



Iris Power Engineering
SUMMER 2005



DIAGNOSTIC NEWS

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COURSES

Partial Discharge
November 8-10, 2005
New Orleans, LA

Motor Maintenance
Nov. 29-Dec. 1, 2005
Orlando, FL

For more information on our courses, please visit us on the web.

www.irispower.com



THE NEED FOR A TECHNICAL REWIND SPECIFICATION

Andy Brown

Over the last 10 years there has been a trend in premature failures of some stator windings systems associated with air cooled machines rated 11kV and above. These failures have been associated with either the slot or the endwinding sections of the winding system and can be in the form of interturn failures, groundwall failures, failure of the stress control systems, poor coil fit, interphasal PD and surface tracking.



The root cause of this trend in premature failures could be associated with changes in operational practices, manufacturing procedures or selection of materials and may be due to several factors rather than any one individual factor:

- ❖ Insufficient endwinding clearances for the electrical stresses imposed between adjacent phases and also to ground.
- ❖ Reduction in endwinding length to reduce manufacturing material costs (copper and insulation materials) and also produce smaller more compact machines, resulting in a compressed endwinding area with insufficient coil to coil clearances.
- ❖ Decrease in main wall insulation thickness, often to get more copper in the slot section but overall increases the electrical stresses to ground.

❖ Increased use of global VPI systems on air cooled machines with longcore lengths which may result in poor impregnation throughout the slot section and possible thermal cycling problems.

❖ Changes in plant operation, including introduction of vacuum circuit breakers and thyristor controls, resulting in high rise time surges on the circuit stressing interturn insulation.

Most of the above issues can and should be addressed by the formation of a detailed technical specification and quality inspection / record procedure as part of the tender process for any new or rewound HV stator winding. This technical specification should go beyond stating the standard IEEE, NEMA, and IEC specifications and be written to address the particular machine operational requirements and conditions anticipated.

Continued on page 3



The 8th Iris Rotating Machine Conference was held in Scottsdale, Arizona this past June. The conference was well attended with a varied list of attendees from seven countries.

As in previous years, events included informative seminars and tutorials, a coterie of illustrious guest speakers, presenting sixteen papers from seven countries, interactive sessions which provided a forum for Iris users to give us their feedback, and a walk-in-clinic which enabled users to receive direct guidance from our specialists regarding data test results.

The interactive sessions are beneficial to the attendees of the IRMC but also provide Iris with an opportunity to meet our customers and gain their input. The insights gleaned from these sessions allow us to better meet the requirements of our customers by manufacturing products that satisfy their needs.



Lest you think the 2005 IRMC was all work, we also offered some recreational moments. One of the highlights of this year's events was our 15th anniversary awards dinner. The dinner provided Iris

Power the opportunity to recognize some of the individuals who have partnered with Iris to make us a success. Awards were presented by Joseph Mbyui, president of Iris Power Engineering. The recipients included ENEL (Italy), Manitoba Hydro (Canada), Ampere (Italy), New York Power Authority (USA), Tennessee Valley Authority (USA), BP SHIS (USA), Ameren UE (USA).

We also extended a general thank you to all of our attendees for their continued support of the IRMC, by offering 16 lucky individuals the opportunity to ride a hot air balloon over the desert at sunrise. The consensus was overwhelmingly positive. (It seems no one minded the 5:00 am start!)



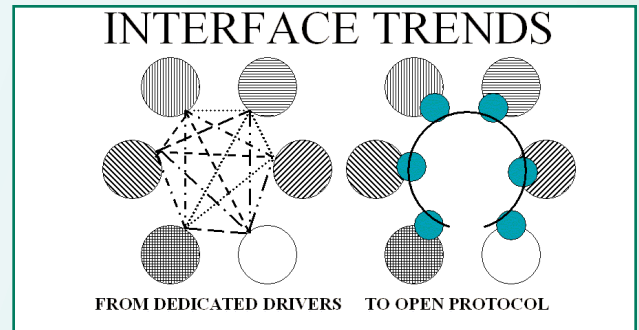
Awards dinner

We would like to thank all of the participants for helping to make the IRMC 2005 a great success. Be sure to join us next June for the IRMC 2006 in Toronto, Canada.

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Plant automation has evolved from electromechanical relays (logic made with cable interconnections) to PLCs (ladder-logic resembling relay circuitry) to the present increasing use of PCs. The access to the field devices has changed from intensive use of cables (digital and analog inputs/outputs) to the use of field buses (e.g., Profibus, DeviceNet, and Ethernet). Field devices started as just passive components but now have become smart units with self-diagnostics and digital communication. Centralized control has migrated to distributed control following the object oriented model, empowering field devices. With PCs there are fewer components, simplified



architecture, fluid data transmission to higher levels, standard communications, more effective use of the IT resources and benefits from ever changing technology pushed by the Internet and office automation (wireless communication, etc.)

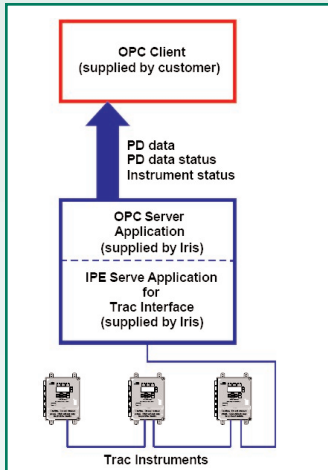
Condition monitoring has become an integral part of plant automation. For this reason, IRIS offers on-line continuous PD monitoring systems of stator winding in two versions. The Guard line provides all the complex capabilities for advanced analysis of PD data., including phase resolved data, sophisticated condition based triggering and advanced alarm options. The Trac line, is a simplified version which provides alarms and trending.

The Trac line for on-line PD monitoring is comprised of: the PDTrac monitor for small machines connected with power cables, the HydroTrac monitor for large hydro generators, and BusTrac monitor for all other types of generators. Current installations may be found in any of the stages of the automation evolution path, and therefore the preferences regarding the type of field device interface to be used are multiple: digital inputs/outputs, analog input/outputs, for that purpose the Trac line has following interface options, available:

- ❖ Digital (relay) output for alarm, RS232 port, and analog outputs for summary numbers. Furthermore analog



inputs for operating parameters (PDTrac only)
 ❖ RS485 port, Ethernet (10BaseT) and Fibre Optic for the networking option (additional modules/converters may be required)



Open Standards.

One obstacle for fluid transfer of data through the plant is the lack of a standard field bus. To overcome this, the OPC Foundation has created several specifications, such as:

- ❖ OPC DA, based on Microsoft's COM/DCOM
- ❖ OPC XML-DA, for platform independent web services
- ❖ OPC DX, for data

exchange between diverse device networks
 ❖ OPC UA, the most advanced with service oriented architecture

IRIS Open Interfaces

IRIS has incorporated optional open interfaces in its scope of supply including:

- ❖ OPC server for the HydroTrac monitors, so that the customer can create an OPC Client to view PD data instead of the Iris' PDView software; the Iris OPC interface is transparent to the end-user; and PD data can be accessed company-wide through the LAN/WAN.
- ❖ FTP interface for the PDTrac monitors to send PD data to a FTP site using XML , to see the data in a customized viewer (client).
- ❖ PI Interface for HydroTrac and BusTrac to bring operating parameters from PI system to trigger PD tests in the HydroTrac/BusTrac monitors.

What is next?

Our users will define what is next. We would like to solicit feedback of your preferences based on your current or future plant communication architecture, i.e. digital/analog I/Os, RS485 bus, Ethernet, OPC, XML, Wireless. Please contact your sales representative or send us your e-mail with your ideas to projas@irispower.com

OPC: OLE for process control (www.opcfoundation.org). The OPC Foundation, Mimoso (www.mimoso.org) and the ISA SP95 Committee (www.isa.org) formed a group to harmonize the specifications to exchange manufacturing O&M information.

XML: Extensible Markup Language (www.w3.org/xml/). The advantages of XML are that it is a platform independent language, and that data transmits

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A detailed technical specification should be applied to any part of the assembly, be it insulation systems for the rotor or stator, stator core materials, forgings etc... Manufacturers are doing their best to be competitive and offer the most economic system to meet the anticipated needs of the customer. However without strict guidelines, especially when in a competitive tender situation, potential tenders are not on an even playing field and are limited into sometimes offering a basic system rather than the best system to meet the operational needs. A detailed technical specification covering the requirements, QA program and testing needs ensures a that all tenders are offering a similar system. A detailed technical specification also ensures that any divergences are apparent at the tender stage and not on completion of the machine when contractual agreements and extended warranties in order to accept a substandard machine often have to be negotiated.


Before preparing a detailed technical specification the machine owner should amongst other things, establish how prescriptive they wish to be with regard to technical details. One pitfall of the specification being too comprehensive is that the design could be established by the user and not the winding manufacturer and hence result in taking the design aspect away with the forced use of a non standard insulation specification.



Contact Andy Brown to find out how the RMTS Group can help you. 416-620-5600 Ext. 295



UPCOMING EVENTS


Partial Discharge Course
November 8-10, 2005
New Orleans, Louisiana


Motor Maintenance Course
Nov. 29-Dec. 1
Orlando, Florida

NEW PRODUCTS & SERVICES

THIRD PARTY TRAINING



Iris Power Engineering is pleased to offer certification training aimed at providing the tools necessary to conduct testing and installation of Partial Discharge (PD) systems. Through lectures and hands-on lab

work, students will learn to successfully install and calibrate couplers and continuous monitoring equipment, and collect and interpret PD readings using portable instruments.

INSTRUCTORS

Our instructors are experts in the field with extensive experience in partial discharge monitoring using and installing Iris equipment in rotating machines and metal clad switchgear. They are experienced in failure processes, PD data analysis, as well as issues that might be encountered during installation. They are customer-oriented and motivated to provide you with extensive training, as well as follow-up support.

CERTIFICATION

There are 3 levels of certification available, each level taking 1 week. Certification is based upon the successful completion of all training courses.

ADVANTAGES

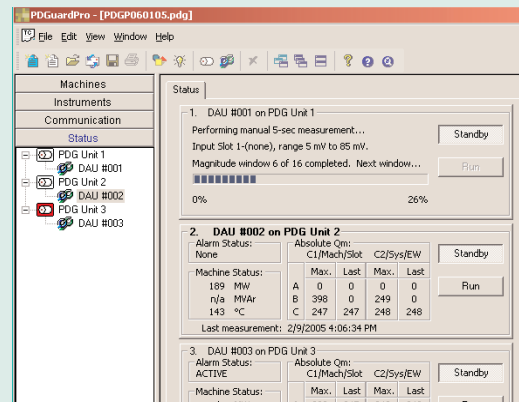
- ✓ Expert training from the preeminent PD system manufacturer
- ✓ Discounts for training and support
- ✓ Inclusion in the Iris list of viable suppliers who provide testing and installation services
- ✓ A listing on the Iris website of offering installation and testing services

(Iris does not accept liability for work done by certified individuals.)

For more information on Third Party Training visit us at www.irispower.com.

PD GUARD PRO

PDGuardPro NOW AVAILABLE FOR GUARDS UPGRADE



Why Upgrade to PDGuardPro?

- ✓ Compatible with Windows XP
- ✓ Improved user interface
- ✓ Unified console for setting alarms and trigger levels, DAU control and data viewing
- ✓ Improved alarming capabilities
- ✓ Effortless remote testing and download
- ✓ Password protection
- ✓ Status of all DAUs on one page
- ✓ Modern hardware and communications
- ✓ What's Included in the Upgrade:
 - ✓ Software upgrade
 - ✓ PDGuardPro software
 - ✓ Hardware upgrade
 - ✓ New system controller
 - ✓ Network card for each DAU
 - ✓ Upgrade service package
 - ✓ Commissioning
 - ✓ Training

