Commercial and Industrial Harmonics Training

June 4, 2025
9 a.m. to 2 p.m.
Hilton Garden Inn, Snake River Room
1741 Harrison St. N., Twin Falls, ID
Class is free for Idaho Power customers.

Attendees will be introduced to general power-quality principles and focus on harmonics in power systems. The class will explain how certain equipment produces harmonic current and voltage distortion; how that distortion impacts motors, transformers, and other power system components; and ways to mitigate the impact of harmonics and extend the life of your equipment.

The class will also cover the rules and standards that apply to harmonics in power systems and help attendees understand how these rules and standards apply to their facilities.

Key Learning Objectives

- Describe the essential parts of a power quality problem
- Learn about the relationship between frequency and power flow
- Understand how rectifiers produce harmonic current
- Learn what is meant by *linear* and *non-linear* load
- Learn about the relationship between harmonics and power factor
- Describe the basic properties of diodes, capacitors, and inductors
- Understand the characteristic harmonics of single- and three-phase rectifiers
- Explain what *triplin* and *negative sequence* harmonics are and why they're a special concern
- Understand harmonics' impact on transformers, conductors, circuit breakers, fuses, and motors
- Learn about Idaho Power's Rule K and the IEEE-519 standard
- Understand how passive filters reduce harmonics
- Understand how active filters reduce harmonics
- Learn about your role in minimizing the impact of harmonics in the power system

Who Should Attend?

- Operational staff
- Maintenance engineers
- Managers, executive, system/process engineers
- Energy efficiency professionals and utility staff
- Variable frequency drive (VFD) vendors

Instructor

Paul Ortmann, P.E. earned a Bachelor of Science in Electrical Engineering from California State University – Sacramento and a Master of Engineering in Electrical Engineering from the University of Idaho. Paul has worked as an Electrical Engineer since 1991 in utility generation and distribution systems and focused on power quality since 1999. He is a member of the Institute of Electrical and Electronics Engineers where he has been on standards committees for harmonics, stray and contact voltage, and

1221 W. Idaho St. (83702)
P.O. Box 70
Boise, ID 83707

voltage quality. Paul regularly teaches a semester-long graduate course in power quality for the University of Idaho and short courses for the University of Wisconsin as well as a variety of workshops and seminars for Idaho Power's customers and employees.

Registration

- ❑ **I will join the seminar in-person**
- ❑ **I will join the seminar virtually**

_____ _____

First Name Last Name Title Phone

_____ _____

Company Name Email Address

_____ _____

Mailing Address City, State ZIP

_____ _____ _____ _____

Vehicle Make Vehicle Model License Plate State

Electrical License Number (if needing CEUs):_____

*Vehicle information is only needed for in-person attendees that would like free parking in Idaho Power lots for the day.

Registration deadline is Tuesday, May 27.
To register, email, phone, or mail registration form to:
Phone: 208-388-5099
Email: training@idahopower.com
Idaho Power c/o Chris Pollow 1221 W. Idaho St. Boise, ID 83702

Questions?
Visit idahopower.com/training or contact Idaho Power at 208-388-5099 or training@idahopower.com.