

QUALIFICATION FILE – Micro Credentials

< Fundamentals of Safety Measures in Electrical Switchgear & Protective devices >

☐ Public ☒ Private

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

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

NCrF/NSQF Level: 4

Submitted By:

< SAFETY SKILL DEVELOPMENT FOUNDATION >

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Section 1: Basic Details

1.	Micro Credential-Qualification Name	Fundamentals of Safety Measures in Electrical Switchgear & Protective devices														
2.	Sector/s	Education, Training & Research; Hydrocarbon, Iron & steel, Mining, Power, Automotive, Construction, Chemicals & Petrochemicals and others.														
3.	National Qualification Register (NQR) Code & Version (Will be issued after NSQC approval.)	NM-04-ET-04311-2025-V1-SSDF	4. NCrF/NSQF Level: 4													
5.	Brief Description of the Micro Credential	The MC offers expertise in understanding the various devices employed for the purpose of switching, controlling, and safeguarding electrical power circuits, as well as different types of electrical equipment by detecting any faulty conditions within the system through the utilization of protection relays, which, in turn, are activated by faulty signals typically originating from current transformers or voltage transformers. Switchgear encompasses circuit breakers, current transformers, voltage transformers, protection relays, measuring instruments, electrical switches, electrical fuses, miniature circuit breakers, lightning arresters or surge arresters, electrical isolators, and other related equipment.														
6.	Eligibility Criteria for Entry for Students/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience <table><tr><th>S. No.</th><th>Academic/Skill Qualification (with specialization- if applicable)</th><th>Relevant Experience (with specialization- if applicable)</th></tr><tr><td>1</td><td>12th grade pass or equivalent</td><td>-</td></tr><tr><td>2</td><td>10th grade pass or equivalent</td><td>3</td></tr><tr><td>3</td><td>Previous relevant qualification of NSQF level 3</td><td>3</td></tr></table> b. Age:NA			S. No.	Academic/Skill Qualification (with specialization- if applicable)	Relevant Experience (with specialization- if applicable)	1	12th grade pass or equivalent	-	2	10th grade pass or equivalent	3	3	Previous relevant qualification of NSQF level 3	3
S. No.	Academic/Skill Qualification (with specialization- if applicable)	Relevant Experience (with specialization- if applicable)														
1	12th grade pass or equivalent	-														
2	10th grade pass or equivalent	3														
3	Previous relevant qualification of NSQF level 3	3														
7.	Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	0.25		8. Common Cost Norm Category (I/II/III) (wherever applicable): I												
9.	Any Licensing Requirements/ Pre-requisites for Undertaking Training (wherever applicable)	NA														

10.	Expected Outcomes of the Micro Credential	Terminal learning outcomes are: ● Determine any faults in the system or an abnormality in the system parameters. ● Determine the parameters that needs metering & regulating ● Identify the type of protection device or electrical switchgear to be used ● Introduce physical modifications to the workplace that will effectively minimize or eliminate the risk of faulty conditions in electrical power circuits. ● Obtain knowledge about appropriate grounding methods and protective measures. Educate yourself on safe practices when using household appliances and electronic devices. ● Maintain continuous compliance with electrical power circuit safety regulations by conducting regular reviews.												
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 Only ☐ Online Only ☐ Blended <table><tr><th>Training Delivery Mode</th><th>Theory (Hours)</th><th>Practical (Hours)</th><th>Total (Hours)</th></tr><tr><td>Classroom (offline)</td><td>4</td><td>3.5</td><td>7.5</td></tr><tr><td>Online</td><td>-</td><td>-</td><td>-</td></tr></table> <i>(Refer Blended Learning Annexure for Details)</i>	Training Delivery Mode	Theory (Hours)	Practical (Hours)	Total (Hours)	Classroom (offline)	4	3.5	7.5	Online	-	-	-
Training Delivery Mode	Theory (Hours)	Practical (Hours)	Total (Hours)											
Classroom (offline)	4	3.5	7.5											
Online	-	-	-											
12.	Assessment Criteria	<table><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><tr><td>42</td><td>58</td><td>-</td><td>-</td><td>100</td><td>50</td></tr></table>	Theory (Marks)	Practical (Marks)	Project (Marks)	Viva (Marks)	Total (Marks)	Passing %age	42	58	-	-	100	50
Theory (Marks)	Practical (Marks)	Project (Marks)	Viva (Marks)	Total (Marks)	Passing %age									
42	58	-	-	100	50									
13.	Is the Qualification Amenable to Persons with Disability	☒ Yes ☐ No If “Yes,” specify applicable type of Disability:												

14.	How participation of women will be encouraged?	Women will be encouraged to join	
15.	Other Indian Languages in which the Micro Credential will be implemented.	English and Hindi	
16.	Is similar Micro Credential Qualification(s) available on NQR-if yes, justification for this qualification	☐ Yes ☒ No URLs of similar Qualifications:	
17.	Name and Contact Details Submitting / Awarding Body SPOC	Name: Anand Kumar Singh Email: aksingh@ssdfindia.org Contact No.: +91-8505955506 Website: www.ssdfindia.org	
18.	NSQC Approval Date: 08-05-2025	19. Validity Duration: 3 Years	20. Next Review Date: 08-05-2028

Section 2: Training Related

1.	Trainer's Qualification and experience in relevant sector (in years) (as per requirement and NCVET guidelines)	M. Tech/ B. Tech with 4 years' experience. Graduate in any discipline / Diploma in Engineering with 7 years' experience. ITI/12TH with 12 years' experience.
2.	Master Trainer's Qualification and experience in relevant sector (in years) (as per requirement and NCVET guidelines)	M. Tech/ B. Tech with 5 years' experience. Graduate in any discipline / Diploma in Engineering with 8 years' experience. ITI/12TH with 13 years' experience.
3.	Tools and Equipment Required for Training	☒ Yes ☐ No (If "Yes," details to be provided in Annexure)

Section 3: Assessment Related

1.	Assessor's Qualification and experience in relevant sector (in years) (as per requirement and NCVET guidelines)	Completed UG/PG in relevant field with 4 years' experience. Completed UG in any discipline / Diploma in relevant field with 7 years' experience. Completed ITI/12TH with 12 years' experience.
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2.	Proctor's Qualification and experience in relevant sector (in years) <i>(as per requirement and NCVET guidelines)</i>	Completed UG/PG in relevant field with 3 years' experience. Completed UG in any discipline / Diploma in relevant field with 6 years' experience. Completed ITI/12TH with 11 years' experience.
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) <i>(as per requirement and NCVET guidelines)</i>	Completed UG/PG in relevant field with 5 years' experience. Completed UG in any discipline / Diploma in relevant field with 8 years' experience. Completed ITI/12TH with 13 years' experience.
4.	Assessment Mode <i>(Specify the assessment mode)</i>	Mode: ☒ Online Only ☐ Offline Only ☒ Blended
5.	Tools and Equipment Required for Assessment	☒ Same as for training ☒ Yes ☒ No <i>(details to be provided in Annexure-if it is different for Assessment)</i>

Section 4: Evidence of Need of the Micro Credential

As per the NCVET Guidelines for evidence of need, provide the required Annexure/Supporting documents.

1.	Government /Industry initiatives/ requirement (Yes/No):No
2.	Number of Industry validation provided: 5
3.	Estimated number of people to be trained: 25,000

Section 5: Annexure Check List

Specify Annexure Number and Name.

1.	Annexure: NCrf/NSQF level justification based on NCrf Level/NSQF descriptors <i>(Mandatory)</i>	Yes
2.	Annexure: Learning Outcomes and Assessment Criteria <i>(Mandatory)</i>	Yes
3.	Annexure: Assessment Strategy <i>(Mandatory)</i>	Yes
4.	Annexure: List of tools and equipment relevant for qualification <i>(Mandatory – Except in case of online course)</i>	Yes
5.	Annexure: Blended Learning <i>(Mandatory in case selected mode of delivery is “Blended Learning”)</i>	No
6.	Annexure: Acronym and Glossary <i>(Optional)</i>	Yes

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	- Understanding Electrical Switchgear - Components of Switchgear - Protective Devices - Operation and Coordination - Switchgear Maintenance and Testing - Personal & System Safety Considerations - Determine the requirements of the electrical system and select appropriate switchgear and protective	- At this level, professionals must demonstrate a thorough understanding of complex switchgear systems and their integration into larger electrical networks. - Involves understanding how these devices protect electrical systems, including their characteristics, settings, and coordination. - Professionals are expected to apply this knowledge to ensure compliance and optimal performance of electrical systems.	4.0

	devices based on factors like voltage, current ratings, and fault levels. ● Install switchgear and protective devices according to manufacturer specifications and electrical codes. Ensure proper wiring, connections, and mechanical installation. ● Configure and calibrate protective devices to match the system's protection requirements.	● Requires an advanced grasp of safety practices to prevent and manage potential electrical hazards.	
Professional and Technical Skills/ Expertise/ Professional Knowledge	● Expertise in the operation, installation, and maintenance of switchgear and protective devices. ● Ability to diagnose and troubleshoot intricate issues with electrical switchgear and protective devices. ● Design and integrate switchgear and protective devices into electrical systems. ● Comprehensive understanding of electrical switchgear and protective devices, including their functions, operation, and impact on overall system performance. ● Advanced skills in analyzing and designing electrical systems that incorporate switchgear and protective devices. ● Deep understanding of relevant safety regulations and industry standards.	● This involves applying advanced techniques for configuring, operating, and troubleshooting sophisticated equipment, reflecting a high level of technical competence. ● At this level, professionals must be adept at using diagnostic tools and methods to address intricate problems, ensuring system reliability and safety. ● Requires advanced skills in designing systems that meet specific technical requirements and ensuring their seamless integration into larger electrical networks. ● Involves a high level of expertise in setting parameters for devices to ensure proper protection and coordination within the electrical system.	4.0

	• Understanding of technical specifications and performance metrics for switchgear and protective devices. • Detailed knowledge of how switchgear and protective devices operate and their role within an electrical system. • Understanding of how switchgear and protective devices are integrated and coordinated within a larger electrical system.	• Includes conducting detailed maintenance procedures and inspections to ensure the continued functionality and safety of equipment.	
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	• Demonstrating advanced technical skills in the installation, operation, and maintenance of switchgear and protective devices. • Obtaining relevant certifications and training in electrical systems, switchgear, and protective devices. • Ability to troubleshoot and resolve complex issues related to switchgear and protective devices. • Ability to innovate and take initiative in improving systems and processes related to switchgear and protective devices. • Paying close attention to details in technical specifications, installation, and maintenance. • Applying critical thinking to analyze complex issues and develop effective solutions	• At this level, professionals are expected to demonstrate a high level of technical proficiency and be able to manage advanced equipment effectively right from the start. • At this level, professionals should be able to drive technological advancements and implement new ideas that enhance system performance and efficiency. • Professionals need to exhibit meticulous attention to detail to ensure that all technical specifications and standards are met accurately. • Involves adhering to stringent safety standards and regulations, ensuring that all practices meet industry and legal requirements.	4.0

	● Adhering to high ethical standards and demonstrating integrity in all professional activities.		
Broad Learning Outcomes/Core Skill	● Mastery of the installation, operation, maintenance, and troubleshooting of electrical switchgear and protective devices. ● Capability to design and integrate switchgear and protective devices into complex electrical systems. ● Deep understanding and application of industry regulations, safety standards, and best practices. ● Proficient in operating, maintaining, and troubleshooting complex switchgear and protective devices. ● Ability to analyze technical problems, evaluate system performance, and make informed decisions. ● Competence in designing and engineering switchgear and protective device systems.	● This involves a high level of technical expertise, reflecting the capability to handle sophisticated systems and resolve intricate issues effectively. Professionals should be able to demonstrate comprehensive understanding and hands-on skills with complex equipment. ● At this level, professionals must be able to design systems that meet specific technical and operational requirements, ensuring efficient integration into existing infrastructure. This requires advanced knowledge of system engineering and design principles. ● Professionals are expected to ensure all operations adhere to stringent safety and regulatory standards, reflecting a high degree of professionalism and compliance.	4.0
Responsibility	● Install switchgear and protective devices according to design specifications and standards. ● Operate and maintain switchgear and protective devices to ensure optimal performance.	● At this level, professionals must exhibit a high level of technical proficiency in installing and commissioning complex systems. This involves advanced knowledge of equipment and adherence to	4.0

	• Diagnose and repair faults in switchgear and protective devices. • Adhere to safety standards and regulatory requirements during all activities. • Contribute to the design and integration of switchgear and protective devices into electrical systems.	detailed installation procedures and safety standards. • Professionals are expected to manage the operation and maintenance of sophisticated equipment, demonstrating the ability to handle advanced systems and perform routine and preventative maintenance tasks effectively • Involves advanced problem-solving skills and the use of diagnostic tools to identify and rectify complex issues. This requires a high level of expertise and critical thinking to minimize downtime and ensure system reliability. • Professionals must have a thorough understanding of safety protocols and regulatory requirements, ensuring that all operations meet high safety standards and comply with relevant legislation. • This responsibility involves applying advanced engineering principles to design systems that are both effective and compliant with technical specifications. Professionals must integrate these devices into existing systems seamlessly.	
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Annexure: Learning Outcomes and Assessment Criteria

Detailed learning outcomes and assessment criteria for the qualification are as follows:

S. No.	Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
1.	PC-1: Identify faults or abnormality in electrical system, recognise potential hazards and understand key parameters for monitoring and measurement.	3	4	-	-
2.	PC-2: Classify different types of switchgear (LV, MV, HV) and their functions..	3	4	-	-
3.	PC-3: Identify the purpose and importance of various switching, controlling and safeguarding devices in electrical systems	3	4	-	-
4.	PC-4: Apply proper grounding techniques and protective measures effectively when dealing with electrical systems.	3	5	-	-
5.	PC-5: Demonstrate basic inspection and maintenance procedures for switchgear components.	3	4	-	-
6.	PC-6: Apply emergency measures & procedures and fire prevention measures on failure of electrical controlling devices.	3	4	-	-
7.	PC-7: Adhere to relevant codes, regulations, and standards for electrical safety.	3	4	-	-

8.	PC-8:Implement safety measures in switchgear operation and use appropriate PPEs & safety tools.	3	4	-	-
9	PC-9:Identify the working principles of circuit breakers, relays, and fuses	3	4		
10	PC-10 Use protection mechanisms against overloads, short circuits, and earth faults	3	5		
11	PC 11 Assess and secure the area to prevent further injury (e.g., switch off the power source if safe to do so) from electrical shocks	3	4		
12	PC 12 Check the victim's responsiveness, breathing, and pulse immediately.If unconscious but breathing, place the victim in the recovery position	3	4		
13	PC 13 Inform the designated emergency response team or call local emergency services without delay.Provide clear details about the incident, including the type of electrical shock (high-voltage/low-voltage).	3	4		
14	PC 14 Conduct a hazard review and implement corrective and preventive actions (CAPA).Revise relevant electrical safety protocols based on investigation findings.	3	4		
Total Marks		42	58	-	-

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.

Mention the detailed assessment strategy in the provided template.

<1. Assessment System Overview:

- Batches are assigned to the assessment agencies for conducting the assessment on SIP/Portal or email.
- Assessment agencies send the assessment confirmation to VTP/TC looping Awarding Body(AB)
- Assessment agency deploys the ToA certified Assessor for executing the assessment.
- AB ensures the assessment process & records.

2. Testing Environment:

- Check the assessment location, date, and time.
- Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.

3. Assessment Quality Assurance levels/Framework:

- Question bank is created by the AA/Subject Matter Experts (SME) are verified by the other SME.
- Questions are mapped to the specified assessment criteria.
- Assessor will be ToA certified & trainer will 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

5. Method of verification or validation:

- Surprise visit to the assessment location.
- Method for assessment documentation, archiving, and access
- Soft/Hard copies of the documents are stored.

On the Job:

1. The candidate works for all modules.
2. The candidate must score 50% in assessment to successfully complete the OJT.
3. Tools of Assessment that will be used for assessing whether the candidate is having desired skills, understanding needs & requirements.
 - Report prepared by trainees during OJT.
4. Assessment of task ensure that the candidate can perform all tasks of the job role required:

Annexure: Tools and Equipment

List of Tools and Equipment

Batch Size: 30

No	Tools/Equipment Name	Specifications	Quantity for specified Batch size
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•	Personal Protective Equipment (PPE)	Nos	5
•	Multimeters	Nos	1
•	Clamp Meters	Nos	1
•	Voltage Testers	Nos	1
•	Phase Sequence Indicators	Nos	1
•	Non-contact voltage testers	Nos	1
•	Megohmmeters	Nos	1
•	Insulation Resistance Testers	Nos	1
•	Ground Resistance Testers	Nos	1
•	Circuit Breaker Test Sets	Nos	1
•	Emergency Showers and Eyewash Stations	Nos	1
•	Fire Extinguishers	Nos	1
•	First Aid Kits	Nos	1
•	Emergency Response Kits	Nos	1
•	Lockout/Tagout (LOTO) Kits	Nos	1
•	Circuit Tracers and Analysers	Nos	1
•	Insulated Hand Tools	Nos	5

•	Portable Generators and Backup Power Supplies	Nos	1
•	Grounding and Bonding Equipment	Nos	1
•	Cable Pullers and Fish Tapes	Nos	1
•	Voltage and Current Calibrators	Nos	1

Classroom Aids:

The aids required to conduct sessions in the classroom are:

1. Black/White board
2. Marker
3. Projector
4. Computer with relevant software

Annexure: Industry Validations Summary

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile (if available)
1	Shapoorji Pallonji and Co. Pvt Ltd	Mr. Nitin Bansal	Manager QAQC	SP Centre, 41/44, Minoo Desai Marg, Colaba, Mumbai - 400005 Maharashtra, India Tel: +91-22-67490000	8130090 463	nitin.bansal @shapoorji. com	-

2	Tata Advanced Systems	Asheesh Singhal	Deputy Manager	Plot no.C-01, 401, 4th Floor, World Trade Tower Sector sixteen, Noida Uttar Pradesh-201301 India Tel +91 120 4847450 -7555 I Fax 91 11 43602735	7290014 317	apkumar@taadvancedsystems.com	-
3	SIMPLEX Infrastructures Limited	Tarak Bhaumik	General Manager (HR&Admin)	Simplex House 27, Shakespeare Sarani, Kolkata-700 017 Tel: (91 33) 23011600 Fax: (91 33) 2283 5966 / 65	-	-	-
4	TECHNOCULTURE Building Center Pvt Ltd	Anurag Tiwari	Manager	Konark Shree Apartment, RBI Road, 301/302, Brajkishore Path, Ali Nagar Colony, Salimpur Ahra, Dujra Diara, Patna, Bihar 800001	9006506 858	vastu.skills@gmail.com	-
5	Urja Building Services Consultants Pvt Ltd	Sheetal Bhilkar	Managing Director	648,649, Laxmi Plaza, Laxmi Industrial Estate, Suresh Nagar, Andheri West,	9819819 212	sheetalbhilkar@urjagroup.in	-

				Mumbai, Maharashtra 400053			
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Annexure: Training Details

Training Projections:

Year	Estimated Training # Total Candidates		Estimated Training # of Women		Estimated Training # People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
2024	800	800	120	120	250	250
2025	1400	1400	200	200	450	450
2026	1400	1400	200	100	450	450

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

Annexure: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

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	Presentations, Reference material, Audio/Video module, e-books, 2-way video platform, Case study.	0% : 100%
2	☐ Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	Presentations, Reference material, Audio/Video module, e-books, 2-way video platform.	0% : 100%
3	☐ Showing Practical Demonstrations to the learners	Presentations, Audio/Video module, e-books	0% : 100%
4	☐ Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	Simulation, Animation, Audio/Video module	0% : 100%

5	☐ Tutorials/ Assignments/ Drill/ Practice	Presentations, Reference material, Audio/Video module, e-books, MCQ based test.	0% : 100%
6	☐ Proctored Monitoring/ Assessment/ Evaluation/ Examinations	Presentations, Reference material, Audio/Video module, e-books, laptop/mobile	0% : 100%
7	☐ On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	On the work site, simulation.	0% : 100%
6	☐ Proctored Monitoring/ Assessment/ Evaluation/ Examinations	Presentations, Reference material, Audio/Video module, e-books, laptop/mobile	0% : 100%
7	☐ On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	On the work site, simulation.	100% : 0%

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
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
OJT	On the Job Training

Glossary

Term	Description
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 based on their main economic function, product, service, or technology.

NSQC Approved