



SALT RIVER ELECTRIC

A Touchstone Energy Cooperative 

111 West Brashear Avenue • Bardstown, Kentucky 40004
(502) 348-3931 • (502) 955-9732 • Fax (502) 348-1993

RECEIVED

DEC 16 2019

PUBLIC SERVICE
COMMISSION

December 12, 2019

Ms. Gwen R. Pinson
Executive Director
KY Public Service Commission
PO Box 615
Frankfort KY 40602-0615

Re: Case No. 2019-00399

Dear Ms. Pinson:

Enclosed is the original and ten (10) copies of Salt River Electric's responses to The Attorney General's Initial Data Request for Information In the Matter of Application of Salt River Electric Corporation for an Order Issuing a Certificate of Public Convenience and Necessity to Construct an Advanced Metering Infrastructure System (AMI) by Order dated November 26, 2019.

If you have any questions, please contact this office.

Sincerely,



Tim Sharp
President and CEO

Enclosure

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

RECEIVED

DEC 16 2019

PUBLIC SERVICE
COMMISSION

In the Matter of:

APPLICATION OF SALT RIVER ELECTRIC)
COOPERATIVE CORPORATION FOR AN)
ORDER ISSUING A CERTIFICATE OF PUBLIC) CASE No.
CONVENIENCE AND NECESSITY TO) 2019-00399
CONSTRUCT AN ADVANCED METERING)
INFRASTRUCTURE SYSTEM (AMI) PURSUANT)
TO 807 KAR 5:001 AND KRS 278.020

THE RESPONSE OF SALT RIVER ELECTRIC COOPERATIVE CORPORATION
TO ATTORNEY GENERAL'S INITIAL REQUEST FOR INFORMATION



Salt River Electric Cooperative Corporation
111 West Brashear Avenue
Bardstown KY 40004
Tel. (502) 348-3931

CASE NO 2019-00399

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COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF SALT)
RIVER ELECTRIC)
COOPERATIVE)
CORPORATION FOR AN)
ORDER ISSUING A)
CERTIFICATE OF)
PUBLIC CONVEINENCE)
AND NECESSITY)

CASE NO. 2019-00399

CERTIFICATE OF PREPARATION

STATE OF KENTUCKY
COUNTY OF NELSON

Timothy J. Sharp, being duly sworn, states that he supervised the preparation of responses to The Attorney General’s Initial Data Request for Information dated received December 02, 2019 in the above-named case, and that the matters and items set forth therein are true and accurate to the best of his knowledge, information and belief, formed after reasonable inquiry.

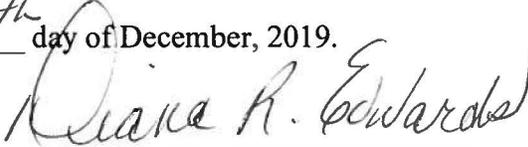
SALT RIVER ELECTRIC COOPERATIVE CORP.



Timothy J. Sharp PE
President and Chief Operating Officer

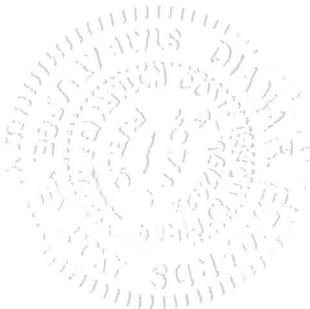
STATE OF KENTUCKY
COUNTY OF NELSON

Subscribed and sworn before me on this 12th day of December, 2019.



Diane R. Edwards

Notary Public, KY State at Large
My commission expires: July 05, 2023
I.D. No. 626327



COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF SALT RIVER ELECTRIC)
COOPERATIVE CORPORATION FOR AN)
ORDER ISSUING A CERTIFICATE OF PUBLIC) CASE No.
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CONSTRUCT AN ADVANCED METERING)
INFRASTRUCTURE SYSTEM (AMI) PURSUANT)
TO 807 KAR 5:001 AND KRS 278.020)

THE RESPONSE OF SALT RIVER ELECTRIC COOPERATIVE CORPORATION
TO ATTORNEY GENERAL'S INITIAL REQUEST FOR INFORMATION

 Salt River Electric Cooperative Corporation
111 West Brashear Avenue
Bardstown KY 40004
Tel. (502) 348-3931

1. Reference Application Exhibit C, "Aclara Reoccurring Costs." Explain the meaning of the term "support increase."

Response:

Support increase is an industry norm where the price for support increases at a set percent after the initial contract.

(Response prepared by Melissa Hite)

2. Provide any re-occurring costs associated with SRECC's current metering system.

Response:

Currently Salt River incurs software/hardware support and backhaul cost with the Landis Gyr system

(Response prepared by Melissa Hite)

3. Provide SRECC's current fees for connections, disconnections, and reconnections, with references to where they can be found in SRECC's tariff.
 - a. Provide all cost support for these fees.

Response:

Salt River Electric does not have fees associated with routine connections, disconnections, or reconnections.

(Response prepared by Timothy J Sharp)

4. Assuming the Commission grants a CPCN for the AMI system, provide the proposed fees for each of connections, disconnections, and reconnections which SRECC proposes, or will propose, once the AMI system is operational.
 - a. Provide all cost support for these fees.
 - b. If SRECC does not have this data available at this time, is the Company willing to commit to providing it?

Response:

Salt River Electric does not plan to charge for routine connections, disconnections, or reconnections.

(Response prepared by Timothy J Sharp)

5. Explain whether all, or just some, of SRECC's proposed new meters will be capable of remote connects, disconnects and reconnects.
- a. If not all of the new meters will have these capabilities, identify and discuss the procedures and/or policies the company will have in place to determine which customers receive the remote connect/disconnect features in their AMI meters.
- (i) Will customers who receive the remote connect/disconnect features in their AMI meters have the right to opt-in and/or opt-out? If not, why not?
 - (ii) Does the company anticipate that those customers who receive meters with the remote connect/disconnect functionality will experience a higher rate of disconnects than those meters without this functionality? Explain.

Response:

All self-contained 200 amp meters will have remote connect/disconnect capabilities. Industrial, large commercial and some large residential locations requiring class 320 amp or instrument type metering will not have remote connect/disconnect capabilities.

(Response prepared by Timothy J Sharp)

6. Explain whether SRECC's existing meters are capable of one-way communication (AMR), or two-way communication (AMI).

Response:

Salt River Electric's current system has limited two way communication primarily used for performing reconnects and disconnects remotely.

(Response prepared by Timothy J Sharp)

7. Refer to PSC DR 1-8. In the event the existing TS2 meters have not been fully depreciated, does SRECC agree that the undepreciated sums represent stranded costs?

Response:

Once the conversion to a new system is complete, Salt River Electric anticipates that any remaining book value will need to be expensed to accurately represent the current system.

(Response prepared by Timothy J Sharp)

8. Refer to PSC DR 1-9. If not already included in SRECC's response to this data request, provide the estimated life span of the battery powering the meter.

Response:

The meters will have no battery. All data is written to non-volatile memory.

(Response prepared by Melissa Hite)

9. Regarding the battery that will power the new meters, describe how frequently the Company intends to "ping" the meters.

Response:

There is no battery, so "pinging" the meter has no effect.

(Response prepared by Melissa Hite)

10. Explain how the new AMI system will work with the Company's existing SCADA, outage management, and customer information systems. If any of those systems will require upgrades / replacement to meet compatibility with the new meter system, explain in full detail and provide cost estimates.

Response:

Integration will be multi-speak, however some minimal changes will need to be made to communicate with the Aclara. Support with each vendor is expected to cover the costs of these changes.

(Response prepared by Melissa Hite)

11. Explain whether the new meters will have a separate RF module, and if so, whether the module is capable of being replaced separately from the meter.

Response:

Yes, the new meters will have a separate communication module which can be independently upgraded and/or replaced.

(Response prepared by Chase Mills)

12. Provide the docket number in which SRECC obtained Commission approval to convert from electro-mechanical meters to its current metering infrastructure.

Response:

Salt River Electric began the conversion to a Power Line Carrier system in 1998 and subsequently moved to the latest generation of that product. The migration was considered a part of the ordinary course of business and submitted as part of the ongoing work plans during that period.

(Response prepared by Timothy J Sharp)

- a. Provide the total costs SRECC incurred in its conversion from electromechanical meters to its current meters.

Response:

The latest metering system upgrade began in 2006 and since that time approximately \$4.9 million has been spent for materials associated with the project

(Response prepared by Timothy J Sharp)

- b. Provide a complete description of all benefits that both SRECC and its ratepayers received in the conversion from electromechanical meters to its current meters. Please include in this description any cost savings for SRECC ratepayers and a quantification of such savings, contrasted with the total costs of this conversion.

Response:

The primary quantifiable benefit from using the current system has been the savings from the reassignment of the workforce over the last 20 years. When Salt River Electric began the change in meter reading, we had 6 employees dedicated to field readings. Using the same read ratios, we would currently need 10 employees to read the meters in the field. Salt River Electric estimates that yearly savings for this reduction alone is a minimum of \$750,000/yr.

Other less quantifiable benefits are a reduction in load loss, a reduction in metering errors, information for customer usage, outage restoration data, phasing data, remote reconnects/disconnects, and theft detection. The intangible benefits to our daily operations are numerous and have becoming engrain in the process to the point that they are accepted as the norm. The benefits associated with the current system are some of the reasons Salt River Electric has been able to for an extended period without a distribution rate increase.

(Response prepared by Timothy J Sharp)

- c. In that prior docket, did SRECC incur any stranded costs, or projections thereof, incurred for the conversion from electromechanical meters to its current meters? If so, please identify all such stranded costs or other related costs.

Response:

Salt River Electric is not aware of any material stranded costs associated with the conversion from electromechanical meters to its current meters.

(Response prepared by Timothy J Sharp)

13. Explain whether the new meters would be capable of receiving upgrades. If so, explain how upgrades would be conducted.

Response:

Yes, the new meters will be able to receive upgrades remotely.

(Response prepared by Chase Mills)

- a. Would there be any limitation on the number of meter upgrades that could be accommodated without having to replace the meter, and/or the battery?

Response:

No, there is no limit to the number of meter upgrades.

(Response prepared by Chase Mills)

14. Confirm that the RF system SRECC has selected is fully compatible with the Company's existing TS2 meters.

Response:

The Aclara and Landis Gyr systems are two complete separate systems that will operate in parallel fashion until the Landis Gyr system is no longer needed.

(Response prepared by Melissa Hite)

15. Explain whether the RF system would be compatible with any other meter manufacturer, or whether only Aclara meters would work with the chosen RF system.

Response:

Yes, as long as the meter includes the Aclara communications module.

(Response prepared by Chase Mills)

16. Refer to p. 13 of the Application, which begins with the following header: "RF Data Collector Unit Cut Sheet." Explain what the following sentence means: "It is an innovative, state-of-the-art system that not only reads meters but also contains smart-infrastructure devices that monitor additional points on utility distribution networks."

- a. Identify the "Additional Points" on the distribution system that the system is capable of monitoring.

Response:

The Aclara RF system is capable communicating with other distribution equipment such as breakers, reclosers, regulators, capacitors, distributed generation resources, load tap changers, smart inverters, fault circuit indications, and other communications capable devices.

(Response prepared by Chase Mills)

- b. Explain what type(s) of monitoring this statement refers to.

Response:

Monitoring refers to the ability to monitor the status of SCADA enabled distribution equipment.

(Response prepared by Chase Mills)

17. Assuming the Commission approves the application, explain whether SRECC would be able to utilize any components of its existing "backhaul network" even after deployment system-wide is achieved, or if the Company will be required to purchase an entirely new backhaul network.

Response:

The existing "backhaul network" is inside each substation. The Aclara RF system is not substation dependent. As a result of that, the existing backhaul services will be discontinued and new service utilized. The cost of these services is included in the proposal.

(Response prepared by Melissa Hite)

- a. Explain whether the new system is at all compatible with other manufacturers' systems, and if so, to what extent.

Response:

No, the Aclara system is not compatible with other manufacturers systems

(Response prepared by Melissa Hite)

- b. Explain whether the backhaul system is capable of being upgraded, and if so, what type(s) of upgrades it can accommodate.

Response:

The Acalara backhaul will be cellular. Upgrades are dependent on the cellular technology.

(Response prepared by Melissa Hite)

18. Refer to Application Exhibit 4. Explain the functions and capabilities of SRECC's "Meter Data Management System."

Response:

Meter Data Management at Salt River is a collection point of meter readings. The system is the backbone that allows our members to login to a portal and view usage information and power the prepay program. This information is also available internally for our employees to

assist members and review information.

(Response prepared by Melissa Hite)

19. Refer to Application Exhibit 4, wherein the Company discusses integration of usage information with the Customer Information System." Explain whether any changes of any type or sort will be required to the Company's CIS as a result of the AMI implementation. If any, provide a description and cost projections.

Response:

Integration will be multi-speak, however some minimal changes will need to be made to communicate with the Aclara. Support with the CIS vendor is expected to cover the costs of these changes.

(Response prepared by Melissa Hite)

20. Refer to Application Exhibit 4, wherein the Company states that direct load control will be offered to all customers.

- a. Explain whether the load control program will be the subject of a future filing with the Commission.

Response:

Salt River Electric currently has a load control program and does not anticipate filing any changes to the program associated with this conversion.

- b. If the Company has any details of the direct load control program available at this time, provide them, including any projections of monetary savings for participating customers.

Response:

See 20. a. (above)

(Response prepared by Timothy J Sharp)

- c. Explain whether the load control program could provide any benefits to East Kentucky

Power Cooperative, and if so, how.

Response:

See 20.a. (above)

(Response prepared by Timothy J Sharp)

- d. Identify the DSM programs that SRECC either currently has in place, or that it plans on having in place, that can utilize the proposed AMI technology.

Response:

See 20.a. (above)

(Response prepared by Timothy J Sharp)

21. Refer to Application Exhibit 4, wherein the Company states that all RF meters are capable of supporting alternative rate structures such as time of use, real-time pricing, on peak / off peak, and time of day rates.

- a. Does the Company have plans to institute any or all such rate structures?

Response:

Salt River currently has a time of use rate. Salt River does not have any plans to add additional rates.

(Response prepared by Timothy J Sharp)

- b. Do the meters also have the capability of supporting peak-time rebate rates? If so, explain whether the Company is willing to consider offering one.

Response:

See 21. a. (above)

(Response prepared by Timothy J Sharp)

22. Refer to Application Exhibit 4, wherein the Company states that the Company will be able to continue to offer a Pre-Pay metering tariff to all residential consumers.

- a. State how many customers currently participate in the company's pre-pay metering system;

Response:

Salt River currently has 1591 members participating in the prepay program.

(Response prepared by Melissa Hite)

- b. Provide an estimate of how many additional customers the company anticipates will enroll in the pre-pay metering system once the AMI project is completed; and

Response:

Salt River does not expect there to be a change in the rate members apply for prepay as a result of the change to Aclara.

(Response prepared by Melissa Hite)

- c. Explain whether any existing equipment or other infrastructure used for the existing Pre-Pay program would be retired as a result of implementing the AMI program. If so, provide cost estimates, and explain how the Company would recover those costs, and when.

Response:

The only needed equipment for prepay is the meter. Meter retirement is discussed in response to question 7.

(Response prepared by Melissa Hite)

23. Refer to Application Exhibit 4, wherein the Company states that the RF infrastructure has the capability to communicate with various types of distribution equipment such as regulators, reclosers, etc.

a. Will the RF infrastructure be compatible with the distribution equipment of other manufacturers, or would those capabilities remain viable only if they are manufactured by Aclara?

Response:

Yes, it will be able to communicate with other manufacturer's equipment but will require an Aclara communications module.

(Response prepared by Chase Mills)

24. Reference Application Exhibit E. Provide a copy of the Company's 2019-2022 Construction Work Plan identified in this document.

Response:

Please see attachment

(Response prepared by Timothy J Sharp)

25. Confirm that if the Commission approves all or a portion of SRECC's request in the instant case, the company will have to pass all costs associated with the CPCN through its base rates.

a. Provide an approximate date for the filing of the Company's next base rate case.

Response:

Salt River Electric does not have plans to file a base rate case in the foreseeable future.

(Response prepared by Timothy J Sharp)

26. Will any of SRECC's substations have to undergo any upgrades or conversions in order for the AMI program to be fully implemented? If so:

a. Provide a description;

Response:

No upgrades will be required in substations

b. Provide all cost projections, and state whether any such costs would be in addition to the projected total project cost provided in the application; and

Response:

No upgrades are required

c. Provide the total costs for early retirements of substation infrastructure resulting from replacement of that infrastructure with infrastructure associated with the Company's AMI program.

Response:

Current AMI substation equipment will be retired at the conclusion of the Aclara AMI program within 4 years following KPSC approval of the program. Salt River would like to recover the undepreciated cost of the substation equipment by escalating the depreciation rate to the commission approved 15 year rate instead of the 25 year rate currently being implemented

(Response prepared by Chase Mills)

27. Provide the following:

a. a per-meter breakdown of the total cost for the CPCN application, by ratepayer class;

Response:

Residential \$109.81

Commercial \$146.08

Industrial \$235.24

(Response prepared by Timothy J Sharp)

b. a per-meter breakdown of benefits the company expects each ratepayer to receive;

Response:

See answer 12.b. above

c. With regard to projected benefits, identify whether the savings are based on operational expenses, and if so, provide the type of operational expense savings.

Response:

See answer 12.b. above

28. Does the project's estimated cost include any and all interest and other costs associated with the applicable RUS loan? If not, please provide those estimated sums.

Response:

The project's estimated cost consists of the cost to replace the existing metering system. The RUS loan will cover the cost incurred for the metering system. Salt River will also incur interest expense on the borrowed funds from RUS. This interest expense amount will be determined based on the variable interest rate at the time the money is borrowed. The current rate on borrowed funds is 1.92%.

(Response prepared by Timothy J Sharp)

29. State whether the Company will require any of the following additional infrastructure items in order for its AMI program to function properly within its service territory, and if so, please provide a cost estimate for each item, and for any other item of infrastructure not listed below:

- a. software servers;
- b. network load balancers;
- c. middleware;
- d. computer networking infrastructure;
- e. network backhaul;
- f. cellular towers;
- g. collectors and/or routers.

Response:

Aclara does require two software servers, each will be virtual servers. Salt River has a Data Center license of windows server, so no additional cost will be incurred for the operating system on these servers. The application to run Aclara One is included in the Aclara proposal. The backhaul is also included in the proposal. At this time, Salt River has adequate storage space to support the Aclara install.

(Response prepared by Melissa Hite)

30. Describe the technology components, whether software, firmware or hardware, which the company either has deployed or will deploy to insure cybersecurity.

Response:

Salt River utilizes firewalls, VLANS, endpoint security, and unified security management systems to insure cybersecurity.

(Response prepared by Melissa Hite)

31. If the Commission should approve all or any portion of SRECC's application, has the Company decided what measurable and enforceable performance metrics it would like to come about as a result of the proposed program? If so, please identify them.

Response:

Salt River Electric considers this a necessary but routine part of the business. The replacement of the current system is only being undertaken because of the difficulty in maintaining and operating the current system in the future. As with any newer technology, we expect benefits in improved efficiency and internal processes. However, we have not set forth any measurable performance metrics.

(Response prepared by Timothy J Sharp)

32. Describe the measures SRECC is proposing to take to insure that the technology it has chosen does not become obsolete.

- a. Has the Company factored into its cost projections the costs for software, firmware and/or hardware upgrades necessary to satisfy any potential standards from the National Institute for Standards and Technology (KIST)? If not, provide a cost projection that includes these estimates.

Response:

Yes, Salt River has considered the needed upgrades. The AMI updates are included as part of Aclara's maintenance, the hardware updates are included as part of normal IT system maintenance.

(Response prepared by Melissa Hite)

- b. Is the Company aware that in some instances, customers of utilities in other states have had to pay hundreds of millions of dollars in stranded costs for obsolete smart meters, some of which were never even installed?

Response:

Yes

(Response prepared by Chase Mills)

- c. In what manner will the meters SRECC has chosen to install be capable of accepting upgrades to software, firmware, and/or hardware?

Response:

Software and firmware upgrades will be possible remotely. It will be possible to replace or upgrade the communication module.

(Response prepared by Chase Mills)

33. To what extent will the proposed AMI technology be interoperable with SRECC's other systems, including but not limited to: IT office systems, metering systems, SCADA and DSM systems, outage management systems, analytic systems, external partners and services. For purposes of this question, the term "interoperable" means the ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged.

Response:

Aclara participates in multi-speak and Salt River has confirmed Aclara currently integrates with our CIS, OMS, Scada, etc. Exchange of information with these systems should be seamless.

(Response prepared by Melissa Hite)

34. How does SRECC propose to reflect operational benefits of the new AMI program in its accounting? Would the company agree to provide a sur-credit of all such benefits on a per-meter basis? If not, why not?

Response:

Salt River Electric considers this a necessary but routine part of the business and both costs and benefits associated with this are reflected in the cost of service through rates. Any savings that are realized will ultimately be returned to the customers in the form of a capital credit at a future distribution.

(Response prepared by Timothy J Sharp)

35. Explain whether the proposed metering system will allow customers the ability to access their electricity consumption, e.g., such as through an internet portal.

Response:

Salt River currently offers a portal utilizing our Meter Data Management System that allows our members to view consumption via the internet or app. This will not change with the adoption of Aclara. The member facing components will remain consistent to what they are accustomed to seeing.

(Response prepared by Melissa Hite)

36. Provide estimates of any cost savings for:

- a. reduced line loss;
- b. reduced outage management expense;
- c. reduced energy theft;
- d. remote connects / disconnects; and
- e. avoidable meter re-reads

Response:

(A) Upgrading to Aclara will not provide any incremental reductions in line losses.

(B) The ability to ping meters following outages will provide a marginal benefit during storms. The current AMI system can take up to 20 minutes to indicate if a customer's power has been restored. Aclara will provide verification within seconds.

(C) Migrating from Salt River's existing AMI system to Aclara will not provide any incremental reductions in energy theft.

(D) Salt River currently has 5,173 remote meters and 1,594 prepay meters. Following deployment of Aclara's AMI system, all class 2 meters will be capable of remote connects/disconnects. This will save Salt River approximately 6,000 service orders per year requiring meter readers to physically visit the meter location and perform a disconnect/reconnect. Existing labor used to perform this task will be reassigned to other task.

(E) The Aclara system will save Salt River from performing approximately 1,000 meter re-reads annually. Existing labor used to perform this task will be reassigned to other task.

(Response prepared by Chase Mills)

2019-2022

CONSTRUCTION WORK PLAN

FOR

SALT RIVER ELECTRIC COOPERATIVE CORPORATION

**KENTUCKY 21 - NELSON
BARDSTOWN, KENTUCKY**

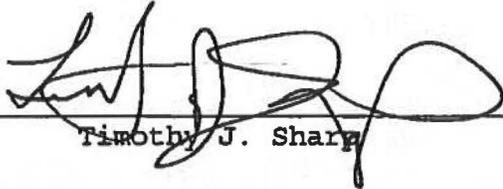
Prepared by:

**SALT RIVER ENGINEERING DEPARTMENT
Bardstown, Kentucky
December 2018**

I hereby certify that this 2019-2022 Construction Work Plan was prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the State of Kentucky. Registration No. 20741

2/7/19
(Date)

By:


Timothy J. Sharp

SEAL



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PURPOSE OF REPORT

This report documents the 2018 engineering analysis and summarizes the proposed construction for Salt River Electric Cooperative Corporation's (Salt River) electric distribution system for the four-year planning period of 2019 thru 2022.

The report also provides engineering support, in the form of descriptions, costs, and justification of required new facilities, for a loan application to finance the proposed construction program.

RESULTS OF PROPOSED CONSTRUCTION

Upon completion of construction of the facilities proposed herein, the system will provide adequate and dependable service to 56739 total residential, farm, small commercial, and large industrial consumers. The residential/farm consumers will have an average of 1134 KWH per consumer per month. The 15 large power and special loads are provided for on an individual basis. It is estimated there will be 3150 idle services.

GENERAL BASIS OF STUDY

The 2022 projected number of consumers and total peak system load were from the cooperative's 2018 Power Requirements Study (PRS) as approved by RUS. This report was prepared by Salt River.

The construction recommended herein is in accordance with the LRP which was completed in 1997. Salt River's February 2017 Operations and Maintenance review, (Review Rating Summary; REA Form 300), was used to determine construction required to replace physically deteriorated equipment and material, upgrade portions of the system to conform with code or safety requirements, and/or improve reliability or quality of service.

New distribution, transmission and power supply construction requirements were considered simultaneously as a "one system" approach for the orderly and economical development of the total system. All of the proposed construction and recommendations herein, relative to power supply and delivery, were discussed with the cooperative's power supplier, East Kentucky Power Cooperative (EKPC).

A complete list of the lines and equipment and their estimated cost, (all based on recent historical data) required to serve an additional 5023 members. Salt River has also included a similar list and cost of necessary service upgrades to existing members is also included.

An analysis, using as a basis RUS guidelines and the design criteria herein, of thermal loading, voltages, physical conditions and reliability was performed on all of the substations, distribution lines and major equipment of the existing system. Milsoft Distribution Analysis was used to analyze the distribution circuits for the projected peak of 328.8 KW for 2023 was modeled in the system. For each deficiency that was determined, alternate solutions were investigated and economically evaluated, so that the most cost effective construction, if required, could be proposed. This analysis was performed using data from 2018 PRS (normal weather projections).

DESCRIPTION OF SERVICE AREA

Salt River Electric Cooperative Corporation (Salt River) is located in Central Kentucky just south of Louisville, Ky. The location and proximity of its service territory to Louisville make it's service area a haven for city workers wishing to reside away from the congestion of the Louisville/Jefferson County area. In addition the lower tax rates and highly regarded school systems of Bullitt, Nelson and Spencer Counties lure new customers.

The cooperative serves major portions of Nelson, Spencer, Bullitt, Washington and parts of Larue, Jefferson, Shelby, Mercer, Anderson and Marion Counties. The headquarters is located in Bardstown (Nelson County) with branch offices in Shepherdsville (Bullitt County), Springfield (Washington County) and Taylorsville (Spencer County).

Washington and Spencer counties served by Salt River are rural with a high percentage of people relying on agricultural enterprises, manufacturing and government services for income. Agricultural products include tobacco, dairy, corn and swine. Tobacco and grain farms are the prime sources of farm income. A number of commercial and industrial areas are within the service territory with a diversity of product lines. Moderate growth is projected for new commercial, small manufacturing and residential consumers throughout most of Salt River's system. TWENTY TWO (22) medium sized (between 1 to 10 MW Demand) industries are currently being served with good potential for future growth existing in Bullitt County and commercial parks surrounding the cities of Bardstown and Springfield.

KEY SYSTEM OPERATING DATA

The following data is from SALT RIVER'S Year end RUS Form 7

DECEMBER 2016:

Number of consumers (year end total)	50,441
MWH Purchased	1,156,873
MWH Sold	1,207,066
Maximum KW Demand	249,260
Total Utility Plant	\$151,281,286
Consumers/Mile	12.05

DECEMBER 2017:

Number of consumers (year end total)	51,349
MWH Purchased	1,184,476
MWH Sold	1,140,882
Maximum KW Demand	243,529
Total Utility Plant	\$155,050,644
Consumers/Mile	12.13

The cooperative has distribution circuits totaling 4232 miles. All circuits are operated at 7.2/12.47 Kilovolts (KV), grounded Wye. Installed overhead conductor sizes range from 8A to 795 spacer cable. With the majority of the three phase overhead line conductor being 1/0 Copper and single phase overhead lines being 6ACWC. All new three phase lines are built of 1/0 ACSR or 336.4 MCM ACSR or

397 spacer cable or 795 spacer cable depending upon the economic conductor selection guide of Salt River. All new single phase line are built of #2 ACSR and 1/0 ACSR conductor. All new underground primary construction is 220 mil 1/0 or 4/0 stranded aluminum conductor which is installed entirely within underground duct systems.

POWER SUPPLY

East Kentucky Power Cooperative (EKPC) provides all power and energy needs to Salt River, plus 15 other distribution cooperatives. A map of EKPC's service area is located in the back of this report. EKPC is an RUS financed G&T cooperative with offices in Winchester, KY.

EKPC constructs, owns, operates, and maintains all thirty of the distribution substations. EKPC also constructs and maintains the 69, 161 and 345 KV transmission lines which supply Salt River's distribution system. The northern district of the territory is served off of the 33 or 69 KV system of Louisville Gas and Electric which wheels power from EKP to Salt River. All power transactions are handled by EKP's Load Dispatch Department.

ANALYSIS OF 1997 LONG RANGE PLAN

Salt River Electric Cooperative Corporation's 1997 Long-Range Plan (LRP) was prepared by Southern Engineering.

The LRP recommends that the distribution system will continue to operate predominately at 7.2/12.47 KV. In addition, the LRP addresses the replacement of deteriorated, or aged, distribution plant that will be included in future CWP's. The projects in the 2019-2022 CWP are consistent with the LRP.

ANALYSIS OF 2017 OPERATIONS AND MAINTENANCE SURVEY

In December 2017 an Operations and Maintenance Survey (O & M Survey) of the system was conducted.

Transmission lines and distribution substations are owned and maintained by East Kentucky Power Cooperative (EKP) and have been excluded from the rating process.

In general, the overhead and underground distribution facilities were found to be in satisfactory condition. There is an on-going program to replace old deteriorated conductor as part of the Long-Range Plan. Approximately 20 miles will be replaced in this work plan.

A program has been implemented to reduce outages, with a corporate goal of 1.5 hours/consumer. The use of vacuum OCR's will increase reliability and reduce maintenance costs. Autobooters have been phased out because of unreliability. The use of fused cutouts and an improved sectionalizing scheme will also improve reliability. Right-of way is cleared on a 5 year cycle including spraying.

SECTIONALIZING STUDIES

Salt River Electric performs annual or when the system changes sectionalizing studies to calculate the coordination data for system protection. The philosophy includes removing the fast trips from the substation ocrs and raising ground trip values as high as 200 amps where minimum trips will allow. This also allows the use of larger downline ocrs to handle the larger loads that Salt River Electric is experiencing. Better coordination between ocrs is achieved by this philosophy. The fault current analysis from this study is utilized by engineering to locate fault information provided by SCADA.

A list has been made of OCR's, fuses, switches and other devices required to adequately protect the entire system. Fused cutouts will be added to all three phase lines at taps and transformers where none exist to minimize outages, improve troubleshooting and minimize blinking lights.

In addition to the above new protection requirements, annually, one third of the system's OCR's are removed, inspected, maintained, (cleaned, tested and serviced), and re-installed.

Copies of the data, calculations and final results of the above circuit protection studies are utilized by Salt River's Engineering Department on a daily basis for coordination decisions. Also retained are Salt River's OCR maintenance and test reports.

Partner software is being utilized in the dispatch center and allows the engineering department to know how many customers are being served from any point in the system. With this information we can foresee problems with load before they arise or better analyze cold load problems as they occur.

SALT RIVER ELECTRIC DESIGN CRITERIA

FOR

2019-2022 CONSTRUCTION WORK PLAN

DECEMBER 2018

Each of the following design criteria items was reviewed by Mike Norman, RUS General Field Representative in December 2018. Mike concurred with the following statements.

All construction proposed within this document is required to meet the following minimum standards for voltage, thermal loading conditions, safety and system reliability. Conditions could require corrective action to exceed minimum standards.

1. The maximum voltage drop on primary distribution lines not to exceed 8 volts, (125 volt base), after re-regulation.
2. Primary conductors are not to be loaded over 90% of their thermal rating. These conductors will be flagged at 80% in the voltage drop studies.
3. Equipment will have maximum loading not to exceed the following nameplate percentages:

<u>EQUIPMENT</u>	<u>WINTER</u>	<u>SUMMER</u>
a. Power Transformers	130%	100%
b. Regulators	130%	100%
c. Reclosers	100%	100%
d. Line Fuses	80%	80%

4. Conductors (and associated poles and hardware as required) will be built, rebuilt, and or relocated if they are found to be

unsafe or fail to meet applicable NESC requirements.

5. Poles and/or crossarms to be replaced if found to be physically deteriorated by visual inspection and/or tests.
6. All new distribution lines to be designed and built according to RUS standard construction specifications and guidelines.
7. New lines and line conversions are to be built according to the standard primary voltage levels as recommended in the Long Range Plan.
8. New primary conductor sizes to be determined on a case by case basis using the Economic Conductor Sizing Computer Program and presently known constraints and variables. The final proposed conductor may be modified to conform with Salt River's Standard sizes and recommendations of the Long Range Plan.
9. All underground circuits are to be designed and installed to allow for a loop feed configuration with faulted circuit indicators for system reliability.

It is recommended that proposed construction items required for voltage improvements whose forecast need is based solely on calculated voltage from computerized circuit analysis printouts, not be authorized for construction until such calculated voltages are measured in the field and extrapolated to peak loading period and then compared to calculated values to corroborate that actual voltages are below the above minimum design levels.

SALT RIVER ELECTRIC COOPERATIVE

SUMMARY OF OUTAGES

CAUSE	2013	2014	2015	2016	2017	5 YEAR AVERAGE
POWER SUPPLY	0.23	0.23	0.09	0.09	0.10	0.15
EXTREME STORM	0.37	1.31	0.29	0.00	0.87	0.57
PREARRANGED	0.00	0.02	0.04	0.05	0.03	0.03
ALL OTHERS	1.23	1.11	1.35	0.93	0.89	1.10
TOTAL	1.83	2.67	1.77	1.07	1.89	1.85

Accts > 1,000 Kva

American Fuji	85178002
Beams	98000001
Marathon-Ashland	90267001
Gordons	157555004
Sabert	187749002
ICS & ASD Healthcare	159446002
Heaven Hill	98003001
Bullitt Co. Stone	96000004
Cedar Creek	192084004
Flaget Hospital	77453003
Amazon	203784004
Amazon	203784014
Retail Convergence	202678001
Magna Seating	199552001
Medimmune	157732001
Flowers Baking Co.	191770001
Best Buy	165442003
Gilt	196828001
Tower Automotive	210272001
Radial	158335002
Eby-Brown Co LLC	217721001
Thai Summit	219364001

ACTUAL CONVERSION COST

(HISTORICAL DATA)

WORK ORDER NUMBER	JOB DESCRIPTION	MILES	TOTAL COST	COST PER MILE	COST PER FOOT	
054115	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	1.80	\$81,485	\$45,258	\$8.57	
030385	3 PHASE 110 CU TO D.C. 338 4 ACSR	1.00	\$33,044	\$33,044	\$10.05	
040323	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	2.50	\$90,313	\$36,205	\$8.88	
031133	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	6.20	\$126,335	\$20,200	\$4.60	
040334	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	2.30	\$77,825	\$33,707	\$8.38	
040312	NEW LINE 3 PHASE 336 4 ACSR	1.50	\$33,823	\$22,416	\$4.28	
050265	NEW LINE 3 PHASE 336 4 ACSR	0.80	\$30,148	\$37,643	\$8.52	
054700	3 PHASE 110 CU TO D.C. 336 4 ACSR	2.20	\$118,000	\$53,273	\$9.90	
040039	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	2.70	\$92,538	\$34,274	\$8.48	
060484	3 PHASE 110 CU TO 336 4 ACSR	0.20	\$373,725	\$40,369	\$7.84	DARWIN THOMAS FEEDER
070042	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	1.20	\$84,719	\$30,163	\$9.50	
064223	1 PHASE 8ACWC TO 3 PHASE 336 4 ACSR	0.02	\$51,805	\$56,158	\$10.64	ARMSTRONG LANE
072207	3 PHASE 110 CU TO 336 4 ACSR	2.75	\$173,138	\$62,959	\$11.02	
060142	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	1.35	\$82,954	\$48,033	\$8.83	ALLEN PLACE NORTH
070005	3 PHASE 110 CU TO 336 4 ACSR	2.40	\$181,828	\$73,027	\$18.83	
060245	2 PHASE 4A CWC TO 336 4 ACSR	0.83	\$38,290	\$48,133	\$8.74	
060075	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	3.78	\$158,412	\$41,808	\$7.84	
070302	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	0.94	\$34,348	\$30,538	\$6.82	
080096	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	3.27	\$129,840	\$39,818	\$7.80	
080283	1 PHASE 8A CWC TO 1 PHASE 110 ACSR	0.80	\$10,297	\$14,023	\$2.83	
080045	1 PHASE 8A CWC TO 1 PHASE 110 ACSR	3.88	\$122,273	\$32,177	\$8.90	CLOYD LANE
070303	NEW LINE 3 PHASE 336 4 ACSR	1.67	\$51,800	\$48,224	\$9.13	
220143	3 PHASE 8ACWC TO 3 PHASE 336 4 ACSR	1.94	\$104,762	\$54,018	\$10.23	STRINGER LANE
210157	3 PHASE 2A CU TO 336 4 ACSR	3.60	\$205,644	\$73,762	\$13.07	HWY 480 CONVERSION
060085	NEW LINE 3 PHASE 110 ACSR	0.54	\$18,447	\$30,013	\$6.82	NALLEY & GIBSON
200144	NEW LINE 3 PHASE 336 4 ACSR	1.58	\$41,145	\$32,016	\$9.85	CEDAR GROVE IND PARK
080264	1 PHASE 8ACWC TO D.C. 397 SPACER(1.83 MI)	6.77	\$388,517	\$80,748	\$11.51	FREDRICKSBURG SUB CONVERSION
210030	NEW LINE D.C. 397 SPACER (1.87 MI)	5.11	\$258,380	\$48,998	\$9.00	SPRINGFIELD IND PARK
	NEW LINE 3 PHASE 336 4 ACSR (4.84 MI)				\$0.00	
201183	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	0.88	\$27,804	\$42,127	\$7.86	HUBBARD LANE
200180	3 PHASE 110 CU TO 336 4 ACSR	2.11	\$93,061	\$25,869	\$4.84	HWY 82
080710	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	0.91	\$42,008	\$47,182	\$8.03	NEW HAVEN LAGOON
210837	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	2.22	\$71,288	\$30,728	\$6.82	CITY OF BARDSTOWN SEWER
210738	NEW LINE 3 PHASE 336 4 ACSR	0.84	\$31,313	\$48,927	\$8.27	WYETH AYERST
201338	NEW LINE 3 PHASE 336 4 ACSR	0.85	\$28,812	\$30,013	\$8.88	BROOKS IND SITE
210872	NEW LINE 1 PHASE 110 ACSR	1.25	\$18,863	\$18,850	\$2.98	WYOMAN PARK DIVISION
210899	1 PHASE 8A CWC TO 1 PHASE 110 ACSR	0.82	\$18,265	\$23,530	\$4.46	MAX ROUSE RD
200084	NEW LINE 3 PHASE 336 4 ACSR	1.60	\$86,783	\$54,248	\$10.27	DALE LANE
210158	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	0.70	\$35,930	\$46,481	\$8.01	KEITH KNDS
201040	3 PHASE 2A CU TO 336 4 ACSR	1.05	\$71,460	\$88,057	\$12.80	BROOKS NORTH
210872	NEW LINE 3 PHASE 336 4 ACSR	0.90	\$39,901	\$40,304	\$7.63	MT WASH IND SITE
090477	2 PHASE 8ACWC TO 3 PHASE 110 ACSR	2.74	\$82,050	\$23,846	\$4.28	31E THREE PHASE
080080	NEW LINE D.C. 397 SPACER (1.70 MI)	2.44	\$283,882	\$114,993	\$21.78	BEULAH BEAM DC
200181	NEW LINE 3 PHASE 110 ACSR	1.81	\$83,047	\$51,582	\$9.77	CEDAR GROVE NORTH
210121	NEW LINE 785 SPACER CABLE(2.78 MI)	3.64	\$324,540	\$80,434	\$18.94	CEDAR GROVE INDUSTRIAL PARK
	3 PHASE 2A CU TO 336 4 ACSR(0.83 MI)				\$0.00	
230070	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	0.98	\$38,827	\$40,334	\$7.84	WATERFORD RD
220704	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	0.88	\$37,223	\$88,538	\$12.80	HWY 680
220920	NEW LINE 397 SPACER CABLE(1.8 MI)	2.03	\$134,882	\$88,318	\$12.84	SCHULER INDUSTRIAL PARK
	NEW LINE 3 PHASE 336 4 ACSR(0.43 MI)				\$0.00	
220818	NEW LINE 3 PHASE 3 ACSR	0.58	\$22,009	\$37,303	\$7.07	KNOXPS DAIRY
220825	NEW LINE 3 PHASE 336 4 ACSR	0.94	\$50,510	\$53,740	\$10.18	CEDAR GROVE INDUSTRIAL PARK
090770	1 PHASE 8A CWC TO 1 PHASE 110 ACSR	0.64	\$38,463	\$42,218	\$4.00	ICETOWN RD
200325	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	1.33	\$88,520	\$30,015	\$9.47	STRINGTOWN RD
220195	3 PHASE 2A CU TO 336 4 ACSR	1.92	\$147,787	\$79,957	\$14.58	GOSPEL HILL
210358	3 PHASE 2A CU TO 336 4 ACSR(2.49 MI)	4.01	\$284,375	\$89,435	\$12.01	BALLTOWN
	3 PHASE 2A CU TO 397 SPACER CABLE(1.52 MI)				\$0.00	
200144	NEW LINE 3 PHASE 336 4 ACSR	0.78	\$81,145	\$104,032	\$19.70	CEDAR GROVE INDUSTRIAL PARK
201156	NEW LINE 3 PHASE 336 4 ACSR	0.22	\$14,842	\$48,100	\$12.82	CEDAR GROVE INDUSTRIAL PARK
080830	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	3.17	\$121,788	\$38,413	\$7.26	LOVE RIDGE
210898	1 PHASE 8A CWC TO 1 PHASE 110 ACSR	0.88	\$20,810	\$23,848	\$4.46	BLOOMFIELD SUB
201156	NEW LINE 3 PHASE 336 4 ACSR	0.22	\$14,842	\$88,100	\$12.82	CEDAR GROVE IND PARK
230330	1 PHASE 8A CWC TO 1 PHASE 110 SPACER CABLE	2.88	\$128,170	\$44,115	\$8.36	GRAYS RUN
230331	1 PHASE 8A CWC TO 1 PHASE 110 ACSR	1.74	\$88,463	\$48,243	\$8.76	LULLY PIKE
230147	3 PHASE 4A CU TO 336 4 ACSR	7.09	\$352,587	\$43,042	\$8.18	HWY 508
230128	3 PHASE 2A CU TO 397 SPACER CABLE	0.75	\$100,295	\$133,873	\$25.32	BROOKS SUB DC
250551	3 PHASE 110 CU TO 336 4 ACSR	1.34	\$134,998	\$106,743	\$19.08	NAZARETH RD CONVERSION
250385	3 PHASE 6A CU TO 336 4 ACSR	3.38	\$193,907	\$87,710	\$10.93	MAUD REBUILD
240396	1 PHASE 6A CU TO 336 4 ACSR	0.71	\$50,703	\$71,413	\$13.53	VALLEY VIEW
240267	3 PHASE 2A CU TO 336 4 ACSR	1.45	\$100,497	\$89,308	\$13.13	SHEPHERDVILLE TO 480
268092	NEW LINE 3 PHASE 397 SPACER	0.03	\$11,536	\$84,625	\$72.83	BLUEGRASS PKWY FEEDERS
260278	3 PHASE 2A CU TO 336 4 ACSR	3.52	\$282,210	\$83,014	\$15.72	BALLTOWN FDR 01
267355	NEW LINE 3 PHASE 397 SPACER	0.91	\$134,032	\$147,248	\$27.90	COIP FEEDERS
250897	1 PHASE 8A CWC TO 1 PHASE 110 SPACER C	0.89	\$36,758	\$53,273	\$10.08	ZONETON RD
267851	2 PHASE 8ACWC TO 3 PHASE 336 4 ACSR	2.75	\$178,435	\$85,240	\$12.36	SHORT CREEK
251158	3 PHASE 110 CU TO 336 4 ACSR	2.99	\$388,824	\$130,041	\$24.63	W BARDSTOWN FDR 01
270712	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	0.70	\$54,640	\$78,344	\$14.84	MARKWELL LANE
273107	NEW LINE 3 PHASE 397 SPACER CABLE	0.76	\$87,114	\$127,782	\$24.20	WASHINGTON CO IND PARK
275494	3 PHASE 4ACWC TO 397 SPACER CABLE	0.57	\$83,780	\$184,543	\$31.16	BOSTON RD RELOCATION
277130	3 PHASE 2 CU TO 336 4 ACSR	3.30	\$391,385	\$118,804	\$22.46	MAYWOOD TO GREER LANE
272441	1 PHASE 8A CWC TO 3 PHASE 110 ACSR	0.81	\$52,263	\$84,522	\$12.22	SOUTH ST GREGORY RD
270395	NEW LINE 397 SPACER CABLE	1.04	\$160,775	\$154,581	\$29.28	FILIATREAU LN TO BLOOMFIELD RD
273453	NEW LINE 397 SPACER CABLE	0.95	\$124,779	\$131,348	\$24.88	NELSON CO IND PARK TO WOODLAW
273454	NEW LINE 397 SPACER CABLE	1.00	\$128,598	\$128,598	\$23.98	NELSON CO IND PARK TO U.S. 150
267851	2 PHASE 2A CWC TO 3 PHASE 336 33 ACSR.	2.74	\$184,416	\$88,000	\$11.38	SHORT CREEK RD CONVERSION
270396	1 PHASE 6A CWC TO 3 PHASE 110 ACSR	0.42	\$22,895	\$84,511	\$10.32	MILL CREEK CONVERSION
271856	NEW LINE 3 PHASE 336 4 ACSR	0.38	\$33,594	\$83,318	\$17.67	LITTLE UNION CONVERSION
272814	NEW LINE 397 SPACER CABLE	0.77	\$100,214	\$130,148	\$24.63	FILIATREAU LN CONVERSION
278743	DC 2ACWC TO DC 397 SPACER CABLE	4.58	\$820,173	\$208,911	\$38.05	BALLTOWN TO NAT ROGERS
281336	NEW LINE 336 4 ACSR	5.58	\$801,548	\$44,163	\$27.30	MT ZION CONVERSION
283293	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	1.55	\$109,660	\$70,740	\$13.40	GLASSCOCK SAWMILL
283430	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	1.55	\$57,989	\$37,412	\$7.09	LANCE HURST THREE PHASE
272183	3 PHASE 2ACWC TO 3 PHASE 336 4 ACSR	3.34	\$104,247	\$121,032	\$22.92	NORTH SPRINGFIELD CONVERSION
287815	1 PHASE 8ACWC TO 3 PHASE 110 ACSR	0.9	\$207,882	\$238,738	\$43.70	PLUM RIDGE ROAD
289387	3 PHASE 2ACWC TO 3 PHASE SPACER CABL	2.07	\$348,682	\$187,484	\$31.72	SOUTH BARDSTOWN FEEDERS

PART IV. OPERATION AND MAINTENANCE BUDGETS

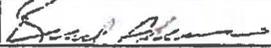
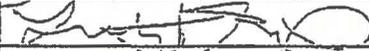
YEAR	For Previous 2 Years		For Present Year	For Future 3 Years		
	2015	2016	2017	2018	2019	2020
	Actual \$ Thousands	Actual \$ Thousands	Budget \$ Thousands	Budget \$ Thousands	Budget \$ Thousands	Budget \$ Thousands
Normal Operation	2,619	2,685	2,780	2,863	2,949	3,038
Normal Maintenance	2,849	2,757	3,025	3,116	3,209	3,305
Additional (Deferred) Maintenance						
Total	5,468	5,442	5,807	5,981	6,161	6,346

14. Budgeting: Adequacy of Budgets for Needed Work 3 (Rating)

15. Date Discussed with Board of Directors 1/4/2018 (Date)

EXPLANATORY NOTES

ITEM NO.	COMMENTS
3h.	A program is underway to remove telephone poles left next to electric poles. Cable TV attachments require constant monitoring and follow-up to ensure code requirements are met.

	TITLE	DATE
RAISED BY: 	MANAGER OPERATIONS	12/20/17
REVIEWED BY: 	PRESIDENT & CEO	12/20/17
REVIEWED BY: 	RUS GPR	12/20/17

SALT RIVER ELECTRIC SYSTEM PLANNING REPORT
DISTRIBUTION COST SUMMARY
2019-2022 CONSTRUCTION WORK PLAN 300 SERIES

SUBSTATION	FEEDER NUMBER	RUS CODE	NEW CONDUCTOR SIZE	COST PER MILE	NO. OF MILES	EXTENDED COST
BALTIMORE						
HWY 49	F1	301	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSS	\$170,000	1.86	\$306,000
Holy Cross Road	F1	302	2 PHASE 1/0 ACSS TO 3 PHASE 336.4 ACSS	\$170,000	3.31	\$562,700
Jim Clark Road to New Hope Road	F1	303	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	1.60	\$192,000
Mat Rogers Road	F4	304	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	1.82	\$182,400
Icetown Road	F4	305	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	1.04	\$124,800
BLOOMFIELD						
Simpson Creek to Alfred Russell Road	F1	306	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	2.27	\$272,400
Ry 1066	F2	307	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	4.14	\$496,800
Mc Zion Road	F4	308	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSS	\$170,000	1.92	\$326,400
Sweeny Ridge Road	F4	309	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	2.09	\$250,800
Brush Grove Road	F4	310	3 PHASE 1/0 CU TO 3 PHASE 336.4 ACSS	\$170,000	4.37	\$742,900
BLUEGRASS PARKWAY						
HWY 62 to Stoner Road	F3	311	3 PHASE 4ACWC TO 3 PHASE 336.4 ACSS	\$170,000	8.92	\$156,400
Bluegrass Parkway Sub to Highway 62	F3	312	3 PHASE 795 spacer cable	\$245,000	2.29	\$561,050
Highway 62	F3	313	THREE PHASE 336 ACSS TO D.C. 397 SPACER	\$275,000	0.36	\$99,000
Old Bloomfield Road to Browns Lane	F3	314	3 PHASE 1/0 CU TO 3 PHASE 336.4 ACSS	\$170,000	2.81	\$477,700
Wire Lane	F3	315	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	1.39	\$166,800
BROOKS						
Brooks Sub to East Blue Lick Rd	F3	316	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSS	\$170,000	0.88	\$98,600
West Blue Lick Road	F6	317	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSS	\$170,000	1.61	\$256,700
DARWIN THOMAS						
Hochstrasser Road	F2	318	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	1.95	\$234,000
DEATSVILLE						
*****Samuels Loop to Antlers Trace Subdivision	F3	319	3 PHASE 6ACWC TO 3 PHASE 336.4 ACSS	\$170,000	8.64	\$112,300
EAST SANDSTONE						
*****Caney Fork to Copperfield Subdivision	F3	320	3 PHASE 1/0 CU TO 3 PHASE 336.4 ACSS	\$170,000	3.49	\$423,300
*****Copperfield Subdivision to US 316	F3	321	3 PHASE 1/0 CU TO 3 PHASE 336.4 ACSS	\$170,000	8.83	\$141,100
FREDRICKSBURG						
*****Crookes Station to Summers Lane	F4	322	1 PHASE 6ACWC TO 1 PHASE 1/0 ACSS	\$65,000	4.61	\$195,250
GOSEPEL HILL						
Pitta Point Road	F6	323	2 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	1.24	\$151,200
JOE TICHENOR						
Joe Tichenor to Mesareth	F1	324	3 PHASE 4ACWC TO 3 PHASE 336.4 ACSS	\$170,000	3.14	\$337,200
*****Hwy 509 to Solder Lane	F3	325	3 PHASE 4ACWC TO 3 PHASE 336.4 ACSS	\$170,000	5.77	\$980,900
Hobbs Lane	F3	326	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	2.41	\$312,200
*****Coxs Creek to High Grove	F4	327	3 PHASE 4ACWC TO 3 PHASE 336.4 ACSS	\$170,000	3.83	\$582,100
KIDS CREEK						
*****Pendleton Hill Road Conversion	F1	328	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	2.11	\$253,300
MOUNT WASHINGTON						
Mount Washington # 3 to US 316	F6	329	397 SPACER CABLE TO 795 SPACER CABLE	\$246,000	3.39	\$588,950
Greenbrier Road	F6	330	2 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	8.63	\$74,400
NORTH SPRINGFIELD						
Highway 53 at Millisburg	F5	331	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSS	\$170,000	1.67	\$283,900
PLEASANT GROVE						
Highway 44 from Truman Drive to Greenbrier Road	F3	332	3 PHASE 1/0 CU TO 3 PHASE 336.4 ACSS	\$170,000	1.44	\$244,800
SHEPHERDSDALE # 2						
Shepherdsville # 2 to Beech Grove Road	F6	333	3 PHASE 3/0 ACSS TO 3 PHASE 336.4 ACSS	\$170,000	3.50	\$425,000
Shepherdsville # 2 to Ry 44	F5	334	3 PHASE 1/0 CU TO 3 PHASE 336.4 ACSS	\$170,000	6.57	\$691,900
SOUTH SPRINGFIELD						
South Springfield Sub To Hwy 182	F5	335	3 PHASE 1/0 CU TO 3 PHASE 336.4 ACSS	\$170,000	3.43	\$417,100
South Springfield Sub To Hwy 155	F2	336	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSS	\$170,000	3.45	\$420,900
Taylorville						
*****Brashers Creek to Little Mt Church Road	F4	337	2 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	4.74	\$368,400
WEST SANDSTONE						
*****Lutheran Church Road	F1	338	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	1.00	\$120,000
Wesley						
Highway 733	F6	339	1 PHASE 6ACWC TO 3 PHASE 1/0 ACSS	\$120,000	1.58	\$189,600
Highway 62 to Mc Moriah Road	F3	340	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSS	\$170,000	2.19	\$372,300
					TOTAL	\$14,193,950

*****Carryover from 2014-2017 CWP

YEAR: 2019-2022

PROJECT NAME: Replacement

CFR CODE: 601

ESTIMATED COST: \$11,602,000

DESCRIPTION OF PROPOSED CONSTRUCTION:

This AMI project for the replacement of AMI meters for the four year construction work plan period. The cost estimate is \$219 per meter for single phase meters and \$433 for three phase meters.

This will include 51000 existing single phase meters to be converted and 1000 existing three phase meters to complete the whole system.

20019-2022 CONSTRUCTION WORK PLAN CONDUCTOR REPLACEMENT SERIES 608

JOB NAME	DISTANCE	CONDUCTOR CHANGE	COST PER MILE	EXTENDED COST
2019	5.0	6A cwc to 1/0 ACSR	\$65,000	\$325,000
2020	5.0	6A cwc to 1/0 ACSR	\$65,000	\$325,000
2021	5.0	6A cwc to 1/0 ACSR	\$65,000	\$325,000
2022	5.0	6A cwc to 1/0 ACSR	\$65,000	\$325,000
	TOTAL MILES	20.0	TOTAL	\$1,300,000

**2019-2022 CONSTRUCTION WORK PLAN
SECTIONALIZING EQUIPMENT (SERIES 603)**

NEW OCR (VERSATEC)	60	\$4,100	\$246,000
UPGRADE EXISTING OCR	75	\$350	\$26,250
CUTOOTS	620	\$120	\$74,400
OCR MAINTENANCE	389	\$150	\$58,350
AIR BREAK SWITCHES (GAOB)	25	\$5,500	\$137,500
TOTAL			\$542,500

DISTRIBUTION LINE VOLTAGE REGULATORS

CFR CODE: 604

ESTIMATED COST: \$912,000

BALLTOWN	F1	1 PHASE 100 AMP REGULATOR	\$10,500
	F2	3 PHASE 150 AMP REGULATOR BANK	\$36,000
	F4	3 PHASE 150 AMP REGULATOR BANK	\$36,000
BARDSTOWN SHOPPING CENTER	F1	1 PHASE 100 AMP REGULATOR	\$10,500
	F2	3 PHASE 150 AMP REGULATOR BANK	\$36,000
BEAMS	F2	1 PHASE 100 AMP REGULATOR	\$10,500
BLOOMFIELD	F1	1 PHASE 100 AMP REGULATOR	\$10,500
		1 PHASE 100 AMP REGULATOR	\$10,500
	F2	1 PHASE 100 AMP REGULATOR	\$10,500
	F4	1 PHASE 100 AMP REGULATOR	\$10,500
	F5	3 PHASE 150 AMP REGULATOR BANK	\$36,000
BLUEGRASS PARKWAY	F3	1 PHASE 100 AMP REGULATOR	\$10,500
		3 PHASE 150 AMP REGULATOR BANK	\$36,000
		3 PHASE 150 AMP REGULATOR BANK	\$36,000
BROOKS	F6	1 PHASE 100 AMP REGULATOR	\$10,500
CEDAR GROVE	F2	1 PHASE 100 AMP REGULATOR	\$10,500
	F3	1 PHASE 100 AMP REGULATOR	\$10,500
	F5	1 PHASE 100 AMP REGULATOR	\$10,500
DARWIN THOMAS	F2	3 PHASE 150 AMP REGULATOR BANK	\$36,000
	F3	3 PHASE 150 AMP REGULATOR BANK	\$36,000
DEATSVILLE	F2	1 PHASE 100 AMP REGULATOR	\$10,500
	F3	1 PHASE 100 AMP REGULATOR	\$10,500
EAST BARDSTOWN	F2	1 PHASE 100 AMP REGULATOR	\$10,500
FREDRICKSBURG	F1	1 PHASE 100 AMP REGULATOR	\$10,500
	F2	1 PHASE 100 AMP REGULATOR	\$10,500
	F3	1 PHASE 100 AMP REGULATOR	\$10,500
GOSPEL HILL	F4	1 PHASE 100 AMP REGULATOR	\$10,500
JOE TICHENOR	F3	3 PHASE 150 AMP REGULATOR BANK	\$36,000
		1 PHASE 100 AMP REGULATOR	\$10,500
KNOB CREEK	F1	1 PHASE 100 AMP REGULATOR	\$10,500
		1 PHASE 100 AMP REGULATOR	\$10,500
LITTLE MOUNT	F2	1 PHASE 100 AMP REGULATOR	\$10,500
MT WASHINGTON #2	F6	3 PHASE 150 AMP REGULATOR BANK	\$36,000
NORTH SPRINGFIELD	F5	1 PHASE 100 AMP REGULATOR	\$10,500
		1 PHASE 100 AMP REGULATOR	\$10,500
SHEPHERDSVILLE #1	F5	3 PHASE 150 AMP REGULATOR BANK	\$36,000
		1 PHASE 100 AMP REGULATOR	\$10,500
SOUTH SPRINGFIELD	F5	3 PHASE 150 AMP REGULATOR BANK	\$36,000
		1 PHASE 100 AMP REGULATOR	\$10,500
TAYLORSVILLE	F2	3 PHASE 150 AMP REGULATOR BANK	\$36,000
	F3	3 PHASE 150 AMP REGULATOR BANK	\$36,000
	F4	3 PHASE 150 AMP REGULATOR BANK	\$36,000
WOOSLEY	F3	3 PHASE 150 AMP REGULATOR BANK	\$36,000
JOE TICHENOR	F3	1 PHASE 100 AMP REGULATOR	\$10,500
DARWIN THOMAS	F3	1 PHASE 100 AMP REGULATOR	\$10,500
	F4	1 PHASE 100 AMP REGULATOR	\$10,500
FREDRICKSBURG	F1	1 PHASE 100 AMP REGULATOR	\$10,500
LITTLE MOUNT	F2	1 PHASE 100 AMP REGULATOR	\$10,500

TOTAL \$912,000

STATUS OF 2014-2017 CONSTRUCTION WORK PLAN

SERIES

- 301 CARRYOVER
- 302 CARRYOVER
- 303 COMPLETED
- 304 CARRYOVER
- 305 CARRYOVER
- 306 COMPLETED
- 307 CARRYOVER
- 308 CARRYOVER
- 309 DELETED WITH THE CONSTRUCTION OF SOUTH BARDSTOWN SUBSTATION
- 310 CARRYOVER
- 311 CARRYOVER
- 312 COMPLETED
- 313 CARRYOVER
- 314 CARRYOVER
- 315 COMPLETED
- 316 CARRYOVER
- 317 IN PROGRESS
- 318 IN PROGRESS

SALT RIVER ECC SUBSTATIONS

	2022 KW PROPOSED SUMMER	2022 KW PROPOSED WINTER
01 BALLTOWN	10800	17200
02 BARDSTOWN SHOPPING CT	9300	11700
03 BEAMS	5700	5100
04 BLOOMFIELD	6500	10300
05 BLUE LICK	8500	8400
06 BROOKS	19500	18000
07 EAST BARDSTOWN	8400	12300
08 GOSPEL HILL	5700	7700
09 LEBANON JCT #1	2800	2800
10 OWENS ILLINOIS	7500	6500
11 CEDAR GROVE	8700	12800
12 MT. WASHINGTON #1	10800	9500
122 MT, WASHINGTON #2	9600	10600
13 NORTH SPRINGFIELD	7100	10900
14 PLEASANT GROVE # 1	15300	12100
14 PLEASANT GROVE # 2	7600	5600
15 SHEPHERDSVILLE #1	4900	7600
152 SHEPHERDSVILLE #2	10800	11100
16 S. SPRINGFIELD	4200	5900
17 TAYLORSVILLE	8800	13700
18 WEST BARDSTOWN	7500	9800
19 WOOSLEY	3200	4900
20 W. MT. WASHINGTON	12200	10100
21 BELULAH BEAM	8000	5800
22 JOE TICHENOR	7200	10900
23 DARWIN THOMAS	13700	17900
24 KNOB CREEK	2200	3200
25 LEBANON JCT. #2	3800	4900
26 FREDERICKBURG	3700	5700
27 LITTLE MOUNT	5000	6400
28 BLUEGRASS PARKWAY # 1	12500	12800
28 BLUEGRASS PARKWAY # 2	1000	600
29 CEDAR GROVE INDUSTRIAL PARK # 1	5900	4900
292 CEDAR GROVE INDUSTRIAL PARK #2	14100	9900
30 DEATSVILLE	6900	11200
31 SOUTH BARDSTOWN	5900	8200
LOCK 7	1800	1800
TOTAL	287100	328800

SUBSTATION LOADING TABLE

SUBSTATION	MAX. LIMIT		PROJECTED		PROJECTED	
	SUMMER RATING	WINTER RATING	SUMMER 2023	PERCENT CAPACITY	WINTER 2023	PERCENT CAPACITY
BALLTOWN	13,620	18,140	10800	79	17200	95
BARDSTOWN SHOP CTR.	11,070	15,720	9300	84	11700	74
BEAM	5,590	7,450	5700	102	5100	68
BEULAH BEAM	13,620	18,140	8000	59	5800	32
BLOOMFIELD	9,800	15,100	6500	66	10300	68
BLUE LICK	13,620	18,140	8500	62	8400	46
BLUEGRASS PARKWAY	9,800	15,100	12500	128	12800	85
BLUEGRASS PARKWAY # 2	9,800	15,100	1000	10	600	4
DROOKS	24,000	31,050	19500	81	18000	58
CEDAR GROVE	13,620	18,140	8700	64	12800	71
CEDAR GROVE INDUSTRIAL #1	11,860	16,840	5900	50	4900	29
CEDAR GROVE INDUSTRIAL #2	9,800	15,100	14100	144	9900	66
DARWIN THOMAS	15,560	20,730	13700	88	17900	86
EAST BARDSTOWN	13,620	18,140	8400	62	12300	68
FREDRICKSBURG	13,620	18,140	3700	27	5700	31
GOSPEL HILL	9,800	15,100	5700	58	7700	51
JOE TICHENOR	13,620	18,140	7200	53	10900	60
KNOB CREEK	2,200	3,730	2200	100	3200	86
LEBANON JUNCTION #1	4,940	7,020	2800	57	2800	40
LEBANON JUNCTION #2	4,900	7,500	3800	78	4900	65
LITTLE MOUNT	15,560	20,730	5000	32	6400	31
MT. WASHINGTON # 1	13,620	18,140	10800	79	9500	52
MT. WASHINGTON # 2	13,620	18,140	9600	70	10600	58
NORTH SPRINGFIELD	8,820	14,940	7100	80	10900	73
PLEASANT GROVE # 1	13,620	18,140	15300	112	12100	67
PLEASANT GROVE # 2			7600		5600	
SHEPHERDSVILLE #1	12,160	16,200	4900	40	7600	47
SHEPHERDSVILLE #2	13,620	18,140	10800	79	11100	61
SOUTH SPRINGFIELD	6,260	8,340	4200	67	5900	71
TAYLORSVILLE	13,620	18,140	8800	65	13700	76
W. MT. WASHINGTON	13,620	18,140	12200	90	10100	56
WEST BARDSTOWN	13,620	18,140	7500	55	9800	54
DEATSVILLE	11,070	15,720	6900	62	11200	71
WOOSLEY	4,690	6,250	3200	68	4900	78
SOUTH BARDSTOWN			5900		8200	

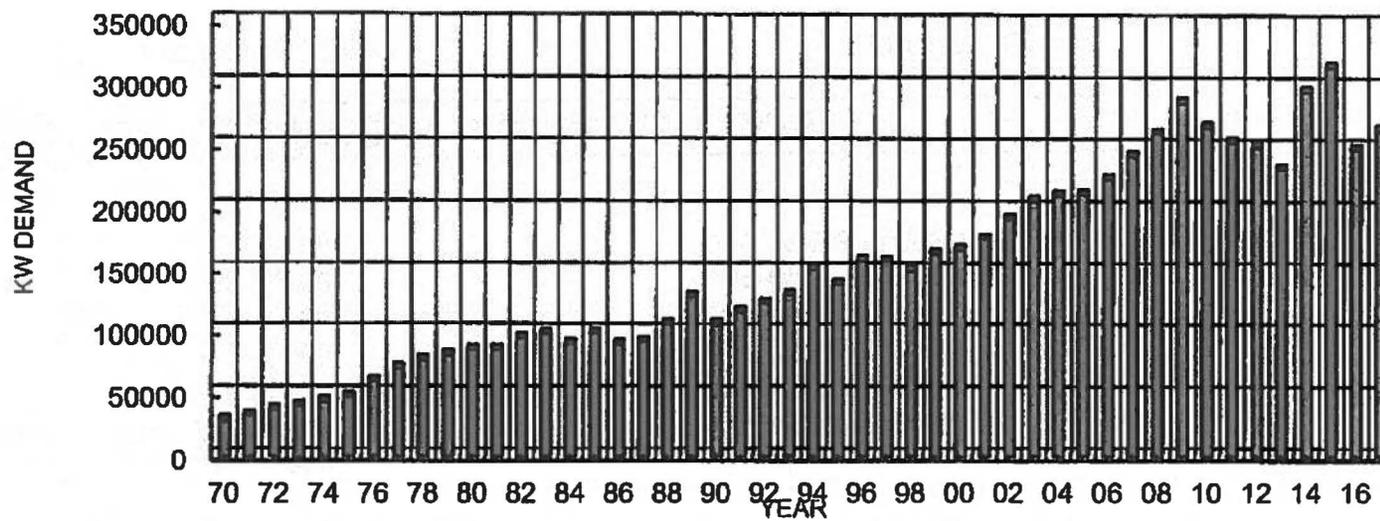
TOTALS

277800

320500

**** FLAGGED AT 90% (projected)

MAXIMUM KW DEMAND
1970-2017



DISTRIBUTION LINE COST

ESTIMATED COST PER MILE

\$120,000
\$85,000
\$170,000
\$295,000
\$210,000
\$245,000
\$275,000

DESCRIPTION

1 PHASE TO 3 PHASE 110 ACSR
1 PHASE TO 1 PHASE 110 ACSR
3 PHASE TO 3 PHASE 336.4 ACSR
D. C. TO D.C. 397 SPACER CABLE
3 PHASE TO 397 SPACER CABLE
3 PHASE TO 795 SPACER CABLE
D. C. 795 SPACER CABLE

DISTRIBUTION EQUIPMENT (INSTALLED COST)

ESTIMATED COST

\$4,500
\$150
\$6,500
\$36,000
\$51,000
\$10,500
\$2,800
\$4,500

DESCRIPTION

TYPE "L" (VACUUM) MECHANICAL OCR
CUTOUT
AIR BREAK SWITCH
3 PHASE 150 AMP REGULATOR BANK
3 PHASE 300 AMP REGULATOR BANK
1 PHASE 100 AMP REGULATOR
FIXED CAPACITOR
SWITCHED CAPACITOR

HISTORICAL DATA 2018

UNDERGROUND	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
NEW SERVICES													
1. WORK ORDERS - CONSTRUCTION (219)	54	51	47	65	54	59	65	78	65	83			621
2. INSTALL FEET - TOTAL	10760	4145	8594	14578	8090	6891	6935	10579	10629	12458	30574	0	125229
PRIMARY	3379	265	2108	8182	2890	1461	1606	1637	2640	3266	19223		46014
SECONDARY	7381	4410	7488	6394	5200	5430	5429	8942	7989	9201	11351		79215
3. AVERAGE LENGTH (FT)	189	81	204	224	150	117	107	136	164	150	#DIV/0!	#DIV/0!	202
4. COST OF NEW CONSTRUCTION (219)	\$85,287.20	\$72,030.38	\$74,487.46	\$215,512.08	\$71,713.64	\$51,615.83	\$44,929.10	\$79,422.05	\$90,789.61	\$65,751.40			\$877,518.75
5. AVERAGE COST (41)	\$1,579.58	\$1,412.36	\$1,584.84	\$3,315.67	\$1,328.03	\$874.84	\$691.22	\$1,018.23	\$1,488.61	\$1,033.15	#DIV/0!	#DIV/0!	\$1,413.07
6. NEW TRANSFORMERS	4	5	20	15	11	19	10	6	11	12	8		121
7. INSTALLED COST PER TRANSFORMER	\$3,932.93	\$3,032.93	\$1,385.65	\$1,696.53	\$2,798.58	\$1,507.41	\$1,507.41	\$1,643.21	\$1,605.31	\$10,545.48	#DIV/0!	#DIV/0!	\$2,129.44
8. NEW METERS	55	46	74	57	49	46	59	85	63	89	56		679
9. INSTALLED COST PER METER	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49		
OVERHEAD													
NEW SERVICES													
10. WORK ORDERS - CONSTRUCTION (219)	16	24	24	22	20	26	20	54	23	25			254
11. LINEAR FEET - TOTAL	5589	8132	5945	14840	4802	6712	2381	12740	6580	7125	3597	0	78443
PRIMARY	4440	6488	8191	13438	3825	6342	2342	12336	8244	7358	2284		68268
SECONDARY	1149	1664	754	1402	977	1370	39	404	1336	-233	1313		10175
12. AVERAGE LENGTH (FT)	349	339	249	675	240	258	119	238	286	285	#DIV/0!	#DIV/0!	309
13. COST OF NEW CONSTRUCTION (219)	\$45,400.54	\$109,538.43	\$133,242.63	\$77,556.25	\$84,593.26	\$84,579.01	\$69,215.81	\$189,241.05	\$80,201.97	\$72,204.23			\$955,771.18
14. AVERAGE COST NEW SERVICE (13-10)	\$2,837.53	\$4,564.02	\$5,551.78	\$3,525.28	\$4,229.68	\$3,253.04	\$3,460.79	\$3,689.65	\$3,487.04	\$2,888.17	#DIV/0!	#DIV/0!	\$3,762.88
15. NEW TRANSFORMERS	15	25	18	15	24	17	18	48	24	26	17		243
16. INSTALLED COST PER TRANSFORMER	\$870.42	\$789.74	\$855.61	\$822.74	\$793.48	\$793.48	\$882.09	\$876.18	\$913.90	\$808.82	#DIV/0!	#DIV/0!	\$835.71
17. NEW METERS	25	8	14	15	10	14	9	28	10	10	14		148
18. INSTALLED COST PER METER	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49		
19. SAFETY LIGHT TOTAL	18	12	29	5	15	10	5	17	9	15	18		151
20. INSTALLED COST PER LIGHT	\$1,122.04	\$1,392.87	\$1,813.00	\$1,269.31	\$1,822.80	\$1,423.38	\$1,335.90	\$2,405.39	\$938.13	\$549.74			\$1,156.05
21. SYSTEM IMPROVEMENTS - TOTAL	2	0	4	2	11	3	3	7	3	12	3		50
22. AVERAGE COST OF SYSTEM IMPROVEMENT	\$1,549.14	\$0.00	\$3,358.15	\$1,561.99	\$1,075.97	\$1,272.16	\$2,703.63	\$1,544.89	\$1,396.25	\$1,560.52			\$1,335.23
23. WIRE REPLACEMENTS	14	1	11	9	23	11	17	53	8	12	24		183
24. AVERAGE COST PER REPLACEMENT	\$2,724.37	\$8,190.07	\$3,816.69	\$3,123.25	\$2,360.13	\$2,148.53	\$2,495.48	\$2,730.75	\$4,584.00	\$3,168.21			\$2,925.98
25. TOTAL OF WORK ORDERS (1+10+19+21)	90	87	104	94	100	88	83	156	100	135	19	0	1078

HISTORICAL DATA 2017

UNDERGROUND	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
NEW SERVICES													
1. WORK ORDERS - UNDERGROUND (219)	44	62	96	69	66	63	88	93	54	71	76	84	845
2. LINEAR FEET - TOTAL	7295	7303	12279	14302	11448	11034	26684	14629	10005	7012	9847	12317	143055
PRIMARY	1916	1630	2164	7698	4598	3982	15231	3998	4369	1294	2127	3999	53092
SECONDARY													
SERVICES	5379	5473	10115	6704	6852	7052	10353	10643	5636	5718	7720	8318	89963
3. AVERAGE LENGTH (219)	166	140	128	207	204	175	291	157	185	99	131	147	169
4. COST OF UNDERGROUND (219)	\$45,016.01	\$81,823.30	\$86,417.47	\$99,358.02	\$81,082.83	\$71,443.60	\$140,127.85	\$69,585.43	\$74,369.18	\$53,581.91	\$66,187.11	\$78,783.81	\$957,767.52
5. AVERAGE COST (219)	\$853.48	\$1,573.53	\$900.18	\$1,439.97	\$1,626.66	\$1,134.03	\$1,592.36	\$748.23	\$1,377.21	\$754.67	\$882.23	\$937.90	\$1,133.45
6. NEW TRANSFORMERS	4	4	9	13	14	14	15	14	7	13	8	17	132
7. INSTALLED COST PER TRANSFORMER	\$3,296.62	\$2,036.55	\$8,595.25	\$8,595.25	\$1,978.23	\$1,744.49	\$2,608.76	\$1,984.23	\$1,467.74	\$1,621.32	\$4,078.99	\$8,088.98	\$2,404.10
8. NEW METERS	48	54	104	72	52	52	57	88	56	68	73	77	799
9. INSTALLED COST PER METER	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49
OVERHEAD													
NEW SERVICES													
10. WORK ORDERS - OVERHEAD (219)	12	25	38	23	36	30	31	50	27	25	21	22	340
11. LINEAR FEET - TOTAL	3536	5858	11760	6365	7525	4194	12941	21809	8338	4858	8538	5600	102318
PRIMARY	4133	4827	9638	5020	6242	4778	12755	20834	8212	5480	8302	6328	96339
SECONDARY													
SERVICES	-597	1029	2122	1345	1283	-576	186	1175	1126	-822	234	-726	5979
12. AVERAGE LENGTH (1110)	285	234	309	277	209	140	417	436	348	184	408	265	301
13. COST OF NEW OVERHEAD (219)	\$37,553.06	\$93,384.80	\$122,852.51	\$87,630.83	\$125,383.08	\$85,450.83	\$124,933.22	\$136,532.30	\$112,171.35	\$108,573.89	\$77,157.25	\$88,241.58	\$1,199,884.50
14. AVERAGE COST NEW SERVICE (1110)	\$3,129.42	\$3,735.39	\$3,232.96	\$3,810.03	\$3,482.86	\$2,848.38	\$4,030.10	\$2,730.65	\$4,154.49	\$4,342.86	\$3,674.15	\$4,010.98	\$3,529.01
15. NEW TRANSFORMERS	13	29	22	20	26	23	24	44	24	22	17	18	282
16. INSTALLED COST PER TRANSFORMER	\$794.24	\$788.26	\$813.61	\$813.61	\$800.95	\$822.55	\$985.56	\$868.92	\$881.50	\$862.84	\$861.96	\$854.94	\$833.70
17. NEW METERS	4	12	31	15	15	13	9	22	14	13	8	9	165
18. INSTALLED COST PER METER	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49
19. SECURITY LIGHT TOTAL	16	45	18	47	14	3	11	33	16	10	14	12	247
20. INSTALLED COST PER LIGHT	\$850.75	\$1,960.53	\$888.23	\$734.19	\$1,078.87	\$1,396.68	\$989.73	\$1,265.76	\$813.85	\$1,074.99	\$1,211.92	\$834.22	\$1,041.66
21. SYSTEM IMPROVEMENTS - TOTAL	1	4	3	2	6	6	9	2	5	4	5	6	55
22. AVERAGE COST OF SYSTEM IMPROVEMENT	\$756.63	\$1,381.71	\$1,898.67	\$1,047.88	\$1,472.84	\$596.85	\$1,574.11	\$1,113.64	\$2,381.11	\$1,650.88	\$1,926.73	\$2,628.63	\$1,532.40
23. POLE REPLACEMENTS	7	19	15	28	12	4	11	15	5	24	19	5	162
24. AVERAGE COST PER REPLACEMENT	\$1,666.81	\$2,483.32	\$2,156.30	\$2,553.84	\$2,092.56	\$2,348.57	\$2,621.97	\$3,080.47	\$2,603.42	\$2,129.67	\$2,336.16	\$1,574.91	\$2,302.32
25. TOTAL OF WORK ORDERS (1+10+19+21)	73	126	165	141	112	102	139	178	102	118	115	126	1487

HISTORICAL DATA

2016

UNDERGROUND	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
NEW SERVICES													
1. WORK ORDERS - CONSTRUCTED IN '19	42	22	48	51	57	45	68	63	62	61	55	87	681
2. LINEAR FEET - TOTAL	4482	4456	6771	5761	9315	6919	7261	6775	12533	10432	7838	8244	90787
PRIMARY	160	2168	2808	818	3852	2146	1642	1522	4845	3602	2242	1390	27193
SECONDARY	4322	2290	3963	4943	5463	4773	5619	5253	7688	6830	5596	6854	63594
3. AVERAGE LENGTH (21)	107	203	141	113	163	154	107	108	153	171	143	95	133
4. COST OF UNDERGROUND (219)	\$41,197.54	\$55,225.08	\$47,319.75	\$41,384.47	\$83,997.01	\$50,607.72	\$49,559.48	\$35,628.17	\$75,482.38	\$82,784.44	\$60,366.17	\$58,637.66	\$682,319.85
5. AVERAGE COST (41)	\$980.89	\$2,510.23	\$985.83	\$811.46	\$1,473.63	\$1,124.82	\$730.29	\$565.53	\$920.52	\$1,367.29	\$1,097.93	\$674.00	\$1,001.84
6. NEW TRANSFORMERS	4	3	12	11	10	8	14	9	14	10	28	9	132
7. INSTALLED COST PER TRANSFORMER	\$2,015.15	\$9,322.52	\$2,015.15	\$2,043.15	\$2,021.20	\$3,101.23	\$2,890.94	\$1,951.70	\$1,951.70	\$1,951.70	\$1,448.47	\$1,752.07	\$2,492.35
8. NEW METERS	42	16	43	48	47	43	64	57	74	53	60	80	597
9. INSTALLED COST PER METER	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	
OVERHEAD													
NEW SERVICES													
10. WORK ORDERS CONSTRUCTED IN '19	14	17	27	28	20	23	13	35	29	18	32	17	273
11. LINEAR FEET - TOTAL	11984	-920	5872	3748	8656	6222	4883	7964	21660	7510	6339	5861	91879
PRIMARY	11343	-1718	4821	3126	8823	6210	5013	6989	20969	7828	6341	5415	84960
SECONDARY	641	798	1051	622	-167	12	-130	975	691	-318	1998	446	7019
12. AVERAGE LENGTH (1110)	856	(64)	217	134	433	271	376	228	754	417	281	345	337
13. COST OF NEW OVERHEAD (219)	\$89,086.68	\$53,870.25	\$102,990.06	\$78,215.43	\$111,714.36	\$76,616.89	\$66,951.53	\$96,334.72	\$106,229.33	\$68,464.82	\$113,839.24	\$54,828.18	\$991,240.19
14. AVERAGE COST NEW SERVICE (1110)	\$4,834.76	\$3,168.84	\$3,814.45	\$2,507.69	\$5,585.72	\$3,331.13	\$5,190.12	\$2,752.42	\$3,663.08	\$3,803.58	\$3,567.48	\$3,231.07	\$3,630.82
15. NEW TRANSFORMERS	23	13	16	20	13	22	18	21	29	23	30	30	258
16. INSTALLED COST PER TRANSFORMER	\$1,226.98	\$1,558.95	\$1,558.95	\$1,558.95	\$1,137.47	\$1,222.40	\$882.60	\$950.68	\$840.86	\$940.37	\$772.82	\$1,022.76	\$1,838.70
17. NEW METERS	8	11	18	17	12	12	3	24	11	6	13	8	144
18. INSTALLED COST PER METER	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	
19. SAFETY LIGHT TOTAL	11	43	18	10	10	18	19	11	11	21	27	12	211
20. INSTALLED COST PER LIGHT	\$955.06	\$1,033.25	\$974.88	\$794.30	\$950.85	\$705.60	\$827.67	\$520.17	\$837.18	\$622.31	\$727.95	\$587.77	\$788.46
21. SYSTEM IMPROVEMENTS - TOTAL	1	0	3	7	5	8	2	5	4	7	1	1	44
22. AVERAGE COST OF SYSTEM IMPROVEMENT	\$4,543.95	\$0.00	\$1,554.97	\$1,085.72	\$1,145.96	\$871.69	\$2,303.68	\$801.39	\$1,360.11	\$1,681.36	\$1,730.01	\$1,347.84	\$1,533.89
23. PURCHASES	7	23	32	21	5	13	8	8	13	5	66	6	207
24. AVERAGE COST PER REPLACEMENT	\$3,698.53	\$2,672.84	\$2,455.79	\$2,131.75	\$2,469.87	\$2,089.19	\$1,324.63	\$3,394.60	\$2,195.82	\$1,358.10	\$1,870.65	\$2,486.26	\$2,328.90
25. TOTAL OF WORK ORDERS (1+10+19+21)	68	82	96	96	92	84	102	114	126	107	115	117	1209

HISTORICAL DATA

2015

UNDERGROUND	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
NEW SERVICES													
1. WORK ORDERS (CONSTRUCTION) (219)	39	52	20	58	28	39	34	60	37	94	46	53	560
2. LINEAR FEET - TOTAL	7916	6794	7014	6410	4146	5220	3597	9446	6173	12401	7296	7716	84129
PRIMARY	3172	2133	5010	320	1166	1265	0	3743	712	1829	2106	1758	23214
SECONDARY													
SERVICES	4744	4661	2004	6090	2980	3955	3597	5703	5461	10572	5190	5958	60915
3. AVERAGE LENGTH (L) (219)	203	131	351	111	148	134	106	157	167	132	159	146	150
4. COST OF UNDERGROUND (219)	\$23,580.11	\$61,041.01	\$88,213.58	\$57,134.73	\$28,791.67	\$27,132.97	\$21,259.64	\$75,017.34	\$26,649.68	\$74,283.88	\$62,732.75	\$54,108.91	\$597,942.25
5. AVERAGE COST (L) (219)	\$604.62	\$1,173.87	\$4,310.68	\$985.08	\$1,028.27	\$695.72	\$625.17	\$1,250.29	\$720.26	\$790.25	\$1,363.76	\$1,020.92	\$1,067.75
6. NEW TRANSFORMERS	6	8	1	10	4	11	2	9	4	16	1	7	79
7. INSTALLED COST PER TRANSFORMER	\$1,400.08	\$1,400.08	\$2,347.85	\$2,347.85	\$1,938.15	\$4,364.81	\$1,872.15	\$3,800.50	\$2,096.15	\$2,092.23	\$1,893.23	\$2,015.15	\$2,282.15
8. NEW METERS	39	55	26	57	25	35	35	49	35	94	44	54	547
9. INSTALLED COST PER METER	\$316.92	\$316.92	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	435.7774
OVERHEAD													
NEW SERVICES													
10. WORK ORDERS (CONSTRUCTION) (219)	12	19	7	23	37	31	15	26	16	48	24	22	280
11. LINEAR FEET - TOTAL	-729	3373	-2293	4791	9593	10489	11515	3174	1709	9923	2005	5626	59175
PRIMARY	-1019	1673	-2477	5112	8140	9051	11244	2851	2092	10256	605	4727	52255
SECONDARY													
SERVICES	290	1700	184	-321	1453	1437	271	323	-383	-333	1400	899	6920
12. AVERAGE LENGTH (L) (219)	(61)	178	(328)	208	259	338	768	122	107	207	84	256	211
13. COST OF NEW CONSTRUCTION (219)	\$54,528.78	\$74,172.82	\$22,051.43	\$102,896.87	\$101,115.66	\$120,245.60	\$64,838.19	\$82,269.68	\$45,470.20	\$138,266.20	\$49,047.12	\$115,388.51	\$970,291.06
14. AVERAGE COST NEW SERVICES (L) (219)	\$4,544.07	\$3,903.83	\$3,150.20	\$4,473.78	\$2,732.86	\$3,878.89	\$4,322.66	\$3,164.22	\$2,841.89	\$2,680.55	\$2,043.63	\$5,244.83	\$3,465.33
15. NEW TRANSFORMERS	9	23	5	18	30	32	15	24	16	48	17	21	258
16. INSTALLED COST PER TRANSFORMER	\$778.71	\$778.71	\$1,848.30	\$1,440.00	\$1,863.30	\$1,844.30	\$1,157.88	\$1,296.59	\$1,368.52	\$1,235.59	\$1,311.60	\$1,143.85	\$1,306.10
17. NEW METERS	8	11	4	13	14	13	4	10	4	23	17	10	129
18. INSTALLED COST PER METER	\$316.92	\$316.92	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	\$433.49	435.7774
19. SECURITY DEBIT TOTAL	12	15	24	26	7	13	7	12	16	36	20	31	219
20. INSTALLED COST PER DEBIT	\$851.44	\$1,065.61	\$1,158.51	\$1,567.62	\$534.91	\$645.02	\$715.19	\$964.92	\$845.54	\$478.05	\$712.82	\$904.48	\$870.34
21. SYSTEM IMPROVEMENTS - TOTAL	1	1	0	9	5	8	5	6	8	12	4	5	64
22. AVERAGE COST OF SYSTEM IMPROVEMENT	\$1,699.36	\$907.94	\$0.00	\$1,515.39	\$801.65	\$1,010.36	\$1,229.14	\$1,089.59	\$1,173.09	\$1,124.85	\$2,092.10	\$2,191.81	\$1,234.60
23. PUMP REPLACEMENTS	21	32	5	19	10	5	11	9	4	17	9	13	165
24. AVERAGE COST PER REPLACEMENT	\$3,083.22	\$2,740.58	\$5,933.31	\$2,400.07	\$2,162.21	\$2,588.25	\$2,789.63	\$2,150.27	\$3,140.72	\$1,595.01	\$2,146.75	\$2,995.99	\$2,810.33
25. TOTAL OF WORK ORDERS (1+10+19+21)	64	87	51	116	77	91	61	104	77	190	94	111	1123

HISTORICAL DATA

2014

UNDERGROUND	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	TOTAL
NEW SERVICES													
1. WORK ORDERS - (UNIFORMED) (19)	35	21	34	30	55	41	54	55	39	81	60	42	547
2. LINE FEET - TOTAL	4300	2396	4083	7570	10109	4839	6088	6059	3814	14301	6769	5289	75615
PRIMARY	585	535	375	5580	4903	1005	285	918	204	4082	508	1393	20373
SECONDARY	8	8	8	8	8	8	8	8	8	8	8	8	8
SERVICES	3715	1861	3708	1990	5206	3834	5801	5141	3610	10219	6261	3896	55242
3. AVERAGE LENGTH (L+I)	123	114	120	252	184	118	113	110	88	177	113	128	138
4. COST OF UNDERGROUND (19)	\$80,379.50	\$37,091.57	\$32,006.40	\$117,562.04	\$66,909.44	\$25,167.38	\$43,743.09	\$45,338.46	\$20,405.46	\$121,294.97	\$45,640.36	\$80,450.65	\$701,996.32
5. AVERAGE COST (L+I)	\$1,725.13	\$1,766.27	\$941.36	\$3,918.73	\$1,216.54	\$613.84	\$810.06	\$824.34	\$677.06	\$1,497.47	\$760.77	\$1,916.49	\$1,283.36
6. NEW TRANSFORMERS	4	5	3	11	15	8	8	6	10	5	3	12	88
7. INSTALLED COST PER TRANSFORMER	\$1,454.88	\$1,477.46	\$2,852.80	\$4,564.31	\$4,564.31	\$1,371.43	\$1,371.43	\$1,531.86	\$1,531.86	\$1,478.86	\$1,479.86	\$1,437.86	\$3,377.81
8. NEW METERS	39	19	33	26	45	35	51	51	34	80	54	34	501
9. INSTALLED COST PER METER	\$314.66	\$314.66	\$314.66	\$314.66	\$314.66	\$232.41	\$232.41	\$232.41	\$316.92	\$316.92	\$316.92	\$316.92	\$333.07
OVERHEAD													
NEW SERVICES													
10. WORK ORDERS - (UNIFORMED) (19)	8	10	14	20	31	21	28	22	22	48	25	17	262
11. LINE FEET - TOTAL	351	1337	3751	328	7164	3359	8269	5254	6932	6094	2432	427	75898
PRIMARY	786	1237	3694	1286	3239	33654	6560	5525	7011	5101	1265	491	71839
SECONDARY	8	8	8	8	8	8	8	8	8	8	8	8	8
SERVICES	-435	100	57	-958	1925	-85	1709	-271	-78	893	1177	-84	4059
12. AVERAGE LENGTH (L+I)	69	134	268	16	231	1,598	318	239	315	127	97	25	290
13. COST OF NEW UNDERGROUND (19)	\$24,079.17	\$31,558.48	\$66,680.19	\$74,905.83	\$96,256.88	\$77,042.62	\$79,677.57	\$76,620.23	\$115,829.04	\$138,706.19	\$55,107.60	\$41,131.94	\$879,595.74
14. AVERAGE COST NEW SERVICE (L+I)	\$4,013.20	\$3,155.85	\$4,905.73	\$3,745.29	\$3,105.06	\$3,668.70	\$3,084.52	\$3,482.74	\$5,264.96	\$2,889.71	\$2,204.30	\$2,419.53	\$3,357.24
15. NEW TRANSFORMERS	8	10	13	17	28	17	20	16	22	37	16	12	214
16. INSTALLED COST PER TRANSFORMER	\$779.12	\$779.12	\$804.55	\$1,843.52	\$1,843.52	\$1,843.52	\$796.68	\$818.02	\$1,289.58	\$1,289.58	\$1,289.58	\$778.71	\$801.97
17. NEW METERS	1	4	9	5	18	9	16	9	10	29	19	10	139
18. INSTALLED COST PER METER	\$314.66	\$314.66	\$314.66	\$314.66	\$314.66	\$232.41	\$232.41	\$232.41	\$316.92	\$316.92	\$316.92	\$316.92	\$333.07
19. SECURITY LIGHT TOTAL	17	14	6	14	22	15	16	23	10	28	17	8	189
20. INSTALLED COST PER LIGHT	\$1,155.09	\$1,182.04	\$1,601.97	\$748.15	\$889.56	\$787.40	\$844.46	\$896.78	\$1,121.92	\$635.93	\$675.30	\$842.41	\$940.08
21. SYSTEM IMPROVEMENTS - TOTAL	1	2	3	1	6	8	2	4	3	6	3	6	45
22. AVERAGE COST OF SYSTEM IMPROVEMENT	\$901.00	\$2,388.60	\$1,283.19	\$1,596.57	\$896.74	\$914.71	\$552.60	\$440.52	\$969.21	\$1,248.94	\$1,422.70	\$1,427.35	\$1,162.78
23. PNE REPLACEMENTS	29	13	16	32	26	24	19	53	15	27	24	20	298
24. AVERAGE COST PER REPLACEMENT	\$1,894.03	\$3,992.86	\$2,130.37	\$2,501.69	\$2,826.12	\$1,618.35	\$1,746.40	\$2,097.28	\$2,321.15	\$3,212.77	\$2,449.22	\$3,166.76	\$2,496.51
25. TOTAL OF WORK ORDERS (1+10+21)	59	47	56	65	114	85	98	104	74	163	106	73	1043

HISTORICAL DATA

		2017	2018	2019	2020	2021	2022	2019-2022	
		TOTAL	AVERAGE PLUS 5%	PLUS 5%	PLUS 5%	PLUS 5%	PLUS 5%	TOTAL	
Notes:	UNDERGROUND	TOTAL	TOTAL						
	NEW SERVICES								
From 219 Report	1 WORK ORDERS - CONSTRUCTED ON 219	845	781	813	854	896	941	988	3679
Formula	2 LINEAR FEET TOTAL	143055	100655	121855	127948	134345	141062	148116	551471
From Mitage Report	PRIMARY	53092	32791	42942	45089	47343	49710	52196	194337
N/A	SECONDARY								
From Mitage Report	SERVICES	89963	67864	78914	82859	87002	91352	95920	357133
Formula	3 AVERAGE LENGTH (2/1)	169	\$ 128.88	149.0877	157	164	173	181	117.54
From 219 Report	4 COST OF UNDERGROUND (219)	\$957,767.52	\$1,039,518.75	998843	1048575	1101004	1156054	1213857	4519491
Formula	5 AVERAGE COST (4/1)	\$1,133.45	\$ 1,331.01	1232	1294	1359	1426	1498	1394
From Mitage Report	6 NEW TRANSFORMERS	132	135	134	140	147	155	162	604
Formula	7 INSTALLED COST PER TRANSFORMER	\$2,404.10	\$ 2,215.17	2310	2425	2546	2674	2807	1583477
From Mitage Report	8 NEW METERS	799	801	800	840	882	926	972	3679
Special Equipment	9 INSTALLED COST PER METER			0	0	0	0	0	219
	Average cost underground			0	1104489	1159713	1217699	1278584	4760486
	OVERHEAD								
	NEW SERVICES								
From 219 Report	10 WORK ORDERS CONSTRUCTED ON 219	340	254	297	312	327	344	361	1344
Formula	11 LINEAR FEET - TOTAL	102318	89846	96082	100888	105930	111227	116798	434832
From Mitage Report	PRIMARY	98339	80984	88662	93095	97749	102637	107769	401249
N/A	SECONDARY								
From Mitage Report	SERVICES	5979	8862	7421	7792	8181	8590	9020	33582
Formula	12 AVERAGE LENGTH (11/10)	301	353.7244094	327	344	361	379	398	94.28
From 219 Report	13 COST OF NEW CONSTRUCTION (219)	\$1,199,884.50	1115771.18	1157818	1215709	1276494	1340319	1407335	5239857
Formula	14 AVERAGE COST NEW SERVICE (13/10)	\$3,529.01	\$ 4,392.80	3961	4159	4367	4585	4815	17926
From Mitage Report	15 NEW TRANSFORMERS	282	226	254	267	280	294	309	1150
Formula	16 INSTALLED COST PER TRANSFORMER	\$833.70	\$ 775.89	805	845	887	932	978	1049802
From Mitage Report	17 NEW METERS	165	165	165	173	182	191	201	1344
Special equipment	18 INSTALLED COST PER METER			0	0	0	0	0	219
	Average cost overhead			0	1296969	1361818	1429908	1501404	5590999
From Mitage Report	19 SECURITY LIGHT TOTAL	247	185	206	216	227	238	250	932
From 219 Report	20 INSTALLED COST PER LIGHT	\$1,041.65	\$ 1,356.05	1199	1259	1322	1388	1457	5426
	Average cost security light			0	272276.6	285890	300185	315194	1173546
From 219 Report	21 SYSTEM IMPROVEMENTS - TOTAL	55	63	59	62	65	68	72	287
From 219 Report	22 AVERAGE COST OF SYSTEM IMPROVEM	\$1,532.40	\$ 1,585.23	1559	1637	1719	1805	1895	472317
From 219 Report	23 POLE REPLACEMENTS	162	219	191	200	210	221	232	862
From 219 Report	24 AVERAGE COST PER REPLACEMENT	\$2,302.32	\$ 3,425.96	2864	3007	3158	3318	3481	2802052
	Average cost system improvements			0	101396.8	106467	111790	117379	437033
Formula	25. TOTAL OF WORK ORDERS (1+10+19+21)	1487	1283	1376	1444	1516	1592	1671	6223
	Average cost pole replacements			0	601543.7	631621	663202	696382	2592729
Special equipment	26. TOTAL TRANSFORMERS PURCHASED - U	138	188	163	171	180	189	198	736
Special equipment	27. INSTALLED TRANSFORMER COST - UG	\$331,765.53	\$ 416,451.30	374108	392814	412455	433077	454731	1693077
Special equipment	28. TOTAL TRANSFORMERS PURCHASED - O	626	437	532	558	586	615	646	2405
Special equipment	29. INSTALLED TRANSFORMER COST - OII	\$521,898.08	\$ 339,063.72	430481	452005	474605	498335	523252	1948198
Special equipment	30. TOTAL METERS PURCHASED	336	0	168	176	185	194	204	760
Special equipment	31. INSTALLED METER COST	\$98,620.74	\$ 40,363.56	69492.2	72967	76615	80446	84468	314496
Special equipment	32. OTHER SPECIAL EQUIPMENT PURCHAS	\$21,207.37	18367.17	18787	20777	21815	22906	24052	89550
	Three phase meters			0	0	0	0	433	1007
	Single phase meters							175	51008

COST ESTIMATE AND LOAN BUDGET FOR ELECTRIC BORROWERS		BORROWER AND LOAN DESIGNATION	KY 21 NELSON
SECTION A. COST ESTIMATES (Page 1 Continuation Sheet)		BORROWER'S COST ESTIMATES	RUS USE ONLY
200 b. New Tie-Lines (Continued)			
	Line Designation	Miles	
207		0.00	\$0
208		0.00	0
209		0.00	0
210		0.00	0
211		0.00	0
212		0.00	0
213		0.00	0
214		0.00	0
215		0.00	0
216		0.00	0
	Miles	0.00	
	Subtotal (transfers to page 1)		\$0
300 c. Conversion and Line Changes (Continued)			
	Line Designation	Miles	
311	3 PHASE 4ACWC TO 3 PHASE 336.4 ACSR	0.92	\$156,400
312	NEW CIRCUIT 795 SPACER CABLE	2.29	561,050
313	3 PHASE 336.4 ACSR TO D.C. 795 SPACER CABLE	0.36	99,000
314	3 PHASE 1Ø CU TO 3 PHASE 336.4 ACSR	2.81	477,700
315	1 PHASE 6ACWC TO 3 PHASE 1Ø ACSR	1.39	166,800
316	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSR	0.58	98,600
317	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSR	1.51	256,700
318	1 PHASE 6ACWC TO 3 PHASE 1Ø ACSR	1.95	234,000
319	3 PHASE 6ACWC TO 3 PHASE 336.4 ACSR	0.66	112,200
320	3 PHASE 1Ø CU TO 3 PHASE 336.4 ACSR	2.49	423,300
321	3 PHASE 1Ø CU TO 3 PHASE 336.4 ACSR	0.83	141,100
322	1 PHASE 6ACWC TO 1 PHASE 1Ø ACSR	4.65	395,250
323	2 PHASE 6ACWC TO 3 PHASE 1Ø ACSR	1.26	151,200
324	3 PHASE 4ACWC TO 3 PHASE 336.4 ACSR	3.16	537,200
325	2 PHASE 4ACWC TO 3 PHASE 336.4 ACSR	5.77	980,900
326	1 PHASE 6ACWC TO 3 PHASE 1Ø ACSR	2.61	313,200
327	3 PHASE 4ACWC TO 3 PHASE 336.4 ACSR	3.43	583,100
328	1 PHASE 6ACWC TO 3 PHASE 1Ø ACSR	2.11	253,200
329	3 PHASE 397 SPACER CABLE TO 795 SPACER CABLE	2.39	585,550
330	2 PHASE 6ACWC TO 3 PHASE 1Ø ACSR	0.62	74,400
331	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSR	1.67	283,900
332	3 PHASE 1Ø CU TO 3 PHASE 336.4 ACSR	1.44	244,800
333	3 PHASE 3Ø ACSR TO 3 PHASE 336.4 ACSR	2.50	425,000
334	3 PHASE 1Ø CU TO 3 PHASE 336.4 ACSR	4.07	691,900
335	3 PHASE 1Ø CU TO 3 PHASE 336.4 ACSR	3.63	617,100
336	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSR	3.65	620,500
337	2 PHASE 6ACWC TO 3 PHASE 1Ø ACSR	4.74	568,800
338	1 PHASE 8ACWC TO 3 PHASE 1Ø ACSR	1.00	120,000
339	1 PHASE 6ACWC TO 3 PHASE 1Ø ACSR	1.58	189,600
340	3 PHASE 2ACWC TO 3 PHASE 336.4 ACSR	2.19	372,300
341			0
342			0
343			0
	Subtotal (transfers to page 1)	68.26	\$10,734,750

PROJECT NAME: Hwy 49
CFR CODE: 301
ESTIMATED COST: \$306,000

DESCRIPTION OF PROPOSED CONSTRUCTION:

A 1.80 mile conversion from three phase 2ACWC to three phase 336.4 ACSR in central Nelson County. This project is on Balltown Substation Fdr 01.

REASON FOR PROPOSED CONSTRUCTION

This project will correct voltage problems on circuit 01 that dip to 109 volts.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were reviewed for this feeder. Economic analysis suggests that the conversion project is the best plan for the future.

PROJECT NAME: Holy Cross road

CFR CODE: 302

ESTIMATED COST: \$562,700

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project involves the conversion of 3.3 miles of three phase 1/0 ACSR to three phase 336.4 ACSR along Holy Cross road in central Nelson County. This conversion is on Balltown Sub Fdr 01

REASON FOR PROPOSED CONSTRUCTION

This project will correct voltage problems on this circuit. This feeder has an existing set of regulator.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

Alternative plan 2 to use another set of regulators did not prove to be economically feasible.

PROJECT NAME: Jim Clark road to New Hope road

CFR CODE: 303

ESTIMATED COST: \$192,000

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project involves the conversion of 1.60 miles of single phase 6ACWC to three phase 1/0 ACSR along Holy Cross road in central Nelson County. This conversion is on Balltown Sub Fdr 01.

REASON FOR PROPOSED CONSTRUCTION

This conversion will correct voltage problems on this feeder.

RESULTS OF PROPOSED CONSTRUCTION:

All Design Criteria will be met with the completion of this conversion.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATION

Alternative plan 2 to use another set of regulators did not prove to be economically feasible.

PROJECT NAME: Nat Rogers Road

CFR CODE: 304

ESTIMATED COST: \$182,400

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project includes 1.52 mile single phase 6ACWC to three phase 1/0ACSR along Nat Rogers Road in central Nelson County. This conversion is on Balltown Substation fdr 04

REASON FOR PROPOSED CONSTRUCTION

This conversion will correct voltage problems on this feeder.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria will be met and reliability will be increased.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered because of the ampacity problems and because the installation of a regulator did not solve voltage problems.

PROJECT NAME: Icetown Road

CFR CODE: 305

ESTIMATED COST: \$124,800

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project includes 1.04 mile single phase 6ACWC to three phase 1/0 ACSR along Icetown Road in central Nelson County. This conversion is on Balltown Substation fdr 04

REASON FOR PROPOSED CONSTRUCTION

This conversion will correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered because of the ampacity problems and because the installation of a regulator did not solve voltage problems

PROJECT NAME: Simpson Creek Road to Alfred Russell Road

CFR CODE: 306

ESTIMATED COST: \$272,400

DESCRIPTION OF PROPOSED CONSTRUCTION:

A 2.27 mile conversion of single phase 6ACWC to three phase 1/0 ACSR in Nelson County. This project is on Bloomfield Substation Fdr 01.

REASON FOR PROPOSED CONSTRUCTION

This conversion will correct voltage problems that dipped to 105 volts on this circuit. This circuit has a lot of consumers on the end of it.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

None.

PROJECT NAME: KY 1066
CFR CODE: 307
ESTIMATED COST: \$496,800

DESCRIPTION OF PROPOSED CONSTRUCTION:

A 4.14 mile conversion from three phase 1/0 CU to three phase 336.4 ACSR along Hwy 1066 in central Nelson County. This is on Bloomfield Substation Fdr 02.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage and loading problems on this feeder.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met and more reliable service will be provided.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered.

PROJECT NAME: MT ZION road

CFR CODE: 308

ESTIMATED COST: \$326,400

DESCRIPTION OF PROPOSED CONSTRUCTION:

A 1.92 mile conversion of three phase 2ACWC to three phase 336.4 ACSR along Mt Zion in central Nelson County. This is on Bloomfield Substation Fdr 04.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct numerous voltage and loading problems on this feeder.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria will be met and more reliable service will be provided.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered.

PROJECT NAME: Sweeny Ridge Road

CFR CODE: 309

ESTIMATED COST: \$250,800

DESCRIPTION OF PROPOSED CONSTRUCTION:

A 2.09 mile conversion of single phase 6ACWC to three phase 1/0 ACSR along Sweeny Ridge road In central Nelson County. This Project is on Bloomfield Substation Fdr 04.

REASON FOR PROPOSED CONSTRUCTION

This project will correct voltage problems in the area.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered.

PROJECT NAME: Brush Grove Road

CFR CODE: 310

ESTIMATED COST: \$742,900

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project is a 4.37 mile three phase phase 1/0 CU to three phase 336.4 ACSR conversion along Brush Grove road road in Washington County. This is on Bloomfield Substation fdr 04.

REASON FOR PROPOSED CONSTRUCTION:

This is a long feeder and will solve voltage problems t the end of it.

RESULTS OF PROPOSED CONSTRUCTION:

By completing this line all design criteria will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered.

PROJECT NAME: Hwy 62 to Stoner Road

CFR CODE: 311

ESTIMATED COST: \$156,400

DESCRIPTION OF PROPOSED CONSTRUCTION:

This job is a 0.92 mile conversion of three phase 4ACWC to three phase 336.4 ACSR along Old Bloomfield road in central Nelson County. This is on Bluegrass Parkway Substation Fdr 03.

REASON FOR PROPOSED CONSTRUCTION:

This project is required due to voltage and loading problems.

RESULTS OF PROPOSED CONSTRUCTION:

All design criteria will be met by building this project as proposed.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives considered.

PROJECT NAME: Bluegrass Parkway Sub to Highway 62

CFR CODE: 312

ESTIMATED COST: \$561,050

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project will consist of the conversion of 2.29 miles of new 795 spacer cable along Woodlawn road in central Nelson County. This project will be constructed on the existing circuit This is on Bluegrass Parkway Substation Fdr 03.

REASON FOR PROPOSED CONSTRUCTION:

This conversion will alleviate loading and voltage problems in this area. Forecast loads are exceeding ampacity of existing wire.

RESULTS OF PROPOSED CONSTRUCTION:

All Design Criteria will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

Economic analysis confirmed the conversion to be the best solution in the long term.

PROJECT NAME: Highway 62

CFR CODE: 313

ESTIMATED COST: \$99,000

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project will consist of the conversion of 0.36 miles of three phase 336.4 ACSR to double circuit 795 spacer cable along HWY 262 in central Nelson County. This is on Bluegrass Parkway Substation Fdr 03.

REASON FOR PROPOSED CONSTRUCTION:

This conversion will alleviate loading and voltage problems on the circuit and the double circuit will allow the circuit to be split.

RESULTS OF PROPOSED CONSTRUCTION:

All Design Criteria will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

Economic analysis confirmed the conversion to be the best solution in the long term.

PROJECT NAME: Old Bloomfield road to Browns lane

CFR CODE: 314

ESTIMATED COST: \$477,700

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project will consist of a 2.81 mile conversion of three phase 1/0 CU to three phase 336.4 ACSR along Bloomfield road in central Nelson County. This project is on Bluegrass Parkway Sub Fdr 03.

REASON FOR PROPOSED CONSTRUCTION:

This job will correct voltage problems on circuit 03 and provide better reliability to a fast growing area.

RESULTS OF PROPOSED CONSTRUCTION:

This project will provide for all design criteria to be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the ampacity problems on this feeder.

PROJECT NAME: Wire lane

CFR CODE: 315

ESTIMATED COST: \$166,800

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project will consist of a 1.39 mile conversion of single phase 6ACWC to three phase 1/0 ACSR along Wire Lane in central Nelson County. This project is on Bluegrass Parkway Sub Fdr 03.

REASON FOR PROPOSED CONSTRUCTION:

This job will correct voltage problems on circuit 03 and provide better reliability to a fast growing area.

RESULTS OF PROPOSED CONSTRUCTION:

This project will provide for all design criteria to be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the voltage problems on this feeder.

PROJECT NAME: Brooks Sub to East Blue Lick Road

CFR CODE: 316

ESTIMATED COST: \$98,600

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project will be a conversion of 0.58 miles of three phase 2ACWC to three phase 333.4 ACSR in northern Bullitt County. This conversion will be on Brooks Sub Fdr 03.

REASON FOR PROPOSED CONSTRUCTION

This project will correct voltage and reliability problems on these feeders. This area is primed for increased growth due to the industrial parks in this area.

RESULTS OF PROPOSED CONSTRUCTION:

By constructing this project all Design criteria will be met and reliability will be increased.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were investigated.

PROJECT NAME: West Blue lick Road

CFR CODE: 317

ESTIMATED COST: \$256,700

DESCRIPTION OF PROPOSED CONSTRUCTION:

A 1.51 mile conversion of three phase 2ACWC to 336.4 ACSR along HWY 61 and West Blue Lick road in central Bullitt County. This conversion is on Brooks Sub Fdr 06.

REASON FOR PROPOSED CONSTRUCTION:

Voltage problems will be corrected with this project.

RESULTS OF PROPOSED CONSTRUCTION:

All design criteria will be met with this project.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were investigated.

PROJECT NAME: Hochstrasser Road

CFR CODE: 318

ESTIMATED COST: \$234,000

DESCRIPTION OF PROPOSED CONSTRUCTION:

This conversion consists of 1.95 mile of single phase 6ACWC to three phase 1/0 ACSR along HWY 61 in Spencer County. this project is on Darwin Thomas Sub Fdr 02.

REASON FOR PROPOSED CONSTRUCTION

This project will correct voltage problems on this circuit. The region is in a high growth area with numerous subdivisions.

RESULTS OF PROPOSED CONSTRUCTION:

By constructing this project all items will be corrected.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were investigated.

PROJECT NAME: Samuels Loop to Antlers Trace Subdivision

CFR CODE: 319

ESTIMATED COST: \$112,200

*** Carryover Item 316 2014-17 CWP

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project involves the conversion of 0.66 miles of 6ACWC to 336.4 ACSR along Hwy 245 in Nelson County. This project is on Deatsville Substation Fdr 02.

REASON FOR PROPOSED CONSTRUCTION:

This project will correct voltage problems on circuit 02.

RESULTS OF PROPOSED CONSTRUCTION:

The construction of these projects all design criteria will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were investigated.

PROJECT NAME: Caney Fork to Copperfield Subdivision

CFR CODE: 320

ESTIMATED COST: \$423,300

**** Carryover Item 301 2014-17 CWP

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 2.49 mile conversion from three phase 1\0 CU to three phase 336.4 ACSR in central Nelson County. The project is on East Bardstown Fdr 02

REASON FOR PROPOSED CONSTRUCTION

This project is required alleviate voltage problems due to numerous very large subdivisions being developed..

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met and more reliable service will be provided.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered because of the ampacity levels.

PROJECT NAME: Copperfield Subdivision to US 31E

CFR CODE: 321

ESTIMATED COST: \$141,100

**** Carryover Item 302 2014-17 CWP

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 0.83 mile conversion from three phase 1\0 CU to three phase 336.4 ACSR in central Nelson County. The project is on East Bardstown Fdr 02

REASON FOR PROPOSED CONSTRUCTION

This project is required alleviate voltage problems due to numerous very large subdivisions being developed..

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met and more reliable service will be provided.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered because of the ampacity lev

PROJECT NAME: Croakes Station to Summers Lane

CFR CODE: 322

ESTIMATED COST: \$395,250

****Carryover from 2014-17 CWP

DESCRIPTION OF PROPOSED CONSTRUCTION:

A 4.65 mile conversion of single phase 6A to single phase 1\0 ACSR through Croake Station road in southern Washington County and Summers Lane in Eastern Nelson County. This is on Fredricksburg Substation Fdr 04.

REASON FOR PROPOSED CONSTRUCTION

This is a project that will improve voltage and loading conditions on this line. There are 160 customers on this existing 6ACWC and mostly are concentrated on the end of the circuit with more lots to be added in the future.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria will be met and more reliable service provided.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered.

PROJECT NAME: Pitts Point Road

CFR CODE: 323

ESTIMATED COST: \$151,200

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 1.26 mile two phase 6ACWC to three phase 1/0 ACSR conversion from the bottom of Brooks Hill road to the end of Pitts Point road in Bullitt County. This project is on Gospel Hill Substation Fdr 05.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

Alternatives included adding a regulator bank but this did not address the reliability problems.

PROJECT NAME: Joe Tichenor Substation to Nazareth

CFR CODE: 324

ESTIMATED COST: \$537,200

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 3.16 mile three phase 4ACWC to three phase 336.4 ACSR conversion from Joe Tichenor Substation Nazareth in Nelson County. This project is on Joe Tichenor Substation Fdr 01.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct ampacity problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the ampacity concerns.

PROJECT NAME: Hwy 509 to Snider Lane

CFR CODE: 325

ESTIMATED COST: \$980,900

**** Carryover Item 311 2014-17 CWP

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 5.77 mile two phase 4ACWC to three phase 336.4 ACSR conversion from Hwy 509 to Snider Lane in Nelson County. This project is on Joe Tichenor Substation Fdr 03.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit and to provide backfeed capabilities.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered.

PROJECT NAME: Hobbs Lane

CFR CODE: 326

ESTIMATED COST: \$313,200

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 2.61 mile single phase 6ACWC to three phase 1/0 ACSR conversion along Hobbs Lane in Nelson County. This project is on Joe Tichenor Substation Fdr 03.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct ampacity problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered.

PROJECT NAME: Coss creek to High Grove

CFR CODE: 327

ESTIMATED COST: \$583,100

**** Carryover Item 310 2014-17 CWP

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 3.43 mile three phase 4ACWC to three phase 336.4 ACSR conversion along US 31E in Nelson County. This project is on Joe Tichenor Substation Fdr 04.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

Regulators were investigated but did not solve problems.

PROJECT NAME: Pendleton Hill Road conversion

CFR CODE: 328

ESTIMATED COST: \$253,200

***Carryover Item 313 from 2014-17 CWP

DESCRIPTION OF PROPOSED CONSTRUCTION:

This project requires the conversion of 2.11 miles of single phase 6ACWC to three phase 1/0 ACSR along Pendleton Hill road in northern Bullitt County. This project is on Knob Creek Substation Fdr 01.

REASON FOR PROPOSED CONSTRUCTION

This project will correct projected loads of over 100% ampacity problems on circuit 01. There currently over 130 customers on this tap and some very long spans. Coordination problems also exist with this project.

RESULTS OF PROPOSED CONSTRUCTION

With the construction all design criteria will be met.

ALTERNATIVE PLANS INVESTIGATED

No alternatives were considered because of ampacity issues.

PROJECT NAME: Mount Washington # 2 to US 31E

CFR CODE: 329

ESTIMATED COST: \$585,550

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 2.39 mile three phase 397 spacer cable to 795 spacer cable conversion along Hwy 44 and US 31E in Bullitt County. This project is on Mount Washington Substation Fdr 06.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct ampacity problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the ampacity problems.

PROJECT NAME: Greenbrier Road

CFR CODE: 330

ESTIMATED COST: \$74,400

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 0.62 mile two phase ACWC to three phase 1/0 ACSR conversion along Clearview Drive and Greenbrier Road in Bullitt County. This project is on Mount Washington Substation Fdr 06.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the ampacity problems.

PROJECT NAME: Highway 53 at Willisburg

CFR CODE: 331

ESTIMATED COST: \$283,900

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 1.67 mile three phase 2ACWC to three phase 336.4 ACSR conversion along Hwy 53 in Willisburg in Washington County. This project is on North Springfield Fdr 05.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the voltage drop concerns.

PROJECT NAME: Highway 44 from Truman Drive to Greenbrier Road

CFR CODE: 332

ESTIMATED COST: \$244,800

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 1.44 mile three phase 1/0 CU to three phase 336.4 ACSR conversion along Hwy 44 in central Bullitt County. This project is on Pleasant Grove Sub Fdr 03.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage and ampacity problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the ampacity concerns.

PROJECT NAME: Shepherdsville # 2 to Beech Grove Road

CFR CODE: 333

ESTIMATED COST: \$425,000

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 2.50 mile three phase 3/0 ACSR to three phase 336.4 ACSR conversion in central Bullitt County. This project is on Shepherdsville # 2 Sub Fdr 06.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage and ampacity problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the ampacity concerns.

PROJECT NAME: Shepherdsville # 2 to KY 44

CFR CODE: 334

ESTIMATED COST: \$691,900

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 4.07 mile three phase 1/0 CU to three phase 336.4 ACSR conversion in central Bullitt County. This project is on Shepherdsville # 2 Sub Fdr 05.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage and ampacity problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the ampacity concerns.

PROJECT NAME: South Springfield Sub to Hwy 152

CFR CODE: 335

ESTIMATED COST: \$617,100

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 3.63 mile three phase 1/0 CU to three phase 336.4 ACSR conversion in southern Washington County. This project is on South Springfield Sub Fdr 05.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to long feeder and the voltage concerns.

PROJECT NAME: South Springfield Sub to Hwy 555

CFR CODE: 336

ESTIMATED COST: \$620,500

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 3.65 mile three phase 2ACWC to three phase 336.4 ACSR conversion in southern Washington County. This project is on South Springfield Sub Fdr 02.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to long feeder and the voltage concerns.

PROJECT NAME: Brashers Creek Road to Little Mt Church Road

CFR CODE: 337

ESTIMATED COST: \$568,800

**** Carryover Item 307 2014-17 CWP

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 4.74 mile two phase 6ACWC to three phase 1/0 ACSR conversion in central Spencer County. This project is on Taylorsville Sub Fdr 04.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to long feeder and the voltage concerns. This an old 6ACWC line.

PROJECT NAME: Lutheran Church Road

CFR CODE: 338

ESTIMATED COST: \$568,800

**** Carryover Item 308 2014-17 CWP

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 1.00 mile single phase 8ACWC to three phase 1/0 ACSR conversion in central Nelson County. This project is on West Bardstown Sub Fdr 01.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the voltage concerns. This an old 8ACWC line. This project will allow backfeeding capabilities.

PROJECT NAME: Highway 733

CFR CODE: 339

ESTIMATED COST: \$189,600

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 1.58 mile single phase 6ACWC to three phase 1/0 ACSR conversion in central Nelson County. This project is on Woosley Sub Fdr 05.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the voltage concerns. This an old 6ACWC line.

PROJECT NAME: Highway 62 to Old Mt Moriah Road

CFR CODE: 340

ESTIMATED COST: \$372,300

DESCRIPTION OF PROPOSED CONSTRUCTION:

This is a 2.19 mile three phase 2ACWC to three phase 336.4 ACSR conversion in central Nelson County. This project is on Woosley Sub Fdr 03.

REASON FOR PROPOSED CONSTRUCTION

This project is required to correct voltage problems on this circuit.

RESULTS OF PROPOSED CONSTRUCTION:

With the construction of this project all design criteria items will be met.

ALTERNATIVE CORRECTIVE PLANS INVESTIGATED:

No alternatives were considered due to the voltage concerns.