

**AGENDA FOR THE
U.S.-JORDAN ELECTRIC POWER TRANSMISSION PARTNERSHIP
EXECUTIVE EXCHANGE VISIT**

**FOR THE
NATIONAL ELECTRIC POWER COMPANY (NEPCO)
OF JORDAN**



**WITH ARIZONA PUBLIC SERVICE, DUKE ENERGY,
THE EDISON ELECTRIC INSTITUTE,
THE FEDERAL ENERGY REGULATORY COMMISSION,
ISO NEW ENGLAND, AND PJM**

**April 25 to May 7, 2009
in Washington, DC; Charlotte, North Carolina; and Phoenix, Arizona**

Managed by
UNITED STATES ENERGY ASSOCIATION (USEA)

Funded by
THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)



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USEA
United States Energy Association

Partnership Goal:

To introduce and transfer best utility practices for planning, operating, managing and maintaining electric power transmission systems.

Executive Exchange Objectives:

1. Improving the reliability and stability of the transmission grid system.
2. Accelerating the integration of renewable energy into the grid.
3. Improving transmission system planning and operations.
4. Introducing advanced techniques for operating the Jordanian electricity market and handling cross-border electricity exchange and cooperation.

Participants:

Jordan Delegation

National Electric Power Company of Jordan (NEPCO)

www.nepco.com.jo

1. Abu Snobar, Ayed, Assistant Managing Director, NEPCO
2. Jabri, Majed, Assistant Managing Director for Operations, NEPCO
3. Khalil, Allan, Manager, Department for Coordination of Electricity Affairs, NEPCO
4. Zaghal, Amin, Manager, Operations Planning Department, NEPCO

Monday, April 27, 2009

Regional Transmission System Operations: ISO New England

ISO New England helps protect the health of New England's economy and the well-being of its people by ensuring the constant availability of electricity, today and for future generations. ISO New England meets this obligation in three ways: by ensuring the day-to-day reliable operation of New England's bulk power generation and transmission system, by overseeing and ensuring the fair administration of the region's wholesale electricity markets, and by managing comprehensive, regional planning processes.

9.00-10.30 OVERVIEW OF ISO OPERATIONS AT ISO NEW ENGLAND

ISO Bulk Power Operations: An Overview

- FERC Regulations/Mandates
- US Independent System Operators
- NERC Regions in Relation to ISO Operation
- ISO Control Area

Keeping the Balance: Reserve Sharing in an ISO

- Unit Commitment
- Operating Reserve
- Reserve Sources

10.50-11.45 ISO NEW ENGLAND (CONTINUED)

- ISO New England Organization, Staffing and Functions
- ISO New England Membership and Governance
- Energy Market Operations: Scheduling Bilateral, Day Ahead and Real Time Transactions
- Settlement Procedures
- ISO New England's Automated Generation Control
- Economic Dispatch and Equal Incremental Cost

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission, or FERC, is an independent agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also reviews proposals to build liquefied natural gas (LNG) terminals and interstate natural gas pipelines as well as licensing hydropower projects.

13.00-15.00 OVERVIEW OF FEDERAL ENERGY REGULATORY COMMISSION

- Federal Jurisdiction
 - Regulation of Transmission System
- Long Term Policy Objectives
- State and Federal Relationships and Coordination
- International Aspect of Transmission Grids and Transactions

Tuesday, April 28, 2009

Regional Transmission System Operations: Pennsylvania Jersey Maryland Interconnect (PJM) Interconnection and Organization of PJM States

PJM Interconnection, LLC is responsible for the day-to-day operation of the largest centrally dispatched electric system in North America. Its foremost responsibility is the safe and reliable operation of the transmission system and ensuring the reliable supply of energy from generating resources to wholesale customers. In addition, it operates the competitive wholesale energy market for the region and facilitates open access to transmission. With over 170 members including every segment of the electric power industry, its market has become one of the most liquid and active energy markets in the United States.

9.00-10.30 OVERVIEW OF ISO OPERATIONS AT PJM ISO Bulk Power Operations: An Overview

- FERC Regulations/Mandates
- US Independent System Operators
- NERC Regions in Relation to ISO Operation
- ISO Control Area

Keeping the Balance: Reserve Sharing in an ISO

- Unit Commitment
- Operating Reserve
- Reserve Sources
- PJM Organization, Staffing and Functions
- PJM Membership and Governance
- Energy Market Operations: Scheduling Bilateral, Day Ahead and Real Time Transactions
- Settlement Procedures
- PJM's Automated Generation Control
- Economic Dispatch and Equal Incremental Cost

13.30-15.30 PJM System Security

- First Contingency Planning
- Interface Capability
- Energy Tagging

PJM's Open Access Same Time Information System

Planning for regional transmission expansion

15.50-17.00 Operating Policies and Planning Standards and Key Regulatory Issues for Transmission

- Mid-Atlantic Area Council (MAC) of the PJM Interconnection
- Transmission planning
- System reliability
- Responsibility and role of the Mid-Atlantic Area Council

Wednesday, April 29, 2009

Briefing at USEA and Work Plan Development

10.00 – 11.00 NEPCO Briefing to USEA membership on state of transmission system in Jordan

11.00-12.00 Discussion of NEPCO work plan

Edison Electric Institute (EEI)

The Edison Electric Institute (EEI) is the association of [U.S. Shareholder-Owned Electric Companies](#). EEI's members serve 95 percent of the ultimate customers in the shareholder-owned segment of the industry, and represent approximately 70 percent of the U.S. electric power industry.

13.30 – 15.30 Meeting with Edison Electric Institute to discuss EEI Services Program

- **EEI position on Current Transmission Issues**
 - **Regulation**
 - **Smart Grid**
 - **Legislative Position**

Thursday, April 30, 2009

Duke Energy (www.duke-energy.com)

Duke Energy is one of the largest electric power companies in the United States. Duke Energy supplies and delivers energy to approximately four million U.S. customers. Duke Energy has approximately 35,000 megawatts of electric generating capacity in the Midwest and the Carolinas, and natural gas distribution services in Ohio and Kentucky. In addition, Duke Energy has more than 4,000 megawatts of electric generation in Latin America. Duke Energy is headquartered in Charlotte, N.C., and is a Fortune 500 company traded on the New York Stock Exchange under the symbol DUK.

9.00-9.15 OVERVIEW OF PROGRAM OBJECTIVES AND INTRODUCTION OF DELEGATION (USEA)

9.15-10.00 PRESENTATION ON TRANSMISSION SYSTEM IN JORDAN (NEPCO)

10.20-12.00 OVERVIEW OF DUKE ENERGY AND REGIONAL TRANSMISSION SYSTEM

- Overview of U.S. and Regional System
- Overview of Duke Energy
- Unique Challenges (Seasonal, Geography, Topography)

13.00-14.30 POWER SYSTEM AND OPERATIONAL PLANNING

- System and Operational Description
- Maintenance/Repair Description
- Outage Planning (Planned vs. Unplanned)
- Planning Process
 - Study Process
 - Special Protection Systems (SPS)
 - Emergency Operations

15.00-16.30 OPERATIONAL RELIABILITY AND STABILITY

- Organizational structure
- Operations and Controls and Rules and Procedures
- Training and Tools

16.30-17.00 INTERACTION WITH THE REGULATOR

- Tariff Issues
- Performance Standards Issues

Friday, May 1, 2009

Duke Energy (continued)

9.00-10.30 INTEGRATION OF RENEWABLE ENERGY INTO THE GRID

- Interconnection of Solar
- Intermittency and Grid Stability
- Scheduling of Nonfirm Energy

10.50-12.30 ENERGY MARKETS/TRADING

- Types, Legal issues, Benefits/Issues, Planning
- How U.S. transmission utility operates in energy market
- Managing information exchanges
- Interchanges and inter-ties
- External power sales

13.30-17.30 SITE VISITS (E.G. CONTROL/DISPATCH CENTER, HIGH VOLTAGE SUBSTATION, RENEWABLE ENERGY FACILITY, ETC.)

Monday, May 4, 2009

APS (www.aps.com)

*Arizona Public Service Company is the largest electric utility in Arizona and the principal subsidiary of publicly-traded S&P 500 member **Pinnacle West Capital Corporation** (NYSE: PNW), which in turn had been formerly named **AZP Group**, when Arizona Public Service reorganized as that holding company in 1985. APS, with 4,000 MW of generating capacity, serves more than one million customers in 11 counties throughout most of the state, but mainly concentrated in northern and central Arizona.*

The holding company, Pinnacle West Capital, through its APS utility sells wholesale and retail power to the wider western United States and also provides energy-related services. Through another major subsidiary, Pinnacle West, it also develops and manages real estate in Arizona.

9.00-9.15 OVERVIEW OF PROGRAM OBJECTIVES AND INTRODUCTION OF DELEGATION (USEA)

9.15-10.00 PRESENTATION ON TRANSMISSION SYSTEM IN JORDAN (NEPCO)

10.20-12.00 OVERVIEW OF APS AND REGIONAL TRANSMISSION SYSTEM

- Overview of U.S. and Regional System
- Overview of APS

- Unique Challenges (Seasonal, Geography, Topography)

13.00-14.30 POWER SYSTEM AND OPERATIONAL PLANNING

- System and Operational Description
- Maintenance/Repair Description
- Outage Planning (Planned vs. Unplanned)
- Planning Process
 - Study Process
 - Special Protection Systems (SPS)
 - Emergency Operations

15.00-16.30 OPERATIONAL RELIABILITY AND STABILITY

- Organizational structure
- Operations and Controls and Rules and Procedures
- Training and Tools

16.30-17.00 INTERACTION WITH THE REGULATOR

- Tariff Issues
- Performance Standards Issues

Tuesday, May 5, 2009

APS (site visits)

SITE VISIT TO APS ENERGY CONTROL CENTER

INTEGRATION OF RENEWABLE ENERGY INTO THE GRID

- Interconnection of Wind and Solar
- Intermittency and Grid Stability
- Scheduling of Nonfirm Energy

10.50-12.30 ENERGY MARKETS/TRADING

- Types, Legal issues, Benefits/Issues, Planning
- How U.S. transmission utility operates in energy market
- Managing information exchanges
- Interchanges and inter-ties
- External power sales

13.30-17.00 SITE VISITS TO NORTHWIND PHOENIX, LLC

APS Energy Services markets, designs, constructs, finances and operates district energy systems throughout the Southwest. District energy, is an innovative centralized cooling and heating system that utilizes an extensive underground network of pipes to efficiently deliver hot and cold water, steam, or electricity from a central plant. This central plant is capable of servicing an entire campus or individual buildings, parceled areas, downtown locations and individual locations where there are concentrated energy requirements.

Wednesday, May 6, 2009

APS (site visits)

9.00

Depart hotel for site visit to STAR (Solar Testing and Research) Facility

Arizona Public Service Company (APS) operates the Solar Test And Research (STAR) facility to provide solar resource monitoring, small scale performance testing of new products, and to act as a staging area to ready and test equipment being installed for customer service. The STAR facility, which is located in the buffer area at the Ocotillo Power Plant in Tempe, is currently the focal point of APS' solar test and evaluation program.