

■ **PROFESSIONAL**
■ ■ **DEVELOPMENT**
■ ■ ■ **SEMINAR SERIES**



GENERAC® | **INDUSTRIAL POWER**

A SERIES OF SEMINARS FOR THE ENGINEERING COMMUNITY BASED UPON “REAL-WORLD” EXPERIENCES

Power Systems are increasingly in demand for a variety of applications.

For many projects, the reliability of the power system is crucial to facility operations. Too often, generators are installed without a thorough understanding of system capability, functionality, reliability and site specific load requirements. These two-hour seminars consist of a 90-minute, in-class session and 30 additional minutes for an online assessment.

Each seminar was designed specifically for practicing engineers who wish to expand their understanding of current technologies, sizing, codes & standards, switching technologies and reliable design characteristics surrounding power systems. If you are a design, sales or consulting engineer, this series is for you. It's a joint effort of the Milwaukee School of Engineering (MSOE) and Generac Power Systems.

Participants who successfully complete an individual seminar and achieve a passing score on the associated final assessment will be awarded 2 Professional Development Hours (PDH) and .2 Continuing Education Units (CEU).

WHO SHOULD ATTEND?

These courses were developed for practicing Design, Sales and Consulting Engineers involved in specifying or installing generators.

COURSE DESIGN

These seminars are designed to be conducted over a 90-minute period. Ideally, they can be conducted as an early morning breakfast meeting or over an extended lunch hour. This minimizes the impact on individual productivity within your firm.

GENERAL SEMINAR CONTEXT

- Introductions
- Course outline
- Course material with exercises
- Online course assessment
(For CEU and PDH qualification)

DEVELOPMENT TEAM

The Professional Development Seminar Series was designed by engineers who are experts in the power generation field. Their goal is to provide you with a thorough understanding of the applications and advances associated with power systems.

PROFESSIONAL DEVELOPMENT SEMINAR SERIES: CURRICULUM ABSTRACTS

GPS – 100 Generator Sizing

Presents methods and calculations for proper sizing of engine-generators. Explores the alternator and engine responses to different types of loads. Presents different techniques to optimize engine-generator performance.

Load types covered:

- Limitations of traditional generator sizing programs
- Dealing with load uncertainty in new construction
- Recognizing leading power factor pitfalls
- And so much more!

GPS – 110 Generator Switching

Discusses performance criteria used to select transfer switches to connect engine-generator power into loads. Explores different grounding considerations and techniques for different applications, plus the selection of overcurrent protection and transfer switch controls.

Switch types covered:

- Open transition
- Soft loading
- Closed transition
- Paralleling switchgear
- Bypass Isolation

GPS – 120 Paralleling concepts & implementation

Introduces generator paralleling and basic concepts of paralleling engine-generators to form larger power systems. Emphasizes paralleling controls for load sharing (real and reactive power), synchronization and protection of paralleled systems.

Discusses control integration, elimination of serial reliability paths and the advantages of parallel power systems over traditional single engine-generator solutions.

GPS – 130 Understanding generator reliability

Explores strategies for value engineering projects through utilization of best available technologies and innovations without sacrificing overall power system reliability. Provides guidelines for selection of the system best suited to meet the project's cost, reliability and performance criteria. Establishes measures for determination of reliability and provides tools to establish reliability criteria for overall engine-generator power system.

GPS – 140 National Electrical® Code (NEC®)

Presents reasons for standby power generation from the Electrical Code perspective. Explains the various articles and requirements covering standby power generation.

GPS – 150 Generator UL Listing & NFPA standards

Introduces Underwriters Laboratories' (UL) standards and the impact of those standards for standby power generation; including the engine-generator set and transfer switch.

Discusses specific NFPA standards and application/installation details for health care, life safety, and fire pumps.

GPS – 160 Generator provisioning & installation

Examines engine-generator configurations and the selection of optional items such as block heaters, base tanks, enclosures, etc. Explores standard configurations versus custom options that may be required based on site-specific criteria.

Introduces good design practice guidelines for the installation of engine-generator sets based on site and application specific details. Emphasizes cooling system selection, unit placement, piping requirements, etc.

GPS – 170 Engines & Alternators

Introduces engines and engine technologies used in design and implementation of standby power generation. Discusses fuel types, selection, design criteria for standby generator engine selection and testing required to prototype and validate a product.

Outlines terminology and performance expectations of the engine-generator alternator. Identifies construction methods, temperature criteria and the fault capacities of alternators.

GPS – 180 Controls

Discusses the impact of engine-generator controls and the evolution of those controls from simple analog designs to fully integrated digital platforms.

Reviews integrated paralleling control technology and fully explore all paralleling functions.

GPS – 190 Writing Performance-Based Generator Specifications

Presents techniques for effective performance-based specifications for engine-generator sets, generator accessories and transfer switches without manufacturer specific language.

Provides tools for writing specifications and general guidelines applicable to typical standby power generation applications.

GPS – 200 200 Gen-Set Fuel (NG vs. Diesel)

Explores various aspects of generator fuel and the growth of natural gas generators in standby power applications. The discussion includes engine operational technologies, reliability of natural gas and onsite diesel, impacts of demand response programs on fuel choice, and total cost of ownership comparisons.

GPS – 410 Gen-Set Natural Gas Piping Design

Discusses the various aspects of generator gas piping design that is needed to establish adequate gas flow with both minimum pressure drop and stable pressure.

Participants will learn the guidelines for sizing the gas service, the correct size selection and type pressure regulators along with gas piping recommendations to minimize pressure drops and regulator drop.

GENERAC INDUSTRIAL POWER PROFESSIONAL DEVELOPMENT SEMINAR SERIES

A LEADER IN THE STANDBY POWER GENERATION INDUSTRY

Generac is committed to innovation and outstanding service to meet the needs of a wide variety of customers. This commitment guided the creation of an educational program for the architectural and engineering communities.

Generac Industrial Power Professional Development Seminar Series consists of 11 individual, 2-hour sessions. It offers Architects and Engineers valuable information regarding the theory and practice of standby power generation while incorporating proven learning methodologies. These sessions include 90 minutes of direct contact with participants in a “Lunch and Learn” format plus an additional 30 minutes to be used post class for independent completion of an online assessment. Credit for the class will be given in the form of an online certificate upon successful completion of the post-test and course survey.

HIGHLIGHTS OF THE PROGRAM:

- A Generac Industrial Distributor will come to your organization to conduct this lunch and learn
- Continuing Education Units (CEU) and Professional Development Hours (PDH) are available
- Learners are provided guides, binder and other useful tools
- An expert on-site during the training will answer questions

CUSTOMER PROMISE

Generac puts you, the customer, first to ensure your peace of mind by delivering a superior product and ownership experience.

JOINT DEVELOPMENT EFFORT WITH MILWAUKEE SCHOOL OF ENGINEERING

Working together, Generac Industrial Power and The Milwaukee School of Engineering (MSOE) identified the skills and knowledge required to successfully specify, apply, and install standby power generation systems. As a result, the two organizations designed and developed the “Professional Development Seminar Series.” MSOE was founded in 1903 on the basis of an educational philosophy that integrates two basic elements of learning; theory and practice. MSOE offers 18 bachelor’s degrees and 11 master degrees in areas relating to engineering, business, nursing, and construction management. MSOE is well known for its close association with business and industry. In 2006, U.S. World News & World Report ranked MSOE among the top colleges in Engineering Programs and Engineering Specialties.

CONTINUING EDUCATION

The purpose of Continuing Education Units (CEU) and Professional Development Hours (PDH) is to provide a permanent record of the educational accomplishment of an individual who has attained certain competencies as a result of a significant non-credit educational experience. CEUs and PDHs provide evidence of completion of continuing education requirements established by various certification bodies and professional societies. One CEU is defined as 10 contact hours of student participation in an organized educational experience under responsible leadership, capable direction and qualified instruction, whereas one PDH is equal to one hour. Individual state licensing boards and other professional organizations have jurisdiction over whether to approve or disapprove the training so PDH and CEU qualification cannot be guaranteed by Generac. That said, the vast majority of states have supported PDSS training.

Requirements to be awarded Professional Development Seminar Series CEUs and PDHs:

- Participation in the full 90-minute classroom session
- A passing score (80%) on the associated assessment

THE PROFESSIONAL DEVELOPMENT SEMINAR SERIES IS PRESENTED BY...



Founded in 1959, Generac Power Systems is a leading manufacturer of diesel and gaseous-fueled, engine-driven power generation equipment, transfer switches, paralleling switchgear, and small engines for industrial, commercial, residential, communication, and recreational applications.



Founded in 1903, MSOE is a private, coeducational university located in downtown Milwaukee. The university offers undergraduate and graduate degrees in areas related to engineering, business, nursing, and construction management. Theory is brought to life for students through extensive integration of laboratory experimentation.



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