



# ***Occupational Profile*** **for** **Smart Grid Technician**

## **Content Expert Panel**

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Prabir Barooah; University of Florida; Gainesville, FL  
Jay Matteson; Palm Beach State College; Palm Beach Gardens, FL  
Roxana Melendez-Norona; Palm Beach State College; Palm Beach Gardens, FL  
William Monzon; Florida Power & Light; Hialeah, FL  
Paul Ollukaren; Florida Power & Light; Juno Beach, FL

Zvi Roth; Florida Atlantic University; Boca Raton, FL  
Robert Seigworth; Lake Sumter State College; Sumterville, FL  
Vichate Ungvichian; Florida Atlantic University; Boca Raton, FL  
James VanZweiten, Jr.; Florida Atlantic University; Boca Raton, FL  
Earl Walker; Siemens Energy Inc.; Orlando, FL

## **Sponsors**

Florida Advanced Technological Education (FLATE) Center of  
Excellence at Hillsborough Community College, Tampa, FL;  
Marilyn Barger, Executive Director/Principal Investigator  
Florida Energy Systems Consortium (FESC) at FLATE; Tampa, FL  
Nina Stokes, Project Manager

**Host:** Palm Beach State College, Palm Beach Gardens, FL

## **Facilitation/Coordination**

Facilitators: Michael Beck, Technical Writer, Advanced Technology Environmental  
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Melonee Docherty, Instructional Designer, ATEEC at Eastern Iowa  
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Coordinators: Jay Matteson, Director, Institute for Energy & Environmental  
Sustainability at PBSC  
Nina Stokes, Project Manager, FESC-FLATE

SMART GRID TECHNICIAN

Job Task Analysis\*

The SMART GRID TECHNICIAN installs, maintains, troubleshoots, repairs, replaces, updates, and configures smart grid-specific components, subsystems, and systems.

DUTIES ⬇

TASKS ➡

|   |     |  |  |  |  |  |  |   |  |
|---|-----|--|--|--|--|--|--|---|--|
| INSTALL OR REPLACE SMART GRID COMPONENTS                    | A.1 | Review the design or work packet<br><div>A.1-1</div>               | Perform receipt inspection<br><div>A.1-2</div>                                     | Perform lockout/tagout (safing the system)<br><div>A.1-3</div> | Comply with applicable construction/code standards<br><div>A.1-4</div>     | Prepare new component<br><div>A.1-5</div>                          | Perform pre-operational checks<br><div>A.1-6</div>   | Remove/demolish old equipment<br><div>A.1-7</div>         | Physically install device component system<br><div>A.1-8</div> |
|   |     | Make connections (e.g., electrical, pneumatic)<br><div>A.1-9</div> | Perform quality control check<br><div>A.1-10</div>                                 | Perform post-operational check<br><div>A.1-11</div>            |  |  |  |   |  |
| CONFIGURE SMART GRID COMPONENTS                             | A.2 | Update IC chipset & jumpers<br><div>A.2-1</div>                    | Establish local telecommunications to the smart grid component<br><div>A.2-2</div> | Update firmware<br><div>A.2-3</div>                            | Update software<br><div>A.2-4</div>  | Set configuration parameters<br><div>A.2-5</div>                   | Set network address<br><div>A.2-6</div>              | Verify end configuration is effective<br><div>A.2-7</div> |  |
| SET UP SMART GRID NETWORK PATH                              | B   | Identify network backbone device location<br><div>B-1</div>        | Physically install network backbone devices<br><div>B-2</div>                      | Establish network telecommunications path<br><div>B-3</div>    |  |  |  |   |  |
| CONFIGURE NETWORK COMPONENTS (WITHIN SMART GRID COMPONENTS) | C   | Update IC chipset & jumpers<br><div>C-1</div>                      | Update firmware<br><div>C-2</div>  | Set communication protocols<br><div>C-3</div>                  | Configure database<br><div>C-4</div>                                       |  |  |   |  |
| TEST/COMMISSION SMART GRID COMPONENTS                       | D   | Review the testing guideline<br><div>D-1</div>                     | Approve the testing guideline<br><div>D-2</div>                                    | Perform basic electrical tests<br><div>D-3</div>               | Perform basic mechanical tests<br><div>D-4</div>                           | Perform network checks<br><div>D-5</div>                           | Collect data from device<br><div>D-6</div>           | Verify data meets specifications<br><div>D-7</div>        | Perform end element testing<br><div>D-8</div>                  |
|   |     | Update as-built document<br><div>D-9</div>                         | Hand over equipment to operations<br><div>D-10</div>                               |  |  |  |  |   |  |
| TROUBLESHOOT SMART GRID COMPONENTS                          | E   | Perform lockout/tagout (safing the system)<br><div>E-1</div>       | Identify how component is supposed to work<br><div>E-2</div>                       | Determine what is happening now<br><div>E-3</div>              | Identify potential failures using test equipment & logic<br><div>E-4</div> | Determine failure & whether to repair or replace<br><div>E-5</div> | Repair or replace failed component<br><div>E-6</div> |   |  |

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| MONITOR & MAINTAIN SMART GRID COMPONENTS/SYSTEM | F | Analyze device-specific health reports, charts, & trends<br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><b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## TECHNICAL KNOWLEDGE, SKILLS, AND ATTRIBUTES

Basic academic competencies:

- Math
- Science
- Reading
- Writing

Math (e.g., basic, geometry, college algebra, trigonometry, Boolean logic)

Science (e.g., thermodynamics, heat transfer, chemical interactions, electromagnetism)

Blueprint reading

Broad energy technology knowledge base

Computer/IT/security

Computer architecture

Computer programming

Customer service

Data collection, management, analysis, interpretation (including trend analysis)

Digital communication protocols (e.g., TCP/IP, MODBUS, BACNET, CAN, DNP3, IEC61850)

Digital instrumentation and control (e.g., DDC, PLC, network security)

Electrical

Electronics

Encryption

(PKI)

Environmental, safety, and health codes and regulations

Mechanical (including use of tools)

Network protection basics

Network topology

## TOOLS AND EQUIPMENT

Basic technician tool kit

Clamp-on ammeters

Communications interface unit/field service unit

Computer laptop/notebook/tablet

Fiber optic tester

Infrared thermography

Oscilloscope

Power quality monitors

Protocol analyzer

Safety equipment (including PPE)

Spectrum Analyzer

Voltmeter, DMM

Quality Assurance/Quality Control (QA/QC)

Safety/risk assessment

Systems thinking/planning/integration

Technical terminology

Test equipment basics

Troubleshooting

## EMPLOYABILITY KNOWLEDGE, SKILLS AND ATTRIBUTES

Communication (e.g., reading comprehension, writing, speaking, presenting)

Critical thinking

Participation in internships/externships

Ability to pass company-specific background check, as applicable

Passion for the technical field/technology

People skills

Personal effectiveness

- Ability to focus
- Ability to listen
- Ability to “sell” self
- Creativity (multidisciplinary)
- Engagement
- Grooming/appearance
- Inquisitiveness
- Lifelong learning and flexibility to learn
- Self-motivation

Problem-solving

Teamwork

Valid driver's license

Works effectively and efficiently with minimal supervision

## IMPORTANT NOTES:

The Smart Grid Technician is a rapidly emerging occupation. The current prevailing title for this job is that of a Utility Technician. The above material for a Smart Grid Technician assumes the technician already has a foundational knowledge in utility technology. This Job Task List attempts to build on and expand the Utility Technician occupation with the listed smart grid tasks.

**Safety is the top priority in this occupation.**

All standard health and safety tasks apply here, but for the sake of brevity these tasks are not individually listed in this Job Task List.

