
* Explain escalation matrix for resolving non compliance to timeline and quality
* Report status of project execution, quality management, risk management etc.
 | * Prepare detailed project construction plan
* Perform activity wise project execution plan
* Plan activities for different team members as per stage of construction
* Perform allocation of resources
* Solve personnel grievances
* Inspect the consumption of raw materials as per standards
* Review timely completion of activities
* Resolve non-compliance to timeline and quality using escalation matrix
* Report status of project execution, quality management, risk management etc.
* Record expenses incurred and manhours utilized
 |
| **Classroom Aids** |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser |
| **Tools, Equipment and Other Requirements**  |
| MS Project, MS Office, Computer, Projector, TV, Stationery, Worksheets, Statistical Tools, design software such as CAD, 3D Max SketchUp, STAAD pro and CRO pro, structural software, architectural norms and standards, Budgeting tools, standards for cold storage equipment, ERP |

## Module 5: Manage vendor and maintain relationship

***Mapped to LSC/N8604, v1.0***

**Terminal Outcomes:**

* Details the steps to be followed for effective vendor management and relationship.

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *50:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Describe various steps involved in tendering process
* Explain the assessment method for vendor proposals
* List the important criteria’s to be considered for vendor evaluation
* Discuss Statement of Work(SOW), service level agreement(SLA) etc
* Explain the method to prepare purchase orders as per company’s standards
* Discuss the process of managing vendor invoices and documentation
* List the factors to be considered for evaluating vendor performance
* Discuss the importance of having effective vendor relationship
 | * Perform the various steps involved in tendering process
* Assess vendor proposals as per terms of reference
* Select most suitable vendor as per company’s evaluation criteria
* Negotiate and manage contract, Statement of Work(SOW), service level agreement(SLA) etc
* Prepare purchase orders as per company’s standards
* Inspect shipments received
* Evaluate activities executed by vendor
* Manage vendor invoices and documentation
* Analyse vendor performance to take corrective actions
* Resolve vendor concerns to improve relationship
 |
| **Classroom Aids** |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser |
| **Tools, Equipment and Other Requirements**  |
| MS Project, MS Office, Computer, Projector, TV, Stationery, Worksheets, Statistical Tools, ERP, standard formats, |

## Module 6: Test and commission cold storage plant

***Mapped to LSC/N8605, v1.0***

**Terminal Outcomes:**

* Demonstrate the steps to be performed for testing and commissioning of cold storage plant

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *50:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Explain the testing process of panels, vapour seals, control panels, refrigeration system etc as per company standards
* Discuss the inspection process for thermal conductivity of the insulation material as per supplier requirements
* Detail the essential checks to be done on temperature, rack systems, electricity supply, emergency alarms etc as per protocol
* Resolve technical issues in coordination with vendors and suppliers
* Detail the commissioning activities to ensure all systems and components of the plant are designed, installed, tested, operated and maintained as per the operational requirements
* Discuss the escalation matrix for failed test scenario
 | * Perform testing of panels, vapour seals, control panels, refrigeration system etc as per company standards
* Inspect thermal conductivity of the insulation material as per supplier requirements
* Perform all essential checks on temperature, rack systems, electricity supply, emergency alarms etc as per protocol
* Resolve technical issues in coordination with vendors and suppliers
* Perform commissioning activities to ensure all systems and components of the plant are designed, installed, tested, operated and maintained as per the operational requirements
* Perform escalation of failed test scenario to stakeholders and re-test
* Collect statutory and insurance approvals
 |
| **Classroom Aids** |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser |
| **Tools, Equipment and Other Requirements**  |
| MS Project, MS Office, Computer, Projector, TV, Stationery, Worksheets, Statistical Tools, testing standards, programmable logic controller equipment, packaging lines, dock levelers, advanced graders, alternate technologies, stacking system, modernization of insulation and refrigeration, cold storage setup, piping, etc |

## Module 7: Compliance to health, safety and security norms

***Mapped to LSC/N9901, v1.0***

**Terminal Outcomes:**

* Describe health, safety, and security procedures in cold storage plants
* Demonstrate the inspection procedure to ensure appropriate and safe conditions of activity area and equipment
* Illustrate the standard protocol to be followed during emergency situations, accidents and breach of safety

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *50:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Detail health, safety and security procedures in cold storage plants
* Explain the inspection procedure to ensure appropriate and safe conditions of activity area and equipment
* Detail hygiene and sanitation standards as per regulatory bodies such as FSSAI, APEDA
* Evaluate protective devices, pipelines and cold storage areas as per SOP
* Detail the pest control methods to be followed to ensure zero pest infestation
* Describe the SOP for safe handling of goods
* Explain the protocol to be followed during accident, emergency etc.
 | * Perform health and safety procedure in cold storage plants
* Follow safety precautionary methods
* Check the activity area and equipment for compliance to safety
* Check the pipeline and cold storage area are as per SOP
* Perform pest control as per SOP to avoid infestation
* Inspect adherence to standard operating procedures (SOP) while handling goods
* Implement standard protocol in case of emergency situations, accidents, and breach of safety
 |
| **Classroom Aids** |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser |
| **Tools, Equipment and Other Requirements**  |
| MS Project, MS Office, Computer, Projector, TV, Stationery, Worksheets, Statistical Toolscompressor, condenser, evaporator, temperature and humidity sensor, simulator, tools and tackles, consumables |

## Module 8: Effective Communication

***Mapped to LSC/N9902, v1.0***

**Terminal Outcomes:**

* Demonstrate effective communication skills to understand targets and performance indicators
* Establish good client relationships and maintain them effectively

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *40:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Understand the target and performance indicator from seniors
* Detail the progress to superiors
* Explain the behavior to be followed in workplace
* Breakdown issues among colleagues
* Interpret cooperation, coordination to be established with colleagues and clients
* Recognize the client requirement
* Manage client escalation immediately
* Manage good client relationship
 | * Communicate effectively with seniors to understand targets, performance indicators
* Practice responsible, disciplined and respectful behavior in the workplace
* Resolve conflicts amongst colleagues
* Practice cooperation, coordination, etiquette and collaboration with colleagues and clients
* Provide expert inputs and guide colleagues
* Communicate effectively with clients to understand work requirements
* Solve client escalations effectively
* Establish and maintain good client relationships
 |
| **Classroom Aids** |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser |
| **Tools, Equipment and Other Requirements**  |
| MS Project, MS Office, Computer, Projector, TV, Stationery, Worksheets, Statistical Toolscompressor, condenser, evaporator, temperature and humidity sensor, simulator, tools and tackles, consumables |

# Annexure

## Trainer Requirements

|  |
| --- |
| Trainer Prerequisites |
| Minimum Educational Qualification | **Specialization** | **Relevant Industry Experience**  | **Training Experience** | **Remarks**  |
| ***Years*** | ***Specialization*** | ***Years*** | ***Specialization*** |  |
| Graduate or Diploma  | Engineering | 6 | cold storage | 1 | cold storage |  |

|  |
| --- |
| Trainer Certification |
| Domain Certification | **Platform Certification** |
| Certified for Job Role: “Cold Chain Process Management specialist” mapped to QP: “LSC/Q8601, v1.0”. Minimum accepted score is 80% | Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q2601”. Minimum accepted score is 80% |

## Assessor Requirements

|  |
| --- |
| Assessor Prerequisites |
| Minimum Educational Qualification  | **Specialization** | **Relevant Industry Experience** | **Training/Assessment Experience** | **Remarks**  |
| ***Years*** | ***Specialization*** | ***Years*** | ***Specialization*** |  |
| 12th Pass | NA | 2 | cold storage | 1 | cold storage | Graduation is preferred |

|  |
| --- |
| Assessor Certification |
| Domain Certification | **Platform Certification** |
| Certified for Job Role: “Cold Chain Process Management Specialist” mapped to QP: “LSC/Q8601, v1.0”. Minimum accepted score is 80% | Recommended that the Assessor is certified for the Job Role: “Assessor”, mapped to the Qualification Pack: “MEP/Q2601”. Minimum accepted score is 80% |

## Assessment Strategy

This section includes the processes involved in identifying, gathering and interpreting information to evaluate the learner on the required competencies of the program.

|  |  |
| --- | --- |
| Sr. No. | Guidelines for Assessment |
| 1 | Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC. |
| 2 | The assessment for the theory part will be based on knowledge bank of questions created by the SSC. |
| 3 | Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below) |
| 4 | Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training canter based on this criterion |
| 5 | To pass the Qualification Pack, every trainee should score a minimum of 70% in each NOS |
| 6 | In case of unsuccessful completion, the trainee may seek re-assessment on the Qualification Pack |

# References

## Glossary

|  |  |
| --- | --- |
| Term | Description |
| Declarative Knowledge | Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.  |
| Key Learning Outcome | Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application). |
| OJT (M) | On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site |
| OJT (R) | On-the-job training (Recommended); trainees are recommended the specified hours of training on site |
| Procedural Knowledge | Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.  |
| Training Outcome | Training outcome is a statement of what a learner will know, understand and be able to do **upon** **the** **completion of the training**.  |
| Terminal Outcome | Terminal outcome is a statement of what a learner will know, understand and be able to do **upon the completion of a module.** A set of terminal outcomes help to achieve the training outcome. |

## Acronyms and Abbreviations

|  |  |
| --- | --- |
| Term | Description |
| QP | Qualification Pack |
| NSQF | National Skills Qualification Framework |
| NSQC | National Skills Qualification Committee |
| NOS | National Occupational Standards |
|  |  |
|  |  |
|  |  |