the Beacon

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Enjoy Your Holidays and attend a Section Meeting!

Nov./Dec. '03
Volume 12
Number 7

The Maine IEEE Communications Society Chapter
proudly sponsors:

Critical Infrastructure Security for the Utility Industry

Presented by Ramon Krikken
NMI InfoSecurity Solutions
Wednesday, December 3, 2003

Lecture Summary: This lecture will address security considerations for communications and control systems in the public utility infrastructure.

The security of the public utility industry is under renewed scrutiny since the 9/11 terrorist attacks. Information system security or "cyber security" is of special concern because of the potential impact on utility operations.

Control systems were designed traditionally to work in a closed environment; as such, they often lack modern security controls and rely on the obscurity of their implementation for protection. With the introduction of general purpose platform implementations, and the requirements for open data access, security is no longer optional. Agencies such as NERC identify cyber security as a priority, and are creating standards to address security of the critical infrastructure. In this presentation we will investigate the risk factors, and what steps can be taken to create a more secure infrastructure.

Speaker background: Mr. Krikken is a senior engineer at NMI InfoSecurity Solutions, and has over seven years of information system security expertise. Ramon holds a Master of Science degree in Computer Science from the University of Twente, the Netherlands. NMI InfoSecurity Solutions is a Portland-based international information security consultancy to the finance, public utility, and insurance sectors.

Where:	Eastland Park Hotel, Wyeth Room 157 High Street Portland, Maine
Agenda:	5:30 PM - 6:15 PM Social – Hors d'oeuvres; cash bar 6:15 PM - 6:30 PM Introductions and chapter review 6:30 PM - 7:30 PM Lecture / Questions 7:30 PM - 8:00 PM Post Lecture Discussion
Cost:	*$20 / Person* *$10 / Student*

Please assist the chapter by pre-registering for this event. Same day registration and walk-ins will also be heartily welcomed! To pre-register, phone or email with contact information to: **Brian Huntley at (207) 236-5805 or huntley@gwi.net**

The Maine IEEE
Power Engineering Society/Industrial Applications Society Chapter
and
Launch Momentum

are pleased to announce a series of short tutorials:

Control Systems Concepts Applied to Generator Voltage Regulation

COURSE OBJECTIVES:

- Explain the building blocks and principles of control systems in power generation: transfer functions, time response, phase – gain, closed and open loop characteristics, frequency and time domain response, Bode plots, root-locus analysis. Develop an understanding of time-domain and frequency domain performance specifications – delay time, overshoot, settling time, frequency response and stability margins. Examine classical control system design techniques – PID, phase lead and phase lag design.
- Present a practical, simplified generator model and the meaning of the model parameters, based on IEEE Std 1110-1991
- Review the practices for excitation modeling in Power System Stability studies (Std. 421.5-1992)
- Analyze specific excitation models in detail and predict the model response to parameters changes.

SESSION 1

Location:	Central Maine Power, 83 Edison Drive , Augusta
Dates:	Session 1: 12/1/03 1-5 PM Session 2: 12/4/03 6-8 PM Session 3: 12/11/04 6-8 PM Session 4: TBD (January 04)
Cost:	$50 for all sessions (to cover course materials and refreshments)
Registration:	Contact *Paul Lerley* : paul.lerley@cmpco.com or 207-623-3521-ext. 3820

Control Systems Basic Principles
Presenter: Dr. Daniel Martin

Monday, December 1st , 1-5 PM

Control Systems

- Transfer Functions, Block Diagrams and Signal Flow Graphs
  Modeling physical systems, differential equations and Laplace transforms
- Stability of Linear Systems
  Transfer function poles and zeros
- Root Locus Analysis
- Time Domain Analysis of Control Systems
  Step and impulse response, steady state error, delay time, rise time, settling time, maximum overshoot, natural frequency and damping ratio
- Frequency Domain Analysis
  Bode plots, phase and gain margins, Nyquist plots
- Classical Design Techniques
  Proportional-integral-derivative feedback (PID) design, phase lead/lag/lead-lag design, robust design

Advanced Control

- Nonlinear and constrained optimization,
- Model Predictive Control (MPC),
- Adaptive Control

Application to Power Systems

- A brief overview of required information ,
- Tools and techniques used in power system stability studies .

SESSION 2

Generator Modeling
Presenters: Dr. Daniel Martin and David Conroy

Thursday, December 4th , 6-8 PM

Generator physical representation and electrical characteristics, including

- Stator, rotor, field and winding concepts
- Generator constants range of values and meaning
- Saturation curves
- Potier diagram

Parameter measurements (IEEE Std. 115-1995 Part II)

- Steady state parameters

- Transient and sub transient values: the decrement curve
- Time constants

Generator modeling (Std. 1110-1991)

- Model classifications
- Application of models
- Saturation effects
- Block diagram

SESSION 3

Excitation System Modeling (Std. 421.2 and 421.5)
Presenter: Dr. Daniel Martin

Thursday, December 11th , 6-8 PM

Criteria and definitions (Std. 421.2-1990)

- Large signal performance criteria
- Small signal performance criteria

Models (Std. 421.5-1992)

- General excitation system diagram
- Type DC exciters (DC1A)
- Type AC exciters (AC1A)
- Type ST exciters (ST1A)
- Power system stabilizers (principles)
- Typical values

SESSION 4

Simulation Results Analysis
Date TBD (January 04)

This is a session where users bring examples of simulations and share the plots with others in a peer review atmosphere. Everyone is encouraged to comment and offer interpretation. It would most beneficial if the model parameters were changed in the simulation to verify the sensitivity to certain parameters. In other words, conduct a small parametric study on a given model.

INSTRUCTOR BIOS.

David M. Conroy

David Conroy is Manager of System Planning for Central Maine Power Company. David has worked in CMP's System Planning area since graduating from college in 1978.

David has represented CMP at New England Power Pool (NEPOOL) technical task forces and committees since the early 1980s, and is presently a member of the NEPOOL Reliability Committee. David has also been a CMP representative to the Northeast Power Coordinating Council (NPCC) since the mid-1980s, and is presently a member of the NPCC Task Force on System Studies. David has also represented CMP at the Electric Power Research Institute.

David is a Registered Professional Engineer in the State of Maine, and has been a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) since the early 1980s, and has been Chairman of the Maine Section and Central New England Council of IEEE. He is presently Chairman of the Maine Joint Chapter of the Power Engineering Society and Industrial Applications Society of IEEE.

David earned a Bachelor of Science Degree in Electrical Engineering from Cornell University, and a Master of Business Administration Degree from the University of Southern Maine

Daniel P. Martin

Dr. Daniel P. Martin is currently the Chief Technical Officer and Vice President of Launch Momentum, LLC located in Falmouth, Maine. Daniel's recent experience includes work in advanced industrial process control services for manufacturing industries. Daniel has over 20 years of experience in aerospace research and development projects such as the *Distributed Control Evaluation System, conducted for the Air Force Research Laboratory* while he was employed at *Integrity* Systems.

Daniel taught Control Systems as an adjunct lecturer at Boston University as well as at the University of Southern Maine. Dr. Martin has also taught courses such as Vector Field Theory for Engineers, and Flight Vehicle Design.

Daniel received his PhD in Mechanical Engineering from Boston University in 1993, and his Bachelor of Science in Engineering Physics from the University of Maine in 1976.

Daniel is the chairman of the Maine Section of the IEEE for 2003 and serves on the organizing committee for the Maine National Engineer's Week celebration. An active pilot, he holds both commercial and flight instructor certificates.

Beacon Publishing

The Beacon is published on a monthly schedule based upon the need to advertise upcoming meetings. All material submitted for the Beacon must be received by the editor no later than the 15th of the month preceding the issue in which it should be included. Sorry, NO EXCEPTIONS!!

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