South Dakota Biannual Regional Power Conference

Tuesday, October 23rd, 2012
SSU Lewis and Clark Room

Schedule

8:00 – 8:20  Check-in (refreshments provided)
8:30 – 9:20  Alternatives in Combining Key Processes on Large Transmission Projects
            Duane Phillips, Stanley Consultants
9:30 – 9:55  Break
10:00 – 10:50  Minnesota Power American Reinvestment and Recovery Act Smart Grid Investment
                Grant (ARRA-SGIG) Project Overview
                Daniel Gunderson, Minnesota Power
11:00 – 11:50  Photovoltaic Devices and Systems
                David Galipeau, South Dakota State University
12:00 – 12:50  LUNCH
1:00 – 1:50  GIS at Minnesota Power
            Tim Felix, Minnesota Power
2:00 – 2:50  Impact of Bakken Area electrical load increases on the local high voltage transmission system
            Matthew Stoltz, Basin Electric Power Cooperative
3:00 – 3:25  Break
3:30 – 4:20  Machine-to-Machine (M2M) Communications
            Amy Rainwater, Independent Consultant
“Current” Topics in Power Presentations and Presenters

Morning Session
8:30-9:20

Alternatives in Combining Key Processes on Large Transmission Projects

Duane Phillips
Senior Project Manager
Stanley Consultants, Inc.
Englewood, CO

Abstract

This presentation develops a process and methodology for successful large project development and completion. The following key areas will be discussed:

Project Overview: Basis for the presentation will be the process approach used for the Center-Grand Forks Transmission Project, a 250+ mile EHV transmission line in North Dakota.

Permitting: The discussion will focus on local/regional permitting within areas, but will address the process of obtaining support and approval for state or federal permitting as well. The focus will be more on the process and developing communication with the agencies, counties, townships, and then develop a process which meets both sets of standards and melds them into a single process flow. Purpose is to show how integration can build project support, public interaction, and increased permitting success from a project management perspective.

Procurement Selection: Presentation will go through the process and considerations for detailed procurement selection and screening process that identifies potential vendors/contractors and provides learning & screening process for project success.

General Contracting: Presentation will go through the process and considerations for being a general contractor for transmission projects. Each consideration will be discussed, as well as some best-practices for each area. Resource considerations as well as typical construction challenges will also be addressed. Content and layout will be such that transmission facility owners or project team members could then have the resources to consider the advantages/disadvantages of being their own general
contractor for future transmission projects. The discussion will focus on local/regional/state/federal permitting within areas, and will address the process of obtaining support and approval for all levels of permitting and public support as well. The focus will be more on the process and developing communication with the agencies, counties, townships, and public rather than detailed focus on permitting itself.

Biography

Duane received his engineering education and degree work in electrical and nuclear engineering while serving in the U.S. Navy. Following a number of successful tours on nuclear submarines, he was selected as a graduate level engineering instructor for advanced Navy nuclear engineers.

Following Naval service, Duane worked at several large nuclear generating stations and was responsible for substation, distribution, transmission, and instrument & controls departments as well as plant operations. He later served as regional manager at two larger utilities responsible for the transmission, distribution, substation, and engineering groups overseeing construction and operations within his territory.

Duane currently works as a Senior Project Manager at Stanley Consultants, responsible for design engineering and construction of large and/or complex transmission projects. He has over 30 years working in electrical industry, with 20+ years of project and construction experience.

10:00-10:50

Minnesota Power American Reinvestment and Recovery Act Smart Grid Investment Grant (ARRA-SGIG) Project Overview

Daniel Gunderson, P.E.

Supervising Engineer, Minnesota Power

Duluth, MN

Abstract

Presentation will focus on Minnesota Power’s Smart Grid Advanced Metering Infrastructure project involves the installation of advanced metering infrastructure (AMI) and explores the application of Distribution Automation in an area of below average reliability.
The project is aimed at achieving three main goals; improving customer understanding of their electricity usage, reducing operations and maintenance costs, and improving awareness of and response to distribution system outages. The project implements two-way communication to: (1) provide customers with more timely electricity usage information, (2) identify when and where outages are occurring, and (3) demonstrate the performance of select distribution automation equipment.

The presentation will focus on the project development, early takeaways, and expected long-term benefits from the Smart Grid Investments.

The American Recovery and Reinvestment Act of 2009 (ARRA-2009) provided DOE with $4.5 billion to fund projects that modernize the Nation’s energy infrastructure and enhance energy independence. For more information about the status of other Recovery Act projects, visit www.smartgrid.gov. To learn about DOE’s Office of Electricity Delivery and Energy Reliability’s national efforts to modernize the electric grid, visit www.oe.energy.gov.

Biography

Dan Gunderson is currently the Supervising Engineer for Metering Operations at Minnesota Power located in Duluth, Minnesota. He specializes in revenue metering on all levels of the system including generation, transmission, and distribution. His experience includes management and training of technical personnel, Management of multiple large scale AMR/AMI installations, Transmission metering design, medium and low voltage Distribution overhead and underground metering installation design, and metering safety policy and standards development. Dan is the current Vice-Chair of the Association of Edison Illuminating Companies (AEIC) Meter and Service committee. He is an active member of the National EEI Metering Committee, Voting Member of the ANSI C12 General Committee on the Code for Electricity Metering, and currently serves as the President of the Minnesota Electric Meter School. Other past experience includes working in Metering Systems as Specialty Engineer for Xcel Energy from 2001-2006 and consulting experience ranging from Meter Department operation strategy and asset management planning for Fortune 500 Utilities to technical projects with many small cooperative and municipal utilities.

Dan has a bachelor's degree in Electrical Engineering with an emphasis in Power Systems from Michigan Technological University in Houghton, MI, a Master of Business Administration degree with an emphasis in business operations from the Carlson School of Management at the University of Minnesota in Minneapolis, MN, a Professional Engineer Registration in the State of Minnesota, and a Class A Master Electrician's license in the state of Minnesota.
Abstract

This presentation includes a description of solar energy basics, photovoltaic devices and systems, the economics of photovoltaic systems, and a discussion of current research which is focused on the development of alternative energy systems for microgrids. A description of the EECS Department Alternative Power Technologies Laboratory will be provided.

Biography

Dr. David W. Galipeau is a Professor of Electrical Engineering, and the Coordinator of the Center for Advanced Photovoltaics, and Electrical Engineering MS and Ph.D. graduate programs at South Dakota State University. He is also the program lead for the Alternative Power Technology (APT) Program supported by the Department of Defense.

He earned the B.S. degree in Electrical Engineering from the University of Rhode Island in 1971, and the MS and Ph.D. Degrees in Electrical Engineering from the University of Maine in 1989 and 1992. He started his career at AT&T in 1971 and held several positions in technical operations and planning in the New England area until 1987. He joined SDSU in 1992 as an assistant professor and has taught and conducted research in the area of microelectronic devices and materials, with emphasis on microsensors, and instrumentation. His current research is on the development of next generation photovoltaic devices and systems.

While at SDSU, he has been the PI or Co-PI on over forty funded research projects, including twelve major NSF awards for over $10 M. He has published over 100 research papers, given numerous presentations, and established a spin off business. He was the first SDSU faculty member to receive the
prestigious NSF-CAREER award and SBIR awards. He was also a Co-founder of the Center for Advanced Photovoltaics, was responsible for implementing the new EE Ph.D. program, and recruited and hired over twenty employees and students during the startup phase of the APT program.

His recognitions include “The National Tibbett’s Award” for contributions to the SBIR Program in 1999; “Researcher of the Year,” College of Engineering, SDSU in 1999 and 2010; Entrepreneur of the Year, College of Engineering, SDSU in 1998; and Senior Member of the IEEE. Three of his technical papers have also won awards. He has served as the Chair of the Sensors & MEMS technical subcommittee for IMAPS and on the organizing committee for several sensors conferences. He is a member of the Institute of Electrical and Electronic Engineers (IEEE), the International Microelectronics and Packaging Society (IMAPS), the Materials Research Society (MRS), and the American Society for Engineering Education (ASEE).

Afternoon Session
1:00 – 1:50

GIS at Minnesota Power

Tim Felix, Supervising Engineer

Minnesota Power

Duluth, MN

Abstract
Presentation will discuss the use of GIS at Minnesota Power, with emphasis on electric distribution applications. The additional value derived from integrating GIS with other corporate IT systems will also be discussed. Presentation is applicable to utility operators interested in considering or expanding the use of GIS in their business. It would also be of interest to GIS professionals or students interested in a focused application of spatial technology supporting real world operations. Discussion will be a high level overview of GIS applications mixed with a more detailed treatment of targeted applications. Basis for the discussion will be the presenter’s over two decades of experience working with GIS at Minnesota Power.
Biography

Tim Felix is Supervising Engineer of Facility Operations for Minnesota Power / Allete. He is responsible for the operation and maintenance of the corporate GIS, having overseen its implementation from inception. His responsibilities also include new application development, mobile GIS data deployment, and interfaces to other corporate data systems. Prior to his current assignment, he held positions in the ITS Department of Engineer Programmer and Project Leader, supporting GIS since 1991 in his 23 years with Minnesota Power. He is a graduate of the University of Minnesota Institute of Technology where he received a degree in mechanical engineering. He is active in local and national GIS user groups, and has served on the MN GIS/LIS Consortium Board of Directors.

2:00 – 2:50

*Impact of Bakken Area electrical load increases on the local high voltage transmission system*

Matthew Stoltz P.E.
Manager Transmission Services
Basin Electric Power Cooperative
Bismarck, ND

Abstract

This year monthly North Dakota oil production exceeded Alaska and is now only second to Texas. The oil and gas extraction and related activities is causing rapid increases of electrical loads in the Bakken region, centered on the town of Williston. The load in the Williston area is expected to increase from approximately 300MW in 2012 to 900MW by 2020. The electrical transmission and distribution networks are struggling to keep pace with this demand for electricity. The load can be placed in service far quicker than a major transmission line can be permitted, designed, and constructed. This presentation will describe the situation in the Bakken area, the types of major loads, and the efforts the network transmission and distribution providers are taking to meet the needs of their customers.
Biography

Matthew Stoltz received his BSEE from NDSU in 1985. From 1986-1999 Matthew worked for Western Area Power Administration, Boulder City, NV and Loveland, CO in Project Management and Transmission Planning. Since leaving WAPA in 1999, he has been in Transmission Planning at Basin Electric Power Cooperative, Bismarck ND.

3:30-4:20

*Machine-to-Machine (M2M) Communications*

*Amy Rainwater,*

*Independent Consultant*

*Rockford, IL*

Abstract

Machine-to-machine (M2M) communication refers largely to digital communication between an endpoint and an enterprise backend system over cellular networks that are initiated with or without human intervention. Periodic transmission of electricity consumption information over cellular networks to the utility systems by smart meters is an example of automated M2M communications. M2M communications consists of using a device, to capture an event relayed through a network to an application, translating the captured event into meaningful information. This definition can be applied to both one-way and two-way communication scenarios where a device can be remotely monitored, information can be collected and analyzed, and the device itself can perform certain functions based on commands from the enterprise or the service provider backend.

M2M’s resurgence can be attributed to converging conditions that are broadening the number and types of opportunities businesses have to connect non-traditional devices. These conditions include:

- Technology miniaturization, which now makes it convenient and cost effective to embed a sensor or communications module in virtually any product.
- Expansive fixed and mobile broadband networks that can transmit information from almost any device, regardless of its location, to a server.
The widespread availability of open, IP-based standards, which allows these technologies to interoperate and communicate with one another.

Cloud-based services that make it possible for the communications exchange between devices to take place on the Internet rather than inside the walls of the enterprise.

This new era of connectivity—the “Internet of things”—is made possible by smarter technologies that allow equipment and devices that previously had no voice on the network to connect and contribute vital information to business systems. In the coming years, M2M services will be built into almost everything we touch—enhancing our quality of life and creating new ways to engage with partners and customers.

**Biography**

Amy Rainwater has over 10 years of experience in the power utility industry as a project manager. In recent years, she has spent most of her time gathering intelligence behind grid design, automation and control systems that support a “smarter” grid. In doing so, she has worked with utilities to develop common sense strategies regarding smart grid implementation.