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ANNUAL REPORT

OCTOBER 1, 2013 - SEPTEMBER 30, 2014

PRODUCED BY:

USAID POWER DISTRIBUTION PROGRAM

ANNUAL REPORT

OCTOBER 1, 2013 – SEPTEMBER 30, 2014

IRG, USAID Contractor for the Power Distribution Program

House 23, Street 19, F-6/2

Islamabad, Pakistan

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ACRONYMS

ABC	Aerial Bundled Cable
AMR	Automatic Meter Reading
AT&C	Aggregate Technical and Commercial
BOD	Board of Directors
CCTV	Closed Circuit Television
CEO	Chief Executive Officer
CFL	Compact Fluorescent Lamp
CIS	Customer Information System
CoS	Cost of Service
CoSS	Cost of Service Study
CPOP	Commercial Process Optimization Project
CPPA	Central Power Purchasing Agency
CPPA-G	Central Power Purchasing Agency Guarantee Limited
CSP	Completely Self-Protected (Transformer)
CT	Current Transformer
DG	Director General
DISCO	Government-Owned Power Distribution Company
DSM	Demand Side Management
ELR	Energy Load Reduction
ERP	Enterprise Resource Planning
FIR	Federal Investigation Report
FY	Fiscal Year
FESCO	Faisalabad Electric Supply Company
GEC	Gender Equity Champion
GEPCO	Gujranwala Electric Power Company
GIS	Geographic Information System
GM	General Manager
GOP	Government of Pakistan

GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HESCO	Hyderabad Electric Supply Company
HHU	Handheld Unit
HR	Human Resources
HT	High Tension
IAPO	Internal Audit Process Optimization
IESCO	Islamabad Electric Supply Company
IGTDP	Integrated Generation-Transmission-Distribution Plan
IMR	Improved Meter Reading
IRG	International Resources Group
IT	Information Technology
KM	Kilometer
KV	Kilo Volt
KVA	Kilo Volt Amperes
kW	Kilowatt
kWh	Kilowatt-hour
LDI	Load Data Improvement
LESCO	Lahore Electric Supply Company
LT	Low Tension
MIS	Management Information System
MEPCO	Multan Electric Power Company
MVAR	Million Volt Ampere Reactive
MW	Megawatt
MWP	Ministry of Water and Power
NEPRA	National Electric Power Regulatory Authority
NESC	National Electric Safety Codes
NTDC	National Transmission and Dispatch Company
NPCC	National Power Control Center
OJT	On-the-Job Training
ORD	Outage Reduction Devices

P&E	Planning & Engineering
PDC	Power Distribution Center
PDP	USAID Power Distribution Program
PEC	Pakistan Engineering Council
PESCO	Peshawar Electric Supply Company
PETSAC	Pakistan Electric and Telecommunications Codes
PT	Potential Transformer
QESCO	Quetta Electric Supply Company
RF	Radio Frequency
SEPCO	Sukkur Electric Power Company
TA	Technical Assistance
TESCO	Tribal Areas Electric Supply Company
US	United States
USG	United States Government
USAID	United States Agency for International Development
VFD	Variable Frequency Drive
VSDs	Variable Speed Drives
VVO	Volt - VAR Optimization

SECTION 1: PROGRAM OVERVIEW

This Annual Report of the United States Agency for International Development (USAID) Power Distribution Program (PDP) covers the continuing efforts of USAID and International Resources Group (IRG) to implement improvements affecting the overall commercial performance of participating government-owned power distribution companies (DISCOs), the Ministry of Water and Power (MWP), and the National Electric Power Regulatory Authority (NEPRA) in the October 2013-September 2014 period. Under Component 1, PDP conducted operational audits of MWP, nine DISCOs, and NEPRA, and developed Action Plans for future interventions and demonstration projects. Components 2 and 3 have focused on the execution of jointly-selected interventions identified in Action Plans as codified in the approved PDP Work Plan, with the goal of improving sustainability in the power sector.

FINANCIAL SUMMARY

Contract No:	EPP-1-00-03-00006-00, Task Order 13
Date of Issuance of Task Order:	September 17, 2010
Amount Obligated Under Task Order:	US \$162,699,409
Total Project Funds Expended to Date:	US \$134,316,947
Project Funds Expended During FY 2013-14:	US \$56,395,335

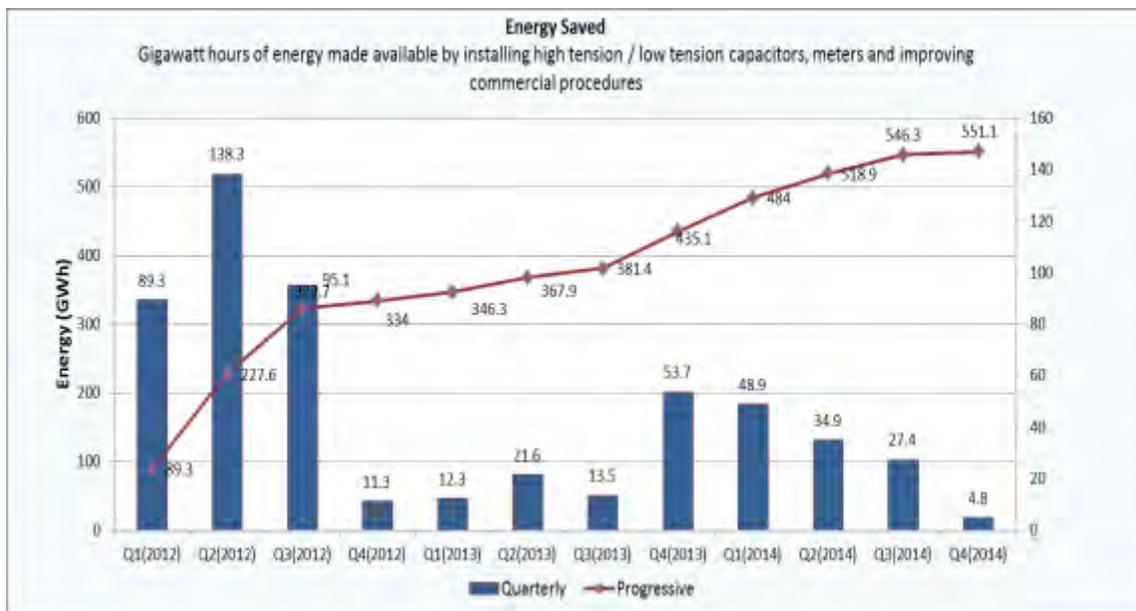
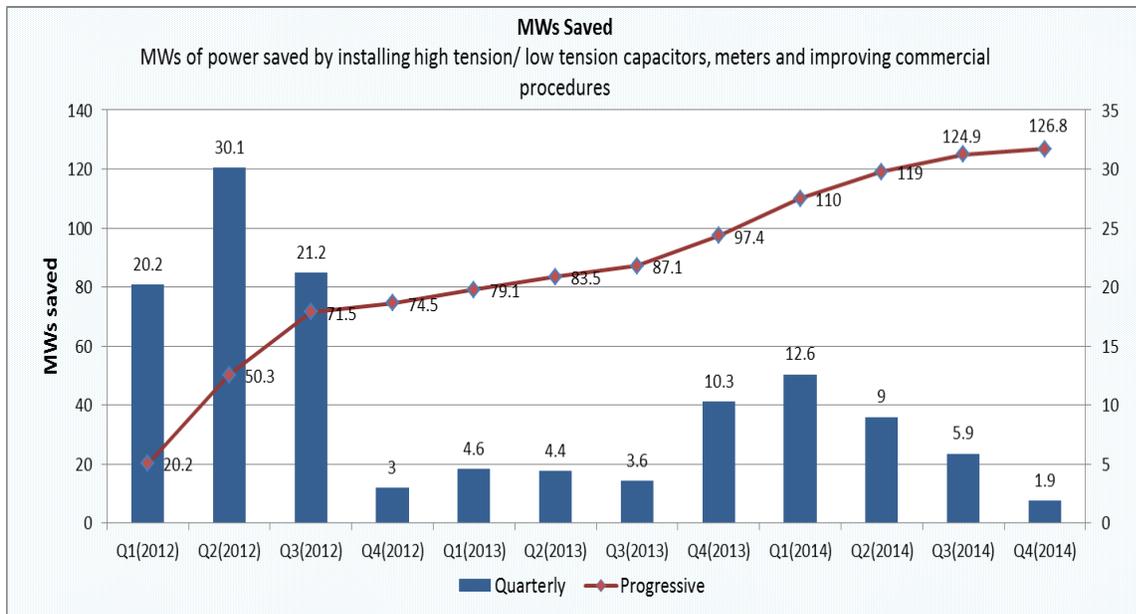
Costs by DISCO

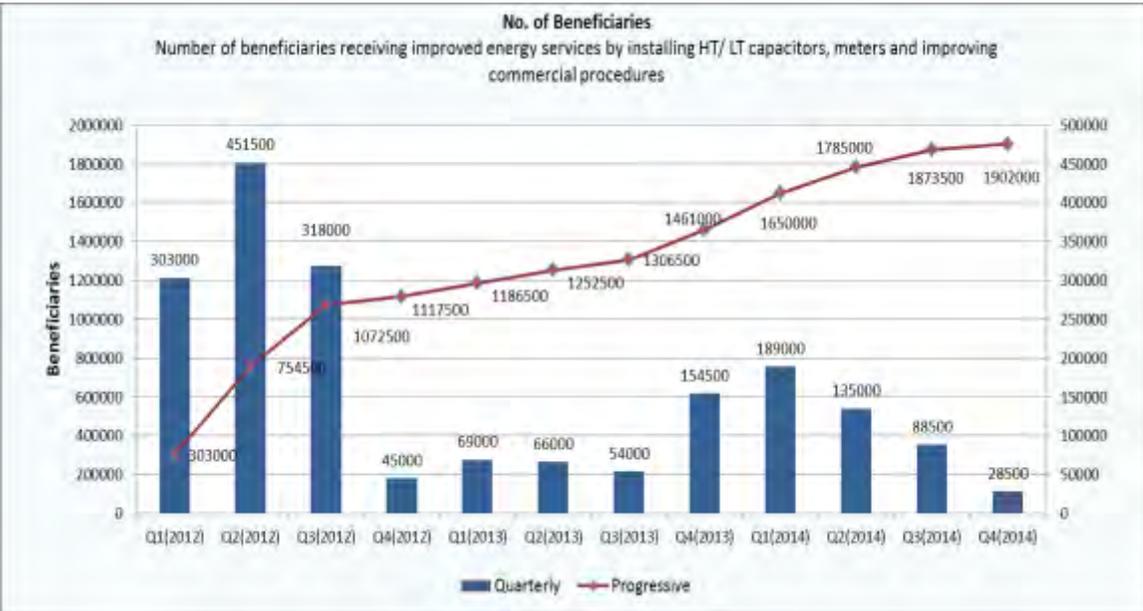
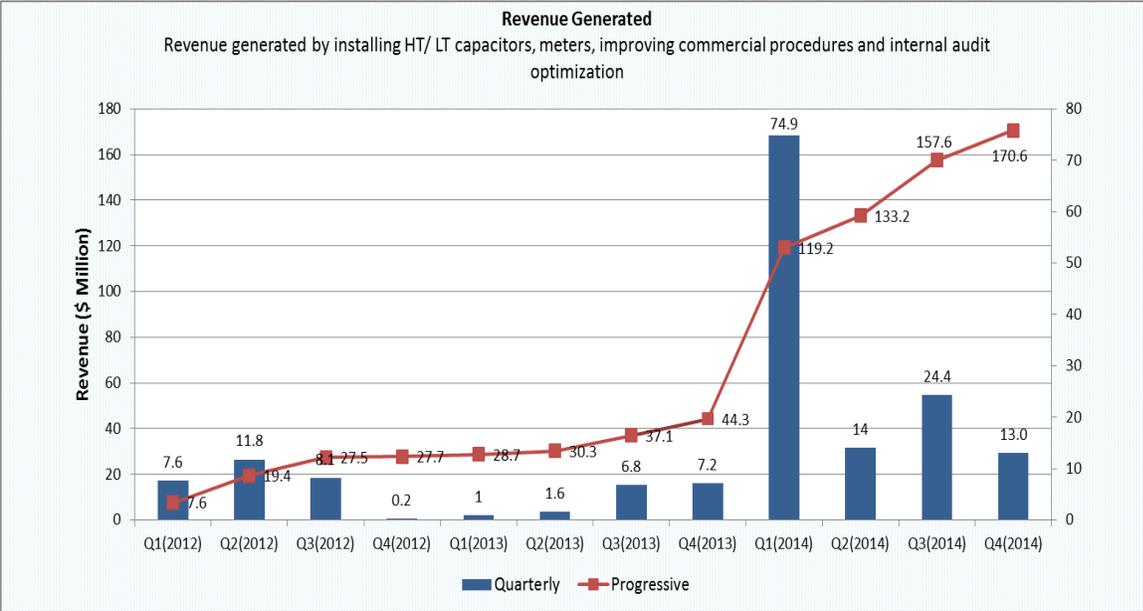
Project Inception to September 30, 2014	
DISCO	Amount (USD)
PESCO	35,531,031
LESCO	17,180,614
MEPCO	20,562,279
IESCO	10,242,318
HESCO	9,126,843
FESCO	8,075,990
GEPCO	6,791,033
QESCO	6,261,927
SEPCO	5,175,777

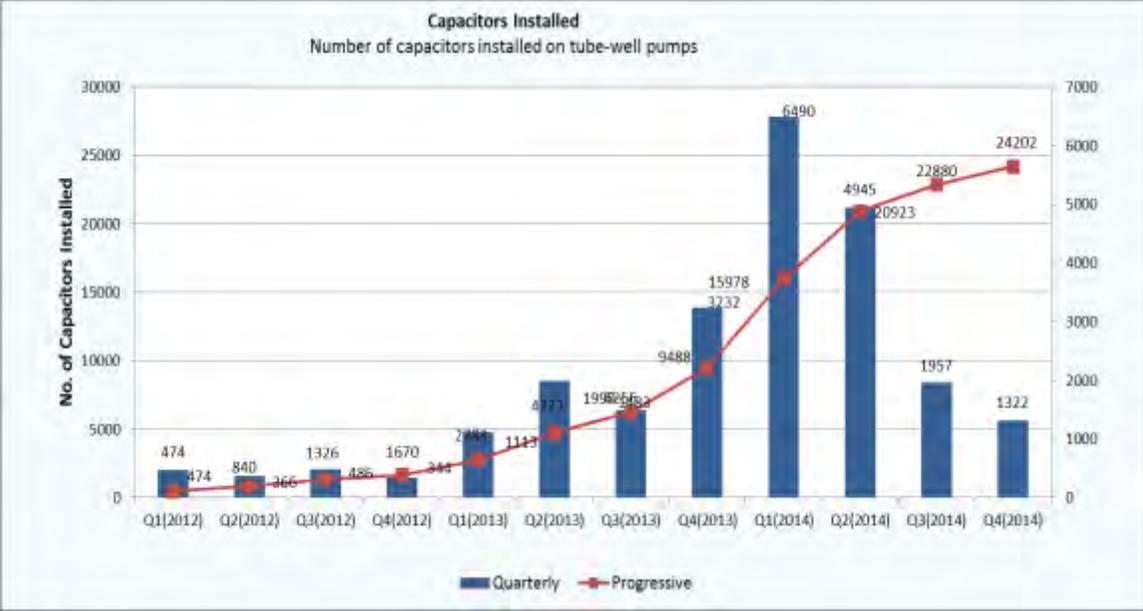
NEPRA/MWP	2,908,273
Stores *	12,460,862
TOTAL	134,316,947

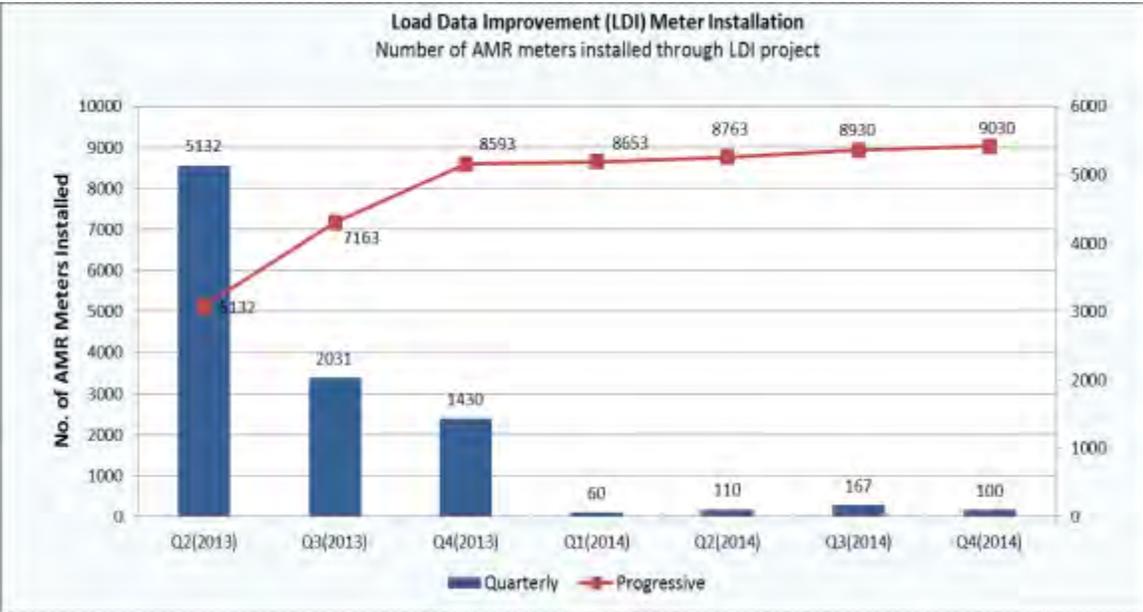
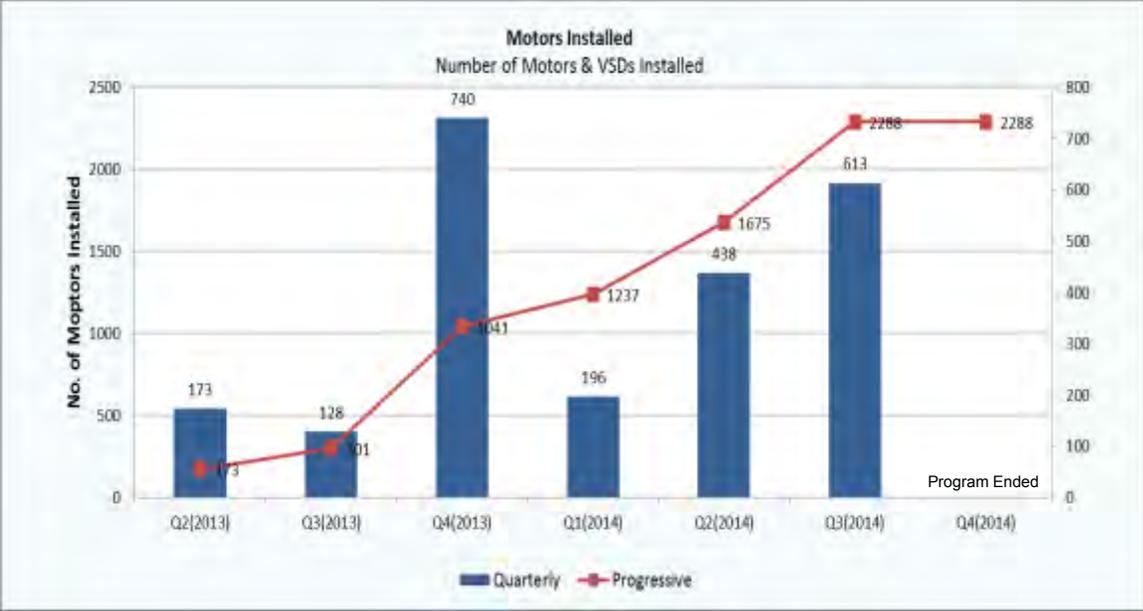
***Commodities which have not been issued to DISCOs and are located in PDP warehouse.**

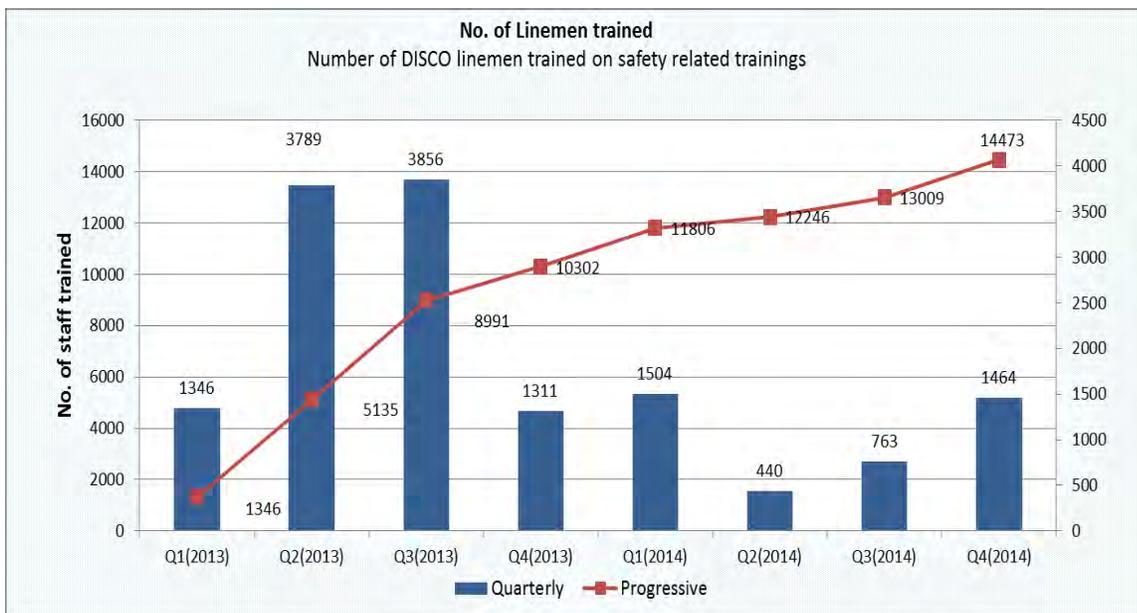
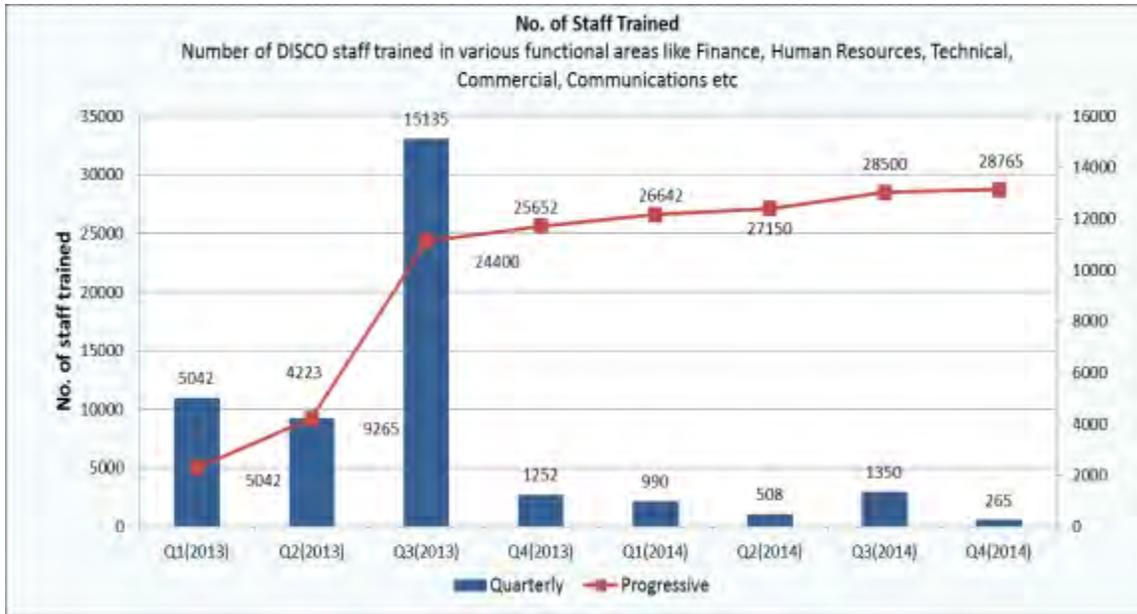
SECTION 2: PERFORMANCE













Purpose built loader vehicles handover to MEPCO and PESCO field offices



Load Data Improvement project training for operators of power distribution control center at LESCO



Handheld Units being used by meter readers of Multan circle



Gender Equity Training for all senior and middle managers of MEPCO



MEPCO reaching out to its consumers via radio program 'Behtri Ka Safar'



USAID PDP in collaboration with PESCO carried out "Energy Conservation Drive" to sensitize students to conserve energy and report electricity theft

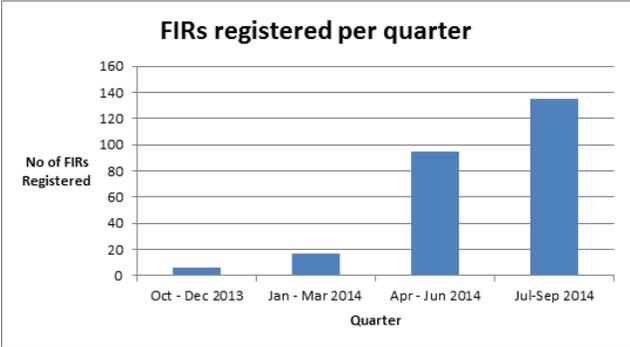
SECTION 3: COMPONENT 3 TASKS

TASK 1: COMMERCIALIZATION OF DISCOS

Task 1 provides a two-pronged approach to commercializing DISCOs, focusing on improving performance of two Turnaround DISCOs – Peshawar Electric Supply Company (PESCO) and Multan Electric Power Company (MEPCO). PDP will modernize policies, processes, and procedures and provide a modern infrastructure in some of the critical business areas that will allow these companies to improve their commercial, technical, and financial performance.

HIGHLIGHTS

- **Using PESCO Revenue Cell to Enhance Revenue** – One of PESCO’s primary challenges has been high losses due to power theft and poor revenue collection. To address this issue and meet the Government of Pakistan’s (GOP) top priority in reducing Aggregate Technical &



Commercial (AT&C) losses, PDP developed an integrated approach to protect revenue and reduce losses. In Fiscal Year (FY) 2013-14, PDP established its Revenue Protection Cell at PESCO’s Kohat Road subdivision. Its core activities include theft surveys, theft surveillance, recovery of arrears, tracking cases of power theft and legal prosecution, and meter reading follow-up. The Cell currently operates in two divisions and will eventually encompass all of Peshawar Circle with its 29 subdivisions and consumer base of about 450,000. Due to the nature of the Cell’s activities, PDP hired a lawyer who streamlined the legal and operational processes required for theft detection and prosecution; a community mobilizer was also hired to educate and motivate local communities against the theft of electricity. In a related capacity, PDP organized a workshop on the effective prosecution of electricity theft which was attended by all key stakeholders, including PESCO’s legal directorate, the police force, and the court magistrate. Additionally, theft cases were successfully transferred from PESCO’s Commercial Directorate to its Legal Directorate, where PDP is supporting PESCO in setting up its desk for electricity theft cases.

- Automatic Meter Reading (AMR) on High-End Customers** – This activity has been designed to assist MEPCO and PESCO to achieve significant improvement in commercial performance through integration of advanced metering infrastructure (AMI). Both turnaround DISCOs have an outdated metering system based on electro-mechanical metering, which is subject to inaccurate readings and field tampering, resulting in a loss of revenue. MEPCO and PESCO lack the funding to upgrade these meters with state-of-the-art technology. Under this activity, PDP is assisting both DISCOs to carry out a large-scale meter replacement program across their territory, with Global System for Mobile Communications (GSM) / General Packet Radio Service (GPRS) enabled AMR meters for all high-end residential, agricultural, commercial, and industrial customers having sanctioned loads of more than 20 kilowatts (kW). This includes AMR meters with current transformers (CTs) and potential transformers (PTs) and three-phase whole current AMR meters with remote disconnect and re-connect capability and these AMR meters will have two-way communication functions to demonstrate load management capabilities. These meters can also support a minimum of two different load thresholds against different time slots (peak / off-peak), which will be programmed to activate disconnection / reconnection automatically by the meter; the time between disconnection and reconnection is also programmable. Under C2, 761 whole current AMR meters have been installed in MEPCO and 36 AMR meters with CTs have been installed in PESCO in FY 2013-14.

- Geographic Information System Mapping Continues in PESCO** –

PDP initiated Geographic Information System (GIS) mapping of high tension (HT) and low tension (LT) distribution network in PESCO and in all other DISCOs, focusing on helping DISCOs to complete GIS mapping of all HT feeders. DISCO staff is now fully trained and capable of completing this activity, with PDP providing minimal on-the-job support. In Component 2, PDP carried out feeder mapping and analysis of one subdivision per DISCO with the goal of enabling all nine DISCOs to develop a geodatabase with accurate mapping and location information. Under Component 3, PDP



The Computerized GIS Maps Provide Planning Engineers with a Holistic Picture and Help Them Perform Consolidated Analysis of DISCO Distribution System

is continuing this effort and building PESCO’s capacities to map entire divisions and circles. By the end of the FY 2013-14, PDP successfully mapped 263 feeders in PESCO’s Mardan, Hazara, and Khyber circles and assisted the DISCOs’ Planning and Engineering (P&E) staff on the planning, analysis, and generation of proposals, for installation of Outage Reduction Devices (ORD) and completely self-protected (CSP) transformers. GIS mapping and the use of SynerGEE (the planning software) will lead to proper and effective planning and efficient system operation, resulting in massive savings.

- **Enterprise Geographic Information System Mapping Begins in MEPCO** – All PDP-created P&E computer centers at DISCOs’ headquarters including MEPCO have been made operational and the mapping function extended to operational staff to ensure consistent updating and maintenance. GIS field data will be made available to field engineers responsible for system construction, maintenance, and operation. PDP, in consultation with MEPCO, identified how the existing GIS Information Technology (IT) infrastructure could be enhanced to facilitate remote data access. PDP will expand the GIS infrastructure to the circle level at MEPCO. The Deputy Director Technical, who remains in close contact with MEPCO’s Stores, Construction, and Operations Divisions, will update the network as needed. PDP is extending HT GIS mapping to all of the eight MEPCO circles, namely Bahawalpur, Vehari, Sahiwal, Bhawalnagar, D.G. Khan, Rahim Yar Khan, Muzaffargarh and Multan. PDP provided on-the-job training (OJT) to MEPCO’s planning engineers, operational staff, and field surveyors to ensure the project’s sustainability. MEPCO’s P&E Department is now able to use GIS maps and SynerGEE power analysis tool for network optimization, calculating HT and transformation losses. Additionally, PDP also completed GIS mapping of the LT network of a number of feeders for meter replacement and Aerial Bundled Cable (ABC) installation.
- **Aerial Bundled Cable Installations in Multan Electric Power Company** – PDP recently issued a contract for the installation of 500 kilometers (KM) of ABC in MEPCO which will be used as a deterrent against theft. In the selected areas, the installation will help reduce theft, reduce losses, increase revenue, and increase system reliability and safety. The GIS mapping of all 462 locations was completed and technical analysis on the SynerGEE planning software began, with a few proposals sent to MEPCO’s Chief Engineer (P&E) for approval and issuance of the required work orders. Additionally, PDP also awarded the contract for the installation of 500 KM of ABC in PESCO; the contractor has begun preparing estimates and the necessary documentation for the work to proceed.
- **Installation of Insulated Cables in Peshawar Electric Supply Company** – Generally, illegal hooks – called “kundas” – to steal electricity are common in congested consumer areas where the electricity lines pass close to roofs and balconies. In addition, the open wires are a constant life-threatening hazard to residents. To control illegal connections and improve safety of the residential consumers, PDP-trained linemen installed quadruplex-insulated secondary cables, in an activity that began in FY 2013-14, with 5 KM of quadruplex cable installed thus far. This cabling replaces the current bare-wire lines and low voltage secondary cables, reducing non-technical losses and improving revenues. The existing LT secondary bare-conductor has been replaced with insulated cable on 26 of the 64 transformers on PESCO’s Watpaga feeder, selected as a pilot project. Field surveys for the remaining transformers were completed; all work orders were issued, and work on replacing bare conductors with insulated cable began and the work is on-going. Recognizing the benefits of this activity, PESCO also began replacing all meters with electrostatic meters on this feeder. This will help in reducing losses, improving safety and reliable supply to the customers.

- **Customer Information System Development Gains Momentum** – The Customer Information System (CIS) is a fully automated system that aims to increase the efficiency of the billing and collection processes, including setting up new connections and managing existing ones. The computerized system will revolutionize the way DISCOs conduct their business through reductions in operating costs, improved customer service, and enhanced employee efficiency. It will also help minimize the time needed to translate customer consumption into billing and billing into revenue, while dramatically reducing paperwork. Augmented with handheld meter reading devices (HHUs), the CIS generates accurate consumer bills and provides the one-window customer service center, all the necessary information resulting in improved customer service. PDP completed HHU implementation at PESCO's Kohat Road subdivision where as a first step, subdivision staff were trained on the HHUs and associated software. Additionally, PDP formed a team comprising staff from PESCO's functional departments to serve on the CIS Implementation Team. The members of this team will later serve as trainers, ensuring its sustainability. A two-week workshop was held for these members of staff on "Utility Best Practices for Oracle CIS" to further develop the necessary skills as master trainers. PDP also organized a kickoff event to establish a common understanding of the roles and responsibilities of all stakeholders.
- **Enterprise Resource Planning Rollout at Turnaround Power Distribution Companies (PESCO & MEPCO)** – Existing DISCO back-office operations are incapable of providing timely information required for making effective managerial decisions or for properly monitoring and controlling utility operations. DISCO cost/revenue centers are dispersed geographically, adding to the delay in reporting. Additionally, current collection, validation, compilation, and data processing processes are inefficient. The automation of back-office operations through an Enterprise Resource Planning (ERP) system will streamline processes, improve workflow efficiency, and enable reliable and precise financial and management information. PESCO's ERP implementation vendor Infotech mobilized and began introductory training for the PESCO staff members who will be the core implementers of Oracle's E-business suite and the customer care and billing system. PDP, Infotech, and PESCO held a kickoff event to celebrate the start of the ERP/CIS implementation activities at PESCO; a similar event was held at MEPCO by Abacus Consulting, the selected ERP implementation vendor. Additionally, 50 master users for the ERP and CIS systems were identified and basic IT trainings were provided, with an additional 400 users expected for trainings before the end of the first quarter in 2015. MEPCO appointed a Project Manager and Deputy Project Manager and established Core and Functional Implementation Teams. PDP interns at both DISCOs continue being valuable resources for the ERP implementation, through their understanding of the current processes in finance, material management, procurement, human resources, and payroll applications.

- **Effective Meter Reading and Surveillance Program Continues at Multan Electric Power Company** – As part of PDP’s efforts to improve the quality of meter reading at DISCOs, PDP delivered four sessions of its “Effective Meter Reading and Surveillance Program” at MEPCO in FY 2013-14. The program focuses on the duties and responsibilities of meter readers and techniques for reading electromechanical and various other types of meters. It enhances the knowledge, skill set, and work attitudes of both commercial and line staff regarding their duties and responsibilities as meter readers, commercial staff, technicians, and customer service representatives. The course also covered the impact of accurate meter reading, actions to resolve meter-related issues, the prevailing modes of controlling electricity theft, and the preventative methods that can be used. Thus far, 106 participants from different MEPCO subdivisions have been trained, with participants expressing strong interest in additional Effective Meter Reading training programs.



A Meter Reader Testing and Verifying a Consumer Meter During a Surveillance Activity in Multan.

- **Theft Crackdown at Peshawar Electric Supply Company** – Due to the high losses that PESCO sustains as a result of electricity theft, a joint team of PESCO, local police, and PDP staff implemented a major anti-theft crackdown in FY 2013-14. A comprehensive mass media anti-theft campaign was also launched using newspaper advertisements, TV commercials, infomercials, billboards, and streetlight pole streamers. The campaign is ongoing in major locations in Peshawar; front page coverage has appeared in the region’s leading newspapers. The campaign is rooted in the new Electricity Theft Ordinance passed by the GOP designed to curtail power theft.

- **Energy Conservation Campaigns Continue to Support Turnaround DISCOs** – The Energy Conservation Drive for school students of Peshawar was launched and continued throughout FY 2013-14. Through attractive audio-visual presentations, the team, comprised of senior PESCO staff and PDP’s Communications Team, reached out through the school students to over 22,000 individuals, including the students’ families, friends, and relatives. The take-home material distributed to the students included conservation tips, plus



Prominently Placed Banners Emphasize Importance of Energy Conservation in Public

responsible citizenry and motivational messages to empower these energy scouts. PESCO plans to continue this activity throughout the year, noting its long-term positive benefits. The successful implementation of energy conservation campaigns has been appreciated by PESCO senior management who also requested the provision of additional consumer awareness material. In a related activity, MEPCO distributed 5.7 million compact fluorescent lamps (CFLs) / energy saver light bulbs among its consumers. These CFLs will replace older, inefficient incandescent bulbs and will help in reducing demand. PDP, in collaboration with MEPCO, launched a media campaign to promote the use of energy savers and the benefits of energy conservation among MEPCO's consumers. The campaign included newspaper advertisements; cable TV and FM channel public services messages; airing of a MEPCO documentary, streamers, and banners within Multan; and displays of standees and banners in all of MEPCO's circle offices. This ongoing CFL campaign not only promotes MEPCO as a consumer-friendly DISCO, but will also facilitate MEPCO in meeting its target of reducing demand. The activity was greatly appreciated by MEPCO senior management who requested additional consumer awareness material; PDP provided information on energy conservation, new connection procedures, and on using of efficient appliances to reduce the demand.

- **One-Window Customer Service Centers at Turnaround DISCOs** –

As part of its CIS initiative at MEPCO, PDP converted the customer services center at MusaPak division into a one-window customer services facility. This Component 2 activity was expanded into Component 3 after MEPCO was selected as the second Turnaround DISCO. The one-window customer service center has already increased customer satisfaction by 125% through a major decrease in the average time taken to resolve complaints. Over 4,000 customers accessed the center's services before the center was handed



One-Window Customer Service Center at MEPCO's Musapak Subdivision

over to MEPCO. Additionally, after senior management asked PDP to extend the intervention to other division offices within Multan Circle, a project plan and cost proposal were developed to remain within the allocated budget. In PESCO, PDP renovated the one-window customer service center in Kohat Road subdivision to facilitate consumers with better service. Customer satisfaction has improved by over 42%. Additionally, the training of all five Kohat Road subdivision customer service representatives was completed and a study conducted on the current state of customer services in PESCO, which included interviewing 61 PESCO employees stationed at various field offices. This data will prove instrumental in ensuring the improvement and sustainability of PDP's customer service interventions.

- **Commercial Activities in Multan Electric Power Company** – In FY 2013-14, PDP started the implementation of mutually agreed performance improvement initiatives that included expansion of Improved Meter Reading (IMR), HHU projects in Multan Circle, and surveillance activity for revenue enhancement. Throughout the year, work began and was completed in 19 subdivisions in the Multan Circle in addition to beginning in four others. Thirteen subdivisions have now been fully switched to HHU billing while parallel billing began in



Meter Readers Use HHUs to Record Readings in MEPCO

additional two subdivisions. The results from these subdivisions are very promising with monthly losses reduced in 16 subdivisions and progressive losses reduced in 14 subdivisions. More than 22,000 defective meters were replaced/re-fixed. Under the surveillance initiative, the PDP Commercial Team, with the help of MEPCO staff, **recovered 4.2 million kWh losses** from direct hook connections, bypassing of energy meters cases etc. Initially, the IMR intervention began as a pilot project in Multan Circle's Gulgasht subdivision where, after only one year of implementation, progressive losses have decreased by **3 %**, **resulting in savings of over US\$ 0.5 million.**

- **Meter Reading Using Handheld Units at Peshawar Electric Supply Company** – Meter-reading data integrity is fundamental to the sustainability of DISCO operations, and ensures that energy sold is accounted for and the customer is billed properly, thereby building trust between both customer and company. Currently, meter readers record their readings on hard copy registers which need to be reentered twice before they are keyed into the database, which leaves an opening for data manipulation and transcription errors. In order to provide reliable data for bill generation, handheld meter reading devices (HHUs) have been introduced. PDP continued meter reading with HHUs at PESCO's Kohat Road subdivision and completed the transition from paper-based meter reading to a handheld system. Subdivision staff was trained on the HHUs and associated software, integration with billing system was made, parallel run of all batches was completed, and discrepancies were removed. The HHU project has resulted in a significant improvement in billing and revenue of the subdivision. Work efficiency has also tremendously improved.
- **Preparing a Strategic Business Plan for Multan Electric Power Company** – PDP is jointly working with MEPCO to develop a five-year strategic plan for the company that will provide a roadmap for implementing specific and measurable improvements. The business plan will identify key activities required to meet the strategic goals and objectives of the Company. PDP continued holding series of workshops for senior management that were designed to educate and edifyt on the development of a business plan's strategic objectives and goals. Upon completion of the workshops, the goals and objectives were reviewed by senior management.

Subsequently, senior management accepted the goals and objectives and sent them to the Board of Directors (BOD) for approval. Additionally, PDP engaged the Lahore University of Management Sciences (LUMS) to provide knowledge-based training in strategic planning and project management.

- **Building Sustainable Working Environment for Women**

– In FY 2013-14, PDP held a series of workshops aimed at inculcating professionalism in the female workforce of both PESCO and MEPCO. The workshops were designed to promote professionalism, integrity, and leadership qualities in employees. Work ethics, organizational dynamics, and changing concepts and perceptions were discussed in interactive sessions. Current challenges facing women in the workplace and related consequences that hinder efficiency and productivity were reviewed. Additionally, PDP conducted Gender Equity Training sessions for MEPCO senior management to sensitize them to gender inequalities and assist them in identifying solutions through active discussions with their subordinates, creating a congenial working environment. In order to build sustainability of these PDP-led initiatives, senior management officials were encouraged to volunteer as Gender Equity Champions (GECs) to conduct surveys on work and communication barriers, on-the-job trainings and reducing the social and sexual harassment faced. These GECs will then remain in communication with PDP concerning the best course of action to resolve the situations faced by female staff in their respective departments.



A Workshop on Gender Equity Training for MEPCO Senior and Middle Managers

- **Computer Labs Established at Turnaround DISCOs** – In FY 2013-14, under its Internship Program, PDP established one computer lab each at PESCO and MEPCO headquarters that will help build IT skills and awareness among company employees. PDP provided furniture, 16 desktops at each center, mainframe server, high-speed printer / scanner, and multimedia and associated screens. These labs will not only enhance the professional capabilities of individual employees, but also contribute to improving MEPCO's & PESCO overall operations. The labs will also be used for ERP training and other trainings for PDP interventions at both DISCOs. Large number of MEPCO & PESCO officers received this training in FY 2013-14. To ensure security, PDP installed closed circuit television (CCTV) cameras in PESCO's labs and in the corridor, to be managed by PESCO Director General (DG) Administration and Services. Both labs have been handed over to DISCO staff and made operational with two sessions per day for 15 participants each are being held.

- **Internship Program Supports Turnaround DISCOs Initiatives** – PDP positioned 22 interns at MEPCO who are assisting and supporting the work PDP is doing under its ERP intervention, wherein the DISCO’s legacy systems are being replaced by automated processes. Seven interns are working with finance department. Four interns are working with the P&E Department to support our GIS and Load Data Improvement interventions; two interns are positioned with the Human Resources (HR) Department to support PDP’s training programs. Seven interns are attached with MEPCO’s Management Information System (MIS) Department and are supporting both MEPCO’s MIS administration and PDP’s IT and CIS interventions; two are working with Commercial Department. In PESCO, PDP positioned 16 interns for supporting PDP’s ERP, GIS, and HR interventions at the company. PDP’s internship program was designed to instill best practices and increase the number of qualified young professionals in the energy sector to facilitate a bottom-up transformational change in DISCOs.

- **Energy Conservation Campaigns at Women Colleges** – PESCO’s PDP-trained female employees successfully completed energy conservation campaigns in four women’s colleges, with over 1,400 students and professors attending. These campaigns educate female college students about PESCO and its role in the power sector, including discussing the power system in Pakistan, and the role and responsibilities of DISCOs in general and PESCO specifically. Energy conservation habits were also discussed and fliers distributed to inculcate these measures in households. The students, most of whom were in their final year of undergraduate study, were also informed about careers in the power sector and were encouraged to join the female workforce.

- **Building Corporate Communications at PESCO and MEPCO** – To educate consumers regarding MEPCO and PESCO goals, responsibilities, and recent reforms, PDP is assisting both the DISCOs in improving their corporate communications including their corporate branded stationery, including calendars, diaries, notebooks, file covers, etc. In a related activity, PDP continued supporting the circulation of PESCO’s seven month-old newsletter, the PESCO Post. This eight-pager, reporting on all PESCO activities, is circulated to a broad audience that includes all major stakeholders, the political leadership, policymakers, engineering universities and libraries, and within PESCO itself. In just under six months, its circulation has increased to 1,500 newsletters per month. Further, in a continuing activity, PESCO moved into its third series of the weekly FM radio talk show program “Behtri Ka Safar” (Journey to Betterment), designed to build awareness among its consumers on the positive developments and initiatives being taken at PESCO. The programs are structured in a



Director General Public Relations Speaking on the Significance of Energy Conservation During a Live Radio Talk Show

way that attract the attention of their listeners with senior management from their respective departments detailing activities within their scope, as part of a roster of guest speakers that cycle through the program. Among the topics that have been discussed are new connection procedures, load shedding, and associated schedules. Similar Radio Talk Shows were carried out in Multan for MEPCO. Thirty-six episodes have aired on three different radio channels in Khyber Paktunkhwa (KPK) and South Punjab, with the addition of 10 shows focused on PESCO in the last quarter of FY 2013-14.

- **Establishing Customer Service Centers at Peshawar Electric Supply Company** – PDP

assisted PESCO in renovating its existing consumer complaint center in the last quarter of this year in an activity that was greatly appreciated by both PESCO and its consumers. Previously, all activities were done manually in cramped spaces with no waiting areas in complaint centers, as opposed to a fully branded air conditioned area with a waiting area and a fully IT-trained staff. Consumers are now able to get their complaints swiftly handled, reducing



Newly Renovated Customer Service Center at PESCO

headaches for both management and consumer, and resulting in complaints redressal and increased customer satisfaction. In FY 2013-14, PDP initiated the tender process for the renovation and upgrade of the centers at Peshawar Circle, at Hayatabad Office and at PESCO headquarters' centers. In parallel, the survey and design work was initiated for the five remaining centers that will be established at Peshawar Cantt, Peshawar City, City Rural, Charsaddah, and Shabqadar divisions, which all fall under Peshawar Circle.

- **“Customer Service Excellence” at Turnaround Distribution Companies** – As part of

PDP’s initiatives to improve the concept of customer service at all DISCOs, PDP delivered two sessions of its “Customer Service Excellence Program” at MEPCO. The sessions were focused on service excellence and followed a customer service model aimed at growth and customer care, resulting in customer satisfaction, and provided an environment for participants for practicing their new skills while learning from peer feedback and experience. In FY 2013-14, 50 participants, including seven women, from different MEPCO subdivisions were trained. Participants have thus far expressed keen interest in additional sessions, stating that this was the first time in their careers that they attended such workshops.

- **Consumer Census Helps Update PESCO Database** – Under PDP’s CIS intervention, PDP

is using consumer censuses to ensure the consumer database reflects accurate information. PDP continued consumer enumeration at Peshawar circle’s Chok Yadgar subdivision and Charsadda Division and enumerated over 20,000 consumers. In addition, PDP hired a

contractor and designed an Android mobile application for consumer data collection using electronic handheld devices. The application has built-in data validation, GPS, and snap features that allow for clearer data. The discrepancies reported so far have been handed over to PESCO for corrective actions. In parallel, the tender process for hiring a contractor to perform data cleansing in 11 additional subdivisions of Peshawar Circle, was completed. PDP performed an analysis on the Peshawar Circle consumer database in preparation for CIS data migration. The gaps observed were forwarded to the Commercial and MIS Departments for remedial actions. Further, in this connection, 3,740 Meter Change Orders and 15 tariff cases were processed for Cantt Division.

TASK 2: ENERGY CONSERVATION & DEMAND SIDE MANAGEMENT

Pakistan is facing the worst power crisis in its history. The country's power supply falls significantly short of the demand year-round. The capacity shortfall has resulted in eight to 10 hours of load shedding in metropolitan cities and as much as 16 hours of load shedding in rural areas. In the face of such challenges, energy efficiency and Demand Side Management (DSM) can contribute to significant improvement and often, within the shortest possible timeframe.

DSM initiatives are considered to be the most cost-effective options for reducing energy wastage or for improving efficiency of the system.



Motor Replacement at Ittehad Chemicals Limited, One of Pakistan's Largest Chemical Companies

HIGHLIGHTS

- **Demand Side Management of Industrial Motors** – The Industrial DSM Program focuses on the replacement of inefficient motors and Variable Speed Drives. Industrial motors are estimated to contribute between 60-80% of industrial electricity consumption in Pakistan industrial sector. PDP replaced 1,540 industrial motors and 749 Variable Frequency Drives (VFDs) over the course of the program that concluded in the last quarter of this year. This activity resulted in saving of 12.54 MW of power. The project was successfully completed and closed in FY 2013-14.
- **Loss Reduction on Feeders** – MEPCO has serious problems managing reactive power and proper voltage on lengthy feeders. To improve this situation, PDP has designed a Volt - VAR Optimization (VVO) program. With the introduction of VVO devices, switched HT capacitors

and voltage regulators, it is expected to achieve about 5% loss reduction on individual feeders where these devices will be installed.

TASK 3: COST OF SERVICE & NEPRA REFORM

This task covers two activities: Cost of Service Study (CoSS) and Tariff Design for all the DISCOs and NEPRA Reform. The Cost of Service Model is the tool with which the CoSS is performed, and includes a repository of financial, technical, and billing information in a spreadsheet-based model. The model performs a functional classification of the total costs a utility incurs, and then allocates these costs to different customer categories. Once a customized model is developed, it becomes possible for utility staff to perform CoSS by simply updating the information repository.

HIGHLIGHTS

- **Cost of Service Study Completed for Four Power Distribution Companies** – PDP completed Cost of Services Studies for MEPCO, Faisalabad Electric Supply Company (FESCO), Lahore Electric Supply Company (LESCO), and Gujranwala Electric Power Company (GEPCO) in this fiscal year, and working sessions were subsequently held with these DISCOs in order to finalize cost predictions for the next quarter. Based on these predictions, the CoSS results for FY 2014-15 are being used as the basis for the next set of tariff petitions for these DISCOs. Once implemented, the new tariffs will be more cost effective and will result in the elimination or reduction of inter-category cross-subsidization. Subsequent to completing the Cost of Service Studies, PDP provided assistance to these four DISCOs in preparing their consumer-end tariff petitions in line with the results of their respective Cost of Service Studies. Several potential tariff petition designs were discussed with DISCOs and recommendations were made, based on the pros and cons of each design. All four DISCOs have now filed tariff petitions with NEPRA and PDP, continuing to support them through participation in the regulatory process and public hearings. Work on COSS study for other DISCOs is also underway.
- **Formulation of NEPRA Guidelines for Determination of Consumer Tariff** – PDP proposed the development of “NEPRA Guidelines for the Determination of an Electricity End-User Tariff,” which is in line with the National Power Policy 2013, the NEPRA Act 1997, and NEPRA Tariff Rules 1998. This methodology will achieve the objectives laid out in the National Tariff and Subsidy Policy 2014 through the determination of revenue requirements using well-established and standardized formulae, requiring Cost of Service Studies, and cost-based rates; using standards to promote technical efficiency and rate structures to promote economic efficiency; applying a surcharge to ensure a transparent administration of subsidies, protecting consumers as a result; and improving the minimum filing requirements to streamline the tariff determination process. PDP also created and reviewed standard

petition formats for DISCOs as well as generation, transmission and distribution development plans and power purchase costs that will then become an integral part of the NEPRA tariff guidelines for determining both single and multi-year consumer tariffs in the future.

- **Assisting NEPRA through White Papers** – One of PDP’s initiatives is supporting NEPRA through the development of white papers on key issues faced by the Authority. PDP submitted two white papers for further discussion – the first on “The impact of the Eighteenth Amendment on Electric Power Distribution in Pakistan” and the second on “Public Procurement Rules as they Impact Government-Owned Power Distribution Company Operations.” The first white paper identified critical issues and key findings that form the basis for a set of recommendations aimed at improved governance of the distribution sector, after the Eighteenth Amendment in the Constitution of Pakistan. The second white paper detailed NEPRA’s Procurement Code; on the one hand, asserting its importance in promoting efficiency and transparent procurement by all operators, public or private, and on the other hand, highlighting issues and risks surrounding the application of the procurement rules, followed by recommended actions.
- **Correction of Under-Billing in Power Distribution Companies Results in Massive Savings** - During the CoSS analysis, PDP discovered that all DISCOs were under-billing select customer groups through the use of incorrect billing formulae. Time of Use consumers paying a fixed rate were being billed based on the determination of average demand, rather than NEPRA’s determined tariffs for maximum demand, resulting in lower consumer bills and less revenue for DISCOs. This practice, instituted for both commercial and industrial consumers who are billed based on both consumption and maximum demand, resulted in up to \$47 million in losses, has been a part of the current system for well over a decade, and would have gone unnoticed for longer except for PDP’s discovery. Subsequently, after reviewing the evidence and supporting documentation supplied, NEPRA concurred with PDP and ordered all DISCOs to immediately correct this situation through a change in their billing formula. This correction was made in April 2014 and DISCOs started billing the correct amount to their consumers. Based on system-wide Management Development Institute-based billing data for FY 2012-13, this change is expected to increase the combined revenue of DISCOs by \$42 million annually and resulted in **savings of \$10.5 million** for the July to September quarter of this fiscal year.
- **Reevaluating Organizational Assessment and Restructuring at NEPRA** – Currently, NEPRA’s organizational structure is non-competitive and non-growth oriented, resulting in low staff retention, limited skill development, and low employee morale. The absence of a mechanism for individual assessment and growth with a perpetually readjusting organizational chart has resulted in significant employee dissatisfaction.



Training on IT Skills for NEPRA Staff

In FY 2013-14, PDP submitted a Job Description manual to NEPRA which clearly details organizational hierarchies and scope of responsibilities for 190 organizational positions. PDP's newly developed Training Needs Assessment Report contains information on hierarchical and departmental training needs, and identifies potential training facilitators in addition to training courses. A Compensation and Benefits Study for NEPRA employees has also been conducted – the initial draft of the study was presented with the final version presented pending USAID approval. The highlight of FY 2013-14 was NEPRA's approval of the PDP-developed performance management system for implementation in FY 2014-15. In a related activity, PDP also conducted an "IT Skills" training program for NEPRA staff for both basic and advance level skills which were attended by 67 participants.

TASK 4: CAPACITORS AT TUBEWELLS FOR POWER FACTOR IMPROVEMENT & LOSS REDUCTION

One of the largest loads on Pakistani DISCOs is that of tubewell pumps. Nationwide, electric consumption via tubewell pumps accounts for about 12% of the total annual energy consumption, with significant variation from one DISCO to another. Tubewell pumps used in Pakistan have low power factors, of the order of 80-85% even when new. Frequent rewinding of pump-motors and poor quality workmanship results in further reduction in power factor. Low power factor increases reactive power demand on transmission and distribution lines and transformers, and results in higher technical losses. The high number of inefficient tubewell pumps with low power factor has a significant effect on the system's technical loss, and creates unnecessary demand on the system.



LT Capacitor Installed on a Tubewell

HIGHLIGHTS

- **Capacitor Installation at Five Power Distribution Companies** – Under its Capacitor Installation Program, PDP is installing capacitors on tubewells throughout the country. The PESCO project concluded with the installation of 2,367 capacitors as did the Quetta Electric Supply Company (QESCO) project with the installation of 15,809 capacitors. The contract for the installation of 45,000 capacitors in MEPCO was awarded and began with the installation of 2,000 capacitors. The installation of capacitors in Sukkur Electric Power Company (SEPCO), Hyderabad Electric Supply Company (HESCO), and Islamabad Electric Supply Company (IESCO) is also being planned and will be implemented in FY 2014-15. The capacitor installation program will result in substantial reduction in demand and technical losses.

TASK 5: FEEDER OPTIMIZATION FOR LOSS REDUCTION

DISCOs have not assessed current requirements for HT power factor correction. Feeder loads have changed with the addition of air conditioner motors and other appliances, causing poor power factor on many feeders, leading to high technical losses, low voltage, and customer dissatisfaction.

PDP's P&E program will focus on MEPCO to perform feeder power flow analysis using new software technology and install 11 kV / HT capacitors. This task will include installation of HT capacitors on feeders and at grid substations. Moreover, MEPCO has serious problems managing reactive power and proper voltage on lengthy feeders. To improve this situation, PDP has designed a Volt - VAR Optimization (VVO) program. With the introduction of VVO devices, switched HT capacitors and voltage regulators, it is expected to achieve about 5% loss reduction on individual feeders where these devices will be installed. The procurement for this project is underway.

HIGHLIGHTS

- **Area Planning Using Geographical Information Systems** – The distribution network underwent tremendous growth in the last few years, but the lack of effective planning resulted in a maze of feeders essentially serving the same area. GIS provides planners with a vision of ground realities and conditions, enabling them to properly manage feeder and transformer loads. The SynerGEE software simulates the conditions and allows planners to test different network arrangements prior to fieldwork. Planners at each DISCO are now using GIS to better visualize ground conditions and generate proposals. PDP also coordinated effective area planning activities with all DISCOs. PESCO planned a load shifting exercise involving multiple feeders, revealing the real benefit of GIS mapping and power analysis tools and affirming that incorporating their use in area planning and other planning tasks leads to better and more feasible network optimization plans. The initial plan created by PESCO's P&E staff prior to GIS mapping was double the cost and lacked a significant reduction in annual energy losses. For example, GIS mapping revealed another grid substation in close proximity to the feeder, which provided a more cost-effective solution resulting in **Rs. 1.27 million in savings**.
- **Planning and Engineering Capacity Building** – A series of OJT field training sessions were conducted in order to cement DISCO independence in GIS mapping and load flow analyses using SynerGEE. These sessions, 71 in total, spread across five DISCOs, focused on facilitating users in processing spatial data captured through field surveys and subsequent processing so that it can be used in SynerGEE. PDP has provided training to all DISCO P&E center staff and as a result, approximately 200 proposals were generated in the last fiscal year. This activity is expected to save around 100 MW



Workshop for Planning Engineers, Introducing SynerGEE, Power Flow Analysis Tool

though this number will be confirmed after possible adjustments and will be reported in the next quarterly report (i.e. October-December 2014).

TASK 6: EXPANSION OF HIGH IMPACT OPPORTUNITIES & IMPROVED GOVERNANCE

This task includes the following activities:

- Activity 1: Load Data Improvement Project
- Activity 2: Improved Meter Reading Project
- Activity 3: Line Staff Skill Development
- Activity 4: Governance
- Activity 5: Lineman Training for all DISCOs

HIGHLIGHTS

- **Load Data Improvement Project** – PDP successfully achieved its Load Data Improvement (LDI) project's objective, i.e., to reduce unscheduled load shedding through the installation of AMR meters at all nine DISCOs' grid substations. Following the establishment of the Tribal Area Electricity Supply Company (TESCO), the MWP asked PDP to integrate its power system with the LDI project. In the last quarter, PDP also installed AMR meters in the tribal areas. In all, 9,030 meters have been installed across all DISCOs, including TESCO. A new power distribution control center has been established at each of the 10 DISCOs.



Acting Mission Director USAID Being Briefed About the Functioning of IESCO's Power Distribution Control Center

The AMR meters will help provide each DISCO Power Distribution Control Center (PDC) and the National Power Control Center (NPCC) with near real-time data on current loads, critical to making quick adjustments to load management issues as they arise, an initiative that has almost eliminated unscheduled (forced) load shedding. PDP also installed specially designed executive screens in the offices of Chief Executive Officer (CEO) and General Manager (GM) / Chief Engineer Operation at all the ten DISCOs. Screens displaying live load data were also installed in the offices of GM NPCC and the NPCC consultant. For the first time in DISCO history, real-time MWs received from the national grid are displayed on these live data screens, instrumental in controlling and reducing unscheduled load shedding. In a related

activity, PDP organized a two-day training session for all 10 DISCOs on the LDI system where participants were briefed about LDI, its working, its potential, its benefits, and its hardware and software components. In hands-on training sessions, participants were given practical demonstrations on all LDI system operations, in order to ensure the smooth and efficient operation of the system. The LDI system was greatly appreciated by DISCO senior management. Now, the live load data is being used for optimum utilization of the available power supply, facilitating an almost complete elimination of forced load shedding leading to improved customer services.

- **Outage Reduction Devices Project** – The reliability of electric power distribution systems is critically important to all the DISCOs and the consumers they serve. Due to the current lack of sectionalizing devices in the DISCOs’ distribution systems, consumers outside the vicinity of power faults are also affected during outages. Under this project, proper sectionalizing devices are being installed on selected feeders. Additionally, installation of fault indicators in strategic locations will assist in reducing the time it takes to determine the source of the fault in the distribution system. PDP is allocating 900-Amps ground-operated gang switches for installation on critical and sensitive feeders, 600-Amps disconnect switches for installation on main feeders and 200-Amps units for installation on branches, and 100-Amps fused cutouts for installation on distribution transformers, making a total of 2056 switches for installation in PESCO. PDP has also allocated 800-Amps and 400-Amps fault indicators for installation on strategic locations in order to expediently pinpoint the location of faults. These devices will reduce the customer outage time while the switches will help in isolating only the affected section and not the entire feeder, therefore reducing the outage time to the remaining customers on that feeder. Design and work orders for 40 feeders were completed and released with the remaining in progress. PESCO has allocated PDP-trained linemen for installing these switches. The installation work for these switches has already begun and the first 600 and 200 Amps switches were installed on the Kohat Road feeder. Similar ORD installation work is ongoing at MEPCO, HESCO, IESCO, LESCO, FESCO, and GEPCO.

- **Improving Lineman Safety in Power Distribution Companies** – Under its Lineman Training Program, PDP trained 979 linemen from all nine DISCOs on safety techniques and meter installations using PDP-provided safety tools and equipment, 291 PESCO line staff and 100 MEPCO linemen were also trained in similar activities. In addition, Rescue 1122 training and PDP’s “Executive Safety Leadership” workshops, trained 154 senior and middle managers from all DISCOs. These workshops were designed to bring awareness about the responsibilities of senior managers concerning



Pole Top Rescue Operation being Demonstrated at the Training Yard

occupational health and safety of their workforce. Further, a significant portion of technical losses in DISCOs results directly from senior management's lack of attention to linemen training and the inadequate investment in tools, materials, training, and procedures. Poorly trained line workers using tools not suited to their tasks are attempting to keep the system operational, resulting in damaged transformers, increased technical losses, and a rising injury and death toll. In addition, under its Safety Improvement Program, PDP provided 70 rickshaws and 30 Suzuki Ravi pickups to both PESCO and MEPCO in FY 2013-14 and is also providing ladders, tools, and other equipment that will support loss reduction activities and will help in improving customer service and outage response time. As part of its "Leading Quality and Safety Training Program," PDP trained 90 managers from MEPCO, QESCO and HESCO. The training is being carried out in other DISCOs also. This program focuses on building management systems that have enabled various organizations to maintain strong leadership positions in their industries for decades, enabling senior management to align the corporate vision with safety directives, while rejuvenating commitment and setting the stage for an effective safety management system in the power sector. Finally, to highlight the importance of linemen safety, PDP conducted Oath Taking Ceremonies in PESCO and HESCO with linemen pledging to always keep safety first when performing their field duties. Events like these are crucial for building and maintaining the morale of field staff, the unsung heroes of the power sector.

- **Upgrading of Regional Training Centers and Establishment of Computer Labs** – In FY 2013-14, PDP continued upgrading of RTCs of PESCO and MEPCO and other DISCOs. Under this project, training aids, tools and safety equipment for linemen training were provided. In addition, PDP established one computer lab at RTC of PESCO and MEPCO and at four other DISCOs (GEPCO, LESCO, HESCO and QESCO) that will help build IT skills and awareness among company employees. PDP provided furniture, 25 desktops at each center, laptops for instructors, printer / scanner, and multimedia and associated screens. These labs will not only enhance the professional capabilities of individual employees, but also contribute to improving DISCOs' overall operations.
- **Meter Installation and Meter Replacement Program Advances** – PDP's meter replacement program replaces electromechanical meters with electrostatic meters. The aim is to improve DISCOs' commercial viability through theft reduction and more accurate consumer billing. It eliminates the possibility of meter tampering, rampant in electromechanical meters, and leads to a reduction in commercial losses and improvement in utility profitability. PDP has completed meter replacement in different subdivisions of LESCO, FESCO, and PESCO, thus far replacing/re-fixing 20,382, 8,610, and 22,579 meters, respectively in these three DISCOs. The contracts for the installation of 40,000 and 30,000 electrostatic meters in PESCO have been awarded to two contractors. Both contractors have been mobilized and installations have commenced. A new initiative to replace electrostatic meters with Radio Frequency (RF) meters was launched in LESCO's Niaz Baig subdivision and completed with

the installation of 6,417 meters. The contract for the installation of 27,260 meters in MEPCO has been awarded to a contractor with installation expected to commence in FY 2014-15.

- **Creating and Institutionalizing an Independent Central Power Purchasing Agency –** PDP is assisting MWP in the re-creation and operationalization of the Central Power Purchasing Agency (CPPA) as an independent company that will act as an agent between generators and distributors. The new entity, now known as “CPPA Guarantee Limited,” was created in December 2013. For this purpose, PDP developed Interim Market Rules, including settlement procedures that could govern how CPPA Guarantee Limited (CPPA-G) would operate in the market. These rules only remain valid until the newly elected BOD produces its own Market Rules. PDP also produced the Business Transfer Agreement, for transfer of assets from CPPA to CPPA-G. These interim Market Rules as well as the Business Transfer Agreement have been prepared by PDP’s regulatory and legal consultants and have been submitted to MWP for relevant action.
- **Preparation of Integrated Generation, Transmission and Distribution Plan for Development of Multi-Year Tariff –** In order to position Pakistan’s power sector for sustainable growth, development and adoption of individual multi-year tariffs for DISCOs is essential. For this purpose, PDP worked with working groups of the National Transmission and Dispatch Company (NTDC) and DISCOs and assisted in the development of the five-year Integrated Generation, Transmission and Distribution Plan (IGTDP) on behalf of the MWP. After supporting all DISCOs at each step in the formulation of their five-year rolling IGTDPs, PDP assisted MWP in issuing directions to DISCOs to submit their plans for regulatory approval, with three DISCOs submitting their IGTDPs to NEPRA by the end of FY 2013-14. Additionally, PDP launched a consulting project with Power Plan International (PPI) to institutionalize the IGTDP process and over a series of meetings with PPI and MEPCO senior management, developed a mutually acceptable methodology and project schedule for MEPCO. Subsequently, MEPCO appointed a focal person for the initiative, in addition to several key persons from each department. This intervention will allow MEPCO to address issues in its current planning function and take the lead in the power distribution sector as being the first entity to incorporate the IGTDP and ensure its sustainability. The IGTDP implementation will economically optimize resource allocation to achieve savings on investments, loss reduction, improved performance, and customer satisfaction. Finally, the recommendations and proposed management framework produced by this project will enable MEPCO to make the planning process fully sustainable. Deliverables under the consultancy will be shared with other DISCOs to assist them in making the IGTDP process fully sustainable across the country.

- **Formulation of National Electric Safety Code**

In FY 2013-14, PDP continued assisting in the formulation and development of national electric safety code (NESC) in collaboration with Pakistan Engineering Council (PEC), a statutory body for regulating the engineering profession in Pakistan. This code will help implement safe work practices in the power sector and Pakistan's telecommunications sector. The intent is to minimize accidents that occur due to failed safety equipment and poor work practices, resulting in the loss of about 200 lives per year both in public and private sectors. The NESC

encompass all processes from generation to end consumers. This quarter, all sub-groups of the taskforce submitted their final draft of the NESC and, in a unanimous decision, changed the name of the NESC to Pakistan Electric and Telecommunication Safety Code (PETSAC). The PETSAC draft was forwarded to the Institute of Electrical and Electronics Engineers, USA (international vetting and standardization), and was placed on the agenda for the upcoming PEC governing body meeting for formal approval, which once obtained, will result in its mandatory adoption across all utilities.



Stakeholders' Workshop for the Development of National Electric Safety Codes

- **Instituting an IT-Friendly Environment at the Ministry of Water and Power** – PDP is expanding the existing IT infrastructure at the MWP, an initiative aimed at improving the overall working and performance of the ministry. This intervention will significantly improve MWP's workflow, efficiency in processing cases, and the quality and speed of its interactions with attached and subordinate organizations. This system was designed to serve as a building block for the MWP's MIS Department, to allow efficient handling of both internal and external communications and administrative processes. This will also help in efficient handling and retrieval of records and archives. The improved IT setup will help MWP play its required leading role in implementing power sector reforms. So far 80% of MWP staff has been equipped with the latest desktop computers and related software. PDP is in the process of procuring additional IT equipment to equip the remaining staff. PDP's provided state-of-the-art video conferencing system has enabled communication between all power sector players and is being increasingly used by MWP for meetings and conferences. This has greatly helped in time and cost savings and reduced the need for travelling to Islamabad by all stake holders. MWP staff has also been trained on basic IT system usage and IT security. Development of a web-based dashboard application to allow the MWP to automate information flow between DISCOs and the Ministry has been completed and is currently going through a trial and testing phase. Once operational, this application will help the MWP to monitor and enforce Key Performance Indicators as detailed in the performance contracts of each DISCO.

SECTION 4: COMPONENT 2 TASKS

CONTINUING IN COMPONENT 3

TASK 1: CONGESTED AREA IMPROVEMENT

Under Component 2, congested area distribution system improvement work is underway at PESCO, and LESCO. This work is continuing in Component 3 but the main focus is now on two Turnaround DISCOs, MEPCO and PESCO. PDP is assisting the DISCOs in improving the distribution system in congested areas, . The work includes installing ABC cable, extending HT lines, shortening LT lines, installing new high efficiency compact (CSP) transformers, and installing outage reduction equipment. To achieve this improvement, PDP has purchased the bulk of the material and it is being installed with DISCO participation. This activity will lead to reduced losses, improved safety and increased revenue in congested and high theft areas, resulting ultimately in improved customer safety and satisfaction.

HIGHLIGHTS

- **Installation of Completely Self-Protected Transformers** – PDP’s intervention to install 45 Kilo Volt Ampere (KVA) CSP transformers aims to reduce overloading of existing PESCO transformers, while reducing the low voltage secondary length in order to reduce losses on lengthy LT lines in selected congested areas. PDP provided and allocated 30 transformers for installation in PESCO’s distribution system, with field survey, design, work orders with maps, and related material released for all 30. PESCO supported the intervention through the provision of PDP-trained linemen to exclusively work on the installation of these transformers; 27 of these transformers were installed by the close of the FY. The remaining transformers have a few right-of-way issues that PESCO is trying to resolve – should the company be unsuccessful, alternate locations will be chosen and new proposals and work orders will be generated. In a related activity, PDP provided and allocated 47 75-KVA transformers for installation in selected areas of PESCO Peshawar Circle, with the accompanying field survey, design, work orders with



A 45 KVA CSP Transformer Being Installed in PESCO’s Peshawar Circle.

maps, and other material released for 12 transformers. The design work for the remaining transformers is ongoing and work orders will be released as the survey and other necessary steps are completed. Installation of these transformers has begun with five transformers installed to date.

TASK 2: HIGH TENSION POWER FACTOR IMPROVEMENT

Under Component 2, the DISCOs committed to repair or replace already installed HT capacitors. PDP will continue under Component 3 to assist the DISCOs to complete this ongoing effort. Improved distribution system power factor will reduce technical losses and reactive power (MVAR) demand with improved voltage resulting in customer satisfaction. DISCOs have not assessed current requirements for HT power factor correction. Yet the feeder loads have changed with continuous loads of air conditioners, motors, CFLs, and other appliances, resulting in poor power factor on many feeders and lost revenue, low voltage, high technical loss, and customer dissatisfaction. PDP will focus on PESCO and MEPCO to conduct feeder power flow analysis, using new software to determine the requirement for installation of HT capacitors on high-loss feeders. At MEPCO, this activity is coupled with voltage regulators for the introduction of Volt-VAR Optimization (VVO) as part of the Energy Loss Reduction (ELR) program in Component 3.

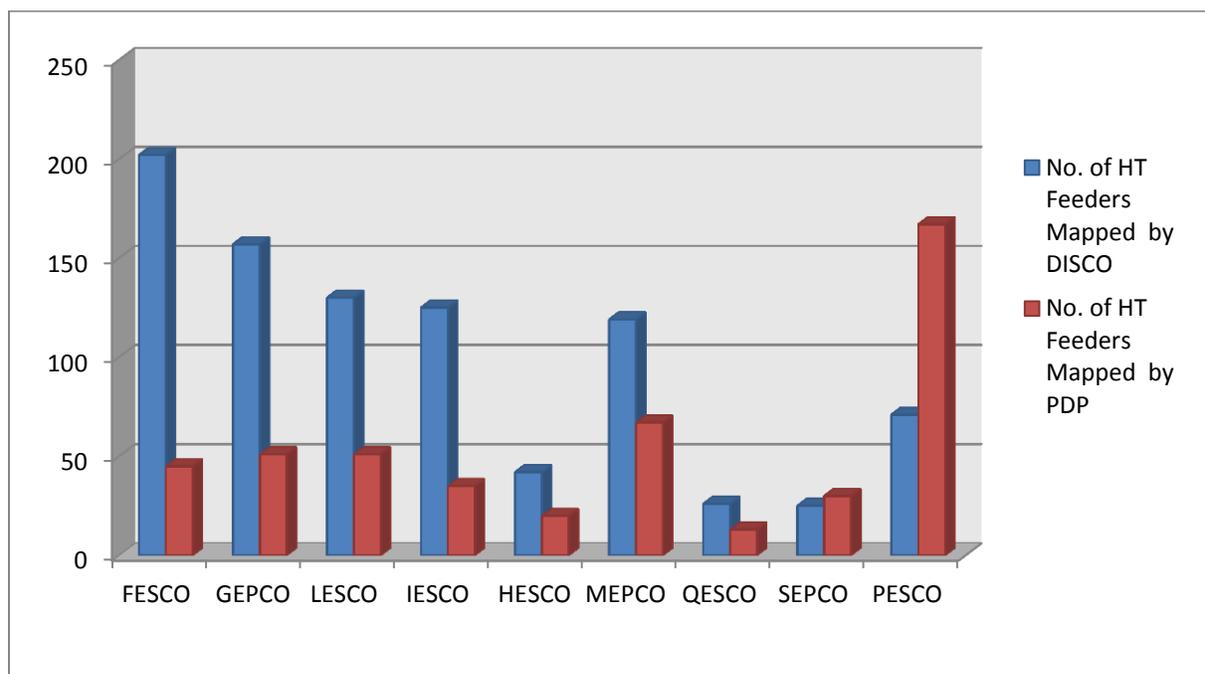
TASK 3: GEOGRAPHIC INFORMATION SYSTEM SURVEY & ENGINEERING ANALYSIS

In Component 2, PDP carried out feeder mapping and analysis of one subdivision per DISCO. PDP initiated a program to enable all nine DISCOs to develop a geodatabase with accurate mapping with locations of all field installations. To date, nine DISCO P&E computer centers have been made operational. Under Component 3, this effort will continue and PDP will build the capacity in DISCOs to map entire divisions and circles. Planning engineers will be encouraged to concentrate their engineering software analysis on these areas to produce more accurate feeder/ area rehabilitation plans, based on field GIS data.

HIGHLIGHTS

- **Data Collection and Database Development Continues at all Distribution Companies –** The creation of a GIS database of the power distribution facilities at all DISCOs is essential for improved governance and resource management. This year, work continued at all DISCOs where individual data per feeder is being collected and processed into a GIS database suitable for mapping and engineering analysis. Seven DISCOs are, with PDP's assistance, now using their own personnel to conduct GIS work, with PDP providing OJT only. PDP's GIS

trainings focused on facilitating staff in processing spatial data captured through field surveys and subsequent processing for use in SynerGEE, the power flow analysis tool. Thus far, over 1,500 feeders have been mapped across the country, with the DISCOs mapping an increasing number of feeders themselves. The chart below provides a comparison between feeders mapped by DISCOs and those mapped with PDP’s assistance.



TASK 4: DEMAND SIDE MANAGEMENT PROGRAM

Industrial motors contribute an estimated 60-80% of industrial electricity consumption in most Pakistani industrial sectors. Under the rollover program and through funding from the Energy Efficiency Program, PDP, in Phase 1 of its “Motors in Industry” program, installed 811 energy efficient motors and 641 VFDs in industries throughout Pakistan (except Baluchistan) until December 2013. In Phase 2, PDP installed 729 motors and 318 VFDs; this phase concluded on May 31, 2014. Another program activity was the replacement of inefficient pump-sets in the publicly-owned water and sewerage utilities. Under Component 2, PDP replaced 135 inefficient municipal pump-sets of Islamabad’s Capital Development Authority Islamabad, and 75 big tubewell motors and pumps in the Karachi Water & Sewerage Board. This activity concluded in December 2013.

TASK 5: LOW TENSION CAPACITOR INSTALLATION PROGRAM

Under Component 2's Capacitor Pilot Program, PDP has installed 24,000 LT capacitors on agricultural tubewells for the purpose of improving pump-set power factor in MEPCO, FESCO, LESCO, IESCO, and QESCO. Based on the successful results of this project, PDP has started the national capacitor installation project under Component 3 with the installation of 81,812 LT capacitors on tubewell motors, addressing the challenges faced during the pilot project, to maximize the nationwide program's success and peak demand savings and technical loss reduction.

TASK 6: COST OF SERVICE STUDY

Having completed the CoS Study with IESCO, PDP started working on CoS Studies at eight DISCOs – LESCO, FESCO, GEPCO, MEPCO, HESCO, PESCO, SEPCO, and QESCO. In this year, CoS study for four Companies has been completed. The study of the rest of the companies is underway. The methodology used with IESCO and approved by NEPRA has been applied and amended to meet the needs of each DISCO. Financial, commercial, and load data has been used to populate the model. AMR meters have been procured and are being installed on all transformers of selected feeders in each DISCO for establishing coincidence and contribution to the DISCO's demand to validate the CoS study results. An appropriate methodology for calculation of weighted average cost of capital will be used to determine market based rate of return.

TASK 7: ORGANIZATIONAL ASSESSMENT AND RESTRUCTURING

A similar project was undertaken at MEPCO under Component 2. Understanding that all DISCOs share similar structures, the assessment work conducted at MEPCO is used as basis for similar activity for PESCO with minimal assessment performed in areas where there might be discrepancies or inconsistencies. The project will focus on the implementation of approved proposals / studies.

HIGHLIGHTS

- **Organizational Assessment and Restructuring at Multan Electric Power Company** – PDP continued its support for MEPCO's organizational restructuring. With MEPCO's buy-in last quarter, PDP this quarter developed Request for Proposals for nine additional



A Workshop on Organizational Restructuring for MEPCO Staff

proposals. These include “Job Descriptions & Key Performance Indicators,” “Performance-Based Evaluation System,” “Training and Capacity Building,” “Training Function Development,” “Recruitment Policy,” “Employee Handbook,” “Rewards and Recognition Policy,” “HR Help Desk,” and “Identification of Anomalies.” The contract has been issued to an outsourced HR consultant firm and the team will be mobilized to Multan in FY 2014-15.

SECTION 5: EVENTS

INAUGURATING POWER DISTRIBUTION CONTROL CENTERS OF DISCOs

ELIMINATING UNSCHEDULED LOAD SHEDDING:

During 2013-14, USAID Power Distribution Program held many media events highlighting U.S. assistance to Pakistan's energy sector. Power Distribution Control Centers (PDCs) were established in each DISCO while inaugural ceremonies of PDCs were held in some of DISCOs including IESCO, HESCO, LESCO and PESCO.

MESSAGE DELIVERED:

With live monitoring screens presenting on-line load data from all DISCOs' grid substations and feeders, PDCs operators, for the first time, have an on-line display of DISCOs' real-time load data and feeder load shedding status. This information will enable DISCOs to monitor their planned load shedding and stay within their NPCC allocated quota.





PROMOTING SAFETY CULTURE IN PESCO

ENHANCING MOBILITY OF PESCO STAFF:

A fleet of 100 vehicles was handed over to the PESCO CEO in a ceremony held at PDP's Islamabad offices. The fleet comprises of 30 Suzuki pickups and 70 purpose-built tri-wheelers. All the vehicles are equipped with necessary lineman safety gear and equipment for field work.

MESSAGE DELIVERED:

These new items will improve the reliability of power supply to the customers by helping PESCO linemen do their job more efficiently and effectively. Additionally, these vehicles were painted in a distinctive Burnt Orange to improve PESCO's image and generate consumer confidence in PESCO's customer care service. These vehicles and tools will also enhance linemen's esteem in their profession and will help them carry out their work more safely.



پشاور ایکسٹرنل سپلائی کمپنی
تقریب برائے حسن کارکردگی

کشمکش کو



RECOGNIZING PESCO EMPLOYEES

FACILITATING EMPLOYEE SATISFACTION:

PDP initiated the first ever PESCO Employee Recognition Awards.

MESSAGE DELIVERED:

The event catered for over 1,000 employees recognizing the best performers (in both management and operational staff). Overall the event was equally appreciated by both PESCO's labor union and staff and will go a long way in bringing a positive change in the performance of the company in 2015.

APPENDIX A: TABULAR PERFORMANCE RESULTS

Indicator	Unit	Start of Project to End of Previous Year (Sep 2013)	Current Year (Oct 2013 -Sep 2014)	Start of Project to End of Current Year
Power and Energy Saving				
MWs of power saved by installing LT capacitors, HT capacitors, meters, pumps, motors and optimization of commercial procedures	MW	97.4	29.4	126.8
Giga-watt hours of energy made available by installing high tension / low tension capacitors, meters and improving commercial procedures	GW-h	435.1	116.0	551.1
Revenue saved or revenue generated by installing high tension / low tension capacitors, meters and improving commercial procedures, internal audit process optimization and advising PESCO on a corporate level	\$ million	44.3	126.3	170.6
Beneficiaries				
Number of beneficiaries receiving improved energy services by installing high tension/low tension capacitors, meters, and improving commercial procedures	No.	1,461,000	441,000	1,902,000
Capacitors				
Number of capacitors installed in tube well pumps	No.	9,488	14,714	24,202
Pumps & Motors				
Number of pumps installed in municipalities	No.	179	31	210
Number of motors installed	No.	644	895	1,539
Number of variable speed drives (VSDs) on motors	No.	397	352	749

Load Data Improvement Project				
Number of AMR meters installed under LDI Project	No.	8,593	437	9,030
Meter Installation Improved Meter Reading & Meter Replacement Activity				
Number of new meters installed through improved meter reading & meter replacement activity	No.	37,721	27,157	64,878
Number of meters re-fixed with new service drops and proper fixing brackets through meter replacement activity	No.	13,970	1,636	15,606
Total new meters installed and re-fixed through improved meter reading and meter replacement activity	No.	51,691	28,793	80,484
Percent reduction in complaints	%	76%	75%	75%
Miscellaneous Installations				
Number of outage reduction devices	No.	-	1,523	1,523
Number of automatic meter reading meters	No.	-	4,374	4,374
Number of transformers	No.	7	25	32
Meters of quadraplex cables	meter	-	5,000	5,000
Revenue Protection Cell				
Total number of FIRs lodged	No.	-	251	251
Total number of theft cases / illegal hooks detected	No.	-	1,588	1,588

Improved Meter Reading				
Number of theft cases detected	No.	-	3,352	3,352
Number of consumer premises checked	No.	-	25,294	25,294
Number of meters replaced	No.	-	9,814	9,814
Census				
Number of consumers enumerated	No.	48,528	20,000	68,528
Number of theft cases observed through census	No.	1,099	-	1,099
Wrong tariff cases identified through census	No.	146	15	161
Linemen Training				
Number of linemen trained on roper safety techniques	No.	10,302	4,171	14,473
Percent reduction in fatal accidents (Maximum in a quarter)	%	66%	57%	57%
Percent reduction in non-fatal accidents (Maximum in a quarter)	%	45%	26%	26%
Functional Training				
Number of DISCO staff trained in various functional areas like Finance, Human Resources, Technical, Commercial, Communication etc.	No.	25,652	3,113	28,765
Governance				
Number of policies and international best practices analyzed, developed and issued	No.	17	22	39

USAID Power Distribution Program

House 23, Street 19, F-6/2,

Islamabad, Pakistan