APPA eCADEMY
AMERICAN PUBLIC POWER ASSOCIATION

Agenda

Electric Utilities 101

Recommended CEUs .6/PDHs 5.5/CPE 6.2 (total for both sessions)
Field of Study: Specialized Knowledge

Session 1: Tuesday, October 20

Noon - 3 pm Eastern

- **Introduction, Agenda Items, Learning Outcomes**
  - Course introduction and expectations
  - Icebreaker activity: What do you want to know about utilities?

- **Section 1: Electricity Basics Review**
  - What is electricity? (Volts, amps, watts, ohms—simple terms)
  - AC vs. DC Fundamentals
  - How the grid works (overview)
  - Power system reliability

- **Section 2: Power Generation 101**
  - Types of generation (fossil, nuclear, hydro, wind, solar, storage)
    - Renewable integration
    - The growing need for storage
  - How power plants work (basic mechanisms)
  - Baseload generation and peak generation
  - Power purchase agreements and independent power producers
  - Introduction to net metering and distributed generation

- **Section 3A: Transmission & Distribution (T&D)**
  - Transmission Systems
    - Grid Overview
    - Transmission system interconnections
    - System Interties
    - Transmission overhead vs. underground
    - Right of way vs. easement

- **Wrap-up, Knowledge Check, Q&A**

- **Session 1 Adjourns**

Session 2: Thursday, October 22

Noon - 3 pm Eastern

- **Recap from Session 1; Agenda for Day 2**

- **Section 3B: Transmission & Distribution (T&D)**
  - Role of substations
    - Substation components
  - Types of distribution systems
    - How transformers work
    - Billing kilowatt-hours
  - Grid reliability, outages, and restoration
    - Types of reliability options
    - Causes of outages
    - Power restoration process
  - Smart grid and modernization
    - Advanced Distribution Management System (ADMS)
    - Supervisory Control and Data Acquisition (SCADA)
    - Distributed Energy Resources
    - Volt-Var Optimization for voltage control

- **Section 4: Clean Energy Basics**
  - Energy transition from fossil fuel to renewable
  - Renewable integration and challenges
  - Electrification of transportation and buildings
  - Storage and emerging technologies

- **Section 5: Customer Experience**
  - Real life examples of batteries, load profiles and rate implications:
  - AMI, time of use, max load calculations, load factor calculation
  - Utility scale batteries – cost analysis
  - Large power rate examples

- **Section 6: Challenges & Opportunities**
    - Grid resilience (cybersecurity, physical grid threats)
    - Supply chain and workforce challenges
    - Innovation and technology outlook
    - Future workforce and skills

- **Wrap up, Q&A, Course Evaluation**

- **Course Adjourns**