INSTALL SPECIALIZED POWER SYSTEMS

UNIT CODE: : 0714 451 16A

TVETCDACC UNIT CODE: ENG/OS/TLE/CR/02/5/MA

UNIT DESCRIPTION

This unit specifies competencies required for installing telecommunication systems power supply. These include; installing solar power supply systems, seting up telecommunication UPS systems, installing power factor correction systems, installing HVAC systems and testing electrical power supply system.

ELEMENT These describe the key outcomes which make up workplace function.	**PERFORMANCE CRITERIA** These are assessable statements which specify the required level of performance for each of the elements. ***(Bold and italicized terms are elaborated in the range).***
1. Install Solar power supply systems.	1.1 Electrical tools, equipment and materials are prepared as per work requirement 1.2 Support structure is erected as per designed specification 1.3 Cable laying ducts are prepared as per design specifications 1.4 Solar power supply cables are terminated at the power panels as per electrical drawing 1.5 Solar power supply is tested as per design specifications
2. Set up Telecommunication UPS system	2.1 Electrical Tools, equipment and materials are prepared as per work requirement 2.2 Support structure is erected as per designed specification 2.3 Cable laying ducts are prepared as per design specifications 2.4 UPS system cables are terminated at the power panels as per electrical drawing 2.5 UPS system is tested as per design specifications
3. Install Power Factor Correction Systems	3.1 Fundamentals of power factor and Power factor correction systems (PFC) are applied as per work requirement. 3.2 Power factor correction system is installed as per work requirement. 3.3 Power factor correction system is maintained as per work requirement.
4. Install HVAC systems	4.1 Fundamentals of Heating, Ventilation and Air Conditioning (HVAC) systems are determined as per design specifications. 4.2 HVAC installation techniques are identified as per design specifications. 4.3 HVAC system testing and commissioning is performed as per work requirement.

5. Test electrical power supply system	5.1 Types of ***electrical tests*** are determined as per power supply designed specifications 5.2 Tests are carried out as per ***IEEE standards*** 5.3 Test results are documented as per organization standard procedure

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	**Range**
1. **Electrical tests** may include but not limited to:	• Continuity Testing • Insulation Resistance Testing • Polarity Testing • Earth Fault Loop Impedance Tests • Prospective Fault Current Test (PFC Test) • Phase Sequence Test • Residual Current Device (RCD) Test
2. ***IEEE standards*** may include but is not limited to:	• IEEE 802® Standards • IEEE P1941.1™ • IEEE P2872™ • ISO standards

REQUIRED KNOWLEDGE AND UNDERSTANDING

1. The individual needs to demonstrate knowledge and understanding of:
    - The manufacturer's warranty requirements relating to installation of Power Lines and related components.
    - The legal requirements relating to commissioning activities for electrical power lines installations and components.
2. Legislation and workplace procedures relevant to:
    - Environment, health and safety;
    - Appropriate PPE (personal protective Equipment)
3. Observe County Government bylaws
    - EPRA (Energy & Petroleum Regulatory Authority)

- NEMA
- KPLC Electrical Safety rules

4. Power Supply Technologies:
    - Knowledge of current power supply technologies
    - Electrical circuit techniques.
5. Automatic Control:
    - Understanding of automatic control systems used in power supply systems.
6. Grounding and Protection Techniques:
    - Knowledge of techniques to ensure the safety and reliability of the power supply system.
7. Design of Battery and Grounding Installations:
    - Ability to design and install batteries and grounding systems.
8. Telecommunications Industry:
    - Broad understanding of the telecommunications industry and the role of power supply within it.
9. Relevant Standards:
    - Familiarity with relevant IEEE standards and other industry regulations.
10. Uninterruptible Power Supplies (UPSs):
    - Understanding of UPSs used in the telecommunications industry to provide communications continuity and reduce downtime.
11. The importance of documenting electrical machines installation information
12. The importance of working to agreed timelines
13. The relationship between time and costs
14. How to prepare, interpret and use sources of technical information for scheduled Electrical power lines construction works
15. The importance of using the correct sources of technical information.
16. The purpose of and how to use identification codes (e.g., colour codes).
17. How the power system operates
18. The operating specifications and tolerances for different types of power systems components
19. The hazards associated with operating construction and operation of a power system.
20. Identification of users to be training needs

FOUNDATION SKILLS

The individual needs to demonstrate the following additional skills:

- Communications (verbal and written);
- Proficient in ICT;
- Time management;
- Analytical
- Faults troubleshooting
- Problem solving;
- Planning;
- Decision making;
- First aid;
- Report writing;

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and understanding and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Terminated Utility power supply cables on panels as per electrical drawing 1.2 Terminated Solar power supply cables at the power panels as per electrical drawing 1.3 Terminated UPS system cables at the power panels as per electrical drawing 1.4 Installed Power factor correction system as per work requirement. 1.5 Identified HVAC installation techniques as per design specifications. 1.6 Carried out Tests as per IEEE standards
2. Resource Implications	The following resources **must** be provided: 2.4 Access to relevant workplace where assessment can take place 2.5 Appropriately simulated environment where assessment can take place 2.6 Materials relevant to the proposed assessment activity or tasks

3. Methods of Assessment	Competency may be assessed through: 3.8 Practical assessment 3.9 Project 3.10 Written assessment 3.11 Observation 3.12 Oral questioning 3.13 Portfolio of evidence 3.14 Third party report
4. Context of Assessment	Competency may be assessed in a: 4.3 Workplace 4.4 Simulated workplace
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.