

APPLICATIONS IN TRANSMISSION PLANNING

Consulting and
Training Services

OVERVIEW

How to integrate a long-term view to the development of transmission systems? This is the challenge of transmission planning: to take into account future uncertainty, new power technologies and economic and operating realities in order to come up with a plan for transmission development.

In the new and emerging competitive markets, transmission planning needs to

demonstrate relevance by providing applicable solutions to anticipated problems. In doing so, planners must provide answers to questions that have not yet been asked.

We will cover the various methodologies that have been tried, and point out the ones that work, and don't work in the new competitive environment. We will discuss the methodologies for de-

veloping the strategic plan, and software-based approach to developing the implementation plan. We address the least-cost methodology, and how this is applicable to modern power systems. Finally, the course will discuss the possible future impacts in increasing penetration of renewable energies into the bulk power system, how to address them and how to plan for them.



COURSE OUTLINE

Overview
Transmission Planning Methodologies
Impact Assessment
Horizon Year Method
Tradeoff-Risk and other Least Cost Methods
Considerations in Transmission Planning
Scenarios and Uncertainty
Options and Technology Solutions
Planning Horizons
Conflicting Objectives and Integrating a Plan

Detailed Plan Development
Planning for Adequate Thermal Capacity
Planning for Voltage Support and Control
Planning for Voltage and Transient Stability
Planning for Transfer Capability
Handling Sensitivities
Case Study
Overview of the Case Study
Development of Scenarios
Developing Individual Plans
Integrating the Plan

implementing the Plan
Compiling a Transmission Plan
Costs
Dependencies
Approvals
General Review and Discussion



WHY TAKE A PTERRA COURSE?

Pterra's short courses cover new and evolving technologies in power system engineering and analysis topics. The courses range from a day to 4 days of intensive, focused discussion on specific, timely topics. Some courses are lecture and discussion type while others include hands-on case studies to enhance learning on applications topics. What makes taking courses at Pterra unique?

- **Experience** - Pterra's instructors talk from experience in practical applications for the particular topics they cover. As a minimum, Pterra's instructors have 10 years experience and 200 lecture hours in a classroom environment.
- **Convenience** - Pterra courses are held in locations where there is convenient access by road, train or air, at venues where there are numerous choices for lodging and meals. In addition, Pterra offers tours and reserved dinners following a day of classes to complement the technical discussions with cultural and social activities. And for those who are unable to travel, we offer specific courses for distance learning.
- **Personal** - Pterra courses are aimed at smaller class sizes with an average instructor to student ratio of 1:5. The classroom atmosphere is casual,



COURSE DETAILS

Attendees

The course is applicable to any of the following:

- New transmission analysts
- Analysts and specialists with at least 1 year experience in planning and operations
- Operations analysts
- Market participants

Format

In the first 3 days of the course, class time is split equally between formal lecture/discussion sessions and hands-on sessions. The hands on sessions provide practical exercises in implementing the concepts and methodologies covered in the lecture/discussion sessions.

The fourth day of the course is optional. On this day, participants have the opportunity to apply the techniques and methodologies covered during the first 3 days to a system of their own choice, typically a study system they are familiar with. Participants will be responsible for providing their own databases. An instructor will be assigned to each participant to provide specific instruction on applications to this database.

Computers will be provided for course participants. These computers will have PSLF installed as a default. Participants who wish to bring their own laptops with their own licensed analytical software. Pterra's instructors can provide coaching for most software packages.

Location and Activities

Live courses are held at Pterra's Training Facility in Albany, New York, located 5 minutes from Albany International Airport on Wolf Road. Over 20 hotels and restaurants within 10 minutes make this an accessible location. Also, the location is within a day's driving distance from anywhere in the Northeast US and eastern Canada.

ware may do so. We also offer this course at sponsored locations. Please contact Pterra for details.

Distance Learning Option

Certain courses offered by Pterra are available via Distance Learning. In Distance Learning, you are able to participate in a short course from your office or home, on a schedule that best fits your availability. The Distance Learning option is available for a limited period following the live session of the course. This is to ensure that the course material and presentation remain timely and applicable.

To avail of Distance Learning, you will require a computer with internet access, sound and email capabilities. Companies have the option of putting this course up in a conference hall for more participants to attend.

Pterra Power Technology Courses

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For *schedules and more info*, please visit us on the web at:
www.pterra.com/training

conducive for open discussions of technical issues. Our training facilitators address specific needs to make the learning experience more comfortable and rewarding. For a very short time commitment from you, come away with the latest thinking on power technologies, and bring this directly to your area of application.