GP Strategies® offers integrated power plant monitoring and training to increase overall performance.

Professional Engineers Continuing Education

Individuals are strongly encouraged to check with their specific regulatory boards to confirm that PDHs issued for courses taken from GP Strategies, a PIE and NERC Authorized Provider, will be accepted by that entity.

Instructors

GP Strategies 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.

Reserve your space today!

Online  www.gpstrategies.com/power-plant-courses
Email  energyservicesregistration@gpstrategies.com
Phone  +1.716.799.1080 or 800.803.6737

2020 Course Location: Buffalo/Niagara Falls, NY

Heat Rate Awareness
June 1–3
September 14–16

Combined Cycle Plant Performance
June 3–5
September 16–18

Fundamentals of Power Plant Performance for Utility Engineers
June 8–12
September 21–25

Advanced Performance Analysis and Troubleshooting for Power Plants
June 15–19
September 28–October 2
Heat Rate Awareness**

Course DESCRIPTION
This 2½-day course provides attendees with heat rate concepts, controllable and non-controllable losses, and the effects of component performance on operating costs for a conventional power plant. The focus will be on developing a detailed understanding of the heat rate effects of operating practices, unit optimization, and environmental compliance.

Prerequisites
Basic understanding of conventional power plant operations.

Course CONTENT
- Power Plant Thermodynamics Review
- Calculating the Cost of Heat Rate Deviations
- Controllable Losses
- Boiler
- Turbine
- Condenser
- Feedwater Heaters
- Ancillary Equipment
- Optimization Tools
- Cycle Isolation
- Instrumentation Effects on Heat Rate
- How Does My Job Relate to Heat Rate?

Course OBJECTIVES
At the end of this course, students should be able to:
- Discuss the details of heat rate concepts
- Explain controllable and non-controllable losses
- Explain the effects of component performance on operating costs
- Discuss how heat rate affects operating practices, unit optimization, and environmental compliance

Who Should Attend
This course is designed for operators, supervisors, engineers, and management who are directly involved in the daily operation of the plant.

Course MATERIALS
The textbook Heat Rate Awareness, steam tables, and a calculator are provided.

**This course incorporates material created under the sponsorship of the Electric Power Research Institute (EPRI).

Combined Cycle Plant Performance**

Course DESCRIPTION
This 2½-day course is focused on improving the availability, reliability, capacity, and efficiency of the combined cycle power plant. It teaches attendees how to diagnose root causes of combined cycle power plant performance deficiencies using a case study-based approach. Diagnostic flowcharts are provided and used interactively for the solutions to the case studies.

Prerequisites
Basic understanding of power plant thermodynamics and operations.

Course CONTENT
- Introduction to Combined Cycle Plant Performance
- Thermodynamic Concepts
- Brayton Cycle Performance
- Gas Turbine Component Design and Function
- Gas Turbine Control and Protection
- Rankine Cycle Performance
- Rankine Cycle Equipment Performance
- Evaluating and Troubleshooting Combined Cycle Performance

Course OBJECTIVES
At the end of this course, students should be able to:
- Identify and diagnose root causes of capacity and efficiency degradation
- Quantify the benefits of performance recovery

Who Should Attend
This course is designed for operators, supervisors, engineers, and management who are directly involved in the daily operation of the plant.

Course MATERIALS
The textbook Combined Cycle Plant Performance with troubleshooting flowcharts are provided.

**This course incorporates material created under the sponsorship of the Electric Power Research Institute (EPRI).
Fundamentals of Power Plant Performance for Utility Engineers

2020
June 8–12
September 21–25
Course Location: Buffalo/ Niagara Falls, NY

Course DESCRIPTION
This 4½-day course is designed to teach attendees how to test and monitor coal-fired power plant equipment and improve unit heat rate. The course presents design and operating theories of power plant equipment. It also 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.

Prerequisites
Good working skills in algebra and graphical interpretation.

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:
• Recognize 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.

Course MATERIALS
The textbook, Fundamentals of Power Plant Performance for Utility Engineers, and steam tables are provided. Attendees are advised to bring a scientific calculator to class.

Advanced Performance Analysis and Troubleshooting for Power Plants

2020
June 15–19
September 28–Oct 2
Course Location: Buffalo/ Niagara Falls, NY

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 Strategies’ 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.

Prerequisites
Basic familiarity with equipment performance test methods and power plant thermodynamics.

Course CONTENT
• Boilers and Air Heaters
• Gas Turbines
• Feedwater Heaters
• Pumps
• HRSGs
• Condensers and Auxiliaries
• Steam Turbines
• Combined Cycle

Course OBJECTIVES
At the end of this course, students should be able to:
• Troubleshoot capacity and efficiency shortfalls of all major power plant components
• Identify where thermal losses are occurring
• Determine if problems are due to equipment or operational issues
• Act to effectively improve heat rate
• Monitor improvements and continually reassess strategies for optimum performance

Who Should Attend
This course is for experienced power plant personnel who are knowledgeable in power plant components/systems.

Course MATERIALS
The textbook, Advanced Performance Analysis and Troubleshooting for Power Plants, 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™ software.

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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 +1.716.799.1080 or 800.803.6737 for information on multi-course discounts.

- Fee includes textbook, other course materials, continental breakfasts, lunches, 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.
- Cancellations within 10 working days or fewer prior to the start of the course and "no shows" are subject to the full fee.
- Substitutions may be made at any time.
- GP Strategies reserves the right to cancel the session at least 10 working days prior to the scheduled start. Participants will be promptly notified. However, GP Strategies cannot be responsible for travel-related expenses or reservation penalties.

Registration & Fee

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Heat Rate Awareness*</td>
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<tr>
<td>Combined Cycle Plant Performance</td>
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<tr>
<td>Fundamentals of Power Plant Performance for Utility Engineers</td>
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<td>$1,750</td>
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<tr>
<td>3½-Day Combined or Rankine Cycle Plants</td>
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<td>4½-Day Combined and Rankine Cycle Plants</td>
<td>$1,950</td>
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*$100 discount for members of EPRI Target 71 Heat Rate and Cost Optimization. Contact GP Strategies for Discount Code

Travel & Lodging

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

Method of Payment:

Charge my:  □ Mastercard  □ VISA  □ AMEX  □ Check  □ P.O.

Account # ____________________________  Exp Date ____________  Sec Code ____________

Signature ____________________________

Amount $ ____________________________

□ This confirms my telephone reservation.

Name ____________________________

Signature ____________________________

Title ____________________________

Company ____________________________

Plant Name ____________________________

Address ____________________________

City/State/ZIP ____________________________

Country ____________________________

(____) (____) (____)

Business Phone ____________________________  Fax ____________________________

E-Mail Address ____________________________

CANCELLATIONS: Applicants may cancel up to 15 working days before the first course day for a full refund. Cancellations received within 11-14 working days prior to the start of the course are subject to a 20% service charge. Cancellations 10 working days or fewer prior to the start of the course and “no shows” are subject to the entire fee. Substitutions may be made at any time.