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**ENERGY POLICY PROGRAM  
LIVE LINE TRAINEE ASSESSMENT—  
REFRESHER COURSE REPORT  
PESCO, IESCO, HESCO, FESCO, AND  
GEPCO  
MARCH – OCTOBER 2015**

**November 2015**

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# ENERGY POLICY PROGRAM

## LIVE LINE TRAINEE ASSESSMENT–REFRESHER COURSE REPORT PESCO, IESCO, HESCO, FESCO, AND GEPCO MARCH – OCTOBER, 2015

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# ACRONYMS

AEAI	Advanced Engineering Associates International, Inc.
ALM	Assistant Lineman
DISCOs	Distribution Company
EPP	Energy Policy Program
FESCO	Faisalabad Electric Supply Company
GEPCO	Gujranwala Electric Power Company
HESCO	Hyderabad Electric Supply Company
IESCO	Islamabad Electric Supply Company
LESCO	Lahore Electric Supply Company
LLM	Live Line Maintenance
LM	Lineman
LS	Line Service
M&E	Monitoring and Evaluation
MEPCO	Multan Electric Power Company
NTDC	National Transmission and Despatch Company
PESCO	Peshawar Electric Supply Company
QESCO	Quetta Electric Supply Company
RE	Resident Engineer
SDO	Sub-divisional officer
SEPCO	Sukkur Electric Power Company
T&P	Tools and Plans
USAID	United States Agency for International Development

# EXECUTIVE SUMMARY

This assessment report summarizes and highlights the responses from Live Line Maintenance (LLM) refresher course participants collected during site visits conducted between March-October, 2015. Based on participant feedback, the assessment highlights the success of LLM training program. To date in refresher course, the Energy Policy Program (EPP) trained 52 linemen from five regional distribution companies (DISCOs) i.e. Islamabad Electric Supply Company (IESCO), Peshawar Electric Supply Company (PESCO), Faisalabad Electric Supply Company (FESCO), Gujranwala Electric Power Company (GEPCO), and Hyderabad Electric Supply Company (HESCO) from March to October, 2015.

As a result of the LLM training, each DISCO has a trained crew to work on live lines with new tools and transportation equipment for high voltage lines. By working on live lines, DISCOs will reduce the number of bottlenecks by avoiding shutdowns for maintenance and repairs. In turn, LLM training will reduce power outages and losses currently affecting the reliable delivery of electricity to consumers. As a result of this training all five crews received the new tools and plants. The chart below details the locations of the participants:

DISCOs	Previously Trained Linemen	Additional Linemen	Total Linemen Trained
Islamabad Electric Supply Company (IESCO)	7		7
Peshawar Electric Supply Company (PESCO)	16		16
Faisalabad Electric Supply Company (FESCO)	7	3	10
Gujranwala Electric Power Company (GEPCO)	5	5	10
Hyderabad Electric Supply Company (HESCO)	5	4	9
<b>Total</b>	<b>40</b>	<b>12</b>	<b>52</b>

To support the training for the remaining DISCO crews, EPP conducted site visits to IESCO, PESCO, FESCO, GEPCO and HESCO to interview and survey participants from Batch I, 14 weeks training conducted from January to December, 2013 at NTDC Tarbela Training Center. EPP asked the participants to detail the challenges they faced during the training, and to propose potential solutions for the future training course. The participants identified the following recommendations:

- Increased duration of the in-classroom training course from three to four weeks

Before the refresher course training, EPP conducted an assessment of the curriculum, trainers, and facilities (NTDC Tarbela Training Center). The results of the assessment were shared with the DISCO, and Training Center assessors to help them strengthen future programs. After the Training Center Assessment, EPP successfully delivered five LLM refresher course trainings to 52 linemen from IESCO, PESCO, FESCO, GEPCO and HESCO at their respective DISCOs.

This assessment reviews the background on LLM training, participant feedback and recommendations provided by participants, their supervisors, and EPP's Monitoring and Evaluation (M&E) Team. Annex I – Collected Comments provides additional comments highlighted in the feedback forms to improve future training.

# BACKGROUND

Prior to LLM training, lines were often shut down for routine and preventative maintenance which resulted in losses and created bottlenecks in energy delivery and reliability. EPP helped each DISCO develop one LLM crew dedicated to using new hot stick tools, maintenance techniques, and trailers to service live 132kV and 66kV transmission lines. Each DISCO crew underwent a 4-week intensive training program that consisted of:

- 1 week of in-class training focused on health and safety standards
- 3 weeks of extensive field-based training, including supervision, on-the-job practice with hot-stick tools, and bare hand maintenance techniques

To date, EPP trained PESCO, GEPCO, HESCO and FESCO in Batch I from January – December, 2013, MEPCO, SEPCO, LESCO and QESCO in Batch II from February – September, 2015 and IESCO, PESCO, FESCO, GEPCO, and HESCO from March- October, 2015 during the refresher course. All these DISCOs received the hot stick tools and trailers. In preparation for an assessment report and future improvements, EPP conducted a detailed assessment of the refresher course training participants to review their experience, capacity gaps, and challenges. The assessment outlines improvements, USAID procedure compliance, recommendations, and future monitoring and evaluation procedures.



Trainees conduct in-the-field practice on using LLM techniques

EPP's Monitoring and Evaluation (M&E) Team conducted a post-LLM refresher course training assessment from March - October, 2015 to identify program's results, challenges and sustainability. The assessment consisted of two steps:

- Feedback forms completed in person with M&E team members
- Sound bites collected from the participants and the training center's representatives

This two-step assessment process provided the linemen and engineers an opportunity to express their opinions about the training, and gave EPP important information that will shape similar future training programs.

## OBJECTIVE

The training sought to:

- Highlight the achieved results
- Identify challenges faced
- To take necessary actions based on the feedback provided by the linemen before the future trainings for improved results
- Sustainability assessment for future and similar trainings
- Identify areas needing improvement.

# POST LIVE LINE TRAINING ASSESSMENT

## MONITORING AND EVALUATION SITE VISITS

In conducting the training assessment, EPP's M&E team worked closely with Mr. Sher Ahmed, EPP's LLM Coordinator, Mr. Zafar Ali Khan, and EPP's Live Line Demonstrator. Assessment forms are attached in Annex II – Assessment Feedback Forms and were delivered in both English and Urdu. EPP visited the DISCOs on the following dates:

- Islamabad Electric Supply Company (7 Linemen) –April 3<sup>rd</sup>, 2015
- Peshawar Electric Supply Company (16 Linemen) – May 5<sup>th</sup>, 2015
- Faisalabad Electric Supply Company (7 previously trained and 3 additional Linemen) – June 19<sup>th</sup>, 2015
- Gujranwala Electric Power Company (5 previously trained and 5 additional Linemen) – September 4<sup>th</sup>, 2015
- Hyderabad Electric Supply Company (5 previously trained and 4 additional Linemen) – October 20<sup>th</sup>, 2015

## ASSESSMENT FINDINGS

The findings below are based on the monitoring and evaluation sessions with the linemen, DISCOs officials and EPP Live Line Demonstrator. The table highlights the general feedback and comments made by the participants during the assessment sessions:

Highlighted Issues	General Feedback and Comments
<b>IESCO, PESCO, FESCO, GEPCO, and HESCO</b>	
Training Duration	<ul style="list-style-type: none"><li>• Increase the duration of the in-classroom training course from three to four weeks for better understanding of the given training manuals</li></ul>
Similar Trainings	<ul style="list-style-type: none"><li>• Trainees requested US-AID to conduct a similar in and outside the country training on the transmission lines and dead towers where they can learn new skills and techniques. Moreover, the additional linemen inducted during the refresher course requested USAID for a 14 weeks certification at Tarbela Training Center.</li></ul>

## GENERAL COMMENTS

Linemen were asked to complete the Live Line Refresher Course Post Training Feedback Form, and were provided assistance by EPP's M&E Team. Most of the linemen opted to fill out the forms in Urdu, and EPP translated their responses to generate quotes. General comments and findings appear below:

*"I am thankful to USAID to train us on 66 and 132 kV live line and dead tower transmission lines with the latest tools, vehicles and plants. Live line training with the T&P will help PESCO save time in repair and maintenance work of the transmission lines."*

*"The training reminded all the practices that we have had done at Tarbela Training Center under the supervision for 3 months. In this session of refresher course we have revised safety procedures, hazard identification, artificial respiration, and importance of PPE"*

*“Due to the non-availability of the tools, it was not possible for the DISCOs to practice the techniques. USAID gave us the tools and vehicles which allowed us to practically perform the skills we have learned during the first LLM training. Refresher course was extremely helpful in recalling all the skills and techniques, in addition there should be a course for top and middle phase of the transmission line”*

*“LLM training helped us in learning to change the disc insulators strings at live and dead tower, replacements of vibration dampers etc. without any interruption of supply to the end consumers. Moreover, it is helping PESCO in reducing the time delays which is improving our work performance”*

*“Our crew was trained for 132 kV live line work but during the previous training the linemen were not satisfied with their work on dead towers. After the refresher course, all the linemen are now able to perform any kind of job on Dead tower”*

*“We have learned many different methods of working on the dead towers. LLM training helped us in learning to change the disc insulators strings at live and dead tower, replacements of vibration dampers etc. without any interruption of supply to the end consumers. Moreover, it is helping the DISCO in reducing the time delays which is improving our work performance”*

*“During the refresher course we revised all the techniques we learned during the first phase of the live line maintenance course at Tarbela. I am satisfied with the job performed at the suspension and dead towers while the lines were live and working. I and all of my team members are eligible to work with the given tools and plants for betterment of GEPCO and FESCO. We would like to thank USAID team for arranging such a wonderful training course”*

*“After this training we can perform our work in much better manner with new tools at subdivisions”*

*“The training reminded all the practices that we have had done at Tarbela Training Center. Mr. Zafar has helped us recall all the bare hand and stick methods while working on the working lines.”*

*“We have been trained in 2013 at Tarbela Training Center for 14 weeks. In 2015, we have received the trainings with the latest tools and plants at HESCO. We have been trained on normal and live lines, string and disc changing techniques which enabled us to work on dead towers. USAID sent monitoring teams to follow up on the training needs and challenges”*

*“We have learned the safer ways to work on live lines. During the refresher course we have worked on live a line which is riskier than working on lines at Tarbela Training center. At Tarbela, on the 132 kV lines we use normal have string 8 disc to work with whereas here at HESCO due to moisture the normal string have 11, 12 or 13 Disc insulators due to which working between cross arm and conductor is very risky. We have done all the practical work under the supervision of Mr. Zafar”*

# RECOMMENDATIONS

As a result of EPP's refresher course assessment, the following recommendations have been offered to enhance future LLM programs:

## SIMILAR TRAININGS

IESCO, PESCO, FESCO, GEPCO and HESCO's additional trainees requested USAID to conduct a similar training in and outside the country on the transmission lines and dead tower where they can learn new skills and techniques.

## PARTICIPANT SELECTION AND BRIEFING

EPP employed USAID-approved participants following the selection and eligibility criteria as given below:

- Less than 45 years of age.
- 10-15 years of experience in their department. For junior linemen, 1-2 years of experience.
- Completion of 10<sup>th</sup> Grade of equivalent and the ability to read and write in Urdu
- Willingness to attend the training sessions
- Mental and physical fitness to perform the standard duties of a lineman.

# ANNEXES

# ANNEX I: COLLECTED COMMENTS

	Overall Experience	Live Line Training Course	Concerns about the Training	Comments
IESCO, PESCO, FESCO, GEPCO, and HESCO	<ul style="list-style-type: none"> <li>I received both the training for Live Line Maintenance; previously the crew wasn't satisfied with their work performance at the dead towers. But during the refresher course, we have had an opportunity to learn more practically while using the latest tools given by USAID</li> <li>I hereby acknowledge that I was posted as AE Live Line Crew. I received the refresher course under the supervision of USAID. Training was very beneficial for me and my staff. All the staff working under the live line crew is fully trained and able to perform their designated work on the live lines. The T&amp;P and Vehicles provided by the USAID are also very beneficial.</li> </ul>	<ul style="list-style-type: none"> <li>The LLM training has helped us in repairing the dumpers and their weights on the live lines and dead tower without any delays. This will help reduce the load shedding in Pakistan.</li> <li>Previously we had to switch off the transmission lines while working on the faults and repairing discs but after this training with new tools and plants we will be able to work on the live lines and fix the faults without any interruptions</li> <li>During the refresher course we revised all the techniques we learned during the first phase of the live line maintenance course at Tarbela. I am satisfied with the job performed at the suspension and dead towers while the lines were live and working. I and all of my team members are eligible to work with the given tools and plants for betterment of the DISCO</li> </ul>	<ul style="list-style-type: none"> <li>Practical demonstration of the work on the dead tower training was excellent, there should be more training like these for more linemen across the country.</li> <li>USAID should continue similar trainings in the future, because live line crews in Pakistan are very limited.</li> </ul>	<ul style="list-style-type: none"> <li>I am thankful to USAID to train us on Live Line Maintenance. We always worked on live lines and this training has helped us in learning about the techniques used at the dead towers with expert opinions and practical demonstration by our trainer. Our trainer Mr. Zafar was very helpful throughout the course.</li> <li>The training has taught us the most recent and better technique in the live line with bare hand and hot sticks methods. We can now maintain live lines safely and without any difficulty.</li> </ul>

# ANNEX II: ASSESSMENT FEEDBACK FORMS

**Confidential information redacted**

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