QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR GREEN JOBS

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What are Occupational Standards (OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack- Solar off-grid Technician

SECTOR: GREEN JOBS

SUB-SECTOR: Renewable Energy

OCCUPATION: Assembly and Repair

REFERENCE ID: SGJ/Q0201

ALIGNED TO: NCO-2015/ NIL

Solar off-grid technician assembles, repairs and maintains solar lamp. He/ she may advance their skills by further taking optional NOS's of assembly and repair of Solar home lighting systems and solar street lights.

Brief Job Description: A Solar off-grid technician assembles, repairs and maintains solar lamp adhering to basic health and safety practices. He/ she may advance their skills by further taking optional NOS's of assembly and repair of Solar home lighting systems and solar street lights.

Personal Attributes: The individual is required to do repetitive kind of operations while doing assembly and repair. The individual must have the factual knowledge of the solar off grid products. He must be self-driven and take the responsibility of his work. He/she must communicate written or oral with desired clarity.

Job Details

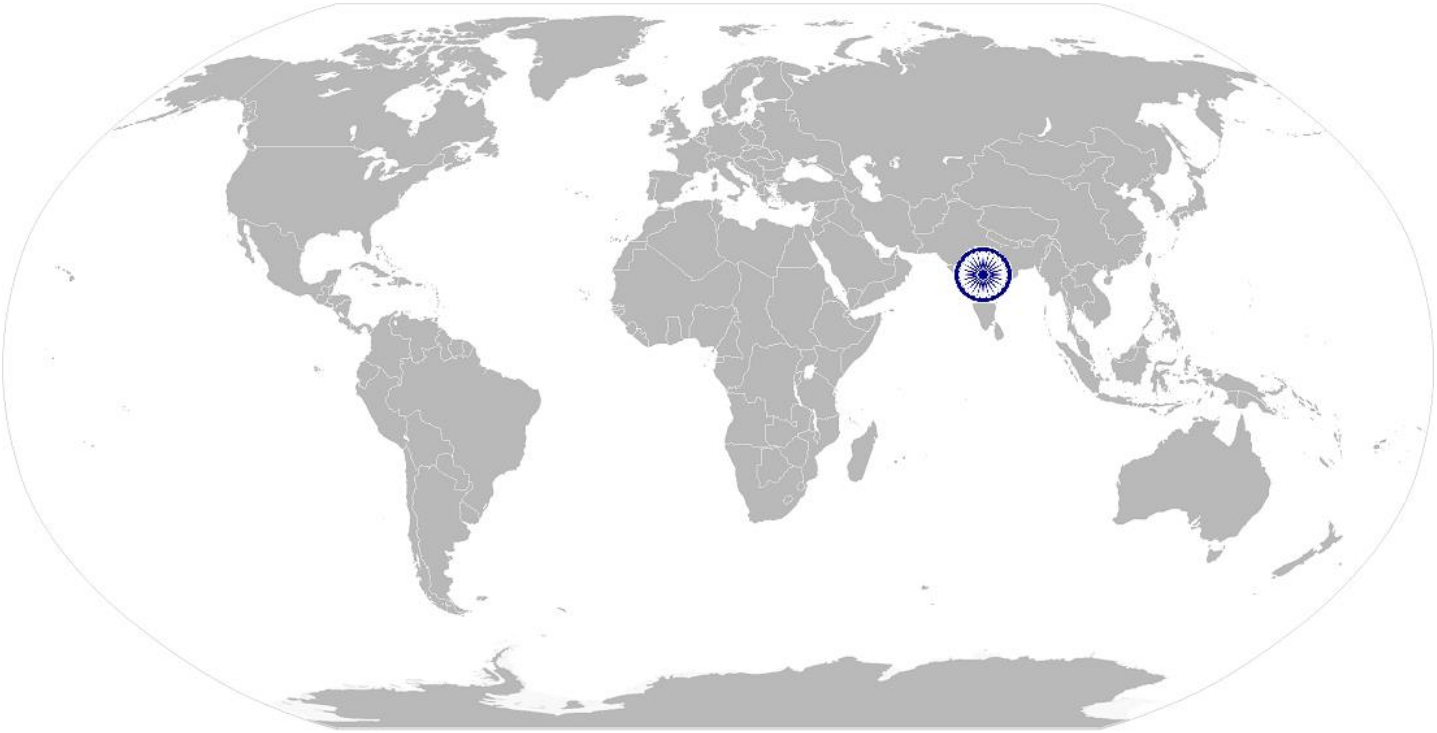
Qualifications Pack Code	**SGJ/Q0201**		
Job Role	**Solar off-grid technician** **This job role is applicable to national scenario**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Sector	**Green Jobs**	**Drafted on**	**28/02/2017**
Sub-sector	**Renewable Energy**	**Last reviewed on**	**27/03/2017**
Occupation	**Assembly and Repair**	**Next review date**	**01/04/2019**
NSQC Clearance on	**N.A**		

Job Role	**Solar off-grid Technician**
Role Description	A Solar off-grid technician assembles, repairs and maintains solar lamp adhering to basic health and safety practices. He/ she may advance their skills by further taking optional NOS's of assembly and repair of Solar home lighting systems, solar street lights.
NSQF level	4
Minimum Educational Qualifications **Maximum Educational Qualifications**	8th Pass, preferably Not Applicable.
Training (Suggested but not mandatory)	N/A
Minimum Job Entry Age	16 years.
Experience	Not Required.
Applicable National Occupational Standards (NOS)	**Compulsory:** SGJ/N0201: Assembly and repair of Solar Lamp. SGJ/N0147: Maintain personal health & safety in a manufacturing facility SGJ/N0106: Maintain Health and safety at project site **Optional:** SGJ/N0202: Assembly and Repair of solar home lighting systems SGJ/N0203: Assembly and Repair of solar street lights
Performance Criteria	As described in the relevant OS units.

Definitions

Keywords/Term	Description
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
Job Role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization
OS	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
NOS	NOS are Occupational Standards which apply uniquely in the Indian context.
Qualifications Pack	Qualifications Pack Code is a unique reference code that identifies a qualifications pack
Qualifications Pack	Qualifications Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Unit Code	Unit Code is a unique identifier for an Occupational Standard, which is denoted by an 'N'.
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to conform to the required standard.
Organizational Context	Organizational Context includes the way the organization is structured And how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills or Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.

National Occupational Standard



Overview

This unit is about assembly and repair of a solar lamp.

SGJ/ N 0201 **Assembly and repair solar lamp**

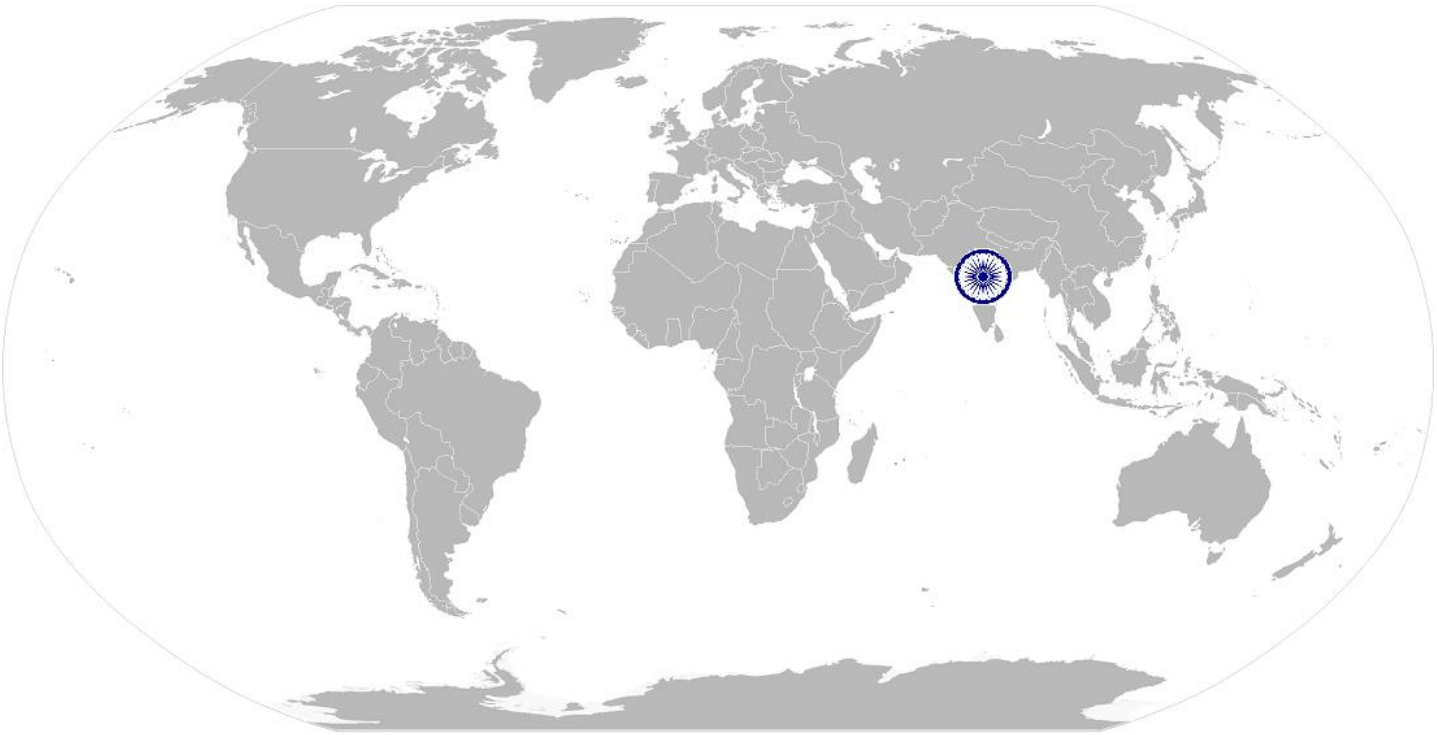
National Occupational Standard

Unit Code	**SGJ / N0201**
Unit Title (Task)	**Assembly and repair solar lamp**
Description	This unit is about assembling solar lamp.
Scope	This unit/task covers the following: • Assembly of Solar Lamp • Repair solar lamp
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Assembly of solar lamp	To be competent, the user/ individual must be able to: PC1. Verify physical properties of all the lamp components. PC2. Measure basic electrical parameters like resistance, current and voltage of different solar lamp electrical components. PC3. Test the solar panel to check if the Voltage at open circuit (VoC) and current at open circuit (IoC) are according to the specifications mentioned by the manufacturer PC4. Test the battery to check if it's voltage is within the range specified by the manufacturer PC5. Perform a continuity check of the load wire to check for any internal breakage PC6. Verify the PCB and LED as per technical specifications mentioned by the manufacturer. PC7. Perform step by step procedure to assemble a solar Lamp
Repair Solar Lamp	To be competent, the user/ individual must be able to: PC8. Perform visual inspection of the solar lamp. PC9. Measure and verify the terminal voltage of the battery as per manufacturer's specification. PC10. Measure and verify the voltage and current of solar PV modules with technical specifications PC11. Verify and replace the faulty switches and DC sockets PC12. Verify the connector pin and other components of a solar lamp PC13. Verify the working of a PCB/ LED drivers PC14. Prepare a basic repair and maintenance report.
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company /organization and its processes)	The individual on the job needs to know and understand the following aspects: KA1. The concept of the entire project. KA2. The entire assembly and distribution process KA3. Must be well versed with the assembly timeline KA4. Time management concepts including discipline, punctuality, act in time on commitment and quality productive time

SGJ/ N 0201 Assembly and repair solar lamp

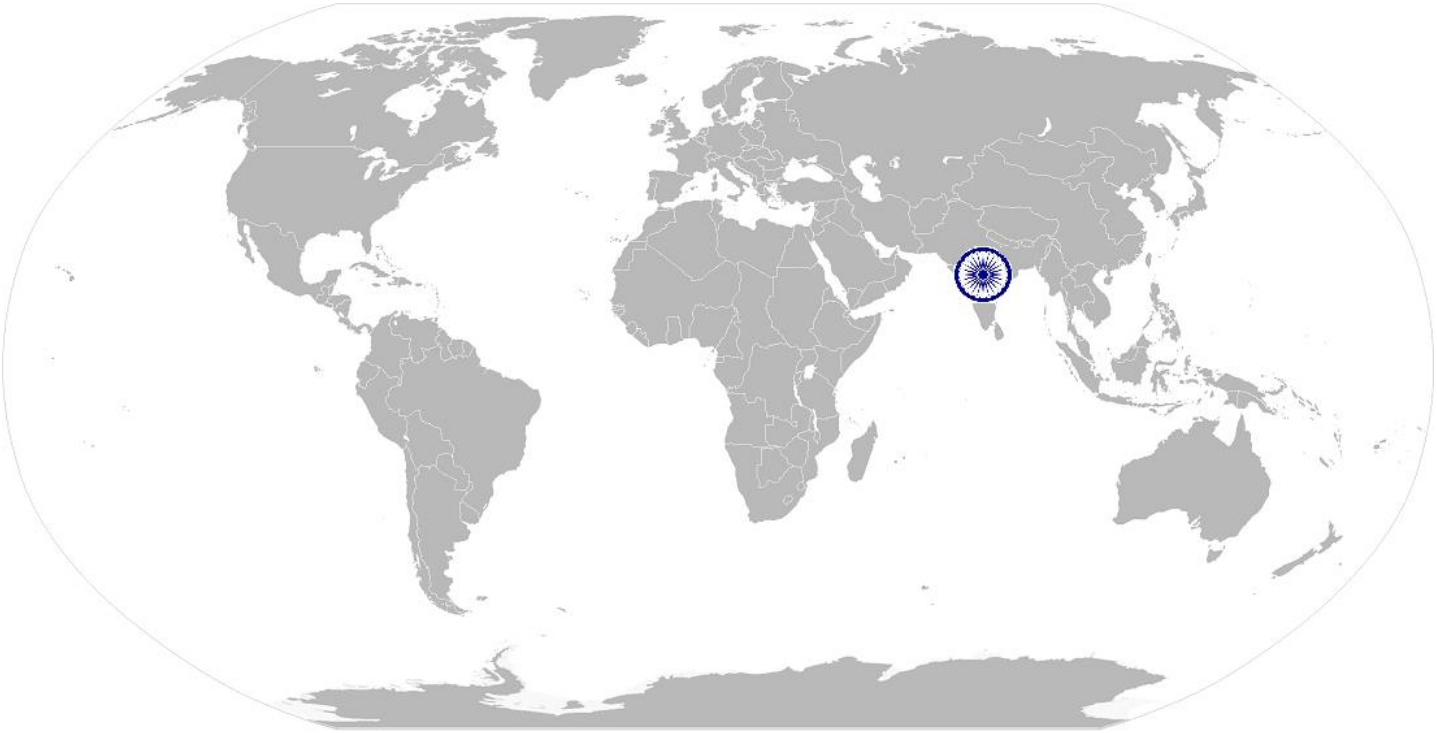
B. Technical Knowledge	The individual on the job needs to know and understand the following aspects: KB1. Natural resources of energy KB2. Voltage, Current and resistance. KB3. Characteristics & specifications of battery, solar module, PCB (Printed Circuit Board), LED (light-Emitting-Diode) load wire and other components of a solar lamp as per the manufacturer. KB4. Operating and working of a multimeter, soldering iron and other tools present in a tool kit. KB5. Preliminary concepts of solar PV system KB6. Complete assembly of a solar lamp as per manufacturer KB7. Warranties of different components of solar lamp. KB8. Ability to shape and direct working/process methods according to self-defined criteria and effective management techniques KB9. Standard operating procedures for carrying out visual inspection of solar lamp. KB10. Testing procedure for verifying the performance of all the components of a solar lamp. KB11. Structure of a basic repair and maintenance report.
Skills	
A. Core Skills / Generic Skills	**Writing Skills**
	The User/ Individual on the job needs to know and understand how to: SA1. Prepare and maintain documentation
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA2. Read and Understand "assembly and distribution training manuals" in English / Hindi / vernacular language. SA3. Basic understanding of vernacular/local language SA4. Read user manuals and safety instructions
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. Express statements or information clearly so that others can hear and understand SA6. Participate in and understand general discussions SA7. Respond appropriately to any queries SA8. Communicate with other employees in the organization
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. Define organization rule-based decision making process SB2. Take decision with systematic course of actions and/or response.
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB3. Plan and organise work schedule to meet deadlines SB4. Work constructively with others.
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB5. Adhere to organisation code of contact SB6. Assemble good quality solar lanterns

	Problem Solving
	The user/individual on the job needs to know and understand how to: SB7. Recognise problems and search for solutions. SB8. Choose the best methods to complete assigned tasks
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB9. Apply domain knowledge, observations and data to select course of action to perform tasks related to assembly of solar lanterns
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB10. Reduce repetition of errors



NOS Version Control

NOS Code	SGJ/N0201		
Credits (NSQF)	TBD	Version number	1.0
Industry Sector	Green Jobs	Drafted on	28/02/2017
Industry Sub-sector	Renewable Energy	Last reviewed on	27/03/2017
Occupation	Assembly and Repair	Next review date	01/04/2019



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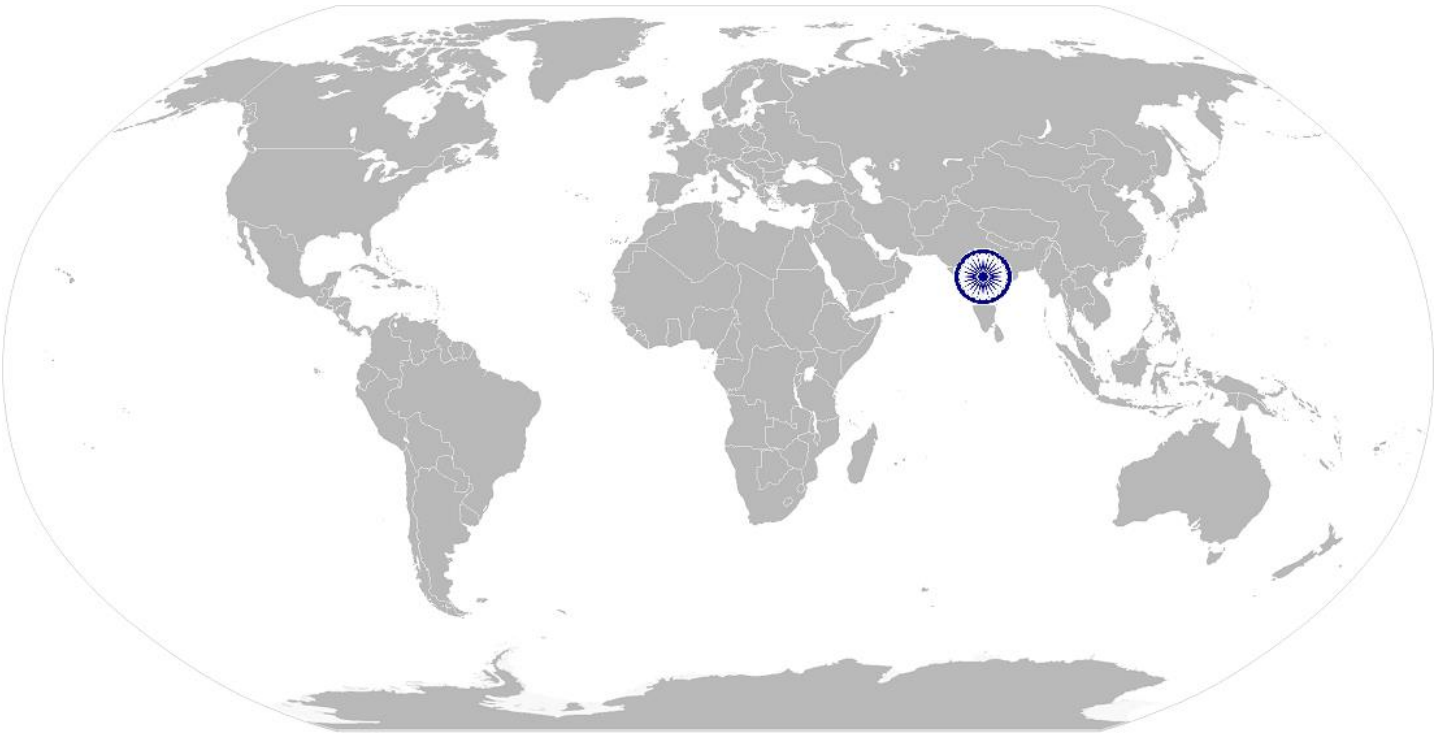

Overview

This unit is about maintaining health & safety in a manufacturing facility

SGJ/ N0147 Maintain Personal health & safety in a manufacturing facility

National Occupational Standard

Unit Code	SGJ/ N0147
Unit Title (Task)	**Maintain personal health & safety in a manufacturing facility**
Description	This unit is about maintaining health & safety in a manufacturing facility
Scope	This unit/task covers the following: • establish and follow safe work procedure • use and maintain personal protective equipment • identify and mitigate safety hazards • demonstrate safe and proper use of required tools and equipment
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Establish and Follow safe work procedure	To be competent, the user/individual on the job must be able to: PC1. identify corporate policies required for workplace safety PC2. identify requirements for safe work area and create a safe work environment PC3. identify contact person when workplace safety policies are violated PC4. provide information about incident/violation PC5. identify the location of first aid materials and administer first aid
Use and maintain personal protective equipment	To be competent, the user/individual on the job must be able to: PC6. identify the personal protection equipment required for specific locations on-site PC7. identify expiry dates and wear & tear issues of specified equipment PC8. demonstrate safe and accepted practices for personal protection
Identify and mitigate safety hazards	To be competent, the user/individual on the job must be able to: PC9. identify environmental hazards associated with the manufacturing facility PC10. identify electrical hazards PC11. identify personal safety hazards or work site hazards and mitigate hazards
Demonstrate safe and proper use of required tools and equipment	To be competent, the user/individual on the job must be able to: PC12. select tools, equipment and testing devices needed to carry out the work PC13. demonstrate safe and proper use of required tools and equipment
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the organization and its processes)	The user/individual on the job needs to know and understand: KA1. company's installation policy KA2. company's customer support policy KA3. company's documentation policy KA4. document information using appropriate corporate forms KA5. obtain authorization from specified field safety officer and supervisor KA6. company's reporting structure & organization culture KA7. company's different department and concerned authority
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. relevant personal protective equipment's required within the manufacturing facility KB2. relevant standards and regulations to be followed in the manufacturing facility KB3. occupational health and safety (OHS) standards to be followed in the manufacturing facility KB4. risk identification and mitigation procedure for safe workin in a manufacturing facility KB5. knowhow of tools & tackles required to carry out the work

SGJ/ N0147 Maintain Personal health & safety in a manufacturing facility

Skills (S)	
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. fill up documentation applicable to one's role
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA2. read vernacular/english language SA3. read and understand manuals, health and safety instructions, memos, other company documents SA4. ability to read from different sources- books, screens in machines and signage SA5. understand the various colour codes, as per standard electrical, mechanical and civil nomenclature
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA6. express statements or information clearly so that others can hear and understand SA7. participate in and understand the main points of simple discussions SA8. respond appropriately to any queries SA9. communicate with peers, supervisor and sub-ordinates
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. follow organization rule-based decision making process SB2. take decision with systematic course of actions and/or response
	Plan and Organize
	The user/individual on the job needs to know and understand: SB3. plan and organize service work to meet deadlines SB4. plan to utilize time and equipment's effectively SB5. work constructively and collaboratively with others
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB6. follow organization code of conduct SB7. manage relationships with customers with intent on satisfying its requirements for service delivery
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB8. recognize problems and search for solutions SB9. choose best methods to complete assigned tasks SB10. approach relevant authority when required
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB11. apply domain knowledge, observations and data to select course of action to perform tasks related to the job role
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB12. critically evaluate information obtained from customers, supervisor and co-workers to perform day to day activities SB13. ask questions for better understanding

NOS Version Control

NOS Code	SGJ/N0147		
Credits (NSQF)	TBD	Version number	1.0
Industry	Green Jobs	Drafted on	01/09/2016
Industry Sub-sector	Renewable Energy	Last reviewed on	15/02/2017
Occupation	Health & Safety	Next review date	30/09/2019

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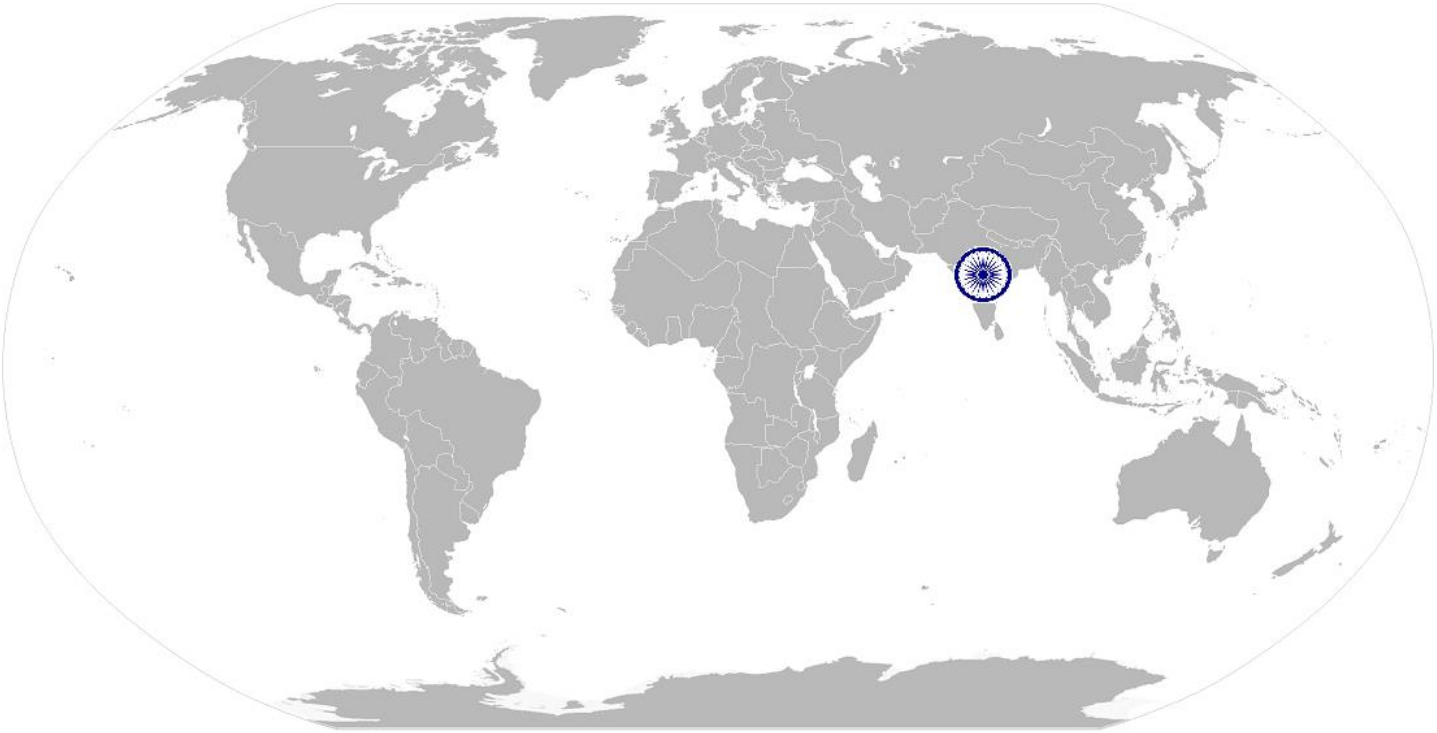


Overview

This unit is about maintaining Personal Health & Safety at project site.

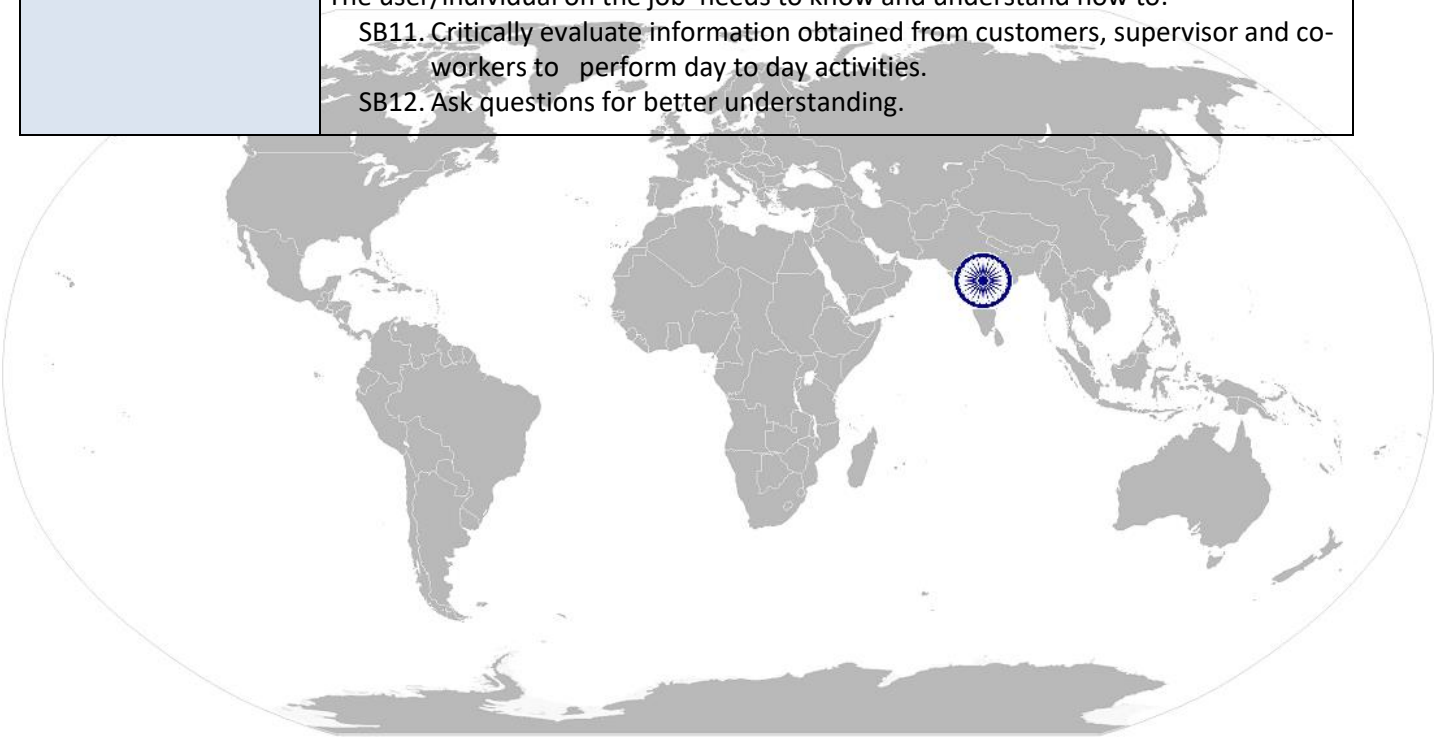
National Occupational Standard

Unit Code	**SGJ / N0106**
Unit Title (Task)	**Maintain Personal Health & Safety at project site**
Description	This unit is about maintaining Work Safety for Solar Photovoltaic Power Plants.
Scope	This unit/task covers the following: • Establish and follow safe work procedure • Use and maintain personal protective equipment. • Identify and mitigate safety hazards. • Demonstrate safe and proper use of required tools and equipment. • Identify work safety procedures and instructions for working at height.
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Establish and Follow safe work procedure	To be competent, the user/individual on the job must be able to: PC1. Identify corporate policies required for workplace safety. PC2. Identify requirements for safe work area and create a safe work environment. PC3. Identify contact person when workplace safety policies are violated. PC4. Provide information about incident/violation. PC5. Identify the location of First Aid materials and administer first aid
Use and maintain personal protective equipment	PC6. Identify the personal protection equipment required for specific locations on-site PC7. Identify expiry dates and wear & tear issues of specified equipment. PC8. Demonstrate safe and accepted practices for personal protection.
Identify and mitigate safety hazards	PC9. Identify environmental hazards associated with photovoltaic installations. PC10. Identify electrical hazards. PC11. Identify personal safety hazards or work site hazards and Mitigate hazards.
Demonstrate safe and proper use of required tools and equipment	PC12. Select tools, equipment and testing devices needed to carry out the work. PC13. Demonstrate safe and proper use of required tools and equipment.
Identify work safety procedures and instructions for working at height.	PC14. Check access from ground to work area to ensure it is safe and in accordance with requirements. PC15. Reassess risk control measures, as required, in accordance with changed work practices and/or site conditions and undertake alterations. PC16. Inspect/install fall protection and perimeter protection equipment ensuring adequacy for work and conformance to regulatory requirements. PC17. Identify approved methods of moving tools and equipment to work area and minimize potential hazards associated with tools at heights PC18. Select and install appropriate signs and barricades PC19. Place tools and materials to eliminate or minimize the risk of items being knocked down. PC20. Dismantle safety Power Plant in accordance with sequence and remove from worksite to clear work area.

SGJ/ N 0202 Assemble and repair of solar home lighting systems

Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. Company's Installation Policy. KA2. Company's work safety policy KA3. Company's Customer Support Policy. KA4. Company's documentation policy. KA5. Obtain authorization from specified field safety officer and supervisor. KA6. Company's reporting structure and Organization culture. KA7. Company's different department and concerned authority.
B. Technical Knowledge	The individual on the job needs to know and understand the following aspects: KB1. The individual on the job needs to know and understand: KB2. Relevant Personal protective equipment's required for installation KB3. Relevant standards and regulations for installation of Solar Photovoltaic Power Plant in India KB4. Occupational health and safety (OHS) standards for installation of Solar Photovoltaic Power Plant KB5. Risk identification and mitigation procedure for safe installation of Solar Photovoltaic Power Plant KB6. Knowhow of tools & tackles required to carry out the work.
Skills	
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. Fill up documentation applicable to one's role.
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA2. Read English and/or vernacular language. SA3. Read and understand manuals, health and safety instructions, memos, other company documents. SA4. Ability to read from different sources- books screens in machines and signage. SA5. Understand the various color codes, as per standard electrical, mechanical
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA6. Express statements or information clearly so that others can hear and understand. SA7. Participate in and understand the main points of simple discussions. SA8. Respond appropriately to any queries. SA9. Communicate with supervisor.
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. Follow organization rule-based decision making process. SB2. Take decision with systematic course of actions and/or response.
	Plan and Organize
	The user/individual on the job needs to know and understand how to : SB3. Planning and organization of work to meet deadlines. SB4. Work constructively and collaboratively with others.
	Customer Centricity

	The user/individual on the job needs to know and understand how to: SB5. Follow code of conduct. SB6. Manage relationships with customers with intent on satisfying its requirements for service delivery.
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB7. Recognize problems and search for solutions. SB8. Choose best methods to complete assigned tasks. SB9. Approach relevant authority when required.
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB10. Apply domain knowledge, observations and data to select course of action to perform tasks related to Solar Photovoltaic Systems.
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB11. Critically evaluate information obtained from customers, supervisor and co-workers to perform day to day activities. SB12. Ask questions for better understanding.



NOS Version Control

NOS Code	SGJ/N0106		
Credits (NSQF)	TBD	Version number	1.0
Industry Sector	Green Jobs	Drafted on	26/06/2015
Industry Sub-sector	Renewable Energy	Last reviewed on	21/10/2015
Occupation	Health & Safety	Next review date	01/10/2018

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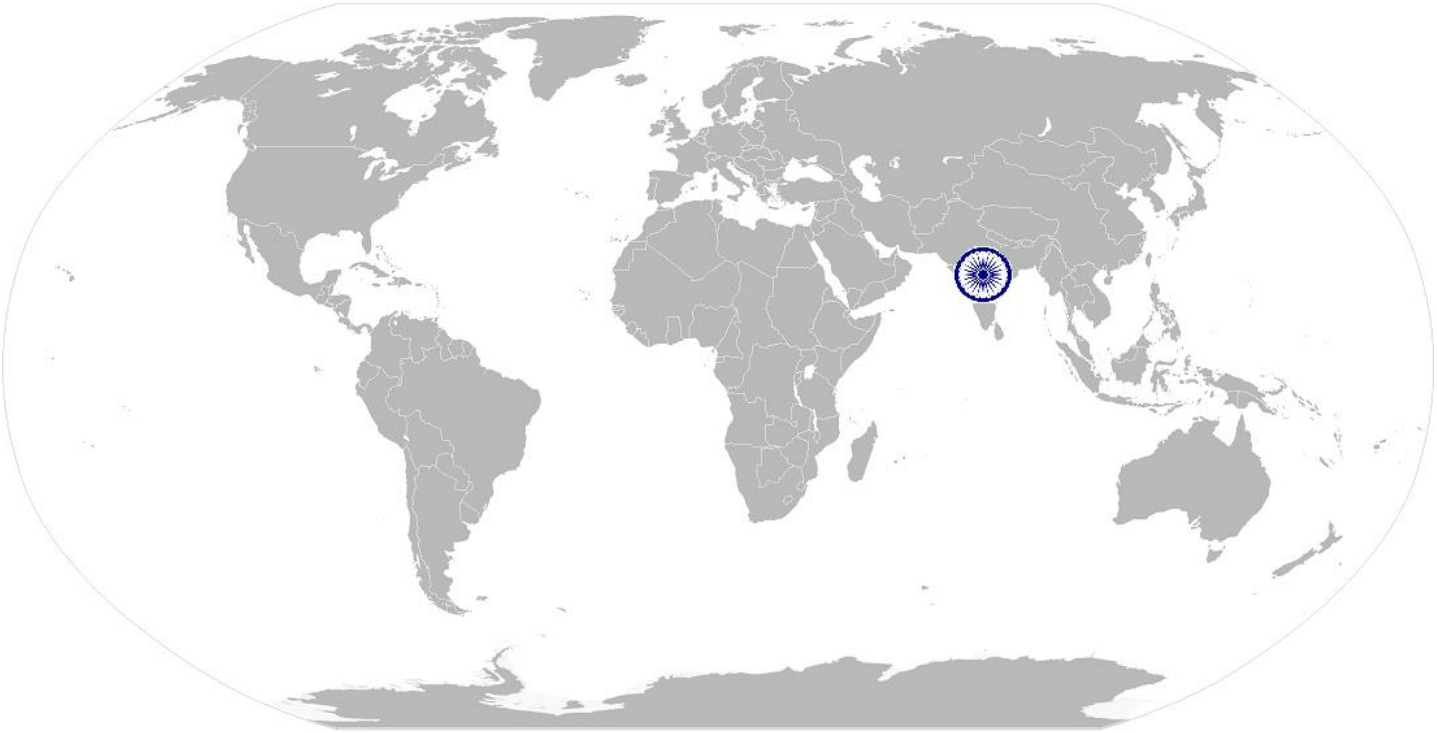


Overview

This unit is about assembly and repair of a solar home lighting systems.

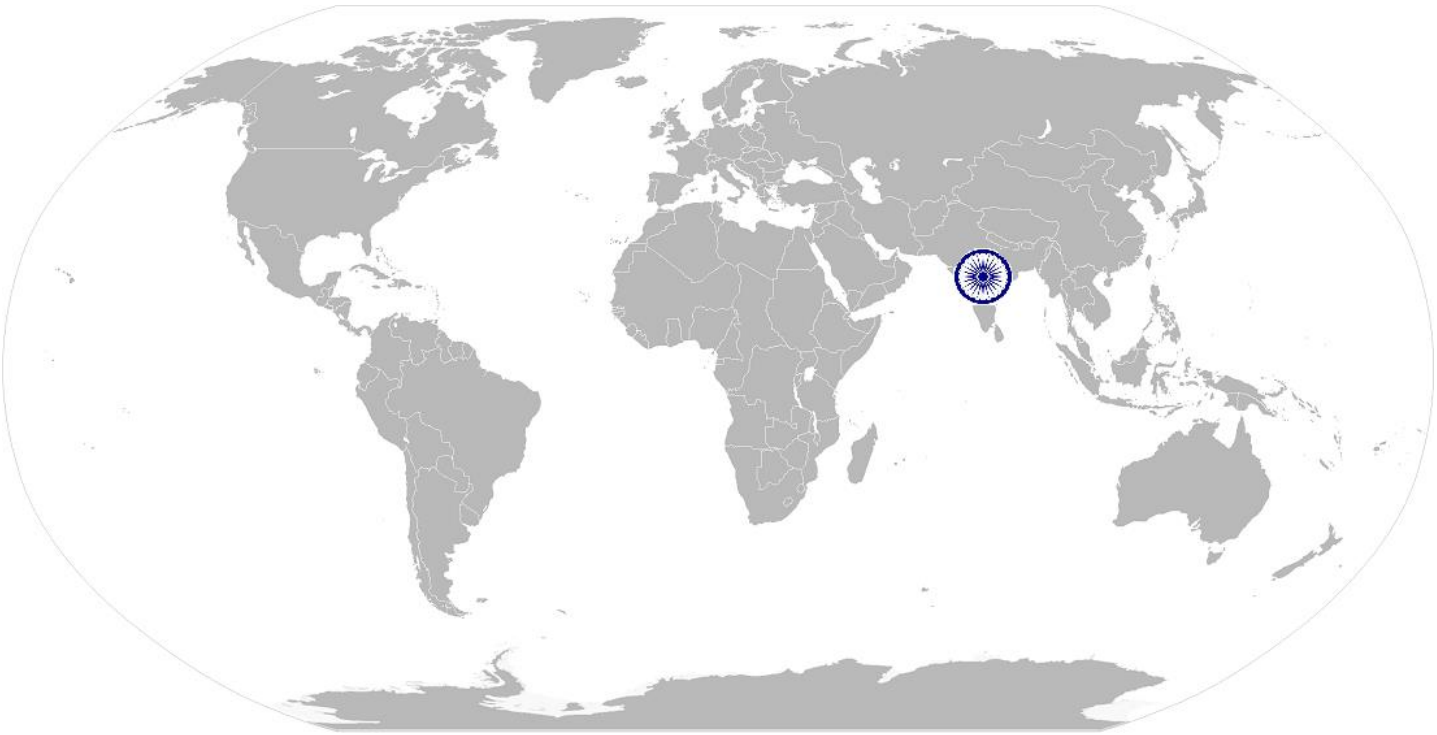
SGJ/ N 0202 Assemble and repair of solar home lighting systems

National Occupational Standard

Unit Code	**SGJ / N0202**
Unit Title (Task)	**Assemble and repair solar home lighting systems**
Description	This unit is about assembling solar home lighting systems.
Scope	This unit/task covers the following: • Assembly of Solar home lighting systems • Repair Solar home lighting systems
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Assembly of solar home lighting systems	To be competent, the user/ individual must be able to: PC1. Verify physical properties of all the solar home lighting systems components. PC2. Measure basic electrical parameters like resistance, current and voltage of different solar home lighting electrical components. PC3. Test the solar panel to check if the Voltage at open circuit (VoC) and current at open circuit (IoC) are according to the specifications mentioned by the manufacturer PC4. Test the battery to check if it's voltage is within the range specified by the manufacturer PC5. Perform a continuity check of the load wire to check for any internal breakage PC6. Verify the PCB and LED as per technical specifications mentioned by the manufacturer. PC7. Perform step by step procedure to assemble a solar home lighting systems
Repair Solar home lighting systems	To be competent, the user/ individual must be able to: PC8. Perform visual inspection of the solar home lighting systems. PC9. Measure and verify the terminal voltage of the battery as per manufacturer's specification. PC10. Measure and verify the voltage and current of solar PV modules with technical specifications PC11. Verify and replace the faulty switches and DC sockets PC12. Verify the connector pin and other components of a solar home lighting systems PC13. Verify the working of a PCB/ LED drivers PC14. Verify the working of the charge controller PC15. Prepare a basic repair and maintenance report.
Knowledge and Understanding (K)	
C. Organizational Context (Knowledge of the company /organization and its processes)	The individual on the job needs to know and understand the following aspects: KA1. The concept of the entire project. KA2. The entire assembly and distribution process KA3. Must be well versed with the assembly timeline KA4. Time management concepts including discipline, punctuality, act in time on commitment and quality productive time

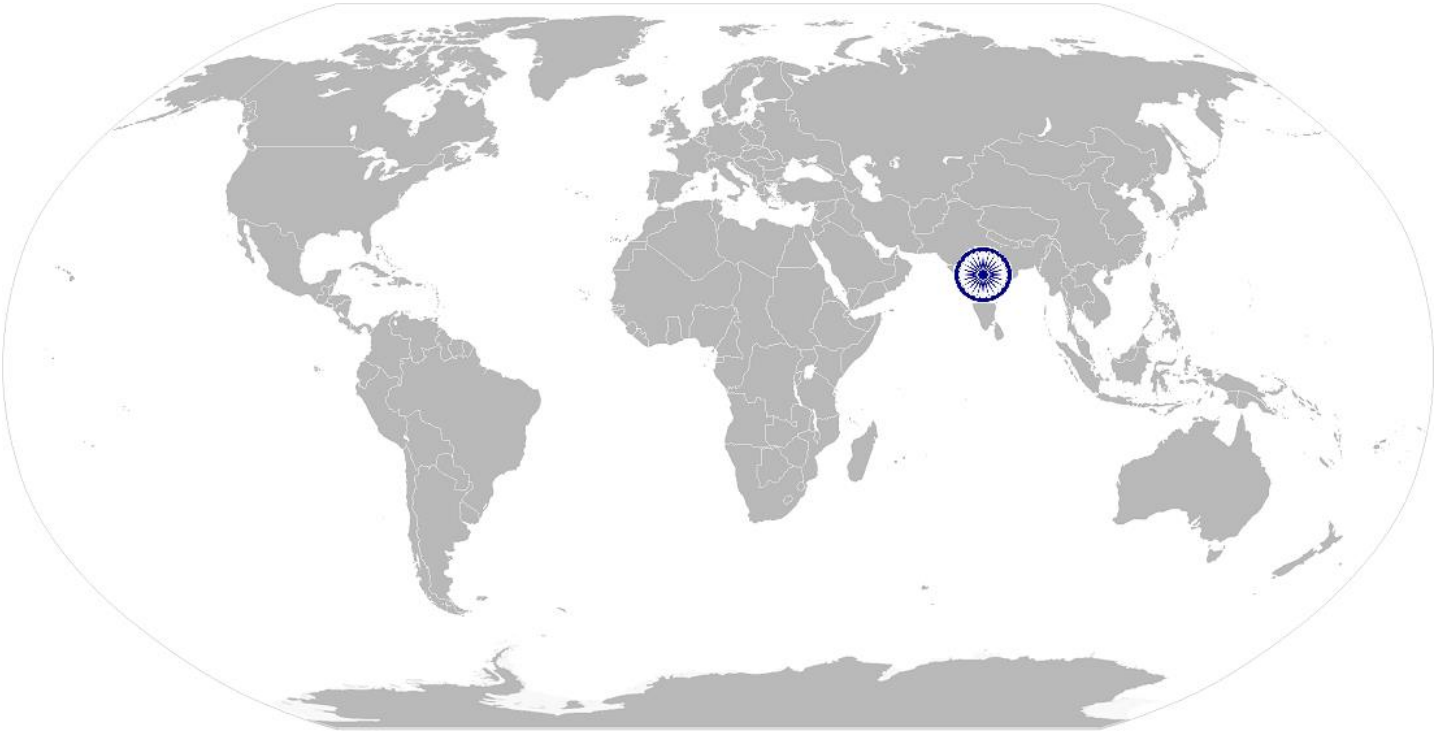
D. Technical Knowledge	The individual on the job needs to know and understand the following aspects: KB12. Natural resources of energy KB13. Voltage, Current and resistance. KB14. Characteristics & specifications of battery, solar module, PCB (Printed Circuit Board), LED (light-Emitting-Diode) load wire and other components of a solar home lighting systems as per the manufacturer. KB15. Operating and working of a multimeter, soldering iron and other tools present in a tool kit. KB16. Preliminary concepts of solar PV system KB17. Complete assembly of a solar home lighting systems as per manufacturer KB18. Warranties of different components of solar home lighting systems. KB19. Ability to shape and direct working/process methods according to self-defined criteria and effective management techniques KB20. Standard operating procedures for carrying out visual inspection of solar home lighting systems. KB21. Testing procedure for verifying the performance of all the components of a solar home lighting systems. KB22. Structure of a basic repair and maintenance report.
Skills	
B. Core Skills / Generic Skills	**Writing Skills**
	The User/ Individual on the job needs to know and understand how to: SA1. Prepare and maintain documentation
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA2. Read and Understand "assembly and distribution training manuals" in English / Hindi / vernacular language. SA3. Basic understanding of vernacular/local language SA4. Read user manuals and safety instructions
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. Express statements or information clearly so that others can hear and understand SA6. Participate in and understand general discussions SA7. Respond appropriately to any queries SA8. Communicate with other employees in the organization
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. Define organization rule-based decision making process SB2. Take decision with systematic course of actions and/or response.
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB3. Plan and organise work schedule to meet deadlines SB4. Work constructively with others.
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB5. Adhere to organisation code of contact SB6. Assemble good quality solar lanterns

	Problem Solving
	The user/individual on the job needs to know and understand how to: SB7. Recognise problems and search for solutions. SB8. Choose the best methods to complete assigned tasks
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB9. Apply domain knowledge, observations and data to select course of action to perform tasks related to assembly of solar lanterns
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB10. Reduce repetition of errors



NOS Version Control

NOS Code	SGJ/N0202		
Credits (NSQF)	TBD	Version number	1.0
Industry Sector	Green Jobs	Drafted on	28/02/2017
Industry Sub-sector	Renewable Energy	Last reviewed on	27/03/2017
Occupation	Assembly and Repair	Next review date	01/04/2019



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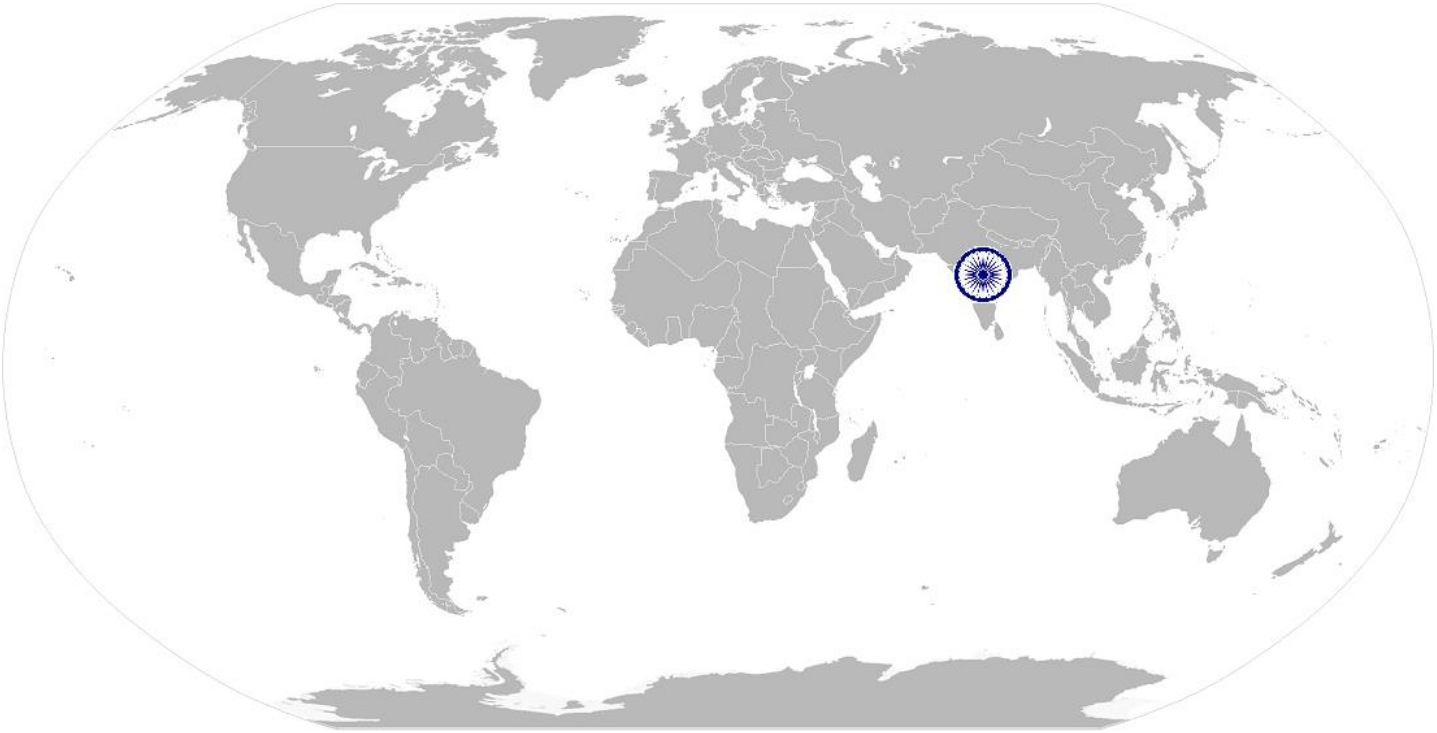
National Occupational Standard



Overview

This unit is about assembly and repair of a solar street lights.

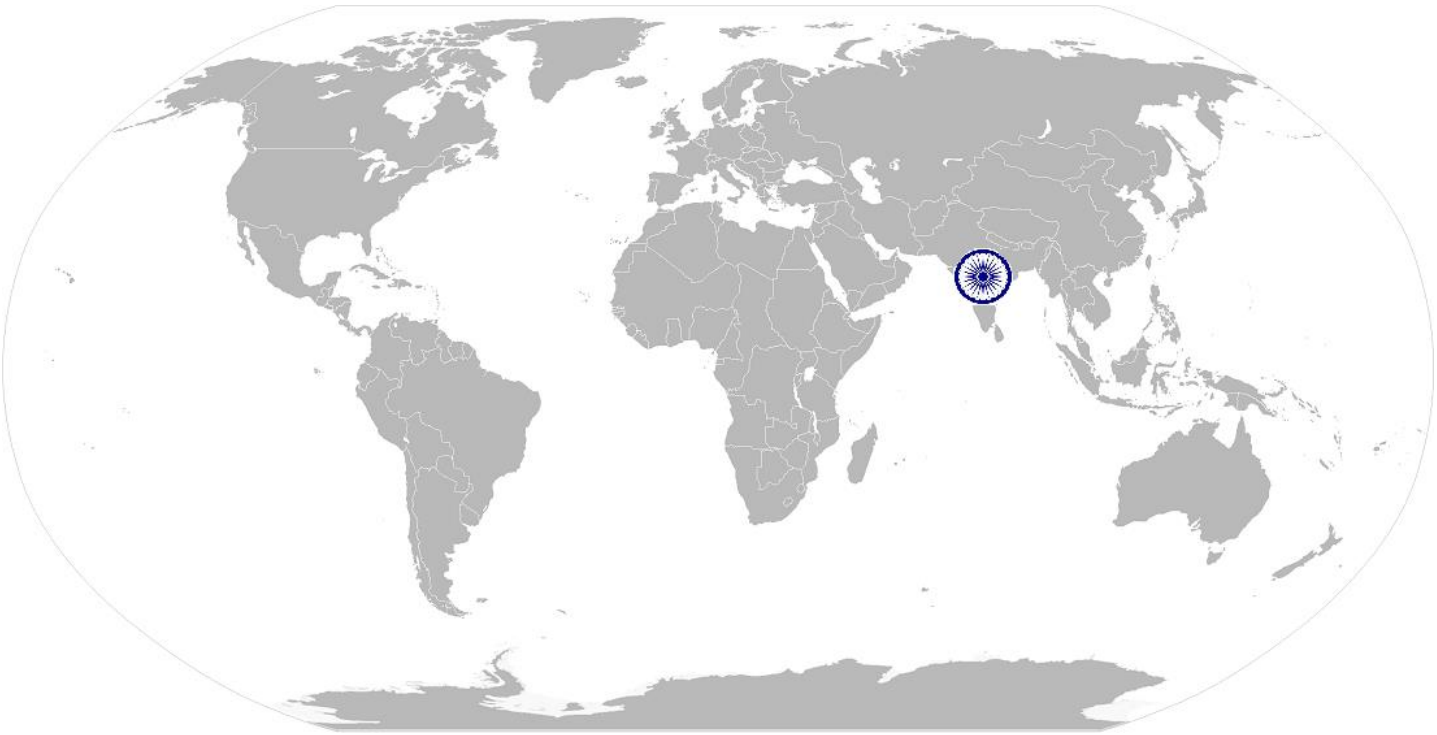
SGJ/ N 0203 Assemble and repair solar street lights

National Occupational Standard

Unit Code	**SGJ / N0203**
Unit Title (Task)	**Assemble and repair solar street lights**
Description	This unit is about assembling solar street lights.
Scope	This unit/task covers the following: • Assembly of Solar Street lights • Repair solar street lights
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Assembly of solar street lights	To be competent, the user/ individual must be able to: PC1. Verify physical properties of all the street lights components. PC2. Measure basic electrical parameters like resistance, current and voltage of different solar street lights electrical components. PC3. Test the solar panel to check if the Voltage at open circuit (VoC) and current at open circuit (IoC) are according to the specifications mentioned by the manufacturer PC4. Test the battery to check if it's voltage is within the range specified by the manufacturer PC5. Perform a continuity check of the load wire to check for any internal breakage PC6. Verify the PCB and LED as per technical specifications mentioned by the manufacturer. PC7. Perform step by step procedure to assemble a solar Street lights
Repair Solar Street lights	To be competent, the user/ individual must be able to: PC8. Perform visual inspection of the solar street lights. PC9. Measure and verify the terminal voltage of the battery as per manufacturer's specification. PC10. Measure and verify the voltage and current of solar PV modules with technical specifications PC11. Verify and replace the faulty switches and DC sockets PC12. Verify the connector pin and other components of a solar street lights PC13. Verify the working of a PCB/ LED drivers PC14. Verify the working of the charge controller PC15. Prepare a basic repair and maintenance report.
Knowledge and Understanding (K)	
E. Organizational Context (Knowledge of the company /organization and its processes)	The individual on the job needs to know and understand the following aspects: KA1. The concept of the entire project. KA2. The entire assembly and distribution process KA3. Must be well versed with the assembly timeline KA4. Time management concepts including discipline, punctuality, act in time on commitment and quality productive time

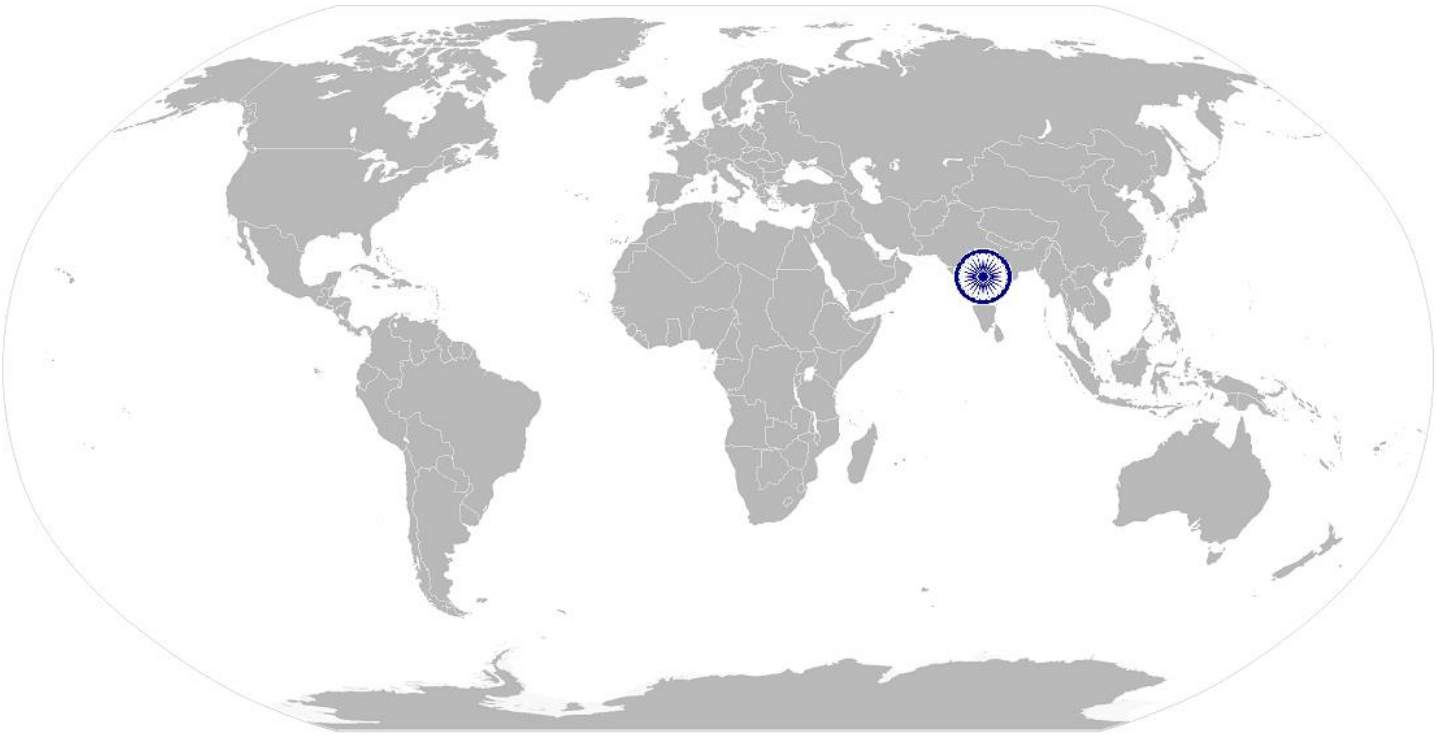
F. Technical Knowledge	The individual on the job needs to know and understand the following aspects: KB23. Natural resources of energy KB24. Voltage, Current and resistance. KB25. Characteristics & specifications of battery, solar module, PCB (Printed Circuit Board), LED (light-Emitting-Diode) load wire and other components of a solar street lights as per the manufacturer. KB26. Operating and working of a multimeter, soldering iron and other tools present in a tool kit. KB27. Preliminary concepts of solar PV system KB28. Complete assembly of a solar street lights as per manufacturer KB29. Warranties of different components of solar street lights. KB30. Ability to shape and direct working/process methods according to self-defined criteria and effective management techniques KB31. Standard operating procedures for carrying out visual inspection of solar street lights. KB32. Testing procedure for verifying the performance of all the components of a solar street lights. KB33. Structure of a basic repair and maintenance report.
Skills	
C. Core Skills / Generic Skills	**Writing Skills**
	The User/ Individual on the job needs to know and understand how to: SA1. Prepare and maintain documentation
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA2. Read and Understand "assembly and distribution training manuals" in English / Hindi / vernacular language. SA3. Basic understanding of vernacular/local language SA4. Read user manuals and safety instructions
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. Express statements or information clearly so that others can hear and understand SA6. Participate in and understand general discussions SA7. Respond appropriately to any queries SA8. Communicate with other employees in the organization
B. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. Define organization rule-based decision making process SB2. Take decision with systematic course of actions and/or response.
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB3. Plan and organise work schedule to meet deadlines SB4. Work constructively with others.
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB5. Adhere to organisation code of contact SB6. Assemble good quality solar lanterns

	Problem Solving
	The user/individual on the job needs to know and understand how to: SB7. Recognise problems and search for solutions. SB8. Choose the best methods to complete assigned tasks
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB9. Apply domain knowledge, observations and data to select course of action to perform tasks related to assembly of solar lanterns
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB10. Reduce repetition of errors



NOS Version Control

NOS Code	SGJ/N0203		
Credits (NSQF)	TBD	Version number	1.0
Industry Sector	Green Jobs	Drafted on	28/02/2017
Industry Sub-sector	Renewable Energy	Last reviewed on	27/03/2017
Occupation	Assembly and Repair	Next review date	01/04/2019



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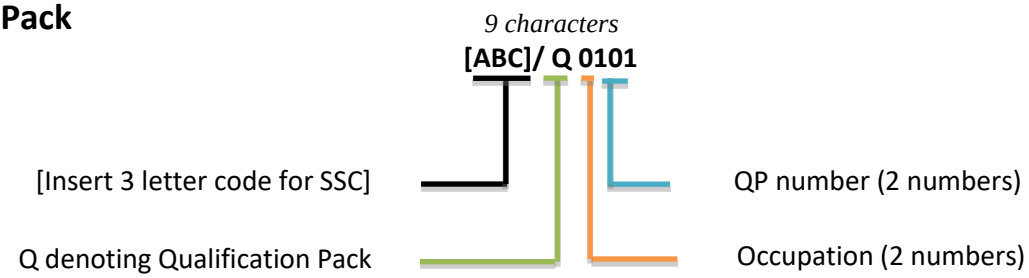
Annexure

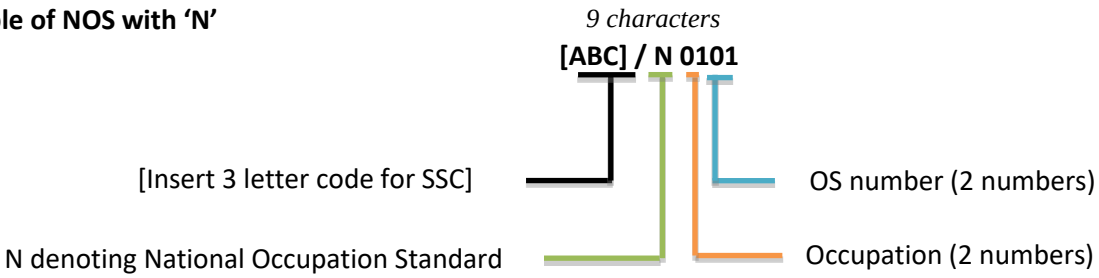
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



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The following acronyms/codes have been used in the nomenclature above:

Sub-sector		Range of Occupation numbers
Renewable Energy (01-35)	Solar Photovoltaic	01-05
	Solar Thermal	06-10
	Wind	11-15
	Hydro	16-20
	Biomass	21-25
	Geothermal	26-30
	All Renewables (Cross-cutting/ Enabling Activities)	31-35
Green Transportation (36 - 40)	Alternative Fuel Transportation	36-40
	Bio-fuels and Farming	40-45
	Other Green Transportation	46-50
Green Construction (51- 60)	Green Buildings	51-55
	Energy Efficiency	56-60
Waste Management (61- 65)	Waste Management	61-65
Water Management (66-70)	Water and Wastewater Management	66-70
Co-Generation (71 - 75)	Co-generation	71-75
Other Green Jobs (76- 99)	Carbon Sinks	76-80
	Environmental Compliance and Sustainability Planning	81-85
	Other Green Jobs	85-99

Sequence	Description	Example
Three letters	Industry name	SGJ
Slash	/	/
Next letter	Whether **Q**P or **N**OS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

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CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Solar off-Grid Technician

Qualification Pack SGJ/Q0202

Sector Skill Council Green Jobs

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack

			Marks Allocation		
NOS	**Performance Criteria**	Total Mark	Out Of	Theory	Skills Practical
SGJ/N0201: Assembly and repair of Solar Lamp.	PC1. Verify physical properties of all the lamp components.	100	8	4	4
	PC2. Measure basic electrical parameters like resistance, current and voltage of different solar lamp electrical components.		8	2	6
	PC3. Test the solar panel to check if the Voltage at open circuit (VoC) and current at open circuit (IoC) are according to the specifications mentioned by the manufacturer		6	1	5
	PC4. Test the battery to check if it's voltage is within the range specified by the manufacturer		6	1	5
	PC5. Perform a continuity check of the load wire to check for any internal breakage		6	1	5
	PC6. Verify the PCB and LED as per technical specifications mentioned by the manufacturer		6	1	5
	PC7. Perform step by step procedure to assemble a solar Lamp		15	3	12
	PC8. Perform visual inspection of the solar lamp.		6	2	4
	PC9. Measure and verify the terminal voltage of the battery as per manufacturer's specification.		6	1	5
	PC10. Measure and verify the voltage and current of solar PV modules with technical specifications		6	2	4
	PC11. Verify and replace the faulty switches and DC sockets		7	2	5

	PC12. Verify the connector pin and other components of a solar lamp		6	2	4
	PC13. Verify the working of a PCB/ LED drivers		8	1	7
	PC14. Prepare a basic repair and maintenance report.		6	2	4
		TOTAL	100	25	75
SGJ/N0147: Maintain personal health & safety in a manufacturing facility	PC1. identify corporate policies required for workplace safety	50	2	1	1
	PC2. identify requirements for safe work area and create a safe work environment		3	2	1
	PC3. identify contact person when workplace safety policies are violated		1	1	0
	PC4. provide information about incident/violation		1	1	0
	PC5. identify the location of first aid materials and administer first aid		2	1	1
	PC6. identify the personal protection equipment required for specific locations on-site		8	3	5
	PC7. identify expiry dates and wear & tear issues of specified equipment		2	1	1
	PC8. demonstrate safe and accepted practices for personal protection		8	3	5
	PC9. identify environmental hazards associated with the manufacturing facility		4	2	2
	PC10. identify electrical hazards		4	2	2
	PC11. identify personal safety hazards or work site hazards and mitigate hazards		6	3	3
	PC12. select tools, equipment and testing devices needed to carry out the work		4	2	2
	PC13. demonstrate safe and proper use of required tools and equipment		5	2	3
		Total	50	24	26
SGJ/N0106: Maintain Health and safety at project site	PC1. identify corporate policies required for workplace safety	50	2	1	1
	PC2. identify requirements for safe work area and create a safe work environment		3	2	1
	PC3. identify contact person when workplace safety policies are violated		1	1	0
	PC4. provide information about incident/violation		1	1	0
	PC5. identify the location of first aid materials and administer first aid		2	1	1
	PC6. identify the personal protection equipment required for specific locations on-site		3	2	1
	PC7. identify expiry dates and wear & tear issues of specified equipment		2	1	1
	PC8. demonstrate safe and accepted practices for personal protection		3	2	1
	PC9. identify environmental hazards associated with the manufacturing facility		2	1	1
	PC10. identify electrical hazards		4	2	2
	PC11. identify personal safety hazards or work site hazards and mitigate hazards		4	2	2
	PC12. select tools, equipment and testing devices needed to carry out the work		4	2	2

	PC13. demonstrate safe and proper use of required tools and equipment		4	2	2
	PC14. Check access from ground to work area to ensure it is safe and in accordance with requirements.		2	1	1
	PC15. Reassess risk control measures, as required, in accordance with changed work practices and/or site conditions and undertake alterations.		2	2	0
	PC16. Inspect/install fall protection and perimeter protection equipment ensuring adequacy for work and conformance to regulatory requirements.		4	2	2
	PC17. Identify approved methods of moving tools and equipment to work area and minimize potential hazards associated with tools at heights		2	1	1
	PC18. Select and install appropriate signs and barricades		2	1	1
	PC19. Place tools and materials to eliminate or minimize the risk of items being knocked down.		1	1	0
	PC20. Dismantle safety Power Plant in accordance with sequence and remove from worksite to clear work area.		2	1	1
		Total	50	29	21

Optional NOS:

SGJ/N0202: Assembly and Repair of solar home lighting systems	PC1. Verify physical properties of all the solar home lighting systems components.	100	8	4	4
	PC2. Measure basic electrical parameters like resistance, current and voltage of different electrical components of solar home lighting system.		8	2	6
	PC3. Test the solar panel to check if the Voltage at open circuit (VoC) and current at open circuit (IoC) are according to the specifications mentioned by the manufacturer		6	1	5
	PC4. Test the battery to check if it's voltage is within the range specified by the manufacturer		6	1	5
	PC5. Perform a continuity check of the load wire to check for any internal breakage		6	1	5
	PC6. Verify the PCB and LED as per technical specifications mentioned by the manufacturer.		6	1	5
	PC7. Perform step by step procedure to assemble a solar home lighting systems		12	2	10
	PC8. Perform visual inspection of the solar home lighting systems.		6	2	4
	PC9. Measure and verify the terminal voltage of the battery as per manufacturer's specification.		6	1	5
	PC10. Measure and verify the voltage and current of solar PV modules with technical specifications		6	2	4
	PC11. Verify and replace the faulty switches and DC sockets		6	1	5
	PC12. Verify the connector pin and other components of a solar home lighting systems		6	2	4

	PC13. Verify the working of a PCB/ LED drivers		6	1	5
	PC14. Verify the working of the charge controler		6	2	4
	PC15. Prepare a basic repair and maintenance report.		6	2	4
		TOTAL	100	25	75
SGJ/N0203: Assembly and Repair of solar street lights	PC1. Verify physical properties of all the street lights components.	100	8	4	4
	PC2. Measure basic electrical parameters like resistance, current and voltage of different electrical components of solar street light .		8	2	6
	PC3. Test the solar panel to check if the Voltage at open circuit (VoC) and current at open circuit (IoC) are according to the specifications mentioned by the manufacturer		6	1	5
	PC4. Test the battery to check if it's voltage is within the range specified by the manufacturer		6	1	5
	PC5. Perform a continuity check of the load wire to check for any internal breakage		6	1	5
	PC6. Verify the PCB and LED as per technical specifications mentioned by the manufacturer.		6	1	5
	PC7. Perform step by step procedure to assemble a solar Street lights		12	2	10
	PC8. Perform visual inspection of the solar street light.		6	2	4
	PC9. Measure and verify the terminal voltage of the battery as per manufacturer's specification.		6	1	5
	PC10. Measure and verify the voltage and current of solar PV modules with technical specifications		6	2	4
	PC11. Verify and replace the faulty switches and DC sockets		6	1	5
	PC12. Verify the connector pin and other components of a solar street lights		6	2	4
	PC13. Verify the working of a PCB/ LED drivers		6	1	5
	PC14. Verify the working of the charge controller		6	2	4
	PC15. Prepare a basic repair and maintenance report.		6	2	4
		TOTAL	100	25	75

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