



Technical Work Inspection for USAID's Energy Policy Project and Power Distribution Project

Final Report (January 2016)



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Final Report

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Acronyms

ABC	Aerial Bundled Cable
ACOR	Alternate Contracting Officer's Representative
AEAI	Advance Engineering Associates International
AJK	Azad Jammu and Kashmir
AMR	Automatic meter reading
CO	Contracting Officer
COR	Contracting Officer Representative
COS	Cost of Service
CSP	Completely Self Protected
DISCO	Distribution Companies
EPP	Energy Policy Program
FATA	Federally Administered Tribal Area
FESCO	Faisalabad Electric Supply Company
GENCOS	Generation Companies
GEPCO	Gujranwala Electric Power Company
GOP	Government of Pakistan
GSO	Grid System Operation
HESCO	Hyderabad Electric Supply Company
HHU	Handheld Unit
HPK	Halcrow Pakistan (Pvt.) Ltd.
HT	High Tension
IESCO	Islamabad Electric Supply Company
IQC	Indefinite Quantity Contract
IT	Information Technology
I&V	Inspection & Verification
IRG	International Resources Group
JMP	Journey Management Plan
KPK	Khyber Pakhtunkhwa (province)
LESCO	Lahore Electric Supply Company
LDI	Load Data Improvement
LT	Low Tension
MCB	Miniature Circuit Breaker
MEPCO	Multan Electric Power Company
MPR	Monthly Progress Report
NEPRA	National Electric Power Regulatory Authority
NTDC	National Transmission and Dispatch Company
ORD	Outage Reduction Device
P&I	Protection & Instrumentation
PDP	Power Distribution Program

PESCO	Peshawar Electric Supply Company
PWP	Project Work Plan
QESCO	Quetta Electric Supply Company
RFE	Radio Frequency Enabled
SEPCO	Sukkar Electric Power Company
TESCO	Tribal Electric Supply Company
TO	Task Order
TWI	Technical Work Inspection
USA	United States of America
USAID	United States Agency for International Development
WAPDA	Water & Power Development Authority

1 Executive Summary

This final report for Technical Work Inspection for EPP (Energy Policy Program) and PDP (Power Distribution Program) covers inspection & verification scope in ten DISCOs and NTDC. Activities for inspection & verification under this Task Order were based on percentage sampling approved by USAID. HPK Inspection Audit team conducted the inspection effectively and observed significant improvements in overall system of DISCOs/NTDC due to PDP and EPP projects funded by USAID.

To accomplish the objectives of the Task Order, HPK engaged teams in three regions i.e. KPK/Islamabad, Punjab, and Sindh/Balochistan regions. Inspection & verification works were commenced as per plan i.e. from 3rd of August 2015 and were completed within the time allocated for TO. All other deliverables under the task order such as monthly reports, weekly updates, and demobilization plan were submitted in a timely manner.

Energy Policy Program was mainly undertaken in KPK in PESCO and NTDC. The scope includes augmentation and addition of new transformers, supplying allied electrical grid stations equipment, revamping /retrofit/repair/rewinding of damaged power transformers, replacement of damaged power transformers with new ones, replacement of old 132 KV circuit breakers, rehabilitation of 132 KV capacitor banks at grid stations, installation of new 11 KV incoming panels with accessories and implementation of automated metering system at grid stations. Transformer Oil Analysis for condition assessment and diagnostics of power transformers throughout PESCO grid stations. Additionally, P&I test equipment, hi-roof vans, and bucket trucks were provided and IT related projects for NTDC were executed as part of capacity building. Live line equipment, vehicles and trailers were also supplied to selected DISCOs. EPP Program by USAID has Strengthen the Grid Station Network of PESCO & NTDC by improving the system capacity.

Power Distribution Program's (PDP) main focus is on distribution system of DISCOs and primarily consists of provision of LT capacitors, HT capacitors, LDI AMR meters at DISCOs grid stations across Pakistan, AMR meters for cost of service studies (COS), AMR meters for various customer categories, electronic meters, AMR meters for high end and tube well consumers, RF-enabled meters, ABC cables, CSP transformers, outage reduction devices (ORDs), hand held units, linemen tools and few other equipment for selected DISCOs. With the implementation of PDP, losses are reduced, revenues are improved and customer services enhanced all over Pakistan. LDI program in grid stations contributed significantly in elimination of unplanned load shedding and better load management. LT capacitors contributed in improving power factor and saving of MWs.

HPK has presented its findings with observations and recommendations in Inspection & Verification (I&V) reports submitted to USAID on 9 and 10 October 2015 respectively and Addendum Report on 27 November 2015. This final report highlights the task accomplished for EPP and PDP in a consolidated manner and also includes objectives and targets achieved, percentage sampling, activities & deliverables, impediments, major concerns, and observations & recommendations.

2 Introduction and Project Brief

2.1 Title

Technical Work Inspection for USAID's Energy Policy Project and Power Distribution Project

2.2 Task Order (TO)

USAID Pakistan awarded the TO contract for the 'Technical Work Inspection for Power Distribution Program and Energy Policy Program' to Halcrow Pakistan (HPK) through Task Order No: AID-391-TO-15-00006 under IQC Contract No: AID-391-1-11-00002. The commencement date of the TO is 16 July 2015 and the planned finish date is 15 January 2016.

2.3 Project Scope

Under the TO scope, USAID requires A-E Services for inspection and verification of technical services provided by International Resource Group (IRG) under USAID's Power Distribution Program (PDP) and Advanced Engineering Associates Inc. (AEAI) under USAID's Energy Policy Program (EPP). This inspection and verification is to remain limited to a representative random sample agreed with USAID prior to commencement of I & Vs. The project area is scattered within territorial jurisdiction of the ten Distribution Companies (DISCOs) across Pakistan and AJK region. Part of the EPP funding was made to NTDC with major activities in KPK. Project Team organogram is annexed as **Appendix A**.

2.4 Objectives & Targets

USAID awarded the TWI contract with objective to verify that the services provided under EPP & PDP match the desired goal of the two programs launched with the aim to improve technical & commercial operation of the DISCOs. Accordingly, careful selection of equipment to be verified and inspected was of prime importance in order to cover all objectives of the TWI. A comprehensive methodology and sampling plan was so prepared that covered entire scope. It was also ensured all areas are covered. The methodology adopted catered for inspection of agreed percentage samples of all items installed under PDP. For EPP almost 100% inspection was ensured. Although the targets set were stringent, yet in most cases, HPK exceeded the targets of the sampling plan/criteria. Equipment list for PDP items (Versions V-I and V-II), Equipment list for EPP items (Version V-II and V-III) and percentage sampling/ detail of inspected items are attached as **Appendices B, C and D** respectively.

3 Project Organization, Roles & Responsibilities

Under TWI, inspection & verification of two major projects funded by USAID were required to be covered. One part, PDP was spread across whole Pakistan & AJK whereas the other part, EPP had main focus in KPK. Accordingly, inspection has to be conducted across Pakistan and far flung areas of KPK including FATA. HPK divided I &V activities into three regions namely *KPK/Islamabad*, *Punjab*, and *Sindh/Balochistan* regions. Each region headed by a lead engineer, comprised of inspectors and junior engineers. Field staff, submitted daily reports/filled in preformas. Scrutinized by lead engineers, the inspection details were counter checked by Senior Electrical Engineer and Project Manager who also conducted many field visits themselves. Using this approach, I&V for both PDP and EPP was carried out successfully and within the time available for this TO. Organization Chart is as per **Appendix-A**.

4 Activities & Deliverables

All activities under the scope of TWI Project were completed in time. Deliverables like weekly updates, monthly reports, work plan, demobilization plan and others were submitted in a timely manner and as per agreed time line. Comparison of work plan targets and results achieved are provided in **Appendix- E**.

5 Inspection & Verification of Components of PDP and EPP

Separate reports of inspection and verification of components included in PDP and EPP has been submitted to USAID under this TO. This chapter provides the lists of components included in each program. Details on inspections are provided in I&V reports.

5.1 Components of PDP

Components included in PDP are:

LT Capacitors

Electronic Meters

RF-Enabled Meters

AMR Meters for Various Customer Categories

AMR Meters for Hi-End and Tube-well Consumers

AMR Meters for Cost of Service Study (COS)

Load Data Improvement (LDI) AMR Meters (On Grid Stations)

CSP Transformers & ABC Cables

HT Capacitors

Hand Held Units (HHUs), Deck Loaders for Linemen, Suzuki Ravi for Linemen

Outage Reduction Devices

Linemen Tools

Voltage Regulators

5.2 Components of EPP

Components included in EPP are:

Power Transformers Repair/ Rewinded

132kV Circuit Breakers Rehabilitation/Replacement

220/132 KV, 250 MVA Power Transformers at 220 KV NTDC Grid Station Mardan

New Power Transformers-40 MVA, 132/11.5 KV

Repair of 150 MVA (500/200 KV, single unit) and 160 MVA (220/132 KV) Power Transformer

Rehabilitation of 132kV Capacitor Banks, Capacitor Cells, Current Transformers, Circuit Breakers

Power Transformer Cooling Fans and MCBs

Bus Disconnectors and Surge Arresters (NTDC G/S Mardan)

11kV Metal Clad Switchgear, Incoming Panels and Accessories (1000 MCM Power Cable, Indoor / Termination Kits

Vehicles (Hiace Vans), Testing Equipment for P&I Vans, Personal Protective Equipment and Tools & Equipment for Transmission Lines & Grids

Transmission Line Tower Repairs, Live Line Maintenance Tools LLM (IESCO, PESCO and FESCO)

Automatic Metering System (AMR)

Transformer Oil Tests (Review of Reports from PTESU Lab & Orient Karachi Lab)

Equipment Supply and Installation for NTDC IT Department

Metering Panels and Data Communication Equipment

Supply of Tools and Equipment for Transmission Lines and Grids

6 Major Concerns, Observations, Recommendations

6.1 Power Distribution Program

PDP started in 2010 with focus on distribution system improvements of DISCOs network. Prior to embarking on the physical activities USAID conducted operational audit of the DISCOs network. Based on the audit report, USAID & DISCOs jointly earmarked the area of concern that required improvements. The aid was disbursed accordingly to strengthen the weak areas.

6.1.1 Major Concerns and Observations

1. Many of LT capacitors in some DISCOs especially in QESCO were found missing in bulk. The farmers and owners of other individual connections are in the habit removing altogether with the complete components mounted wooden boards and also shifting the capacitors from the approved connections/tube wells on different tube wells and even on unapproved connections. Installation of LT Capacitors on wooden boards with loose connections / wiring and components is also a serious concern. Due to peculiar and unruly behavior prevalent in the area, QESCO has no control on such an illegal exercise, therefore, full benefits of the LT capacitors in QESCO could not be reaped fully.
2. DISCOs staff was not found fully familiar with COS meters and its implications.
3. During course of TWI task order inspections, 57 number Non Compliance Reports were raised with 24 major & 33 minor NCRs reported to USAID. The detail in tabulated form is given in Appendix-F.

6.1.2 Recommendations

1. Outreach of highly successful projects like LT & HT capacitors, ORDs, provision of testing & safety equipment, voltage regulators, and vehicles should be extended further and to other DISCOs as well.
2. For LT capacitors to private consumers, refined approach need to be adopted especially in DISCOs with uncompromising consumers like QESCO.
3. Training on safety should continue with improved zeal. Feedback from DISCOs to improve upon the training aspects is likely to help a lot.
4. For Cost of Service Meters (COS smart meters), the impact of the study or outcome should be effectively used
5. Data from COS meters should be shared/discussed regularly with DISCOs for improving the outcome of this exercise in real terms. USAID should arrange comprehensive training to DISCOs and other relevant organizations staff for taking full advantage and maximum benefit of this study.

6.2 Energy Policy Program

EPP was also launched in 2010. It was started with the intent to improve grid system network in PESCO and NTDC (mainly KPK). This program resulted in improving system capacity of grid stations across PESCO. Replacement of outdated circuit breakers, refurbishment of 132 capacitor banks and other grid equipment, provision of smart meters at grid stations all contributed in improving operational performance of the PESCO & NTDC. Some IT related projects for NTDC Design & Planning Wings at Wapda House, Lahore were also launched with the view to improve operational performance of NTDC.

6.2.1 Major Concerns and Observations

1. Important EPP projects were not handled with the level of expertise so required for installation and commissioning of new transformers and retrofit of the various transformers. Costly equipment like power transformers of rating (250 MVA) were ordered, inspected, erected and commissioned in a way that raises serious doubts on the prolonged operational life of the equipment. HPK raised its concerns through major NCRs.
2. Similarly for installation & commissioning 40 MVA power transformers, contract awarded to M/s PEL Pakistan on turnkey basis, had many loop holes that could be easily avoided had the erection & commissioning crew cared more on quality assurance to avoid many open points as punch list. In one case (At PESCO's DI Khan Grid Station), the major flaw due to loose /inappropriate earthing system had already subjected new transformer to severe jerks under fault conditions. It was only after HPK audit inspection team reported the matter to PESCO's concerned quarters and the fault was attended saving the transformer from further shocks that could result into early damage of the same.
3. The quality of repair of power transformers by the Heavy Electrical complex (HEC) Hattar, Haripur, as observed during the inspection of the repaired transformers (132 KV Shahibagh & Gadoon), is simply appalling. The repaired 31.5/37 MVA, 132/66 Kv power transformer (Elta Poland Make) at Shahi Bagh Grid Station is leaking profusely that endangers not only the power transformer but also poses fire threat to other grid equipment and environment. Highly controversial, unprofessional methods are adopted by PESCO maintenance crew to top up the oil through conservator which leads to contamination of oil and ingress of moisture.
4. Similarly quality of repair for same capacity & make transformer (Repaired from PTESU, Wapda Foundation and Lahore) is not up to mark as minor leakage was observed in short duration of service from this newly repaired transformer as well. It is also noted that transformer after repair / re-winded transported and assembled at site, the used old gaskets (cork) were installed on the transformer valves, tap changer top cover, radiator bank flanges and bucholz relay etc. The contactor AEAI's assertion that for repaired transformers prone to oil leakage has to be attended by GSO maintenance crew, HPK is of the view that AEAI's opinion is not justified as transformers were repaired/retrofit and subjected to leakage within approximately 6 months of the repair from the factory/workshop. One out of the two EHV power transformers (160 MVA, 220/132 KV), reportedly failed in lightning impulse test that was performed after its repairs at HV & SC Lab Rawat. Again it speaks about the poor quality of repair at HEC, Hattar and Haripur Workshop.
5. Scope of work should be prepared on turnkey basis contract for new transformers procurement, installation, testing & commissioning. The methodology adopted during this EPP projects execution mainly of NTDC projects, a visible gap of coordination was observed among different contractors that affected quality of work and specifying one party responsible.

6. Factory Inspection of transformers at Manufacturer's Works was not up to mark. Glaring omissions were observed in this regard. Even very costly equipment's FAT like 220/132 KV Power Transformers was not up to mark.
7. Ferules, cable tags were found missing in the power transformers local control cabinet, Circuit breakers control cabinet, relay and control panels wiring carried out by AEAI/NTDC/PEL. From maintenance point of view, this is a serious flaw and during fault localization and replacement of cables/wiring is likely to contribute negatively. Faults localization/ rectification will take more time.
8. During course of TWI task order inspections, 19 number Non Compliance Reports were raised with 10 major & 9 minor NCRs reported to USAID. The detail in tabulated form is given in Appendix-G.

6.2.2 Recommendations

1. While awarding contracts, strict monitoring from the donor agency is required to take full advantage of the funding. It should not be the case that contractors are allowed relaxations like the one at NTDC grid Mardan was observed by HPK during commissioning of two 250 MVA Power Transformers. The contractor should be fully responsible for the quality of erection, testing & commissioning of the equipment.
2. The warranty period of costly equipment like power transformers should commence from the date of commissioning only.
3. DISCOs, the ultimate beneficiary, should strictly advise and bound their technical staff about the sensitivities of the proper erection, testing & commissioning of the equipment. Close liaison during erection, testing & commissioning phase is sure to yield immense benefits to all parties especially the DISCOs.
4. 3rd Party Neutral Agency should be assigned for review of work scope of major equipment procurement, design, vendor approval, FAT Inspections and supervision of installations, testing & commissioning activities at site to ensure corrective actions promptly till completion of the project and timely reporting to USAID.
5. Installation & commissioning procedures should be followed with documentation.
6. QA /QC document should be prepared / documented by contractors and to be submitted for approval by neutral third party assigned by USAID for TWI Inspections.
7. Beside Oil Analysis, it is recommended to carry out effective Infra-Red Thermography of the transformers installed in PESCO. Although this activity is being carried out in PESCO, it appears that real benefits are not obtained. Infra-Red thermography is essentially required to perform and inspect the hot spot on bushings, tap changer contacts, bus bar terminations joints and radiators banks. Most of the transformers are over loaded, prone to oil leakages and are operating without comprehensive preventive maintenance. Infra -red Thermography is a tool for preventative maintenance guidance. With the guideline transformers subjecting to failure /damage can be avoided.
8. All missing ferules/cable marking should be provided on wiring and cables to facilitate easy fault rectification.
9. With addition of more MVA by adding system capacity (augmentation of existing transformers, addition of new transformers), earth mesh of the grid stations needs to be tested and studied. Weak earth mesh may not cope with the increased fault levels and may result into damage to costly grid equipment.
10. Transformers earthing pit should be constructed separately with test points available for easy measuring of earth resistance. Mostly all such points were found buried in the sand/ground.
11. Most of the protection & control panels at 220 KV NTDC Mardan grid station are quite old. Protection relays installed on these relay panels are mostly old electro mechanical relays, therefore, reliability and speed of protection relays is doubtful. Costly grid

equipment including power transformers should not remain at the mercy of old electro mechanical relays.

7 Implementation Problems

No major problem or impediment was faced during the course of TWI assignment. Few minor problems that were faced were resolved amicably without affecting time frame. USAID and both its main contractors IRG and AEIA were very helpful in providing data/information required by HPK to carry out technical work inspection. Issues raised during course of the whole exercise were addressed during meetings with COR and representatives of the EPP and PDP contractors.

8 Photographs

An album of photographs of both PDP and EPP items that were inspected has been developed and is attached in **Appendix H**.

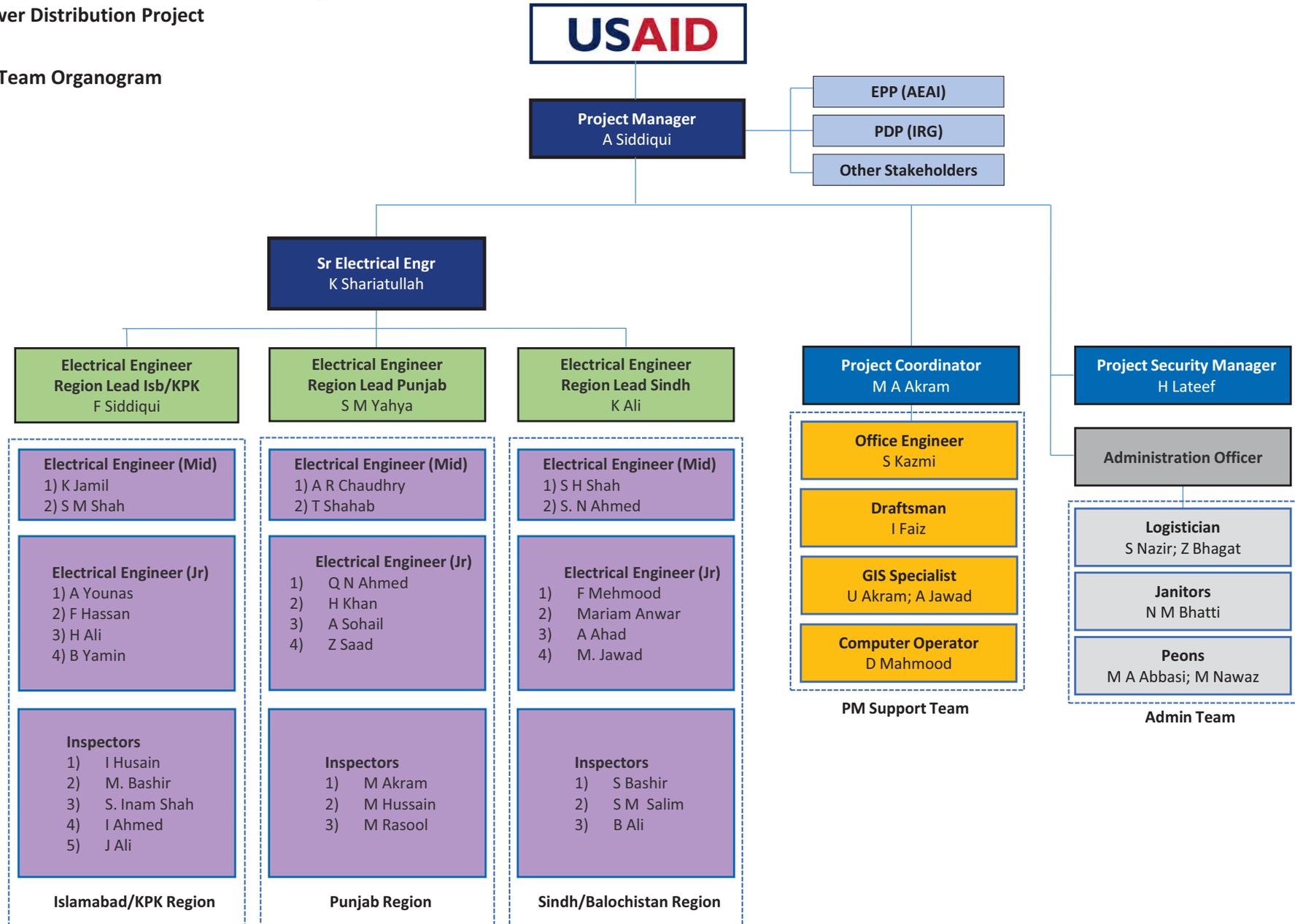


Appendix A

Project Team Organogram

Technical Work Inspection for USAID'S Energy Policy Project and Power Distribution Project

Project Team Organogram





Appendix B

Equipment List PDP
(V-I & V-II)

**List of PDP Equipment Version V-I
Installed/Provided in the Field by December 2014**

Equipment	DISCO	District(s)	Quantity Installed
LT Capacitors	MEPCO	Multan, Lodhran, Vehari, Khanewal, Bahawalpur, Bahawalnagar, Muzaffargarh, Rahim Yar Khan and Sahiwal	14,466
	FESCO	Mianwali and Khushab	1,033
	IESCO	Chakwal, Islamabad, Jehlum, Attock and Rawalpindi	401
	LESCO	Okara	1,058
	QESCO	Pishin, Qila Saifullah, Qila Abdullah, Ziarat, Loralai, Quetta, Noshki, Mastung, Qalat and Kharan	15,409
	PESCO	Bannu, Hazara, Khyber, Mardan, Peshawar and Swat	2,367
		TOTAL	
Electronic Meters	PESCO	Peshawar	17,956
	FESCO	Faisalabad	7,561
		TOTAL	25,517
RF-Enabled Meters	LESCO	Lahore	6,417
		TOTAL	6,417
AMR Meters for Various Customer Categories	IESCO	Rawalpindi	324
	MEPCO	Multan	761
	LESCO	Lahore	83
	HESCO	Hyderabad	7,412
	PESCO	Peshawar	76
	TOTAL		8,656
AMR Meters for Hi-End Consumers	MEPCO	Multan, Lodhran, Vehari, Khanewal, Bahawalpur, Bahawalnagar, Muzaffargarh, Rahim Yar Khan, Sahiwal, Rajan Pur, DG Khan, Jhang and Layyah (In selected districts these 4,983 AMRs are installed, however, ultimately they will be installed almost in all the districts).	4,983

Equipment	DISCO	District(s)	Quantity Installed
AMR Meters for Hi-End Consumers	PESCO	All Districts of KPK (In selected districts these 973 AMRs are installed, however, ultimately they will be installed almost in all districts of KPK)	973
		TOTAL	5,956
AMR Meters for Cost of Service Study	LESCO	Lahore	44
		TOTAL	44
LDI AMR Meters (On Grid Stations)	FESCO	Pakistan Wide in 750 Grids Stations of all ten DISCOs	1,083
	GEPCO		881
	HESCO		581
	IESCO		1,123
	LESCO		1,744
	MEPCO		1,330
	PESCO		1,047
	QESCO		669
	SEPCO		575
	TESCO		120
		TOTAL	9,153
CSP Transformers	PESCO	Peshawar	35
		TOTAL	35
Municipal Pumps	CDA-Islamabad	Islamabad	135
	KWSB-Karachi	Karachi	75
		TOTAL	210
Industrial Motors	FESCO	Faisalabad, Mianwali and Khushab	147
	HESCO	Jamshoro, Thatta and Hyderabad	157
	IESCO	Chakwal and Jehlum	2
	KESC	Karachi	51
	LESCO	Lahore, Qasur and Shaikhupura	516
	MEPCO	DG Khan, Sahiwal, Khanewal, Multan and Muzaffargarh	252
	PESCO	Haripur, Nowshera, Kohat and Swabi	410
	SEPCO	Benazirabad	4
		TOTAL	1,539
Hand Held Units (HHUs)	MEPCO	Multan and Khanewal	130
	PESCO	Peshawar	143
	IESCO	Rawalpindi	13
		TOTAL	286

Equipment	DISCO	District(s)	Quantity Installed
Laptop Computers	FESCO	Faisalabad	2
	GEPCO	Gujranwala	5
	HESCO	Hyderabad	5
	LESCO	Lahore	5
	MEPCO	Multan	5
	PESCO	Peshawar	5
	QESCO	Quetta	5
	SEPCO	Sukkur	1
		TOTAL	33
Desktop Computers	FESCO	Faisalabad	8
	GEPCO	Gujranwala	32
	HESCO	Hyderabad	34
	IESCO	Islamabad	1
	LESCO	Lahore	35
Desktop Computers	MEPCO	Multan	68
	PESCO	Peshawar	63
Desktop Computers	QESCO	Quetta	32
	SEPCO	Sukkur	7
		TOTAL	280
Deck Loaders for Linemen	MEPCO	Multan, Khanewal	70
	PESCO	Peshawar, Charsadda	70
		TOTAL	140
Suzuki Ravis for Linemen	MEPCO	Multan, Khanewal	30
	PESCO	Peshawar, Charsadda	30
		TOTAL	60
Fault Indicators	FESCO	Faisalabad	69
	GEPCO	Gujranwala	69
	HESCO	Hyderabad	36
	IESCO	Jhelum	60
	LESCO	Lahore	24
	MEPCO	Multan	120
	PESCO	Peshawar	18
	TOTAL	396	
600 AMP Off Load D/Switch - 1Phase	FESCO	Faisalabad	24
	GEPCO	Gujranwala	24
	HESCO	Hyderabad	6
	IESCO	Jhelum	24
	LESCO	Lahore	15
	MEPCO	Multan	48
	PESCO	Peshawar	6
	TOTAL	147	
200 AMP Load Break Switch	FESCO	Faisalabad	93
	GEPCO	Gujranwala	180
	HESCO	Hyderabad	3
	IESCO	Jhelum	63
	LESCO	Lahore	12
	MEPCO	Multan	231
	PESCO	Peshawar	3

Equipment	DISCO	District(s)	Quantity Installed
		TOTAL	585
100 AMP Fused Dropout Cutout	FESCO	Faisalabad	255
	GEPCO	Gujranwala	600
	HESCO	Hyderabad	57
	IESCO	Jehlum	105
	LESCO	Lahore	192
	MEPCO	Multan	417
		TOTAL	1,626
900 Amp Three Pole Load Break (Gang-Operated)	FESCO	Faisalabad	4
	GEPCO	Gujranwala	1
	MEPCO	Multan	1
		TOTAL	6
Linemen Tools (Ladders, Gloves, Belts, Hard Hats, High Visibility Vests, Spanners, Pliers, Wrenches, Drilling Machines, Clamps, Tool	FESCO	Faisalabad	43,998
	GEPCO	Gujranwala	
	HESCO	Hyderabad and Jamshoro	
	IESCO	Islamabad and Rawalpindi	
	LESCO	Lahore	
	MEPCO	Multan and Khanewal	
Linemen Tools (Ladders, Gloves, Belts, Hard Hats, High Visibility Vests, Spanners, Pliers, Wrenches, Drilling Machines, Clamps, Tool Kits, Hot Sticks, Grounding Sets, Training Aids etc.)	PESCO	Peshawar and Charsadda	43,998
	QESCO	Quetta	
	SEPCO	Sukkur	
		TOTAL	43,998

**List of PDP Engineering Equipment Version V-II
Installed in the Field by June 2015**

Equipment	DISCO	Quantity Installed by June 30, 2015
LT Capacitors	MEPCO	45,615
	FESCO	1,033
	IESCO	788
	LESCO	1,058
	QESCO	16,007
	PESCO	2,367
	HESCO	715
	SEPCO	2,019
	TOTAL	69,602
Electronic Meters	PESCO	25,480
	FESCO	7,561
	MEPCO-refixing	16,685
	TOTAL	49,726
RF-Enabled Meters	LESCO	6,417
	PESCO	3,872
	TOTAL	10,289
AMR Meters for Various Customer Categories	IESCO	343
	MEPCO	761
	LESCO	84
	HESCO	12,803
	PESCO	98
	TOTAL	14,089
AMR Meters for Hi-End and Tubewell Consumers	MEPCO	29,687
	PESCO	10,007
	TOTAL	39,694
AMR Meters for Cost of Service Study	FESCO	
	GEPCO	169
	HESCO	24
	LESCO	122

Equipment	DISCO	Quantity Installed by June 30, 2015
AMR Meters for Cost of Service Study	MEPCO	179
	PESCO	123
	QESCO	
	SEPCO	
	TOTAL	617
LDI AMR Meters (On Grid Stations)	FESCO	1,101
	GEPCO	891
	HESCO	581
	IESCO	1,139
	LESCO	1,797
	MEPCO	1,379
	PESCO	1,062
	QESCO	670
	SEPCO	594
	TESCO	121
	TOTAL	9,335
CSP Transformers	PESCO	55
	TOTAL	55
Municipal Pumps	CDA-Islamabad	135
	KWSB-Karachi	75
	TOTAL	210
Industrial Motors	FESCO	147
	HESCO	157
	IESCO	2
	KESC	51
	LESCO	516
	MEPCO	252
	PESCO	410
	SEPCO	4
	TOTAL	1,539
ABC Cable (Km)	PESCO	85
	MEPCO	269
	TOTAL	354
HT Capacitors	MEPCO	40
	TOTAL	40

Equipment	DISCO	Quantity Installed by June 30, 2015
Voltage Regulators	MEPCO	-
	TOTAL	-
Hand Held Units (HHUs)	MEPCO	538
	PESCO	900
	IESCO	13
	TOTAL	1,451
Deck Loaders for Linemen	MEPCO	70
	PESCO	70
	TOTAL	140
Suzuki Ravis for Linemen	MEPCO	30
	PESCO	30
	TOTAL	60
Outage Reduction Devices	FESCO	703
	GEPSCO	853
	HESCO	153
	IESCO	862
	LESCO	784
	MEPCO	1,254
	PESCO	2,400
	TOTAL	7,009
Linemen Tools (Ladders, Gloves, Belts, Hard Hats, High Visibility Vests, Spanners, Pliers, Wrenches, Drilling Machines, Clamps, Tool Kits, Hot Sticks, Grounding Sets, Training Aids etc.)	FESCO	43,998
	GEPSCO	
	HESCO	
	IESCO	
	LESCO	
	MEPCO	
	PESCO	
	QESCO	
	SEPCO	
TOTAL	43,998	



Appendix C

**Equipment List EPP
(V-II & V-III)**

**List of Items/Material Version V-II
Delivered by EPP**

S.No	Purchse Order Description	Deliverables	Qty.	Unit	Districts
1	Transformer Oil Tests	• Oil Sample test results	211	Tests	Throughout KPK
2	Repair of 40 MVA, 132/66 kV Power Transformer	Delivered and installed at Shahibagh	1	Nos.	Peshawar
3	Implementation of Automated Metering System (AMR)	• Application Software for Control Room	1	Nos.	Throughout KPK
		• PC Application for Remote Client	3	Nos.	
		• Data Concentrator Unit	61	Nos.	
		• Three Phase Whole Current Energy Meter with RF Module	141	Nos.	
4	Complete Rewinding of 40 MVA, 132/66 kV Power Transformer	40MVA Power Transformer delivered Chakdara	1	Nos.	Dir Lower
5	Supply of PTF Cooling Fans & Circuit Breakers	• Power Transformer Cooling Fans	348	Nos.	Throughout KPK
		• Fan Motor Circuit Breakers (MCB up to 40 Amps, 3 Phase)	28	Nos.	
		• Fan Motor Circuit Breakers (individual 2-5 Phase)	28	Nos.	
6	Supply of 132kV Circuit Breakers-PESCO	• 132kV Circuit Breakers	7	Nos.	Charsadah, Bannu, Kohat, Mansehra, Nowshera
7	Supply of Metering Panels and Data Communication Equipment	• 4 Line Metering Panels with Bidirectional (Import & Export)Energy Meters 1 Amp rating accuracy class 0.2S as per specifications P-1999:2008 & P-202-2012,	3	Nos.	Lahore, Gujranwala
		• 3 Line Metering Panels with Bidirectional (Import & Export) Energy Meters 1 Amp rating accuracy class 0.2S as per specifications P-1999:2008 & P-202-2012,	1	Nos.	
		• 2 Line Metering Panels with Bidirectional (Import & Export) Energy Meters 1 Amp rating accuracy class 0.2S as per specifications P-1999:2008 & P-202-2012,	10	Nos.	
		• Data Communications Equipment as per specifications-199:2008 Line Metering Panels with Bidirectional (Import & Export) Energy Meters 1 Amp rating accuracy class 0.2S as per specifications P-1999:2008 & P-202-2012, 12 Sets	12	Sets	
8	Supply of 03 Toyota HIACE High Roof Vans	• Toyota Hiace Vans	3	Nos.	Peshawar, Abbottabad, Mardan
9	Supply of 132 kV Circuit Breaker, Current Transformer and Capacitor Cell for PESCO GS	• SF6 Circuit Breaker Type GL 312 F1/4031 P(31mm/kV), F1, Three Pole Autorecloser 145KV-3150A-50Hz-40kA/3 s, with steel structure, HV connectors, SF6 Gas for first filling and Anchor Bolts.	3	Sets	Nowshera, Hangu, Bannu
		• 132kV Current Transformer with complete assembly outdoor type	1	Nos.	
		• Capacitor cell 8280V, Type PSLP, 400kVAr, 50Hz, Capacitance 18.6µF,	100	Nos.	
		Installation, testing and commissioning of capacitor banks	3	Nos.	

S.No	Purchse Order Description	Deliverables	Qty.	Unit	Districts
10	Supply, Installation and commissioning of 03 new Power Transformers at Hattar, DI Khan and Jamrud	• 31.5/40MVA, 132/11.5kV Power Transformer Complete with Auxiliary Panels and all other Accessories	3	Nos.	DI Khan, Haripur, Khyber Agency
		• Full 11kV outdoor bus bar system with all ancillaries suitable for 5 x 1000 MCM Power Cables per phase on the LV side of the Power Transformers	3	Nos.	
11	Repair & Rehabilitation of Power Transformer-PESCO	20/26MVA, 132/11kV Power Transformer at Gadoon Amazai	1	Nos.	Swabi
12	Supply of Power Transformer Oil IEC-60296	For 40MVA Power Transformer delivered at Chakdara			Dir Lower
14	Supply of Testing Equipment for P&I Vans	• 3 Phase 10KVA Honda Petrol Generator	3	Nos.	All KPK Districts
		• Secondary Injection Relay Test Set	3	Nos.	
		• Circuit Breaker Analyzer system	3	Nos.	
		• Digital Insulation Resistance Tester 10KV	3	Nos.	
		• Digital Clamp Meter	3	Nos.	
		• True-RMS Industrial Logging Multi-meter	3	Nos.	
		• Low Resistance Ohmmeter 230V	3	Nos.	
		• 3 Phase fully automatic TTR 300 Series with accessories	3	Nos.	
		• Capacitance and Dissipation Factor Test Set	3	Nos.	
		• Digital Low resistance Ohmmeter 600A	3	Nos.	
		• Phase Rotation Indicator	3	Nos.	
		• CLR Meter	3	Nos.	
		• Digital Clamp Meter	3	Nos.	
• Electrician Tool Kit in a Box 14 Items	3	Sets			
15	Supply and delivery of 11kV metal clad switchgear, incoming Panels. Supply & Delivery of total 4KM 1000 MCM. Indoor termination Kits for 1000 MCM. Outdoor termination Kits for 1000MCM.	• 11 kV Switchgear Incoming Panels	3	Sets	DI Khan, Haripur, Khyber Agency
		• 4 KM 1000 MCM Power Cable	3	Sets	
		• Complete Outdoor Termination Kits	27	Nos.	
		• Complete Indoor Termination Kits	27	Nos.	
16	Supply of PTF Cooling Fans & Circuit Breakers - 2nd Batch	Power Transformer Cooling Fans	129	Nos.	All KPK Districts
		Fan Motor Circuit Breakers (Individual 1~2 Amps, 3-phase)	50	Nos.	
17	Telescopic bucket trucks have been delivered at PESCO warehouse on April 28, 2015	Registration ongoing	4	Nos.	All KPK Districts
18	Nine (09) Transmission Line Tower Repairs	Tower steel and foundations	9	Lines	Peshawar, Mardan and Abottabad Division
19	LLM IESCO-April 13, 2015	Live Line tools, trailers and vehicles	1	Set	Islamabad
20	LLM PESCO-May 8, 2015	Live Line tools, trailers and vehicles	1	Set	Peshawar

S.No	Purchse Order Description	Deliverables	Qty.	Unit	Districts
21	LLM FESCO-June 20, 2015	Live Line tools, trailers and vehicles	1	Set	Faisalabad
22	NTDC Design Center Upgrade & Training (hardware + software)	Desktop Computers	24	Nos.	Lahore
		Laptops	11	Nos.	
		Printers	9	Nos.	
		Scanners	8	Nos.	
		Multimedia	1	Nos.	
		UPS	24	Nos.	
		Wireless Routers	8	Nos.	
		Server	1	Nos.	
22	NTDC Design Center Upgrade & Training (hardware + software)	Plotter	1	Nos.	Lahore
		Bentley Substation V8i Design	13	Licenses	
		AutoCAD 2014	19	Licenses	
		STAADPRO	3	Licenses	
		PLS-CADD	4	Licenses	
		Tower	3	Licenses	
		PLS POLE	3	Licenses	
		SAPS	3	Licenses	
		SAGSEC	7	Licenses	
		CAISSON	3	Licenses	
		Arc GIS	8	Licenses	
		Microsoft Project	35	Licenses	
23	Supply and delivery of Application Servers, Storage Area Network (SAN), and Display Portals	• Storage Area Network (SAN)	2	Nos.	WAPDA House, Lahore; PESCO, IESCO, GEPCO, LESCO, MEPCO, SEPCO, HESCO, QESCO, FESCO and TESCO
		• Application Server	4	Nos.	
		• UPS	6	Nos.	
		• Display Portals	45	Nos.	
		• Laptop Computers	5	Nos.	
24	Supply of PPEs and earth sets for PESCO grid stations	• Grounding Sets	40	Nos.	Peshawar, Mardan, Bannu, Abbottabad
		• Hardhats	200	Nos.	
		• Visibility Jackets	200	Nos.	
		• Leather Gloves	40	Nos.	
		• Flash Goggles	40	Nos.	
		• Welder's Safety Goggles	20	Nos.	
25	Supply of Tools and equipment for transmission lines and grids	Welding Set	4	Nos.	Peshawar, Mardan, Bannu, Abbottabad
		Generator 5kVA	4	Nos.	
		Gas cutter	4	Nos.	
		Press machine high pressure 15 ton	4	Nos.	
		Press machine high pressure 20 ton	4	Nos.	

S.No	Purchse Order Description	Deliverables	Qty.	Unit	Districts
	Supply of Tools and equipment for transmission lines and grids	Press machine high pressure 100 ton	4	Nos.	Peshawar, Mardan, Bannu, Abbottabad
		Blower Machine	4	Nos.	
		Hand Line with Rope	4	Nos.	
		Strain Board	4	Nos.	
		Live line measuring stick	4	Nos.	
		Conductor grips	16	Nos.	
		Grounding sticks with duck bill and clamp	16	Nos.	
		linemen belts with harness	20	Nos.	
		AVO Meter	4	Sets	
26	Supply, delivery, installation and training of equipment for NTDC IT Department	Server	5	Nos.	Lahore, Islamabad
		Desktop Computers	18	Nos.	
		Laptops	4	Nos.	
		Printers	3	Nos.	
		scanner	2	Nos.	
		Print Server	1	Nos.	
		UPS	1	Nos.	
		Switch	3	Nos.	
		Fiber optic laying and installation	1	Job	

List of Items/Material Version V-III

Delivered by EPP

S.No	Purchase Order Description	Deliverables	Qty.	Unit	Districts	Completion percentage	Completion Date
1	Transformer Oil Tests	Oil Sample test results	218	Tests	Throughout KPK	100%	Q2 2015
2	Repair of 40 MVA, 132/66 kV Power Transformer	Delivered and installed at Shahibagh	1	Nos.	Peshawar	100%	Q3 2013
3	Implementation of Automated Metering System (AMR)	Application Software for Control Room	1	Nos.	Throughout KPK	100%	Q4 2013
		PC Application for Remote Client	3	Nos.		100%	Q4 2013
		Data Concentrator Unit	61	Nos.		100%	Q4 2013
		Three Phase Whole Current Energy Meter with RF Module	141	Nos.		100%	Q4 2013
4	Reactive Power compensation study	Final report	1	Job	Peshawar	100%	Q1 2014
5	Complete Rewinding of 40 MVA, 132/66 kV Power Transformer	40MVA Power Transformer delivered Chakdara	1	Nos.	Dir Lower	100%	Q1 2015
6	Supply of PTF Cooling Fans & Circuit Breakers	Power Transformer Cooling Fans	348	Nos.	Throughout KPK	100%	Q2 2014
		Fan Motor Circuit Breakers (MCB up to 40 Amps, 3 Phase)	28	Nos.		100%	Q2 2014
		Fan Motor Circuit Breakers (individual 2-5 Phase)	146	Nos.		100%	Q2 2014
7	Supply of 132kV Circuit Breakers-PESCO	132kV Circuit Breakers with spare parts	7	Nos.	Charsadah, Bannu, Kohat, Mansehra, Nowshera	100%	Q3 2014
8	Supply of Metering Panels and Data Communication Equipment	4 Line Metering Panels with Bidirectional (Import & Export) Energy Meters 1 Amp rating accuracy class 0.2S as per specifications P-1999:2008 & P-202-2012,	3	Nos.	Lahore, Gujranwala	100%	Q1 2014
		3 Line Metering Panels with Bidirectional (Import & Export) Energy Meters 1 Amp rating accuracy class 0.2S as per specifications P-1999:2008 & P-202-2012,	1	Nos.		100%	Q1 2014
		2 Line Metering Panels with Bidirectional (Import & Export) Energy Meters 1 Amp rating accuracy class 0.2S as per specifications P-1999:2008 & P-202-2012,	10	Nos.		100%	Q1 2014
		Data Communications Equipment as per specifications-199:2008 Line Metering Panels with Bidirectional (Import & Export) Energy Meters 1 Amp rating accuracy class 0.2S as per specifications P-1999:2008 & P-202-2012, 12 Sets	12	Sets		100%	Q1 2014
9	Supply of 03 Toyota HIACE High Roof Vans	Toyota Hiace Vans	3	Nos.	Peshawar, Abbottabad, Mardan	100%	Q1 2015
10	Supply of 132 kV Circuit Breaker, Current Transformer and Capacitor Cell for PESCO GS	SF6 Circuit Breaker Type GL 312 F1/4031 P(31mm/kV), F1, Three Pole Autorecloser 145KV-3150A-50Hz-40kA/3 s, with steel structure, HV connectors, SF6 Gas for first filling and Anchor Bolts.	3	Sets	Nowshera, Bannu, Jahangira	100%	Q1&3, 2015
		132kV Current Transformer with complete assembly outdoor type	1	Nos.		100%	Q1&3, 2015
		Capacitor cell 8280V, Type PSLP, 400kVAR, 50Hz, Capacitance 18.6µF,	100	Nos.		100%	Q1&3, 2015
		Installation, testing and commissioning of capacitor banks	3	Nos.		100%	Q1&3, 2015
11	Supply, Installation and commissioning of 03 new Power Transformers at Hattar, DI Khan and Jamrud	31.5/40MVA, 132/11.5kV Power Transformer Complete with Auxiliary Panels and all other Accessories	3	Nos.	DI Khan, Haripur, Khyber Agency	100%	Q3 2014
		Full 11kV outdoor bus bar system with all ancillaries suitable for 5 x 1000 MCM Power Cables per phase on the LV side of the Power Transformers	3	Nos.		100%	Q3 2014
12	Repair & Rehabilitation of Power Transformer-PESCO	20/26MVA, 132/11kV Power Transformer at Gadoon Amazai	1	Nos.	Swabi	100%	Q3 2014

S.No	Purchase Order Description	Deliverables	Qty.	Unit	Districts	Completion percentage	Completion Date		
13	Supply of Power Transformer Oil IEC-60296	For 40MVA Power Transformer delivered at Chakdara			Dir Lower	100%	Q1 2015		
14	Supply of Testing Equipment for P&I Vans	· 3 Phase 10KVA Honda Petrol Generator	3	Nos.	All KPK Districts	100%	Q1 2015		
		· Secondary Injection Relay Test Set	3	Nos.		100%	Q1 2015		
		· Circuit Breaker Analyzer system	3	Nos.		100%	Q1 2015		
		· Digital Insulation Resistance Tester 10KV	3	Nos.		100%	Q1 2015		
Supply of Testing Equipment for P&I Vans	· Digital Clamp Meter	3	Nos.	All KPK Districts	100%	Q1 2015			
	· True-RMS Industrial Logging Multi-meter	3	Nos.		100%	Q1 2015			
	· Low Resistance Ohmmeter 230V	3	Nos.		100%	Q1 2015			
	· 3 Phase fully automatic TTR 300 Series with accessories	3	Nos.		100%	Q1 2015			
	· Capacitance and Dissipation Factor Test Set	3	Nos.		100%	Q1 2015			
	· Digital Low resistance Ohmmeter 600A	3	Nos.		100%	Q1 2015			
	· Phase Rotation Indicator	3	Nos.		100%	Q1 2015			
	· CLR Meter	3	Nos.		100%	Q1 2015			
	· Digital Clamp Meter	3	Nos.		100%	Q1 2015			
	· Electrician Tool Kit in a Box 14 Items	3	Sets		100%	Q1 2015			
	15	Supply and delivery of 11kV metal clad switchgear, incoming Panels. Supply & Delivery of total 4KM 1000 MCM. Indoor termination Kits for 1000 MCM. Outdoor termination Kits	· 11 kV Switchgear Incoming Panels		3	Sets	DI Khan, Haripur, Khyber Agency	100%	Q3 2014
			· 4 KM 1000 MCM Power Cable		3	Sets		100%	Q3 2014
· Complete Outdoor Termination Kits			27	Nos.	100%	Q3 2014			
· Complete Indoor Termination Kits			27	Nos.	100%	Q3 2014			
16	Supply of PTF Cooling Fans & Circuit Breakers - 2nd Batch	Power Transformer Cooling Fans	129	Nos.	All KPK Districts	100%	Q2 2015		
		Fan Motor Circuit Breakers (Individual 1~2 Amps, 3-phase)	50	Nos.		100%	Q2 2015		
17	Telescopic bucket trucks have been delivered at PESCO warehouse on April 28, 2015	Registration ongoing	4	Nos.	All KPK Districts	100%	Q3 2015		
18	Nine (09) Transmission Line Tower Repairs	Tower steel and foundations	9	Lines	Peshawar, Mardan and Abbottabad Division	100%	Q3 2015		
19	Live Line Tools - Local Procurment Ikrarm	Live Line Tools & Equipment Local Procurement	110	Nos.	Islamabad	100%	Q3 2015		
20	Live Line Tools & Equipment - International	Live Line Tools & Equipment Internaitonal KOBBECOUSA	2223	Nos.	Islamabad	100%	Q3 2015		
21	Live Line tools Trailers	Live Line Tools Trailers - KOBBECOUSA	9	Nos.	Islamabad	100%	Q3 2015		
22	Supply and delivery of Application Servers, Storage Area Network (SAN), and Display Portals	· Storage Area Network (SAN)	2	Nos.	WAPDA House, Lahore; PESCO, IESCO, GEPCO, LESCO, MEPCO, SEPCO, HESCO, QESCO, FESCO and TESCO	100%	Q2 2015		
		· Application Server	4	Nos.		100%	Q2 2015		
		· UPS	6	Nos.		100%	Q2 2015		
		· Display Portals	45	Nos.		100%	Q2 2015		
		· Laptop Computers	5	Nos.		100%	Q2 2015		
23	Supply of PPEs and earth sets for PESCO grid stations	· Steel Toe Shoes	96	Nos.	PESCO, IESCO, GEPCO, LESCO, MEPCO, SEPCO, HESCO, QESCO, FESCO and NTDC Tarbela	100%	Q3 2015		
		· Fire Retardant Shirts	192	Nos.		100%	Q3 2015		
		· Fire Retardant Trousers	192	Nos.		100%	Q3 2015		
		· Flash Goggles (1 clear + 1 shaded lense)	192	Nos.		100%	Q3 2015		
		· Fire Retardant Hooded Jacket	96	Nos.		100%	Q3 2015		
24	Supply of Tools and equipment for transmission lines and grids	Welding Set	4	Nos.	Peshawar, Mardan, Bannu, Abbottabad	100%	Q3 2015		
		Generator 5kVA	4	Nos.		100%	Q3 2015		
		Gas cutter	4	Nos.		100%	Q3 2015		
		Press machine high pressure 15 ton	4	Nos.		100%	Q3 2015		
		Press machine high pressure 20 ton	4	Nos.		100%	Q3 2015		
		Press machine high pressure 100 ton	4	Nos.		100%	Q3 2015		
		Blower Machine	4	Nos.		100%	Q3 2015		
		Hand Line with Rope	4	Nos.		100%	Q3 2015		

S.No	Purchase Order Description	Deliverables	Qty.	Unit	Districts	Completion percentage	Completion Date
	Supply of Tools and equipment for transmission lines and grids	Strain Board	4	Nos.	Peshawar, Mardan, Bannu, Abbottabad	100%	Q3 2015
		Live line measuring stick	4	Nos.		100%	Q3 2015
		Conductor grips	16	Nos.		100%	Q3 2015
		Grounding sticks with duck bill and clamp	16	Nos.		100%	Q3 2015
		linemen belts with harness	20	Nos.		100%	Q3 2015
		AVO Meter	4	Sets		100%	Q3 2015
		Drill machine with bits	4	Nos.		0%	Q4 2015
		Punch Machine EP 2110V	4	Nos.		0%	Q4 2015
		Tool Box Complete	4	Nos.		0%	Q4 2015
		First Aid Box	4	Nos.		0%	Q4 2015
		Thermo vision camera T-640-15 Flir	4	Nos.		0%	Q4 2015
	Supply of Tools and equipment for transmission lines and grids	Rukhsukh Machine with steel rope 3 tons (tirfor hoist) + 100m steel rope	4	Nos.	Peshawar, Mardan, Bannu, Abbottabad	0%	Q4 2015
		Rukhsukh Machine with steel rope 5 tons (tirfor hoist) + 100m steel rope	4	Nos.		0%	Q4 2015
		Rope Ladder	4	Nos.		0%	Q4 2015
		Polypropylene rope 1/2"	1200	meters		0%	Q4 2015
		Polypropylene rope 3/4"	1200	meters		0%	Q4 2015
		Polypropylene rope 1/4"	1200	meters		0%	Q4 2015
		Polypropylene rope 1"	1200	meters		0%	Q4 2015
		Polypropylene rope 1 1/2"	1200	meters		0%	Q4 2015
		Oil Testing set (OTS 80PB UK Megger)	4	Nos.		0%	Q4 2015
		Earth testing set (DET 3TD, Meger)	4	Nos.		0%	Q4 2015
C&DF Test set portable 12kv high voltage power factor test set Megger	4	Nos.	0%	Q4 2015			
25	Supply, delivery, installation and training of equipment for NTDC IT Department	Server	5	Nos.	Lahore, Islamabad	100%	Q2 2015
		Desktop Computers	18	Nos.		100%	Q2 2015
		Laptops	4	Nos.		100%	Q2 2015
		Printers	3	Nos.		100%	Q2 2015
		scanner	2	Nos.		100%	Q2 2015
		Print Server	1	Nos.		100%	Q2 2015
		UPS	1	Nos.		100%	Q2 2015
		Switch	3	Nos.		100%	Q2 2015
Fiber optic laying and installation	1	Job	100%	Q2 2015			
26	NTDC Design Center Upgrade & Training (hardware + software)	Desktop Computers	24	Nos.	Lahore	100%	Q3 2015
		Laptops	11	Nos.		100%	Q3 2015
		Printers	9	Nos.		100%	Q3 2015
		Scanners	8	Nos.		100%	Q3 2015
		Multimedia	1	Nos.		100%	Q3 2015
		UPS	24	Nos.		100%	Q3 2015
		Wireless Routers	8	Nos.		100%	Q3 2015
		Server	1	Nos.		100%	Q3 2015
		Plotter	1	Nos.		100%	Q3 2015
		Bentley Substation V8i Design	13	Licenses		100%	Q3 2015
		AutoCAD 2014	19	Licenses		100%	Q3 2015
		STAADPRO	3	Licenses		100%	Q3 2015
		PLS-CADD	4	Licenses		100%	Q3 2015
		Tower	3	Licenses		100%	Q3 2015

S.No	Purchase Order Description	Deliverables	Qty.	Unit	Districts	Completion percentage	Completion Date
	NTDC Design Center Upgrade & Training (hardware + software)	PLS POLE	3	Licenses	Lahore	100%	Q3 2015
		SAPS	3	Licenses		100%	Q3 2015
		SAGSEC	7	Licenses		100%	Q3 2015
		CAISSON	3	Licenses		100%	Q3 2015
		Arc GIS	8	Licenses		100%	Q3 2015
		Microsoft Project	35	Licenses		100%	Q3 2015
27	Oil Purification Plants	Oil purification plant with accessories	2	Nos.	Peshawar and Bannu	0%	Q4 2015
		Spare parts	2	Sets		0%	Q4 2015
		Test equipment	2	Sets		0%	Q4 2015
28	Supply, Installation and commissioning of 02 new Power Transformers at Chakdara and Peshawar Industrial 132kV GS	31.5/40MVA, 132/11.5kV Power Transformer Complete with all accessories	2	Nos.	Peshawar and Chakdara	0%	Q4 2015
		Provision of control cable for protection and control interconnection wiring from the transformer to auxiliary and relevant CP/RP inside control room (including inter trip and LV CT differential protection) per site requirements	2	Nos.		0%	Q4 2015
29	Supply, Installation and commissioning of 03 new Power Transformers at Bannu 220kV GS, Mardan 220 kV GS and Peshawar Cantt 132kV GS	31.5/40MVA, 132/11.5kV Power Transformer Complete with all accessories	3	Nos.	Mardan, Bannu and Peshawar	0%	Q4 2015
		Provision of control cable for protection and control interconnection wiring from the transformer to auxiliary and relevant CP/RP inside control room (including inter trip and LV CT differential protection) per site requirements	3	Nos.		0%	Q4 2015
30	Supply, Delivery, Installation and Training of turnkey solution for a Real Time Digital Simulator for NTDC Planning Department.	RTDS Hardware	1	Set	Lahore	0%	Q4 2015
		Hypersim target licenses	62	Nos.		0%	Q4 2015
		Hypersim host licenses	10	Nos.		0%	Q4 2015
		Test view	1	Nos.		0%	Q4 2015
		Scope view	1	Nos.		0%	Q4 2015
		IEC Drivers	1	Nos.		0%	Q4 2015
		RT-XSG and eHS FPGA development and simulation software	6	Nos.		0%	Q4 2015
		Support services	1	Job		0%	Q4 2015
31	Supply and delivery of twenty 132kV Circuit breakers for PESCO GS	Circuit breakers GL312 F1/4031 P three pole auto reclosing 145kV-3150A-50kA/3s	20	Nos.	Charsaddah, Tall, Gumbat, Peshawar, Kohat, Gadoon Amazai, Jehangira, Hattar, Swabi, Timergara, Tank, Mardan, Gurguri, Bannu, Battal, Nowshera	0%	Q4 2015
		Spare parts for 145kV circuit breakers		Sets		0%	Q4 2015
32	Study for the intergration of renewables into the national grid	Final report	1	Nos.	Lahore	0%	Q4 2015
33	Additional tools for live line	Tools	1	Set	Nationwide	0%	Q4 2015
34	2 Nos. 250MVA Autotransformer	250MVA 220/132kV autotransformer alongwith all associated accessories, devices and spare parts	2	Nos.			
35	Supply and Delivery of Hardware Connectors and Conductors.	220kV String double tension string assemblies with turnbuckle	36	Sets	Mardan and Faisalabad	0%	Q4 2015
		220kV String double tension string assemblies without turnbuckle	36	Sets		0%	Q4 2015
		220kV double suspension string assemblies	18	Sets		0%	Q4 2015
		Straight Connector 2x600/Flat, 0DBHF	6	Nos.		0%	Q4 2015
		Straight Connector 2x600/60, 0DBH60	12	Nos.		0%	Q4 2015
		Straight Connector 2x600/60, 0DMH60	12	Nos.		0%	Q4 2015
		90 Connector 2x600/F, 90/TDBHF	6	Nos.		0%	Q4 2015
		90 Connector 2x600/60, 90/TDMH60	48	Nos.		0%	Q4 2015
		90 Connector 2x600/40, 90/TDMH40	15	Nos.		0%	Q4 2015
		132 kV Double tenstion string assemblies with turnbuckle	18	Sets		0%	Q4 2015

S.No	Purchase Order Description	Deliverables	Qty.	Unit	Districts	Completion percentage	Completion Date
	Supply and Delivery of Hardware Connectors and Conductors.	132 kV Double tenstion string assemblies without turnbuckle	18	Sets	Mardan and Faisalabad	0%	Q4 2015
		Straight Connector 2x600/Flat, 0DBHF	12	Nos.		0%	Q4 2015
		Straight Connector 2x600/40, 0DBH40	9	Nos.		0%	Q4 2015
		Straight Connector 2x600/40, 0DMH40	30	Nos.		0%	Q4 2015
		90 Connector 2x600/40, 90/TDMH40	54	Nos.		0%	Q4 2015
		90 Connector 2x600/40, 90/TDBH40	21	Nos.		0%	Q4 2015
		90 Connector 2x600/30, 90/TDMH30	27	Nos.		0%	Q4 2015
		Tee connector 2x600/2x600, TDMHH	150	Nos.		0%	Q4 2015
		Tee connector 1x600/1x600, TMHH	50	Nos.		0%	Q4 2015
		Monometallic spacer, SH 200	72	Nos.		0%	Q4 2015
		Monometallic spacer, SH 400	72	Nos.		0%	Q4 2015
		PG Clamp 600-600, PGHH	40	Nos.		0%	Q4 2015
		Hawthorn conductor 600mm2	13	km		0%	Q4 2015
		Copper conductor 120mm2	9	km		0%	Q4 2015
36	Supply of Toyota Hilux Vigo	Toyota Hilux Vigos for 9 Discos	9	Nos.		0%	Q4 2015
37	Supply and Delivery of Busdisconnectors and Surge Arrestors	245kV Disconnecter, M1 Class, motor-operated, 2000A, 50kA with spare parts	8	Nos.		0%	Q4 2015
		145kV Disconnecter, M1 Class, 2000A, 40kA for serial arrangement with spare parts	4	Nos.		0%	Q4 2015
		145kV Disconnecter, M1 Class, 2000A, 40kA for parallel arrangement with spare parts	4	Nos.		0%	Q4 2015
38	Supply and Delivry of Fire Protection system	Nitrogen injection explosion prevention and fire protection system (Xuming type BPZM-F) suitable for 220/132kV 250MVA autotransformer	2	Nos.		1	Q4 2015
39	Supply and Delivery of Testing Equipment to NTDC for Maintenance of Grid Stations	C&DF Test set 12kV	10	Nos.	Nationwide	0%	Q4 2015
		Insulation Resistance tester (1/5kV/10kV)	10	Nos.		0%	Q4 2015
		Hi-pot testing set DC 160kV	5	Nos.		0%	Q4 2015
		Generator 10kVA	10	Nos.		0%	Q4 2015
		SF6 Purity test set	10	Nos.		0%	Q4 2015
		TTR test set (digital) 3-Phase	10	Nos.		0%	Q4 2015
		SF6 gas dew point test set	10	Nos.		0%	Q4 2015
		Transfomer turns ratio test set (Digita	10	Nos.		0%	Q4 2015
		Multimeter	20	Nos.		0%	Q4 2015
		Circuit breaker analyzer / timing test set with accessories	10	Nos.		0%	Q4 2015
		Oil DES (Di-electric strength) test set 100kV liquid di-electric test set	10	Nos.		0%	Q4 2015
		Vacuum interrupter tester	5	Nos.		0%	Q4 2015
		Circuit breaker minimum voltage trip test set	10	Nos.		0%	Q4 2015
		Primary injection test set (5000A) CP	10	Nos.		0%	Q4 2015
		Winding resistance testing set	10	Nos.		0%	Q4 2015
		Digital grounding test set	10	Nos.		0%	Q4 2015
		Contact resistance test set (low resistance ohm meter)	10	Nos.		0%	Q4 2015
		Secondary injection test set (100A)	10	Nos.		0%	Q4 2015
		Power / Harmonics analyzer	5	Nos.		0%	Q4 2015
		Universal relay test set	5	Nos.		0%	Q4 2015
		Sweep frequency response analyzer	5	Nos.		0%	Q4 2015
Phase rotation meter	10	Nos.	0%	Q4 2015			
Clamp on meter 10µA resolution	20	Nos.	0%	Q4 2015			
CT/PT analyzer	10	Nos.	0%	Q4 2015			

S.No	Purchse Order Description	Deliverables	Qty.	Unit	Districts	Completion percentage	Completion Date
	Supply and Delivery of Testing Equipment to NTDC for Maintenance of Grid Stations	Energy meter test set	5	Nos.	Nationwide	0%	Q4 2015
40	Supply and Delivery of Crane Mounted Trucks	Crane Mounted Trucks for PESCO	4	Nos.		0%	Q4 2015
41	Supply of PPEs and earth sets for PESCO grid sta	· Grounding Sets	40	Nos.	Peshawar, Mardan, Bannu, Abbottabad	100%	Q3 2015
		· Hardhats	200	Nos.		100%	Q3 2015
		· Visibility Jackets	200	Nos.		100%	Q3 2015
		· Leather Gloves	40	Nos.		100%	Q3 2015
		· Flash Goggles	40	Nos.		100%	Q3 2015
		· Welder's Safety Goggles	20	Nos.		100%	Q3 2015
42	Repair of 2 Nos. 150 & 160 MVA autotransformers	Repair of 2 nos. 150 & 160 Autotransformers for NTDC	2	Nos.	Peshawar	0%	Q4 2015
43	Supply of Software and Training to NTDC Design Department	Bentley Substation V8i Design	13	Licenses		100%	Q3 2015
		AutoCAD 2014	19	Licenses		100%	Q3 2015
		STAADPRO	3	Licenses	NTDC Design Department, Lahore	100%	Q3 2015
		PLS-CADD	4	Licenses		100%	Q3 2015
		Tower	3	Licenses		100%	Q3 2015
		PLS POLE	3	Licenses		100%	Q3 2015
		SAPS	3	Licenses		100%	Q3 2015
		SAGSEC	7	Licenses		100%	Q3 2015
		CAISSON	3	Licenses		100%	Q3 2015
		Arc GIS	8	Licenses		100%	Q3 2015
Microsoft Project	35	Licenses		100%	Q3 2015		



Appendix D

Percentage Sampling

Power Distribution Program (PDP) Inspections:

Overall Inspections with Percentage Sampling For PDP

Equipment	Name of DISCO	Quantity Installed by June 30, 2015	% Sample / Qty. for inspection as proposed by HPK	Inspected	% Progress / Remarks
		(List provided by USAID)			
LT Capacitors	MEPCO	45,615	2% (912)	931	102%
	FESCO	1,033	2% (21)	45	214%
	IESCO	788	5% (39)	58	149%
	LESCO	1,058	2% (21)	89	424%
	QESCO	16,007	2.5% (400)	403	100%
	PESCO	2,367	2% (47)	25	53%
	HESCO	715	10% (72)	105	146%
	SEPCO	2,019	10% (202)	210	100%
Electronic Meters	PESCO	25,480	0.2% (51)	72	141%
	FESCO	7,561	2% (151)	206	136%
	MEPCO-refixing	16,685	2% (334)	408	122 %
RF-Enabled Meters	LESCO	6,417	4% (257)	1041	405%
	PESCO	3,872	1% (39)	61	156%
AMR Meters for Various Customer Categories	IESCO	343	10% (34)	37	109%
	MEPCO	761	4% (30)	53	177%
	LESCO	84	4% (3)	29	967%
	HESCO	12,803	1% (128)	183	143%
	PESCO	98	25% (25)	84	336%
AMR Meters for Hi-End and Tubewell Consumer	MEPCO	29,687	2% (593)	611	103%
	PESCO	10,007	1% (100)	159	159%
AMR Meters for Cost of Service Study	GEPCO	169	10% (17)	78	459%
	HESCO	24	50% (12)	24	200%
	LESCO	122	10% (12)	68	557%

Equipment	Name of DISCO	Quantity Installed by June 30, 2015	% Sample / Qty. for inspection as proposed by HPK	Inspected	% Progress / Remarks
		(List provided by USAID)			
	MEPCO	179	10% (18)	56	311%
	PESCO	123	10% (12)	13	108%
LDI AMR Meters (On Grid Stations)	FESCO	1,101	12% (132)	355	269%
	GESCO	891	12% (107)	164	153%
	HESCO	581	10% (58)	311	536%
	IESCO	1,139	15% (176)	230 No	131%
	LESCO	1,797	12% (216)	987	457%
	MEPCO	1,379	12% (165)	770	467%
	PESCO	1,062	10% (106)	202	191%
	QESCO	670	10% (67)	124	185%
	SEPCO	594	10% (60)	251	418%
	TESCO	121	10% (12)	28	233%
CSP Transformers	PESCO	55	25% (14)	22	157%
ABC Cable (Km)	PESCO	85	2% (2 Km)	4.8	240%
	MEPCO	269	5% (15 Km)	56.3 Km	375%
HT Capacitors	MEPCO	40	10% (4)	40	1000%
Hand Held Units (HHUs)	MEPCO	538	15% (81)	121	149%
	PESCO	900	10% (90)	250	278%
	IESCO	13	50% (7)	10	143%
Deck Loaders for Lineman	MEPCO	70	11% (8)	20	250%
	PESCO	70	10% (7)	15	214%
Suzuki Ravis for Linemen	MEPCO	30	20% (6)	13	217%
	PESCO	30	10% (3)	7	233%
Outage Reduction Devices	FESCO	703	10% (70)	147	210%
	GESCO	853	10% (85)	150	176%
	HESCO	153	10% (15)	47	313%
	IESCO	862	10% (86)	137	159%

Equipment	Name of DISCO	Quantity Installed by June 30, 2015	% Sample / Qty. for inspection as proposed by HPK	Inspected	% Progress / Remarks
		(List provided by USAID)			
	LESCO	784	10% (78)	226	290%
	MEPCO	1,254	10% (125)	141	113%
	PESCO	2,400	1% (24)	52	217%
Linemen Tools (Ladders, Gloves, Belts, Hard Hats, High Visibility Vests, Spanners, Pliers, Wrenches, Drilling Machines, Clamps, Tool Kits, Hot Sticks, Grounding Sets, Training Aids etc.)	FESCO	43,998 in All Discos	0.5% (22)	20	
	GEPSCO		(In each Disco)	720	
	HESCO		2% (912)	94	
	IESCO		2% (21)	284	
	LESCO		5% (39)	184	
	MEPCO		2% (21)	444	
	PESCO		2.5% (400)	108	
	QUESCO		2% (47)	23	
	SEPCO		10% (72)	54	

Table: Power Distribution Program (PDP) Inspections:

Overall Inspections with Percentage Sampling for PDP Lt Capacitors and Unquantified Items in PDP List V2

Equipment	Name of DISCO	Quantity Installed by June 30, 2015	% Sample / Qty. for inspection as proposed by HPK	Inspected	% Progress / Remarks
		(List provided by USAID)			
LT Capacitors	QESCO	16,007	2.5% (400)	403	100%
	PESCO	2,367	2% (47)	25	53%
	HESCO	715	10% (72)	102	141%
	SEPCO	2,019	10% (202)	202	100%
AMR Meters for Cost of Service Study	FESCO	140	10% (14)	20	142%
	QESCO	88	10% (9)	35	388%
	SEPCO	141	10% (14)	30	214%
Voltage Regulators	MEPCO	80	10% (8)	12	150%

Energy Policy Program (EPP) Inspection.

Overall Inspections with Percentage Sampling For EPP

Energy Policy Program (EPP) Inspections						
S/No	Name of Equipment	Name of Disco/Grid Station	Quantity Installed by June 30, 2015 (List provided by USAID)	% Sample	Inspected	Progress / Remarks
1	Transformer Oil Tests (Reports)	PESCO	211	100%	100 % reports reviewed	100%
2	Repair of 40 MVA, 132/66 KV Transformer	PESCO/ Shahi Bagh	1	100%	1 No	100%. Major NCR raised
3	Implementation of Automated Metering System (AMR)	PESCO Grid Stations	141	10%	100%	100%
4	Complete rewinding of 40 MVA, 132/66 KV Transformer	PESCO/Chakdara	1	100%	1 No	100%
5	Supply of PTF Cooling Fans & Circuit Breakers	All over PESCO Grids	477	10%	65 No	135%
6	Supply of 132kV Circuit Breakers- PESCO	PESCO Grids	Shabqadar, Bannu, Kohat, Manshera, Balakot & Nowshera)	100%	7 No	100%
7	Supply of Metering Panels and Data Communication Equipment	In IPPs, NTDC	Lot		11 Nos.	
8	Supply of 03 Toyota HIACE High Roof Vans	PESCO	3	100%	3 No	100%
9	Supply of 132 kV Circuit Breaker, Current Transformer and Capacitor Cell for PESCO GS	PESCO/ Tall, Bannu, Jhangira Grids	3 1 100	100%	3 1 100	100%
10	Supply, Installation and commissioning of 03 new Power Transformers at	PESCO/ DI Khan, Hattar & Jamrud	3	100%	3 No	100%

Energy Policy Program (EPP) Inspections

S/No	Name of Equipment	Name of Disco/Grid Station	Quantity Installed by June 30, 2015 (List provided by USAID)	% Sample	Inspected	Progress / Remarks
	Hattar, DI Khan and Jamrud					
11	Repair & Rehabilitation of Power Transformer- PESCO	PESCO/Gadoon Amazai	1	100%	1 No	100%
12	Supply of Power Transformer Oil IEC-60296	PESCO/Chakdara	7600 liter	For use in 40 MVA repaired Power transformer at Chakdara Grid station		
13	Supply of Testing Equipment for P&I Vans	PESCO (GSO)	3 Vans and set of testing equipment	100%	3 Vans and set of testing equipment	100%
14	Supply and delivery of 11kV metal clad switchgear, incoming Panels. Supply & Delivery of total 4KM 1000 MCM. Indoor termination Kits for 1000 MCM. Outdoor termination Kits for 1000MCM.	PESCO/ DI Khan, Hattar & Jamrud	3 incoming panels with accessories	100%	3 incoming panels with accessories	100%
15	Telescopic bucket trucks have been delivered at PESCO warehouse on April 28, 2015	PESCO	4	100 %	4	100%
16	Nine (09) Transmission Line Tower Repairs	PESCO/ Various locations (GSO)	9	100%	9 No	100%
17	LLM IESCO-April 13, 2015	IESCO (GSO)	Lot	100%	100% Lot	Lot
18	LLM PESCO-May 8, 2015	PESCO (GSO)	Lot	100%	100% Lot	Lot
19	LLM FESCO-June 20, 2015	FESCO (GSO)	Lot	100%	100% Lot	Lot

Energy Policy Program (EPP) Inspections

S/No	Name of Equipment	Name of Disco/Grid Station	Quantity Installed by June 30, 2015 (List provided by USAID)	% Sample	Inspected	Progress / Remarks
20	NTDC Design Center Upgrade & Training (hardware + software)	NTDC	Lot			80 Nos. Items
21	Supply and delivery of Application Servers, Storage Area Network (SAN), and Display Portals	NTDC/Discos	Lot			30 Nos. Items
22	Supply of PPEs and Earth Sets for PESCO grid stations	PESCO (GSO)	540	100%	540 No	100%
23	Supply of Tools and equipment for transmission lines and grids	PESCO (GSO) Peshawar/Mardan, Bannu, Abbottabad	92	50%	84 No	91%
24	Supply, delivery, installation and training of equipment for NTDC IT Department	NTDC Lahore	Lot			25 Nos. Items

Additional list of Major items/Material Delivered by EPP-As Agreed with USAID through addendum.

Overall Inspections with Percentage Sampling For EPP (Addendum as Per EPP List V3-V4)

Energy Policy Program (EPP) Inspections						
S/No	Name of Equipment	Name of Disco/Grid Station	Quantity Installed by Nov 2015 (List provided by USAID)	% Sample	Inspected	Progress / Remarks
1	Supply, Installation and commissioning of 02 new Power Transformers at Chakdara and Peshawar Industrial 132 KV GS	PESCO	2%	100%	2%	100%
2	Supply, Installation and commissioning of 03 new Power Transformers at Bannu 220 KV GS, Mardan 220 KV GS and Peshawar Cantt 132 KV GS	NTDC/PESCO	3	100%	3	100%
3	Supply and delivery of twenty 132 KV Circuit breakers for PESCO GS	PESCO	20	100%	95	95%
4	2 Nos. 250MVA Autotransformer	NTDC	2	100%	2	100%
5	Supply and Delivery of Busdisconnectors and Surge Arrestors	NTDC	Lot	50%	50%	100%
6	Repair of 2 Nos. 150 & 160 MVA autotransformer	NTDC	0%	100% proposed	0%	Both transformers are still under repair at HEC Hattar.



Appendix E

Work Plan Targets and Result Achieved

COMPARISON OF WORK PLAN TARGETS AND REMARKS			
Work Plan Targets and Tasks	Start Date	Schedule Completion Date	Remarks
Technical Work Inspection for USAID's EPP and PDP	16-Jul-15	15-Jan-16	Completed on time
General Management & Administrative Support	16-Jul-15	15-Jan-16	Provided timely throughout the project
General Advise and Support	16-Jul-15	15-Jan-16	Provided timely throughout the project
Coordination with COR	16-Jul-15	15-Jan-16	Maintained throughout the project
Coordination with stake Holders	16-Jul-15	15-Jan-16	Maintained throughout the project
Managing of USAID Funded Property	16-Jul-15	15-Jan-16	Maintained throughout the project
Branding Implementation and Marking plan	16-Jul-15	15-Jan-16	Maintained throughout the project
Security Plan Review and Implementation	16-Jul-15	15-Jan-16	Maintained throughout the project
Project Plan Management	16-Jul-15	15-Jan-16	
Project Work Plan	16-Jul-15	16-Aug-15	Submitted on time
Cost Control Reporting	16-Jul-15	11-Aug-15	Submitted on time
Financial Reports	16-Jul-15	31-Dec-15	Submitted on time
Financial Vouchers	16-Jul-15	4-Dec-15	Submitted on time
Monthly Progress Report	1-Sep-15	4-Dec-15	Submitted on time
Email Updates	16-Jul-15	31-Dec-15	Submitted on time
Inspection and Verifications	16-Jul-15	15-Oct-15	
Inspection and Verification, Methodology	16-Jul-15	13-Aug-15	Submitted on time
Staff Mobilization	16-Jul-15	20-Aug-15	Completed on time
Inspection in Islamabad, KPK & Khyber Agency	3-Aug-15	30-Sep-15	Completed on time
Inspection in Punjab	3-Aug-15	30-Sep-15	Completed on time
Inspection in Sindh & Balochistan	3-Aug-15	30-Sep-15	Completed on time
Inspection reports Phase-I (Separate for PDP & EPP)	30-Sep-15	15-Oct-15	Submitted on time
Inspection Reports Phase-II (Separate for PDP & EPP) Addendum Report	30-Sep-15	15-Oct-15	Submitted on time
Non-compliance Reports	3-Aug-15	15-Oct-15	Submitted on time

COMPARISON OF WORK PLAN TARGETS AND REMARKS

Work Plan Targets and Tasks	Start Date	Schedule Completion Date	Remarks
Project Close Out			
Preparation of Demobilization Plan	27-Jul-15	31-Jul-15	Submitted on time
Demobilization - Phase I (Demobilization of Field Staff)	15-Nov-15	30-Nov-15	Completed on time
Demobilization - Phase II (Project Team, Property Disposition and Data Handover)	1-Jan-16	15-Jan-16	In Progress
Final Report	15-Oct-15	15-Jan-16	Submitted on time



Appendix F

Status of Major/
Minor NCRs –PDP

Major NCRs of I & V (PDP) Main Report

S/No	NCR No	NCR Detail	Status Open/Close
1.	PDP-1	75 KVA CSP Peshawar Saddar (Defective)- KPK/ISL Region	
2.	PDP-2	45 KVA CSP Peshawar Saddar, Arbab Road (Defective)- KPK/ISL Region	
3.	PDP-1	AMR meters for various customer category (COS Study)- 2 No- ISL	
4.	PDP-6	LDI Meter (11111) Jinnah Road Feeder at Cantt Grid Rawalpindi- Meter is mute –ISL (KPK/ISL Region)	
5.	PDP-1	Electronic Meter (Garden Colony S/Div- FESCO) flashed out/freeze S/No. 16027- Punjab Region	
6.	PDP-2	Electronic Meter (Garden Colony S/Div- FESCO) flashed out/freeze S/No. 11053- Punjab Region	
7.	PDP-3	LDI Meter (S/No 3014) on I/coming-3 Panel is mute at 66 KV Bhabra GS- Punjab Region	
8.	PDP-4	LDI Meter (S/No 4758) on I/coming-3 Panel is mute at 132 KV Bhakkar GS- Punjab Region	
9.	PDP-5	LDI Meter (S/No 2578) on Notak feeder at 66 KV Behal GS is mute – Punjab Region	
10.	PDP-8	AMR Meter For Cost of Service Study (Close to Jumper of Transformer)- Punjab Region.	
11.	PDP-9	Non Radio Frequency Enabled (RFE) Meter in Niaz Beg Town- LESCO Punjab Region	
12.	PDP-13	LDI Meter (S/No 8455) on 220 KV Kala Shah Kaku GS Hadu Key Feeder is mute – Punjab Region	
13.	PDP-14	Electronic Meter (Garden Colony S/Div- FESCO) burnt at Jhal Khanuala feeder S/No. 9738- Punjab Region	
14.	PDP-15	LT Capacitors (20 KVAR at Abbakhel Minawali S/Div) S/No 655 burnt- Punjab Region	
15.	PDP-16	AMR meter for Hi-end consumers (S/No. 29327) is burnt Liaqat pur Main Road- Punjab Region	
16.	PDP-17	ABC Cable in Chak 10/14 Mian Channu S/div- Poorly laid- Punjab Region	
17.	PDP-1	LDI Meter (S/No 7490) at 132 KV Mirpur Methalo GS has errors – Eeprom & Parameterizing Sindh/Baluchistan Region	
18.	PDP-2	LDI Meter (S/No 7492) at 132 KV Mirpur Methalo GS is faulty – Not working Sindh/Baluchistan Region	
19.	PDP-5	LDI Meter (S/No 7269) at 132 KV Tando Allah Yar Khan GS has errors – Eeprom & Parameterizing Sindh/Baluchistan Region	
20.	PDP-10	LDI Meter (S/No 7452) at 132 KV Rohri GS not communicating - SEPCO Sindh/Baluchistan Region	
21.	PDP-10	AMR Meters for COS (S/No. 59000465) at Qasimabad Hyderabad is faulty (Burnt)	
22.	PDP-04	Lineman Tool Kit(Data/Record) not found- QESCO Sindh/Baluchistan Region	

Major NCRs of I & V (PDP) Addendum Report

S/No	NCR No	NCR Detail	Status Open/Close
1.	PDP-1	Missing LT Capacitors 168 No -QESCO (Sindh/Baluchistan Region)	
2.	PDP-2	Voltage Regulator- MEPCO (Punjab Region)	

Minor NCRs of I & V (PDP) Main Report

S/NO	NCR No	NCR Detail	Status Open/Close
1.	PDP-02	200 Amp Outage Reduction Device(Tilted)-IESCO (KPK/ISL)	
2.	PDP-03	100 Amp Outage Reduction Devices(Tilted) –IESCO (KPK/ISL)	
3.	PDP-04	LT Capacitor(Disconnected) –IESCO (KPK/ISL)	
4.	PDP-05	200 Amp Outage Reduction Device(Burnt)-IESCO (KPK/ISL)	
5.	PDP-03	75 KVA CSP-Transformer(Non Energized) –PESCO (KPK/ISL)	
6.	PDP-06	100 Amp Outage Reduction Device (Installation Pending) & 800 Amp Fault indicator(Information Missing)- Punjab	
7.	PDP-07	100 Amp Outage Reduction Device (Installation Pending)-Punjab	
8.	PDP-10	RFE Meters (Defective)-Punjab	
9.	PDP-11	LDI Meter Sr.2159 (Not Recording Data) -Punjab	
10.	PDP-12	RFE Meter(Burnt, Non RFE installed, Height Problem)-Punjab	
11.	PDP-01	LDI Meter Sr.7174 (Error)-HESCO (Sindh/Balochistan)	
12.	PDP-02	LDI Meter Sr.7265 (Error)-HESCO (Sindh/Balochistan)	
13.	PDP-03	LDI Meter Sr.6383 (Error)-HESCO (Sindh/Balochistan)	
14.	PDP-04	LDI Meter Sr.10516 (Error)-HESCO (Sindh/Balochistan)	
15.	PDP-06	LDI Meter Sr.6898 (Error)-HESCO (Sindh/Balochistan)	
16.	PDP-07	LDI Meter Sr.6383 (Error)-HESCO (Sindh/Balochistan)	
17.	PDP-08	200 Amp Outage Reduction Device(Damage)-HESCO (Sindh/Balochistan)	
18.	PDP-09	200 Amp Outage Reduction Device(Damage)-HESCO (Sindh/Balochistan)	
19.	PDP-11	Line Man Tool Kit(Not Available)-HESCO (Sindh/Balochistan)	
20.	PDP-01	LDI Meter Sr.8083 (Error)-QESCO (Sindh/Balochistan)	
21.	PDP-02	LDI Meter Sr.8012 (Error)-QESCO (Sindh/Balochistan)	
22.	PDP-03	LDI Meter Sr.8080 (Error)-QESCO (Sindh/Balochistan)	
23.	PDP-03	LDI Meter Sr.7543 (Error)-SEPCO (Sindh/Balochistan)	
24.	PDP-04	LDI Meter Sr.7546 (Error)-SEPCO (Sindh/Balochistan)	
25.	PDP-05	LDI Meter Sr.9157 (Error)-SEPCO (Sindh/Balochistan)	
26.	PDP-06	LDI Meter Sr.9210 (Error)-SEPCO (Sindh/Balochistan)	
27.	PDP-07	LDI Meter Sr.7438 (Error)-SEPCO (Sindh/Balochistan)	
28.	PDP-08	LDI Meter Sr.7545 (Error)-SEPCO (Sindh/Balochistan)	
29.	PDP-09	Line Man Tool Kit(Not Available)-SEPCO (Sindh/Balochistan)	

Minor NCRs of I &V (PDP) Addendum Report

S/NO	NCR No	NCR Detail	Status Open/Close
1	PDP-01	AMR meters for cost of service study (Punjab Region)- FESCO	
2	PDP-01	Disconnected LT Capacitors- HESCO (Sindh/Baluchistan Region)- HESCO- 1 No	
3	PDP-01	Disconnected LT Capacitors- SEPCO (Sindh/Baluchistan Region)- SEPCO 41 No	
4	PDP-02	Disconnected LT Capacitors- QESCO (Sindh/Baluchistan Region)- QESCO 63 No	

Summary of PDP NCRs

Identification	Major NCRs	Minor NCRs	Total
Main I&V Report	22	29	51
Addendum I& V Report	2	4	6
Total	24	33	57



Appendix G

Status of Major/
Minor NCRs -EPP

Major NCRs of I & V (EPP) Main Report

S/No	NCR No	NCR Detail	Status Open/Close
1	EPP-1	40 MVA Transformer Shahibagh Peshawar(Repaired by HEC, Hattar)	
2	EPP-2	40 MVA Transformer Chakdara Lower Dir. (Repaired by PTESU, Lahore)	
3	EPP-3	DCU at 66 KV Tajazai Grid Station	

Major NCRs of I & V (EPP) Addendum Report

S/No	NCR No	NCR Detail	Status Open/Close
1	EPP-1	250 MVA Power Transformer at NTDC Mardan Grid Station (1st Transf.)	
2	EPP-4	250 MVA Power Transformer at NTDC Mardan GS- On line Monitoring Device. (1st Transformer)	
3	EPP-5	250 MVA Power Transformer at NTDC Mardan GS- On line Monitoring Device. (2nd Transformer)	
4	EPP-6	250 MVA Power Transformer at NTDC Mardan GS- Fire Fighting Equipment (1st Transformer)	
5	EPP-7	250 MVA Power Transformer at NTDC Mardan GS- Fire Fighting Equipment (2nd Transformer)	
6	EPP-8	250 MVA Power Transformer at NTDC Mardan Grid Station (2nd Transf.)	
7	EPP-10	40 MVA Power Transformer at Nowshera Industrial City	

Minor NCRs of I & V (EPP) Main Report

S/No	NCR No	NCR Detail	Status Open/Close
1	EPP-4	132 KV CB (Alstom Make) Bannu on Kurram Ghari Line	
2	EPP-5	132 KV CBs (Alstom Make) Nowshera Industrial – 2 CBs	
3	EPP-6	132/11.5 KV, 20/26 MVA Power Transformer (Ansaldo Make) Repaired by HEC Hattar	
4	EPP-7	132 KV CB (Alstom Make) at Kohat Grid for 40 MVA Siemens T/F	
5	EPP-8	132/11.5 KV,40 MVA Transformer at DI Khan – New PEL Transformer	
6	EPP-9	132 KV Tower near Peshawar City Grid	

Minor NCRs of I & V (EPP) Addendum Report

S/No	NCR No	NCR Detail	Status Open/Close
1	EPP-2	40 MVA Transformer at Peshawar Industrial Grid Station	
2	EPP-3	40 MVA Transformer at NTDC Mardan Grid Station	
3	EPP-9	132 KV New circuit breakers (20 No.)	

Summary of EPP NCRs

Identification	Major NCRs	Minor NCRs	Total
Main I&V Report	3	6	9
Addendum I& V Report	7	3	10
Total	10	9	19



Appendix H

Photographs

132 KV Circuit Breaker PESCO



132 KV Circuit Breaker PESCO



Capacitor Bank



Power Transformer



Vehicles



Testing Equipment



Personal Protective Equipment (EPP)



Transmission Line Tower Repairs



Automatic Metering System



LLM



LLM



NTDC IT Training Equipment



NTDC Design Center Up gradation (Hardware + Software)



Application Server Storage Area Network and Display Portal



250MVA Power Transformer



40MVA Power Transformer with Bus Bars & Power Cables



132KV Circuit Breaker



40MVA Power Transformer



11KV Incoming Panel



132KV Current Transformer



220KV Circuit Breaker Lightning Arresters



220KV Disconnectors, CTs(Packed)



LT Capacitors



Electronic Meters



RF-Enabled Meters



AMR Meters for Various Customer category



AMR Meters for Hi-End and Tubewell Costumers



AMR Meters for Cost of Service Study



LDI AMR Meters (On Grid Stations)



CSP Transformers



ABC Cable (Km)



HT Capacitors



Hand Held Units (HHUs)



Deck Loaders for Linemen



Suzuki Ravis for Linemen



Outage Reduction Devices



Linemen Tools



Voltage Regulators



AMR Meters for Cost of Service Study



AMR Meters for Cost of Service Study



LT Capacitor



LT Capacitor



LT Capacitor

