



## Course Information Letter ---- G406

# GENERATOR ELECTRICAL TESTING

G406

This class was created in response to increasing requests for more detail on this subject. For each electrical test in the course topics the presentation will include:

- Purpose of the Test, that is, what do we want to accomplish.
- Safety Considerations
- Test Device Used
- Setup
- Data Collection
- Data Evaluation
- Troubleshooting Considerations

**Topics include:** Generator Theory (Review) • Generator Construction (Review) • STATOR Testing: RTD, DLRO, Insulation Resistance, Dielectric Absorption, DC Current Leakage Test, Dissipation Factor Test, Radio Noise Test, High Potential Testing, Ring Test, Bump Test, EL CID, Capacitance Mapping, Partial Discharge • FIELD Testing: Winding Resistance, Insulation Resistance, Polarization Index, Recurrent Surge Oscillator, AC Impedance, High Potential Testing

## WHAT YOU WILL RECEIVE:

1. 1 copy of HPC Technical Services' textbook, Generator Electrical Testing, a \$195 value, as written by Harold Parker, with technical support by Joe Romeo, John Mitchell and AGT Services. This text contains a significant number of equipment photographs, graphics and data tables. It is a valuable desktop reference in addition to being able to enhance the learning process. (This valuable text is available for purchase if you cannot attend – US\$195).
2. A "Certificate of Completion" with 1.9 CEUs, authorized for issue by the International Associate of Continuing Education/Training.
3. One "Letter of Accomplishment" for those requesting the Certification Examination. Participants who are active in HPC's Certification Program will be required to complete a comprehensive examination upon course completion. As usual, there is a 80% passing requirement.

## COURSE DATES/LOCATION/FEE

For current dates / locations / prices, please see HPC's website, [www.hpcnet.com](http://www.hpcnet.com).

## Generator Electrical Testing – G406

**OBJECTIVES:** Upon completion of this course, participants will be able to:

1. List all those electrical tests commonly performed on large AC generator stators.
2. List all those electrical tests commonly performed on a large AC generator field.
3. For each electrical test listed, describe the purpose of conducting that test; i.e., what are we looking for as a result of the test?
4. For each electrical test listed, describe safety considerations associated with that test and what should be planned to ensure safety.
5. For each electrical test listed, describe proper setup of equipment.
6. For each electrical test listed, describe data collection procedures that will result in meaningful data.
7. For each electrical test listed, demonstrate the ability to interpret test data (as that data might apply to more common issues).
8. For each electrical test listed, demonstrate the ability to troubleshoot routine problems.

## FREQUENTLY ASKED QUESTIONS

- Will HPC Technical Services bring this course to our location for our personnel only? YES, call or email Stephen Parker, [stparker@hpcnet.com](mailto:stparker@hpcnet.com) for a price quotation. Please note, however, you need to have lab facilities. Our equipment can be transported or labs can be set up with available equipment on-site.
- Will HPC Technical Services customize the presentation at our site to suit our particular needs? Yes.
- Is HPC Technical Services' textbook available for purchase as a reference document? Yes. \$195 + S&H.
- What is the cost for HPC Technical Service to deliver this course at our location? Well, of course that can vary, but generally speaking, if you're planning on having 6+ attend, when considering your T&L, it is to your advantage to perform the course at your plant (office). You gain from the customization and price.
- Can HPC Technical Services provide "Technical Assistance" in the planning and implementation of our outages? Yes we can. Call or contact Harold Parker, [hparker@hpcnet.com](mailto:hparker@hpcnet.com) for our rate sheets and any further information required.

## COURSE SYNOPSIS

### Day One

#### **Generator Theory (Review)**

**Generator Construction (Review):** Stator Frame, Core, Windings, End Shield, Rotor Body, Field Windings, Retaining Rings, Collector Rings, Diesel and Hydroelectric Differences

#### **Review of Tests Typically Performed: Purpose and Overview**

### Day Two

**STATOR:** Winding Resistance, Insulation Resistance, Dielectric Absorption, Direct Current Leakage, Dissipation Factor Test, Radio Noise (Corona), High Potential Test, Ring Test, EL-CID

### Day Three

**ROTOR:** Resistance Test, PI, Impedance Testing, Flux Pattern Test, Pole Drop, High Potential Testing

**Certification Examination for those who request it.**

## GENERATOR MAINTENANCE CERTIFICATION:

There are three levels of certification (All levels require this course):

1. Engineer
2. Mechanical Maintenance Technician
3. Electrical Maintenance Technician

Those who attend this course are automatically qualified to take HPC Technical Services' Certification Examination. This examination is offered at no additional expense to the participant. An 80% passing grade is required. The examination length will not exceed 2-hours. Those who complete this examination will receive a revised "certificate of completion" that recognizes this accomplishment along with two-copies of a "To Whom It May Concern" letter that states their accomplishment. (Two copies are provided, one for the participants' employer and one for the participants' personal file.)

Consult HPC's website, [www.hpcnet.com](http://www.hpcnet.com), for detail on this certification program.

## HPC INSTRUCTOR / CONSULTANT (S):



**John Mitchell.** John Mitchell is a multi-talented leader with over 33 years management, engineering, installation and maintenance experience in thermoelectric power plants. He is especially an expert in steam turbines, generators and their controls. Prior to June 2003 (when he accepted an early retirement package from GE), John was a Customer Training Specialist with the GE International Department. Other past responsibilities included being Manager, Engineering Services, Senior Application Engineer, Senior Service Engineer, Lead Training Specialist, Program Support Engineer, Instructor Technical Training, and Field Engineer. All of this on operation & maintenance of steam turbine generator hardware and controls. John resides in Schenectady NY.

**Robert Johndrow.** Bob Johndrow has been a GE Field Engineer specializing in many disciplines including Generator Maintenance and Testing. Bob completed GE's Generator Specialist Training Program early in his career and has been involved in many generator design issues, mechanical maintenance, electrical testing, and troubleshooting O&M problems since then. Bob earned a BS in Industrial Distribution from Clarkson University in Potsdam NY and also has GE Six Sigma Green Belt Certification. Bob accepted an early retirement package late 2003 and has worked as an independent as well as being associated with HPC Technical Services since then. He resides in Connecticut.

**Joe Romeo.** Mr. Romeo provides consulting services through his company, JR Consulting. He provides engineering services in assisting clients in planning maintenance outages on power generation equipment, provides job management services, writes repair procedures on generator stators and fields, investigates failures, provides re-build specifications, provides 2nd opinions on repair procedures, investigates insurance claims, provides electrical test services, assists clients in evaluating OEM procedures, and time permitting, supports HPC Technical Services on meeting its training requirements. Joe has been a recognized "generator specialist" since 1967 and currently resides near Richmond VA.

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**HPC TECHNICAL SERVICES**  
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Website: [www.hpcnet.com](http://www.hpcnet.com)

**REGISTRATION FORM**

Company: \_\_\_\_\_

Plant: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_ FAX: \_\_\_\_\_

Course Number/Title: \_\_\_\_\_

Course Dates: \_\_\_\_/\_\_\_\_/\_\_\_\_ Thru \_\_\_\_/\_\_\_\_/\_\_\_\_

Course Location: \_\_\_\_\_ Course Fee: \_\_\_\_\_

**PLEASE ENROLL THE FOLLOWING INDIVIDUAL(S) LISTED BELOW:**

Student #1: \_\_\_\_\_ Email: \_\_\_\_\_

Student #2: \_\_\_\_\_ Email: \_\_\_\_\_

Taking advantage of HPC’s 3-4-2 Policy: Send 3, Pay for 2 when paying in advance.

Student #3: \_\_\_\_\_ Email: \_\_\_\_\_

**ENROLLED BY:** \_\_\_\_\_ **Email:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**METHOD OF PAYMENT**

Check to Follow: \_\_\_\_\_

Check Enclosed #: \_\_\_\_\_

MC/Visa/AMEX #: \_\_\_\_\_

Expiration Date: \_\_\_\_\_ CV Code: \_\_\_\_\_

Purchase Order #: \_\_\_\_\_

**Please advise how you found out about this course initially.**

- Website search
- Fax advertisement
- Magazine advertisement
- Familiar with HPC
- HPC mailing
- Other: \_\_\_\_\_