QUALIFICATION FILE – Refrigeration Equipment Maintenance Specialist

☒ Short Term Training (STT) ☐ Long Term Training (LTT) ☐ Apprenticeship

☒ Upskilling ☐ Dual/Flexi Qualification ☐ For ToT ☐ For ToA

☒ General ☐ Multi-skill (MS) ☐ Cross Sectoral (CS) ☐ Future Skills

NCrF/NSQF Level: 5

Submitted By:

Logistics Sector Skill Council

No. 480 A, 7th floor Khivraj Complex 2, Anna Salai, Nandanam, Chennai – 600 035

Submitting Body Contact Details:

Name: Ms. Reena Murray

Position in the Organization: Head - Standards & Quality Assurance

Address if different from the above: Same as above

Tel Number: 044 4851 4607

E-mail Address: reena@lsc-india.com

Table of Contents

Section 1: Basic Details

1.	**Qualification Name**	Refrigeration Equipment Maintenance Specialist	
2.	**Sector/s**	Logistics	
3.	**Type of Qualification: ☐ New ☒ Revised ☐ Has Electives/Options** **☐ OEM**	**NQR Code & version of the existing /previous qualification:** QG-05-TW-00237-2023-V1-LSC & V1.0	**Qualification Name of the existing version:** Refrigeration Equipment Maintenance Specialist
4.	**a. OEM Name** **b. Qualification Name** *(Wherever applicable)*	Refrigeration Equipment Maintenance Specialist	
5.	**National Qualification Register (NQR) Code & Version** (*Will be issued after NSQC approval)*	QG-05-TLW-04964-2026-V1-LSSC	**6. NCrF/NSQF Level:** 5
7.	**Award (Certificate/Diploma/ Advanced Diploma/ Any Other)** *(Wherever applicable specify multiple entry/exits also & provide details in annexure)*	Certificate	
8.	**Brief Description of the Qualification**	The individual at work prepares a refrigeration equipment maintenance schedule checklist and monitors its preventive maintenance. The person is also responsible for overseeing the installation, replacement, service and repair of cold chain equipment like condensers, compressors, and evaporators, providing workforce and material resources to maintenance technicians, and training plant engineers on handling and maintaining refrigeration equipment.	

9. Eligibility Criteria for Entry for Student/Trainee/Learner/Employee

a. Entry Qualification & Relevant Experience:

S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Relevant Experience (with Specialization - if applicable)
1	Completed UG diploma or equivalent (Diploma in Mechanical / Electrical / Electronic / Refrigeration engineering)	1 Year relevant experience in handling refrigeration equipment
2	12th grade Pass or equivalent	4 Years of relevant experience in handling refrigeration equipment
3	Completed 3 year diploma after 10th	2 years of relevant experience in handling refrigeration equipment
4	Previous relevant Qualification of NSQF Level (4)	3 Years of relevant experience in cold storage/ refrigeration/ air conditioning equipment maintenance operations

Age:

10.	**Credits Assigned to this Qualification** *(as per (NCrF))*	19	**11. Common Cost Norm Category: I**
12.	**Any Licensing Requirements for Undertaking Training on This Qualification** *(wherever applicable)*	NA	
13.	**Training Duration by Modes of Training Delivery** *(Specify **Total Duration** as per selected training delivery modes and as per requirement of the qualification)*	☒ **Offline Only** ☐ **Online Only** ☐ **Blended**	

Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)
Classroom (offline)	**170**	**370**	**30**		**570**
Online					

(Refer to the Blended Learning Annexure for details)

14.	**Aligned to NCO/ISCO Code/s** *(if code is not available, then mention the same)*	NCO-2015/NIL	
15.	**Progression Path After Attaining the Qualification** *(Please show Professional and Academic progression) (wherever applicable)*	Cold chain specialist (Green Engineering)	
16.	**Other Indian Languages in which the Qualification & Model Curriculum are being Submitted**	**Hindi**	
17.	**Is similar Qualification(s) available on NQR-if yes, justification for this qualification**	**☐ Yes ☒ No URLs of similar Qualifications:**	
18.	**Is the Job Role Amenable to Persons with Disability**	**☐ Yes ☒ No *If "Yes", specify applicable type of Disability:***	
19.	**How participation of women will be encouraged?**	The Job Role is gender neutral and can be performed by women.	
20.	**Are Greening/ Environment Sustainability Aspects Covered** *(Specify the NOS/Module which covers it), wherever applicable*	**☐ Yes ☒ No**	
21.	**Is Qualification Suitable to be Offered in Schools/Colleges**	**Schools ☐ Yes ☒ No Colleges ☒ Yes ☐ No**	
22.	**Name and Contact Details of Submitting / Awarding Body SPOC** *(In case of CS or MS, provide details of both Lead AB & Supporting ABs)*	**Name**: Ms. Reena Murray **Email**: reena@lsc-india.com **Contact No**.: 044 4851 4607 **Website**: www.lsc-india.com	
23.	**Final Approval Date by NSQC:** 06-02-2026	**24. Validity Duration:** 3 years	**25. Next Review Date:** 06-02-2029

Section 2: Module Summary

NOS of Qualifications

(In exceptional cases these could be described as components)

Mandatory NOS:

Specify the training duration and assessment criteria at NOS/ Module level. For further details refer curriculum document.

***Th.**-Theory **Pr.**-Practical **OJT**-On the Job **Man.**-Mandatory Training **Rec.**-Recommended **Proj.**-Project*

S. No	NOS/Module Name	NOS/Module Code & Version *(if applicable)*	Core/ Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
1	Introduction to Refrigeration Equipment Maintenance Specialist	Bridge module	Non-core	5	1	20	10	-	-	30	0	0	-	0	-	0
2	Plan preventive maintenance of refrigeration equipment	LSC/N9101 & v3.0	Core	5	3	20	35	5	-	60	30	60	-	10	100	20
3	Supervise Maintenance Activities	LSC/N9102 & v3.0	Core	5	3	20	35	5	-	60	30	60	-	10	100	20
4	Administer Installation or Replacement of Refrigeration Equipment Components	LSC/N9105 & v1.0	Core	5	2	20	35	5	-	60	30	60	-	10	100	20

S. No	NOS/Module Name	NOS/Module Code & Version *(if applicable)*	Core/ Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
5	Monitor overall performance and continuous improvement	LSC/N9103 & v3.0	Core	5	3	20	35	5	-	60	30	60	-	10	100	10
6	Maintain food and personnel safety, health and hygiene in the cold storage plant	LSC/N9901 & v3.0	Core	5	2	20	35	5	-	60	30	60	-	10	100	10
7	Oversee modified atmosphere requirements for the products	LSC/N9202 & v2.0	Core	5	3	20	35	5	-	60	30	60	-	10	100	10
8	Employability Skills	DGT/VSQ/N0102 v1.0	Non-core	5	2	30	30	-	-	60	20	30	-	0	50	10
	Duration (in Hours) / Total Marks				**19**	**170**	**370**	**30**	**-**	**570**	**200**	**390**	**-**	**60**	**650**	**100**

Assessment - Minimum Qualifying Percentage

Please specify any one of the following:

Minimum Pass Percentage – Aggregate at qualification level: 70 % *(Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)*

Minimum Pass Percentage – NOS/Module-wise: 50 % *(Every Trainee should score specified minimum passing percentage in each mandatory and selected elective NOS/Module to successfully clear the assessment.*

Section 3: Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Any degree + 2 years of relevant industrial experience specifically in Cold chain Recommended that the Trainer is certified for the Job Role: "Trainer (VET and Skills)", mapped to the Qualification Pack: "MEP/Q2601, V3.0". Minimum accepted score is 80%
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Any degree + minimum 5 years of experience in the logistics industry, specifically in Cold chain Certified for Job Role: "Refrigeration Equipment Maintenance Specialist" mapped to QP: "LSC/Q9101 ,V3.0". Minimum accepted score is 80%
3.	**Tools and Equipment Required for the Training**	☒Yes ☐No (*If "Yes", details to be provided in Annexure)*
4.	**In Case of Revised Qualification, Details of Any Upskilling Required for Trainer**	NA

Section 4: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Any degree + 2 years of relevant industrial experience Recommended that the Assessor is certified for the Job Role: "Assessor (VET and Skills)", mapped to the Qualification Pack: "MEP/Q2701, V3.0". Minimum accepted score is 80%
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines) wherever applicable*	Any degree + 2 years of relevant industrial experience Certified for Job Role: "Refrigeration Equipment Maintenance Specialist " mapped to QP: "LSC/Q9101, V3.0". Minimum accepted score is 80%
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines) wherever applicable*	Any degree + 5 years of relevant industrial experience + 1 year assessment experience Recommended that the Assessor is certified for the Job Role: "Lead Assessor", mapped to the Qualification Pack: "MEP/Q2702, V3.0". Minimum accepted score is 80%
4.	**Assessment Mode** *(Specify the assessment mode)*	Online and Offline
5.	**Tools and Equipment Required for Assessment**	☒ Same as for training ☐ Yes ☐ No *(details to be provided in Annexure-if it is different for Assessment)*

Section 5: Evidence of Need for the Qualification

1.	**Latest Skill Gap Study (not older than 2 years) (Yes/No):** Yes
2.	**Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):** No
3.	**Government /Industry initiatives/ requirement (Yes/No):** No
4.	**Number of Industry validation provided:** 21
5.	**Estimated nos. of persons to be trained and employed:** As per Annexure: Training and Employment Details
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** Yes

Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	**Annexure:** NCrF/NSQF level justification based on NCrF level/NSQF descriptors *(Mandatory)*	Yes
2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)*	Yes
3.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	Assessment of the Candidates on completion of the Training is a very important activity that is monitored by Logistics Sector Skill Council (LSC). It ensures sustained quality of training delivery. It also indicates to the LSC the need for any changes in training content. LSC has developed policies related to affiliation of assessment agencies and assessment process to enhance the quality of assessments and they are outlined in succeeding paragraphs. 1) Guidelines on affiliation of assessment agencies: As per NSDC guidelines on affiliation of assessment agency, we are adhering the following: a) Application evaluation b) Affiliation certificate c) SME profile validation d) Question bank validation e) TOA process f) Link through SIP 2) Assessment process: 1) The assessment process would begin by developing the correct qualitative questions for theory/practical and viva. Questions papers are submitted by Assessment Bodies (AB) to LSC for approval.

		2) AB submits Assessor's details, their experience and credentials to LSC for approval. 3) Third step in the process would be allocation of batches by LSC to AB for which LSC has shifted from a manual allocation system to automated allocation on the basis of grading system on the below mentioned parameters. i. Quality of the assessors submitted by the assessment agency. ii. Certification of the assessor by LSC basis the training of assessor's program conducted by LSC. iii. Adherence to schedule of assessments by the assessment agencies. iv. Integrity of the assessor in conducting quality assessments. v. Quality of the question papers submitted by the assessment agencies to LSC. vi. Submission of quality documents of the assessments conducted as insisted by LSC. vii. Time of submission of the required assessment related documents to LSC for approval viii. Time of submission of results in SDMS system post approval by LSC Basis the above grading metrics the system would allocate the batches to the assessment agencies, which has brought transparency in the system of who are allocated how many batches and it is made very clear to the ecosystem that performance matters a lot. This has in turn also helped to improve the quality of the trainings as the check list of documents advised by LSC to be submitted by the assessment agencies speaks on the quality of trainings happening.
4.	**Annexure:** Assessment Strategy *(Mandatory)*	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 validated and approved 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 centre based on these criteria 5. To pass the Qualification Pack, every trainee should score a minimum of 70% for NSQF level 4 & above job roles and 50% for NSQF level 1 to 3 job roles. 6. In case of unsuccessful completion, the trainee may seek re-assessment on the Qualification Pack.
5.	**Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is Blended Learning)*	No
6.	**Annexure:** Multiple Entry-Exit Details *(Mandatory, in case qualification has multiple Entry-Exit)*	No
7.	**Annexure:** Acronym and Glossary *(Optional)*	Yes
8.	**Supporting Document:** Model Curriculum *(Mandatory - Public view)*	Yes
9.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	Yes
10.	**Supporting Document:** Occupational Map *(Mandatory)*	Yes
11.	**Supporting Document:** Assessment SOP *(Mandatory)*	https://drive.google.com/file/d/1G3IXYAboNyUNjTb6nHRY6fuK3HQkEsLu/view?usp=sharing
12.	**Any other document you wish to submit:**	NA

Annexure: Evidence of Level

NCrF/NSQF Level Descriptors	Key requirements of the job role/ outcome of the qualification	How the job role/ outcomes relate to the NCrF/NSQF level descriptor	NCrF/NSQF Level
Professional Theoretical Knowledge/Process	• Possesses knowledge in multidisciplinary contexts, broadly, within the chosen fields of technology/ skills/ job role.	Applies refrigeration theory, cold storage operations, and preventive/corrective	5

	• Deeper knowledge and understanding of specialized field of technology / skills/ job role and its underlying principles • Acquired specialized knowledge and a range of cognitive and practical skills to accomplish tasks like basic design, prototyping, testing so as to solve a problem by selecting appropriate information, methods, tools, and materials.	maintenance knowledge to ensure proper functioning of refrigeration equipment.	
Professional and Technical Skills/ Expertise/ Professional Knowledge	• Demonstrates cognitive specialised professional and technical skills required for performing and accomplishing difficult tasks relating to the chosen field/s of technology / skills/ job role; successfully applying techniques in routine or non-routine technical skills, displays clarity of knowledge and practice in broad range of activities/ tasks. • Possesses a range of professional and project management skills; organisation and time management; emotional intelligence.	Uses technical and practical expertise in diagnosing issues, supervising repair/replacement, and guiding technicians on refrigeration systems.	5
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	• Possesses excellent oral and written communication and collaboration skills for clearly taking the vision of the leaders to the shop floor level workforce. • Communication and collaboration skills to act as a layer between the senior management and workforce/shop floor. • Very good Digital, Financial and Legal Literacy to use them effectively. • Has a good understanding the constitutional, humanistic, ethical, and moral values.	Collaborates with cold chain staff, ensures adherence to safety and hygiene standards, and demonstrates leadership in supervising maintenance teams.	5

	• Very good in data collecting, organising information, analysis and communication of results for informed decision making. Very good in complex calculations, and mathematical and financial analysis skills for applied solutions. • Has well informed practical understanding of the social, political and work environment. • May have an entrepreneurial Mind-set for creating a start-up/ small businesses and its end to end management.		
Broad Learning Outcomes/Core Skill	• Should be able to listen and understand properly and present complex information in a clear and concise manner. • Make judgement and take decision, based on the analysis and evaluation of information, for determining solutions to a variety of unpredictable problems associated with the chosen fields of learning. • Takes responsibility for the nature and quality of outputs. • Is able to work on processes to improve the quality of outputs. • Can analyse and synthesise ideas. • Uses discretion and judgement over a range of known and innovative responses to familiar and un-familiar problems and issues.	Applies judgment in evaluating equipment performance, maintaining records, improving efficiency, and applying safety standards in predictable and occasional unpredictable contexts.	5

Responsibility	• Manages processes and procedures within broad parameters for defined activities. • Supervises the routine work of others, takes the required responsibility for the evaluation and improvement of work or study activities. • Constantly motivates, guides, mentors and trains the workforce. • At level 5.0 the candidate is a Technical supervisor or junior/ deputy manager. • Is responsible for managing an independent work unit/ shop floor/ section/ business activity/ assignment.	Takes responsibility for personal work and supervises junior technicians, ensuring reliable operations of cold chain systems, aligning with supervisory responsibility .	5

Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size: 30

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1.	Refrigeration equipment (compressor, condenser, evaporator)	Standard Make	2
2.	Computers with web camera, MS office	Standard Make	15
3.	Electrical testing tools (multimeter, insulation tester)	Standard Make	2
4.	Leak detectors	Standard Make	2
5.	Manifold gauges, Vacuum pump	Standard Make	2
6.	PPE	Standard Make	5

7.	Cleaning kits, Temperature & humidity sensors, Maintenance checklists, Calibration tools, Thermal imagers	Standard Make	2
8.	Simulator, Tools and tackles, Consumables, Asset tags	Standard Make	2
9.	Multimeter, Calibration kits, Ethylene gas filters and monitoring devices	Standard Make	2
10.	CMMS software, SCADA/BMS dashboards	Standard Make	5
11.	Torque wrenches, Brazing kit, Refrigerants, Lubricants,	Standard Make	2
12.	MA storage containers, Nitrogen generator, Purge port assemblies, Gas analyzers and sensors (O_2, CO_2, ethylene), Absorbers/adsorbers, Air sampling kits	Standard Make	2
13.	LLMS(Learning Version)	LLMS software logins to be subscribed from LSC. Regarding equipment guidance, please reach out to Logistics Sector Skill Council.	15 logins per center

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Training Kit (Trainer Guide, Presentations)
2. Charts, Models, Video presentation, Flip Chart
3. Whiteboard/Smart Board, Marker, Board eraser

Annexure: Industry Validations Summary

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile *(if available)*
1.	Aeris Dynamics Packaging India Pvt Ltd	Nigel Dsouza	Business Head-Indian subcontinent & Middle East	Mumbai			
2.	Alamu Medicals	Suresh Narayanan	Manager	Chennai			
3.	Annamalaiyar Gramathu Paalagam	Manikandan	Proprietor	Chennai			
4.	Bluestar limited	Ashish ranjan	Deputy Manager	Mumbai			
5.	Carryfresh Logistics Pvt Ltd	Prakash. T	Managing Director	Chennai			
6.	Daikin Aircondtioning India Pvt Ltd	Daksh Yadav	Senior Executive-Human Resource	New Delhi			
7.	The Dental Boutique	Krupa Sharan Balaji	Doctor	Chennai			
8.	FB Cakes	Ajith	Store In-Charge	Chennai			
9.	Federal Transport Pvt Ltd	Meena Nandhagopal	Accounting Manager	Chennai			
10.	GPEMC	A Marialeon	Chief Manager	Chennai			

11.	Gubba Groups	Annamalaiyaar V.G	Branding and Communication Manager	Chennai			
12.	Jayam Provisional Stores	Vinodh	Proprietor	Chennai			
13.	JBS Jeena Logistics	Samir J Shah	Director	Ahmedabad			
14.	Jublie Medicals	K Ayyapan	Staff	Chennai			
15.	Medplus	M Ajith Kumar	Pharmacy incharge	Chennai			
16.	Polar Bear	Divya	Senior GSA	Chennai			
17.	Sattva Hitech and Conware Pvt Ltd	S. Padmanabhan	Director	Chennai			
18.	Shreepa Logistics Pvt Ltd	M Ruthwik	Manager	Chennai			
19.	Vasanth & Co	Selvaraj	Manager	Chennai			
20.	Vinaya Foods Products	V. Ramesh	Proprietor	Chennai			
21.	VK Medicals	Sarala	Owner	Chennai			

Annexure: Training & Employment Details

Training and Employment Projections:

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
2025-26	70	0	0	0	0	0
2026-27	85	0	0	0	0	0
2027-28	94	0	0	0	0	0

Data to be provided year-wise for next 3 years.

Training, Assessment, Certification, and Placement Data for previous versions of qualifications:

Qualification Version	Year	Total Candidates				Women				People with Disability			
		Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed
V2.0	2024-2025	176	0	0	0	2	0	0	0	0	0	0	0
V2.0	2023-2024	58	10	10	0	2	0	0	0	0	0	0	0
V2.0	2022-2023	29	0	0	0	0	0	0	0	0	0	0	0

Applicable for revised qualifications only, data to be provided for past 3 years.

List Schemes in which the previous version of Qualification was implemented:

1. NON PMKVY

Content availability for previous versions of qualifications:

☒ Participant Handbook ☒ Facilitator Guide ☐ Digital Content ☐ Qualification Handbook ☐ Any Other:

Languages in which Content is available: English, Hindi

Annexure: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

Refer NCVET "Guidelines for Blended Learning for Vocational Education, Training & Skilling" available on:
https://ncvet.gov.in/sites/default/files/Guidelines%20for%20Blended%20Learning%20for%20Vocational%20Education,%20Training%20&%20Skilling.pdf

S. No.	Select the Components of the Qualification	List Recommended Tools – for all Selected Components	Offline : Online Ratio
1	☐Theory/ Lectures - Imparting theoretical and conceptual knowledge		
2	☐Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		
3	☐Showing Practical Demonstrations to the learners		
4	☐Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training		
5	☐Tutorials/ Assignments/ Drill/ Practice		
6	☐Proctored Monitoring/ Assessment/ Evaluation/ Examinations		
7	☐On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training		

Annexure: Detailed Assessment Criteria

Detailed assessment criteria for each NOS/Module are as follows:

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Plan preventive maintenance of refrigeration equipment	**PC1.** List all refrigeration equipment, record their key specifications and tag critical systems.	2	3	-	0.5
	PC2. Review OEM Guidelines, Maintenance Manuals and manufacturer manuals for each unit.	2	4	-	-
	PC3. Identify the recommended service intervals, Parts replacement timelines, Calibration/ inspection points, and Critical thresholds for temperature, pressure, and performance.	2	3	-	1
	PC4. Prepare work program and schedules for maintenance based on equipment criticality (daily, weekly, monthly, quarterly, and annually), Usage intensity (24/7 operation vs. seasonal use) and Environment (high-dust, high-humidity, or food-grade zones).	1	4	-	1
	PC5. Prioritize maintenance as per legislative laws, organisation requirements, resources, and environment	2	3	-	0.5
	PC6. Plan electrical system maintenance at least once in five years as per the Institute of Electrical and Electronics Engineers Code of Practice	2	4	-	0.5
	PC7. Develop PM Checklists for Each Equipment Type which should include Visual Inspection (corrosion, leaks, frost buildup), Mechanical Check (compressor noise, vibration, fan operation), Electrical Check (connections, insulation, relays, overloads), Refrigerant System Check (leak detection, pressure testing, level verification), Cleaning Tasks (coils, filters, panels, drain lines) and Control System Calibration (thermostats, sensors, defrost timers, BMS/PLC inputs).	1	4	-	1
	PC8. Be sure electrical connections for corroded terminals, evaporators for defrosting, and coil surfaces for dust accumulation checks are included.	2	4	-	0.5

	PC9. Confirm that the maintenance plan checks oil safety and high-pressure controls of compressor units	2	3	-	0.5
	PC10. Schedule PM during non-peak hours or planned downtime, and coordinate with production, warehouse, or logistics teams to minimise disruption.	2	4	-	0.5
	PC11. Record the schedules for preventive maintenance and share them with the respective stakeholders.	2	3	-	0.5
	PC12. Identify resources for maintenance based on the skills required and timelines.	2	3	-	0.5
	PC13. Assign roles and responsibilities to those who perform which tasks, such as an in-house technician vs. an external service contractor.	2	4	-	0.5
	PC14. Provide information on priority to the mechanics and deadlines for the tasks, so that losses are minimized	2	4	-	0.5
	PC15. Make contingency plans for emergencies regarding the working of the equipment and for variations in workforce availability.	2	4	-	0.5
	PC16. Maintain inventory of Common spares (filters, thermostats, gaskets, fuses, refrigerants), Tools (leak detectors, manifold gauges, multimeters, cleaning kits) and PPE.	1	3	-	0.5
	PC17. Identify long-lead items or parts with import lead times and arrange them in advance.	1	3	-	1
	NOS Total	**30**	**60**	**-**	**10**
Supervise maintenance activities	**PC1.** Inspect regularly to ensure maintenance activities are done as per quality requirements, timelines and within the costs planned.	1	3	-	0.5
	PC2. Prepare preventive maintenance Calendar and Monitor the sequence of activities as per the schedule and that the equipment is calibrated correctly before use.	2	3	-	0.5
	PC3. Ensure compliance with Refrigerant handling regulations (e.g., India's Ozone Depleting Substances Rules) and Electrical safety and lockout/tagout procedures.	2	4	-	0.5
	PC4. Confirm that the quality of the products stored under refrigeration is not harmed while equipment components are being checked	2	3	-	0.5
	PC5. Ensure that there is safe discharge of ammonia, so that excess refrigerant is discharged safely (not inside the cold room and away from the work area)	2	4	-	0.5
	PC6. Ensure that drains in the cold area are free of debris and check the operations of door seals.	1	3	-	0.5

	PC7. Ensure workers are using PPE and leave the area safe and clean after performing maintenance activities	2	3	-	0.5
	PC8. Carry out a walk-around inspection regularly to monitor the activities of subordinates.	1	3	-	0.5
	PC9. Allocate parallel tasks to handle different components of refrigeration equipment, like the evaporator, compressor and condenser, wherever possible	1	3	-	0.5
	PC10. Observe the work efficiency of the workforce and identify training needs wherever necessary	2	3	-	0.5
	PC11. Communicate with workers as often as needed to ensure the maintenance schedule is followed	1	3	-	0.5
	PC12. Do warranty analysis and tag critical systems.	1	3	-	0.5
	PC13. Renew license with concerned authorities every year as per the AMC Expiry of certain equipments.	2	4	-	0.5
	PC14. Assign a resource to maintain records during refrigeration equipment maintenance activities	2	2	-	0.5
	PC15. Conduct regular checks on the maintenance log and instruct the person concerned if it's inaccurate.	2	3	-	0.5
	PC16. Maintain logs for the Maintenance performed, Spare parts used, Issues found and resolved, Equipment downtime and repair history, etc.	2	3	-	1
	PC17. Use CMMS (Computerised Maintenance Management System) or digital tools like Excel, UpKeep, or Maintain.	1	3	-	0.5
	PC18. Review failure logs and service history every 6 months and update maintenance schedules based on Unexpected breakdowns, Equipment age or upgrade, Energy efficiency targets, etc.	2	3	-	0.5
	PC19. Incorporate feedback from operators and facility managers and maintain the Operational Calendar.	1	4	-	0.5
	NOS Total	**30**	**60**	**-**	**10**
Administer Installation or Replacement of Refrigeration Equipment Components	**PC1.** Conduct a site inspection to evaluate physical space, ventilation, power supply, and drainage.	2	4	-	0.5
	PC2. Confirm equipment specifications align with Cooling load requirements, Type of refrigerant, Voltage and amperage compatibility.	2	4	-	0.5
	PC3. Review the installation plan and the manufacturer's guidelines.	2	3	-	0.5
	PC4. Confirm readiness of necessary tools such as a vacuum pump, gauges, torque wrenches, a leak detector, a brazing kit, etc.	2	4	-	0.5

	PC5. Ensure the availability of the Correct refrigerant type, Lubricants, sealants, replacement parts or components, and PPE.	2	3	-	0.5
	PC6. Ensure that the old equipment is isolated and decommissioned (if applicable) and the power supply is shut off using lockout/tagout (LOTO) procedures.	2	4	-	0.5
	PC7. Monitor whether the new unit or component is positioned (compressor, evaporator, expansion valve, etc.) securely.	2	4	-	0.5
	PC8. Ensure that the connections and fittings are done as per the manufacturer's specifications.	2	3	-	0.5
	PC9. Conduct Pressure Testing and Leak Detection using techniques once the installation is completed.	2	3	-	0.5
	PC10. Confirm that the refrigerant is charged by weight as per the manufacturer's specs and that the correct charging method (liquid or vapour) is followed.	2	4	-	1
	PC11. Perform Functional Testing, such as Control panel response and digital thermostat reading, once the equipment is Powered On.	2	4	-	0.5
	PC12. Record the performance parameters once the equipment starts functioning, such as suction and discharge pressure, ambient and box temperature, compressor amperage and voltage, and subcooling and superheating (if required).	2	4	-	1
	PC13. Log all installation/replacement steps, parameters, and refrigerant weight used.	1	4	-	0.5
	PC14. Update asset tag, service record, and maintenance database.	1	4	-	0.5
	PC15. Provide commissioning report, warranty documents, and system manual to facility management.	2	4	-	1
	PC16. Monitor performance trends of the equipment and check operator feedback.	2	4	-	1
	NOS Total	**30**	**60**	**-**	**10**
Monitor overall performance and continuous improvement	**PC1.** Carry out tests or checks regularly to ensure the system is working as required	1	2	-	0.5
	PC2. Check for freezer insulation degradation by observing compressor duty cycle, condensation or presence of ice	1	2	-	0.5
	PC3. Check the operation of the defrost system and thermostat and ensure that the equipment is calibrated correctly before using it.	1	2	-	0.5
	PC4. Inspect cold store ceiling panel suspension rods and also their attachments at least once a year	1	2	-	0.5
	PC5. Examine discharge pressure and suction pressure in the control system and make adjustments if necessary	1	2	-	0.5

	PC6. Ensure that hygiene procedures are followed	-	2	-	0.5
	PC7. Physically inspect systems for Unusual noises, vibrations, leaks, or icing and Audit refrigerant levels and compressor efficiency	2	2	-	0.5
	PC8. Perform thermal imaging to detect insulation failures or hot spots and Validate calibration of sensors and thermostats	1	2	-	-
	PC9. Trace faults in the components of the refrigeration system when they arise	1	2	-	0.5
	PC10. Test the working of the equipment, after service or repair and Compare actual vs. expected performance.	1	2	-	-
	PC11. Plan repairs limited to thermostats, electrical systems, start relays and defrost timers as much as possible	1	2	-	0.5
	PC12. Avoid repairs to the cooling system if they are uneconomical, and consider replacement of components.	1	2	-	-
	PC13. Define Key Performance Indicators (KPIs) and Establish measurable benchmarks to assess equipment performance such as Temperature stability (vs. setpoint), Compressor run time and cycling frequency, Energy consumption (kWh per unit or per hour), Refrigerant pressure and level, Frequency of breakdowns or maintenance calls, Mean Time Between Failures (MTBF), Mean Time to Repair (MTTR), etc.	2	2	-	-
	PC14. Set Up Real-Time Monitoring Tools and Install sensors and data loggers to track Temperature, humidity, pressure, and power usage.	1	2	-	0.5
	PC15. Collect and Analyse Data Regularly to review equipment data daily/weekly for trends and anomalies.	1	2	-	-
	PC16. Collect and Analyse Data Regularly to review equipment data daily/weekly for trends and anomalies.	1	2	-	0.5
	PC17. Implement Corrective & Preventive Actions such as Adjust setpoints or defrost cycles for energy optimization, Replace underperforming components (e.g., fans, motors, valves), Upgrade to energy-efficient parts or automation systems, etc.	1	3	-	-
	PC18. Revise maintenance schedules (move from time-based to condition-based where possible).	1	2	-	0.5
	PC19. Maintain a Continuous Improvement Log containing Identified issues, Corrective actions, Outcomes (energy saved, fewer breakdowns, better temperature control) and Use this to justify investments or schedule capital upgrades.	1	2	-	0.5
	PC20. Maintain issue logs and complaints by Internal ticketing management of issues like regular ticket, unexpected ticket and renewal ticket.	1	2	-	-

	PC21. Train maintenance staff to follow safety procedures while handling refrigerants and provide information on hazardous effects of refrigerants to the environment.	1	2	-	0.5
	PC22. Educate maintenance staff to ensure refrigerant leaks do not enter work areas or closed rooms, and to comply with procedures and practices to maintain refrigeration equipment.	1	3	-	0.5
	PC23. Teach maintenance staff on procedures while removing or replacing an evaporator, condenser or compressor.	1	2	-	0.5
	PC24. Sensitize maintenance staff on the energy consumption of refrigeration equipment and ways to conserve energy.	1	2	-	0.5
	PC25. Train maintenance staff to recognise early signs of failure, promptly report anomalies, and follow updated SOPs.	1	2	-	0.5
	PC26. Instruct staff to inspect, dismantle, repair, and reinstate refrigeration components (evaporators, condensers, compressors) using appropriate tools, techniques, and control circuit diagrams.	1	2	-	0.5
	PC27. Guide staff to perform required numerical calculations, data entry, and support improvement of feedback loops.	1	2	-	0.5
	PC28. Train staff on emergency responses for malfunctioning refrigeration equipment or components.	1	2	-	-
	PC29. Educate staff on FSSAI hygiene, temperature, and documentation compliance for cold chain operations.	1	2	-	-
	NOS Total	**30**	**60**	**-**	**10**
Maintain food and personnel safety, health and hygiene in the cold storage plant	**PC1.** Assess the various health, safety and environmental hazards in the cold storage	0.5	1	-	-
	PC2. Take necessary steps to eliminate or minimize the hazards	1	2	-	1
	PC3. Analyze the causes of accidents at the workplace	0.5	1	-	-
	PC4. Take preventive measures to avoid risk of cold burns and other injury due to contact with hot surfaces, gas, fire, hot fluids/ liquids, etc.	1	2	-	1
	PC5. Ensure the employees have access to first aid kit when needed	1	2	-	-
	PC6. Ensure to use personal protective equipment and safety gear such as gloves, jacket, footwear etc. for loading and unloading material in cold rooms to protect themselves from hypothermia, frostbite etc	1	2	-	1
	PC7. Ensure to display safety signs at places where necessary for people to be cautious	1	2	-	-
	PC8. Use rubber mats in the places where floors are constantly wet	0.5	2	-	1

	PC9. Ensure electrical precautions such as insulated clothing, adequate equipment insulation, dry work area, switch off the power supply when not required, etc	2	2	-	-
	PC10. Display emergency exit plan at prominent places and have emergency assembly area earmarked as a grid for easy counting of on duty associates and workers.	1	2	-	-
	PC11. Unplug the control panel, compressor, condensor etc before performing maintenance	0.5	1	-	-
	PC12. Report to the superior on any problems and hazards identified	1	2	-	1
	PC13. Install fire alarms (electrical/manual) in cold store/deep freeze and keep other safety devices like hammer/mallet in the storage area	1	2	-	1
	PC14. Maintain appropriate ventilation in the cold rooms to avoid unacceptable accumulation of heat, condensation or odours	0.5	1	-	-
	PC15. Check and review the cold storage areas frequently	0.5	2	-	-
	PC16. Stack items in an organized way and use safe lifting techniques to reduce risk of injuries from handling procedures at the storage areas	1	2	-	-
	PC17. Ensure no sign of pest infestation and install rodent traps, fly glues and insectocutors wherever needed	1	2	-	1
	PC18. Follow hygiene & sanitation standards of Government bodies like FSSAI, APEDA and /or EIA or importing countries like FAO, EU standards	1	2	-	-
	PC19. Use effective loading and unloading systems	1	2	-	-
	PC20. Proper stock rotation (First in First out) to be practiced	1	2	-	-
	PC21. Segregate damaged/non-conforming products from other products to designate area for appropriate disposition	1	2	-	1
	PC22. Fumigate containers depending upon product and contamination or as per customers requirement	1	2	-	-
	PC23. Avoid smoking, spitting, eating etc near food storage area	1	2	-	-
	PC24. Ensure reefers are covered, clean, free from pest infestation & other contaminants	1	2	-	1
	PC25. Dispose cold storage plant waste in the designated areas safely as per companys policies and rules	1	2	-	-
	PC26. Ensure to be safe while handling machines (generator, compressor, condenser etc.), gas (ammonia) and chemicals (ethylene, refrigerants etc.)	1	2	-	1
	PC27. Keep the floors free from oil, water and grease to avoid slippery surface	1	2	-	-

	PC28. Cut nails regularly and avoid applying nail paint. Avoid wearing bangles, rings, and chains in cold storage	1	2	-	-
	PC29. Wash hands with soap solution and dry under a dryer as they enter for duty or after using wash room	1	2	-	-
	PC30. Periodic examination of protective devices, pressure vessels and pipelines, and parts of pipework by a competent person to prevent defect that may give rise to danger	1	2	-	-
	PC31. Ensure workers suffering from abscess, boils etc. should be relieved from food handling	1	2	-	-
	PC32. Develop personal hygiene habits like brushing teeth, taking shower every day, wearing clean and tidy clothes after ironing etc.	1	2	-	-
	NOS Total	**30**	**60**	**-**	**10**
Oversee modified atmosphere requirements for the products	**PC1.** Maintain temperature ranges ideal for the products stored or transported	2	3	-	-
	PC2. Maintain concentration of oxygen, carbon dioxide, nitrogen and ethylene as per the commodities stored	2	3	-	-
	PC3. Consider product heat and set ventilation to control cooling and carbon dioxide level	2	3	-	-
	PC4. Monitor composition of gases regularly and accurately	2	3	-	-
	PC5. Monitor for chilling injury symptoms on the products	2	3	-	1
	PC6. Ensure to keep the room or container sealed	2	3	-	1
	PC7. Ensure proper sanitation to avoid conditions which favours thriving of pathogenic microorganisms	2	4	-	1
	PC8. Assign a resource to maintain records of refrigeration equipment	2	3	-	-
	PC9. Operate nitrogen generator with its controls and fan blowers	2	3	-	1
	PC10. Regularly sample air parameters in the cold chamber to check the conditions	2	3	-	-
	PC11. Monitor when to stop the system and replenish the cold chamber with fresh air when required	2	3	-	1

	PC12. Ensure to retrofit container with purge port assembly, when they contain perishable products and transported, to make it suitable for modified atmosphere use	2	4	-	1
	PC13. Prepare absorbers and adsorbers of oxygen, carbon dioxide, ethylene and water	1	4	-	1
	PC14. Ensure that legal requirements are followed while collecting, moving or	1	4	-	1
	PC15. Prepare documentation regarding modified atmospheric conditions maintained for different products	1	4	-	1
	PC16. Ensure that maintenance records of relevant equipment and cleaning records in the modified atmosphere storage area are made	1	4	-	-
	PC17. Report any faults in the readings of required modified atmosphere requirements	1	3	-	1
	PC18. Quantify extended storability of the products dealt with	1	3	-	-
	NOS Total	**30**	**60**	**-**	**10**
Employability Skills (60 Hours)	***Introduction to Employability Skills***	1	1	-	-
	PC1. Identify employability skills required for jobs in various industries	-	-	-	-
	PC2. Identify and explore learning and employability portals	-	-	-	-
	Constitutional values – Citizenship	1	1	-	-
	PC3. Recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
	PC4. Follow environmentally sustainable practices	-	-	-	-
	Becoming a Professional in the 21st Century	2	4	-	-
	PC5. Recognise the significance of 21st Century Skills for employment	-	-	-	-
	PC6. Practice the 21st Century Skills such as Self- Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
	Basic English Skills	2	3	-	-

	PC7. Use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
	PC8. Read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
	PC9. Write short messages, notes, letters, e-mails etc. in English	-	-	-	-
	Career Development & Goal Setting	1	2	-	-
	PC10. Understand the difference between job and career	-	-	-	-
	PC11. Prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
	Communication Skills	2	2	-	-
	PC12. Follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
	PC13. Work collaboratively with others in a team	-	-	-	-
	Diversity & Inclusion	1	2	-	-
	PC14. Communicate and behave appropriately with all genders and PwD	-	-	-	-
	PC15. Escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
	Financial and Legal Literacy	2	3	-	-
	PC16. Select financial institutions, products and services as per requirement	-	-	-	-
	PC17. Carry out offline and online financial transactions, safely and securely	-	-	-	-
	PC18. Identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
	PC19. Identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
	Essential Digital Skills	3	4	-	-
	PC20. Operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
	PC21. Use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-

	PC22. Use basic features of word processor, spreadsheets, and presentations	-	-	-	-
	Entrepreneurship	2	3	-	-
	PC23. Identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
	PC24. Develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
	PC25. Identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
	Customer Service	1	2	-	-
	PC26. Identify different types of customers	-	-	-	-
	PC27. Identify and respond to customer requests and needs in a professional manner.	-	-	-	-
	PC28. Follow appropriate hygiene and grooming standards	-	-	-	-
	Getting ready for apprenticeship & Jobs	2	3	-	-
	PC29. Create a professional Curriculum vitae (Résumé)	-	-	-	-
	PC30. Search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
	PC31. Apply to identified job openings using offline/online methods as per requirement	-	-	-	-
	PC32. Answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
	PC33. Identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
	NOS Total	**20**	**30**	**-**	**-**

Annexure: Assessment Strategy

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

1. Assessment System Overview:
   - SSC will receive batches through SIP or email to schedule assessment.
   - Batches will be assigned to the NCVET affiliated assessment agencies for conducting the assessment.
   - Assessment agencies send the assessment confirmation and procedure to TP/TC looping SSC.
   - Assessment agency deploys the ToA certified Assessor for executing the assessment.
   - SSC will monitor the assessment process & records.

2. Testing Environment:
   - Check the Assessment location, date and time is same as SIP data.
   - Specified equipment must be available to facilitate assessment.
   - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.

3. Assessment Quality Assurance levels/Framework:
   - Question bank is created by the Subject Matter Experts (SME) are verified by the other SME of LSC.
   - Questions are mapped to the specified assessment criteria.
   - Assessor must be ToA certified.
   - Mock test/Self assessment will be conducted during training through LSC software's.

4. Types of evidence or evidence-gathering protocol:
   - Time-stamped & geotagged reporting of the assessor from assessment location
   - Centre photographs with signboards and scheme specific branding
   - 21 points check list must be adhered by both AA and assessor.

5. Method of verification or validation:

- LSC will validate the evidence and results through LSC portal.
- Validation will be candidate wise scrutiny.

6. Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored by AA for certain years.
- Softcopies of evidences will be stored in LSC portal.

On the Job (OJT assessment applicable):

1. The candidate must score 60% to successfully complete the OJT.
2. Tools of Assessment that will be used for assessing whether the candidate is having desired skills and etiquette of dealing with customers, understanding needs & requirements, assessing the customer and perform Soft Skills effectively:
   • Videos of Trainees during OJT
3. Assessment of each Module will ensure that the candidate is able to:

- Effective engagement with the customers
- Understand the working of various tools and equipment.

Annexure: Acronym and Glossary

Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
OJT	On the Job Training

Glossary

Term	Description
National Occupational Standards (NOS)	NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
Qualification	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
Qualification File	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
Sector	A grouping of professional activities on the basis of their main economic function, product, service or technology.
Long Term Training	Long-term skilling means any vocational training program undertaken for a year and above. https://ncvet.gov.in/sites/default/files/NCVET.pdf