

2010 IEEE Rural Electric Power Conference
Orlando, Florida
May 16-19, 2010
Short Course and Technical Workshop – May 19, 2010

**Renewable Energy, Distributed Generation and Rural Electric Power System:
Interconnection Issues, Design and Application Guidelines**

Dr. P.K. Sen, PE, Professor of Engineering, Colorado School of Mines, Golden, CO 80401
Dr. Keith Malmedal, PE, President, NEI Elec. Power Eng., Arvada, CO 80033

This 8-hrs. short course has been designed for practicing engineers (young or experienced), managers and technical personnel interested in different aspects of Renewable Energy (Wind, Photovoltaics) and Distributed Generation connected to Rural Electric Power Systems. The main objective of the course is to introduce the basic tools required for all power systems calculations and used in a number of design problems. The primary focus of this course is on the high (HV) (115kV and 230kV) and medium voltage (MV) power systems (12.47kV). It is assumed that participants will have some basic knowledge of fundamentals of electric power systems. Practical experience is preferable, but not required. Numerous real world design problems will be solved.

The short course will be divided in two, four-hour, stand-alone module. The first half will discuss the “big picture” and is designed for all engineering, managerial and operation and maintenance personnel. The second half will build on the concepts from the first half and will include more design problems and calculations related to electric power systems. Extensive handouts will be provided at the workshop. This introductory class is absolutely essential for all practicing power systems engineers, utility and no-utility alike, and consulting firms.

(Tentative) Course Outline

Part I (First Half- 4 hrs.):

- Basics of Electric Power Systems and “The Big Picture” - The Electric Grid, Distributed Generation, Renewable Energy, Wind Energy and Photovoltaics
- Energy Policy Act of 2005, Energy Security Act of 2007, and Renewable Portfolio Standards: How are they Interconnected?
- Power, Reactive Power, Apparent Power, Power Factor and Understanding Reactive Power and Power Factor Improvement: Layman’s Approach!!
- Interconnection Guidelines

Part II (Second Half- 4 hrs.):

- Wind Firm: Power Systems Design Fundamentals and Choices, Issues and Challenges
- Photovoltaics: Advancement in Design and Applications
- Procurement of Major Equipment and Quick Cost Estimate
- Protection and Safety
- Penetration Level and Retrofit Design Issues
- Future Trend and the Future?
- Plenty of time for Questions and Answers, Very Informal Discussions and Breaks.

\$400/person (2 or more attendees from the same company \$350/person) for the 8-hr. course (including lunch & coffee break)

\$200/person (2 or more attendees from the same company \$175/person) for the 4-hr. course (including coffee break)

Course may be cancelled, if the enrolment is less than 15 within the three weeks of the conference. You are encouraged to pre-register, and you will be notified within three weeks for cancellation at no cost.

Drs. Sen and Malmedal have a combined 65+ yrs of teaching, consulting and engineering design experience.

For further information, please contact Dr. P.K. Sen, P.E., Professor,

Phone: (303) 339-6750 and email: pksen@neiengineering.com

Also contact Vikki Joseph at (303) 431-7895, NEI Electric Power Engineering, Inc., vjoseph@neiengineering.com