

Power Plant Performance Knowledge™ Series

Reserve your space today!

To register, call toll free

800.803.6737

Online: [www.gpworldwide.com/
fossil_fuel_courses/registration.asp](http://www.gpworldwide.com/fossil_fuel_courses/registration.asp)

ON-SITE TRAINING

GP places the highest priority on satisfying specific customer needs with the most professional, cost-effective programs available.

All of our courses are available for on-site instruction, at a considerable savings to you in time and money. For an all-inclusive fee, we can provide you with top-notch instructors able to tailor training to your needs. Groups of employees can be trained together at a location of your choosing. Due to our wide-ranging resources and flexibility, we are able to provide quick response to requests for specific training. For more details and cost specifics, call our Amherst office at 800.803.6737 and ask for "on-site course information."

INSTRUCTORS

GP instructors have served as plant managers, operation superintendents, performance engineers, and shift supervisors at power plants. Our instructors bring hands-on experience to the classroom. They understand the problems that you may encounter and the environment you work in. To learn more about GP's instructors, visit our website at:

www.gpworldwide.com/fossil_fuel_courses/instructors.asp

CEUs EARNED

In accordance with guidelines established by the International Association for Continuing Education and Training (IACET), we will award appropriate CEUs for completion of these courses.

Professional Engineers Continuing Education

GP is an approved continuing education provider in many states. Please call 800.803.6737 for a complete up-to-date list of approved states.

General Physics Corporation

Power Plant Performance Knowledge™ Series

Advanced Performance Analysis and Troubleshooting for Power Plants

January 22 - 26, 2007 • Tampa, FL
June 4 - 8, 2007 • Buffalo/Niagara Falls, NY
October 8 - 12, 2007 • Denver, CO

Fundamentals of Power Plant Performance for Utility Engineers

May 7 - 11, 2007 • Chicago, IL
July 16 - 20, 2007 • Buffalo/Niagara Falls, NY
September 24 - 28, 2007 • Denver, CO

Improving Combined Cycle Power Plant Performance

February 6 - 8, 2007 • Tampa, FL
October 23 - 25, 2007 • San Diego, CA



GP's Energy Services Group offers integrated power plant monitoring and training to increase overall performance.



General Physics Corporation
25 Northpointe Parkway • Suite 100
Amherst, NY 14228

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Leading the World to Better Performance

www.gpworldwide.com

800.803.6737

Advanced Performance Analysis and Troubleshooting for Power Plants (9203-1) 2.45 or 3.15 CEUs

COURSE DESCRIPTION

This 4½ day course is designed to teach attendees how to diagnose root causes of fossil and combined cycle power plant performance deficiencies. Over 25 different case studies are presented and solved, beginning with test data on specific components, followed by pertinent performance calculations, and ending with a “root cause” analysis of the problem. Diagnostic flowpaths, using “expert system” techniques, are provided for many of the case studies. The case studies are based on GP’s extensive experience in troubleshooting and testing all types of power plant equipment. Topics are optimally arranged to allow engineers from both plant types to pick and choose the equipment of most interest to them without any loss of continuity. Attendees have the option of attending the first 3½ days on the Rankine cycle plant, the last 3½ days on the combined cycle plant or the full 4½ day program.

COURSE CONTENT

- Boilers and Air Heaters
- Steam Turbines
- Condensers and Auxiliaries
- Feedwater Heaters
- Gas Turbines
- Combined Cycle
- HRSGs
- Pumps

COURSE OBJECTIVES

At the end of this course, students should be able to:

- Understand the principles of thermodynamics and heat transfer.
- Identify where thermal losses occur.
- Determine if problems are due to equipment or operational difficulties.
- Act to effectively control heat rate.
- Monitor improvements and continually reassess strategies for optimum performance.

WHO SHOULD ATTEND

This course is for experienced power plant engineers and managers who are familiar with the ASME PTCs and knowledgeable in power plant components/systems.

COURSE MATERIALS

The textbook *Advanced Performance Analysis*, diagnostic flowpaths, steam tables, and performance software are provided. Attendees are requested to bring a laptop computer with Microsoft® Excel™. Each attendee will receive a personal copy of the latest version of GPCALCS™.

Improving Combined Cycle Power Plant Performance (9224-1) 2.1 CEUs

COURSE DESCRIPTION

This 3 day course is focused on improving the availability, reliability, capacity, and efficiency of the combined cycle power plant. It provides operators and engineers with an understanding of plant design for performance and the effect of operating parameters on plant efficiency and capacity. Attendees are taken through practical combined cycle thermodynamic principles. Emphasis is placed on the effect of design and operating conditions on plant performance. Performance of the combustion turbine, heat recovery steam generator, and steam turbine is determined using case studies.

COURSE CONTENT

- Thermodynamics Review
- Introduction to Combined Cycle Power Generation
- Gas Turbines
- HRSGs
- Steam Turbines
- Combined Cycle Operation & Maintenance Considerations

COURSE OBJECTIVES

At the end of this course, students should be able to:

- Understand the principles of thermodynamics relating to the combined cycle.
- Describe Brayton cycle and Rankine cycle performance parameters.
- Determine the performance levels of major plant equipment.
- Determine if performance problems are due to equipment or operational issues.
- Act to effectively optimize combined cycle plant performance.

WHO SHOULD ATTEND

This course is designed for control room operators, shift supervisors, plant engineers, and plant management personnel.

COURSE MATERIALS

The textbook *Combined Cycle Power Plant Performance*, steam tables, and a calculator are provided.

Fundamentals of Power Plant Performance for Utility Engineers (9201-1) 3.15 CEUs

COURSE DESCRIPTION

This 4½ day course is designed to teach attendees how to test and monitor power plant equipment and improve unit heat rate. The course presents design and operating theories of power plant equipment. It emphasizes efficiency and testing with full consideration given to the expectations and limits of component equipment. The laws of thermodynamics and the principles of heat transfer are reviewed and applied to equipment operation and efficiency. Actual test data is used to calculate turbine efficiency, condenser cleanliness, turbine cycle heat rate, turbine cycle heat rate corrections, boiler efficiency, and feedwater heater performance. The perspective of performance testing and monitoring is maintained throughout.

COURSE CONTENT

- Overview of ASME Performance Test Codes
- Thermodynamics Review
- Overview of Boilers, Turbines, Feedwater Heaters, Condensers, Pumps, and Cooling Towers
- Test Instrumentation
- Data Evaluation

COURSE OBJECTIVES

At the end of this course, students should be able to:

- Understand and use standard testing methods.
- Determine the performance levels of major plant equipment.
- Test performance accurately and interpret results.
- Improve the efficiency of plant operations.

WHO SHOULD ATTEND

This course is designed for engineers, engineering managers, and plant engineers. *Prerequisite: Good working skills in algebra and graphical interpretation.*

COURSE MATERIALS

The textbook *Fundamentals of Power Plant Performance* and steam tables are provided. Attendees are advised to bring a scientific calculator to class.

Detailed Course Outlines are available on our website at:
www.gpworldwide.com/fossil_fuel_courses/course_catalog.asp

4 Easy Ways to Register

PHONE ▶ 716.799.1080
▶ 800.803.6737

FAX ▶ 716.799.1081

MAIL ▶ General Physics Corporation
25 Northpointe Parkway • Suite 100
Amherst, NY 14228-2213

ONLINE ▶ www.gpworldwide.com/fossil_fuel_courses/registration.asp

All of our courses offer a 10% multi-registrant discount to organizations registering three or more persons for the same class at the same time. Call **716.799.1080** or **800.803.6737** for information on multi-course discounts.

- Fee includes textbook, other course materials, continental breakfasts, and daily beverage breaks.
- Cancellations received more than 15 working days prior to the start of the course are entitled to a full refund.
- Cancellations within 11-14 working days prior to the start of the course are subject to a 20% service charge.
- Those persons who have not canceled ten working days prior to the start of the course and “no shows” are subject to the full fee.

Note: Occasionally, a particular course will not meet a minimum registration requirement. GP reserves the right to cancel such a session at least 15 working days prior to the scheduled start. Participants will be promptly notified and refunded their monies. However, we cannot be responsible for travel-related expenses or reservation penalties.

Please register me for:

Advanced Performance Analysis and Troubleshooting for Power Plants

- January 22 - 26, 2007 _____ Tampa, FL
- June 4 - 8, 2007 _____ Buffalo/Niagara Falls, NY
- October 8 - 12, 2007 _____ Denver, CO

3½ Day Combined or Rankine Cycle Plants

4½ Day Combined and Rankine Cycle Plants

Fundamentals of Power Plant Performance for Utility Engineers

- May 7 - 11, 2007 _____ Chicago, IL
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- September 24 - 28, 2007 _____ Denver, CO

Improving Combined Cycle Power Plant Performance

- February 6 - 8, 2007 _____ Tampa, FL
- October 23 - 25, 2007 _____ San Diego, CA

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E-Mail Address _____

Cancellations: Applicants may cancel up to 15 working days before the first course day for a full refund. Cancellations received later than 11 - 14 working days prior to course are subject to a 20% service charge. Those who have not canceled reservations ten working days prior to the course and “no shows” are subject to the entire fee. Substitutions may be made at any time.

Course Fees

Advanced Performance Analysis and Troubleshooting for Power Plants

3½ Day Combined or Rankine Cycle Plants \$1,750

4½ Day Combined and Rankine Cycle Plants \$1,950

Fundamentals of Power Plant Performance for Utility Engineers

\$1,500

Improving Combined Cycle Power Plant Performance

\$1,050

TRAVEL & LODGING

Participants are responsible for making their own travel and hotel arrangements. A block of rooms are set aside in a local hotel for our students. Be sure to mention GP to ensure receiving the special rate. Maps and hotel information will be mailed to you with your registration confirmation.

GP’s Travel Department can make your travel arrangements and can offer significant discounts on airfares. For assistance, call **800.817.1152** or FAX **410.540.5312**.