Short Course Agenda

Probabilistic Fundamentals and Models in Generation and Bulk Power Reliability Evaluation

Agenda

December 13, 2017 | 12:00pm – 5:00pm EDT
December 14, 2017 | 8:00am – 5:00pm EDT
December 15, 2017 | 8:00am – 12:00pm EDT

Location
The Ritz Carlton Buckhead (Hotel rebranded to The Whitney Hotel on December 1, 2017)
3434 Peachtree Rd NE,
Atlanta, GA 30326

Biography – Distinguished Professor Emeritus Roy Billinton

Roy Billinton obtained B.Sc and M.Sc degrees from the University of Manitoba and Ph.D and D.Sc degrees from the University of Saskatchewan. He joined the University of Saskatchewan as an Assistant Professor in 1964, after working in the System Planning and Production Divisions of Manitoba Hydro.

Dr. Billinton’s area of research is power system reliability, economics and performance and he has developed a wide range of techniques to evaluate the reliability of engineering systems, from simple configurations to complex systems such as large electric power generation, transmission and distribution systems. In this regard, he has made a significant contribution to the development and application of quantitative techniques for past performance and predictive assessment of power system reliability. He is the author or co-author of ten books dealing with power system reliability. Two of these books, now in their second editions, have been republished in Chinese and one in Russian. His first book, published in 1970, is considered to be the first book in English on the subject of power system reliability.

He is the author or co-author of over 975 technical papers related to his research with over 535 publications in international refereed journals and has a Google Scholar h-index of 83. He has made presentations, or given courses, in over thirty countries, and has given over one hundred short courses on reliability evaluation to electric power utilities in Canada or abroad. During his tenure at the University of Saskatchewan over one hundred and thirty five graduate students have received their degrees under his supervision. He became a Fellow of the Institute of Electrical and Electronic Engineers (IEEE) in 1978 and the Royal Society of Canada (RSC) in 1980.
A large portion of his research was conducted while holding important academic responsibilities at the University of Saskatchewan, including serving as the Head of the Department of Electrical Engineering (8 years), Assistant Dean (2 years), Associate Dean (15 years) responsible for Graduate Studies, Research and Extension, and Acting Dean (2 years) of the College of Engineering. Dr. Billinton officially retired and became a Professor Emeritus effective July 1, 2003. Since that time he has been active in conducting research and supervising graduate students either individually or jointly. He was appointed as a Distinguished Professor Emeritus effective July 2013.

Day 1 - December 13, 2017

Noon – 1:00pm
1. Registration and Lunch

1:00 – 1:30pm
2. Welcome - Noha Abdel-Karim, Manager of Reliability Assessment, NERC
3. NERC Antitrust Compliance Guidelines and Public Announcement
4. Opening Remarks
   Gerry Cauley, President and CEO of NERC
5. Introduction – Dr. Roy Billinton

1:30 – 2:30pm
6. Session 1 – Basic Probability and Reliability Concepts
   a. Basic Probability Concepts
   b. Basic Reliability Concepts

2:30 – 2:45pm
BREAK

2:45 – 4:00pm
7. Continue Session 1 - Basic Probability and Reliability Concepts
   a. System Reliability and Availability
   b. Monte Carlo Simulation

4:00 – 5:00pm
8. Session 2 – Generation Capacity Reliability Evaluation
   a. Basic Generation System Model and Conceptual Tasks
   b. Generation System Adequacy Indices
   c. Generating Units Two-State and Multi-State Availability Models
   d. Problem Assignment

5:00pm
ADJOURN
Day 2 - December 14, 2017

8:00 – 8:30am
1. Breakfast

8:30 – 10:30am
2. Session 2 – Generating Capacity Reliability Evaluation (Continued)
   a. Generating Unit Outage Statistics
   b. Basic Risk Evaluation Methods and Elements
   c. Problem Assignment

10:30 – 10:45am
BREAK

10:45am – Noon
3. Session 2 – Generating Capacity Reliability Evaluation (Continued)
   a. Wind Power Modeling
   b. Study System Analysis Including Wind Capacity
   c. System Well-Being Analysis
   d. Epistemic and Aleatory Uncertainty
   e. Problem Assignment

Noon – 1:00pm
LUNCH

1:00 – 2:30pm
4. Session 3 – Transmission and Bulk Power System Reliability Evaluation
   a. Basic Concepts in Bulk System Adequacy Assessment
   b. Bulk System Reliability Assessment Methods
   c. Transmission System Equipment Outage Data

2:30 – 2:45pm
BREAK

2:45 – 4:00pm
5. Session 3 – Transmission and Bulk Power System Reliability Evaluation (Continued)
   a. Study System Sensitivity Analysis
   b. Bulk System Performance Indices
   c. Common Mode and Dependent Transmission outages

4:00 – 5:00pm
6. Session 3 – Transmission and Bulk Power System Reliability Evaluation (Continued)
   a. Station Related Forced and Maintenance Outages
   b. Value Based Reliability Planning
   c. Problem Assignment
Day 3 - December 15, 2017

8:00 – 8:30 am
Breakfast

8:30 – 9:15 am
1. Problem Solving Session
2. Future R&D Needs

9:15 – 9:45 am
7. The Importance of Probabilistic Assessment on future power systems – Mark Lauby, IEEE PES Roy Billinton Power System Award & Senior Vice President and Chief Reliability Officer of NERC

9:45 – 10:15 am
3. Considerations for New Adequacy Standards for the North Pacific West, John Fazio, Northwest Power Pool Council

10:15 – 10:30 am
BREAK

10:30 – 11:00 am
4. Weather Shape Impact on Resource Adequacy Analysis, Kevin Carden, Astrape Consulting

11:00 – 11:30 pm
5. IEEE Reliability, Risk and Probability Applications (RRPA) Subcommittee Activities and IEEE 762 and 859 Standards Update – Milorad Papic, Idaho Power

11:30 – 12:00 pm
6. NERC Towards More Probabilistic Approaches for Assessing Bulk Power System Reliability – Noha Abdel-Karim, Manager of Reliability Assessment, NERC
   a. NERC Probabilistic Assessment Working Group – Current and Future Work Activities
   b. NERC Independent Reliability Assessment on Probabilistic Natural Gas Disruptions Study
   c. Wrap Up

12:00 pm
ADJOURN