



QUALIFICATION FILE– Micro Credentials

Basics of Green Hydrogen Electrical Grid Design

☒ Public ☐ Private

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

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

NCrF/NSQF Level: 6

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

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Section 1: Basic Details

1.	Micro Credential-Qualification Name	Basics of Green Hydrogen Electrical Grid Design																
2.	Sector/s	Hydrocarbon																
3.	National Qualification Register (NQR) Code & Version (Will be issued after NSQC approval)	NM-06-HY-03837-2025-V1-HSSC & V-1.0	4. NCrF/NSQF Level: 6															
5.	Brief Description of the Qualification	An electrical grid Infrastructure Design operator, also known as a system operator, is a key player in the energy industry, responsible for maintaining the reliable and secure operation of the electrical grid. They constantly monitor the grid’s performance, ensuring it operates within its capacity, while always meeting electricity demand. Moreover, grid operators play a role in balancing and always meeting electricity demand. ancillary service markets to ensure demand matches supply and to guarantee system security.																
6.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	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 4th year UG engineering in Chemical/Industrial/ Petro chemical/ Mechanical/ relevant branch</td><td>with 1.5 years of experience</td></tr><tr><td>2</td><td>Completed 3-Year UG Degree in Science (Chemistry/ Physics /Relevant field)</td><td>3 years of relevant experience</td></tr><tr><td>3</td><td>Previous relevant Qualification of NSQF level 5.5</td><td>with 1.5 years of experience</td></tr><tr><td>4</td><td>Previous relevant Qualification of NSQF level 5</td><td>3 years of relevant experience</td></tr></table> b. Age: 22		S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1	Completed 4th year UG engineering in Chemical/Industrial/ Petro chemical/ Mechanical/ relevant branch	with 1.5 years of experience	2	Completed 3-Year UG Degree in Science (Chemistry/ Physics /Relevant field)	3 years of relevant experience	3	Previous relevant Qualification of NSQF level 5.5	with 1.5 years of experience	4	Previous relevant Qualification of NSQF level 5	3 years of relevant experience
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7.	Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	1	8. Common Cost Norm Category – Category (I)															
9.	Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)	NA																
10.	Expected Outcomes of the Micro Credential	Terminal learning outcomes are: • Overview of power sector and electric power system • Power transmission and distribution network in India • Overview of general power transmission systems and features • Introduction about Primary Transmission, Secondary Transmission, Primary Distribution, Secondary Distribution																

		• Elements of a power Distribution System • Communication systems in a grid • Integration of Renewable Energy with Grid System • Smart Grid & Their Application in the Grid System • Internet of Things (IOT) and Its Applications • Visit to a power grid station																		
11.	Training Duration by Modes of Training Delivery (<i>Specify Total Duration as per selected training delivery modes and as per requirement of the qualification</i>)	☒ Offline ☐ Online ☐ Blended <table border="1"> <thead> <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> </thead> <tbody> <tr> <td>Classroom (offline)</td><td>20</td><td>10</td><td>-</td><td>-</td><td>30</td></tr> <tr> <td>Online</td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <i>(Refer Blended Learning Annexure for details)</i>	Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)	Classroom (offline)	20	10	-	-	30	Online					
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12.	Assessment Criteria	<table border="1"> <thead> <tr> <th>Theory (Marks)</th><th>Practical (Marks)</th><th>Project (Marks)</th><th>Viva (Marks)</th><th>Total (Marks)</th><th>Passing %age</th></tr> </thead> <tbody> <tr> <td>150</td><td>70</td><td>-</td><td>50</td><td>270</td><td>70</td></tr> </tbody> </table>	Theory (Marks)	Practical (Marks)	Project (Marks)	Viva (Marks)	Total (Marks)	Passing %age	150	70	-	50	270	70						
Theory (Marks)	Practical (Marks)	Project (Marks)	Viva (Marks)	Total (Marks)	Passing %age															
150	70	-	50	270	70															
13.	Other Indian languages in which the Micro Credential will be implemented	Hindi																		
14.	Is similar Micro Credentials Qualification(s) available on NQR-if yes, justification for this qualification	☐ Yes ☒ No																		
15.	Is the Job Role Amenable to Persons with Disability	☐ Yes ☒ No If "Yes", specify applicable type of Disability:																		
16.	How Participation of Women will be Encouraged	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.																		
17.	Name and Contact Details of Submitting / Awarding Body SPOC <i>(In case of CS or MS, provide details of both Lead AB & Supporting ABs)</i>	Name: Mr. SK Bose Email: ceo@hsscindia.in Contact No.: +91 9871115360 Website: www.hsscindia.in																		
18.	Final Approval Date by NSQC: 18-02-2025	19. Validity Duration: Three Years from the date of Approval 20. Next Review Date: 17-02-2028																		

Section 2: Training Related

1.	Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Post Graduate in Electrical/Mechanical with 6 years of experience in the relevant industry, including 4 years of training and assessment experience
2.	Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Post Graduate in Electrical/Mechanical with 6 years of experience in the relevant industry, including 5 years of training and assessment 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 3: Assessment Related

	Assessor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Post Graduate in Electrical/Mechanical with 6 years of experience in the relevant industry, including 4 years of training and assessment experience
	Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Post Graduate in Electrical/Mechanical with 6 years of experience in the relevant industry, including 4 years of training and assessment experience
	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Post Graduate in Electrical/Mechanical with 6 years of experience in the relevant industry, including 5 years of training and assessment experience
	Assessment Mode (Specify the assessment mode)	Both – Online and Offline
	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 4: 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: Up to 5 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 2000 shall be trained and gradually employed across new projects every year. 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. 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. 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 desulphurization, ammonia production for fertilizers 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: <i>The Ministry of Petroleum & Natural Gas (MoPNG) which is the Line Ministry for Hydrocarbon Sector has been requested to accord the concurrence</i> 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 <i>(Mandatory)</i>	Annexure: NCrf/NSQF level justification based on NCrf level/NSQF descriptors
2.	Annexure: List of tools and equipment relevant for qualification <i>(Mandatory, except in case of online course)</i>	Annexure: List of tools and equipment relevant for qualification
3.	Annexure: Detailed Assessment Criteria <i>(Mandatory)</i>	Annexure: Detailed Assessment Criteria
4.	Annexure: Assessment Strategy <i>(Mandatory)</i>	Annexure: Assessment Strategy
5.	Annexure: Blended Learning <i>(Mandatory, in case selected Mode of delivery is “Blended Learning”)</i>	Annexure: Offline Learning Mode
6.	Annexure: Multiple Entry-Exit Details <i>(Mandatory, in case qualification has multiple Entry-Exit)</i>	Annexure: NA
7.	Annexure: Acronym and Glossary <i>(Optional)</i>	Annexure: Acronym and Glossary
8.	Supporting Document: Model Curriculum <i>(Mandatory – Public view)</i>	Supporting Document: Model Curriculum
9.	Supporting Document: Career Progression <i>(Mandatory - Public view)</i>	Supporting Document: Career Progression – Occupational Map
10.	Supporting Document: Occupational Map <i>(Mandatory)</i>	Supporting Document: Occupational Map
11.	Supporting Document: Assessment SOP <i>(Mandatory)</i>	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	An individual in this job role includes a deep understanding of power system engineering, grid topology, and control strategies. Proficiency in electrical concepts such as load flow analysis, fault detection, and system protection are vital. Operators should also grasp grid stability, reactive power management, and the impact of renewable energy integration. Familiarity with regulatory frameworks, grid	• Possesses specialized knowledge of procedures employed in both routine and non-routine contexts. • Possesses specialized operational knowledge and understanding of the work • Has knowledge of collecting and interpreting the available information, drawing conclusions & communicating the	6

	modernization, and emerging technologies is essential for navigating the evolving energy landscape. Additionally, strong analytical skills are necessary for efficient decision-making in real-time operations, ensuring grid reliability, and addressing emerging challenges in the dynamic field of electrical grid management.	same.	
Professional and Technical Skills/ Expertise/ Professional Knowledge	An individual needs a blend of professional and technical skills. Technical skills include expertise in power system analysis, control systems, and grid monitoring tools. Proficiency in SCADA (Supervisory Control and Data Acquisition) systems, real-time data interpretation, and troubleshooting is crucial. Understanding cybersecurity protocols and communication protocols within the grid network is essential. Additionally, operators must possess strong problem-solving abilities, adaptability to handle emergencies, and effective communication skills for coordination with various stakeholders. Adeptness in using grid management software and staying abreast of technological advancements ensures optimal performance in maintaining a reliable and resilient electrical grid.	• Possesses specialized professional and technical skills; displays clarity of professional knowledge and technical skills in broad range of activities/ tasks. • Can apply the required knowledge for successfully implementing or applying techniques/ processes in a specific field/ job role • The ability to gain, and where relevant apply a range of knowledge, skills and understanding • Possesses the required operational skills for the work/ job. Skill to deliver job/ work with the required precision and in the estimated timelines. • Capabilities of carrying out a choice of processes and procedures within the range of familiar / unfamiliar contexts.	6
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	Employment readiness and entrepreneurship skills for electrical grid infrastructure design encompass effective time management, teamwork, and adaptability to dynamic work environments. Problem-solving and decision-making abilities are crucial in handling unforeseen challenges. Communication skills are essential for collaboration with diverse stakeholders. Entrepreneurial traits such as innovation and a proactive approach to embracing emerging technologies contribute to the success of operators in navigating the evolving landscape of electrical grid management. Continuous learning and staying updated on industry trends are vital for professional growth and resilience in the rapidly changing energy sector.	• Have much broader Employability Skills including understanding of career planning, digital skills, financial and legal literacy. • Good Communication skills, both oral and written. • Advanced literacy and Numeracy skills • Can comfortably use most of the basic digital tools, has clear understanding of Financial and Digital literacy, Aadhaar and Mobile, uses digital payments etc. with proficiency • Good understanding of Constitutional values & Citizenship, inclusion and Diversity. • Very Good understanding of social political and work environment	6
Broad Learning Outcomes/Core Skill	A Basics of Green Hydrogen Electrical Grid Design include a comprehensive understanding of power systems, proficiency in grid analysis and control, and mastery of relevant technologies such as SCADA systems. Operators should develop problem-solving skills for efficient troubleshooting, effective communication abilities for	• The candidate must be able to carry out a specialized job/ work/ tasks in a familiar/ unfamiliar, predictable/ unpredictable, routine/ nonroutine, situation of multiple options/ choices • Focus on range of application of standard procedures or operations in production/services.	6

	collaboration, and adaptability to handle diverse challenges. Knowledge of cybersecurity protocols and awareness of emerging trends in renewable energy integration are also key outcomes, ensuring operators are well-equipped to maintain the reliability and resilience of electrical grids.	• Able to identify/ anticipate the problems and possible range of solutions in production/services • Complex tasks are performed by himself without much instructions and supervision. • Apply related occupational safety & general hygiene norms and environmental aspects. • Applies range of well - developed technical skills with clarity of activities involving clear choices within familiar contexts. • Has knowledge and is able to continuously improve processes which the individual uses for concerned job roles • Has information of associated Risks with related job roles.	
Responsibility	An individual in this job role is responsible for monitoring and controlling the power grid in real-time. Their duties include ensuring grid stability, managing power flow, and responding to faults or emergencies promptly. Operators must implement preventive measures, conduct routine system checks, and coordinate with other personnel to maintain the grid's reliability. Additionally, they play a vital role in integrating renewable energy sources, adhering to safety protocols, and staying updated on industry standards to ensure the efficient and secure operation of the electrical grid.	The individual is majorly responsible for his own job and self-learning process which justifies the pegging of the QP at level 4 • At level 6 the candidate is a highly skilled master technician • Can perform all non-standard procedures and non-routine tasks with confidence.	6

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	Power transformers, Distribution transformers, High-voltage switchgear, Medium-voltage switchgear, Circuit Breakers, Busbars and Busbar Protection, Protection and Control Devices, SCADA (Supervisory Control and Data Acquisition) systems, Remote Terminal Units (RTUs), Communication equipment (fiber optics, microwave links, etc.), Conductors (wires), Insulators, Towers or poles, Distribution Lines,		NA

Capacitor Banks, Voltage Regulators, Power Quality Equipment, Generators and Distributed Generation Systems, Metering and Instrumentation, Grounding Systems

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	O.I.L	Shri Jayant Barua	CEO		9435348638	jayantbarua@oilindia.in	
2	BPCL	Shri Vishwas Saxena	Dy. General Manager		9669320555	vishwassaxena@bharatpetroleum.in	
3	HPCL	Imtiyaz Arshad	CEO & Secretary		8332864450	iarshad@hpcl.in	
4	IOCL	Apurva Nagmote	DGM (Learning & Skill Development)		8373919522	nagmoteas@indianoil.in	
5	GAIL	Shri M. A. Qureshi	CM (Training)		9179061305	maqureshi@gail.co.in	
6	CPCL	Shri Ayyamuthu A	Assistant Manager (Personnel)		9732492888	ayyamuthu@cpcl.co.in	
7	CHT	Shri Kishore Kumar Bhimwal	Additional Director		9958798282	kishore.bhimwal@cht.gov.in	
8	MRPL	Shri Venkateswarlu Kumbha	Chief Manager (TS)		9035044404	venkat_kumbha@mrpl.co.in	
9	SOM Projects PVT. LTD.	Shri Kuldeep Kumar	Manager			spplusar@gmail.com	
10	EIL	Shri Tathagat Sahoo	SR Manager HR		9702088305	tathagat.sahoo@eil.co.in	

Annexure: Training & Employment Details

Training and Employment Projections: 1350

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
2024	350	Green Hydrogen is new in India, so training is given to develop future workforce.	150	Green Hydrogen is new in India, so training is given to develop future workforce.	20	Green Hydrogen is new in India, so training is given to develop future workforce.

		Training will be given to college students		Training will be given to college students		Training will be given to college students
2025	450	Green Hydrogen is new in India, so training is given to develop future workforce. Training will be given to college students	200	Green Hydrogen is new in India, so training is given to develop future workforce. Training will be given to college students	20	Green Hydrogen is new in India, so training is given to develop future workforce. Training will be given to college students
2026	550	Green Hydrogen is new in India, so training is given to develop future workforce. Training will be given to college students	250	Green Hydrogen is new in India, so training is given to develop future workforce. Training will be given to college students	20	Green Hydrogen is new in India, so training is given to develop future workforce. Training will be given to college students

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
Overview of power sector in India and electric power system	PC1. Know general features of Indian power sector	3	0		
	PC2. Understand how power sector has grown over time	2	1		
	PC3. Comprehend installed capacities, state wise distribution, and upcoming facilities	2	1		1
	PC4. Know Per capita consumption and follow major demand drivers	2	1		
	PC5. Understand about the basic limitations and problems with India power sector	2	0		1
	PC6. Know how much electricity is generated in India	2	1		
	PC7. Comprehend how electricity is generated from different sources	2	1		1
	PC8. Understand how a thermal power plant works	2	1		
	PC9. Understand how a hydel power plant works	2	1		1
	PC10. Understand how a nuclear power plant works	2	1		
	PC11. Understand how a diesel/gas power plant works	2	1		1
	PC12. Understand how a solar power plant works	2	1		1
	PC13. Understand how a wind power plant works	2	1		1
	PC14. Understand how a tidal power plant works	2	1		
	PC15. Grasp share of each type of power plant in electricity generation in India	2	1		1
	PC16. Grasp configuration and components in power grid system	2	1		1
	PC17. Know importance of base load and peak load wrt to power plants type	2	1		1
	Total Marks	35	15	-	10
Transmission and Distribution of Electricity	PC1. Know about the power transmission and distribution network of India	2	1		1
	PC2. Understand basic features and components of a power transmission system	2	1		
	PC3. Know underground power transmission	2	1		1
	PC4. Know overhead power transmission and its features	2	1		
	PC5. Conceptualize primary transmission and its features.	2	1		1
	PC6. Conceptualize Understand what is secondary transmission	2	1		1
	PC7. Conceptualize primary and secondary distribution and its features	2	1		1
	PC8. Understand how bulk transmission of power is done	2	1		1
	PC9. Identify and grasp the role of transmission network components such as power lines, cables, circuit breakers, switches and transformers	2	1		1

	PC10. Identify sources of energy losses in a grid network	2	1		
	PC11. Know advantages of high voltage transmission	2	1		1
	PC12. Understand various communication arrangements used in a grid system and its importance	2	1		1
	PC13. Grasp how PLC, SCADA, Fiber optical communication, GSM communication etc. works	2	1		1
	PC14. Identify alarm systems and their utility	2	1		
	PC15. Various safety protocols in a power grid system	2	1		
	Total Marks	30	15	-	10
Integration of renewable energy with grid, Smart Grids and Internet of things	PC1. Understand the need to integrate renewable energy with the grid	2	1		
	PC2. Identify the issues of grid imbalance with solar and wind	3	0		1
	PC3. Know why balancing of overall Grid system is required	2	1		1
	PC4. Grasp how balancing of grid system is done	2	1		1
	PC5. Understand technological options for grid integration with renewable	2	1		1
	PC6. Comprehend what is a smart grid	2	0		1
	PC7. Know the technologies employed to make the grid a smart grid	2	1		1
	PC8. Understand what a smart grid do	2	1		1
	PC9. Comprehend various applications /benefits of a smart grid	2	1		1
	PC10. Understand what is internet of things (IoT)	2	1		1
	PC11. Identify general applications of IoT	2	1		1
	PC12. Grasp utility of IoT in power industry and electricity grid system	2	1		
	Total	25	10	-	10
Roles and Responsibilities	PC1. Operate systems at utility companies and other companies that access power grid.	2	1		1
	PC2. Control and direct the transmission of electricity to meet distribution demands	2	1		
	PC3. Monitor power-generating equipment fuelled by coal, gas, nuclear, wind, or other energy sources	2	1		1
	PC4. Ensure constant flow of electricity to avoid blackouts	2	1		
	PC5. Monitor and operate current converters.	2	1		1
	PC6. Control the flow of electricity through transmission lines to industrial plants and substations that supply residential and commercial needs for electricity.	2	1		
	PC7. Observe voltage transformers and circuit breakers.	2	1		1
	PC8. Monitor other distribution equipment and record readings at a map board.	2	1		
	PC9. Monitor the status of transmission circuits and connections with substations and industrial plants.	2	1		1
	PC10. Communicate with power plant operators, energy traders, and local utilities to route energy from generating stations to customers.	2	1		
	PC11. Anticipate changes in power needs caused by weather.	2	1		1

	PC12. React to changes in the structure of the grid due to transformer or transmission line failures and route current around affected areas.	2	1		
	PC13. Operate and monitor equipment that increases or decreases voltage.	2	1		1
	PC14. Operate switchboard levers to control the flow of electricity in and out of the substations.	2	1		
	PC15. Check equipment to monitor pressure, temperature, and vibration	2	1		1
	PC16. Oversee maintenance personnel	2	1		
	PC17. Monitor and visually inspect station instruments, meters, and alarms	2	1		1
	PC18. Start or stop generator turbines when necessary	2	1		
	PC19. Complete and maintain station records, logs, and reports	2	1		1
	PC20. Locate and isolate system problems	2	1		
	Total Marks	40	20	-	10
Onsite Training	PC1. Know actual working of a power grid station	2	1		1
	PC2. Understand working aspects of different units in a grid sytem	2	1		1
	PC3. Grasp how variation in electrical load over grid is managed	2	1		1
	PC4. Understand grid imbalances and how and when it happens	2	1		1
	PC5. List down how records and documentation is maintained in a water treatment unit	2	1		1
	PC6. Observed grid control room activities and automation	2	1		1
	PC7. List down various testing equipment to check health of a grid sytem	2	1		1
	PC8. Observed integration of renewable electricity with the electrolyser system	2	1		1
	PC9. List down safety features employed in the facility	2	1		1
	PC10. Prepare a short report of the visit and learnings	2	1		1
Total Marks		20	10	-	10
Grand Total		150	70	0	50

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 SIDH 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 SIDH
- 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