



# HANDS-ON RELAY SCHOOL 2023 ANNUAL REPORT

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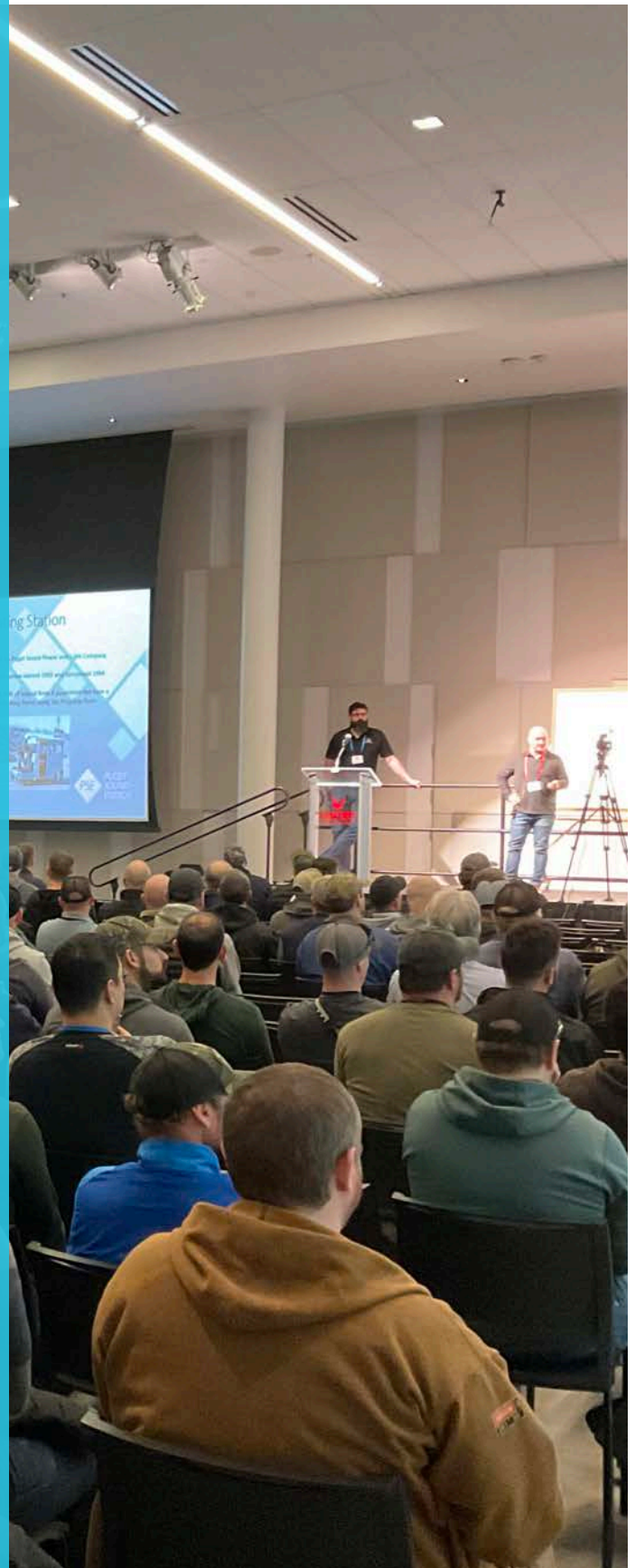
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“ PRESENTERS WERE KNOWLEDGEABLE ON RELAYS AND VARIOUS TEST PROCEDURES AND HAD A LOT OF REAL WORLD EXPERIENCE FROM MANUFACTURING TO TESTING.  
- EVALUATION COMMENT 2023 ”



# OPENING LETTER

Dear Industry Partners,

This year's Hands-On Relay School took place March 27 – 31, 2023 at Eastern Washington University in Cheney, Washington. This report provides a summary of the 2023 school showing the schedule of labs and classes, and naming the participants who made the school possible. The photographs and student quotes tell the rest of the story, illustrating the level of student and participant engagement, and the spirit of learning and knowledge sharing.

One major statistic that stands out is student enrollment. With 248 students, and more on the wait list, we mark a return to pre-pandemic enrollment numbers. Participants gave HRS high marks on their evaluation forms. One question from the form was particularly telling of students' experience with 97 percent of respondents indicating that they would recommend this school to a colleague.

As an organizing committee, comprised of volunteers from utilities and Western Energy Institute, we are especially gratified with this response. It indicates that we are doing things right and are providing the type of training the industry needs: a mix of hands-on training with test equipment and protective relays, combined with classroom lessons on relevant system protection topics.

The industry is experiencing unprecedented change in technology, generating resources, and an influx of new personnel hungry for training. We see this in the demand for our Basic Track, and the fact that roughly half of this year's students reported they attended the school for the first time.

As we delve into the future, we stand committed to our mission of delivering quality and relevant training to participants. The introduction of the Automation & Integration Track, in its second year, underscores our ongoing dedication to staying at the forefront of industry advancements. This specialized track combines power system communications, SCADA, precision timing, and automated controls into a single track.

Our next project is development of a Commissioning Track over the next few years to fill a training void voiced by our students. High voltage equipment commissioning often falls on many who attend the school and we believe we can develop the right hands-on experience to meet industry needs.

The 2023 Hands-on Relay School is a testament to our industry's commitment to technical education and professional development. We extend our gratitude to the facilitators, lecturers, vendors, and committee members who have contributed to the success of HRS.

Excellent instruction in a lab environment, quality hands-on experience with test equipment and relays, leading industry experts providing classroom lectures, and the best networking opportunity found at any school or conference – all at a reasonable price. This is Hands-on Relay School.

Sincerely,



**Chris Gallacher**  
Electrical Engineer  
RAS / Disturbance (TOOC)  
Bonneville Power Administration



**Diana Zoren, CAE**  
Director of Strategic Initiatives  
Western Energy Institute



**Beverly Woolf**  
Director of Programs  
Western Energy Institute

FOUNDED  
1882





“ THE NEW LECTURES WERE FRESH AND INTERESTING, AND THE OLD LECTURES ARE ALWAYS A GOOD REFRESHER. - EVALUATION COMMENT 2023 ”



“ THE LECTURE PORTIONS WERE PHENOMENAL. I PARTICULARLY ENJOYED CLASSES WHERE PEOPLE WERE VERY ENGAGED AND ASKED GOOD QUESTIONS. - EVALUATION COMMENT 2023 ”





# ABOUT US

## WHAT

Established in 1984, the Hands-On Relay School (HRS) is a week-long professional training course offering instruction for both beginning and experienced students, for relay technicians, electrical/power plant technicians, engineers, protective relay test specialists and others in the field of system protection.

Throughout the school students exchange ideas, resolve problems in open forums, and learn preventative and corrective methods through hands-on labs and classroom lectures taught by a variety of industry experts. The school provides theory instruction and hands-on training in power-protective relay systems for both manual and automated relay testing across eight tracks:

- Automation & Integration
- Basic
- Distribution
- Transmission
- Generation
- Electromechanical
- Computerized Relay Testing
- Theory

## WHO

HRS is planned, organized and coordinated by the Steering Committee. This group of elected volunteers from electric utilities across the Western U.S. work throughout the year to bring together volunteers from utilities, equipment manufacturers and other organizations to build a successful training each year. The school is sponsored by Western Energy Institute (WEI).

## HOW

HRS is run on a zero based budget and is only made possible due to generous support and donated resources provided by our industry partners from utilities, manufacturers, WEI, EWU and other organizations.

## WHERE

Eastern Washington University, in Cheney, WA.

“ [I WAS MOST IMPRESSED WITH] THE AMOUNT OF PREPARATION AND EFFORT THAT GOES INTO THE SCHOOL. IT PAYS OFF- THINGS SEEMED TO GO VERY SMOOTHLY. - EVALUATION COMMENT 2023 ”

**SCHOOL MISSION STATEMENT:** To increase the level of knowledge and expertise in the field of system protection by providing the highest quality hands-on and theory training available.



## Want to get involved?

The school is always in need of motivated and experienced system protection professionals to help drive our mission.

We look for volunteers to help coordinate and plan throughout the year; and to lecture, instruct and facilitate during the week of the school.

To get involved please contact the Hands-On Relay Steering Committee Chair:

Chris Gallacher  
Electrical Engineer  
RAS / Disturbance (TOOC)  
Bonneville Power Administration  
cwgallacher@bpa.gov  
509-319-3702

# BY THE NUMBERS

EVALUATION SCORE

**8.3/10**

**248**  
STUDENTS

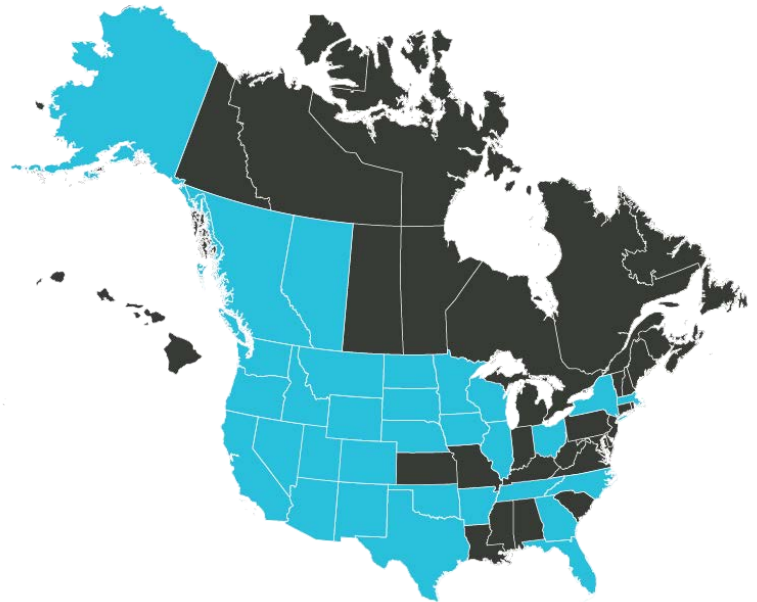
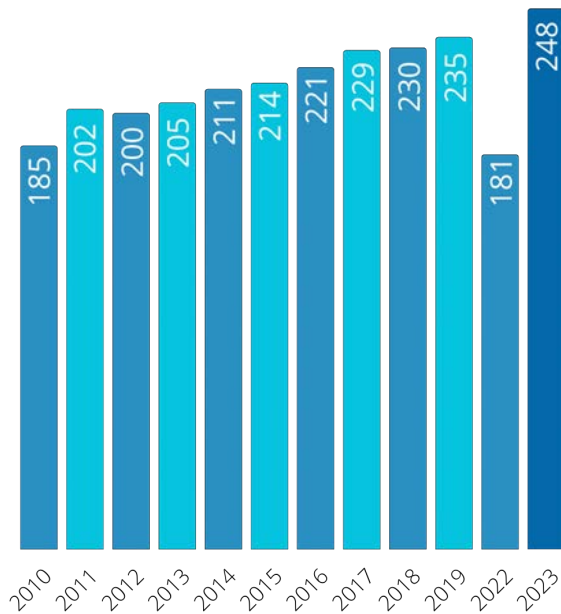
STUDENT RECOMMENDATION

**97%**

Percentage of students who would recommend the school to a friend or colleague.

## ATTENDANCE

248 students attended the school in 2023



## WIDE REACHING

248 students + 67 lab facilitators representing the states and provinces in blue.

**117.5**

classroom lecture hours

**3,869.0**

lab facilitator hours

**2,159.0**

steering committee hours

**606.0**

lab instructor hours

+

**6,751.5**

total volunteer hours

**\$700**

REGISTRATION FEE

Includes five days of training, materials, break food, supplier showcase + student social evening

**88**

PARTICIPATING ORGANIZATIONS

**67**

LABORATORY FACILITATORS

**32**

RELAYS TESTED BY TYPE

**14**

SHOWCASE MANUFACTURERS



# PROGRAM FORMAT



“ THE CHANGE TO EWU HAS BEEN AMAZING. THE FOOD HAS BEEN GREATLY IMPROVED. THE COMMITTEE MEMBERS WERE ENGAGED AND VERY HELPFUL. - EVALUATION COMMENT 2023 ”



“ THE SIZE OF CLASS WAS EXCELLENT. - EVALUATION COMMENT 2023 ”



# How has HRS been able to not only sustain for 38 years, but also continue to grow? What makes this school great?

- **Our unique, hands-on approach to training:** The school includes at minimum 66 percent hands-on laboratory training.
- **Small groups:** We guarantee testing in a setting of only three students per lab group to ensure the most effective learning.
- **Track selection:** Organizing the school by tracks allows students to select an area of interest and emphasis for the week.

## Relay Testing by Track

### MANUAL RELAY TESTING

**Tracks:** Basic, Distribution, Transmission, Generation, Electromechanical

Students perform test techniques on a variety of relays and test equipment in a laboratory setting under the direction and guidance of experienced technicians (laboratory facilitators) and manufacturer experts. Students in manual testing tracks attend laboratory classroom lectures where they learn the specifics of protective relay application, theory and operating characteristics. Students exchange ideas, resolve problems in open forums, and learn preventative and corrective methods. After the lab lectures, they have the opportunity to apply the training through “hands-on” testing of relays in the lab.

### COMPUTERIZED RELAY TESTING

**Tracks:** Doble, Enoserv, Manta, Megger, Omicron

Experienced relay technicians and student learn how to operate automated relay testing software and related equipment. They perform test techniques on a variety of relays and test equipment in a laboratory setting under the direction and guidance of experienced technicians (laboratory facilitators) and manufacturer experts. The Doble, Enoserv and Omicron tracks are divided into two sections—beginning and advanced—to allow for specific training on the software depending on experience level.

## 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 communications systems. This includes rudimentary metering and alarming (SCADA) up through complex process buss-style centralized protection.

## Theory Track

This track offers a week of classroom training on a variety of advanced system protection topics relating to generation, transmission, distribution protection and communications. Topics are presented by experts in the utility industry. Although the theory track offers less hands-on learning, its focus is to instead provide practical, applicable training for the engineer or advanced technician. Students in this track should already be familiar and comfortable with relay testing.

## Concurrent Open Lectures

A unique feature of the HRS is the concurrent open lectures on general power-system theory related to protective relaying offered Monday and Tuesday mornings. Twelve lecture choices are offered, and students have the opportunity to attend any six lectures of their choosing. Lectures are presented by system protection experts from utilities and equipment manufacturers. At least five new lecture topics are presented each year.

## Feature Presentations

Additional feature presentations on current hot-topics within the utility industry are offered on Fridays.

## Student Track Allocation

Students gain registration priority based on the level of involvement and support for the school by their sponsoring organizations. Track allocation and student placement is administered by the HRS steering committee based on:

- Preference points gained for organizations who support the school by supplying lecturers, facilitators, committee members and/or equipment
- Wait list status from prior year
- WEI member status
- First-come-first-serve registration

## Evaluations + Feedback

The school gauges its success based on student and facilitator evaluation forms. The HRS steering committee carefully analyzes the evaluations and also considers comments passed on verbally to committee members throughout the week. This feedback is incorporated into subsequent school planning in order to improve the school each year.



# SCHOOL SCHEDULE



“

THE LECTURE PORTIONS WERE PHENOMENAL. I PARTICULARLY ENJOYED CLASSES WHERE PEOPLE WERE VERY ENGAGED AND ASKED GOOD QUESTIONS.

- EVALUATION COMMENT 2023

”



## SUNDAY, MARCH 26, 2023

3:00 - 6:00 PM	FACILITATOR LAB STATION SET-UP
5:30 - 7:30 PM	REGISTRATION + RECEPTION
7:00 - 8:00 PM	FACILITATOR MEETING

## MONDAY, MARCH 27, 2023

6:45 - 7:30 AM	REGISTRATION + REFRESHMENTS							
7:30 - 8:00 AM	WELCOME, OPENING ANNOUNCEMENTS + SAFETY PRESENTATION: PT FAILURE							
8:00 - 9:40 AM	<b>TRACK OVERVIEW + LAB LECTURES</b> For Basic, Distribution, Transmission, Generation, Electromechanical, Theory and Automated Testing (Doble, Enoserv, Megger, Omicron), and Automation & Integration Track Students							
9:50 - 10:50 AM	<b>CONCURRENT OPEN LECTURES</b> General theory of power systems and system protection-related topics. Students select from 12 different topics over two days.							
	High Level Overview of Distributed Energy Resources/IBR (Inverter Based Resource)	Phasors	Fault Analysis for Relay Techs	History of Protection	Symmetrical Components 1	Instrument Transformers		
11:00 AM - 12:00 PM	<b>CONCURRENT OPEN LECTURES</b> General theory of power systems and system protection-related topics. Students select from 12 different topics over two days.							
	NERC Compliance (PRC-005)	Stop Pumping my Breaker!	High Impedance Fault Protection	Transformer Protection	Symmetrical Components 2	Substation Commissioning		
1:00 - 5:00 PM	<b>HANDS-ON LABS</b> Eight hours of lab work include: <ul style="list-style-type: none"> <li>• Three hours of lab lectures on operating principles, testing and application of relays or automated software training</li> <li>• Five hours of hands-on testing</li> </ul>							
	Basic Track	Distribution Track	Transmission Track	Generation Track	Electro-mechanical Track	Computerized Relay Testing Tracks	Theory Track	Automation & Integration Track
	SEL: 751A	Cooper: Form 6	HITACHI: RET670	SEL: 700G	ABB: CO + GE: IAC	Protection Suite (Doble) Beginning: Software Overview Protection Suite (Doble) Advanced: Software Overview RTS (Enoserv) Beginning: Software Overview RTS (Enoserv) Advanced: Software Overview Omicron: GE: IAC Megger: SEL: 311L	Distribution Event Analysis	EMS & SCADA Overview + IP Network Fundamentals
5:00 PM	ADJOURN							

## TUESDAY, MARCH 28, 2023

7:30 - 8:30 AM	<b>CONCURRENT OPEN LECTURES</b> General theory of power systems and system protection-related topics. Students select from 12 different topics over two days.						
	High Level Overview of Distributed Energy Resources/IBR (Inverter Based Resource)	Phasors	Fault Analysis for Relay Techs	History of Protection	Symmetrical Components 1	Instrument Transformers	
8:40 - 9:40 AM	<b>CONCURRENT OPEN LECTURES</b> General theory of power systems and system protection-related topics. Students select from 12 different topics over two days.						
	NERC Compliance (PRC-005)	Stop Pumping my Breaker!	High Impedance Fault Protection	Transformer Protection	Symmetrical Components 2	Substation Commissioning	
9:50 - 10:50 AM	<b>CONCURRENT OPEN LECTURES</b> General theory of power systems and system protection-related topics. Students select from 12 different topics over two days.						
	High Level Overview of Distributed Energy Resources/IBR (Inverter Based Resource)	Phasors	Fault Analysis for Relay Techs	History of Protection	Symmetrical Components 1	Instrument Transformers	



**TUESDAY, MARCH 28, 2023 CONTINUED**

11:00 AM - 12:00 PM	<b>CONCURRENT OPEN LECTURES</b> General theory of power systems and system protection-related topics. Students select from 12 different topics over two days.							
	NERC Compliance (PRC-005)	Stop Pumping my Breaker!	High Impedance Fault Protection	Transformer Protection	Symmetrical Components 2	Substation Commissioning		
1:00 - 3:00 PM	<b>HANDS-ON LABS</b> Eight hours of lab work include: • Three hours of lab lectures on operating principles, testing and application of relays or automated software training • Five hours of hands-on testing							
	Basic Track	Distribution Track	Transmission Track	Generation Track	Electro-mechanical Track	Computerized Relay Testing Tracks	Theory Track	Automation & Integration Track
	ABB: CO	BASLER: BE1-FLEX	BECKWITH: M-3311-A	ABB: REG615	ABB: CA + GE: PVD	Protection Suite (Doble) Beginning: GE: IAC Protection Suite (Doble) Advanced: SEL: 421 RTS (Enoserv) Beginning: GE: IAC RTS (Enoserv) Advanced: SEL: 421 Omicron Advanced: GE: BDD Megger: SEL: 311L	Generation Protection : Basics of Communications and Time Synchronization	IP Network Fundamentals
6:00 - 8:00 PM	<b>SUPPLIER'S SHOWCASE</b> The Centennial - Riverfront Ballroom, Spokane, WA Manufacturers demonstrate new products related to system protection and the greater utility industry. Students have the opportunity to see the latest relays, test equipment, and learn about other equipment available in the system protection field. Door prizes awarded throughout the evening!							

**WEDNESDAY, MARCH 29, 2023**

7:30 AM - 5:00 PM	<b>HANDS-ON LABS</b> Eight hours of lab work include: • Three hours of lab lectures on operating principles, testing and application of relays or automated software training • Five hours of hands-on testing							
	Basic Track	Distribution Track	Transmission Track	Generation Track	Electro-mechanical Track	Computerized Relay Testing Tracks	Theory Track	Automation & Integration Track
	ABB: IRD-9 + GE: BDD	SEL: 751A + Beckwith: M7679	GE: L90 + ABB: KD10	Beckwith: 3425A + Basler BE1-Flex	ABB: KLF-1 + ABB: IRD-9	Protection Suite (Doble) Beginning: GE: BDD + SEL: 587 Protection Suite (Doble) Advanced: SEL: 421 RTS (Enoserv) Beginning: GE: BDD + SEL 587 RTS (Enoserv) Advanced: SEL: 421 Megger: SEL: 421 Omicron Advanced: SEL: 587 + SEL: 311L	Transmission Line Protection + Distribution Faults and Events Analysis	Centralized Protection & IEC61850 ABB: REG615
5:00 PM	<b>ADJOURN</b>							
6:00 - 8:30 PM	<b>SOCIAL DINNER + ENTERTAINMENT</b> Flatstick Pub Spokane, Washington An evening of networking, dinner and games to entertain.							



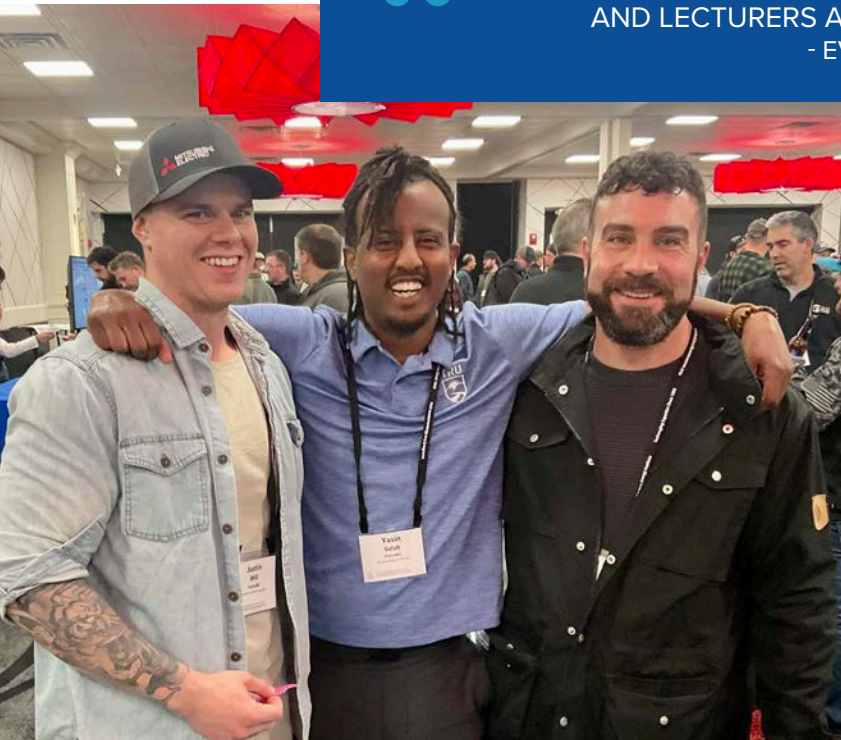
**THURSDAY, MARCH 30, 2023**

<p><b>HANDS-ON LABS</b>                  Eight hours of lab work include:</p> <ul style="list-style-type: none"> <li>• Three hours of lab lectures on operating principles, testing and application of relays or automated software training</li> <li>• Five hours of hands-on testing</li> </ul>								
	Basic Track	Distribution Track	Transmission Track	Generation Track	Electro-mechanical Track	Computerized Relay Testing Tracks	Theory Track	Automation & Integration Track
7:30 AM - 5:00 PM	SEL: 311C	ABB: REF615 + SEL: 787	SEL: 487V + SEL: 411L	SEL: 700G/400G	ABB: HU + ABB: KD10	Protection Suite (Doble) Beginning: SEL 311C Protection Suite (Doble) Advanced: SEL: 311L RTS (Enoserv) Beginning: SEL: 421 RTS (Enoserv) Advanced: SEL: 311L Megger: SEL: 421 Omicron Advanced: SEL: 311L	BECKWITH: M-3311-A + SEL: 587Z + SEL: T400L	DNP
5:00 PM	ADJOURN							

**FRIDAY, MARCH 31, 2023**

7:30 - 7:45 AM	REVIEW OF THE WEEK
7:45 - 9:00 AM	<p><b>STATE OF THE INDUSTRY</b>  <i>Rich Bauer, NERC</i></p> <p>The electrical grid is in a period of unprecedented change. Changing to a low carbon resource mix requires a new look at how we have performed our jobs for over a century. From system protection to resource adequacy to rate structure, everything needs to be viewed through a different lens. Join us as we talk about how the Industry is managing these unprecedented times.</p>
9:15 - 11:30 AM	<p><b>A CLEAN ENERGY FUTURE: ADVANCED SMALL MODULAR REACTOR</b>  <i>Kevin Nordt, Grant County PUD</i></p>
11:30 AM	2023 SCHOOL ADJOURNED

“THE SCHOOL IS VERY WELL ORGANIZED, AND RUNS SEAMLESSLY. INSTRUCTORS AND LECTURERS ARE VERY PASSIONATE ABOUT THE CRAFT.”  
 - EVALUATION COMMENT 2023





# TRACKS



“ THE BEST PART WAS THE LECTURES ON MONDAY AND TUESDAY, THEY WERE VERY GOOD AND THOUGHT OUT. THERE WASN'T ONE THAT DIDN'T KNOW WHAT THEY WERE TALKING ABOUT AND I TOOK GREAT NOTES ON EVERYONE THAT I TOOK AND IT WILL HELP WITH MY ESSAYS FOR MY APPRENTICESHIP.

- EVALUATION COMMENT 2023

”



# 2023 RELAYS TESTED BY TYPE

ABB: CA  
ABB: CO  
ABB: REG615  
ABB: HU  
ABB: IRD9  
ABB: KD10  
ABB: KLF-1  
ABB: REF615  
BASLER: BE1-FLEX  
BECKWITH: M-3311-A  
BECKWITH: 3425A  
BECKWITH: M7679-R  
COOPER: FORM 6  
GE: BDD  
GE: CEH  
GE: INC77  
GE: IAC  
GE: L90  
GE: PVD  
HITACHI/ABB: REL 670  
SEL: 311L  
SEL: 311C  
SEL: 351S  
SEL: 411L  
SEL: 421  
SEL: 487V  
SEL: 587  
SEL: 651R  
SEL: 700G  
SEL: 751A  
SEL: 787

## Manual Testing Tracks

### BASIC

#### 2023 STUDENT COUNT: 51

The basic track provides beginning technicians a foundation for learning the more complex protection systems. Students focus on the calibration, maintenance, testing and understanding of basic relays. Testing selection included overcurrent, differential, reclosing, voltage or frequency relays.

### DISTRIBUTION

#### 2023 STUDENT COUNT: 18

This track is for students who wish to learn more about distribution protection systems and focus on the testing and understanding of multifunction microprocessor relays and recloser controllers used for distribution protection. Testing selection included overcurrent, transformer differential, reclosing, synch-check and frequency protection.

### TRANSMISSION

#### 2023 STUDENT COUNT: 24

Transmission track students learn about transmission system protection. The track features both electromechanical and microprocessor-based multi-function relays used for protection of transmission equipment, including distance and line current differential protection.

### GENERATION

#### 2023 STUDENT COUNT: 24

This track emphasizes generator protection systems and 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.

### ELECTROMECHANICAL

#### 2023 STUDENT COUNT: 15

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, repairing relays and verifying results.

## Automated Testing Tracks

### 2023 STUDENT COUNT: 15

Automated tracks are intended for technicians who already understand relay operating principals, have experience in manual testing and are ready to learn automated testing methods.

### PROTECTION SUITE BEGINNING

#### 2023 STUDENT COUNT: 12

### PROTECTION SUITE ADVANCED

#### 2023 STUDENT COUNT: 9

### RTS BEGINNING

#### 2023 STUDENT COUNT: 14

### RTS ADVANCED

#### 2023 STUDENT COUNT: 13

### OMICRON ADVANCED

#### 2023 STUDENT COUNT: 15

### MEGGER

#### 2023 STUDENT COUNT: 4

## Advanced Training

### THEORY

#### 2023 STUDENT COUNT: 39

Emphasis in this year's track was distribution protection and applications. Topics included: wind energy, distribution fault analysis, arc flash protection, and distributed generation operations and protection. This track is for students who wish to gain a more in-depth understanding in the theory of operation of the electric power system and its associated equipment and the protection of power-system components. The class size is limited to allow an engaging learning atmosphere that promotes student interaction and discussion as well as hands-on experience where possible.

### AUTOMATION & INTEGRATION

#### 2023 STUDENT COUNT: 16

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 communications systems. This includes rudimentary metering and alarming (SCADA) up through complex process bus-style centralized protection.



# VOLUNTEERS, CONTRIBUTORS, + SPONSORSHIP



“THE SCHOOL GATHERED PROFESSIONALS FROM ITS INDUSTRIES.  
THE EXPERIENCE THAT THEY SHARED WAS PRICELESS.”

- EVALUATION COMMENT 2023

## THANK YOU TO OUR LEADERSHIP, SUPPORTING ORGANIZATIONS + COMPANY SPONSORS!

Many thanks from all of us on the Hands-On Relay steering committee to our supporting organizations and company sponsors. We sincerely would not be able to offer our one-of-a-kind training without your guidance, experience, volunteerism, resources and enthusiasm.

The continued support from utilities, manufacturers, WEI, EWU and other organizations ensures the school is able to successfully operate on a zero-based budget.

Manufacturers furnished specific relays and test equipment, and they also provided training materials and laboratory instructors who taught students the application and theory of specific relay types.

Similarly, many utilities and organizations provided trained relay technicians as laboratory facilitators and instructors, and furnished a broad range of protective relays and test equipment.

Both utilities and manufacturers contributed classroom lecturers who taught students about system protection theory and related topics.

## STEERING COMMITTEE VOLUNTEERS: OUR EXPERT LEADERS

---

# 2,159

VOLUNTEER HOURS

## SUPPORTING + CONTRIBUTING ORGANIZATIONS

3AC Engineering

ABB Inc.

Advanced Electrical Technologies

Allied Edison

Alta Link

APR Staffing

Avista Corp.

Avista Utilities

Basler Electric Company

Beckwith Electric Company

Bonneville Power Administration

Central Arizona Project

Central Electric Cooperative

Chelan County PUD

Consolidated Edison

DCS Morgan

Doble Engineering Co.

Eastern Washington University

Eaton Cooper Power Systems

Electrical Consultants Inc.

Fluke Corp.

GE Renewable Energy

Grant County PUD

Hitachi Energy

Hubbell

Idaho Power Company

Intellirent

Megger

NERC

NovaTech Automation

NV Energy

OMICRON

Pacific Gas and Electric Company

Pacific Power

PacifiCorp

Peak Measure

Portland General Electric

POWER Engineers, Inc.

Power Solutions Group

Puget Sound Energy

Qualus Power Services

Rocky Mountain Power

Sacramento Municipal Utility District

Salt River Project

San Diego Gas & Electric Company

Schweitzer Engineering Laboratories

Seattle City Light

Snohomish County PUD

SV Electrical Testing

Tacoma Power

Telex Testing and Commissioning

US Army Corps of Engineers

US Bureau of Reclamation

Vertiv

Western Area Power Administration

Western Energy Institute



## STEERING COMMITTEE MEMBERS

Christopher Gallacher  
Steering Committee Chairman  
Bonneville Power Administration  
cwgallacher@bpa.gov

Ron Alexander  
Senior Manager Power Delivery -  
Construction and Maintenance  
Grant County PUD  
ralexander@gcpud.org

Beth Andrews  
Relay Protection, Metering, and Security  
Engineering  
Consolidated Edison  
andrewse@coned.com

Karl Cabrera  
Lead Relay Technician  
Salt River Project  
karl.cabrera@srpnet.com

Scott Dixon  
SPC Technical Advisor  
Idaho Power Company  
sdixon@idahopower.com

Bryan Focht  
Testing and Energization Engineer  
Portland General Electric  
bryan.focht@pgn.com

Jessica Grant  
WEI Representative  
Western Energy Institute  
grant@westernenergy.org

Tyge Legier  
Principle Field Technician Strategy Advisor  
San Diego Gas & Electric Company  
tleger@sdge.com

Paul Luther  
Relay Technician  
Puget Sound Energy  
paul.luther@pse.com

Stephen Marx  
Dist. Operations & Maintenance Manager  
Bonneville Power Administration  
semarx@bpa.gov

Andy Parks  
Technician  
Chelan County PUD  
andy.parks@chelanpud.org

Travis Rider  
Manager, Power Generation Testing  
Commissioning, & Start-up  
Pacific Gas and Electric Company  
tjrl@pge.com

Greg Sharpes  
Protection Control Meter Shop Foreman  
Avista Utilities  
greg.sharpes@avistacorp.com

Tanyl Tinhof  
Relay Support Staff - Principal  
PacifiCorp  
tanyl.tinhof@pacificorp.com

Bill Unbehaun  
Senior Journeyman Meter Relay Technician  
PacifiCorp  
william.unbehaun@pacificorp.com

Beverly Jones Woolf  
WEI Representative  
Western Energy Institute  
joneswoolf@westernenergy.org

Vlad Yerokhin  
Associate Engineer  
Tacoma Power  
vyerokhin@cityoftacoma.org

Diana Zoren  
WEI Representative  
Western Energy Institute  
zoren@westernenergy.org

## CLASSROOM LECTURERS

OVERVIEW + CONCURRENT OPEN LECTURES

Ron Alexander  
Grant County PUD  
ralexander@gcpud.org

Rich Bauer  
NERC  
rich.bauer@nerc.net

Chi Carnegie  
NovaTech Automation  
chi.carnegie@novatechautomation.com

Brent Carper  
3AC Engineering  
brent.carper@3ac-eng.com

Cameron Chapman  
Avista Utilities  
cameron.chapman@avistacorp.com

Scott Cooper  
OMICRON  
scott.cooper@omicronenergy.com

Aaron Cowan  
POWER Engineers, Inc.  
aaron.cowan@powereng.com

Benjamin Crum  
Seattle City Light  
benjamin.crum@seattle.gov

Scott Dixon  
Idaho Power Company  
sdixon@idahopower.com

Normann Fischer  
Schweitzer Engineering Laboratories  
normann\_fischer@selinc.com

Jon Gilrein  
Avista Corp.  
jon.gilrein@avistacorp.com

Daniel Goodrich  
Bonneville Power Administration  
dagoodrich@bpa.gov

Jill Ham  
Avista Utilities  
jill.ham@avistacorp.com

Wayne Hartmann  
GE Renewable Energy  
wayne.hartmann@ge.com

Matt Horvath  
POWER Engineers, Inc.  
matt.horvath@powereng.com

Paul Luther  
Puget Sound Energy  
paul.luther@pse.com

Stephen Marx  
Bonneville Power Administration  
semarx@bpa.gov

Ryan McAuliffe  
NovaTech, LLC  
ryan.mcauliffe@novatechautomation.com

Andrew Moradpour  
San Diego Gas & Electric Company  
amoradpour@sdge.com

Thomas Morrell  
Schweitzer Engineering Laboratories  
thomas\_morrell@selinc.com

Brad Morse  
NovaTech Automation  
brad.morse@novatechautomation.com

Kevin Nordt  
Grant County PUD  
knordt@gcpud.org

Dan Ransom  
GE Renewable Energy  
daniel.ransom@ge.com

Will Scheibe  
Omicron  
will.scheibe@omicronenergy.com

Tyler Smith  
Idaho Power Company  
tsmith@idahopower.com

Drew Welton  
Intellirent  
dwelton@intellirentco.com

Ken Workman  
Schweitzer Engineering Laboratories  
ken\_workman@selinc.com

## LABORATORY INSTRUCTORS

Ron Alexander  
Grant County PUD  
ralexander@gcpud.org

Rodger Allen  
APR Staffing  
rwallen@bpa.gov

Tony Chen  
ABB Inc.  
tony.g.chen@us.abb.com

Scott Cooper  
OMICRON  
scott.cooper@omicronenergy.com

Benjamin Crum  
Seattle City Light  
benjamin.crum@seattle.gov

Mohamad El Masri  
Eaton Corp.  
mohamadaelmasri@eaton.com

Martin Eng  
Schweitzer Engineering Laboratories  
martin\_eng@selinc.com

Glenn Goldfarb  
ABB Inc.  
glenn.goldfarb@us.abb.com

Terron Hatch  
Hubbell  
thatch2@hubbell.com

Dan Henriod  
Schweitzer Engineering Laboratories  
dan\_henriod@selinc.com

Justin Jeter  
Schweitzer Engineering Laboratories  
justin\_jeter@selinc.com

Mike Kockott  
Hitachi Energy  
mike.kockott@hitachienergy.com

Troy Ledford  
Schweitzer Engineering Laboratories  
troy\_ledford@selinc.com

Kevin Leech  
Schweitzer Engineering Laboratories  
kevin\_leech@selinc.com

Jacob Loyd  
Megger  
jacob.loyd@megger.com

Steve Morgan  
DCS Morgan  
smorgan@dcs-morgan.com

Dan Ransom  
GE Renewable Energy  
daniel.ransom@ge.com

Jeff Reilly  
Schweitzer Engineering Laboratories  
jeff\_reilly@selinc.com

Will Scheibe  
OMICRON  
will.scheibe@omicronenergy.com

Bob Schuyler  
Beckwith Electric Company  
rschuyler@hubbell.com

Greg Sharpes  
Avista Utilities  
greg.sharpes@avistacorp.com

Tom Steinmetz  
Basler Electric Company  
tomsteinmetz@basler.com

Bill Unbehaun  
PacifiCorp  
william.unbehaun@pacificorp.com

Michael Wilson  
Megger  
michael.wilson@megger.com

Ken Workman  
Schweitzer Engineering Laboratories  
ken\_workman@selinc.com

## LABORATORY FACILITATORS

**BASIC**  
Erik Kysar  
Advanced Electrical Technologies  
erikk@aet-pneco.com

Adam Druffel  
Avista Utilities  
adam.druffel@avistacorp.com

Aaron Gullion  
Bonneville Power Administration  
amgullion@bpa.gov

Carl Martin  
Idaho Power Company  
cmartin2@idahopower.com

Brandon Miller  
Idaho Power Company  
bmiller@idahopower.com

Peter Jereb  
Pacific Gas and Electric Company  
pxj2@pge.com

Bobby Jones  
Pacific Gas and Electric Company  
rhjd@pge.com

Austin Subler  
Power Solutions Group  
asubler@powersolutionsgroup.com

Jim Albright  
Puget Sound Energy  
jim.albright@pse.com

Walt Collins  
Puget Sound Energy  
walter.collins@pse.com

Mike Boyle  
Qualus Power Services  
mboyle@powergridmail.com

Justin Stevens  
Salt River Project  
justin.stevens@srpnet.com

Craig Berkwitz  
San Diego Gas & Electric Company  
cberkwitz@sdge.com

Eric Hapke  
Seattle City Light  
eric.hapke@seattle.gov

Kyle Ball  
Telex Testing and Commissioning  
kball@telexllc.com

Thomas Bell  
US Bureau of Reclamation  
tbell@usbr.gov

Rob Butzer  
US Bureau of Reclamation  
rbutzer@usbr.gov

**DISTRIBUTION**  
Jeff Kramer  
Pacific Power  
jeffery.kramer@pacificorp.com

Jason Hall  
Puget Sound Energy  
jason.hall@pse.com

Tony Ortiz  
Qualus Power Services  
anthony.ortiz@qualuscorp.com

Jeff Molea  
Salt River Project  
jeffrey.molea@srpnet.com

David Murray  
Salt River Project  
david.murray@srpnet.com

Christian Brandt  
San Diego Gas & Electric Company  
cbrandt@sdge.com



## ELECTROMECHANICAL

Lorene Zinn  
Bonneville Power Administration  
lazinn@bpa.gov

David Burson  
Central Arizona Project  
dburson@cap-az.com

Terence Wolf  
Salt River Project  
terence.wolf@srpnet.com

Brian Jarvis  
Telex Testing and Commissioning  
bjarvis@telexllc.com

Matthew Grosz  
Western Area Power Administration  
mgrosz@wapa.gov

## GENERATION

Brandon Murphy  
NV Energy  
brandon.murphy@nvenergy.com

Mike Burrow  
Pacific Gas and Electric Company  
michael.burrow@pge.com

Tommy Matthews  
Pacific Gas and Electric Company  
tdmj@pge.com

Matthew Anderson  
Salt River Project  
matthew.anderson@srpnet.com

Warren Weeks  
Salt River Project  
warren.weeks@srpnet.com

Jim Matthias  
US Army Corps of Engineers  
james.d.matthias@usace.army.mil

Andrew Allsbrook  
US Bureau of Reclamation  
aallsbrook@usbr.gov

Ira Smith  
Vertiv  
ira.smith@vertiv.com

## OMICRON (BEGINNING)

Juan Gomez  
OMICRON  
juan.gomez@omicronelectronics.com

Ryan Manning  
OMICRON  
ryan.manning@omicronenergy.com

Will Scheibe  
OMICRON  
will.scheibe@omicronenergy.com

Erik Smith  
OMICRON  
erik.smith@omicronenergy.com

Harold Cabrera  
Sacramento Municipal Utility District  
harold.cabrera@smud.org

## PROTECTION SUITE (ADVANCED)

Russell Hayden  
PacifiCorp  
russell.hayden@pacificcorp.com

Pat Eckroth  
Tacoma Power  
peckroth@cityoftacoma.org

John Williams  
Tacoma Power  
jwillia5@cityoftacoma.org

## PROTECTION SUITE (BEGINNING)

Dean Hatch  
Bonneville Power Administration  
dghatch@bpa.gov

Rob Husband  
Bonneville Power Administration  
rwhusband@bpa.gov

Jason Beverly  
Central Electric Cooperative  
jbeverly@cec.coop

Mark Bennett  
Pacific Power  
mark.bennett@pacificcorp.com

Shane Friesen  
Rocky Mountain Power  
friesen009@gmail.com

## RTS (ADVANCED)

Nick Belzile  
AltaLink  
nicolas.belzile@altalink.ca

William Harker  
Central Arizona Project  
wharker@cap-az.com

Danny Napoli  
Pacific Gas and Electric Company  
dnng@pge.com

Jorge Esmerio  
San Diego Gas & Electric Company  
jesmerio@sdge.com

Rob Loch  
US Bureau of Reclamation  
rloch@usbr.gov

## RTS (BEGINNING)

Jagjit Dhaliwal  
ABB Inc.  
jagjit.dhaliwal@us.abb.com

Paul Turner  
Portland General Electric  
paul.turner@pgn.com

Adam Johnson  
Salt River Project  
adam.johnson@srpnet.com

Jared Egger  
Snohomish County PUD  
jmegger@snopud.com

Greg French  
Tri-State Generation and Transmission  
Association, Inc.  
gregory.french@tristategt.org

## TRANSMISSION

Michael Everroad  
Bonneville Power Administration  
maeverroad@bpa.gov

Mark Marr  
Bonneville Power Administration  
mamarr@bpa.gov

Omar Valle Guzman  
Bonneville Power Administration  
novg21@hotmail.com

Ron Ritchie  
Idaho Power Company  
rritchie@idahopower.com

Scott Robertson  
Pacific Power  
scott.robertson@pacificcorp.com

John Hamilton  
Snohomish County PUD  
jwhamilton@snopud.com

Simme Veldman  
SV Electrical Testing  
sveldman@svetesting.com

Gregory Silva  
Western Area Power Administration  
gsilva@wapa.gov

## SUPPLIER SHOWCASE EXHIBITORS

Roy Braatz  
Doble Engineering Co.  
rbraatz@doble.com

Scot Dobson  
Allied Edison  
skyke101@yahoo.com

Larry Gross  
Electrical Consultants Inc.  
larry144@relayapplication.com

Tim Johnston  
Peak Measure  
tim@peakmeasure.com

Santana Jose  
Schweitzer Engineering Laboratories  
santana\_jose@selinc.com

Jeff Lindgren  
Eaton Corp.  
jeffreyslindgren@eaton.com

Brad Morse  
NovaTech Automation  
brad.morse@novatechautomation.com

Ariany Moura  
OMICRON  
ariany.moura@omicronenergy.com

Steve Olshever  
Basler Electric Company  
steveolshever@basler.com

Sarah Salgueiro  
Qualus Power Services  
sarah.salgueiro@qualuscorp.com

Adam Sheffield  
Fluke Corp.  
aksheff@gmail.com

Paul Stack  
ABB Inc.  
paul.d.stack@us.abb.com

Anant Venkateswaran  
Hitachi Energy  
anant.venkateswaran@hitachienergy.com

Drew Welton  
Intellirent  
dwelton@intellirentco.com



“ 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. ”  
- EVALUATION COMMENT 2023





# CLASS OF 2023

**248**  
STUDENTS

ORGANIZATIONS  
REPRESENTED  
**88**

Congratulations to the class of 2023! Thank you for being a part of the 38th Annual Hands-On Relay School, as it delivers a unique educational experience offering hands-on training, the opportunity to network with peers and learn from leading experts in the field of system protection.

## MANUAL RELAY TESTING

### AUTOMATION & INTEGRATION

Robert Baffrey  
Senior Relay Technician  
NV Energy

Jose Cruz Chavez  
Apprentice Relay Technician 8th  
Salt River Project

Ryan Davenport  
Protection and Control Technician  
Lewis County PUD

Jason Freadman  
SCADA Tech.  
Portland General Electric

Will Greenland  
Lead Electrical Technician  
Pacific Gas and Electric Company

Todd Johnson  
SCADA Technician  
Portland General Electric

Thomas Kluge  
S. Electrical Technician  
Nevada Irrigation District

John Koga  
Electrical Technician  
Pacific Gas and Electric Company

Mike Lindquist  
Meter Relay Tech  
Western Area Power Administration

Dan Pace  
Technician  
Chelan County PUD

Jean Royer  
CPC Tech  
FortisBC

Joseana Ruiz  
Apprentice Relay Technician 8th  
Salt River Project

Brett Sternhagen  
Relayman  
Snohomish County PUD

Cyrus VandenBerghe  
Electrical Technician  
Pacific Gas and Electric Company

Jeremy Young  
Electrical Technician  
Pacific Gas and Electric Company

Daniel Zumwalt  
Electrical Technician  
Pacific Gas and Electric Company

### BASIC

John Baughman  
PSCC Apprentice  
US Bureau of Reclamation

Brendon Benton  
Relay Tech 2  
Telex Testing and Commissioning

Nick Bibeau  
Electrical Technician  
Pacific Gas and Electric Company

Chett Borchers  
Engineering Manager  
Power Solutions Group

Aron Brouillette  
Meter & Relay, CIT  
Western Area Power Administration

Matthew Brown  
Apprentice Electrical Technician  
Pacific Gas and Electric Company

Caleb Caspe  
Relay/SCADA  
UNS Energy Corp.

Chet Cawley  
Electrician  
Idaho Falls Power

Nolan Coleman  
Apprentice Relay Technician 2nd  
Salt River Project

Jason Collins  
System Protection Control Craftsman Trainee  
5  
Bonneville Power Administration

Behzad Dananiani  
System Protection Control Craftsman Trainee  
6  
Bonneville Power Administration

Gene Day  
Communication Technician  
Idaho Power Company

Jake Densmore  
Relay Technician Trainee  
Puget Sound Energy

Jacob Durant  
Apprentice Relay Technician 2nd  
Salt River Project

Joshua Enloe  
Assistant to the Chief Inspirational Officer  
Telex Testing and Commissioning

Justin Everette  
Shop Technician  
Power Solutions Group

Allen Frank  
Meter Relay Foreman  
Central Lincoln PUD

Nick Gates  
Control Wiring  
Idaho Power Company

Richard Grieshop  
NETA II Technician  
Power Solutions Group

Jacob Haugen  
Relay Technician Trainee  
Puget Sound Energy

Mathew Hendrickson  
Assistant Meter Relay Tech  
Pacific Power

Robert Hernandez  
Relay Tech 2  
Telex Testing and Commissioning

Jason Holman  
Assistant Meter & Relay Tech  
Pacific Power

Jacob Johnson  
PSCC Apprentice  
US Bureau of Reclamation

Kacey Kroon  
Relay Technician Trainee  
Puget Sound Energy

Lars Larsen  
Relay Technician Trainee  
Puget Sound Energy

Drew Larson  
Test Technician II  
Aubrey Silvey Enterprises

Mark Magers  
Meterman / Lineman  
Avista Utilities

Brian Marsengill  
Substation Technician  
Pend Oreille County PUD

Arturo Mendez Romero  
Apprentice Relay Technician 2nd  
Salt River Project

James Milligan  
PSCC Apprentice  
US Bureau of Reclamation

Santiago Munoz  
Power Plant Electrician  
US Army Corps of Engineers

Luis Navarro  
Engineer  
Grant County PUD

James Nichols  
Power Systems Control Craftsman -  
Apprentice  
US Bureau of Reclamation

Tristin Noble  
Assistant Meter & Relay Technician  
Pacific Power

Alex Odoms  
Station Control Technician  
Idaho Power Company

Ruben Olyano  
Protection and Control Electrician  
Seattle City Light

Brian Pence  
Assistant Meter & Relay Technician  
Pacific Power

Rebekah Rakestraw  
Relay Tech Trainee  
Tacoma Public Utilities

Aaron Record  
Assistant Meter & Relay Technician  
Pacific Power

Benjamin Rodd  
Meter & Relay Craftsmen-in-Training  
Western Area Power Administration

Stephen Salazar  
System Protection Control Craftsman Trainee  
5  
Bonneville Power Administration

Ernie Salcido  
Apprentice Relay Technician 2nd  
Salt River Project

Aaron Sample  
Wireman/Relay Tech  
Grays Harbor PUD #1

Caleb Short  
Apprentice Electrical Technician  
Pacific Gas and Electric Company

Brian Silva  
Assistant Meter & Relay Technician  
Pacific Power

Jeff Tiiistra  
Communications / Relay Technician  
Orcas Power & Light

Kyle Williams  
Meterman  
Central Lincoln PUD

Benson Winfield  
Assistant Meter & Relay Technician  
Pacific Power

## DISTRIBUTION

David Adams  
Relay Technician  
Central Arizona Project

Russell Barrowcliff  
Meter/Relay Tech  
Eugene Water & Electric Board

Derrick Bodine  
Relay Technician Trainee  
Pacific Power

Ashley Campbell  
Apprentice Relay Technician 4th  
Salt River Project

Mike Cassidy  
Relay Tech  
Eugene Water & Electric Board

Steve Correll  
Meter Relay Tech 2  
Grant County PUD

Chandler Elmore  
Relay Technician II  
Qualus Power Services

Todd Hestand  
Apprentice Relay Technician 4th  
Salt River Project

Ethan Johnson  
Apprentice Relay Technician 4th  
Salt River Project

Kirk Long  
Meter Relay Tech III  
Grant County PUD

Joseph Montez  
Apprentice Relay Technician 5th  
Salt River Project

Brent Poarch  
Relay Technician  
Central Arizona Project

Danica Prather  
Engineer II  
San Diego Gas & Electric Company

Javier Ramirez  
Meter Relay Tech III  
Grant County PUD

Abel Rodriguez  
Lead Electrical Technician  
Pacific Gas and Electric Company

Joseph Silva  
Relay Technician  
Central Arizona Project

Brandon Smith  
Protection Engineer  
Mason County PUD 3

Richard Wacker  
Relay Tech Trainee  
Tacoma Public Utilities

## ELECTROMECHANICAL

Charles Barrett  
Test Technician Apprentice  
Burbank Water and Power

Chris Flynn  
Meter and Relay CIT  
Western Area Power Administration

Rodney Griffing  
Substation Electrician  
Dairyland Power Cooperative

Jordan Holt  
Meter and Relay Mechanic (Apprentice)  
Western Area Power Administration

Benjamin Kuehn  
Tech II  
EPC Services

Sean Osburn  
Relay Tech  
Pacific Gas and Electric Company

Aaron Ruckman  
Relayman  
Snohomish County PUD

Yasin Salah  
CPC Tech  
FortisBC

Richard Stewart  
Meter & Relay Apprentice  
Western Area Power Administration

Kurt Stuehler  
Technician  
Pacific Power

Deleon Thompson  
Electrical Engineer  
Bonneville Power Administration

Jose Valladarez  
Test Technician Apprentice  
Burbank Water and Power

Nicholas Wenzel  
System Protection Control Craftsman Trainee  
7  
Bonneville Power Administration

Michael Wise  
Engineer  
Golden Valley Electric Association, Inc.

## GENERATION

Joseph Andre  
Generation Technician  
Idaho Power Company

Jim Becker  
Meter Relay Technician  
Chelan County PUD

Jesse Burk  
Generation technician  
Idaho Power Company

Rhett Dewey  
Relay Technician  
Puget Sound Energy

Michelle Fagan  
Power Plant Electrician  
US Army Corps of Engineers

Patrick Feay  
Relay Technician Trainee  
Puget Sound Energy

Cody Foster  
Generation Technician  
Idaho Power Company

Corbin Goggia  
Apprentice Electrical Technician  
Pacific Gas and Electric Company

Manuel Guerrero  
Technician  
Chelan County PUD

David Haley  
Protection and Control Electrician  
Seattle City Light

Joe Harris  
Relay Technician Trainee  
Puget Sound Energy

Benjamin Hobbs  
Electrician  
US Army Corps of Engineers

Mike Hobbs  
Electronic Controls Craftsman  
US Army Corps of Engineers

Taylor Hudson  
Relay Engineer  
Puget Sound Energy

Sarah Lau  
Protective Relay Engineer  
Southern California Edison

Robert Miller  
TC&S Supervisor  
Pacific Gas and Electric Company

Jess Multani  
Electrical Technician  
Pacific Gas and Electric Company

Devin O'Connell  
Apprentice Electrical Technician  
Pacific Gas and Electric Company

Tom Rowe  
Electrician  
Idaho Falls Power

Jason Royal  
Appr. Electrical Technician  
Pacific Gas and Electric Company

Matthew Schroeder  
Field Engineer A  
Electrical Reliability Services

Gary Stutheit  
Electrical Constructor  
Snohomish County PUD

Amanda Taylor  
Senior Electrical Engineer  
Pacific Gas and Electric Company



Eh Doh Wah  
Apprentice PCM Technician  
Avista Utilities

### TRANSMISSION

Benjamin Albert  
Relay Technician Trainee  
Pacific Power

Tom Allen  
Relay Technician Trainee  
Puget Sound Energy

Clint Bush  
Meter & Relay Assistant  
Pacific Power

Cale Carlson  
Relay Technician Trainee  
Puget Sound Energy

Mike Collver  
Lead Electrical Technician  
Pacific Gas and Electric Company

John Dobin  
System Protection Control Craftsman I  
Bonneville Power Administration

Douglas Doty  
Electrical Engineer  
Bonneville Power Administration

Brian Evensen  
Assistant Meter Relay Tech.  
Pacific Power

Jon Gilrein  
System Protection Engineer  
Avista Corp.

Rodney Hendrickson  
Electrical Engineer  
Bonneville Power Administration

Bryson Hopfe  
Electrical Technician  
Pacific Gas and Electric Company

Ryan Joersz  
Apprentice PCM Technician  
Avista Utilities

Adam Judge  
Apprentice PCM Technician  
Avista Utilities

Austin Lay  
Relay Tech Trainee  
Pacific Power

Jeremy Miller  
Relay Trainee  
Pacific Power

Brian Perez  
Electrical Engineer  
Bonneville Power Administration

Ken Poulter  
Engineer  
San Diego Gas & Electric Company

Robert Roman  
Protection Engineer  
Avista Utilities

Jim Saunders  
Meter and Relay Tech Assistant  
Pacific Power

Eric Tucker  
Relay Trainee  
Snohomish County PUD

Lucas Wisdom  
Relay Technician Trainee  
Puget Sound Energy

Rick Zuchowski  
System Protection Control Craftsman Trainee 7  
Bonneville Power Administration

## COMPUTERIZED RELAY TESTING

### COMPUTERIZED PROTECTION SUITE - OMICRON

Richard Atkinson  
Protection Specialist, Expert  
Pacific Gas and Electric Company

Jonathan Balbuena  
Electrical Technician  
Sacramento Municipal Utility District

Adam Borchers  
NETA III Technician  
Power Solutions Group

Tad Conant  
Meter & Relay Craftsman  
Western Area Power Administration

Mark Fahrner  
Electrical Technician  
Sacramento Municipal Utility District

Mehdi Halvaei  
Apprentice Electrical Tech  
Sacramento Municipal Utility District

Jeremy Hutchings  
Meter/Relay Technician  
Merced Irrigation District

Chris Jackson  
Meter and Relay Tech  
Western Area Power Administration

Zach Melton  
Relay Technician  
Puget Sound Energy

Glen Moss  
Meter/Relay Foreman  
Merced Irrigation District

Vincent Nunnemaker  
Lead Electrical Technician  
Pacific Gas and Electric Company

John Prater  
Lead Electrical Technician  
Pacific Gas and Electric Company

Luke Schneider  
Meter & Relay Apprentice  
Western Area Power Administration

Glen Turnquist  
Relay Technician  
Jolma Utilities

Brad Weideman  
Apprentice Relay Technician 8th  
Salt River Project

**MEGGER**  
Wilson Ibishaka  
Engineer  
Kaiser Aluminum

T'Sharra Parkhurst  
PDM Tech  
Kaiser Aluminum

Jeremy Short  
PDM Tech  
Kaiser Aluminum

Simeon Spencer  
PDM Tech  
Kaiser Aluminum

### PROTECTION SUITE (ADVANCED)

Jade Holm  
Relay Technician Trainee  
Pacific Power

Marc Jensen  
Relay Trainee  
Pacific Power

Kasey Jorgensen  
Substation Lead  
Dixie Power

Ermias Nagash  
Electrical Field Test Engineer III  
EPC Services

Kevin Raber  
Relay Technician  
Rocky Mountain Power

Colby Scholes  
Substation Foreman  
Idaho Falls Power

Devin Sexton  
Journeyman Meter and Relay Tech  
Tillamook PUD

Keith Wells  
CPC Tech  
FortisBC

Dustin White  
Relay Technician  
Rocky Mountain Power

### PROTECTION SUITE (BEGINNING)

Brian Butler  
Electrical Technician  
Pacific Gas and Electric Company

Will Gisler  
Supervising Electrical Technician  
Yuba Water Agency

Augustus Herzog  
Electrical Field Test Engineer 1  
EPC Services

Grayson Hilborn  
Testing Technician  
EPC Services

Andrew Horsley  
Substation and generation tech  
Logan City Light & Power

Jared Lerwill  
Electrician  
Idaho Falls Power

Phil Mattheus  
Meter/Relay Tech  
Hanford Mission Integration Solutions

Michael Newcomer  
Electrical Engineer  
Western Area Power Administration

John Nunnelee  
Associate Engineer  
Central Lincoln PUD

Ben Sangster  
Field Service Technician  
Accurate Power Group

Jason Slaven  
Meter Relay Technician  
Central Electric Cooperative

Sam Smith  
Electrician  
Yuba Water Agency

### RTS (ADVANCED)

Dale Bagley  
Electrical Technician  
Sacramento Municipal Utility District

Chris Goe  
Meter Relay Tech IV  
Grant County PUD

Roger Jensen  
Meter Relay Tech IV  
Grant County PUD

Ihor Kripak  
P&C Technologist  
AltaLink

Fairel Nichols  
Tech 2  
Douglas County PUD

Fabian Nogales  
Relay Tech.  
UNS Energy Corp.

Marcus Padilla  
Substation Technician  
Tri-State Generation and Transmission  
Association, Inc.

Lucas Pourchot  
Relay Tec  
NV Energy

Shawn Roberts  
P&C Technologist  
AltaLink

Lucas Schechla  
Electrical Technician  
Sacramento Municipal Utility District

Dan Trahan  
Electrical Technician  
Sacramento Municipal Utility District

Tuck Walker  
Substation Technician  
Tri-State Generation and Transmission  
Association, Inc.

### RTS (BEGINNING)

Jack Atkins  
Substation Technician Apprentice  
Tri-State Generation and Transmission  
Association, Inc.

Shane Bender  
Relay/Meter Technician  
Tri-State Generation and Transmission  
Association, Inc.

Kaleb Ferriter  
Electrical Field Test Engineer  
EPC Services

Adam Goodburn  
Electrical Field Test Engineer III  
EPC Services

Justin Marquez  
Lead Relay Technician  
Aubrey Silvey Enterprises

Justin Mill  
CPC Tech  
FortisBC

Evan Mueller  
Electrician  
Talen Energy

Sam Neutgens  
Substation Technician Apprentice  
Tri-State Generation and Transmission  
Association, Inc.

John O'Connell  
Electrical Technician  
Talen Energy

Evan Ralph  
P&C Technologist  
AltaLink

Skyler Schwend  
Electrician  
Talen Energy

Kurt Simonson  
Technician  
Clark Public Utilities

Braden Tethal  
Test Engineer  
EPC Services

Isaiah Wolf  
Substation Technician  
Tri-State Generation and Transmission  
Association, Inc.

## ADVANCED TRAINING

### THEORY

Aaron Barker  
Relay tech foreman  
Golden Valley Electric Association, Inc.

Tom Baumgartner  
Electrician  
Dairyland Power Cooperative

Cameron Bentley  
System Protection Engineer  
Idaho Power Company

Shane Breitenfeldt  
Electrical Engineer  
Hanford Mission Integration Solutions

John Buckner  
Protection Engineer  
Idaho Power Company

Clint Burgess  
Meter Relay Tech  
Portland General Electric

Chris Christopherson  
Outage Coordinator  
Avista Utilities

Michael Coen  
Wireman Golden Valley  
Electric Association, Inc.

Jarryd Collyer  
Relay Technician  
Farmington Electric Utility System

Kelly Fadden  
Substation Meter And Relay Technician  
Portland General Electric

Jake Gunn  
Meter Power Protection Technician 1  
City of Richland

Elroy Harry  
Relay Technician  
Farmington Electric Utility System

Gordon Harvey  
System Operator  
Avista Corp.

Andrew Heiman  
Electrical Engineer  
Western Area Power Administration

David Hodder  
Engineer  
Hodder & Associates

Brandon Hovda  
Meter & Relay Craftsman  
Western Area Power Administration

Andy Hunter  
Electrical Engineer  
Bonneville Power Administration

Justin Kelley  
Apprentice Relay Technician 8th  
Salt River Project

John Klein  
Meter Relay Tech  
Merced Irrigation District

Levi Knott  
Engineer I  
Idaho Power Company

Chayse Lee  
Relay Technician III  
Qualus Power Services

Andrew Maehl  
Electrical Field Test Engineer  
EPC Services

Joseph Maher  
Meter and Relay Craftsman  
Western Area Power Administration

Calvin Mizner  
Electrical Engineer  
Grant County PUD

Marco Orozco  
Protection Engineer, Asc  
Pacific Gas and Electric Company

Kuru Palaiyan  
Test Engineer  
EPC Services

Samuel Pavlenko  
Electrical Engineer  
Bonneville Power Administration

Sharon Perez Esquivel  
Electrical Engineer  
Bonneville Power Administration

Joel Perry  
System Protection Engineer  
Idaho Power Company

Michael Reynolds  
Wireman Relay Tech  
Golden Valley Electric Association, Inc.

Chad Sebo  
Relay Technician  
Dairyland Power Cooperative

Nik Tkachenko  
Protection Engineer  
Pacific Gas and Electric Company

Mitchell Trounce  
Electronic Integrated Systems Mechanic  
(Meter/Relay)  
Western Area Power Administration

Igor Tyshchuk  
MPP Technician 1  
City of Richland

Charles Upgren  
Meter and Relay Craftsman  
Western Area Power Administration

Nathan Whitford  
Meter & Relay Craftsman  
Western Area Power Administration

Robert Williams  
Meter Relay Technician  
Eugene Water & Electric Board

Corinna Wittig  
Electronic Integrated Systems Mechanic  
(Meter and Relay CIT)  
Western Area Power Administration

Brent Wurz  
Meterman  
Benton PUD





## DATES TO REMEMBER

**Application Process Opens**  
November 1, 2023

**Applications Due**  
January 15, 2024

**Admittance + Placement  
Notifications**  
February 1, 2024

**39th Annual Hands-On Relay School**  
March 24 - March 29, 2024

## UPCOMING COMMITTEE MEETINGS

**Conference Call**  
February 22, 2024

**Cheney, Washington**  
March 28, 2024

**Tempe, AZ**  
May 16, 2024

**Richland, Washington**  
June 20, 2024

**Portland, Oregon**  
August 15, 2024

**Spokane, Washington**  
October 2024

## QUESTIONS?

**Chris Gallacher**  
Steering Committee Chair  
Electrical Engineer  
RAS / Disturbance (TOOC)  
Bonneville Power Administration  
509-319-3702  
cwgallacher@bpa.gov

**Diana Zoren, CAE**  
Director of Strategic Initiatives  
Western Energy Institute  
971-255-4965  
zoren@westernenergy.org

**Beverly Woolf**  
Director of Programs  
Western Energy Institute  
971-303-2294  
woolf@westernenergy.org

**Jessica Grant**  
Program Manager  
Western Energy Institute  
971-930-2023  
grant@westernenergy.org

**westernenergy.org**