EPRI | ELECTRIC POWER RESEARCH INSTITUTE

One Day Summary Course and Tutorial

Addressing the Educational Needs for Engineers Designing and Operating Future Electric Grids with Distributed Energy Resources

Location: Salt River Project

Pera Club – Clubhouse Lower Level
1 East Continental Drive
Tempe, Arizona 85281-1053

Friday, March 6, 2015

Time	Topic	Presenter
8:00 am	***Light Breakfast***	
8:30 am	***Introduction, Background, Objectives*** • The Changing Utility Industry • Workforce Educational Needs • GridEd – The Center for Grid Engineering Education • Educating Power Engineers for a Future Distribution Grid	*Mark McGranaghan and Tom Reddoch*
9:00 am	***Distributed Generation Technologies and Applications*** • Overview of Course Content • Solar Technologies & Applications • Value Analysis • Regulatory Issues	*Haresh Kamath*
10:00 am	***BREAK***	
10:15 am	***Smart Inverter Standards and Grid Codes*** • Smart Inverter Principles • IEEE 1547 Status • UL1741 Listing • German MV and LV Grid Codes • California Rule 21 Status	*Aminul Huque*

11:00 am	***Electric Power Distribution Systems***
	• Overview of Course Content
	• Changes in Distribution Systems
	  ○ Integration of distributed generation and storage
	  ○ Microgrids
	  ○ Electric vehicles and other load changes
	• Smart grid systems and technologies
	  ○ DG Impacts on Voltage Drop
	  ○ DG Impacts with Different Transformer Connection
	  ○ DG Impacts on Coordination
	  ○ Design an Automated System
		Tom Short

12:00 pm	***LUNCH***	

1:00 pm	***Dynamic Distribution System Modeling***
	• Overview of Course Content
	  ○ Why Dynamic Distribution Modeling?
	  ○ Capturing both time-specific and location-specific value
	• Increasing Hosting capacity via voltage control
	• Results to date:
	  ○ DPV and Hosting Capacity Variations
	  ○ Smart Inverter Modeling results from EPRI/DOE study
		Jeff Smith

2:15 pm	***BREAK***	

2:30 pm	***Smart-Inverter Grid Support Functionalities*** • DOE/EPRI Project Background • Advanced Functions – Design & Testing • Demonstration – Site Specific Objectives • Modeling – Identifying Best Settings • Lessons Learned and Conclusions	*Aminul Huque*

3:15 pm	**Business Case Analysis in the Electric Utility Industry**
	• Overview of Course Content
	• Extensions of Utility Planning Analysis:
	  ○ Value-based Planning
	  ○ Integrated Least Cost planning
	• Types of CBA
	  ○ Economic vs. Financial Analysis "Perspective"—Who's Costs & Benefits?
	  ○ *Drawing the Circle*: What's in, What's out? Who's in, Who's out?
	  ○ Utility Planning versus "Textbook" Financial Analysis
	• CBA Case Studies
	  ○ Smart Grid Investments
	  ○ Accommodating Distributed Generation
		Jeff Roark

4:00 pm	***Adjourn***	