



PAKISTAN UTILITY EXECUTIVES EXAMINE U.S. BEST PRACTICES IN DISTRIBUTION SYSTEM ENGINEERING, DESIGN & OPERATIONS

EXECUTIVE EXCHANGE WITH UNITED ILLUMINATING COMPANY AND DUKE ENERGY

NEW HAVEN, CONNECTICUT AND CINCINNATI, OHIO – Senior managers from eight of Pakistan’s electricity distribution utilities recently met with American utility counterparts to review U.S. best practices in distribution system engineering, design and operations. The U.S. Agency for International Development (USAID) Power Distribution Program supported this exchange to improve access to reliable electricity for the people of Pakistan.

USAID’s Power Distribution Program (PDP) is a three-year project conducted jointly with government-owned electric power distribution companies in Pakistan to improve their performance in the areas of loss-reduction, revenue collection, and customer services. As part of the Power Distribution Program’s capacity-building efforts in Pakistan, a delegation of ten distribution executives engaged in meetings, presentations, roundtable discussions, and technical site visits at the United Illuminating Company in New Haven, Connecticut and Duke Energy in Cincinnati, Ohio to identify the most effective strategies for system design, engineering and operations utilized in the U.S. electricity distribution sector.



Above: Members of the Power Distribution Program delegation study the evolution of meter technology at United Illuminating Company. Thomas Succi (left), Supervisor of Meter Engineering and Meter Testing, demonstrates the tamper-proof smart meters installed by United Illuminating Company.

UNITED ILLUMINATING COMPANY

The delegation from Pakistan met with senior planning managers and executives at United Illuminating Company in New Haven, Connecticut. The United Illuminating Company (UI) is a regional electric distribution company headquartered in New Haven, Connecticut. UI was founded in 1899, and transmits, distributes and sells electricity to over 325,000 residential, commercial and industrial customers. Covering a service territory of 335 square miles, UI employs 1,066 people.

UI gave an overview of their distribution planning process, including design standards, planning software, safety protocols and smart grid initiatives. Delegates learned the benefits of Geographic Information Systems (GIS) mapping of the distribution system, which enables utilities to quickly identify breakdowns and allocate appropriate resources to resolve the issue. GIS mapping is also a key component in Supervisory Control and Data Acquisition (SCADA) systems that can locate power theft. The exchange demonstrated the financial, operational and planning benefits of GIS mapping.

UI staff also explained the financial benefits of installing smart meter technology. The staff discussed their rigorous meter-testing procedures designed to prevent tampering and power theft, increase meter accuracy, and streamline billing and collections. Preventing meter tampering is a priority for many of Pakistan's utilities, and the low cost protective casings for UI's meters were of particular interest to the delegation. With tamper-proof smart meters, utilities are able to monitor electricity usage across the distribution network and operate the grid more effectively. At the same time, it is easier to detect meter tampering and power theft. By implementing smart meter technology, UI was able to reduce revenue losses by over \$43 million since 2000.



Above: The delegation prepares to visit UI's 345 kV Trumbull Substation. Front, left to right: Benjamin Loebick, UI; Syed Rahman UI; Tahir Mahmood, LESCO; Noor Ahmed Soomro, SEPCO; Zafar Hussain, MEPCO; Syed Abdullah, QESCO; Khalid Khan, IESCO; Ali Madad, QESCO; Muhammad Saleem, FESCO; Ed Delmonte, UI. Back row, left to right: Andrew Palmateer, USEA; Muhammad Ashgar Khan, MEPCO; Tajamul Hussain, HESCO; Sohail Khan, PESCO.



Above: The PDP delegation visits Duke Energy's Envision Center, which gives an interactive tour of Duke's cutting-edge research in energy efficiency for residential consumers. Here, examples of state-of-the-art smart meters are displayed.

DUKE ENERGY

During the second half of the exchange, the delegation met with senior management and planning staff from Duke Energy. Duke is the largest electric power holding company in the U.S. Headquartered in Charlotte, North Carolina, Duke Energy provides electricity to over 7 million customers throughout the Carolinas, the Midwest and Florida. Duke Energy also owns 32,000 miles of transmission infrastructure and 58,200 MW of electricity generating capacity from a variety of resources. Duke Energy has nearly 30,000 employees working across a service territory of 104,000 square miles.

Duke staff demonstrated their streamlined planning process, where GIS mapping, smart grid technology, and design software help integrate the planning, design and maintenance process in real time. During outages or planned maintenance, Duke staff can identify faulty equipment, specify necessary replacements or repairs, and dispatch work crews. The system also allows management to track and implement scheduled equipment replacement as it reaches the end of its life cycle. This reduces outages and saves the utility's valuable time and resources.

The delegation also toured Duke's Envision Center. The Envision Center gives customers the opportunity to experience Duke's smart grid plans in an interactive setting. The Envision Center demonstrates the benefits of smart grid and energy efficient technologies.

BACKGROUND ON PAKISTAN'S POWER & ELECTRICITY DISTRIBUTION SECTOR

Pakistan's power sector is confronted by significant challenges. These include the limited availability of reliable and affordable electric power, aging and inadequate transmission and distribution networks, high rates of lost revenue due to inadequate metering, and theft. Additionally, many distribution utilities lack the robust technological infrastructure that can enable efficient back-office operations, such as handling customer service requests.

For major electric distribution utilities in Pakistan, these deficiencies translate into unsustainable levels of financial performance. Financial self-sufficiency is becoming critical, as Pakistan's power industry is undergoing sweeping changes. These changes include transitioning from wholly Government-owned utilities to fully autonomous companies that will engage in power generation, transmission, and distribution under the Government's aggressive reform agenda. A similar industry structure exists and functions smoothly in many other countries today. In Pakistan, however, outdated policies, procedures, and work practices, as well as low investment in infrastructure, pose barriers to a successful transition.

RESULTS

The PDP delegation observed the best practices in distribution system engineering, design and operations at both utilities.

As a result of this program, the delegates:

- HESCO, IESCO, MEPCO and PESCO delegates plan to pursue further distribution system automation and digitization.
- FESCO, SEPCO, QESCO and HESCO delegates underlined the need for increased standardization of distribution system materials
- Delegates from all Pakistan utilities will try to expand and accelerate GIS mapping of the distribution network. GIS mapping is in progress in several of Pakistan's utilities.
- Received emergency and blackout/loadshedding management policies, along with restoration processes from United Illuminating.
- Received recommendations for useful engineering handbooks, including:
 - Lineman's and Cableman's Handbook 12th Edition
 - Electric Power Distribution Handbook
 - Standard Handbook for Electrical Engineers, 5th Edition

UTILITY EXCHANGE PROGRAM PARTICIPANTS

1. Mr. Sohail Khan, SDO (PDP Seconded Staff), Peshawar Electric Supply Company (PESCO)
2. Mr. Tajamul Hussain, Assistant Manager P&E, Hyderabad Electric Supply Company (HESCO)
3. Mr. Khalid Khan, Deputy Manager Procurement PMU, Islamabad Electric Supply Company (IESCO)
4. Mr. Zafar Hussain, Additional Manager Planning, Multan Electric Power Company (MEPCO)
5. Mr. Muhammad Asghar Khan, Deputy Manager Planning, Multan Electric Power Company (MEPCO)
6. Mr. Tahir Mahmood, Deputy Manager Planning, Lahore Electric Supply Company (LESCO)
7. Mr. Syed Abdullah, Deputy Manager Planning, Quetta Electric Supply Company (QESCO)
8. Mr. Ali Madad, Assistant Manager Project Management Unit, Quetta Electric Supply Company (QESCO)
9. Mr. Muhammad Saleem, Deputy Manager Planning, Faisalabad Electric Supply Company (FESCO)
10. Mr. Noor Ahmed Soomro, Assistant Manager, Sukkur Electric Power Company (SEPCO)

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