Announcement

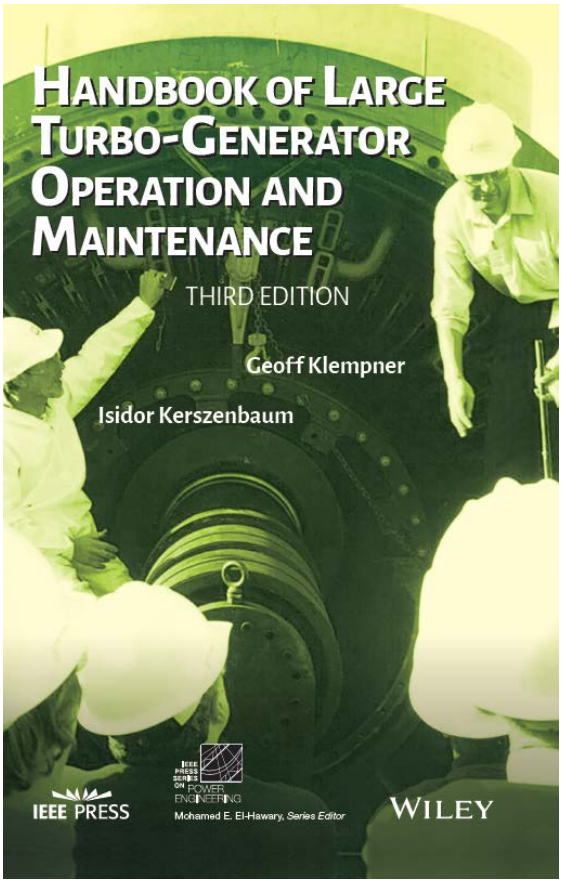
"Large Turbo-Generators – Design, Operation and Maintenance"

IZZYTECH LLC and GSK GENERATOR ENGINEERING LTD. are sponsoring a 5-day technical course. It is our pleasure to invite you to participate in the seminar, **"Large Turbo-Generators – Design, Operation and Maintenance"**. The course conveys the most current information presented by generator specialists Geoff Klempner and Isidor (Izzy) Kerszenbaum. The course will be held in **Irvine, California** on **January 13-17, 2020.**

Target Audience:
This seminar is designed for power plant and repair shop engineers and managers, turbine-generator maintenance personnel, repair vendor's personnel, and personnel engaged in the selection of inspection/evaluation/repair services.

Course Materials:
The course is based on the comprehensive textbook; "Handbook of Large Turbo-Generator Operation and Maintenance", co-Authored by Geoff Klempner and Isidor Kerszenbaum.

A copy of the book will be supplied as the course material.

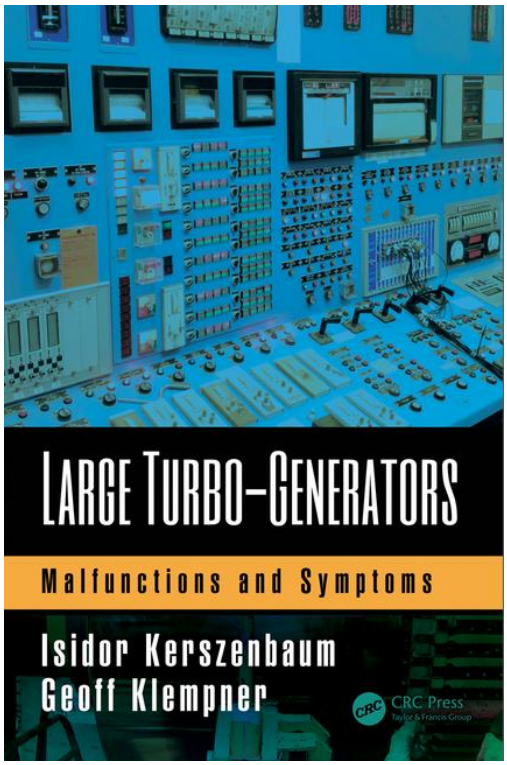


This book is a comprehensive guide for the full range of aspects of large turbo-generators and a detailed reference on the topics of:

- Basic machine principles and theory
- Design and construction of generators and auxiliary systems
- Generator operation, including interaction with the grid
- Monitoring, diagnostics and protection of turbo-generators
- Inspection practices, including stator, rotor and auxiliary systems
- Maintenance testing, including electrical and non-destructive examination
- Ideas on maintenance strategies and life cycle management
- Uprating and long-term storage of generators

It is based on the authors' combined sixty-plus years of generating station and design work experience. The information presented in the book is designed to inform the reader about actual machine operational problems and failure modes that occur in generating stations and other types of facilities.

The book itself is an excellent resource for operators and inspectors of large utility and industrial generating facilities who deal with multiple units of varying size, origin, and vintage. It is also an excellent learning tool for students, consulting and design engineers. It offers the complete scope of information regarding operation and maintenance of all types of turbine-driven generators built in the world, as detailed above. The book comes loaded with photos and graphs, commonly used inspection forms, and extensive references for each topic. It is an indispensable reference for anyone involved in the design, construction, operation, protection, maintenance, and troubleshooting of large generators in generating stations and industrial power facilities.



Students that work in, or support power plants, may consider purchasing from the CRC or other online company a copy of the book by the same authors titled "Large Turbo-Generators / Malfunctions and Symptoms". This book complements the "Handbook" mentioned above. It presents a comprehensive list of about every type of malfunction that may afflict a generator, and its symptoms.

The book has a section on how to respond to generator trips and alarms. It also contains a section on monitoring of the generator functions.

The book is all in color (graphs, photos and font!)

This book is a "must-have" for operators and engineers in power plants.

This generator course has been presented numerous times on behalf EPRI and directly to various utilities, OEMs, and other organizations around the world. It has been given in the UK, South Africa, Australia, Israel, Malaysia, Canada and the USA. It is well established over many years, with about 3,000 slides, covering the entire book content as well as additional information, presented over the five-day period. It has been presented in Irvine several times over the last decade, every time including new information from the latest operational experiences. The Irvine seminar is open to all.

Course Content:

PART 1 THEORY, CONSTRUCTION AND OPERATION

Chapter 1: Principles of Operation of Synchronous Machines
Chapter 2: Generator Design and Construction
Chapter 3: Generator Auxiliary Systems
Chapter 4: Operation and Control
Chapter 5: Monitoring and Diagnostics
Chapter 6: Generator Protection

PART 2 INSPECTION, MAINTENANCE AND TESTING

Chapter 7: Inspection Practices and Methodologies
Chapter 8: Stator Inspection
Chapter 9: Rotor Inspection
Chapter 10: Auxiliaries Inspection
Chapter 11: Generator Maintenance Testing
Chapter 12: Maintenance
Chapter 13: New grid codes and how they affect generator design and operation

Course Details:

Date: 2020, Monday, January 13, to Friday 17.
Time: 8:00am to 4:30pm daily
Light continental breakfast at 7:30am daily at the lecture room
Location: Wyndham Irvine Hotel, Irvine, California
Cost: $2,200 USD

Presentation of the course will be by both authors.

GEOFF KLEMPNER

Geoff is an IEEE Fellow and a large rotating electrical machines specialist in the power industry. He is a consulting engineer in GSK Engineering, located in Toronto, Canada. His areas of expertise include: large generator and motors, including, inspection, testing, design evaluation, failure analysis, electromagnetic FE analysis, life assessment, preparation of technical specifications and test procedures.

Previously he worked for several years as a Senior Consulting Engineer in NSS-AMEC, and Senior Engineer-Specialist in Ontario Hydro (now Ontario Power Generation) for over 25 years. His responsibilities included: Engineering improvements and modifications to generating station power equipment, specifically large generators and motors. He provided advice to project engineers and generating station maintenance and operation staff. These activities covered the technical areas as above, also including financial evaluations and tender evaluation.

His consulting activities have included assistance to Southern California Edison, PG&E, ESKOM, Ameren UE, Duke Power, Delta Electricity, GE, Alstom and Ontario Power Generation, to name a few. He has also worked extensively on EPRI projects, concerning electrical machines and monitoring. Geoff has authored or co-authored numerous papers and documents, listing over 50 articles, and has an extensive background of professional activities, with IEEE, EPRI and CIGRE.

ISIDOR (Izzy) KERSZENBAUM, Ph.D.

Izzy is an IEEE Fellow, located in Irvine, CA. He is a generator specialist consulting to power plants on operation, maintenance and troubleshooting of large motors and generators. He consults through IzzyTech LLC.

He started his career as a high-voltage protection engineer, moving next into the world of rotating machines, first as a designer and R&D engineer, and then as a specialist on large synchronous generators. He also spent a number of years in design and R&D of power transformers. During his professional career, Izzy has consulted to power plants, both within the Edison International family of generating stations, as well as others, on generators.

Izzy has published many technical papers and authored and co-authored two books on the operation and maintenance of large synchronous generators. He's a past Chair of the Electric Machines Committee of the IEEE-PES. He is past chair of the Working Group 3 of the Electric Machines Committee of the IEEE-PES, and also past chair of WG10. He was the technical chair of the 1999 International Electric Machines and Drives Conference held in Seattle and the co-technical chair of the same conference held in Miami in 2009.

Izzy has been very active in EPRI and the IEEE regarding the operation and maintenance of large generators.

Together with Geoff Klempner, he has held a number of very successful seminars like this one.

Day 1 - Monday

7:30 am Continental breakfast

8:00 am Introduction

8:15 am PRINCIPLES OF OPERATION OF SYNCHRONOUS MACHINES
- Introduction to Basic Notions on Electric Power
- Electrical – Mechanical Equivalence
- Alternated Circuits (AC) / Three-Phase Circuits
- Basic Principles of Machine Operation / The Synchronous Machine
- Basic Operation of the Synchronous Machine

10:00 am Break

10:30 am GENERATOR DESIGN AND CONSTRUCTION
- Stator Core and Frame
- Flux and Armature Reaction / Electro-magnetics
- End-Region Effects and Flux Shielding
- Stator Core and Frame Forces
- Stator Windings and Wedges
- End-Winding Support Systems
- Stator Winding Configurations
- Stator Terminal Connections

12:00 noon Lunch

1:00 pm GENERATOR DESIGN AND CONSTRUCTION
- Rotor Forging
- Rotor Winding and Slot Wedges / Amortisseur Winding
- Retaining-Rings

2:30 pm Break

3:00 pm GENERATOR DESIGN AND CONSTRUCTION
- Bore Copper and Terminal Connectors
- Slip/Collector Rings and Brushgear
- Rotor Shrink Coupling / Rotor Turning Gear
- Bearings
- Air and Hydrogen Cooling / Rotor Fans
- Hydrogen Containment / Hydrogen Coolers

4:30 pm Adjourn

Day 2 - Tuesday

7:30 am Continental breakfast

8:00 am GENERATOR AUXILIARIES (SYSTEM CONFIGURATIONS AND INSPECTION)
- Lube Oil System
- Hydrogen Cooling System
- Seal Oil System
- Stator Cooling Water System
- Exciter Systems

10:00 am Break

10:30 am OPERATION AND CONTROL
- Basic Operating Parameters
- Operating Modes
- Machine Curves
- Special Operating Conditions
- Basic Operation Concepts

10:30 am OPERATION AND CONTROL

12:00 noon Lunch

1:00 pm OPERATION AND CONTROL
- System Considerations
- Grid Induced Torsional Vibrations

2:30 pm Break

3:00 pm OPERATION AND CONTROL
- Excitation and Voltage Regulation
- Performance Curves
- Sample of Generator Operating Instructions

4:30 pm Adjourn

Day 3 - Wednesday

7:30 am Continental breakfast

8:00 am MONITORING AND DIAGNOSTICS
- Generator Monitoring Philosophies
- Simple Monitoring with Static Hi Level Alarm Limits
- Dynamic Monitoring with Load Varying Alarm Limits
- Artificial Intelligence Diagnostic Systems

10:00 am Break

10:30 am MONITORING AND DIAGNOSTICS
- Monitored Parameters

12:00 noon Lunch

1:00 pm GENERATOR PROTECTION
- Basic Philosophy
- Generator Protective Functions
- Brief Description of Protective Functions
- Specialized Protection Schemes
- Tripping and Alarming Methods

2:30 pm Break

3:00 pm INSPECTION PRACTICES AND METHODOLOGIES
- Site Preparation
- Experience and Training
- Safety Procedures – Electrical Clearances
- Inspection Frequency
- Generator Accessibility
- Inspection Tools
- Inspection Forms

4:30 pm Adjourn

Day 4 - Thursday

7:30 am Continental breakfast

8:00 am STATOR INSPECTION
- Stator Frame and Casing
- Stator Core

10:00 am Break

10:30 am STATOR INSPECTION
- Stator Windings
- Phase Connectors and Terminals
- Hydrogen Coolers

12:00 noon Lunch

1:00 pm ROTOR INSPECTION
- Rotor Removal
- Rotor Cleanliness
- Retaining Rings
- Fretting/Movement at Interference-Fit Surfaces of Wedges and Rings
- Centering (Balance) Rings / Fan Rings or Hubs / Fan Blades
- Bearings and Journals
- Balance Weights and Bolts
- End Wedges and Damper Windings / Other Wedges
- Windings General / End-Windings and Main Leads

2:30 pm Break

3:00 pm ROTOR INSPECTION
- Collector Rings / Collector Ring Insulation
- Bore Copper and Radial (Vertical) Terminal Stud Connectors
- Brush-Spring Pressure and General Condition / Brush Rigging
- Shaft Voltage Discharge (Grounding) Brushes
- Rotor Winding Main Lead Hydrogen Sealing - Inner and Outer
- Circumferential Pole Slots (Body Flex Slots)
- Blocked Rotor Radial Vent Holes – Shifting of Winding and/or Insulation
- Couplings and Coupling-Bolts / Bearing Insulation / Hydrogen Seals

4:30 pm Adjourn

Day 5 - Friday

7:30 am Continental breakfast

8:00 am GENERATOR MAINTENANCE TESTING
- Stator Core Mechanical Tests
- Stator Core Electrical Tests
- Stator Winding Mechanical Tests
- Water Cooled Stator Winding Tests
- Stator Winding Electrical Tests

10:00 am Break

10:30 am GENERATOR MAINTENANCE TESTING
- Rotor Mechanical Testing
- Rotor Electrical Testing
- Hydrogen Seals / Bearings
- Thermal Sensitivity Test & Analysis
- Heat Run Testing
- Hydrogen Leak Detection

12:00 noon Lunch

1:00 pm MAINTENANCE
- General Maintenance Philosophies
- Operational and Maintenance History
- Maintenance Intervals / Frequency
- Type of Maintenance
- Work Site Location / Work Force / Spare Parts

2:30 pm Break

3:00 pm MAINTENANCE
- Uprating
- Life Cycle Management
- Single Point Vulnerability

3:30 pm NEW GRID CODES / EFFECT ON GENERATOR DESIGN AND OPERATION

4:30 pm Adjourn

Additional Details:

Attendance is limited to 30 people on a first-come, first-serve basis. Please register on-line at: www.izzytech.com

Or return the completed registration form and your check (payable to IZZYTECH LLC) to the address on the registration form. The fee per person is $2,200 U.S. This fee includes light breakfast, refreshments at breaks, and a hard copy of the course books. The classes will start at 8:00 a.m. and end at 4:30 p.m., with breaks in between and a one-hour lunch break at 12 noon. Lunch is not provided but is readily available at the hotel and several locations next to it.

Recording / Photography:

No filming, photography, or recording allowed at any point during the training.

Accommodations:

Wyndham Irvine Hotel
17941 Von Karman Ave, Irvine, CA 92614
Phone: 949-863-1999

Attendees must make their own hotel room reservations.
We have arranged a special rate of $139.00 per night (double occupancy) at the seminar hotel and special rate of $12 per day for parking. To obtain these rates you must book with the hotel before December 23, 2019 and you must state during the booking that you are coming to attend the *IZZYTECH LLC, LARGE TURBINE GENERATOR O&M SEMINAR*.

The hotel is located just off the San Diego Freeway (Interstate 405) on Von Karman Ave and Main Street. John Wayne airport (SNA) is right next-door, and Los Angeles airport (LAX) is about 50 minutes away. There are free shuttles from/to the hotel and the John Wayne airport. After collecting your baggage use the courtesy phones to ask for a shuttle.

This is one of the nicest areas in Southern California, with great weather. Disneyland and other attractions are only a short drive away.

Enquiries:

Izzy Kerszenbaum Tel: 949-733-0458
Email: info@izzytech.com

Geoff Klempner Tel: 416-276-8901
Email: gskgeneng@aol.com

Registration Form

Large Turbo-Generators – Design, Operation and Maintenance
5 day technical course

Registration fee is $2,200 USD per attendee.

Payment can be made by credit card on our website at:
www.izzytech.com

Website registration is a two-step process. Please complete (1) the online contact form AND (2) payment through the IZZYTECH LLC merchant secure payment webpage.

Payment by check can be made by returning this registration form and your check (payable to IZZYTECH LLC) to:

IZZYTECH LLC – Electric Power Consulting Engineering
PO BOX 50636
Irvine CA 92619-0636

Name of Registrant _____

Title/Department _____

Organization _____

Address _____

_____

City/State/Zip/Country _____

Phone ( ) _____ Fax ( )_____

E-mail Address _____

Signature: _____

Disclaimers
IZZYTECH LLC reserves the right to cancel the course up to one week prior to the course start date, should not enough participants be secured to hold the course. A full refund will be given should this occur.

Cameras/Recordings are not allowed and cell phones must be put on silent mode.

Cancellation Policy
Cancellation by attendees before September 30, 2019 will result in a reimbursement of 90% of the paid seminar fee. Cancellations between October 1 and October 31 will result in a reimbursement of 50% of the paid seminar fee. No refunds after October 31, 2019.