



Course Information Letter ---- G305

GENERATOR MAINTENANCE & TESTING

G305

There are NO SMALL PROBLEMS when it comes to your GENERATOR!! Be prepared for your next outage. Make sure you fully understand Safety, Testing, Inspection/Repair as well as disassembly/reassembly. Don't be surprised. Be prepared. Register for this course today. This course is designed for plant engineers who have a specific need to better understand generator equipment. Plant electrical and mechanical maintenance technician's benefit as well.

- Corona discharge, what does that mean?
- How do you repair fused stator punchings?
- What components should be high potential tested?
- How can we avoid accidental injury when testing the generator?
- What are the probable causes of grounded fields?
- ...And the list of answered questions goes on!!

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

1. Describe the major activities associated with generator maintenance.
2. Describe proper generator disassembly and reassembly sequences.
3. Describe the procedures for cleaning generator components.
4. Describe the procedures for inspection of generator components.
5. Given any generator component, describe the types of damage that might be found, and what are probable causes of that damage.
6. Describe the various repair methods for defective component condition.
7. List all those electrical tests commonly performed on large AC generators.
8. 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?
9. Describe the procedures for the various generator tests.
10. List and describe safety precautions for the conducting of these electrical tests.

COURSE DATES/LOCATION/FEE

For current dates / locations / prices, please see HPC's website, www.hpcnet.com.

Registration / Scheduling note: This course is that last 1.5 days of HPC Technical Services' course called Utility Generators, G401. For information on what is included in the first three days, please consult our website on this course. We recommend attendance in G401, but recognize there is for some their interests lie in maintenance ONLY, so we offer this option.

COURSE TOPICAL OUTLINE

Thursday

Outage Planning & Scheduling: Why Maintenance, Preparation, Tooling, Documentation, Pre-Shutdown Maintenance, Decision Making

Generator Mechanical Maintenance Activities: Why Generators Fail, Special Tools, Spare Parts, Safety Precautions, Disassembly/Reassembly Procedure, Cleaning and Checklists. Stator Visual Inspection to include; Loose Slot Wedges, Discoloration, Loose Punchings, Bar Vibration, Girth Cracks, Corona, Loose/Broken Ties, Liquid Connections, Air Baffles, Oil Deflectors, and Hydrogen Seals. Rotor Visual Inspection to include Collector Rings, Rotor Journal Surface, Terminal Studs, Hydrogen Seal areas, Axial Flow Fans, End Turns, Field Slot Wedges, Retaining Rings.

Friday

Purpose of Generator Electrical Tests: Safety Considerations, STATOR: Winding Resistance, Insulation Resistance, Dielectric Absorption, Direct Current Leakage, Dissipation Factor Test, Radio Noise (Corona), High Potential Test, Ring Test, EL-CID and for the ROTOR: Resistance Test, PI, Impedance Testing, Flux Pattern Test, Pole Drop, High Potential Testing, Air Gap Flux Probe Testing.

Certification Examination

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 for a price quotation.
- 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 our Generator Technologies text, that includes generator maintenance, is available at \$219 + 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 for our rate sheets and any further information required.

WHAT YOU WILL RECEIVE:

1. 1 copy of HPC Technical Services' textbook, Generator Maintenance, as written by Harold Parker, with technical support by via HPC's Advanced Generator Maintenance Seminar personnel, primarily 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.
2. A "Certificate of Completion" with 1.0 CEUs, authorized for issue by the International Associate of Continuing Education/Training.

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, for detail on this certification program.

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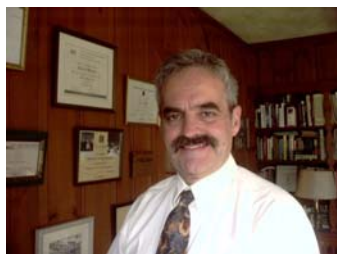
www.hpcnet.com

HPC INSTRUCTOR / CONSULTANT (S):



Harold Parker is the founder & President of H Parker & Company, Inc. Mr. Parker has worked in the "Power Generation" industry for 36 years, 14-years with GE as a Field Engineer, Start-Up Engineer, Technical Training Specialist and Manager. In 1983 Mr. Parker resigned from GE and started a training company, Schenectady Learning Systems, in Schenectady NY, which evolved into H Parker & Company, Inc. today. During this post-GE period, Mr. Parker was briefly employed as Manager Turbine-Generator Services with General Physics (2-years) and as a Field Engineer with Mechanical Dynamics & Analysis (2-years). Mr. Parker is the primary contributor to the development of the text used in this course presentation. Mr. Parker holds a BSME ('69 from Lawrence Institute of Technology), a MBA ('81 from the State University of New York @ Albany) and is a member of ASME, ASTD and IEEE

Brendan Bennett has over 20 years hands on experience in all areas of power generation as a field engineer, generator specialist, and project manager. His employment history includes General Electric, Trans Alta Utilities and Manitoba Hydro. At General Electric, he provided technical direction on the repair and overhaul of gas turbines, steam turbines and generators, including generator rewinds ranging in size of 30 to 1200 megawatts. His experience includes GE Frame 5, 6, 7 and 9 gas turbines, D-11 steam turbines, and Alstom and Hitachi generators. As a project manager at Trans Alta, he was responsible for managing capital projects for three large thermal generating stations. This included tracking costs, developing and monitoring work progress and coordination of schedule conflicts. He has also performed risk analysis and investigated equipment performance issues.



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 hired into GE as a field engineer on the same day as HPC's founder, Harold Parker. That was 36-years ago. Since that date, 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 Rhode Island.

Sal Paolucci has over 28 years of, (GE frame 3, 5, 6, & 7) Gas Turbine Operation, Maintenance, Installation, Start-up, and troubleshooting Gas Turbine Controls; MK2, MK4, & MK5. 10 years of experience in Combine Cycle Plant, Outage Planning, Plant Spare parts, and Plant Performance (Heat Rate). BSME Cleveland State University, Cleveland OH. Career includes approximately 15-years as a GE field engineer servicing clientele in the USA as well as internationally. He also worked for 10-years (5 in operations and 5 in maintenance) for Mass Power, in Massachusetts. He currently resides in the Boston MA area.

RECENTLY SATISFIED CLIENTS:

AES, Alstom Power, AmerGen Energy, Arizona PSC, Associated Electric Cooperative, ATCO Electric, BP Products, Braintree (MA) Electric Lighting Dept., Cardinal Operating Company, Cayman Islands Utilities, Chelan County PUD, Chevron Geothermal Salak, Connectiv Operating Services, Consolidated Edison, Detroit Edison, Doosan Heavy Industries, Duke Energy, Dynegy Power, Eastman Chemical, Edison Mission Energy, El Paso Electric, Enron, Entergy-Arkansas, Entergy-Louisiana, Entertainment & Engineering Operations, Exelon Nuclear, Exxon-Mobil, Foster Wheeler, Georgia Power, Hawthorne Power Services, Hovensa Oil Refinery, Iberdola (Spain), Institute for Nuclear Power Operators (INPO), International Paper, Kansas City Board of Public Utilities, Korea Midland Power Company, Korea Nuclear & Hydro Company, Korea Plant Services & Engineering, Korea Southern Power, L&S Industries, Madison Gas & Electric, MidAmerican Energy, New England Power, North America Energy Services, Northern Star Generation, NRG, Nuclenor (Spain), Oklahoma Gas & Electric, Orange County Sanitation Department, Orrville City (OH) Utilities, Ottumwa (IA) Water Works, Portland G&E, Progress Energy, Pyro-Pacific Cogen, SaskPower (Canada), Seattle City Lighting, Sierra Pacific Power, Sithe Energies, Southern California Edison, Southwestern Electric Power, Standard Aero Energy (Canada), Syncrude Canada, Tennessee Valley Authority, Texas Municipal Power Agency, Tolko (Canada), University of Texas, TransAlta Utilities, Trigen Cinergy Solutions, US Army Corps of Engineers, US Bureau of Reclamation, US Navy, US Power Gen, Vermont Yankee, Wisconsin Public Service, Xcel Energy

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www.hpcnet.com

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Website: 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: _____

Student #2: _____

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

Student #3: _____

Enrolled by: _____ **Date:** _____

METHOD OF PAYMENT

Check to Follow: _____

Check Enclosed #: _____

MC/Visa/AMEX #: _____

Expiration Date: _____ CV Code: _____

Purchase Order #: _____

HOW DID YOU LEARN OF THIS COURSE?

Familiar with HPC courses

Received a fax

Received an email

Internet search

Fellow employee

Other: _____