

# Hydrogenerator Maintenance Course

August 13-15, 2019  
Montreal, Canada



## OVERVIEW

Stator winding problems have been identified in over 40% of all hydraulic generators having modern thermoset windings. This coupled with less frequent but equally expensive rotor winding failures means that almost 50% of hydrogenerator failures are caused by the deterioration of rotor and stator windings. To capture additional failures related to the fixation of mechanical components

(bearings, rim, poles, foundations joints) modern monitoring systems include vibration and air gap monitoring along with electrical parameters and process parameters (temperatures, pressures, flow) for a broad understanding of machine behavior during operation, both electrically and mechanically.

Preventing machine failures involves a thorough understanding and appreciation of the design, function and interaction of all major components that make up typical machine. Proper training and education on machine component function, specification, testing, monitoring, maintenance and preparing effective repair specifications is the first step in prevention.

## SEMINAR OBJECTIVES

The course focuses on hydro-electric generators. Although much of the discussion relates to synchronous machines rated greater than 10MVA and 6.9kV the principles apply equally to generators of all sizes down to 4kV. Discussion will concentrate on stators (frames, windings and laminated cores), rotors (windings, rims and spiders), as well as brackets, bearings and cooling. The course is presented from an end user perspective, rather than that of a machine designer.

## WHO SHOULD ATTEND?

This course is directed at engineering and maintenance personnel responsible for the purchase, installation, maintenance, testing and repair of hydrogenerators.

## Course Instructors

**Dr. Nicolas Dehlinger** is a Rotating Machine Engineer at Iris Power (Qualitrol). He graduated from the Université Laval, Québec, Canada, in 2007 (M.Sc.) and in 2011 (Ph.D.), with a specialization in Electrical Machine Design. Since 2010, he has been working as an electrical design engineer for GE (formerly Alstom) in Tracy, Canada and in Denver, USA. He was mainly involved in generator refurbishment projects, repair/testing and assessment of generator windings and cores.

**Dr. Greg Stone** was one of the developers of on-line partial discharge test methods to evaluate the condition of the high voltage insulation in stator windings. From 1975 to 1990 he was a Dielectrics Engineer with Ontario Hydro, a large Canadian power generation company. Since 1990, Dr. Stone has been employed at Iris Power L.P. in Toronto Canada, a motor and generator condition monitoring company he helped to form. He has published two books and >200 papers concerned with rotating machine windings. He has awards from the IEEE, Cigre and IEC for his technical contributions to rotating machine assessment. Greg Stone has a BSc, MSc and PhD in Electrical Engineering from the University of Waterloo (Canada), is a Fellow of the IEEE. He is a registered professional engineer in the Province of Ontario, Canada.

## AGENDA

### Day 1

#### Introduction and Stator Windings

8:30am to 4:30pm

- Introduction
- Component overview
- Stator frames and cores
- Stator winding design and installation

### Day 2

#### Stator Windings and Core

8:30am to 4:30pm

- Stator winding/core failure mechanisms, monitoring and testing
- Stator winding/core repair

### Day 3

#### Stators and Rotors

8:30am to 4:30pm

- Rotor design; rims, spiders, windings, brackets, bearing and cooling
- Rotor failure mechanisms, monitoring and testing
- General question period

Registration form on page 2

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To register for the seminar please send completed form with credit card information to fax # 905-677-8498 or e-mail to [khoward@qualitrolcorp.com](mailto:khoward@qualitrolcorp.com). If paying by check please make check payable to Iris Power LP and send to 3110 American Drive, Mississauga, Ontario, L4V 1T2. Please write "Iris Hydro Course" on the check to ensure that it is received by the appropriate department and include a completed registration form with payment.

Name: \_\_\_\_\_

Title: \_\_\_\_\_

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

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

City & Province/State: \_\_\_\_\_

Postal/Zip Code: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

Special Dietary needs: \_\_\_\_\_

\_\_\_\_\_

Please print email address clearly

Payment made via:

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Visa                  MasterCard

Card #: \_\_\_\_\_ CVS # \_\_\_\_\_ Exp. Date: \_\_\_\_\_

Card Holder Name: \_\_\_\_\_

Signature: \_\_\_\_\_

## **REGISTRATION** Only 20 seats available, so register now.

Registration includes breakfast, lunch and breaks daily.

A complete set of notes is also included.

## **PRICE DOES NOT INCLUDE HOTEL ACCOMMODATIONS.**

Confirmation will be issued upon receipt of payment.

## **COST**

**\$1495.00 USD**

Send registration to:

Karen Howard

Fax: 905-677-8498

[khoward@qualitrolcorp.com](mailto:khoward@qualitrolcorp.com)

Tel.: 905-364-4568

## **Location of Venue**

Le Westin Montreal

270, Saint-Antoine Ouest

Montréal, Québec H2Y 0A3

Canada

(514) 380-3333

Room Rate: \$249.00 Canadian

Book room online

## **CANCELLATION POLICY**

Cancellation received 30 days prior to date of seminar will result in a \$75.00 US processing fee. Withdrawal received up to one week prior to the seminar will be subjected to a charge of \$150.00 US. There will be no refunds a week prior to the seminar. Delegations substitution is permitted.