Minnesota Power Systems Conference

November 5-7, 2002
Earle Brown Continuing Education Center
University of Minnesota, St. Paul Campus

Cosponsored by:
Twin Cities Section of IEEE
College of Continuing Education,
University of Minnesota

This conference provides electric utility engineers and consultants
the opportunity to stay abreast of today’s power system technology. The conference
emphasizes the unique challenges faced by electric utilities in the Midwest. The conference also serves as a forum for
power engineers to meet with their colleagues from other utilities to
discuss mutual concerns. Newly created and redesigned concurrent
sessions include substations, distributed resources, project
management, delivery systems, relaying, utility industry futures,
and distribution automation.

Earn 16 Professional Development Hours for attending this program.
**Program Schedule**

**Tuesday, November 5, 2002**

**GENERAL SESSION**
8:15 a.m.-12:00 noon

*Moderator: Al Haman*

*Co-Moderators: Dave Peterson, Gerry Steffens*

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<tr>
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<tbody>
<tr>
<td>7:15</td>
<td>Check-in</td>
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<tr>
<td>8:15</td>
<td>Welcome <em>Al Haman</em>, STAR Energy Services, LLC</td>
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<tr>
<td>8:30</td>
<td>September 11th and the Recovery at Consolidated Edison <em>Frank Doherty</em>, Consolidated Edison</td>
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<tr>
<td>9:55</td>
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<tr>
<td>10:15</td>
<td>MISO Representation: Goals, Planning and Function <em>Jeff Webb</em>, Midwest ISO</td>
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<tr>
<td>10:45</td>
<td>State Demographics <em>Tom Gillaspy</em>, Minnesota Planning</td>
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<tr>
<td>11:15</td>
<td>Department of Commerce — Energy Regulation Update <em>Jim Bernstein</em>, Minnesota Department of Commerce</td>
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<tr>
<td>12:00</td>
<td>Lunch</td>
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**CONCURRENT SESSIONS**
1:00-4:15 p.m.

**SUBSTATION**

*Moderator: Nathan Germolus*  
*Co-Moderators: Steve Mohs, Mike Klopp*

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<tr>
<td>1:00</td>
<td>Substation Monitoring via the Web <em>Mike Cannon</em>, Cannon Technologies</td>
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<tr>
<td>1:45</td>
<td>Impact of Technical Condition on Utilization of Power Equipment <em>Mario Locarno</em>, Doble Engineering Company</td>
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<tr>
<td>2:30</td>
<td>Break</td>
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<tr>
<td>2:45</td>
<td>Battery and DC System Testing and Maintenance <em>Russ Mattson</em>, Minnesota Power</td>
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<tr>
<td>3:30</td>
<td>Optical Voltage and Current Sensors <em>Fred Dennert</em>, NxtPhase</td>
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<tr>
<td>4:15</td>
<td>Adjourn</td>
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**DISTRIBUTED RESOURCES**

*Moderator: Tom Gutormson*  
*Co-Moderators: Phil Spaulding, Craig Turner*

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<td>Residential Fuel Cells — A Wisconsin Experience <em>Jeff Olson</em>, Pierce Pepin Cooperative Services</td>
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<td>Cow Power: Energizing Agriculture with Renewable, Distributed Generation <em>Henry Fischer</em>, East Central Energy</td>
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<td>Break</td>
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<td>2:45</td>
<td>Standards for Interconnection and Operation of Distributed Generation — A Minnesota Perspective <em>Pete Daly</em>, Power System Engineering, Inc.</td>
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<tr>
<td>3:30</td>
<td>Local/Community Aspects of Generation <em>Paul Imberson</em>, University of Minnesota</td>
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<tr>
<td>4:15</td>
<td>Adjourn</td>
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**EXHIBITOR RECEPTION**
4:15-6:00 p.m.
**Wednesday, November 6, 2002**

**CONCURRENT SESSIONS**

*8:30 a.m. - 12:00 noon*

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<tr>
<th>PROJECT MANAGEMENT</th>
<th>DELIVERY SYSTEMS I</th>
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</table>
| **Moderator:** Denny Branca  
Co-Moderators: Mike Steckelberg, Mark Harvey | **Moderator:** Roger Simundson  
Co-Moderators: Gerry Steffens, Al Haman |
| 7:30  | 7:30  |
| Continental Breakfast | Continental Breakfast |
| 8:30  | 8:30  |
| Project Management for the Electric Utility Industry  
*Ed Schweitzer*, Schweitzer Engineering Laboratories, Inc. |
| 9:15  | 9:15  |
| Cathodic Protection of Tower Anchors  
*Dan Schmitt*, Minnkota Power Cooperative, Inc. | Pleasant Valley to Austin 161 kV Line Real Time Transmission Line Monitoring Equipment  
*Joe Livingston*, Great River Energy |
| 10:00 | 10:00 |
| Break | Break |
| 10:30 | 10:30 |
| Gas-Insulated Substation Project – Xcel Energy  
PSCo’s Elati 230kV GIS Substation  
*Ray A. LaPense*, Xcel Energy | The CU HVDC Project: Life Extension Issues and Examples  
*Karl Mortensen*, Great River Energy |
| 11:15 | 11:15 |
| Train Derailments and Critical Delivery of Transformers  
*Joe Jubert* and *Kevin Lennon*, Great River Energy | Correlating Outage Trends with Weather Trends  
*Len F. Osborne*, Jr., Meridian Environmental Technology, Inc. |
| 12:00 | 12:00 |
| Lunch | Lunch |

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<tr>
<th>CONCURRENT SESSIONS</th>
<th>DELIVERY SYSTEMS II</th>
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</table>
| **RELAYING**  
Moderator: Jon Wahlgren  
Co-Moderators: John Johanson, Nathan Germolus | **DELIVERY SYSTEMS II**  
Moderator: Mike Steckelberg  
Co-Moderators: Chad Nissen, Larry Brusseau |
| 1:00  | 1:00  |
| Review of Ground Fault Protection Methods for Grounded, Ungrounded, and Compensated Distribution Systems  
*Ken Behrendt*, Schweitzer Engineering Laboratories, Inc. | Tagging and Operations for Non-operational Engineers  
*Don Benjamin*, North American Electric Reliability Council |
| 1:15  | 1:45  |
| High Impedance Fault Detection on Distribution Feeders  
*Steve Wierzy*, Otter Tail Power Company;  
*Greg Rindal*, Minnesota Power Company |
| 1:30  | 2:30  |
| Break | Break |
| 2:45  | 2:45  |
| Power Line Carriers Research Project  
*Bob Nelson*, North Dakota State University | Arrowhead-Weston 345kV Line – Line Loadability Issues  
*George Swezy*, Minnesota Power |
| 3:30  | 3:30  |
| High Performance Differential Protection Analog versus Numerical  
*Roger Hedding*, ABB Inc. | Red River Valley Study/ West Central Minnesota Transmission Improvement Planning Study  
*Thomas A. Jones*, Minnesota Power;  
*James J. Weiers*, Otter Tail Power Company |
<p>| 4:15  | 4:15  |
| Adjourn | Adjourn |</p>
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<tr>
<th>Time</th>
<th>Utility Industry Futures</th>
<th>Distribution Automation</th>
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<td>7:30</td>
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<tr>
<td>8:30</td>
<td>Nuclear Power—Today and Tomorrow</td>
<td>8:30 Panel Overview-Advanced Applications for</td>
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<td>Speaker to be announced</td>
<td>Distribution Automation – Why Use It?</td>
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<tr>
<td>9:15</td>
<td>Overcoming Barriers to Increased Use of</td>
<td>Dan Nordell, Xcel Energy and Russell Fanning,</td>
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<td>Distributed Generation</td>
<td>We Energies</td>
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<td>Michael Ropp, South Dakota State University</td>
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<td>10:00</td>
<td>Break</td>
<td>Evaluating Wireless Technologies for</td>
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<td>Remediation of Dredged Sediments in</td>
<td>Ken Barber, Telemetric</td>
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<td>Duluth Using the ElectroChemical</td>
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<td>GeoOxidation Process</td>
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<td>J. Kenneth Wittle, Electro Petroleum,</td>
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<td>Inc.</td>
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<td>David Frith and Terry Walmsley, Fibrowatt LLC</td>
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<tr>
<td>11:45</td>
<td>Conference Adjourns</td>
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GENERAL SESSION

September 11th and the Recovery at Consolidated Edison
Frank Doherty, Consolidated Edison

The September 11th attack destroyed a significant fraction of the office space in New York City, two major electrical substations, and a large slice of the electric, gas, and steam distribution system in lower Manhattan. This presentation briefly recounts the attack, its effect on the Con Edison system, and the successful recovery.

Using Technology to Visualize Electrical Structures with Virtual Reality Imaging
Kam Miller, Short Elliot Hendrickson Inc. and Andy Beckel, Xcel Energy

Given the advancement of technology and computers, many communities are requesting the use of 3-D visualization technology to illustrate different site and build options for substations and transmission lines. Virtual Reality Imaging (VRI®) has developed a basic library of substation components as well as transmission structures to demonstrate the visual impact of electrical structures with a photorealistic environment. This paper explores the steps to developing a VRI.

MISO Representation: Goals, Planning and Function
Jeff Webb, Midwest ISO

Planning in today’s environment is more uncertain than ever. Integrated transmission and generation planning is a thing of the past. MISO will discuss how the planning function of the RTO can serve to re-integrate transmission and generation by providing non-traditional information to market participants to guide a more coordinated development of the bulk power system.

State Demographics
Tom Gillaspy, Minnesota Planning

Tom will discuss recent past and projected population change in Minnesota. In addition, Tom will explore some of the major trends in population and housing characteristics with possible implications for the economy and utilities in Minnesota.

SUBSTATION

Substation Monitoring via the Web
Mike Cannon, Cannon Technologies

Substation monitoring delivers information necessary to optimize distribution efficiency, while simultaneously identifying equipment maintenance needs and fault detail information in real time. Browser access to substation information allows the utility enterprise to benefit from accurate “process information” from its “factory floor” while maintaining the conventional Scada/EMS as a secure, limited access control system. This presentation discusses the functions and benefits of a Web-based substation information system, with integral business case considerations.

Impact of Technical Condition on Utilization of Power Equipment
Mario Locarno, Doble Engineering Company

Deregulation and open market trading have increased impact on power system operation in many countries. One of the key technical issues is to ensure adequate availability of the network at all times. At peak demand this can often lead to transmission constraints, requiring short term overloading of key apparatus. This, in turn, creates increasing concern due to reliability risks associated with the age and adequacy of the supply network.

Battery and DC System Testing and Maintenance
Russ Mattson, Minnesota Power

Utilities rely on 125v DC power for all control, relay, and communication functions in substations and plants. The availability and performance of these battery installations is critical to the core objectives of electric utility operations: transmitting and distributing electric energy.

At Minnesota Power we have a formal maintenance and testing program for our DC systems. The intent of this program is to assure, with as great a level of confidence as practical, that the DC system is available and ready to function as designed. The presentation will discuss the creation, evolution, and present day practices relating to DC system testing and maintenance.

Optical Voltage and Current Sensors
Fred Dennert, NxtPhase

This session will include an introduction to optical current and voltage sensing technologies; an illustration of these technologies applied to metering and protection applications at several substations; a brief look at the practical aspects of interfacing optical sensors and integrating with existing equipment; and an introduction to understanding the value of optical sensors compared to conventional CTs and VTs.
DISTRIBUTED RESOURCES

Residential Fuel Cells — A Wisconsin Experience
Jeff Olson, Pierce Pepin Cooperative Services

Pierce Pepin has always been active in the research and development (R&D) of new technologies and while the fuel cell is not “new” technology, it is new to the residential energy market. This presentation will review the experiences, thus far, of Pierce Pepin’s work with ECO and Hpower to refine the proton exchange membrane (PEM) fuel cell unit for commercialization.

Cow Power: Energizing Agriculture with Renewable, Distributed Generation
Henry Fischer, East Central Energy

Energy from biomass, or biogas, is becoming more and more popular with dairy, hog, and poultry farmers around the world. One of the newest, productive, and most exciting projects is right here in Minnesota.

The Haubenschild Farms near Princeton, Minnesota, is one of 13 projects nationwide that effectively demonstrate that electric energy can be produced reliably from cow manure. The anaerobic digester project was judged to be the state’s most outstanding renewable energy project by the Minnesota Environmental Initiative this year.

Standards for Interconnection and Operation of Distributed Generation – A Minnesota Perspective
Pete Daly, Power System Engineering, Inc.

Following the enactment of the Minnesota Energy Act in August 2001, the Minnesota PUC issued its order initiating docket inviting people to file proposed standards and to comment on those received. In response, regulated electric utilities collectively filed proposed interconnection guidelines and others submitted various comments. In June, the PUC called for the formation of two work groups, one to address technical issues and the other to address rates. These groups are expected to file their recommendations by February 2003. This presentation will examine the standards setting process in Minnesota and highlight the key issues and contrast them with other states and recent federal activities.

Local/Community Aspects of Generation
Paul Imbertson, University of Minnesota

Five Minnesota communities look at electrical generation, each from their own perspective. Options range from wind to biomass, but before moving ahead, they must first understand what energy is, how it is generated and used, and how their unique circumstances determine their options and possible role in Minnesota’s energy future.

PROJECT MANAGEMENT

Project Management for the Electric Utility Industry
Ivars Vancers, Great River Energy

Project Management in the Electric Utility Industry is unique as it encompasses a wide variety of issues ranging from long-term planning, permitting, land rights, technical design, construction, and final energization. This paper discusses aspects relating to project definition, project management needs, responsibility/accountability issues, and schedule/resource/quality considerations, and presents different organizational structures to manage a project oriented culture. A project is done only once and combined with the universal truth (that project managers have significant responsibility but little authority) that presents challenges to the general goal of “keeping the lights on.”

Cathodic Protection of Tower Anchors
Dan Schmitt, Minnkota Power Cooperative, Inc.

On April 18, 2001, Minnkota Power Cooperative, Inc. lost a 320-foot microwave tower due to guy anchor corrosion. Guy anchor corrosion is not something new to Minnkota; a cathodic protection program had been implemented by Minnkota dating back to 1980. A review of Minnkota’s past cathodic protection practices and the installation of new cathodic protection systems including the establishment of a monitoring and maintenance program will be discussed in detail.

Gas-Insulated Substation Project – Xcel Energy/PSCo’s Elati 230kV GIS Substation
Ray A. Laplane, Xcel Energy

Public Service Company of Colorado (now part of Xcel Energy) energized its first and only (to date) 230kV SF6 Gas Insulated Substation on June 10, 1991. This substation is located in the middle of downtown Denver, Colorado, where land is at a premium and visual aesthetics and total evaluated cost are primary factors in the design criteria. This substation includes a combination of 230kV GIS in one building, 13.8kV metal clad switchgears (5-feeders per MCS), T-line relaying, and SCADA equipment housed in a separate control building, and outdoor 230-13.8kV main power transformers and 13.8kV metal clad capacitor banks. The entire substation is surrounded by a 20-foot high, pre-fabricated concrete perimeter wall (with decorative exterior wall treatment paneling). This presentation will cover some of the unique technical challenges encountered, including the logistics of procuring and shipping the equipment from Japan. Plenty of photos will be presented so that the audience can “see” what a modern indoor GIS substation looks like.

Train Derailments and Critical Delivery of Transformers
Joe Fuhert and Kevin Lennon, Great River Energy

Good project planning typically includes some amount of float at key times in the critical path. Float may also be associated
with completion of critical milestones such as permits or delivery of materials. What do you do when the float is gone and any project delay will incur millions in additional expense due to purchased power, and you’re told, “the train derailed?” This presentation describes the sequence of events Great River Energy encountered during the construction of Lakefield Junction Generating Plant when a critical delivery threatened to derail the project.

**DELIVERY SYSTEMS**

**Attack and Defend Tools for Remotely Accessible Control and Protection Equipment in Electric Power Systems**

*Ed Schweitzer*, Schweitzer Engineering Laboratories, Inc.

The industry-wide trend to downsize and automate is increasing the level of remote accessibility of critical control and protection equipment. Furthermore, our electric power infrastructure is a potentially high-value target for individuals, organizations, and nations with anti-U.S. sentiments. As a result, there is a very real and rapidly increasing probability that malicious individuals will attempt to gain remote access to power control equipment. This paper outlines some of the tools and techniques that may be used to accomplish this, as well as the defensive measures that can be employed to counter this threat.

**Pleasant Valley to Austin 161 kV Line Real Time Transmission Line Monitoring Equipment**

*Joe Livingston*, Great River Energy

Great River Energy was in the process of constructing a new 161 kV line from its new Generating Pleasant Valley plant to Austin substation. Load flow models had determined that the thermal rating of the Pleasant Valley-Austin line would be exceeded during contingencies (equipment outages). Installing the line monitoring equipment on the Pleasant Valley-Austin 161 kV line enabled Great River Energy to attain the full output of the Pleasant Valley Generation Plant during contingencies, without designing the transmission line with a larger conductor or higher ground clearances.

This presentation will describe the different methods of real-time transmission line monitoring, the benefits and drawbacks of each line monitoring method; the method Great River Energy utilized on the Pleasant Valley-Austin Line; and some of the challenges Great River Energy had installing the equipment.

**The CU HVDC Project: Life Extension Issues and Examples**

*Karl Mortensen*, Great River Energy

The CU HVDC transmission system is more than 20 years old with no end of life in sight. This discussion is in two parts. First is a general discussion of life extension issues relating to the CU HVDC transmission system. Second is a description of several upgrade/life extension projects that are completed or underway.

**Coring Outage Trends with Weather Trends**

*Leon F. Osborne, Jr.*, Meridian Environmental Technology, Inc.

A study of trends in winter and summer weather patterns over the past two decades has been performed that has identified significant weather factors associated with repetitive power distribution difficulties in eastern North Dakota and northwestern Minnesota. The presentation describes these factors and briefly discusses possible methods to mitigate and/or prepare for their occurrence.

**RELAYING**


*Ken Behrendt*, Schweitzer Engineering Laboratories, Inc.

This paper reviews ground fault protection and detection methods for distribution systems. The paper first reviews and compares medium-voltage distribution-system grounding methods. Next, we describe directional elements suitable to provide ground fault protection in solidly- and low-impedance grounded distribution systems. We then analyze the behavior of ungrounded systems under ground fault conditions and introduce a new ground directional element for these systems. Then we examine the behavior of compensated systems during ground faults and describe traditional fault detection methods. We conclude by introducing new ground fault detection methods for compensated systems.

**High Impedance Fault Detection on Distribution Feeders**

*Mark Adamik*, General Electric Power

Several technologies to detect and/or prevent High-Impedance (HiZ) ground faults from downed or sagging distribution conductors have been commercially available for several years. This paper first reviews the fundamental operation of the available technologies – both mechanical and algorithmic. It then looks at the performance and lessons learned from several hundred device years of service of a signature-based HiZ detection device.

**Power Line Carriers Research Project**

*Bob Nelson*, North Dakota State University

An overview will be provided of recent power line carrier (PLC) research conducted with Otter Tail Power Company. The research has had several aspects – including unique testing methods, the use of numerical simulations to evaluate the effect of various parts of the PLC system, and the initial design of an “auto-tuner” used to improve PLC performance. A brief overview will be provided of each aspect of the research.
High Performance Differential Protection Analog versus Numerical
Roger Hedding, ABB Inc.

Security and dependability are the main requirements for any protection system, but in application they oppose each other. Both qualities are extremely important for differential protection applications, especially bus differential protection. For bus zone applications, it is extremely important to have good security since an unwanted operation might have severe consequences. Analog bus differential relays have been around since the 1960s with great performance. Only recently, advances in microprocessor technology and software have permitted the equivalent microprocessor bus differential relay to match the performance of the analog relay.

Based on the tests performed in the heavy current laboratory, the comparison in performance of the analogue and numerical differential relays will be presented. In the same time, the CT requirements will be clarified and compared between these two protection systems. The test results have shown that the numerical differential protection is fully stable for different external faults, even when a current transformer saturates within approximately one millisecond. On the other hand, the numerical differential protection system can provide a trip signal within 11 milliseconds for internal faults.

DELIVERY SYSTEMS II

Tagging and Operations for Non-operational Engineers
Don Benjamin, North American Electric Reliability Council

Don Benjamin will explain how merchants set up interchange transactions (“deals”) and how Control Areas implement those transactions from the electronic “tags” that the merchants provide. Don will also explain the Eastern Interconnection’s Transmission Loading Relief Procedure.

Engineering Effects on Safety, “Safety by Design”
Steve Welles, Otter Tail Power Company and Greg Rindal, Minnesota Power Company

This session will take a look at some practical examples of engineering effects on safety and safe working. We’ll look at several field installations and discuss related safety concerns. The second part of the presentation will discuss engineering effects on worker protection. We’ll look at Flame Resistant Clothing, Barriers and Interlocks, and also Personal Protective Equipment and Protection Standards.

Arrowhead-Weston 345kV Line – Line Loadability Issues
George Sanjay, Minnesota Power

A phase shifting transformer is being planned for installation at the Arrowhead Substation as part of the Arrowhead-Weston 345 kV transmission line project. In conjunction with a remedial action controller, this device will respond to optimize the line loading and preserve voltage stability margins following major Twin Cities 345 kV transmission outfall contingencies. This paper discusses the phase shifter application as well as general line loadability and voltage stability issues.

Red River Valley Study/ West Central Minnesota Transmission Improvement Planning Study
Thomas A. Jones, Minnesota Power and Jason J. Weiers, Otter Tail Power Company

The Red River Valley/West Central Minnesota Transmission Improvement Planning Study (TIPS) provides a comprehensive assessment of the Region. Benchmark analyses confirmed previous studies identifying that the system is vulnerable to voltage collapse. The region of potential blackout involves the Red River Valley and West Central Minnesota regions. Major load centers within these areas include Alexandria, Bemidji, Fargo, Grand Forks, Jamestown, and Moorhead. The study’s framework is designed to consider both transmission and generation alternatives in accordance with the requirements of the Midwest Independent System Operator (MISO) and Minnesota statutory requirements. This presentation describes the overall study, its findings, the analytical methods employed, and innovative techniques in study collaboration.
Remediation of Dredged Sediments in Duluth Using the ElectroChemical GeoOxidation Process
J. Kenneth Wittke, Electro Petroleum, Inc.

U.S. regulators are accepting the use of ECGO, a patented technology, invented by Dr. Doering in Germany as a meaningful process for the in situ redox modification of organic and inorganic material in soils and sediments. Organic materials such as PAHs have been oxidized using the technology while chlorinated hydrocarbons have been dechlorinated using the technology. More than 50 sites have been successfully remediated at various waste sites in Europe and the United States. The electrochemical process is being demonstrated on sediments in a project in Minnesota and at other sites in the United States. Background material on the process and an update of the projects currently underway in the United States will be discussed.

Development of the Fibrominn Biomass Power Plant
David Frith and Terry Walmsley, Fibrowatt LLC

The background to the development of the Fibrominn 50 MW Biomass Power Plant will be described. The plant will be fueled principally by turkey litter and follows the successful implementation of similar projects in the UK. This unique project, the first of its kind in the U.S., presented a number of challenges, both technical and environmental, during its development.

DISTRIBUTION AUTOMATION

Panel Overview-Advanced Applications for Distribution Automation – Why Use It?
Dan Nordell, Xcel Energy and Russell Fanning, We Energies

This discussion will lay the groundwork for consideration of the use of advanced automation techniques in the electric delivery system. Intelligent automation can be used cost-effectively to enhance delivery reliability and reduce customer service disruptions. This track will introduce the topic and foster interchange of ideas among the participants.

Evaluating Wireless Technologies for Distribution Automation
Ken Barber, Telemetric

The presentation will provide a review of currently available wireless communications technologies for Distribution Automation applications. The focus will be on matching technologies with specific application requirements (bandwidth, coverage, cost, etc.). The presentation will also review emerging technologies that hold promise in the future.

UCA Users Group
Dan Nordell, Xcel Energy, Inc.

The Utility Communication Architecture (UCA) provides the foundation for robust automated system communication not only to control centers but also between smart field devices. This discussion will highlight the newly-formed UCA User’s Group and its efforts to advance the use of the UCA to solve delivery system problems.

Smart Feeders: Using Distributed Intelligence for Enhanced Reliability
Thomas M. Lebakken, Power System Engineering, Inc.

This presentation will discuss concepts being developed under a new EPRI initiative to use advanced automation techniques in constructing so-called "Smart Feeders" which will be self-healing without the active intervention of central dispatch systems.
LOCATION AND ACCOMMODATIONS

The conference will be held at the Earle Brown Continuing Education Center on the St. Paul Campus of the University of Minnesota. Parking is available adjacent to the center in lot S104 for $5 per day, across the street in lot S102 for $3.75 per day, and in the Fairground lot S108 for $3.25 per day.

Convenient lodging for out-of-town participants is available at the Four Points Sheraton Hotel Minneapolis, 1330 Industrial Boulevard, Minneapolis, 612-331-1900 or 1-800-777-3277. The rate is $84, plus tax, single or double room. Participants are responsible for making their own lodging reservations. To ensure receiving the special conference rate, please identify yourself as a participant of the Minnesota Power Systems Conference. Reservations must be made by October 13. After this date reservations will be accepted on a space and rate available basis.

REGISTRATION AND FEES

The fee for the conference is $200 if received by October 21; if received after October 21 the fee is $225. The conference fee includes all sessions, two luncheons, refreshments breaks, the exhibitor reception, and the conference proceedings. You are encouraged to register early to take advantage of the lower fee.

If you need to cancel your registration, a refund, minus $25, will be issued if you cancel your registration in writing by October 28. If you cancel after this date you will be ineligible for a refund. A full refund will be issued if the conference is cancelled by the University of Minnesota.

EXHIBITOR RECEPTION

The exhibitor reception will be held on Tuesday, November 5, from 4:15 to 6:00 p.m. at the Earle Brown Continuing Education Center (the same location as the conference sessions). The exhibits will be displayed in the main ballroom and foyer. Exhibitors will display brochures and small equipment. All conference attendees are invited to attend this reception to view the exhibits, meet the exhibitors, and enjoy some hors d’oeuvres.

CONTINUING EDUCATION UNITS (CEUs)

Participants who attend the entire conference will receive 1.6 CEUs. Participants who attend only Tuesday and Wednesday will receive 1.3 CEUs. One CEU is defined as 10 contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction. A CEU certificate will be sent to each participant after the conference. A permanent record of CEUs earned will be maintained by the University of Minnesota Office of Admissions and Record Transcript Unit.

FOR FURTHER INFORMATION

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1994 Buford Avenue
St. Paul, MN 55108
Phone: 612-624-4754
Fax: 612-624-6225
E-mail: smueffel@cce.umn.edu

CALL FOR PAPERS FOR 2003 CONFERENCE


If you would like to be considered for the 2003 program, please submit an abstract of approximately 300 words to: Nicole Hettwer, Department of Continuing Professional Education, University of Minnesota, 353 Classroom Office Building, 1994 Buford Avenue, St. Paul, MN 55108, E-mail: nhettwer@cce.umn.edu

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