HANDS-ON RELAY SCHOOL

MARCH 24-29, 2024

EASTERN WASHINGTON UNIVERSITY
526 5TH ST. CHENEY, WA 99004

WesternEnergy INSTITUTE

OBJECTIVES OF THE HANDS-ON RELAY SCHOOL

The Hands-On Relay School is a professional development short course that trains protective relay technicians,electrical/power plant technicians, engineers, and protective relay test specialists.

Students are enrolled in one of eight tracks for the duration of the school.

- Basic
- Distribution
- Transmission
- Generation
- Electromechanical
- Computerized Relay Testing - Includes Doble Protection Suite Beginning, Doble Protection Suite Advanced, RTS Essentials, RTS Developers, Omicron, Megger
- Automation & Integration
- Theory

Students participating in these tracks will:

- Become familiar with manual or computerized test methods for a variety of protective relays and test equipment.
- Gain valuable knowledge relating to relay applications and operating characteristics.
- Exchange ideas and resolve problems in an open forum.
- Learn preventative and corrective maintenance methods.

APPLICATION

School enrollment is limited, and priority is given to organizations providing Lab Facilitators, Lecturers, Steering Committee support, and Western Energy Institute member utilities. Refer to important application and enrollment procedures at the end of this brochure.

CALL FOR LAB FACILITATORS

If you are an experienced relay technician who is willing to share your knowledge with others, you can attend the Hands-On Relay School as a Lab Facilitator. Lab Facilitators work with groups of three students testing relays and may attend all classroom lectures and school activities. Lab Facilitators are not required to pay the application fee and their company receives priority points for students applying for the school. If you are interested, contact WEI at 971.255.4965 or sign up at here: Facilitator Application

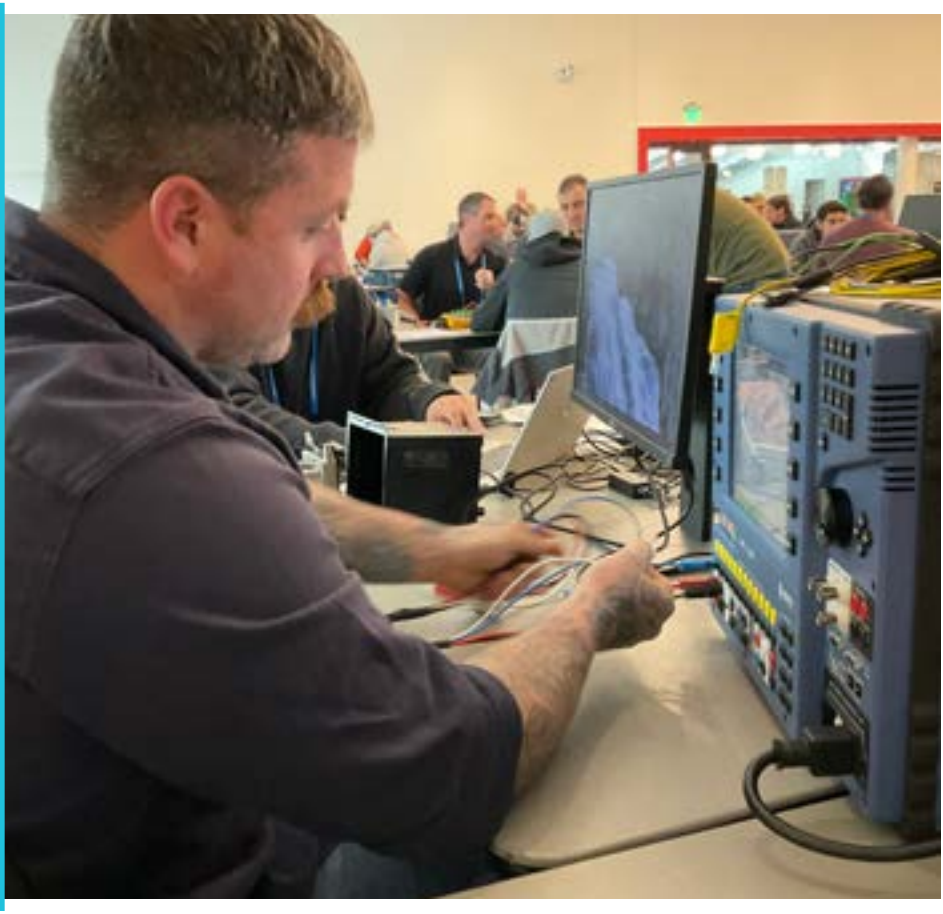
BASIC TRACK

The Basic Track focuses on the fundamentals of protection systems, safe work practices, relay settings, calibration, maintenance, testing, and application of microprocessor and electromechanical relays. *51 Students Maximum.*

Students in this track will:

- Attend the Basic Overview lecture.
- Attend the Open Lecture "Phasors" on Monday. Choose five (5) Concurrent Open Lectures to attend on Tuesday.
- Attend the Friday Feature Lecture Presentations.
- Wire an overcurrent and a reclosing relay to a breaker simulator to test and troubleshoot an entire protection circuit.
- Perform hands-on testing in the lab on the following relays:

  ABB: CO, IRD-9, HU
  GE: IAC, CEY51A
  SEL: 311C
  Eagle Timer, OCR



DISTRIBUTION TRACK

This track is for those students who wish to focus on the testing and understanding of multifunction microprocessor relays and recloser controllers used for distribution protection. The selection of relays may include overcurrent, transformer differential, reclosing, synch-check, and frequency protection. *18 Students Maximum.*

Students in this track will:

- Attend the Distribution Overview lecture.
- Choose six (6) Concurrent Open Lectures to attend.
- Attend the Friday Feature Lecture Presentations.
- Perform hands-on testing in the lab on the following relays:
  - **ABB:** REF615
  - **Basler:** BE1-FLEX
  - **Beckwith:** M-7679-R
  - **Cooper:** Form 7
  - **SEL:** 751A
  - **GE:** Multilin 845

DISTRIBUTION PROTECTION OVERVIEW LECTURE

Jon Gilrein, Avista Utilities

This lecture will review fundamental principles of distribution system protection, including IEEE device designations, fault current calculations, coordination of overcurrent protection, and reclosing schemes.

TRANSMISSION TRACK

This track features both electromechanical and microprocessor- based multifunction relays used for protection of transmission equipment, including distance and line current differential protection. *24 Students Maximum.*

Students in this track will:

- Attend the Transmission Overview lecture.
- Choose six (6) Concurrent Open Lectures to attend.
- Attend the Friday Feature Lecture Presentations.
- Perform hands-on testing in the lab on the following relays:
  - **ABB:** KD10
  - **Beckwith:** M-3311-A
  - **GE:** L90
  - **Hitachi Energy:** RET670
  - **SEL:** 411L

TRANSMISSION PROTECTION OVERVIEW LECTURE

Matt Horvath, Power Engineers, Inc.

This lecture will review fundamental principles of transmission line protection. Concepts of distance protection, directional overcurrent, line differential, and pilot protection schemes will be discussed.

GENERATION TRACK

This track features electromechanical and multifunction microprocessor relays used for transformer and generator differential, over-excitation, stator ground, reverse power, synch-check, negative sequence, and loss of field protection of generators. *24 Students Maximum.*

Students in this track will:

- Attend the Generation Protection Overview lecture.
- Choose six (6) Concurrent Open Lectures to attend.
- Attend the Friday Feature Lecture Presentations.
- Perform hands-on testing in the lab on the following relays:

  ABB: REG615
  Basler: BE1-FLEX
  Beckwith: M-3425A
  GE: CEH, INC77
  SEL: 700G/400G, 2664 (field)

GENERATION PROTECTION THEORY AND APPLICATION OVERVIEW LECTURE

Wayne Hartmann, GE Grid Solutions, part of GE VERNOVA.

This lecture will review fundamental principles of generation protection theory and application with a focus on industry standards and best practices.

ELECTROMECHANICAL TRACK

This track focuses exclusively on electromechanical relays used for line, bus, transformer, or generator protection. More hands-on effort is spent on troubleshooting relay problems, calibrating relays, adjustment techniques, and verifying results. *15 Students Maximum.*

Prerequisite: Basic track or related experience.

Students in this track will:

- Attend their choice of Distribution, Transmission, or Generation Protection Overview Lectures.
- Choose six (6) Concurrent Open Lectures to attend.
- Attend the Friday Feature Lecture Presentations.
- Perform hands-on testing in the lab on the following relays:

  ABB: IRD9, HU, KD10
  GE: CEH, INC77, JBCG

COMPUTERIZED RELAY TESTING TRACK

This track is intended for technicians who already understand relay operating principles, have experience in manual testing, and are ready to learn computerized testing methods. *Student Maximum Varies. Laptop Computer Required.*

Note: This track is NOT recommended for those relay technicians who are just starting out. The emphasis of this track is on the test equipment and software, not on the relays. The hands-on labs are taught by the test equipment and software manufacturers, not by the relay manufacturers.

Prerequisite: Experience in manual relay testing and computer use. A laptop computer will be used to communicate with the relays and/or the test set. All students must have administrative rights to their laptop, with the appropriate software pre-loaded.

Students in this track will:

- Attend their choice of Distribution, Transmission, or Generation Protection Overview Lectures.
- Choose six (6) Concurrent Open Lectures to attend.
- Attend the Friday Feature Lecture Presentations.
- Perform hands-on testing in the lab using one of the following testing software platforms:

Megger	Omicron
Doble Protection Suite Beginning	RTS Developers
Doble Protection Suite Advanced	RTS Essentials

Some test software vendors will focus on both a Beginning and an Advanced section, depending on enrollment and skill level of the students. All computerized testing still requires a prerequisite understanding of manual testing.

Beginning Tracks will cover the following:

- Building of test plans
- Macros used for testing basic relay functions

Advanced Tracks will cover the following:

- Worksheets and advanced software features
- Quad Element Testing
- Breaker simulators
- Playback features
- End-to-end testing

AUTOMATION & INTEGRATION TRACK

This track is intended for technicians who have basic familiarity with microprocessor-based relays and would like to learn more about their integration into substation automation and communications systems. This includes metering and alarming (SCADA), networking, and substation communications protocols. This track presents theoretical material then provides a hands-on environment to apply the theory learned. *Student Maximum Varies.*

Students in this track will:

- Attend the Automation Integration Overview Lecture.
- Choose six (6) Concurrent Open Lectures to attend.
- Attend the Friday Feature Lecture Presentations.
- Participate in the following lab-based courses.

IP Network Fundamentals

- OSI Model introduction: IPv4 Addressing, Subnetting, and MAC Addressing
- IPV4 Troubleshooting

Time Synchronization

- IRIG, SNTP, and PTP time synchronization for protection and SCADA applications

Communications Fundamentals

- Differences between communications mediums and protocols
- Insight into RS232 and serial communications

DNP Fundamentals/Troubleshooting

- An introduction to Distributed Network Protocol (DNP)
- ASE-2000 DNP protocol analyzer tool basics
- Wireshark network protocol analyzer tool basics

DNP Lab

- NovaTech Orion Automation Processor and SEL RTAC RTUs
- Integration troubleshooting exercises with microprocessor relays and RTUs

AUTOMATION & INTEGRATION OVERVIEW LECTURE

This lecture includes a high-level overview of the following, plus a round-table collaboration and Q&A session.

- Sources and types of SCADA information at a substation
- How data is processed and organized at a substation
- How data is organized and integrated into a utility's Energy Management System (EMS)
- How data is used by system operators and integrated into real-time system models

THEORY TRACK

This track provides more in-depth training on the application and theory of operation of protection systems utilized in the power system. This track does not normally include any hands-on training with relays. *40 students maximum.*

Note: The theory track is for the journeyman relay technician and relay engineer. It is NOT recommended for those relay technicians who are just starting out. Instructors and lecturers for the theory track are considered to be experts in their field.

Students in this track will:

- Attend their choice of Distribution, Transmission, or Generation Protection Overview Lectures.
- Choose six (6) Concurrent Open Lectures to attend.
- Attend the Monday and Tuesday PM and all day Wednesday and Thursday Lectures.
- Attend the Friday Feature Lecture Presentations.
- Attend the advanced topic lectures throughout the week, as follows:

RELAYING VS METERING CT'S

David Ward, Instrument Transformer Equipment Corporation (ITEC)

This session will compare the performance of metering and relay current transformers and will include a review of:

- Instrument Transformer Standards
- Metering Accuracy Classes - standard, high accuracy & extended range
- Relaying Accuracy Classes - what do they mean?
- Burden calculations & how it impacts metering and relaying
- Review of typical excitation curves for relaying CT's
- Do's & Don'ts of instrument Transformer Installations

DISTRIBUTED ENERGY RESOURCES : OPERTION, CONTROL & PROTECTION

Wayne Hartmann, GE Grid Solutions, part of GE VERNOVA

This session provides solid background on Distributed Energy Resources (DER) connected into distribution systems from multiple aspects: industry history, types, operational sequences, benefits to Utilities and Owners, control, example guidelines, IEEE 1547 and point-of-common coupling (PCC) interface to culminate and focus on protection aspects at the PCC as well as impact on distribution protection.developments will be summarized.

COMMUNICATION

Bob Peterson, Bonneville Power Administration

This session will cover the operation and troubleshooting techniques of the RS-232 communication standard. Additional information will be provided concerning the challenges of integrating RS-232 Asynchronous data into a Synchronous network.

WHY TRANSFORMERS FAIL

Drew Welton, Intellirent

In this session we will take a deep dive into transformer failure and bridge the gap between transformer protective relay systems and maintenance testing to form a more holistic approach to the subject. Often times there is a disconnect between those responsible for protective relaying and maintenance testing, and by looking at a more complete picture, we can possibly extend the transformer's life expectancy, and avoid catastrophic failure. We will define types of failures, location of failures within the transformer, and examine the difference between electrical, mechanical, and insulation failures. We will show examples and look at various case studies that include interactions between protective relays, and electrical test results. We will also examine diagnostic testing techniques for on-load tap changers and bushings, which make up a large portion of system failures.

TRANSMISSION/LINE PROTECTION

Michael J. Wright, PE, Qualus

Transmission line protection is a fundamental form of protection critical to the effective transmission of electric power. This high-level class removes some of the mystery about how line protection works and specifically does a deep dive into the end-to-end protection schemes where relays at each end of a line work together to detect faults and initiate isolation with as little time delay as possible. This class covers line protection topics such as physical characteristics of transmission lines, the MHO circle, theory of impedance protection, zones of protection, and end-to-end protection schemes.

BASICS OF COMMUNICATIONS AND TIME SYNCHRONIZATION FOR PROTECTION AND CONTROL APPLICATIONS

Galina Antonova, Hitachi Energy

Fundamentals of communications and time synchronization applicable to protection and control field will be covered. Various communication channel types, interfaces and technologies will be explained. Industry move towards packet-switched communications and integration of services will be highlighted. The basics and evolution of time synchronization methods will be presented. Latest time synchronization standards developments will be summarized.

FAULT ANALYSIS

Ken Workman, Schweitzer Engineering Labs

Analyzing power system relay event data is a challenge. In this session, participants will use SEL-5601-2 SYNCHROWAVE Event Software to analyze real-world events and learn how to quickly identify the source of power system problems. Topics will include the following:

- Event report triggers
- Types of event reports
- Event report retrieval
- Overview of SYNCHROWAVE Event
- Analysis of real-world events

Each participant should bring a laptop with the latest version of SYNCHROWAVE Event installed prior to class.

CONCURRENT OPEN LECTURES

The Hands-On Relay School offers twelve (12) lectures on a wide range of topics relevant to the trade. Each lecture is one (1) hour long and given a total of three (3) times. Students can attend up to six (6) lectures of their choosing.

SHUNT CAPACITOR PROTECTION

What are shunt capacitors and why do we use them in electrical transmission systems? This lecture covers the theory of how these devices work and the systems/ schemes employed to protect them.

TRANSFORMER PROTECTION DEVICES

Brent Carper, 3AC Engineering

Join this hands-on session examining Sudden Pressure Relays, Buchholz Relays, Temperature Gauges, Seal-in Relays, and Lockout Relays. This session will cover how they work, how they are tested, and what you need to know about them.

SYMMETRICAL COMPONENTS 1

Stephen Marx, Bonneville Power Administration

Basic principles of symmetrical components with explanation of phasors, per unit system, and symmetrical component equations using sequence networks. Network connections for each power system fault type are analyzed. Samples of protective relay applications using symmetrical component method. Suggest attending Symmetrical Components 2 lecture as a continueaton of Symmetrical Components.

SYMMETRICAL COMPONENTS 2

Stephen Marx, Bonneville Power Administration

Continuation from Symmetrical Components 1. Samples of protective relay applications using symmetrical component method. Suggest attending Symmetrical Components 1 lecture as a prerequisite.

HISTORY OF PROTECTION

Scott Cooper, Omicron

A walk through a single substation often shows a varying array of relay types from old to new. This lecture will look at the similarities and differences of various vintages of protective relays including electromechanical, solid state, and microprocessor relays.

INSTRUMENT TRANSFORMERS

Thomas Morrell, Schweitzer Laboratory Inc.

Current and voltage inputs are fundamental to the successful operation of a relay. This session will provide a theoretical overview of current transformers (CTs), potential transformers (PTs), and coupling capacitor voltage transformers (CCVTs) as well as their application in protective relays.

FAULT ANALYSIS FOR RELAY TECHS

Ken Workman, Schweitzer Engineering Laboratories, Inc.

Event reports continue to be an invaluable feature in microprocessor-based relays. Some events are relatively straightforward to analyze, and others require experience and considerable knowledge of the power system and protective relay system in order to find the root cause. This session provides an outline of the event analysis process, several \real-world event examples, time to evaluate them, and solutions.

GROUND DISTANCE

Steve Laslo, Bonneville Power Administration

This lecture will cover fundamentals of Ground-Distance Relay Protection and Testing. We will examine principles that affect relay settings and decision-making and introduce ground-distance relay concepts such as 'compensation factor/Kn', 'per-phase impedance', and 'loop impedance'. We will also discuss how to calculate test quantities for ground-mho and ground-quad characteristics and examine some sample automated test results.

PHASORS

Ron Alexander, Grant County PUD

Phasors are the universal language of system protection technicians and engineers. This lecture emphasizes the need for a basic knowledge of phasor diagrams and their use in understanding the power system. Topics include load flow phasor analysis, fault phasor analysis, and using phasors to determine the phase angle across delta-wye transformers banks. It is recommended to take this lecture prior to the Symmetrical Components lecture.

TRIP/RISK MITIGATION FOR IN-SERVICE RELAYS

Kyle Ball, Telex Testing & Commissioning

This lecture is not intended to be a traditional lecture. We are bringing in an entire line panel and prints! This will be an interactive isolation of protection on a line panel that is in service and will be isolated by the audience. Trips may happen! We intend to cover healthy substation skepticism, improper order of isolation, identifying operational risks to the utility and balancing authorities, identifying mis-wires, labeling errors, print errors, general trip mitigation, and associated human performance traps.

INTRO TO DIGITAL LOGIC USED IN MICROPROCESSOR RELAYS

Ron Ritchie, Idaho Power Company

Digital Logic is the basis of modern multifunction relays. This class will cover logic gates, truth tables, Boolean logic, ladder logic and how they're used in modern microprocessor relays. Samples of relay logic and digital logic designs will be presented.

COMMUNICATION-AIDED TRIPPING

Matt Horvath, Power Engineers

When speed is a necessity for transmission line protection, communication between line terminals can provide high speed clearing of faults. Topics include communication aided protection schemes and the equipment that makes it possible.

FRIDAY FEATURE PRESENTATIONS

PHASE SHIFTING TRANSFORMERS

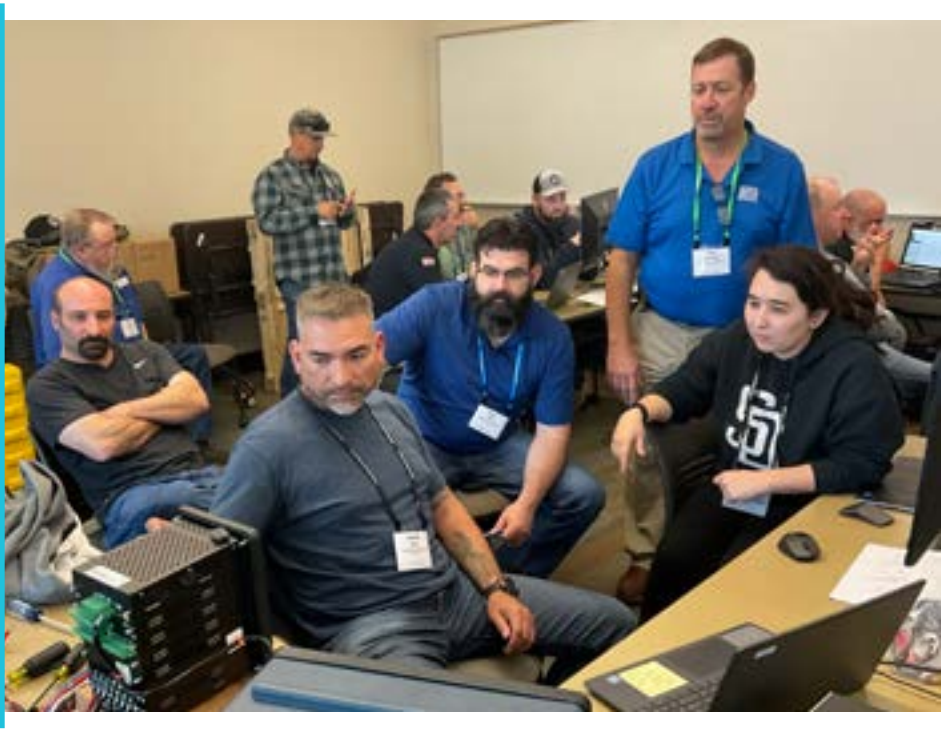
Harish Chaluvadi, Schweitzer Engineering Laboratories

This Friday lecture will explore all you need to know about phase shifting transformers (PSTs)—highlighting practical considerations in designing PST protection systems, as well as testing and commissioning.

COMMISSIONING TRACK PILOT

Paul Luther, Puget Sound Energy

A review of the new Commissioning Track that was piloted this year. Review topics will include what was covered and how well it was received. Also up for discussion will be future renditions of the Track, possible additional Tracks involving Substation Commissioning, and Facilitator requirements and needs to accomplish possible expansion. There will be time allotted for questions and comments.



2024 SCHEDULE AT A GLANCE

The Hands-On Relay School is held on the Eastern Washington University campus in Cheney, Washington. Evening events and Sunday check-in registration are held at Eastern Washington University in Cheney, Washington, or as noted.

SUNDAY, MARCH 24

3:00 - 6:00 PM	**Facilitator Lab Set Up**
5:30 - 7:30 PM	**Registration & Reception**
7:00 - 8:00 PM	**Lab Facilitator Meeting**

MONDAY, MARCH 25

6:45 - 7:30 AM	**Registration**
7:30 AM - Noon	**Opening Announcements** **Safety Presentation** **Overview Lectures** **Concurrent Open Lectures**
1:00 - 5:00 PM	**Hands-on Lab Instruction**

TUESDAY, MARCH 26

7:30 AM - Noon	**Concurrent Open Lectures**
1:00 - 5:00 PM	**Hands-on Lab Instruction**
6:30 - 8:30 PM	**Suppliers' Showcase**

WEDNESDAY, MARCH 27

7:30 AM - Noon	**Hands-on Lab Instruction**
1:00 - 5:00 PM	**Hands-on Lab Instruction**
6:30 - 9:00 PM	**Dinner and Social Networking**

THURSDAY, MARCH 28

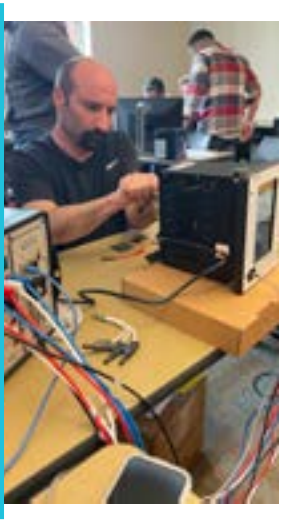
7:30 AM - Noon	**Hands-on Lab Instruction**
1:00 - 5:00 PM	**Hands-on Lab Instruction**

FRIDAY, MARCH 29

7:30 - 8:00 AM	**Closing Remarks**
8:00 - 10:30 AM	**Friday Feature Presentations**

STEERING COMMITTEE

Chris Gallacher	*Chair, Bonneville Power Administration*
Ron Alexander	*Grant County PUD*
Beth Andrews	*ConEd*
Karl Cabrera	*Salt River Project*
Ben Crum	*Seattle City Light*
Scott Dixon	*Idaho Power Company*
Bryan Focht	*Portland General Electric*
Jessica Grant	*Western Energy Institute*
Troy Ledford	*Avista Utilities*
Tyge Legier	*San Diego Gas & Electric Co.*
Paul Luther	*Puget Sound Energy*
Stephen Marx	*Bonneville Power Administration*
Jason Maynard	*PacifiCorp*
Andy Parks	*Chelan PUD*
Travis Rider	*Pacific Gas and Electric Company*
Jason Schilling	*Bonneville Power Administration*
Greg Sharpes	*Avista Utilities*
Tanyl Tinhof	*PacifiCorp*
Eric Watson	*Salt River Project*
Beverly Woolf	*Western Energy Institute*
Vlad Yerokhin	*Tacoma Power*
Diana Zoren	*Western Energy Institute*



CONTRIBUTING ORGANIZATIONS

The Hands-On Relay School Steering Committee gratefully acknowledges the following organizations for their generous contributions of equipment and support personnel.

3AC Engineering
ABB Inc.
Accurate Power Group
Advanced Electrical Technologies
Allied Edison
AltaLink
APR Staffing
Aubrey Silvey Enterprises
Avista Corp.
Basler Electric Company
Beckwith Electric Company
Benton PUD
Bonneville Power Administration
Burbank Water and Power
Central Arizona Project
Central Electric Cooperative
Central Lincoln PUD
Chelan County PUD
City of Richland
Clark Public Utilities
Consolidated Edison
Dairyland Power Cooperative
DCS Morgan
Dixie Power
Doble Engineering Co.
Eaton Corp.
Electrical Consultants Inc.
EPC Services
Eugene Water & Electric Board
Farmington Electric Utility System
Fluke Corp.
FortisBC
GE Renewable Energy
Golden Valley Electric Association, Inc.
Grant County PUD
Grays Harbor PUD #1
Hanford Mission Integration Solutions
Hitachi Energy
Hodder & Associates
Hubbell
Idaho Falls Power
Idaho Power Company
Intellirent
Jolma Utilities
Kaiser Aluminum
Lewis County PUD
Logan City Light & Power
Mason County PUD 3
Megger
Merced Irrigation District
NERC
Nevada Irrigation District
NovaTech, LLC
NV Energy
OMICRON
Orcas Power & Light
Pacific Gas and Electric Company
Pacific Power
Peak Measure
Pend Oreille County PUD
Portland General Electric
POWER Engineers, Inc.
Power Solutions Group
Puget Sound Energy
Qualus
Rocky Mountain Power
Sacramento Municipal Utility District
Salt River Project
San Diego Gas & Electric Company
Schweitzer Engineering Laboratories
Seattle City Light
Snohomish County PUD
Southern California Edison
SV Electrical Testing
Tacoma Power
Talen Energy
Telex Testing and Commissioning
Tillamook PUD
Tri-State Generation and Transmission Association, Inc.
UNS Energy Corp.
US Army Corps of Engineers
US Bureau of Reclamation
Vertiv
Western Area Power Administration
Western Energy Institute
Yuba Water Agency

SCHOOL INFORMATION

APPLICATION PROCESS AND FEES

- Application process opens on November 1, 2023. Application is online here: Student Application
- Priority is given to utilities providing Lab Facilitators, Lecturers, Steering Committee Support, and Western Energy Institute member utilities, if the Application is received by January 15, 2024. The remaining slots will be filled on a first-come, first-served basis.
- Applicants select which track they wish to attend in order of preference. Every effort will be made to place students into their preferred track, but track placement is by availability and subject to the priorities as described above. Many tracks will fill up and students may not be able to get their preferred track.
- Students will be notified in writing no later than **February 8, 2024**, of their acceptance into the school and track placement. You are not accepted to attend until unless you receive the confirmation of acceptance from WEI which you will have two weeks to complete your registration and make payment to keep your spot in the school.
- School fee of $700 includes electronic copies of lecture notes, Sunday night reception, Tuesday night Suppliers' Showcase, Wednesday night Student Social, break refreshments, and EWU offers free parking in designated areas.
- Payment is due at the time of registration. Once invoiced you will have two weeks to secure a spot in the school. If payment is not received the school reserves the right to fill your spot with other applicants.

ACCOMMODATIONS AND TRAVEL

Please make your own travel and hotel reservations once you have received registration confirmation. Spokane International Airport is 15 miles north of Cheney. Davenport Grand (509.458.3330) in Spokane, and the Double Tree Spokane (509.455.9600) in Spokane, have rooms blocked for this event.

CANCELLATION POLICY

Your full registration fee will be refunded if WEI receives your written cancellation notice by March 1, 2024. Cancellations made after March 1 are subject to a processing fee of $350. Students who do not attend and have not canceled by March 15 are responsible for the full registration fee. Substitutions may be made at any time.

PROGRAM CHANGES AND CANCELLATIONS

The Hands-On Relay School reserves the right to make changes in programs or speakers or to cancel programs if enrollment criteria are not met. In the unlikely event that this School is canceled, the School's liability is limited to refund of registration fees. If we are unable to place you in a track you have selected or an acceptable substitute track, your full registration will be refunded.

AMERICANS WITH DISABILITIES ACT

Accommodations for individuals who qualify under the Americans with Disabilities Act are available upon request. Please contact us at least ten (10) days before the school at 503.231.1994, or email info@westernenergy.org.

CONTINUING EDUCATION UNITS (CEU)

CEUs are available to participants who complete a CEU enrollment form prior to the start of the school and satisfactorily complete the requirements for the class. CEUs are nationally recognized units of achievement that may be used as evidence of professional development and for job advancement. One CEU is awarded for every 10 hours of instruction, totaling 3.6 for this school. A fee of $90 must accompany the registration fee to receive the CEU credits.

REGISTER TODAY

Once your application is accepted you can register here: https://www.westernenergy.org/programs/hands-on-relay-school-3/

REVIEWS OF HANDS-ON RELAY SCHOOL

"The professional and practical experience of the instructors was ultra-awesome to learn from."

"The instructor and lab facilitators were great! They all worked together teaching not only the students but also one another about tips and tricks with different software use."

"The school is very well organized, and runs seamlessly. Instructors and lecturers are very passionate about the craft."

"The lecture portions were phenomenal. I particularly enjoyed classes where people were very engaged and asked good questions."

"The quality of material taught in all the classes was great. I enjoyed learning from other companies' perspectives."

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