QUALIFICATION FILE

Green Hydrogen Plant Junior Technician-Electrolyzer

☒ Short Term Training (STT)

☒ Future Skills

NCrF/NSQF Level: 3

Submitted By:

Skill Council for Green Jobs

Chief Executive Officer
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Contents

Section 1: Basic Details

1.	**Qualification Name**	**Green Hydrogen Plant Junior Technician- Electrolyzer**	
2.	**Sector/s**	**Green Hydrogen**	
3.	**Type of Qualification: ☒ New**	**NQR Code & version of existing/previous qualification:**	**Qualification Name of existing/previous version:**
4.	**a. OEM Name** **b. Qualification Name** (Wherever applicable)	**Green Hydrogen Plant Junior Technician-Electrolyzer**	
5.	**National Qualification Register (NQR) Code &Version**	QG-03-ES-00765-2023-V1-SCGJ version 1	**6. NCrF/NSQF Level:** 3
7.	**Award (Certificate/Diploma/Advance Diploma/ Any Other**	Certificate	
8.	**Brief Description of the Qualification**	Green Hydrogen Plant Junior Technician-Electrolyzer would primarily install electrolyzer units along with other Mechanical and Electrical equipment of a green hydrogen plant and perform the associated civil works. He/She would also assist in performing Pre-commissioning checks/tests and install & commission electrolyzer unit along with other sub system in a green hydrogen/green ammonia plant.	

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

a. Entry Qualification & Relevant Experience:

S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)
1	Grade 10 pass	NA
2	Grade 8 pass with two year of (NTC/ NAC) after 8th	NA
3	Previous relevant Qualification of NSQF Level 2.5	1.5 year relevant experience

b. Age: 18 Years

10. Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))

11

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** ☐**Online** ☐**Blended**

Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Employability (Hours)	Total (Hours)
Classroom (offline)	130	110	60		30	330
Online						

(Refer Blended Learning Annexure for details)

14.	**Aligned to NCO/ISCO Code/s** (if no code is available mention the same)	NCO-2015/ 8131.2100 Ammonia Operator/Ammonia Plant Operator
15.	**Progression path after attaining the qualification** (Please show Professional and Academic progression)	Vertical Progression: Green Hydrogen Plant Technician (Level 4)
16.	**Other Indian languages in which the Qualification & Model Curriculum are being submitted**	**Nil**
17.	**Is similar Qualification(s) available on NQR-if yes, justification for this qualification**	**☐ Yes ☒ No**
18.	**Is the Job Role Amenable to Persons with Disability**	**☒ Yes ☐ No** **If "Yes", specify applicable type of Disability:** **☒ Deaf ☒ Hard of Hearing ☒ Acid Attack Victims ☒ Dwarfism**
19.	**How Participation of Women will be Encouraged**	The programme would be proposed to be incorporated in women ITIs and diploma colleges to train women candidates on the job role. TPs shall be encouraged to onboard at least a certain number of female candidates in each batch

20.	**Are Greening/ Environment Sustainability Aspects Covered** (Specify the NOS/Module which covers it)	☒ **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:** Dr. Praveen Saxena **Email:** ceo@sscgj.in **Contact No.:** 9871119101 **Website:** **https://sscgj.in/**	
23.	**Final Approval Date by NSQC:** 31.08.2023	**24. Validity Duration:** 3 years	**25. Next Review Date:** 30.08.2026

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.	Emp.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
1.	Basics of Green Hydrogen Production	SGJ/N4301 Version 1	Core	3	1	20	10			30	30	20			50	15

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.	Emp.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
2.	Analyse Main Parts of green hydrogen production unit	SGJ/N4302 Version 1	Core	3	1	20	10	60		30	30	20			50	17
3.	Installation of Electrolyzer for green hydrogen production plant	SGJ/N4306 Version 1	Core	3	3	50	40			90	28	22			50	17
4.	Perform Operation and Maintenance of Electrolyzer	SGJ/N4307 Version 1	Core	3	2	30	30			60	32	18			50	17
5.	Perform Health and safety measures for installing and operating Electrolyzer at Green hydrogen Plant	SGJ/N4048 Version 1	Core	3	1	10	20			30	30	20			50	17
6.	Employability Skills (30 hours)	DGT/VSQ/ N0101	Non Core	3	1					30	20	30			50	17
7.	On the Job Training								60	60						
Duration (in Hours) / Total Marks						130	110	60	30	**330**	170	130			300	100

Assessment - Minimum Qualifying Percentage

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.)*

Section 3: Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Graduate/Diploma(Technical) with two years of experience in Electrolyzer industry/Electrical/Power system industries/relevant experience Or Certified under relevant Craft Instructor Training Scheme (CITS) course
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Engineering Graduate with 5 years of experience in hydrogen production/Electrolyzer manufacturing/power system manufacturing
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**	Not Applicable

Section 4: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Graduate/Diploma(Technical) with three years of experience in Electrolyzer industry/Electrical/Power system industries/relevant experience Or Certified under relevant Craft Instructor Training Scheme (CITS) course
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Engineering Graduate with 5 years of experience in hydrogen production/Electrolyzer manufacturing/power system manufacturing
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Engineering Graduate with 6 years of experience in hydrogen production/Electrolyzer manufacturing/power system manufacturing
4.	**Assessment Mode** *(Specify the assessment mode)*	Online and offline both

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):** No published skills gap study is available across the green hydrogen value chain as this is relatively a new technology segment however a detailed training needs assessment study is planned to be implemented by SCGJ in coordination with The South Asia Regional Energy Partnership (SAREP) which is the flagship regional energy program of the United States Agency for International Development (USAID).
2.	**Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):** Yes following key documents are available in the public domain a. National Green Hydrogen Mission: https://mnre.gov.in/img/documents/uploads/file_f-1673581748609.pdf b. https://powermin.gov.in/sites/default/files/Green_Hydrogen_Policy.pdf c. Harnessing Green Hydrogen, NITI Aayog: https://www.niti.gov.in/sites/default/files/2022-06/Harnessing_Green_Hydrogen_V21_DIGITAL_29062022.pdf d. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA_Green_hydrogen_cost_2020.pdf?rev=4ce868aa69b54674a789f990e85a3f00
3.	**Government /Industry initiatives/ requirement (Yes/No):** Yes, The global energy sector is on a path of rapid decarbonization and green hydrogen is poised to play a vital role for this transformation in energy systems,Scaling up green hydrogen production and utilisation across multiple sectors like power generation, transportation and other hard to abate sectors will be essential to helping global economies achieve net zero emissions and limit global temperature rises to 1.5C. Many major economies including India have declared Green Hydrogen roadmap as part of the climate and clean energy related actions. These measures largely seek to address the technical and financial challenges in scaling up Green Hydrogen generation, enhancing Green Hydrogen use across focus sectors, developing scalable technologies supported by enabling policies and regulations. After the announcement of the National Green Hydrogen Mission by the Prime Minister in August 2021, there has been a serious push on both policy and industry actions on green hydrogen. Leading energy companies including NTPC, Reliance and Adani Group along with several other major companies have forayed into this segment and have already announced mega green hydrogen projects. Cabinet has very recently approved the National Green Hydrogen mission with an aim to make India a leading producer and supplier of Green Hydrogen in the world. Government of India is set to provide a fillip to the renewable energy sector by making green hydrogen significantly cheaper while also supporting the nascent industry to establish global supply chains. With the National Mission, there is clear focus on government funding and support for R&D, measures for demand creation, financial support for manufacturing and infrastructure development along with creating opportunities for employment and economic development. The Mission targets setting up of at least 5

	MMT (Million Metric Tonne) per annum of green hydrogen capacity with an associated renewable energy capacity of about 125 GW by 2030. The targeted production capacity will bring over ₹8 lakh crore in total investments and will result in creation of over 6 lakh clean jobs. Implementation of the Mission is expected to create a large-scale ecosystem for Green Hydrogen production and use in the country which would also provide a huge opportunity for skilling and jobs creation. In alignment with the Mission targets, SCGJ is actively consulting with Key stakeholders like Green hydrogen industry which includes renewable energy developers, electrolyzer manufacturers, Green hydrogen generators etc to identify their evolving skilling requirement and accordingly designing and implementing skilling interventions to ensure that trained and certified candidates are readily available for the industry.
4.	**Number of Industry validation provided:** 10 leading companies including solar developers, Electrolyzer manufacturers, project developers who have made recent announcements for Green Hydrogen/Ammonia generation projects.
5.	**Estimated nos. of persons to be trained and employed:** Up to 6 lakhs new jobs are expected to be created by 2030 across the Green hydrogen value chain as per the Green Hydrogen Mission. Multiple qualifications across the key segments of the green hydrogen value chain shall be developed as per the requirement of the industry. It is expected that up to 25000 technicians shall be trained and gradually employed across new projects every year. Considering that the domestic industry is at a very nascent stage currently and the most of the Green hydrogen generation units in the country as recently announced are mainly under planning stage, targeted skilling activities can be undertaken for priority job roles like for technicians who would set up and operate green hydrogen production system. Over 4 lakhs jobs are expected to be generated only for meeting the required renewable energy capacity of 125 GW which would be required for powering the Green hydrogen facilities producing at least 5 MT per annum till 2030. SCGJ already has a portfolio of qualifications for performing key installation and O&M functions in various renewable energy projects and it is expected that the new green hydrogen investments will further drive the required skilling and employment opportunities across renewable energy domain. In the short and medium term, Industry will lead the way and Green Hydrogen production plant will also generate significant jobs across plant installation, commissioning and O&M functions along with various other technical and non technical roles at various levels. Upstream process including storage, handling, distribution, applications across industries will generate new jobs and Technicianial opportunities supported with the strong policy framework for the green hydrogen ecosystem, along with the robust standards and regulations framework for the sector. In the medium to long term, innovative business models particularly in transport and power sectors will evolve in the coming decade leading to new opportunities for both jobs and self- employment across various industry clusters. Oil refineries using hydrogen for desulphurisation, ammonia production for fertilisers and chemicals industry, treatment of basic metals along with steel industry will create the leading market, skilling and employment opportunities for green hydrogen in the short-medium term. Green hydrogen technologies and applications as alternate energy carrier / vector for industrial process heating, transportation and long duration energy storage will also emerge in the long term possibly creating new opportunities for both skilling and employment.

6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** Concurrence has been requested from the Ministry of New and Renewable Energy

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: Evidence of Level
2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)*	Annexure: Tools and Equipment (Lab Set-Up)
3.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	Annexure: Detailed Assessment Criteria (Mandatory)
4.	**Annexure:** Assessment Strategy *(Mandatory)*	Annexure: Assessment Strategy
5.	**Annexure:** Acronym and Glossary *(Optional)*	Annexure: Acronym and Glossary
6.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	Attached
7.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	Annexure: Career progression and OM
8.	**Supporting Document:** Occupational Map *(Mandatory)*	Annexure: Career progression and OM
9.	**Supporting Document:** Assessment SOP *(Mandatory)*	Annexure: Assessment Strategy

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 individual is expected to perform assembling of electrolyzer unit, operate and do preventive maintenance of the Electrolyzer in Green hydrogen generation facilities.	The green hydrogen plant skilled technician would have a knowledge specific to processes of electrolysis in producing green hydrogen. Since the individual's working knowledge is limited in familiar, routine & predictable context of electrolysis process rather than encompasses jobs for setting up various components of a plant providing relevant solutions. The job holder doesn't require to exhibit factual & theoretical knowledge in contexts within hydrogen value chain and other associated components, etc. S/he justified to be placed at NSQF Level 3. Since individual is required to have knowledge of procedure both in routine and non-routine context and required to have operational knowledge and quality of range of	3

		issues. He/she can't be placed at level 2.5. Since individual doesn't require to have complete knowledge on time management for producing specific quantity of Hydrogen produce. Individual doesn't require to know various sub sections of the plants and their operations. Thus, considering the scope of work the job holder cannot be placed at Level 4.	
Professional and Technical Skills/ Expertise/ Professional Knowledge	The individual is expected to exhibit basic skills to identify and use of specific tools required for electrolyzer installation. She/he need to identify problems in operation of Electrolyzer and convey message to associated Technician.	The Job holder is expected to possess factual knowledge and skills to operate Electrolyzer unit, he/she need not to demonstrate troubleshoot activities related electrolyzer dis-functioning. Therefore she/he is placed at level 3. Since the individual have to have specialized technical skill and would perform broad range of activities and need to posses specific skill and expertise about Electrolyzer that required work with precision in	3

		estimated timeline, S/he can't be placed at level 2.5 Since he/she doesn't required to possess specialized skills or multidisciplinary approach to handle any problem like hydrogen gas leakage but only able to identify the leakage and communicate to senior official, this cannot be placed at level 4.	
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	The individual is expected to work within a team of one unit i.e Electrolyzer unit, she/he would be have intermediate numeracy skill to read technical sheet of input and output of machineries.	The Job holder is expected to possess a limited range of practical skills to accomplish tasks and communicate identified problems to senior officer. So it is placed at level 3. Since the individual will have to have good communication skill and good skill for accurate working with mathematical calculations and would require to use basic digital tool associated with Electrolyzer and hydrogen production, S/he can't be placed at level 2.5	3

		Since person is not expected to ensure effective functioning of electrolysis process and only required to communicate local language. He/She is expected to build a team to cater specific problem. This cannot be placed at level 4.	
Broad Learning Outcomes/Core Skill	The individual is expected to carryout job in familiar context of specific machineries. He/she able to understand risk and safety guideline with the assembly of Electrolyzer.	The Job holder is expected to be perform required skills with little instruction. She/he not required rigorous training to perform job. Thus, considering the core skills, s/he can be placed at Level 3. Since the individual will have to carryout specialized job and should have clean understanding of safety guideline as output of a Electrolyzer is a combustible gas which require necessary safety and follow specified safety guideline. He/she should possess information about associated risk, S/he can't be placed at level 2.5 She/he is not required to collect and organize information of the local site to	3

		prepare solutions. He/she not expected to exhibit core skills to understand socio- political environment. S/he can't be placed at Level 4.	
Responsibility	The individual is primarily responsible for assembling and operate Electrolyzer unit of green hydrogen plant.	Job Holder is responsible for his/ her own work as s/he has to perform assembling of electrolyzer and responsible in limited context. Considering the responsibilities, the individual can be placed at level 3. Since the individual works as a skilled technician, takes help from assistants and is also able to assist in planning of routine and predictable tasks of green hydrogen generation and its purity. He/she also share responsibility of green hydrogen plant, he/she can't be placed at level 2.5 He/she is not to ensure proper operation of the Electrolyzer unit. She/he is not responsible for passing knowledge and skills to his/ her sub-ordinate. the individual cannot be placed at level 4.	3

Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size:

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1 .	Small size/demonstration units of transformer, rectifier, electrolyzer and solar power plant	Standard Make	
2	Personnel Protective Equipment, First aid kit, Material Safety Data Sheet, Gas leakage detector	Standard Make	
3	Tool kit, IR Thermometer ,Barometer,Double ended flat spanner, Double ended ring spanner, Wrenches,Combination pliers, Side cutting pliers, Nose pliers, Screw driver, Vanier calliper, hammer, Cutters, Tweezers, Stripping & Crimping Tools, Safety helmet, electronic pressure gauge, clampmeter, multimeter, KOH concentration measuring tools, gas leakage detector, Nose mask, Safety goggles, Ear plug, PVC hand glove, Cotton hand glove, Reflective jacket, Safety Gloves ,Chemical Mask, Leather gloves, flame proof aprons,	Standard Make	

	Flame proof overalls buttoned to neck, Helmets/hard hats, Full body harness, Hand shields, , fire extinguishers, First aid equipment, Safety instruments		

Classroom Aids

The aids required to conduct sessions in the classroom are:

Marker, chart and visual aid; Colour code nomenclature chart of Hydrogen, Hydrogen production flowchart, Hydrogen supply chain flow chart , Schematics of Green hydrogen production plant;

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.	Bugalia International Pvt. Ltd.	Preeti	Director	47, Ashok Vihar, Jodhpur	9353000097	info@bugaliainternational.com	NA
2.	Danao Green Tech Private Limited	Dr. Sanjay Danao	Director	203, Sai Avenue, D-7, CIDCO Meghdoot, Butibori MIDC, Nagpur-441122	9545648496	danaogreentech@gmail.com	NA
3.	Gujaraj Institute of Solar Energy	Japen Gor	Project Director	620 Sharan Circle Hub, Opp. BRTS Bus Stop, Zundal, Gandhi Nagar-382421	7201922622	j.gor@gise.in	NA
4.	Greenergy Solar Solutions	S. Kannan	Chief Executive Officer	No.234, 1st Floor, Lawspet Main Road,	9943256109	greenergypdy@gmail.com	NA

				Pakkamudayanpet, Lawspet, Puducherry-605008			
5.	SolarTech Saarthi Pvt. Ltd.	Lucky Aggarwal	Managing Director	17, Amar Colony, Main Rohtak Road, Nangloi, Delhi-110041	9711851306	Lucky.solarsaarthi@gmail.com	NA
6.	Innodust Marketing Private Limited	Sunil Kumar Sahoo	Director	A/63/1, Sahidnagar, Bhubaneswar, Odisha	7894412585	Sunil.innodust@gmail.com	NA
7.	M/s Oriana Power Limited	Parveen Kumar	Director	C-103, 1st Floor, Sec-2, Noida, U.P-201301	+91-120-4114695	Parveen.jangra@orianapower.com	NA
8.	Saitech Energy Space Systems Pvt. Ltd.	Sanyam Indurkhya	Director	Hall No. 1A, Ground Floor, Chittod Complex, Zone 1, M.P Nagar, Bhopal - 462011	9685580822	Saitechsystem471@gmail.com	NA
9.	Shigoto International Pvt. Ltd.	Sunil Kumar	Director	6-B-12, Mahaveer Nagar 3, Kota, Rajasthan	9829707243	shigotointernational@gmail.com	NA
10.	OM Sai Solar Power System	Rajendra Singh	General Manager	Plot No. C 183, Noida, Sector -63, U.P- 201301	9999596127	Omsaisolarpowersystem12@gmail.com	NA

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	Colour code nomenclature chart of Hydrogen, Hydrogen production flowchart, Hydrogen supply chain flow chart	60:40
2	☒Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		
3	☒Showing Practical Demonstrations to the learners	Small size/demonstration units of transformer, rectifier, electrolyzer and solar power plant, Visit to a green hydrogen production site; Tool kit, IR Thermometer ,Barometer,Double ended flat spanner, Double ended ring spanner, Wrenches,Combination pliers, Side cutting pliers, Nose pliers, Screw driver, Vanier calliper, hammer, Cutters, Tweezers, Stripping & Crimping Tools, Safety helmet, electronic pressure gauge, clampmeter, multimeter, KOH concentration measuring tools, gas leakage detector, Nose mask, Safety goggles, Ear plug, PVC hand glove, Cotton hand glove, Reflective jacket, Safety Gloves ,Chemical Mask, Leather gloves, flame proof aprons, Flame proof overalls buttoned to neck, Helmets/hard hats, Full body harness, Hand shields, , fire extinguishers, First aid equipment, Safety instruments	
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	**Practical**	**Project Marks**	**Viva Marks**
Basics of Green Hydrogen Production	30	20		
Analyse Main Parts of green hydrogen production unit	30	20		
Installation of Electrolyzer for green hydrogen production plant	28	22		
Perform Operation and Maintenance of Electrolyzer	32	18		
Perform Health and safety measures for installing and operating Electrolyzer at Green hydrogen Plant	30	20		
Employability Skills (30 hours)	20	30		
Grand Total	**170**	**130**		

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required c

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 SDSM/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
- SSC 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 papers created by the Subject Matter Experts (SME)
- Question papers created by the SME verified by the other subject Matter Experts
- Questions are mapped with NOS and PC
- Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management

- Assessor must be ToA certified & trainer must be ToT Certified
- Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:
   - Time-stamped & geotagged reporting of the assessor from assessment location
   - Center 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 audit of the batch
   - Random audit of any candidate

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

On the Job:

OJT Monitoring Report

- As in Green Jobs Sector, reproducing the evidence for assessment is not feasible due to constraints like cost, confidentiality and controlled environment, every
- apprentice is required to record the evidences performed during the OJT and the same gets authorized by his/her supervisor.
- The evidence recording is done in a structured monitoring report, termed as OJT Monitoring report.
- During the OJT, every trainee is required to fill the OJT monitoring report which is required to be signed by his/her supervisor.
- Towards the end of OJT period these reports are submitted with the HR department of company
- These duly submitted reports are then verified by an Industry nominated assessor for verification of evidence.

Theory, Practical & Viva:

- Scope – Is used to test the knowledge and understanding and skills acquired during the OJT as well as to conform the OJT monitoring report.
- Some personality traits and generic skills (such as – promptness, sharpness, communication skills, depth of knowledge, comprehension, presentation, patience
- etc) can also be tested, which is also required for the QP.
- Tools – The assessment's questions should be aligned with the Qualification Pack, covering the PCs. There will be summative assessment at the end of the OJT.
- Method – Direct questions open and close ended questions, situation-based questions, analytical questions, and decision-making based questions for Viva,
- MCQ for the theory and performing QP related operations for practical. Different questions in theory, practical and viva are included to test relevant PCs from
- the QP
- Analysis – Assessor draws a spectrum of ready answers to be expected from trainee for Viva. This reduces effect of subjectivity of the assessor. Comparative
- quality of trainees within a batch or different institutes can be gauged. The skill is gauged by observing the practical work.

Execution of OJT Assessment:

- HR department hands over the individual OJT monitoring report with Industry nominated assessor and schedules an assessment meeting for each trainee.
- Industry nominated assessor assesses each trainee based on OJT monitoring report, viva on each PC and also takes into account attendance of each trainee towards the end of the OJT period.
- The OJT marks are compiled for each NOS by the Industry nominated assessor and submitted with HR department of company.
- The OJT assessment results are then sent to SCGJ by HR department of company in a sealed envelope for compiling the assessment results in case of offline assessment.

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

Annexure: Career Progression and OM