**Solar Electric Technician (Level 2)**

**Module 4: Site selection for solar PV systems**

**E4: Assignment - Solar PV inverter manual**

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| **E4: ASSIGNMENT MEMO** | |
| **Date** | …. |
| **To** | Participants |
| **From** | Trainers |
| **Subject** | Solar PV inverter manual |
| **What** | Review and comprehend the solar PV inverter’s manual to perform the installation as per the instruction provided in the manual. |
| **Why** | The objective of the assignment is to equip trainees with the skills to review, read and comprehend the instructions provided in the manual to perform installation as per the standard practice. |
| **How** | 1. Work in group of 2 or 4. 2. Divide group in such a way that each team is assigned with a specific section of the manual to review. 3. Read and carefully follow the instructions to perform the specific task. 4. Record the findings/observations for each specific tasks in the table and discuss the results with the trainer. 5. Answer the questions and discuss the results. |
| **Time** | 60’ for each technology (at least two) |

**Comprehend the solar PV inverter manual to perform installation**

**Required tools/equipment:**

* Solar PV inverter manual
* Camera (smartphone) for documentation

| **Specific tasks/instructions** | **Findings/Observations** |
| --- | --- |
| **Task 1: Read thoroughly the solar PV inverter manual to:** | |
| 1. Identify all safety precautions in the manual, such as the need for Personal Protective Equipment (PPE), and safe handling of the inverter during installation and operation. |  |
| 1. Review the recommended protection devices, such as circuit breakers and surge protectors. |  |
| 1. Note down the warnings related to electrical shock, fire hazards, and other potential risks. |  |
| 1. Discuss how to de-energize the system safely for maintenance or emergencies. |  |
| 1. Review the guidelines on how to mount the inverter securely on a wall or frame. |  |
| 1. Identify the types of surfaces that are appropriate for mounting and any weight restrictions or requirements for mounting hardware. |  |
| 1. Ensure you understand the importance of proper alignment and ensuring the inverter is mounted in a level position. |  |
| 1. Take note of any specific environmental requirements for the mounting location (e.g., outdoor versus indoor installation, exposure to direct sunlight |  |

| **Specific tasks/instructions** | **Findings/Observations** |
| --- | --- |
| 1. Comprehend **the operating conditions of the following:** | |
| * **Voltage:** Identify the recommended DC input voltage range and the inverter’s AC output voltage. Discuss what happens if the voltage goes outside the operating range. |  |
| * **Current:** Understand the current rating for both DC input and AC output. Ensure that you are aware of the inverter’s current handling capacity. |  |
| * **Temperature:** Review the operating temperature range and ensure you understand what conditions are optimal for inverter performance. Note any temperature limits that may require additional cooling or ventilation. |  |
| * Discuss the maximum power point tracking (MPPT) range (if applicable) and its significance for optimizing the inverter’s efficiency |  |
| 1. **Read and understand the installation process as per the following instructions:** | |
| * Review the step-by-step installation instructions provided in the manual. |  |
| * Identify the sequence of tasks for connecting the inverter to the solar PV array and the electrical system. |  |
| * Ensure you understand grounding requirements and the importance of securely fastening all electrical connections. |  |
| * Review the instructions for pre-commissioning checks, including ensuring all connections are secure and testing the system before operation. |  |
| 1. Review the wiring requirements, including the recommended wire sizes for DC input and AC output connections. |  |
| 1. Ensure you understand how to connect the positive and negative terminals properly to avoid reverse polarity issues. |  |
| 1. Discuss wire routing to minimize exposure to heat, moisture, and mechanical damage. |  |
| 1. Identify strain relief requirements and ensure wires are not under tension after installation. |  |
| 1. Review the cooling system for the inverter, whether it’s passive (convection) or active (fan-assisted). |  |
| 1. Review the clearance requirements around the inverter for proper airflow to prevent overheating. |  |
| 1. Identify ventilation recommendations and ensure you understand the importance of placing the inverter in a well-ventilated area, avoiding enclosed spaces. |  |
| 1. Identify any national or local regulations that need to be followed during installation, such as electrical codes, NEA regulations on size, grid connection and safety standards. |  |
| 1. If available, physically review an inverter and relate the manual’s instructions to the actual components. |  |
| 1. Check for the safety labels on the inverter and relate them to the instructions in the manual. |  |
| 1. Prepare a brief summary of your section and share their findings with the class. |  |
| 1. Discuss any challenges or unclear points in the manual and seek clarification as needed. |  |