T&D Technology
Research Stem

Mladen Kezunovic
Stem Leader

Industrial Advisory Board Meeting
May 29-31, 2002
Outline

- Introduction
- Membership
- History
- Research Roadmap
- Current and future activities
- Vision for the future
- Questions/comments
Introduction

• Research Stems:
  - Markets
  - T&D technology
  - Systems

• The Role:
  - Coordinating research efforts
  - Producing a detailed roadmap
  - Facilitating discussion between industry and Academia
  - Advising Director, IAB and EC on technical issues
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Membership-Industry (16)

- Mike Agee (Duke Energy)
- Jim Bell (Oncor)
- Bob Birch (FPL), observer
- James Crane (Exelon)
- Bruce Dietzman (Oncor), observer
- Mike Ingram (TVA)
- Paulette Kaptain (WAPA)
- Dale Krummen (AEP), observer
- Art Mander (Tri State G&T)
- Nick Miller (GE)
- Ali Nourai (AEP)
- Mahendra Patel (Allegheny Power)
- Don S. Pelley (Salt River Project)
- Don Sevcik (Reliant Energy HL&P)
- Mani Subramanian (ABB)
- Wendei Wang (GE), observer
Membership-Academia (11)

- Ali Abur (Texas A&M), observer
- Gerald (Jerry) Heydt (Arizona State)
- Ward Jewell (Wichita State), observer
- George Karady (Arizona State), observer
- Mladen Kezunovic (Texas A&M)
- Bob Lasseter (Wisconsin)
- James Momoh (Howard), observer
- Bob Olsen (Washington State), observer
- Rahmat Shoureshi (Colorado School of Mines)
- Kevin Tomsovic (Washington State)
- Mani Venkata (Iowa State)
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History

- Meeting #1, May 25, 01, Conf. Call
- Meeting #2, May 31, 01, Chicago IAB
- Meeting #3, July 23, 01, Conf. Call
- Meeting #4, Aug. 27, 01, Conf. Call
- Meeting #5, Oct. 5, 01, Conf. Call
- Meeting #6, Dec 5, 01, College Station IAB
- Meeting #7, Feb. 15, 02, Conf. Call
- Meeting #8, April 5, 02, Conf. Call
- Meeting #9, May 29, 02, Chicago IAB
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Research Roadmap

I. Substation Data Integration and Enhanced Functions
II. Managing an Aging Infrastructure
III. Distribution and Transmission Automation
IV. New Devices and Related Control Concepts
V. New Monitoring, Control and Protection Paradigms
Substation Data Integration and Enhanced Functions

- Transformer loading
- Fault location and outage management
- Automated analysis of data coming from DFRs and other IEDs
- Power quality
- New communication technique, e.g. wireless, etc.
Managing an Aging Infrastructure

- Life assessment
- Life extension
- Upgrading and re-rating
- Risk management and related maintenance strategies
- Advanced diagnostics, monitoring and maintenance
- Better understanding of failure and stress mechanisms
- Maximizing the utilization of the existing infrastructure
Distribution and Transmission Automation

- EMS and DMS
- Improved monitoring and diagnostics
- Automated fault assessment and outage management
- Advanced communication infrastructures for feeder automation
- New DMS functions
- Power quality assessment, quantification and mitigation
- Load control
New Devices and Related Control Concepts

- New fault current management (devices, strategies, and systems)
- New power device concepts
- Advanced power electronics devices
- New sensors and related measurement system
- Novel devices and controls for distributed resources
- Electric storage devices and related control issues to meet varied business and system objectives
New Monitoring, Control and Protection Paradigms

- Dynamic rating concepts
- System-wide relaying and related coordination with control strategies
- Integration of substation and feeder automation into EMS and DMS
- Advanced tools for testing and evaluation
- Customer focused energy delivery (energy needs from a customer prospective)
- Innovative data mining and visualization
- Interactive customer/supplier load control and protection
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Current and future activities

- On-going research projects
- Completed research projects
- New research projects
- Research coordination with “outside” organizations
On-going research projects

a.) Forming technical panels consisting of stem members or other designated experts for monitoring progress of projects that are covering similar applications (2)

b.) Reviewing project progress in separate meetings (using distance conferencing or net facilities/services) that will take place in-between the IAB meetings (42)

c.) Organizing workshops around specific research topics covered by on-going research projects and/or groups of on-going projects (8)

d.) Initiating review of the Statement of Work (SOW) documents for the projects in similar research areas making sure the coordination of the research activities is optimized (18)
Completed research projects

a.) Organizing presentations of research results in a separate meeting in-between IAB meetings using distance conferencing and or net facilities/services (17)

b.) Making sure the final reports for completed PSerc projects are properly reviewed and advertised (37)

c.) Grouping PSerc publications according to the topics indicated in the research roadmap to facilitate the retrieval (9)
New research projects

a.) Producing a list of research areas of interest for the solicitation of new proposals (37)

b.) Developing a list of experts, in the selected areas from the research roadmap, to serve as reviewers of the proposals (0)

c.) Conducting the review process and ranking of the proposals (32)
Research Coordination with “outside” organizations

a.) Engaging in a discussion with EPRI of the research roadmaps of PSerc and EPRI with a goal of both sides being well informed and hence avoiding an overlap in research efforts (7)

b.) Making an overview of on-going research activities within CERTS and PSerc providing technical details needed to assess the similarities and differences in the research project coverage (14)

c.) Creating a detailed portfolio of the stem research efforts/capabilities that may be used for attracting further interest (16)
Highest priority

- Reviewing project progress in separate meetings (using distance conferencing or net facilities/services) that will take place in-between the IAB meetings (42)
- Initiating review of the Statement of Work (SOW) documents for the projects in similar research areas making sure the coordination of the research activities is optimized (18)
- Making sure the final reports for completed PSerc projects are properly reviewed and advertised (37)
- Producing a list of research areas of interest for the solicitation of new proposals (37)
- Conducting the review process and ranking of the proposals (32)
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Vision for the Future

• Facilitating formulation of targeted projects with supplemental funding
• Expanding participation from industry experts typically not involved with IAB
• Enhancing the means for performing an advisory role for IAB, EC and Director
• Formulating a balanced management strategy for project monitoring and planning
• Inventing additional means for technical exchange within PSerc
Questions/Comments