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Dr. Lee was the recipient of the "Diagnostics Achievement Award" in 2017 from the IEEE Power Electronics Society (PELS), and received eighteen IEEE Prize Paper awards. He received the 2005 PES Prize Paper Award from the IEEE Power Engineering Society (PES), the 2014 IEEE Transactions on Industry Applications (IAS) Prize Paper Award (Honorable Mention) from IEEE IAS, the 2020 1st Prize, 2019 1st Prize, 2013 2nd Prize, 2011 1st Prize, 2008 2nd Prize, 2005 1st Prize, and 2001 2nd Prize Paper Awards from IEEE IAS Electric Machines Committee (EMC), the 2017 1st Prize Paper Award from IEEE IAS Industrial Drives Committee (IDC), the 2022 3rd Prize Paper Award from IEEE IAS Renewable and Sustainable Energy Conversion Systems Committee (RSECSC), the 2019. 2017, 2013, 2011, and 2009 SDEMPED Prize Paper Awards from the Technical Committee on Diagnostics of the IEEE PELS, and the 2015 1st Place, 2014 2nd Place Technical Paper Awards from the Pulp and Paper Industry Committee of IEEE IAS. He served as a Distinguished Lecturer (2014-2016) for the IEEE IAS, and as an Associate Editor for the IEEE Transactions on Industry Applications for the IEEE IAS EMC from 2007 to 2018.

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Lecture Topics

1. Electrical Testing and Diagnostics of Induction and Synchronous Machines in an Industrial Environment

AC electric machines are the most common and important type of electrical apparatus used in industry, and their continued operation is critical for maintaining the productivity, efficiency, reliability, and safety of the facility. The objective of this lecture is to present an overview of diagnostic techniques used in the field for off-line testing and on-line condition monitoring of medium~high voltage induction and synchronous machines with emphasis on electrical monitoring. The subjects covered in this lecture include failures in the 1) source (high resistance connections), 2) motor (rotor cage/damper/field winding, eccentricity, bearing, magnetic wedge, stator core, and winding insulation) and 3) coupling/load. A description of the root causes and consequences of failure are given, and the benefits and limitations of commercially available technologies are presented. The target audience is practicing engineers and researchers in the area of reliability of electrical machines. This lecture can also serve as an overview of electric machine testing for attendees with undergraduate level knowledge of electric machines.

2. Stator Insulation Testing and Case Studies of Turn/Phase Insulation Failures for Medium-High Voltage AC Machines

Stator winding insulation is the most vulnerable component in medium-high voltage AC machines. This makes periodic stator insulation testing an essential part of predictive maintenance for preventing costly forced outages. An overview of off-line and on-line stator insulation test methods is given, and statistics on their effectiveness for preventing stator groundwall insulation failures are presented. A recent investigation of case studies of turn and phase insulation failures that resulted in forced outages is presented. As these failures are difficult to prevent with existing tests, an insight into how stator winding turn insulation failures can be prevented is provided based on the investigation of the failures. The target audience is practicing engineers and academic researchers in the area of diagnostics of electrical machines in industrial environments. This lecture can also serve as an overview of stator insulation for attendees with undergraduate level knowledge of electric machines.