

SUBSTATION I PROGRAM

Fr Fridays
Remote*

MARCH 14 – 17, 2023
MARCH 28 – 31, 2023
APRIL 18 – 21, 2023
MAY 2 – 5, 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



Weekly Tests (20 Questions); Mid-Term Exam (25 Questions); Final Exam (50 Questions)

Northeast Public Power Association | 200 New Estate Road, Littleton, MA 01460 | P: (978) 540-2200 | www.neppa.org

AGENDA

Agenda details are subject to change.

Session I: March 14 – 17, 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: March 28 – 31, 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
2:00 pm Adjourn

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

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: April 18 - 21, 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 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

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

Session IV: May 2 – 5, 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

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.)
2:00 pm Adjourn

Day 3

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

Day 4 (Virtual)

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



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.

