QUALIFICATION FILE

Green Hydrogen Storage Assistant Technician

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

☐Apprenticeship

☒Upskilling ☐ Dual /Flexi Qualification ☐ For TOA

☐ General Skill ☐ Multi Skill (MS) ☐ Cross Sectorial (CS) ☒Future Skills ☐ OEM

NCrF/NSQF Level: 3.5

Submitted By:

Hydrocarbon Sector Skill Council

Chief Executive Officer

OIDB Bhawan, Block G+3, 2nd Floor,

Plot No.2, Vikas Marg, Sector – 73,

Noida, Uttar Pradesh -201301

Contact Details: +91 9871115360;

Email id: ceo@hsscindia.in

Table of Contents

Section 1: Basic Details

<table>
<tr><td>1.</td><td>Qualification Name</td><td colspan="2">Green Hydrogen Storage Assistant Technician</td></tr>
<tr><td>2.</td><td>Sector/s</td><td colspan="2">Hydrocarbon</td></tr>
<tr><td>3.</td><td>Type of Qualification:
☒ New ☐ Revised ☐ Has Electives/Options
☐OEM</td><td>NQR Code & version of existing/previous qualification:</td><td>Qualification Name of existing/previous version:</td></tr>
<tr><td>4.</td><td>a. OEM Name
b. Qualification Name (Wherever applicable)</td><td colspan="2"></td></tr>
<tr><td>5.</td><td>National Qualification Register (NQR) Code & Version (Will be issued after NSQC approval)</td><td>QG-3.5-HY-01366-2023-V1-HSSCI</td><td>6. NCrF/NSQF Level: 3.5</td></tr>
<tr><td>7.</td><td>Award (Certificate/Diploma/Advance Diploma/ Any Other
(Wherever applicable specify multiple entry/exits also & provide details in annexure)</td><td colspan="2">Certificate</td></tr>
<tr><td>8.</td><td>Brief Description of the Qualification</td><td colspan="2">A Green Hydrogen Storage Assistant Technician is responsible for the safe and efficient operation, maintenance and management of hydrogen storage systems, ensuring the safe and reliable storage for utilization of green hydrogen</td></tr>
<tr><td>9.</td><td>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</td><td colspan="2">a. Entry Qualification & Relevant Experience:
<table>
<tr><th>S. No.</th><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Required Experience (with Specialization - if applicable)</th></tr>
<tr><td>1</td><td>Completed 3-year Diploma (Engineering Trade) after 10th</td><td>NA</td></tr>
<tr><td>2</td><td>Pursuing 3rd year of 3-year Diploma (Engineering Trade) after 10th and continuing education</td><td>NA</td></tr>
<tr><td>3</td><td>12th grade pass (science) with 1-year NTC/NAC/Diploma (Engineering Trade)</td><td></td></tr>
<tr><td>4</td><td>10th Grade pass with 2-year of NTC (Engineering Trade)</td><td>1-year of relevant experience</td></tr>
<tr><td>5</td><td>Previous relevant qualification of NSQF level 3</td><td>1.5-year of relevant experience</td></tr>
</table>
b. Age: 18</td></tr>
<tr><td>10</td><td>Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</td><td>17</td><td>11. Common Cost Norm Category – Category (I)</td></tr>
<tr><td>12</td><td>Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)</td><td colspan="2">NA</td></tr>
</table>

<table>
<tr><td>13</td><td>Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</td><td colspan="2">☒Offline ☐Online ☐Blended
<table>
<tr><th>Training Delivery Modes</th><th>Theory (Hours)</th><th>Practical (Hours)</th><th>OJT Mandatory (Hours)</th><th>OJT Recommended (Hours)</th><th>Total (Hours)</th></tr>
<tr><td>Classroom (offline)</td><td>105</td><td>315</td><td>90</td><td></td><td>510</td></tr>
<tr><td>Online</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
(Refer Blended Learning Annexure for details)</td></tr>
<tr><td>14</td><td>Aligned to NCO/ISCO Code/s (if no code is available mention the same)</td><td colspan="2">NCO 2015/3134.0200, ISCO-08/3134</td></tr>
<tr><td>15</td><td>Progression path after attaining the qualification (Please show Professional and Academic progression)</td><td colspan="2">Senior Storage Technician- Green Hydrogen</td></tr>
<tr><td>16</td><td>Other Indian languages in which the Qualification & Model Curriculum are being submitted</td><td colspan="2">Hindi</td></tr>
<tr><td>17</td><td>Is similar Qualification(s) available on NQR-if yes, justification for this qualification</td><td colspan="2">☐ Yes ☒ No</td></tr>
<tr><td>18</td><td>Is the Job Role Amenable to Persons with Disability</td><td colspan="2">☐ Yes ☒ No
If “Yes”, specify applicable type of Disability:</td></tr>
<tr><td>19</td><td>How Participation of Women will be Encouraged</td><td colspan="2">This job is gender neutral and focus during training should be on enrolment of women in each batch. SSC will encourage the TP and other training bodies to enrol women candidates.</td></tr>
<tr><td>20</td><td>Are Greening/ Environment Sustainability Aspects Covered (Specify the NOS/Module which covers it)</td><td colspan="2">☒ Yes ☐ No</td></tr>
<tr><td>21</td><td>Is Qualification Suitable to be Offered in Schools/Colleges</td><td colspan="2">Schools ☒ Yes ☐ No Colleges ☒ Yes ☐ No</td></tr>
<tr><td>22</td><td>Name and Contact Details of Submitting / Awarding Body SPOC
(In case of CS or MS, provide details of both Lead AB & Supporting ABs)</td><td colspan="2">Name: Mr. SK Bose
Email: ceo@hsscindia.in
Contact No.: +91 9871115360
Website: www.hsscindia.in</td></tr>
<tr><td>23</td><td>Final Approval Date by NSQC: 30-11-2023</td><td>24. Validity Duration: Three Years from the date of Approval</td><td>25. Next Review Date: 29-11-2026</td></tr>
</table>

Section 2: Module Summary

NOS/s of Qualifications
(In exceptional cases these could be described as components)

Mandatory NOS/s:
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.	Module 1: Introduction to Hydrocarbon sector and the job role of Green Hydrogen Storage Technician	HYC/N4001 & V 1.0	Bridge/ Core	3.5	4	30	60	30	Nil	120	35	60	00	00	95	25
2.	Module 2: Hydrogen safety security and health management procedures	HYC/N4001 & V1.0	Core	3.5					Nil							
3.	Module 3: Hydrogen Storage Technologies and Methods	HYC/N4010 & V1.0	Core	3.5	9.5	45	180	60	Nil	285	25	30	00	10	65	50
4.	Module 4: Working effectively in a team	HYC/N9301 & V1.0	Non-Core	3.5	1.5	15	30	00	Nil	45	20	30	00	00	50	15
5.	Module 5: Employability Skills	DGT/ VSQ/N0102 V 1.0	Core	3.5	2	15	45	00	Nil	60	20	30	00	00	50	10
Duration (in Hours) / Total Marks					17	105	315	90	Nil	510	100	150	00	10	260	100

Assessment - Minimum Qualifying Percentage
*Please specify **any one** of the following:*

Minimum Pass Percentage – Aggregate at qualification level: 50% *(Every Trainee should score specified minimum aggregate passing percentage at qualification level 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)*	3-Year Diploma (after class 10th) with 2-year of relevant industry experience and 1-year of academic experience OR CITS Certified Trainers for relevant CITS course with 2 years of relevant industry experience
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	3-Year Diploma (after class 10th) with 2-year of relevant industry experience and 2-year of academic experience OR CITS Certified Trainers for relevant CITS course with 2 years of relevant industry experience and 2-year of academic experience
3.	**Tools and Equipment Required for 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)*	3-Year Diploma (after class 10th) with 2-year of relevant industry experience and 1-year of academic/assessment experience OR CITS Certified Trainers for relevant CITS course with 2 years of relevant industry experience
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	3-Year Diploma (after class 10th) with 1-year of relevant industry experience and 1-year of academic/assessment experience
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	3-Year Diploma (after class 10th) with 2-year of relevant industry experience and 2-year of academic/assessment experience OR CITS Certified Trainers for relevant CITS course with 2 years of relevant industry experience and 2-year of academic/assessment experience
4.	**Assessment Mode** *(Specify the assessment mode)*	Both – 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 the need for the Qualification

Provide Annexure/Supporting documents name.

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):** Yes
3.	**Government /Industry initiatives/ requirement (Yes/No):** Yes
4.	**Number of Industry validation provided:** 10 (Due to limited number of Industries available in Oil & Gas Sector; endorsed by MoPNG through Letter)
5.	**Estimated nos. of persons to be trained and employed:** The Storage Technician work in Green Hydrogen plant, is to conduct the safe and efficient operation, maintenance and management of hydrogen storage systems, ensuring the safe and reliable storage for utilization of green hydrogen.

	This job role is identified as high priority /niche for skill development vocational training under Green Hydrogen Mission to meet the skilled manpower requirement all across the new energy of Oil & Gas Industry. Storage Technician - Green Hydrogen in being projected through support of national govt and the private sector as one of the major alternative fuels having potential to decarbonize the nation in a significant way. National standards have been drafted that the work force in this job should possess at the time of deploying the work force on the job for performing the operations.
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** *The Ministry of Petroleum & Natural Gas (MoPNG) which is the Line Ministry for Hydrocarbon Sector has been requested to accord the concurrence* If "No", why:

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)*	**Annexure:** NCrF/NSQF level justification based on NCrF level/NSQF descriptors
2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)*	**Annexure:** List of tools and equipment relevant for qualification
3.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	**Annexure:** Detailed Assessment Criteria
4.	**Annexure:** Assessment Strategy *(Mandatory)*	**Annexure:** Assessment Strategy
5.	**Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is "Blended Learning")*	**Annexure:** Offline Learning Mode
6.	**Annexure:** Multiple Entry-Exit Details *(Mandatory, in case qualification has multiple Entry-Exit)*	**Annexure:** NA
7.	**Annexure:** Acronym and Glossary *(Optional)*	**Annexure:** Acronym and Glossary
8.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	**Supporting Document:** Model Curriculum
9.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	**Supporting Document:** Career Progression – Occupational Map
10.	**Supporting Document:** Occupational Map *(Mandatory)*	**Supporting Document:** Occupational Map
11.	**Supporting Document:** Assessment SOP *(Mandatory)*	**Supporting Document:** Assessment SOP
12.	**Any other document you wish to submit:**	**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	The Green Hydrogen Storage Assistant Technician should demonstrate a solid understanding of the theoretical principles and processes underlying the safe and efficient operation, maintenance, and management of hydrogen storage systems. This knowledge is essential for ensuring the secure and reliable storage of green hydrogen for its	The activities for this require well developed skill, with clear choice of procedures in familiar context and s/he handles all this independently (with minimal supervision)	3.5

	utilization. The technician should be well-versed in the theoretical aspects of hydrogen storage, allowing them to make informed decisions and effectively contribute to the responsible management of green hydrogen resources. This theoretical knowledge forms the foundation for practical and effective work in this role, aligning with industry and environmental objectives		
Professional and Technical Skills/ Expertise/ Professional Knowledge	The Green Hydrogen Storage Assistant Technician is expected to possess in-depth knowledge and expertise in the safe and efficient operation, maintenance, and management of hydrogen storage systems. This includes a comprehensive understanding of the principles and practices related to the safe and reliable storage of green hydrogen, with a focus on ensuring its utilization. Proficiency in maintaining the integrity of storage systems and adherence to safety protocols is paramount. These competencies are vital for facilitating the responsible and effective utilization of green hydrogen, contributing to sustainable energy practices and environmental goals.	The individual should know the maintenance requirements of measurement/control/ protection and detection systems and equipment The individual shall have Knowledge of facts, principles, processes and general concepts in a field of work or study.	3.5
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	The individual should exhibit a strong aptitude for effective communication, both within the organization and when interacting with external stakeholders. This reflects a fundamental understanding of the social and professional dynamics within the workplace, aligning with the values of safety and sustainability in the green hydrogen industry. Additionally, the technician should demonstrate practical problem-solving skills, critical thinking abilities, and an adaptable mindset, facilitating the efficient and safe operation, maintenance, and management of hydrogen storage systems for the reliable storage and utilization of green hydrogen. These professional skills and mindsets are integral for success in this role, contributing to the industry's goals of sustainability and environmental responsibility.	The individual will demonstrate practical skill, which are routine and repetitive using appropriate rule, tools and quality concepts The individual must have capacity to apply professional skills needed to operate equipment with the understanding of principles needed to explore and adapt systems. The individual must have range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information.	3.5
Broad Learning Outcomes/Core Skill	The individual should excel in effective communication, both within the organization and when engaging with external entities, showcasing a profound understanding of the social and professional dynamics within the workplace. This proficiency fosters collaboration and ensures the secure and efficient operation, maintenance, and management of hydrogen storage systems, promoting the safe and reliable storage and	The individual will be able to communicate well within or outside the organization and conduct in always, which show a basic understanding of the social and professional environment of working in workplace	3.5

	utilization of green hydrogen. Additionally, the technician should possess strong problem-solving skills, adaptability, and a capacity for continuous learning, which are essential for addressing the dynamic and evolving challenges within the green hydrogen industry. These core skills contribute to the technician's ability to support sustainability and safety in their role.	The individual is expected to conduct themselves in ways, which show a basic understanding of the social and professional environment of working environment.	
Responsibility	A Green Hydrogen Storage Assistant Technician is responsible for the safe and efficient operation, maintenance and management of hydrogen storage systems, ensuring the safe and reliable storage for utilization of green hydrogen.	The individual is majorly responsible for his own job and self-learning process which justifies the pegging of the QP at level 3.5	3.5

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	**Wrenches & Torque Wrenches**		6 piece each for a batch of 30
2	**Pressure Gauges**		6 piece for a batch of 30
3	**Multimeters**		6 piece for a batch of 30
4	**Hydrogen Sensors**		1 piece for a batch of 30
5	**Leak Detection Equipment**		6 piece for a batch of 30
6	**Piping and Tubing Tools**		6 piece for a batch of 30
7	**Valves**		6 piece for a batch of 30
8	**Pressure Relief Devices**		6 piece for a batch of 30
9	**Hydrogen Storage Tanks**		It should either be acquired in demonstration form or small capacity or as available in the plant
10	**Personal Protective Equipment (PPE):** Safety helmet, safety glasses, ear protection, respiratory protection (if required), protective gloves, safety boots.		1 set for each individual

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. White / Black board and Projector
2. Digital Presentation
3. Computer/Laptop
4. Public Addressing System

Annexure: Industry Validations Summary*

Provide the summary information of all the industry validations in table. This is not required for OEM qualifications.

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile *(if available)*
1	Oil India Ltd.	Jayant Barua	CEO		9435348638	jayantbarua@oilindia.in	
2	AVI Oil India Pvt ltd	Surender Singh Pal	DGM-HR& IR		9810882599	surender@avi-oil.com	
3	GAIL	Raghunandan Bassi	Deputy General Manager				
4	BPCL	Vishwas Saxena	Deputy General Manager HRS-CO		9669320555	vishwassaxena@bharatpetroleum.in	
5	EIL	Tathagat Sahoo	Senior Manager-HR		9702088305	tatthagat.sahoo@eil.co.in	
6	CHT	Kishore Kumar Bhimwal	Additional Director		9958798282	kishore.bhimwal@cht.gov.in	
7	HPCL	Imtiyaz Arshad	CEO & Secy. SDI		8832864450	iarshad@hpcl.in	
8	Indradhanush Gas Grid Ltd.	Ananya Buragohain	Chief Manager (Planning)		9435130100	ananya.buragohain@iggl.co.in	
9	CPCL	Shri Ayamutthu. A	Asst. Manager-Personal		9732492888	Ayamuthu@cpcl.co.in	
10	Som Project Pvt. Ltd.	Mangoo Ram Sharma	Regional Chief Manager		9968573757	Sppl.usar@gmail.com	

Annexure: Training & Employment Details

Training and Employment Projections: NA

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
NA	NA	NA	NA	NA	NA	NA

Data to be provided year-wise for next 3 years

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		Offline
2	☐Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		Offline
3	☐Showing Practical Demonstrations to the learners		Offline
4	☐Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training		Offline
5	☐Tutorials/ Assignments/ Drill/ Practice		Offline
6	☐Proctored Monitoring/ Assessment/ Evaluation/ Examinations		Offline
7	☐On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training		Offline

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
HYC/N4001: Hydrogen Safety, Security, and Health Management Procedures	PC1. use of appropriate protective clothing/equipment for specific tasks and work conditions	1	2		
	PC2. identify possible sources of hydrogen leak/fire and associated risk of mishap/ accident in the workplace	1	2		
	PC3. read and interpret data from instrument and equipment used in hydrogen production processes	1	2		
	PC4. Understand and implement key safety elements /parameters towards handling hydrogen & oxygen at the production facility.	1	2		
	PC5. Assess and regulate hydrogen release pressure vis – a -vis rated parameters.	1	2		
	PC6. Understand key safety requirements for electrical equipment's in green hydrogen production	2	1		
	PC7. Understand functioning of hydrogen venting system and its healthy operation	1	2		
	PC8. Interpret standard operating practice for safe venting of hydrogen & oxygen, reference cga 5.5 & nfpa 2.0 for h2 venting and aiga021-19 for o2 vent	2	1		
	PC9. Understand hydrogen ignition source management	1	1		
	PC10. identify relevant documents (SOPS) and interact with people responsible for health and safety in the workplace	1	1		
	PC11. identify common safety signs, displayed in various areas in the plant	1	2		
	PC12. Check the inertization of hydrogen production and auxiliary systems with nitrogen	1	2		
	PC13. undertake safe shutdown of hydrogen plant as per procedure.	1	1		
	PC14. safe handling of lye solution (koh solution)	1	2		
	PC15. carry out safe working practices while dealing with hazards to ensure the safety of self and others	1	2		
	PC16. Familiarization with Hydrogen Leak and flame detection system, Identification of Hydrogen Fire; use appropriate fire suppression techniques.	2	1		
	PC17. Initialize steps to mitigate hydrogen fire, isolation of Hydrogen supply line and follow rescue techniques applied during fire hazard	1	2		
	PC18. follow good housekeeping practice in order to prevent fire hazards	1	2		
	PC19. list issues concerning the hydrogen safety in work place	1	2		
	PC20. understanding the need to maintain clear work areas and escape routes free from any hindrance	1	2		
	PC21. inform fire safety department about any near-miss incidents in the work place	1	1		
	PC22. follow the applicable laws, regulations and codes as per safety standard	1	2		
	PC23. prepare written accident/incident report and share with the concerned officer/department	1	2		

	PC24. provide appropriate first aid to victims in emergency situation	1	2		
	PC25. demonstrate basic techniques of bandaging	1	2		
	PC26. respond promptly and appropriately to an accident	1	2		
	PC27. perform rescue activity during an accident in real or simulated environments	1	3		
	PC28. follow correct escape route during an emergency	1	2		
	PC29. demonstrate correct method to rescue injured people and others during an emergency	1	2		
	PC30. Familiarize with emergency protocols, including evacuation and shutdown procedures	1	2		
	Total Marks	**35**	**60**		
HYC/N4010: Hydrogen Storage Technologies and Methods	PC1. apply various methods of storing Hydrogen	2	1		1
	PC2. Check the storing of hydrogen in gaseous form, liquid form	2	2		1
	PC3. Apply other methods of hydrogen storage like adsorption in metal hydrides and bonding with liquid organic hydrogen carriers (LOHC)	2	2		1
	PC4. Check the advantages and disadvantages of each method of storing hydrogen.	1	0		1
	PC5. Check the storing of Hydrogen in Cylinders, bullets, and salt caverns	1	2		1
	PC6. Understand various types of hydrogen storing cylinders (steel, aluminum, or composite materials), their storage capacity and utilization.	1	2		1
	PC7. Efficiently Manage compressed hydrogen storage systems	1	2		
	PC8. Manage Liquified hydrogen storage methods and liquid hydrogen storage tanks	2	1		
	PC9. Apply hydrogen liquefaction process and safe handling of liquid hydrogen	2	2		
	PC10. Apply LOHC method and its utility.	1	1		
	PC11. Apply the fundamentals of storage in adsorption-based materials and their applications.	1	2		1
	PC12. Comprehend the thermodynamics and design principles of absorption-based hydrogen storage, including metal hydrides.	2	0		1
	PC13. Manage Hydrogen storage yards including safety of the storage site	1	2		
	PC14. Manage Storage of hydrogen in refilling stations	1	2		
	PC15. Implement safety protocols diligently in all hydrogen storage operations	0	3		1
	PC16. Analyze the performance of various hydrogen storage technologies and propose enhancements to optimize plant operations and safety.	1	1		
	PC17. Ensure strict compliance with safety standards and regulations in hydrogen storage facilities ensuring efficient safety management and compliance with safety/ regulatory standards/ guidelines.	1	2		1
	PC18. Effectively troubleshoot and resolve issues that may arise in hydrogen storage systems	1	2		
	PC19. Selection of most appropriate storage solutions, considering safety, maintenance and utilization	2	1		
	Total Marks	**25**	**30**		**10**
HYC/N 9301 Working effectively in a team	PC1. maintain clear communication with colleagues	2	3		
	PC2. pass on information to colleagues in line with organizational requirements	2	3		
	PC3. provide support to the team members	2	4		

	PC4. respect the colleagues	3	4		
	PC5. fulfil commitments made to colleagues	2	3		
	PC6. inform team members timely, if timelines can't be met	2	4		
	PC7. take the necessary initiatives to resolve the issues while working in team	3	4		
	PC8. adopt gender neutral behavior while interacting with colleagues	2	2		
	PC9. offer assistance to a person with disability (PWD), only if required	2	3		
	Total Marks	**20**	**30**		
HYC/N 0102 Employability Skills – NOS (60 hours)	PC1. Introduction to Employability Skills	2	0		
	PC2. Constitutional Values – Citizenship	1	1		
	PC3. Becoming a Professional in the 21st Century	1	3		
	PC4. Basic English Skills	2	3		
	PC5. Communication Skills	1	1		
	PC6. Financial and Legal Literacy	2	5		
	PC7. Essential Digital Skills	3	7		
	PC8. Diversity & Inclusion	1	1		
	PC9. Entrepreneurship	3	5		
	PC10. Customer Service	2	2		
	PC11. Getting Ready for Apprenticeship & Jobs	2	2		
	Total Marks	**20**	**30**		
Grand Total		**100**	**150**		**10**

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:
   - Batches assigned to the assessment agencies for conducting the assessment on SIP or email
   - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
   - Assessment agency deploys the ToA certified Assessor for executing the assessment
   - HSSC monitors the assessment process & records
2. Testing Environment:
   - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
   - Check the duration of the training.
   - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
   - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
   - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
   - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
   - Check the availability of the Lab Equipment for the particular Job Role.
3. Assessment Quality Assurance levels/Framework:
   - Question bank is created by the Subject Matter Experts (SME) of Hydrocarbon Sector are verified by the Industry Experts, each performance criteria have its marks for theory based on the level of question i.e., easy, medium and difficult.
   - Questions are mapped to the specified assessment criteria
   - Assessor must be ToA certified & trainer must be ToT Certified
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
   - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
   - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos
5. Method of verification or validation:
   - Surprise visit to the assessment location
   - Random crosschecking with candidate over audio/video call or physical visit
   - Random audit of the batch
6. Method for assessment documentation, archiving, and access
   - Hard copies of the documents are stored
   - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
   - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives
7. **On the Job:**
   1. The evidence record of OHT will be done through organized Monitoring Reports

2. During the OJT, every trainee is required to fill the OJT monitoring report which is required to be signed by his/her supervisor and the HR of that company.
3. During assessment, each module will be assessed separately.
4. The candidate must score 60% in each module to successfully complete the OJT.
5. 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
6. 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