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| **Model Curriculum**  **QP Name: Tank Farm Associate**  **QP Code: LSC/Q3511**  **QP Version: 2.0**  **NSQF Level: 3**  **Model Curriculum Version: 2.0** |
| **­**  Logistics Sector Skill Council|| Logistics Sector Skill Council, No. 480 A, 7th floor Khivraj Complex 2, Anna Salai, Nandanam, Chennai, Tamil Nadu 600035 |

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**Training Parameters**

|  |  |
| --- | --- |
| **Sector** | Logistics |
| **Sub-Sector** | LIQUID LOGISTICS |
| **Occupation** | PORT OPERATIONS COORDINATION, LIQUID TRANSPORT OPERATIONS, ENGINEERING/MAINTENANCE |
| **Country** | India |
| **NSQF Level** | 3 |
| **Aligned to NCO/ISCO/ISIC Code** | NCO – 2015 – 9333 and ISCO -08 - 9333 |
| **Minimum Educational Qualiﬁcation and Experience** | Grade 9  or Grade 8 with one year of (NTC/ NAC) after 8th  or Grade 8 pass and pursuing continuous schooling in regular school with vocational subject  or 8th grade pass + 1 year relevant experience or 5th grade pass + 4 year relevant experience or Ability to read and write + 5 year 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** | 04-08-2022 |
| **Model Curriculum Valid Up to Date** | 04-08-2025 |
| **Model Curriculum Version** | 2.0 |
| **Minimum Duration of the Course** | 420 hrs |
| **Maximum Duration of the Course** | 480 hrs |

# 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:

## Perform monitoring, measurement and basic maintenance of tank farm equipment.

## Clean tank farms and remove any residuals.

## Apply the necessary precautions while handling dangerous and hazardous goods.

## Comply to work place integrity, ethical and regulatory practices.

## Examine compliance to regulatory and safety norms to ensure safe and healthy work environment

## Options:

## Inspect tank farm equipment and identify maintenance work to be done.

## Compute and document inventory levels in tank farm.

## Compulsory Modules

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| NOS and Module Details | Theory  Duration | Practical  Duration | On-the-Job Training Duration (Mandatory) | On-the-Job Training Duration (Recommended) | Total Duration |
| Bridge Module | **20** | **10** |  |  | **30** |
| Module 1: Introduction to Tank Farm Associate role | 20 | 10 |  |  | 30 |
| LSC/N3521 – Tank operations and its basic maintenance  NOS Version 1.0  NSQF Level 3 | **20** | **35** | **5** |  | **60** |
| Module 2: Monitor tank operations and perform basic maintenance | 20 | 35 | 5 |  | 60 |
| LSC/N3527– Tank cleaning process  NOS Version 1.0  NSQF Level 3 | **20** | **35** | **5** |  | **60** |
| Module 3: Assist in tank cleaning and residual collection | 20 | 35 | 5 |  | 60 |
| LSC/N4307 – Pipeline operation and its maintenance  NOS Version 1.0  NSQF Level 3 | **20** | **35** | **5** |  | **60** |
| Module 4: Operate and maintain pipeline | 20 | 35 | 5 |  | 60 |
| LSC/N4310 - Loading/unloading process of liquid cargo NOS Version 1.0  NSQF Level 3 | **20** | **35** | **5** |  | **60** |
| Module 5: Assist in wagon/truck loading/unloading | 20 | 35 | 5 |  | 60 |
| LSC/ N9904 - Guideline on integrity and ethics NOS Version 1.0  NSQF Level 3 | **20** | **35** | **5** |  | **60** |
| Module 6: Maintain and monitor integrity and ethics in operations | 20 | 35 | 5 |  | 60 |
| LSC/N9905 - Follow health safety and security procedures  NOS Version 1.0  NSQF Level 3 | **20** | **35** | **5** |  | **60** |
| Module 7: Follow health, safety and security procedures in liquid logistics | 20 | 35 | 5 |  | 60 |
| Employability  DGT/VSQ/N0101, v1.0 | **15** | **15** |  |  | **30** |
| Total Duration | **155** | **235** | **30** |  | **420** |

## 

## Optional Modules

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

**Option 1: Tank Farm Supervision**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| NOS and Module Details | Theory  Duration | Practical  Duration | On-the-Job Training Duration (Mandatory) | On-the-Job Training Duration (Recommended) | Total Duration |
| LSC/N3523 - Tank farm inspection and inventory tracking  NOS Version 1.0  **NSQF Level 3** | **30** | **30** |  |  | **60** |
| Module 8: Perform tank farm inspections and inventory tracking | 30 | 30 |  |  | 60 |
| Total Duration | **30** | **30** |  |  | **60** |

**Module Details**

## Module 1: Introduction to Tank Farm Associate

***Mapped to Bridge Module***

**Terminal Outcomes:**

* Describe the basic structure and functions of supply chain and logistics sector
* Detail the role of Tank Farm Associate.

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *10:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Explain the basics of supply chain and logistics sector * Describe the various sub-sectors and the opportunities in them * Detail the activities in warehouse, port yard, land, ship and liquid logistics * Describe job roles in ports and tank farms * Elaborate the job role of tank farm associate and its interface with other job roles * Brief the various activities in a port yard * Detail the documentation requirements for goods transport * Explain the basics of hazardous goods handling | * List the major components in logistics sector and supply chain. * Classify the different opportunities available in logistics and the sub-sectors within. * Distinguish the various activities in warehouse, port yard, land, ship and liquid logistics * Characterize your job role as tank farm associate and interface with other job roles * Demonstrate all the events in a port yard in terms of Tank farming. * Prepare some of the documents required for goods transport * Practice the ways to handle hazardous goods |
| **Classroom Aids** | |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser | |
| **Tools, Equipment and Other Requirements** | |
| Teaching board, computer, projector, video player or TV | |

## Module 2: Tank operations and its basic maintenance

***Mapped to LSC/N3521, v1.0***

**Terminal Outcomes:**

* Detail the steps involved in Tank operations
* Describe reporting and maintenance activities.

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *35:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Explain tank farm and related equipment * Detail the firefighting, safety and security requirements for different types of liquid cargo * Describe basic trouble shooting and maintenance of tank farm equipment * Document maintenance requirements for tank farm equipment | * Compose about tank farm and the equipment used * Operate equipment related to tank farm operations * Record pressure, volume, density and other measurements using gauges and control panel * Detail the firefighting, safety and security requirements for different types of liquid cargo * Demonstrate the trouble shooting steps and the maintenance of tank farm equipment * Assess the maintenance requirements for tank farm equipment and perform. |
| **Classroom Aids** | |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser | |
| **Tools, Equipment and Other Requirements** | |
| Tank, control and measuring equipment, tools and tackles, firefighting systems and alarms, consumables, SOP, computer, projector, worksheets, etc. | |

## Module 3: Tank cleaning process

## *Mapped to LSC/* *N3527, V1.0*

**Terminal Outcomes:**

* Detail the steps to be followed in tank cleaning
* Discuss the reporting process of inspection and repairs.

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *35:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Describe the PPE and tools used for handling different types of cargo * Explain the chemicals required and process to be followed for cleaning tanks * Detail the process of degasification of tanks * Explain residue disposal methods for different types of liquid cargo * Formulate the methods of dry and wet cleaning of tanks * Describe pickling and de-rusting process * Detail the various processes for steam and chemical cleaning of tanks | * Identify the various PPE and tools required for different types of cargo * Interpret the process for cleaning tanks and list down various chemicals required * Demonstrate how to degasify tanks * Practice on residue disposal methods for different types of liquid cargo * Illustrate dry and wet cleaning of tanks * Demonstrate the pickling and de-rusting process * Enact steam and chemical cleaning of tanks |
| **Classroom Aids** | |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser | |
| **Tools, Equipment and Other Requirements** | |
| Tank, control and measuring equipment, tools and tackles, fire-fighting systems and alarms, cleaning equipment, consumables, SOP, computer, projector, worksheets, etc | |

## Module 4: Pipeline operation and its maintenance

## *Mapped to LSC/* *N4307, V1.0*

**Terminal Outcomes:**

* Describe pipe cleaning process
* Detail the maintenance and repairing of pipeline

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *35:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Describe alkali and acid flushing process to clean pipe line * Elaborate filter suitability and turbulent movement of flush for piping operation * List the different types of pipe couplings using valves and angles * Detail the process of recording pressure, temperature, volume, density and flow rates using different gauges * Compile inspection and repairing process for seals, couplings, joints and valves | * Demonstrate cleaning pipe line using alkali and acid flushing. * Illustrate about the suitability of filter and turbulent movement of flush, for piping operation * Discriminate different types of pipe couplings using valves and angles * Record pressure, temperature, volume, density and flow rates using different gauges * Inspect and repair seals, couplings, joints and valves * Demonstrate liquid cargo pumping process with different types of pumps * Report leaks, accidents and damages |
| **Classroom Aids** | |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser | |
| **Tools, Equipment and Other Requirements** | |
| Tank, pipelines, control and measuring equipment, tools and tackles, fire-fighting systems and alarms, liquid cargo, control console, consumables, SOP, computer, projector, worksheets, etc. | |

## Module 5: Loading/unloading process of liquid cargo

## *Mapped to LSC/* *N4310, V1.0*

**Terminal Outcomes:**

* Detail the steps to be followed in tank cleaning
* Discuss the reporting process of inspection and repairs.

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *35:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * List the various documents related to transport vehicle, and liquid transported * Detail the process of using dip stick study under different categories of liquids * Describe piping and security arrangement for loading/unloading liquids * Elaborate the reporting process for recording volume of goods loaded/unloaded, spilled etc. | * Prepare the documents for transporting liquid according to vehicle. * Operate various equipment used for loading/unloading * Operate weighbridge to record weight readings * Perform dip stick study of different categories of liquids transported * Demonstrate piping and security arrangement for loading/unloading * Operate valves and control equipment for loading/unloading process * Measure volume of goods loaded/unloaded * Report volume of goods loaded/unloaded, spilled etc. |
| **Classroom Aids** | |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser | |
| **Tools, Equipment and Other Requirements** | |
| Tank, wagon/truck, weighbridge, pipelines, pumping equipment, control and measuring equipment, tools and tackles, fire-fighting systems and alarms, liquid cargo, control console, consumables, SOP, computer, projector, worksheets, etc. | |

## Module 6: Guidelines on integrity and ethics

***Mapped to LSC/N9904, v1.0***

**Terminal Outcomes:**

* Explain the concepts of integrity, ethics
* Detail the various regulatory requirements related to logistics industry

|  |  |
| --- | --- |
| Duration: *20:00* | Duration: *35:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Describe the concepts of integrity, ethics * Detail the various regulatory requirements related to logistics industry * Explain data and information security practices * Detail the procedure for documenting all integrity and ethics violations * Explain escalation matrix for reporting deviation | * Practice the principles of integrity and ethics * Follow the various regulatory requirements related to logistics industry * Perform data and information security practices * Discuss corrupt practices * Discuss regulatory requirements, code of conduct and etiquettes * Identify corrupt practices * Comply to regulatory requirements * Practice code of conduct and etiquettes * Document all integrity and ethics violations * Report deviation as per the escalation matrix |
| **Classroom Aids** | |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser | |
| **Tools, Equipment and Other Requirements** | |
| SOP, Teaching board, computer, projector, video player, stationery, worksheets and TV | |

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

***Mapped to LSC/N9905, v1.0***

**Terminal Outcomes:**

* Describe health, safety, and security procedures in warehouse
* 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: *35:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Detail health, safety and security procedures in warehouse * Describe the 5S to be followed * Explain the inspection procedure to ensure appropriate and safe conditions of activity area and equipment * Discuss unsafe working conditions * Describe the inspection procedure to check safe handling of hazardous goods * Discuss the standard protocol to be followed during emergency situations, accidents and breach pf safety * Document health, safety and security violations * Explain the escalation matrix for reporting deviation | * Follow health, safety and security procedures in warehouse * Implement 5S at workplace * Inspect the activity area and equipment, for appropriate and safe conditions * Identify unsafe working conditions * Inspect adherence to standard operating procedures (SOP) while handling dangerous and hazardous goods * Implement standard protocol in case of emergency situations, accidents, and breach of safety * Prepare report on health, safety and security violations * Report deviation as per the escalation matrix |
| **Classroom Aids** | |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser | |
| **Tools, Equipment and Other Requirements** | |
| PPEs, MHEs like Forklift, reach stacker, pallet truck, barcode scanner, packaging devices, packing material, markers and stationery, etc | |

**Module 8: Employability Skills**

***Mapped to DGT/VSQ/N0101, v1.0***

**Terminal Outcomes:**

* Appraise the significance of employability skills in meeting the job requirements
* Identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices.
* Illustrate English and communication skills, customer service, entrepreneurship, and getting ready for jobs and apprenticeship.

|  |  |
| --- | --- |
| Duration: *15:00* | Duration: *15:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Detail the importance of Employability Skills in meeting the job requirements * Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen. * Describe positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations. * Discuss the significance of reporting sexual harassment issues in time * Appraise the significance of using financial products and services safely and securely. * Explain the importance of managing expenses, income, and savings. * Detail the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws * Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely * Categorize the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges * Discuss the significance of maintaining hygiene and dressing appropriately * Discuss how to search and register for apprenticeship opportunities | * Analyze 21st century skills. * Practice appropriate basic English sentences/phrases while speaking * Demonstrate how to communicate in a well -mannered way with others. * Illustrate working with others in a team * Demonstrate how to conduct oneself appropriately with all genders and PwD * Operate digital devices and use the associated applications and features, safely and securely * Differentiate between types of customers * Create a biodata * Experiment with various sources to search and apply for jobs * Identify customer needs and address them * Compose the significance of dressing up neatly and maintaining hygiene for an interview |
| **Classroom Aids** | |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser, UPS, LCD Projector, Computer Tables & chairs | |
| **Tools, Equipment and Other Requirements** | |
| Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be latest version or one/two version below), Scanner cum Printer | |

**OPTION 1: Tank Farm Supervision**

***Mapped to LSC/N3523, v1.0***

**Terminal Outcomes:**

* Detail the various inspection and recording processes.
* Describe damaged goods handling.

|  |  |
| --- | --- |
| Duration: *30:00* | Duration: *30:00* |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| * Explain the preventive maintenance checks undertaken in tank farm * Explain the typical defects in tank farm equipment * Detail the maintenance requirements for equipment. * Describe standard parameters to be maintained for different types of liquids based on their nature and tank type * Detail preventive and corrective steps to be undertaken to prevent loss of liquid | * Demonstrate maintenance checks and preventive methods in tank farm * Identify the faults that appear in tank farm equipment * Record the maintenance requirements * Compute liquid loss from storage tanks * Detail preventive and corrective steps to be undertaken to prevent loss of liquid * Record liquid loss and preventive measures undertaken |
| **Classroom Aids** | |
| Charts, Models, Video presentation, Flip Chart, Whiteboard/Smart Board, Marker, Board eraser | |
| **Tools, Equipment and Other Requirements** | |
| Tank, pipelines, control and measuring equipment, tools and tackles, liquid cargo, control console, consumables, SOP, computer, projector, worksheets, etc. | |

# 

# Annexure

## Trainer Requirements

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Trainer Prerequisites | | | | | | |
| Minimum Educational Qualification | **Specialization** | **Relevant Industry Experience** | | **Training Experience** | | **Remarks** |
| ***Years*** | ***Specialization*** | ***Years*** | ***Specialization*** |  |
| Graduate |  | 2 | PORT OPERATIONS COORDINATION, LIQUID TRANSPORT OPERATIONS, ENGINEERING/MAINTENANCE | 1 | PORT OPERATIONS COORDINATION, LIQUID TRANSPORT OPERATIONS, ENGINEERING/MAINTENANCE |  |

|  |  |
| --- | --- |
| Trainer Certification | |
| Domain Certification | **Platform Certification** |
| Certified for Job Role: “Tank farm Associate” mapped to QP: “LSC/Q3511, v2.0”. 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*** |  |
| Graduate |  | 3 | Ports, CFS, ICD | 1 | Ports, CFS, ICD |  |

|  |  |
| --- | --- |
| Assessor Certification | |
| Domain Certification | **Platform Certification** |
| Certified for Job Role: “Tank farm Associate” mapped to QP: “LSC/Q3511, v2.0”. 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

The emphasis is on ‘learning-by-doing' and practical demonstration of skills and knowledge based on the performance criteria. Accordingly, assessment criteria for each job role are set and made available in qualification pack.

The assessment papers for both theory and practical would be developed by Subject Matter Experts (SME) hired by Logistics Sector Skill Council or with the LSC accredited Assessment Agency as per the assessment criteria mentioned in the Qualification Pack. The assessments papers would also be checked for the various outcome-based parameters such as quality, time taken, precision, tools & equipment requirement etc.

Each NOS in the Qualification Pack (QP) is assigned a relative weightage for assessment based on the criticality of the NOS. Therein each Element/Performance Criteria in the NOS is assigned marks on relative importance, criticality of function and training infrastructure.

The following tools would be used for final assessment:

1. **Practical Assessment:** This comprises of a creation of mock environment in the skill lab which is equipped with all equipment required for the qualification pack.

Candidate's soft skills, communication, aptitude, safety consciousness, quality consciousness etc. is ascertained by observation and marked in observation checklist. The outcome is measured against the specified dimensions and standards to gauge the level of their skill achievements.

1. **Viva/Structured Interview:** This tool is used to assess the conceptual understanding and the behavioral aspects with regard to the job role and the specific task at hand. It also includes questions on safety, quality, environment, and equipment etc.
2. **On-Job Training:** OJT would be evaluated based on standard logbook capturing departments worked on, key observations of learner, feedback and remarks of supervisor or mentor.
3. **Written Test:** Question paper consisting of 100 MCQs (Hard:40, Medium:30 and Easy: 30) with questions from each element of each NOS. The written assessment paper is comprised of following types of questions:
   1. True / False Statements
   2. Multiple Choice Questions
   3. Matching Type Questions
   4. Fill in the blanks
   5. Scenario based Questions
   6. Identification Questions

**QA Regarding Assessors:**

Assessors are selected as per the “eligibility criteria” laid down by LSC for assessing each job role. The assessors selected by Assessment Agencies are scrutinized and made to undergo training and introduction to LSC Assessment Framework, competency-based assessments, assessors guide etc. LSC conducts “Training of Assessors” program from time to time for each job role and sensitize assessors regarding assessment process and strategy which is outlined on following mandatory parameters:

* + 1. Guidance regarding NSQF
    2. Qualification Pack Structure
    3. Guidance for the assessor to conduct theory, practical and viva assessments
    4. Guidance for trainees to be given by assessor before the start of the assessments.
    5. Guidance on assessments process, practical brief with steps of operations practical observation checklist and mark sheet
    6. Viva guidance for uniformity and consistency across the batch.
    7. Mock assessments
    8. Sample question paper and practical demonstration

# References

## Glossary

|  |  |
| --- | --- |
| Term | Description |
| 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 |
| 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 |