# Advanced Power Distribution Engineering For Utilities Training

## Description

### Course Description

In our modern world, distribution systems deliver electricity literally everywhere, taking power generated at many locations and delivering it to end users. Generation, transmission, and distribution – of these big three components of the electricity infrastructure, the distribution system gets the least attention.



Yet, it is often the most critical component in terms of its effect on reliability and quality of service, cost of electricity, and aesthetic (mainly visual) impacts on society.
Like much of the electric utility industry, several political, economic, and technical changes are pressuring the way distribution systems are built and operated. Deregulation has increased pressures on electric power utilities to cut costs and has focused emphasis on reliability and quality of electric service.

The great fear of deregulation is that service will suffer because of cost cutting. Regulators and utility consumers are paying considerable attention to reliability and quality. Another change that is brewing is the introduction of distributed generation on the distribution system. Generators at the distribution level can cause problems (and have benefits if properly applied). Customers are pressing for lower costs, better reliability, and less visual impact from utility distribution systems.

### Course Objectives

- Deregulation and technical changes increase the need by utility engineers for better information. This course helps fill some of those needs in the area of electric distribution systems.
- The first two days of the course focus on the equipment-oriented information and applications such as choosing transformer connections, sizing and placing capacitors, and setting regulators. Day three and four of this course cover reliability and power quality.
- The performance of the distribution system determines greater than 90% of the reliability of service to customers (the high-voltage transmission and generation system determines the rest). If performance is increased, it will have to be done on the distribution system. At the last day of

this course, we tackle lightning protection, grounding, and safety. Safety is a very important consideration in the design, operation, and maintenance of distributed facilities.
- The last two sessions of day five on distributed generation provide information to help utilities avoid problems caused by the introduction of distributed generation.
- This course provides many tools to help address the challenges of providing a more reliable distribution system given significant cost constraints. In addition to a wealth of classic information on distribution practices, the course provides new insights based on recent research by EPRI, the Consortium for Electric Infrastructure to Support a Digital Society (CEIDS), IEEE, and others.

**Course Outlines**

**Upon completion of this course, participants will have good knowledge on the following areas:**

- Modern Power Distribution Systems
- Overhead Lines
- Underground Distribution
- Distribution Transformers
- Distribution Substations
- Voltage Regulation
- Capacitor Application
- Faults
- Short Circuit Protection
- Reliability
- Voltage Sags and Monetary Interruptions
- Power Quality
- Lightning Protection
- Grounding & Safety
- Distributed Generators