



# IEEE Canada

## Northern Canada Section



### IEEE-NCS, IAS/PES Presents

Wednesday, April 19<sup>th</sup>, 2017, 6:00 to 8:00pm, doors open at 5:30pm

## **IAS Distinguished Lecturer Technical Seminars**

### *“Effects of Modern Variable Speed Drives on Motor Winding Insulation”*

*Presented by Blake Lloyd*

#### **Abstract:**

For over 70 years, researchers have understood that fast rise-time voltage surges from a circuit breaker closing can lead to an electrical breakdown of the turn insulation in motor stator windings. Rapid advances in power electronic components in the past decade have led to a new source of voltage surges. Inverter-fed drives (IFDs) of the pulse width modulated (PWM) type that use insulated-gate bipolar junction transistors (IGBTs) can create tens of thousands of fast rise-time voltage surges per second. Anecdotal evidence suggests that the large number of voltage surges from IFDs can lead to gradual deteriorations and eventual failure of the turn insulation—both in low voltage (less than 1,000V) and medium voltage (2.3 to 4.16kV) motors.

This presentation describes the characteristics of voltage source PWM drives Impact on random wound (LV) motor stators as well as the impact on form wound (MV) stators. It will also describe the relevant standards to qualify insulation systems for converter fed motors.

### About the Speaker:



**Blake Lloyd**, PEng, Fellow IEEE, Director – Product Development, Iris Power.

Mr. Lloyd is an Electrical Engineer with extensive experience in instrumentation and product development. In past lives, he worked in software development and then in the Electrical Research Department at Ontario Hydro, where he was responsible for conducting research into advanced measurement, testing, and diagnostic monitoring techniques for rotating machines and insulation systems. Since co-founding Iris Power in 1990, Mr. Lloyd has been one of the principle architects of Iris's line of diagnostic instrumentation and analysis software for rotating machine condition assessment. Products include on-line partial discharge monitoring, air gap flux monitoring, current signature analysis, end-winding vibration, shaft voltage and current monitoring, as well as several off-line test instruments. Mr. Lloyd has two US patents, and has published 20 refereed papers in IEEE and CIGRE, as well as over 40 conference papers.

He has been a Member of IEEE since 1985 serving in the following capacities:

- 1992-1994 - Committee Member – IEEE/PES Hydro-generator Subcommittee
- 2002-2003 – Canadian Expert – IEC Technical Committee 2: Rotating Machines, WG 26
- 2006-2007 - Chairman - IEEE/IAS Pulp and Paper Technical Committee
- 2008-2009 – Chair IEEE/IAS Executive Board Electronic Communications Committee
- 2010 Meritorious Engineering Award Winner of IEEE/IAS Pulp and Paper Technical Committee
- 2013-2014 – President IEEE Industry Application Society



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When: Date: Wednesday 19 <sup>th</sup> of April, 2017 Time: 5:30PM to 8:00PM All times are: Canada/Mountain	
Where: Four Points by Sheraton Edmonton South	
Agenda: 5.30pm: Doors open and light meal 6:00pm: Technical Seminar 8:00pm: Q&A	

### Online Registration (Open from February 27 to April 12, 2017)

<https://events.vtools.ieee.org/m/44163>

#### Early bird online registration fee

- IEEE Members: \$20
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#### At the Door Registration - (Payable by cash or cheque)

- IEEE Members: \$25
- Non-IEEE members: \$35
- IEEE Undergraduate/ Graduate Student Members: \$5
- IEEE Life/ Fellow Members: \$5

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