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**Electrification Sustainability Program
In South Sudan
(ESP)
Cooperative Agreement No. AID-668-A-12-00002**

Quarterly Report

October 1 – December 31, 2012

**NRECA International Ltd.
January 30, 2013**

Electrification Sustainability Program In South Sudan Quarterly Report

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List of Terms and Acronyms

CIS	Customer Information System
COP	Chief of Party
DCOP	Deputy Chief of Party
ECMP-3	Electronic Module Component Panel-Model 3
ESP	Electrification Sustainability Program
RSS	Republic of Southern Sudan
KAPECO	Kapoeta Electric Company
LBG	The Louis Berger Group
MECO	Maridi Electric Company
NGOs	Non-Government Organizations
NRECA	National Rural Electric Cooperative Association
SUWASA	Sustainable Water and Sanitation in Africa
USAID	United States Agency for International Development
WES	Western Equatorial State
YECO	Yei Electric Cooperative

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Introduction

Background

Since 2005, the U.S. Government has provided ongoing infrastructure and institutional support to strengthen power sector planning throughout South Sudan, and to initiate or improve service delivery in Kapoeta, Maridi, Yei and Juba. Under the South Sudan Rural Electrification Project, USAID financed design and construction of a small generation-distribution utility in Yei that has evolved into a self-sustaining municipal electric cooperative serving approximately 1,200 consumers. Thereafter, USAID financed construction of two additional market town electrification projects in Kapoeta and Maridi; these two systems began commercial operations in April, 2011 and serve approximately 300 customers – households, commercial enterprises, public institutions and NGOs – in each community.

The challenges these small utilities face are similar but not identical. In the case of Yei, the utility commercializes enough electrical energy to cover all operating expenses and has managed to finance corrective and preventative maintenance costs for the past four years. However, the staff turnover has been high, and management still requires support to achieve long-term institutional and financial sustainability.

The two nascent utilities in Kapoeta and Maridi have not yet connected enough consumers nor do they sell enough electricity to achieve financial sustainability. The cost of generated energy is quite high, house wiring costs are still high, and there simply has not been enough time to connect enough consumers to reach a break-even point between operating costs and revenues. In both cases, there is also a need for ongoing training and mentoring for the boards of directors, the management, and employees who work at both utilities.

The Electrification Sustainability Program (ESP) has been designed to address the needs of all three utilities, as well as to undertake hydroelectric studies in Yei and Maridi (should additional funding become available), and to support Western Equatoria State (WES) and the Republic of South Sudan (RSS) to initiate planning for utility formation in Yambio.

This report covers the period October 1 through December 31, 2012. It summarizes ESP activities, challenges and accomplishments during the reporting period and identifies action items that will need to be addressed by NRECA International as well as issues that may require USAID attention.

ESP Objectives

The ESP is designed to support the process of achieving long-term sustainability for the electric generation-distribution utilities in Kapoeta, Maridi and Yei and to initiate utility formation in Yambio.

As per the Cooperative Agreement, the program assistance will result in “generation-distribution utilities that have well-established business systems and staff that are trained to manage the business systems without external oversight; to have a technical team with the capacity to manage the day-to-day operating challenges of small, islanded, vertically integrated electric

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utilities, including power plant management and the operation and maintenance of the distribution system.”

A second project objective is to complete pre-feasibility studies to explore the potential for development of micro- and small-hydro generation near Maridi and Yei in order to reduce the cost of power supply to MECO and YECO. In the event that USAID decides to pursue these investments, the ESP program includes an option to review the feasibility of these investments and oversee the completion of final design of micro/small hydroelectric projects as proposed.

The third project objective will focus on completion of an institutional and technical evaluation of the incomplete Yambio electric generation-distribution system. The ESP team will engage in a comprehensive evaluation of the engineering and construction requirements to energize the generation-distribution system, and will evaluate management options to achieve sustainable operation of the utility in collaboration with WES leadership and technical-administrative staff .

Project Team

The NRECA project team assigned to support ESP includes the following team members, by position:

Person	ESP Duties	Tenure
Robert O. Ellinger	Chief of Party	Full Time
Janet Kauffman	Deputy Chief of Party	Full Time
Swalleh Rajab	Senior Commercial Utility Advisor	Full Time
James VanCoevering	Electrical Engineer	Part Time
Md. Tajul Islam	Customer Information System (CIS) Specialist	Contracted-Part Time
Jerry Rodgers	Lineman Training Specialist	Contracted-Part Time
Eldon Stanley	Power Generation Specialist	Contracted-Part Time
Gregory Boudreaux	Board Development Specialist	Contracted Part Time
Kent Wick	Utility Finance Specialist	Contracted Part Time
Laban Kariuki	Utility Planning Specialist	Contracted Part Time

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Additional support will be provided by the NRECA International Foundation that will take responsibility for organizing volunteer services of U.S. line workers from NRECA member cooperatives in the United States. NRECA International Foundation contributions will be managed by the Foundation Program Manager and Foundation Program Assistant.

Activity Summary

Task I – Technical and Financial Sustainability Support for Kapoeta, Maridi and Yei Electric Utilities

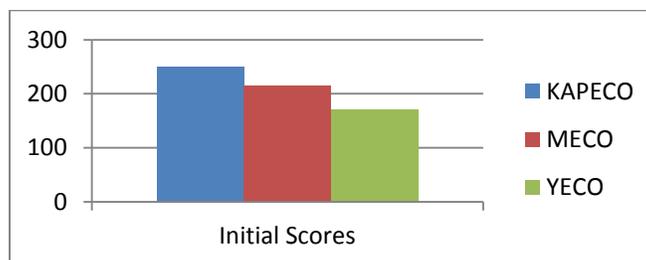
Benchmark Diagnostics

NRECA completed a benchmark diagnostic of enterprise functionality at each utility in October. The assessment included an evaluation of general management proficiency, administrative functions including accounting, financial management and human resource systems, commercial management, operations and maintenance functions of the generation and distribution plant, and other ancillary activities.

Utility	Evaluation	Board/Management Presentation
Yei Electric Co-op (YECO)	October 10-12	November 17
Maridi Electric Co. (MECO)	October 15-16, 19	November 21
Kapoeta Electric Co (KAPECO)	October 24-26	November 30

The evaluation produced a diagnostic score card compiled for each utility and shown below. Results were presented to the board and management of each utility in November. This assessment will be used to define the baseline performance of KAPECO, MECO and YECO, and to determine specific capacity building needs of each program partner. The diagnostic will be updated annually to present objective information to the board and management of KAPECO, MECO and YECO as well as to USAID.

The assessments were conducted by NRECA staff through direct interviews with board members, management and staff along with field observations throughout each utility’s compound and service area. The baseline scoring for the three utilities is as follows; KAPECO - 250, MECO - 215, and YECO - 171 (out of a total of approximately 426 total points).



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KAPECO scored highest in the areas of Board of Directors, Operations and Maintenance, Organization and Human Resources while the following areas were identified for improvement; Engineering, Finance and Managing Director. MECO scores were high in the areas of Managing Director, Board of Directors, Customer Service and Human Resources while the following areas for improvement were identified; Engineering, Finances and Organization. YECO scored high in the areas of Board of Directors and Accounting with a need to improve in Engineering, Operations and Maintenance, Finance, Customer Service and Organization.

All three utilities scored low in the Engineering evaluation which could be expected because they do not have an engineer on staff and we fully expect that this will not change in the future. The ESP team will now build upon the strengths and improve the weaknesses exposed at the utilities in the evaluation.

A copy of the evaluation form is included with this report.

Customer Information System (CIS) and Accounting Workshops and Mentoring Activity

The CIS package used to support YECO, MECO and KAPECO was adapted to meet the specific accounting, billing, and reporting needs of these utilities in recognition of the modest business systems requirements of these three small enterprises. However, even with a simplified software design, the administrative, accounting and commercial staff have and will continue to require ongoing training and orientation in the software system. In an effort to address the remedial support needed, Janet and Tajul prepared and conducted training workshops in Kapoeta on November 15-21; in Yei from November 26-December 7; and finally in Maridi from December 10-20, 2012.

The workshops varied in length from 7-10 days, depending upon the needs of each utility. Each workshop began with formal classroom sessions on the following topics:

- Correctly setting the parameters for CIS processing
- Data entry and processing
- Introduction to accounting principles and practices
- Transaction analysis

The second half of the workshops was spent in the office observing system operations and activity where day to day work issues could be dealt with during the observation and mentoring sessions.



As part of their mentoring session in Yei a plan has been developed for YECO to enter an entire year of transactions to enable the YECO staff to close books in a timely manner. Specific directions have been provided to the Manager of Finance and Administration and a follow-up visit is scheduled for January.



Plans were also developed to visit each utility in January to provide year-end accounting assistance.

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Attendance for the CIS / Accounting programs at each utility is noted in the following table:

Utility	Trainees	Male	Female
Kapoeta Electric Co (KAPECO)	4	1	3
Maridi Electric Co. (MECO)	4	4	0
Yei Electric Co-op (YECO)	8	5	3
Totals	16	10	6

Lineman Training and Mentoring Activity

Jerry Rodgers, Lineman Training Specialist, began the lineman training and mentoring program by visiting each utility during the months of November-December presenting formal classroom training supplemented with field training and observation of work practices in the field. The main thrust of these sessions combines safety training with skills development to ensure that linemen and groundmen learn how to work with minimal risk of injury while building skills in all phases of line construction, operation and maintenance procedures. Jerry visited Maridi November 20-29; Yei November 30 - December 8; and Kapoeta December 9-20.



The training program at each utility began with an examination of recent electric service installations and line segment construction completed by the utility crews during the past nine months. This training activity focused on diagnosing compliance and non-compliance with best work practices of randomly selected work orders and staking sheets undertaken

by line staff including pole top assemblies, pole setting, transformer mounting, transformer and service connections, guying, and other construction, operation and maintenance practices.

The formal classroom training sessions covered the following topics:

- Program introduction
- Work order and line inspection reporting
- Line patrol and reporting procedures along with pole numbering – why and how
- Basic and three-phase transformer connections
- Tool and material storage and maintenance
- Basics of line staking
- Reorganization of “spec book” (standards and specifications for line construction)
- Millimeter to inch conversions
- Demonstration on the proper use of block and tackle
- Proper use and tying of knots
- Development of single line diagram of three-phase backbone system



Field training, observation and mentoring included:

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- Line patrol
- Inspection of secondary service drops
- Tool inspection
- Observing road crossings and discussing what determines a proper road crossing



- Setting an “in-line” pole on the with three-phase system, proper grounding procedures, installation of hardware, loading pole and “tailgate” discussion
- Setting of pole for pole climbing, observation of pole climbing abilities and techniques by the linemen and pole climbing instruction
- Proper use of the shotgun stick.
- Evaluation of line and pole location of a river crossing
- Eradication of bees nesting in and around substation switches

- Pole top rescue
- Wiring a three-phase transformer bank
- Chain saw operation and repair
- Proper use of the volt-amp multi-meter and phase meter

Attendance for the Lineman Training Programs at each utility is noted in the following table:

Utility	Trainees	Male	Female
Kapoeta Electric Co (KAPECO)	8	8	0
Maridi Electric Co. (MECO)	9	8	1
Yei Electric Co-op (YEEO)	11	11	0
Totals	28	27	1

Power Generator Training and Mentoring Activity

Bud Stanley, Power Generation Operations and Maintenance Specialist, began the power plant operation and maintenance training and mentoring program by visiting each utility during the months of November-December. During each visit Bud presented formal classroom training sessions supplemented with troubleshooting, observation and mentoring. These training sessions focused on skill development to ensure the proper, safe and efficient operation and maintenance of the power system and compound generators. Bud visited Kapoeta November 29 - December 5; Yei November 30 - December 8; and Kapoeta December 12-20.

The formal classroom and field training sessions covered the following topics:

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- Basic electricity training including Ohms law and how to apply it to the DC circuits in the generator sets which forms the basis for troubleshooting problems
- Troubleshooting of starting circuits, batteries, and generator exciters
- Basic electrical theory and AC circuits as applied to generators, relationship to speed, voltage control, use of potentiometers to regulate speed and trouble shooting
- Review of various reports, manuals, and prints with discussion on how they related to the operation and base line performance of machines and maintenance requirements
- Troubleshooting of compound generator
- Capacitor start squirrel cage motors
- Battery maintenance and how to determine when a battery has sulfated plates and why such a condition is something to be avoided
- Function and operation of substation breakers including an examination of how bypass fuses are applied and how to replace a blown fuse
- Current transformers – applications and dangers
- Starting circuits, batteries, and generator exciters – their use in trouble shooting
- Analyzing a fault that occurred during a rain/wind storm and why the generator breaker did not trip
- Review of a diesel engine's fuel and air requirements to properly operate and carry the loads placed on the generator.



Also as part of the classroom training various reports, guidance documents and operating manuals for the generator's Electronic Module Component Panel – Model 3 (EMCP-3) were gathered together with missing items replaced with the documents restored to good condition for future use / reference.

Field training, trouble shooting, observation and mentoring included:

- Installation of the fuel filter/fuel valve in the compound genset
- Running of compound genset for two hours under full load as a test
- Replacement of a spare battery
- Completed the wiring of the station service power to the compound genset so that the battery will be charging from the station service when the genset is not running
- Troubleshot a low coolant level alarm for the generator
- Taking an inventory of the spare parts – with employees identify each part and pointing out where the part is used on the gensets.
- Reading and selecting the correct function on the EMCP 3 controls

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- Observed a voltage unbalance on a generator which was traced to unbalanced loading on the distribution line (no problem with gensets) – What can be done
- Troubleshoot generator for failure to carry load and found an extremely dirty air filter which was causing the problem.
- Examination of a bendix and a discussion on how it engages the flywheel to start generator and troubleshooting of compound diesel genset.
- Use of the multi-meter to troubleshoot the circuit and found a bad potentiometer which they replaced.
- Thorough cleaning of generator units including coolant radiator, fan blades and fuel radiator with instruction provided on the proper way to clean the equipment with a power washer.
- Resetting the clock on the electronic KWH meter to record the proper date and time of the peak loading on the generator
- Examination of the engine sensors – location and function and a review of the electronic controls on the generator units.
- Instructed power plant operators on the correct method of cleaning the electrical/electronic controls of spider webs and dust.



Power Plant Generator Checks - As part of this visit the specialist connected the generator communications units with the diagnostic computers



using diagnostic software to evaluate past operation faults and operation performance. The lap top checked the logs of the power plant gensets with the Caterpillar software - CAT ETool checking for any alarms since the units were placed in service. The diagnostic procedure was presented the plant operators but the sophistication of the technology will require additional (and many years of) training. Most problems were minor and could be corrected on site with supplies available at utilities.

Attendance for the Power Generation O& M Training at each utility is noted in the table below:

Utility	Trainees	Male	Female
Kapoeta Electric Co (KAPECO)	2	2	0
Maridi Electric Co. (MECO)	4	4	0
Yei Electric Co-op (YECO)	7	7	0
Totals	15	15	0

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Daily Technical Assistance and Mentoring

The ESP team members invest significant time and effort to bring practical, technical assistance in each developmental area addressed in the specific workshops, training sessions and field observations. Not only do the various formal sessions place an emphasis on developing specific skillsets but the continuation of the training by observing the daily work routine combined with the mentoring process of providing practical suggestions and guidance leads to improvement in the employees' hands-on, day to day business skills and approach.

Once such example that highlights this process is the coordination and planning support provided by the local ESP team and NRECA International to MECO as they work with the Sustainable Water and Sanitation in Africa (SUWASA) organization in constructing an extension of the three-phase distribution network to the Maridi water treatment plant. The team is working with local staff on all aspects of project development including customer meetings, project planning and design, procurement, financing and decision making. Such real world application of the skills taught by the training specialist will serve to instill confidence in the employees as they approach future opportunities. It is expected that this particular project will be constructed in April/May 2013 with the support of volunteer linemen provided through the NRECA International Foundation.

Weekly Utility Operations Report

The weekly utility operations report was revised this quarter with key performance monitoring and measuring indicators established to contribute to the understanding of good business practices.

Key performance indicators for the Quarter (October-December)

Key Performance Indicators	KAPECO	MECO	YEI
Services in Place (12/31)	384	480	1,176
New Services	33	35	0
Increase in Connections - Quarter	9.4%	7.7%	0%
System Peak (kW) Y-T-D	135	97	527
Generator Efficiency (kWh/Liter)	2.69	2.62	2.81
Average Run Hours per Day	13	16	17
Outages	3	0	1
Outage Hours per Consumer	.010	0	.003

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Key issues and activities at the utilities for the past quarter include:

KAPECO

- The young man hired and trained to become the new Managing Director returned to Juba. Apparently the salary offered (and increased during negotiations) was not high enough to retain his services. Stephen Okeny, Commercial Manager was appointed acting managing director and position announcements are being readied for distribution.
- Training of lineman trainee – replacement for one who resigned

MECO

- Feeder east pole numbering ongoing

YECO

- YECO – Currently advertising for the position of General Manager
- YECO team has been advised by Uganda Distribution Electric Company (UDECL) that an environmental problem has been identified with the chemical used to treat poles purchased by YECO. It was learned that the chemical can be corrosive if it comes in contact to exposed parts of the body. An action plan is being developed.
- Applicants interviewed for the Customer Service Assistant and Compound Guard positions

Additional key monitoring and measuring indicators will be included in future monthly and quarterly reports.

Task II – Yei, Maridi Hybrid Micro-Hydro Capacity

This is an activity in ESP that will require action at the earliest possible date. It is quite significant that, while the number of connections at Kapoeta and Maridi continue to increase and approach the number of connections we originally thought would allow these utilities to achieve self-sufficiency; the point of financial break-even has still not been reached. The reason is that newly connected consumers are using very little energy, and the cost of generated power remains high.

For this reason, we believe that it would be extremely important to evaluate other renewable energy options – in addition to the hydroelectric power options already reviewed – in Kapoeta and Maridi. We would like to evaluate potential for wind generation in Kapoeta, and solar photovoltaic generation in both Kapoeta and Maridi.

Should one or both of the small hydroelectric options receive funding at Maridi and/or Yei, we recommend that these activities be fast-tracked to allow the utilities to avail of lower cost energy at the earliest possible date. Providing lower cost energy will have an immediate and lasting impact on self-sufficiency for each utility that enjoys this option.

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Task III - Utility Evaluation and Development Support for Yambio

Activities to evaluate the options to develop an electric utility in Yambio have been stalled. The review of the remnants of the generation-distribution system built by an Egyptian contractor is being slowed by disagreements over the payment of the contractor and rightful ownership of the assets. While significant progress had been made to design, procure and install power generation and distribution infrastructure in Yambio, the system has not been placed in commercial operation and the components of the system are falling into disrepair. The Hon. Clement Juma Mbugoniwia, Minister of Physical Infrastructure and Public Utilities for the Western Equatorial State (WES) continues to try and open dialogue with representatives in Juba on how the system be placed into service.

Key Issues - Challenges

Logistics

Kapoeta, Maridi, Yei and Yambio are not closely located and travel between the towns is very difficult. The difficulty in travel (time and reliability) poses a significant geographic challenge for the implementation of the project. Travel by road, while the most reliable, can take many hours as the majority of roads are dirt requiring slow, cautious driving and many roads become impassable during the rainy season. Commercial air transportation is nonexistent and while social service agencies provide air transport to a few of the locations the airports are limited and the flight schedules vary from day to day including cancelation of flights during poor flying conditions (including takeoff and landing from dirt runways).



To address this challenge the NRECA has established a base of operations in Maridi at the MECO compound where both the Chief of Party (COP) and Deputy Chief of Party (DCOP) reside and provide management oversight. In addition, a senior commercial specialist assigned to reside and work in Kapoeta where he provides management oversight to KAPECO. The COP and DCOP will travel to Kapoeta periodically to provide management, accounting and CIS specific training. The COP, DCOP and senior management specialist have also begun to provide support to YECO. The ESP team travels as a group when possible by either vehicle or air transportation. The current vehicle is



experiencing a high failure rate and the purchase of a new vehicle (included in the budget) is being evaluated.

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Initial plans called for ESP to hold board training sessions and peer-to-peer workshops in a central location, and while this plan looks good on paper discussions with the utility directors has led the ESP team to conclude that this may not be possible for many board members at all three utilities. The time required for travel may take several days and when added to the training would require board members to be away for more than one week at a time which is not possible for directors who are businessmen and community leaders. While joint board training sessions will be considered in the first year of ESP for the MECO and YECO boards the training session for KAPECO board members will be held in Kapoeta. Plans to offer employee training on a central basis will continue with various options being considered. To the extent centralized training activities can be utilized to allow the training of employees at all three utilities, the ESP training team will encourage such an option. Of course training sites for all groups will be dependent upon the availability of training facilities, as well as the cost to the Program and the convenience and benefit for trainees. For example the linemen and power generation training is being provided by short-term specialists and volunteers on site, traveling to each utility.

Barriers to Increase Service Connections

The lifeblood of any business is a positive revenue stream that is dependent upon a growing customer base. Unfortunately, increasing service connections at all three utilities has been and continues to be limited by a variety of different factors. As part of the ESP project, the team will evaluate how to overcome some barriers to new connections, given that the financial health of each of the utilities is dependent upon growth of electricity sales. The teams will also review means of encouraging more sales per consumer given that more unit sales will concurrently contribute directly to financial viability. The team will also explore options on how to reduce the cost of wiring homes and businesses in an attempt to reduce the initial installation costs and encouraging more customer connections. It is interesting to note that during the quarter the total number of services in place increased by 33 (9.4%) at KAPECO and by 35 (7.7%) at MECO while the YECO customer base remains stagnant because of lack of materials.

Limitations in CIS / Accounting Training

The CIS & Accounting Training at all three utilities is showing progress slowed by several issues:

- The employees do not fully understand basic accounting and much of the training time is spent focusing on basic transaction analysis and journal entry preparation for activities not specifically covered in CIS. Monitoring and mentoring by the ESP team continues to take place in an effort to improve this area of concern.
- The process of CIS training has helped identify specific issues with the software that can be improved to make use of the CIS easier and more effective. Adjustments to the CIS will be made by the CIS team and an update will be implemented during the next visit by the specialist in the near future.
- CIS access is limited to only one computer at each utility. In order to ensure that multiple team members at each utility build CIS skills and understanding, access will need to be expanded to additional computers by sharing access via a network. We will be exploring

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the possibility of networking the office computers to allow CIS activities to be carried out by more than one person on one computer.

Language Comprehension

While many of the South Sudanese profess to understand English there is a question of their full comprehension of the language. Many times following a presentation and training session further explanation must be made by those in attendance who fully comprehend to those who need further clarification / assistance in their native tongue. We are exploring opportunities to work with local training organization to address this concern.

Basic Technical Knowledge and Understanding of Science and Mathematics

During the power generation operation and maintenance training program we have noticed that many of the “technicians” (power plant operators) have a limited knowledge of science and very little understanding in math. Recognizing this fact we are limiting some of the technical training for some of the employees to focus on taking the proper readings and understanding how the various meter readings apply to the proper operation and maintenance of the generators and not troubleshooting and repair. We are exploring opportunities to work with local training organization to address this concern.

Utility Assets

Asset disposition for all three utilities continues to be a topic of discussion among the board of directors, management staff and the ESP team. In cooperation with Louis Berger Group, Inc. (LBGI), the asset lists for both KAPECO and MECO have been provided to USAID. NRECA has prepared and presented the accounting for the YECO assets which we propose to have transferred to the local cooperative; USAID has requested clarification of selected data from the asset list that is under preparation at the present time.

Once ownership of the assets is transferred NRECA will provide guidance on asset valuation and depreciation to establish fixed asset accounting records for the utilities. The delay in asset transfer combined with a lack of understanding is causing some problems in regards to true ownership, legal responsibilities (e.g. insurance coverage, replacement) and the question of using assets to secure funding through commercial sources for the purchase of material and supplies.

Major Events – Upcoming Activity

- Program Development and Project Planning
 - Continue the development of Board training program including finalizing schedule for April/May travel.
 - Continue the development of Management training program to be held in late March.
 - Developing a plan to address the need to maintain control of all material and inventory along with examining a possible joint purchasing effort among the three utilities. This evaluation may lead to the development of a network of East

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African suppliers for the utilities. The supplier network will require inspections of product and facilities along with the establishment of MOUs to ensure their ability to provide quality material at a competitive price.

- CIS / Accounting
 - Work with YECO staff to enter an entire year's worth of transactions and close books in a timely manner.
 - Begin visits with each utility to provide year-end accounting assistance to all three utilities
- Explore Training Partner Opportunities in Kapoeta, Maridi and Yei

Financial

Financial Status (as of end of reporting period - 12-31-2012):	
a. Project Start Date:	8/08/2012
b. Project Completion Date:	8/07/2015
c. Estimated Life of Activity (months):	36
d. Expired Life of Activity (months):	2
e. Total Estimated Cost:	3,870,000
f. Unilateral Obligation	2,194,000
g. Bilateral Sub-obligation	0
h. Total Obligation:	2,194,000
i. Mortgage (e-h):	1,676,000
j. Expenditures:	630,775
k. Pipeline as of end of reporting period (h-j):	1,563,225
l. Historical Monthly Burn Rate (j/d):	126,155
m. Average Monthly Burn Rate (Last Quarter):	75,108
n. Length of Pipeline in Months (k/m):	12.39
o. Cumulative Expenditures as % of Obligations:	28.75%

Program Tracking and Activity Chart

No.	Activities and Tasks	Duration	Task Descriptions	Milestones	Planned Completion Date	Completion Date
1.0	Project Team Mobilization	Month 1 to Month 3				
1.1	Program Workplan, M&E Plan and B&M Plans established		2013 Workplan, Monitoring and Evaluation Plan and Branding and Marketing Plan developed and submitted to USAID/South Sudan for comment	Project plans completed	5-Sept-2012	5-Sept-2012
1.2	Kick-off meeting with USAID/South Sudan		Program review with USAID/SS AO & AOR.	Meeting conducted.	13-Sept-2012	13-Sept-2012
1.3	Program Workplan, M&E Plan and B&M Plans reviewed		USAID Provide comments on various project plans for revision	Comments received from USAID	28-Sept-2012	8-Oct-2012 13-Oct-2012
1.4	Workplan, M&E & B&M Plans revised and approved		Final Submittal to USAID and Approval	Plan Approved by USAID	19-Oct-2012	17-Oct-2012
2.0	Technical assistance and mentoring program	Month 3 to Month 13				
2.1	Board training		Training will be provided in a central location for all three utilities and will cover all facets of board functionality including; elections, board responsibilities, interaction of boards of directors and utility management	Training workshop completed	18-Jan-2013	
2.2	Board training		Guided peer-to-peer functions designed to facilitate shared experiences and challenges.	Peer to peer sessions completed.	23-Jan-2013	
2.3	Leadership training		A leadership training module that will focus on sound decision making, clear communication skills, and team building.	Training module completed	22-Mar-2013	
2.4	GM Training		A GM's role with the board of directors module that will explore and explain the relationship between the policy setting body (the board of directors) and the executive management position (the General Manager) in a modern electric utility.	Training module completed	29-Mar-2013	
2.5	Annual GM retreat		The retreat that will allow the GMs and senior utility managers to participate in a guided forum to share experiences and challenges to learn from one another.	GM retreat completed	3-April-2013	
2.6	Human resources management		An introduction to human resource management which will focus on human resource policies and procedures.	Training module completed	24-May-2013	
2.7	Accounting and finance control training		This training module will provide accountants, bookkeeping assistants and cashiers with the knowledge and understanding to perform basic general ledger entries, to manage the accounting module of the CIS, including generation of monthly financial reports.	Training module and workshops completed	28-June-2013	
2.8	Meter reading and data management		This training module will focus on best practice policies and procedures for control of meter readers and the meter reading process.	Training module and workshops completed	8-Mar-2013	
2.9	Commercial management		An introduction to commercial management focused on customer relations, promotion of new accounts, management of connections and disconnections, dispute resolution, and other commercial management functions.	Training module completed	30-Nov-2012	

Program Tracking and Activity Chart

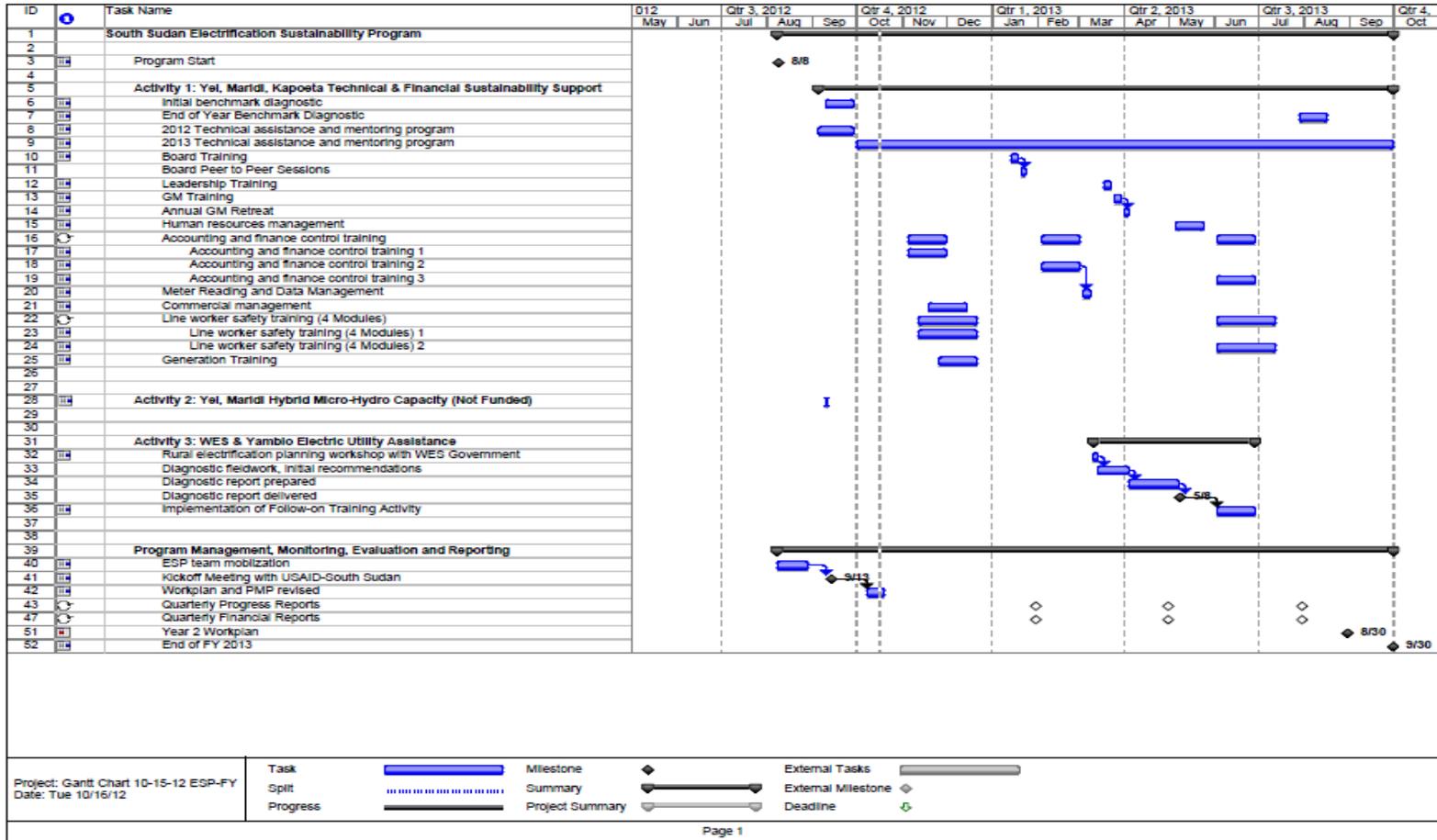
No.	Activities and Tasks	Duration	Task Descriptions	Milestones	Planned Completion Date	Completion Date
2.10	Line worker and safety training		A training module on new service installations consisting of inspection of the consumer premises, including extension of the service drop from the distribution transformer to the meter; meter mounting and interconnection with the house wiring circuit; inspection of internal house wiring; and instructions to provide to the home or shop owner.	Training module and workshops completed	12-July-2013	In Progress
2.11	Line worker and safety training		A training module on the construction of short primary line extensions covering pole excavation, pole top structure assembly, pole setting, guying, conductor pulling, and transformer mounting procedures.	Training module and workshops completed	12-July-2013	In Progress
2.12	Line worker and safety training		Training on the inspection of customers' generator disconnect switchgear identifying switchgear that do not comply with utility standards or are not being used properly leading to improved line worker safety.	Training module and workshops completed	12-July-2013	In Progress
2.13	Line worker and safety training		A general maintenance workshop training module which will cover more central themes during which the trainer will demonstrate a common maintenance activity, and will coach linemen participants to replicate it as part of a practical training session.	Training module and workshops completed	12-July-2013	In Progress
2.14	Generation training		This training for management and line staff will focus on proper operations and maintenance of the generator equipment including operation and monitoring procedures, proper scheduling of maintenance and maintenance partners along with fuel monitoring and procurement.	Training module and workshops completed	21-Dec-2012	20-Dec-2012
3.0	Maridi, Yei Hybrid Micro-Hydro Capacity		This option, should additional funding come available, is for final design of one or more viable micro/small hydro generation projects in Yei and Maridi, depending upon the results of EGAT-financed prefeasibility studies for two sites in Yei and a third site in Maridi.	Funding source not yet identified	N/A	N/A
4.0	WES and Yambio Electric Utility Assistance	Month 3 to Month 13				
4.1	Rural electrification planning workshop with Western Equatoria State (WES) government		Discussion of the opportunities available and the necessary steps to introduce rural electrification into WES	Workshop held	13-Mar-2013	
4.2	Diagnostic fieldwork and initial recommendations		Complete a field diagnostic evaluation to include an analysis of the improvements and expansion needs of the electric distribution system to provide more complete coverage of the community, as well as an institutional review of the options available to satisfy the goals of the public-private partnership and the private sector to manage both power generation and commercialization of electric service..	Diagnostic completed	03-April-2013	

Program Tracking and Activity Chart

No.	Activities and Tasks	Duration	Task Descriptions	Milestones	Planned Completion Date	Completion Date
4.3	Diagnostic report		Diagnostic report completed and presented	Diagnostic report completed and presented	08-May-2013	
4.4	WES Training		In the event funding is made available and an external firm is contracted to manage the operation of the power generation and distribution systems, the ESP team will further evaluate the training that will be required for WES Ministry of Physical Infrastructure staff to oversee the management contractors. The implementation of the diagnostic study will be combined with training sessions for WES staff on rural electrification planning.	Training workshops completed	TBD	

Program Tracking and Activity Chart

ESP Project Gantt Chart



Program Tracking and Activity Chart

Utility Diagnostics Evaluation Form

Utility Evaluation / Diagnostics Assessment

NRECA will build on prior direct experience with the participating utilities by designing specific training activities for each utility. The tailored programs will begin with a benchmark diagnostic of utility functionality at program outset, updated annually as part of a policy to present objective information to the utilities' boards and management. The diagnostic will evaluate the degree of functionality of general management, administrative (accounting, finance and human resources), commercial, and maintenance and operations functions of each utility to identify gaps in performance. The evaluation will produce a diagnostic score card that will be used to define the baseline performance of KAPECO, MECO and YECO, and will thereafter be used to determine specific capacity building needs of each individual program partner.

Name of Utility: _____

Date of Assessment: _____

This document is being used to assess the degree of functionality of the utilities at program outset and will be updated annually to present objective information to the board and management of the three utilities – KAPECO, MECO and YECO as well as USAID and NRECA. The evaluation will measure the strengths and weakness of each organization and help determine the specific capacity building needs of each utility.

Specific areas of the organizations to be assessed are:

Organization	Accounting
Board of Directors	Financial
General Manager	Operations and Maintenance
Human Resources	Engineering
Customer Service	

The assessments will be conducted by NRECA staff but include representatives from within the organizations: Questions have been designed for the assessments to be completed in one - two days at the utility. Shown below are details of the assessment process which need to be understood by each person participating in the assessments.

Instructions for completing "Utility Evaluation and Diagnostics Assessment"

1. Time requirement: One or two days;
2. Personnel requirements: NRECA Staff plus utility staff from each area of evaluation
3. Each section should be reviewed and completed thoroughly by the evaluators;
4. NRECA staff following consultation with utility staff will determine how many points should be assigned for each line item and section. At the completion of each major section, points for that section should be listed at the end of the Assessment, in "**Section Points Earned**".
5. Points earned in each major section should be totaled which will be identified as the "**Total Evaluation Score**".

Section Points Earned

Section Title	Points Earned	Points Possible
Organization		36
Board of Directors		48
General Manager		27
Human Resources		24
Customer Service		51
Accounting		87
Finance		39
Operations and Maintenance		87
Engineering		27
Statistics		
Total Evaluation Score		426

Names of NRECA Reviewer(s): _____

Names of Utility Participants: _____

Organization (0 – 36 points) (Utility staff member – GM, Asst. GM)

Ratings on form are: 0 - Unsatisfactory -- No Records
 1 - Corrective Action Needed -- See Attached Corrective Action Plan
 2 - Acceptable, But Should Be Improved -- See Attached Recommendations
 3 - Satisfactory -- No Additional Action Required at this Time
 NA - Not Applicable

Description / Activity	Rating
1. Does the Utility keep a set of updated Articles of Incorporation on file at the HQ?	
2. Does the Utility keep a set of updated set of Board Policies at the HQ?	
3. Has the Utility developed a set of day to day Operating Procedures?	
4. Does the Utility keep a set of updated day to day Operating Procedures at the HQ and make available to all employees on request?	
5. Does the Utility have an organization chart with the majority of positions filled/assigned??	
6. Does the General Manager hold an all employees meeting at the HQ at least monthly?	
7. Does the General Manager hold management staff meetings least twice a month?	
8. Does the General Manager encourage management staff to hold regular meetings with staff at least monthly	
9. Does the Utility practice any type of “Key Accounts Management”?	
10. Does the General Manager develop the Board by reporting regularly on management practices and activity of surrounding utilities?	
11. Are meetings held with customers, general public and community leaders to discuss utility activity?	
12. View the Headquarters facilities - generally are they in good condition?	

Board of Directors (0 – 48 points) (Utility Staff Member – Board Chairman or Vice-Chair)

Ratings on form are: 0 - Unsatisfactory -- No Records
 1 - Corrective Action Needed -- See Attached Corrective Action Plan
 2 - Acceptable, But Should Be Improved -- See Attached Recommendations
 3 - Satisfactory -- No Additional Action Required at this Time
 NA - Not Applicable

Description / Activity	Rating
1. Does the Board have a full complement of members?	
2. Are all Board positions filled (i.e. Chairman, Vice Chairman, Secretary, Treasurer)?	
3. Does the Board hold regular meetings? (Must be monthly to receive a rating of 3)	
4. Do Board members attend Board meetings regularly?	
5. Are Board meeting minutes prepared following each Board meeting?	
6. Are the previous Board meeting minutes distributed to Board members before the next Board meeting?	
7. Is the Board meeting agenda distributed to Board members before the upcoming Board meeting?	
8. Are Board meeting minutes kept in a safe location?	
9. Have at least 50% of the Board members taken formal Board training?	
10. Are female Board members afforded full participation and rights at the Board meetings?	
11. Does the Board discuss the reports of the General Manager and management staff?	
12. Do standing committees of the Board meet Quarterly?	
13. Does the Board regularly evaluate the General Manager (3 rating must be \leq 1 year)	
14. Do Board members meet with the customers, public and/or political leaders on a regular basis?	
15. Is Board membership open to the customer base?	
16. Board establishes policy and allows General Manager handle day to day operations?	

General Manager (0 – 27 points) (Utility Staff Member – GM)

Ratings on form are: 0 - Unsatisfactory -- No Records
 1 - Corrective Action Needed -- See Attached Corrective Action Plan
 2 - Acceptable, But Should Be Improved -- See Attached Recommendations
 3 - Satisfactory -- No Additional Action Required at this Time
 NA - Not Applicable

Description / Activity	Rating
1. Does the General Manager have an employment agreement with the Board?	
2. Does General Manager have management experience? (Utility=3, Non-utility =2 or less)	
3. Does the General Manager keep all important files (such as legal documents, correspondence, contracts, etc.) in a readily available and secure area at the HQ?	
4. Does the General Manager take steps to address Board concerns in a timely manner?	
5. Does the General Manager evaluate all management staff on a regular basis? (3= \leq yearly)	
6. Are management staff evaluations recorded and filed?	
7. Does the General Manager attend local political / community organization meetings regularly?	
8. Does the General Manager practice disciplinary methods in a fair and evenhanded manner?	
9. Has the General Manager taken formal management training??	

Human Resources (0 – 24 points) (Utility Staff Member – GM or Asst. GM)

Ratings on form are: 0 - Unsatisfactory -- No Records
 1 - Corrective Action Needed -- See Attached Corrective Action Plan
 2 - Acceptable, But Should Be Improved -- See Attached Recommendations
 3 - Satisfactory -- No Additional Action Required at this Time
 NA - Not Applicable

Description / Activity	Rating
1. Does each employee have a written employment agreement?	
2. Does each employee have a written copy of their job description?	
3. Does each employee have individual personnel file stored in a secure area?	
4. Can any employee view his or her position description during work hours?	
5. Are “Performance Appraisals” conducted of each employee, recorded and maintained on file?	
6. Is the turnover of employees high? (3=None in last three years)	
7. Does the General Manager recruit highly trained employees fairly or are “favors” involved?	
8. Does the management staff / customer service representative attend local political / community organization meetings regularly?	

Customer Service (0 – 51 points) (Utility Staff Member – GM or Asst. GM)

Ratings on form are: 0 - Unsatisfactory -- No Records
 1 - Corrective Action Needed -- See Attached Corrective Action Plan
 2 - Acceptable, But Should Be Improved -- See Attached Recommendations
 3 - Satisfactory -- No Additional Action Required at this Time
 NA - Not Applicable

Description / Activity	Rating
1. Are Customers entering the HQ treated in a friendly and respectful manner?	
2. Are Customer wait times kept to a minimum?	
3. Are new connection requests handled in an efficient and effective manner?	
4. Are customer complaints recorded and handled in a fair and timely manner?	
5. Does the customer service staff receive regular training?	
6. Are customer lists current?	
7. How many days from the day of registration to day of connection? 3=< 7	
8. Are customer meetings held regularly?	
9. Are general public meetings held regularly??	
10. Is there activity taking place to educate the community on utility activities?	
11. Are customers surveyed / questioned to evaluate how they feel about the utility?	
12. If customers are surveyed, are the responses positive? (3=Yes-Majority)	
13. If customers are surveyed, does the utility respond in a positive way to concerns?	
14. Is every meter read each month?	
15. Are meter readers rotated to different meter reading routes on a regular basis?	
16. Are meter readers allowed to collect bills from the customers?	
17. Are receipts prepared manually or through an automated (CIS) system?	

Accounting (0 – 87 points) (Utility Staff Member – Accountant)

Ratings on form are: 0 - Unsatisfactory -- No Records
 1 - Corrective Action Needed -- See Attached Corrective Action Plan
 2 - Acceptable, But Should Be Improved -- See Attached Recommendations
 3 - Satisfactory -- No Additional Action Required at this Time
 NA - Not Applicable

Description / Activity	Rating
1. Is an Operating Budget prepared annually?	
2. Is Budget approved and by whom? (Utility Board=3 or Management=2)	
3. Is the Budget approved in advance of the fiscal year or during the year which the Budget represents?	
4. Does the Board and/or General Manager review actual expenditures and compare results to the Budget regularly? (Monthly=3)	
5. Is the Board advised when actual expenditures exceed the Budget by large amounts?	
6. Are the accounting records closed and financial statements produced regularly?	
7. Are accounting records closed and reports submitted for the following month's board mtg.	
8. Does the Utility have written policy and procedure for procurement?	
9. Does the Utility follow all applicable procurement policies and procedures?	
10. Is consumer accounting (billing and collections) computerized and in proper working order?	
11. Accounts receivable and collections regularly reviewed and action taken?	
12. Is the subsidiary ledger reconciled with the general ledger on a regular basis?	
13. Is plant accounting computerized?	
14. Is payroll computerized?	
15. Is there a computerized record of inventory transactions?	
16. Is a physical count of the inventory made?	
17. Is data backed up on a regular basis? (Weekly = 3)	
18. Is computer back-up data kept in a secure area (Off Site=3)?	
19. Is the data processing software for all applications and hardware adequate for Utility operations?	
20. How much time delay is there between reading meters and bill delivery? 3 = ≤ 5 days	
21. Does the General Manager and Management staff use the various reports generated by customer information system (CIS) to improve utility performance (i.e. Form 1, etc.)?	
22. Is there a Petty Cash Fund at the Headquarters and, if so, is money held in a secured area?	
23. Are there specific instructions on how and who handles petty cash and are they followed?	
24. Are cash receipts recorded in the CIS on a timely basis?	
25. Is cash stored overnight in the HQ and, if so, is the cash in a secure location?	
26. When is cash deposited into the bank? (3=daily)	
27. Are Bank Statements and Cash reconciled monthly?	
28. Is the person reconciling Bank Statements different than the person making deposits and withdrawals?	
29. Are all entries supported with documentation that is kept on file?	

Financial (0 – 39 points) (Utility Staff Member – Accountant)

Ratings on form are: 0 – Unsatisfactory – No Records
 1 – Corrective Action Needed – See Attached Corrective Action Plan
 2 – Acceptable, But Should Be Improved – See Attached Recommendations
 3 – Satisfactory – No Additional Action Required at this Time
 NA – Not Applicable

Description / Activity	Rating
1. Are there positive margins for the current fiscal year?	
2. Are there positive margins for the previous fiscal year?	
3. Has kWh Sales has increased compared to previous fiscal year?	
4. Line Loss (3+≤ 1.3 x “Target Percentage”)	
5. Positive Current Ratio for current fiscal year?	
6. Positive Current Ratio for previous fiscal year?	
7. Collection Rate (3=≥ 95%, 2=≥90% and 1=≥85%)	
8. Operation & Maintenance Expenses per kWh Sold is decreasing compared to previous year	
9. Are payments to suppliers made on time?	
10. Are taxes remitted timely?	

Operations & Maintenance (0 – 87 points) (Utility Staff Member – Technical Manager)

Ratings on form are: 0 - Unsatisfactory -- No Records
 1 - Corrective Action Needed -- See Attached Corrective Action Plan
 2 - Acceptable, But Should Be Improved -- See Attached Recommendations
 3 - Satisfactory -- No Additional Action Required at this Time
 NA - Not Applicable

Description / Activity	Rating
1. Are outages reported on a monthly basis and reviewed regularly by management?	
2. Are outages registering a decline in number and duration?	
3. Is generator efficiency increasing quarterly?	
4. Is load factor monitored?	
5. Is load factor increasing each quarter?	
6. Are substations generally neat, with grass trimmed, minimal excess material existing, free from rust, control cabinets free from dust, animals and debris?	
7. Are substation fences and gates grounded, with no gaps greater than three (3) inches?	
8. Is equipment generally free from oil leaks and clean?	
9. Are Power Transformers, other equipment and control cabinets properly grounded?	
10. Are monthly substation inspections completed and monthly inspection reports filled out per Utility instruction?	
11. Are meters tested to ensure accuracy and stored in a clean and secure environment?	
12. Are distribution or transmission structures and lines impacted by untrimmed trees?	
13. Are distribution and transmission structures vertical, guys taut, crossarms and insulators unbroken?	
14. Do at least 95% of the key poles in the distribution primary lines have pole numbers physically placed on the pole in the field? (Key poles are defined as tap poles, junction poles, dead end poles, poles with equipment on them and poles where a change in wire size takes place)?	
15. Are transmission and distribution line patrols completed and documented on a regular basis? (3 = quarterly)	
16. Are corrective measures determined from line inspections (patrols), implemented in a	

timely manner and documented?	
17. Do transmission & distribution structures generally agree with applicable safety codes	
18. Does Utility have all assigned vehicles such as trucks and motorcycles in good working order?	
19. Does Utility have all the necessary specialized equipment, such as equipment for meter testing and repair, electrical testing, data processing hardware, etc.?	
20. Is there a program to routinely test/inspect meters installed?	
21. Is the Warehouse and Storage yard organized?	
22. Are lineman's tools checked on a regular basis? (3=daily / weekly)	
23. Are service orders of all work such as service drops, meter installations, pole changes, transformer installations, street light installations, etc. prepared and filed?	
24. Are meters tested on a regular basis? (3= \leq 3 years)	
25. Is fuel inventory monitored on a regular basis? (3=weekly)	
26. Is there a written safety policy which includes guidelines and procedures?	
27. How long has it been since the last employee/contractor electrical contact or other accident that resulted in one (1) or more deaths or loss of hand, foot or limb? (3= \geq 10 years)	
28. How many employee/contractor electrical contact or other accidents have there been in the past three (3) years that resulted in one (1) or more deaths or loss of hand, foot or limb? (3=none)	
29. How long has it been since the last public electrical contact accident? (3 = $>$ 10 years)	
30. How many public electrical contact accidents have there been in the past 3 years? (3=none)	
31. Are there meetings held with the public to explain electrical safety?	
32. Are employee safety meetings conducted on a regular basis that include all line department personnel, and are documented with written discussions of accidents and near misses leading to changes in policy and procedure?	

Engineering (0 – 27 points) (Utility Staff Member – Technical Manager)

Ratings on form are: 0 - Unsatisfactory -- No Records
 1 - Corrective Action Needed -- See Attached Corrective Action Plan
 2 - Acceptable, But Should Be Improved -- See Attached Recommendations
 3 - Satisfactory -- No Additional Action Required at this Time
 NA - Not Applicable

Description / Activity	Rating
1. Are construction Work Orders issued for all construction projects?	
2. Does each construction work order include a staking sheet?	
3. Are the As-Built Staking Sheets filed in a readily accessible location, in an orderly manner (after records updated) and indexed by year?	
4. Are pole numbers marked on the staking sheets?	
5. Is there a procedure to verify from As-Built Staking Sheets, Transformer Installation & Removal Forms, etc.?	
6. Is the Single Line Diagram current and up to date showing installed kVa and staked / connected customers?	
7. Does the utility have Key Maps and Detail Maps current and up to date?	
8. Does the utility have on file a current, formal Long-Range Plan (LRP) that identifies facilities needed (including transmission lines, grid substations and distribution substations), required funding, and power requirements?	
9. Are Voltage Drop Studies, Fault Current Studies, Technical Loss Studies, and Power Factor Studies current and up to date?	

Utility _____

Statistics

Description	Number
KM – Distribution Line	
KM – Transmission Line	
Number of poles on system	
Number of meters on system	
Number of transformers on system	
Sum of transformer capacity on system (kVa)	
Sum of substation peak demands	
Average number of customers	
Total Operation Expense for fiscal year	
Total Maintenance Expense for fiscal year	
Total Employee Payroll for fiscal year	