NSDA Reference
To be added by NSDA

QUALIFICATION FILE - CONTACT DETAILS OF THE SUBMITTING BODY

Name and address of submitting body:

- National Institute of Electronics And Information Technology (NIELIT)
  Electronics Niketen
  6, CGO Complex, Lodi Road, New Delhi 110003, India

Name and contact details of individual dealing with the submission

- **Name**: R.K. Tombisana Singh
  Position in the organisation: Scientist –C

  Address if different from above: NA

  Tel number(s) : +919436628178
  E-mail address: - tombisana@nielit.gov.in / dir-imphal@nielit.gov.in.

List of documents submitted in support of the Qualifications File:

1. Industry validation - Annexure I
2. Placement Details –Annexure II
3. Detailed Curriculum- Annexure III
4. Occupation Map NIELIT-- Annexure IV
5. Renewable-Energy-Solar-Skill-Gap-Annexure V
6. Green job Affiliation Certificate--- Annexure VI

QUALIFICATIONS FILE SUMMARY

Qualification Title:	Solar Power Installation, Operation and Maintenance
Qualification Code	**NIELIT/RE/1/21**
Nature and purpose of the qualification:	Certificate course in Solar PV System Installation and maintenance Technician .To Provide employment opportunities to youth of the region
Body/bodies which will assess candidates	**Examination Cell,** National Institute of Electronics and Information Technology, 6-CGO Complex, Electronics Niketan, Lodhi Road, New Delhi-110003
Body which will accredit providers to offer the qualification:	**Examination Cell,** National Institute of Electronics and Information Technology, 6-CGO Complex, Electronics Niketan, Lodhi Road, New Delhi-110003 Presently, Accreditation is not prescribed; affiliation is one of the models.
Occupation(s) to which the qualification gives access:	Solar PV System Installation and Maintenance Technician
Proposed level of the qualification in the NSQF:	4
Notional learning Hours:	80 Hours
Entry requirements / recommendations:	10 +2, Diploma/Any Graduates.
Progression from the qualification:	After completion of the course student can go for course in Solar Panel Testing Technician - Cell ,Prototype Developer and Maintenance Engineer
Planned arrangements for the Recognition of Prior learning (RPL):	• Presently, only candidates who undergo training shall be assessed • It will be incorporated once RPL strategy is finalized.
Licensing required	NA
International comparability where known:	Yes - Section V

Formal structure of the qualification:			
Title of unit or other component (including any identification code used)	Mandatory/Optional	Estimate size (learning hours)	Level
Understanding the Solar PV cells parameters	Mandatory	08	4
Selecting the solar PV system components	Mandatory	16	
Solar PV System Design and Integration	Mandatory	16	
Installing, Trouble Shooting and Safety	Mandatory	20	
Project	Mandatory	20	
TOTAL HOURS		**80**	

Please attach any document giving further detail about the structure of the qualification – e.g. a Curriculum or Qualification Pack. Detailed Curriculum attached at Annexure III

SECTION 1

ASSESSMENT

Name of assessment body:
Examination Cell,

National Institute of Electronics and Information Technology
6-CGO Complex, Electronics Niketan,
Lodhi Road, New Delhi. 110003.

Will the assessment body be responsible for RPL assessment?

Give details of how RPL assessment for the qualification will be carried out and quality assured.

Presently, only candidates undergoing training shall be assessed. Later on, candidates having experience and knowledge shall be assessed. The information will be provided on finalization of such procedure.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:

The emphasis is on practical demonstration of skills & knowledge based on the performance criteria. Each OUTCOME is assessed & marked separately. Student is required to pass in all

OUTCOMEs individually and marks are allotted. Following assessment methodologies are used.

A. Written Assessment (Multiple Choice Questions)
B. Practical Assessment
C. Project Assessment
D. Viva Voce Assessment

The assessment results are backed by following evidences.

1. The assessor collects a copy of the attendance for the training done under the scheme. The attendance sheets are signed and stamped by the In charge / Head of the Training Centre.
2. The assessor verifies the authenticity of the candidate by checking the photo ID card issued by the institute as well as any one Photo ID card issued by the Central/Government. The same is mentioned in the attendance sheet.
3. The assessor assigns roll number.
4. The assessor takes photograph of all the students along with the assessor standing in the middle and with the centre name/banner at the back as evidence.

Please attach any documents giving further information about assessment and/or RPL.

ASSESSMENT EVIDENCE

Complete the following grid for each grouping of NOS, assessment unit or other component as listed in the entry on the structure of the qualification on page 1.

Job Role: Solar PV System Installation and Maintenance Technician

Title of Unit/Component:

(Detailed Curriculum attached As Annexure-III)

Assessable Outcomes	Assessment criteria for the outcome	Total mark	Written	Practical	Viva voce
1. **Explain the Solar PV**	Learn procedure of measurement of Electrical Quantities	50	05	05	05
	Follow procedure to measure Solar parameters		05	05	05

cells parameters	Learn how to assemble Solar PV module		05	10	05
		Total	**15**	**20**	**15**

2. **Selecting the Solar PV system components**	Recognize different types of Batteries and their uses.	100	10	10	05
	Use of Solar charge controller (MPPT)		20	15	10
	Learn working principle of Inverter		10	15	05
		Total	**40**	**40**	**20**
3. **Solar PV System Design and Integration**	Design methodology for SPV system.	100	20	20	10
	Various tools use for Solar PV panel mounting		05	05	05
	Design of Mechanical structure for Solar PV		10	20	05
		Total	**35**	**45**	**20**
4. **Installing, Trouble Shooting and Safety**	Installation and Troubleshooting Solar PV System	130	20	20	10
	Installation and Troubleshooting Solar Street Light and Solar Lantern.		10	20	10
	Maintenance and Safety of Solar PV System, Electrical Audit.		10	20	10
		Total	**40**	**60**	**30**
5. **Project**	Preparation of Solar PV Plant Installation Check list	200	10	20	10
	Installation and Troubleshooting of 300Wp Solar Power Plant		40	100	20
		Total	**50**	**120**	**30**
		Total	**180**	**285**	**115**

Means of assessment 1

Proctored online assessments (LAN and Web based), carried out using a variety of question formats applicable for linear / adaptive methodologies; performance criteria being assessed via situation judgement tests, practical, and multiple choice questions etc.
The emphasis is on practical demonstration of skills and knowledge based on the performance criteria.

SECTION 2
EVIDENCE OF NEED

1. What evidence is there that the qualification is needed?

   Attached file "renewable-energy-solar-skill-gap"

2. What is the estimated uptake of this qualification and what is the basis of this estimate?

   Student uptake from Industry.

3. What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?

   As the understanding and adoption models of QPs evolve in the industry and across its sub-sectors, we foresee consolidation of qualification packs as a natural progression. The Qualification does not exist as per information available in public domain.

4. What arrangements are in place to monitor and review the qualification(s)?

   The Qualification is to be monitored and reviewed every two years.
   The following data will be used

   1. Results of assessments
   2. Employer feedback will be sought post-placement
   3. Student feedbacks
   4. Workshops and seminar for reviewing the qualifications
   5. Industry Requirements
   6. Consultation/ Tie-up with Industries or Expert for review of the Curriculum.

5. What data will be used and at what point will the qualification(s) be revised or updated?

   As per the latest industries requirement.

Please attach any documents giving further information about any of the topics above.
NIL

SECTION 3
SUMMARY EVIDENCE OF LEVEL

Level of qualification: 4
Summary of Direct Evidence:

Justify the NSQF level allocated to the QP by building upon the five descriptors of NSQF. Explain the reasons for allocating the level to the QP.

Generic NOS is/are linked to the overall authority attached to the job role.

Solar PV System InstallationTechnician					
Process required	Professional knowledge	Professional skill	Core skill	Responsibility	level
The Technician must be able to clean the solar PV module for optimal output in a periodical manner, checking and inspection of the interconnections for any faults .Identify faults such as hotspots and visual inspection of the mounting mechanical structure and PV panels for any faults , Considering the repetitive nature, it is level 4.	The Technician should have knowledge of electrical parameters of solar energy .Understanding of components such as batteries, charge controllers, inverters, and solar priority controller. Due to the requirement of Factual knowledge of the job requirements, it is level 4	The Technician must have a knowledge of the tools an equipment use for mounting structure and for aligning of PV solar module .Since the technician is required to Recall and demonstrate practical skill, routine and repetitive using appropriate rule and tool, it is level 4	The Technician needs to know and understand how to read product and equipment manuals, warning labels and complete the installation according to the requirement looking at these outcomes, the job is level 4.	The Technician must follow safety procedure, cleaning and troubleshoot, take records and file reports of the system periodically, the technician is responsible for his own job and self-learning and no supervision of others and it is level 4.	**4**

SECTION 4

EVIDENCE OF RECOGNITION AND PROGRESSION

What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

Vertical and Horizontal mobility options are available in the Occupation map attached "**Occupation map NIELIT"**

SECTION 5
EVIDENCE OF INTERNATIONAL COMPARABILITY

List any comparisons which have been established.

The two below are also offering similar kind of course

1. **http://www.solarenergy.org/ul-pv-system-installer-certification/**
2. **http://www.seas.org.sg/Uploads/Events/files/WSQPV-Dec16%20Brochure.pdf**