

SUBSTATION I PROGRAM

**Fridays
Remote***

**MARCH 28 – 31, 2023
APRIL 18 – 21, 2023
MAY 2 – 5, 2023
MAY 23 – 26, 2023**

NEPPA's is pleased to offer the revitalized Substation I Program which is held 3.5-days/week for 4 weeks/year. Substation I is designed to be an introduction to substations including safety, design, operation, equipment and theory. Upon successful completion of the Program, students are awarded a Certificate of Completion.

In addition to in-class lecture, the Substation I Program incorporates hands-on application of concepts and testing, field visits and tours of different installations, and weekly testing including a final exam to demonstrate knowledge and comprehension of the course content. Each Friday of the session will be conducted virtually for review and testing.

WHO SHOULD ATTEND

This course is designed for:

- Lineworkers or operations employees
- Substation Technicians
- Employees or Supervisors transitioning from other departments
- Engineers
- Construction Supervisors
- Project Managers

LEARNING OBJECTIVES

Upon completion of this four-week program, participants will be able to successfully:

1. Recognize safety hazards in a substation
2. Demonstrate a foundational knowledge of how electricity is transmitted through substations
3. Practice safely entering, exiting, and performing maintenance in a substation.
4. Apply concepts of the substation's role in a distribution system.
5. Identify and classify equipment found in a substation, including applicable safety precautions including PPE
6. Demonstrate an understanding of SCADA, as well as basic switching and tagging.
7. Ability to deenergize and reenergize a power transformer
8. Recognize applicable standards, specifications, and regulations such as OSHA and the National Electrical Safety Code (NESC).

TESTING



AGENDA

Agenda details are subject to change.

Session I: March 28 – 31, 2023

Day 1 (Basic Electricity & Mathematics for Utility Operations [BEM]) – (Prerequisite)

8:00 am Welcome & Introductions
 8:15 am Module 1: Basic Electricity
 9:15 am Break
 9:30 am Module 2: Basic Mathematics
 10:45 am Module 3: Electrical Safety
 11:30 am Lunch
 12:00 pm Module 4: Electric Power & Energy
 12:45pm Module 5: Power System Overview
 1:45 pm Final Exam & Practical
 2:30 pm Review Final
 2:45 pm Certificates of Completion
 3:00 pm Adjourn**

** Day 1 goes until 3:00 pm

Day 2

8:00 am Substation I Program Welcome
 8:30 am Types of Substations
 9:15 am Break
 9:30 am Substation & Arc Flash Safety
 11:30 am Lunch
 12:00 pm Introduction to SCADA
 2:00 pm Adjourn

Session II: April 18 - 21, 2023

Day 1

8:00 am Welcome, Introductions & Recap
 9:00 am Major Substation Equipment:
 Power Transformers
 9:45 am Break
 10:00 am Power Transformers (cont.)
 11:30 am Lunch
 12:00 pm Major Substation Equipment:
 Circuit Breakers
 2:00 pm Adjourn

Day 2

8:00 am Major Substation Equipment: Relays
 9:45 am Break
 10:00 am Major Substation Equipment:
 Disconnectors, Instrument
 Transformers, Bus Bar, Surge
 Arresters
 11:30 am Lunch
 12:00 pm Hands-On Exercises and/or Testing
 1:30 pm Summary

Day 3

8:00 am Switching & Tagging
 9:45 am Break
 10:00 am Introduction to the NESC
 11:30 am Lunch
 12:00 pm Introduction to Inspections
 1:00 pm Introduction to Test Equipment
 2:00 pm Adjourn

Day 4 (Virtual)

8:00 am Review the Week
 9:00 am Break
 9:15 am Week 1 Test & Review Results
 11:00 am Adjourn

2:00 pm Adjourn



Day 3

8:00 am Hands-On Exercises & Testing
 11:30 am Lunch
 12:00 pm Field Visit & Tour
 2:00 pm Adjourn

Day 4 (Virtual)

8:00 am Review the Week
 9:00 am Break
 9:15 am Week 2 Test & Review Results
 11:00 am Adjourn

Session III: May 2 – 5, 2023**Day 1**

8:00 am Welcome, Introductions & Recap
 Weeks 1 & 2
 8:30 am Secondary Substation Equipment:
 Voltage Regulation
 9:45 am Break
 10:00 am Secondary Substation Equipment:
 Breakers
 11:30 am Lunch
 12:00 pm Secondary Substation Equipment:
 Capacitors & Capacitor Banks
 2:00 pm Adjourn

Day 3

8:00 am Hands-on Exercises and/or Testing
 11:30 am Lunch
 12:00 pm Substation & Battery Installation Tour
 2:00 pm Adjourn

Day 4 (Virtual)

8:00 am Review the Week
 9:00 am Break
 9:15 am Week 3 Test & Review Results
 11:00 am Adjourn

Day 2

8:00 am Auxiliary Substation Equipment:
 DC Supplies (Batteries, Cells &
 Chargers)
 9:30 am Break
 9:45 am DC Supplies (Batteries, Cells &
 Chargers, cont.)
 11:30 am Lunch
 12:00 pm Hands-On Exercises and/or Testing
 2:00 pm Adjourn

Session IV: May 23 – 26, 2023**Day 1**

8:00 am Welcome, Introductions & Recap
 9:00 am Auxiliary Station Equipment:
 AC Supplies/Transformers, Electrical
 Panelboards, Lighting & Heating
 10:00 am Break
 10:15 am Introduction to Print Reading
 11:30 am Lunch
 12:00 pm Introduction to Print Reading (cont.)
 2:00 pm Adjourn

2:00 pm Adjourn

Day 2

8:00 am Introduction to Print Reading (cont.)
 9:45 am Break
 10:00 am Hands-On Exercises
 Students bring examples of diagrams
 and layouts to review as a group
 11:30 am Lunch
 12:00 pm Hands-On Exercises (cont.)



Day 3

8:00 am Hands-On Testing
11:30 am Lunch
12:00 pm Field Visit & Tour
2:00 pm Adjourn

8:00 am Final Recap of Weeks 1 – 3
9:45 am Break
10:00 am Final Exam
11:15 am Certificates of Completion
11:30 am Adjourn

Day 4 (Virtual)



INSTRUCTOR

Tim Richardson, P.E., Technical & Safety Trainer



Tim Richardson joined NEPPA in September of 2019 and has been an asset to the training team. Tim has long history working in the electric utility industry, Belmont Municipal Light Department from 1995 – 2007. There he served in many management capacity including General Manager.

Most recently, Tim has worked as Principal of Fundy Power Services, LLC and at Consulting Engineers Group prior to that.

Tim brings a wealth of both technical and safety expertise to the organization and applies his expertise of both in an easy-to-understand and easy-to-learn approach.

