

OPERATING AGREEMENT (FACILITY USE ANCILLARY SERVICES)

This OPERATING AGREEMENT detailing Facility Use Ancillary Services ("Operating Agreement") is made effective the 1st day of June, 2021 by and between SHO-ME POWER ELECTRIC COOPERATIVE, a Missouri rural electric cooperative ("Sho-Me"), and the CITY OF WAYNESVILLE, MISSOURI, a municipality validly organized and existing under Missouri law (the "City"). Both Sho-Me and the City are referred to collectively herein as the "Parties" or in the singular as a "Party". Capitalized terms used in this Operating Agreement shall have the same meaning as prescribed in the Facilities Use Agreement executed by the Parties contemporaneously with this Operating Agreement unless otherwise noted.

WHEREAS, this Operating Agreement is intended to be executed in coordination with that certain Facilities Use Agreement between Sho-Me and the City for the Facilities which consist of the electric facilities and equipment required for the transformation of electric power to be delivered to the City through the Waynesville Substation owned by Sho-Me;

WHEREAS, the Substation also serves a Rural Electric Cooperative ("REC") member of Sho-Me, so the Substation has a dual service commitment for both the City and Sho-Me's REC member; and

WHEREAS, the City desires to proceed with a plan that will allow the City to directly contract with Sho-Me for electric transformation facilities use, with operations and management of such facilities to be governed by a formal operating agreement that takes into consideration the dual use of the Substation and the safety, security, inspection, and maintenance of the Facilities during the term of the Facilities Use Agreement;

NOW THEREFORE, be it agreed between the Parties, in exchange for good and valuable consideration, the receipt, adequacy and sufficiency of which is hereby acknowledged, as follows:

1. **Shared Monitoring Services Supplied by Sho-Me Power.** Sho-Me shall provide continuous and constant monitoring of the Facilities through a Supervisory Control and Data Acquisition (SCADA) system along with a separate physical security system monitored 24 hours a day, 7 days a week, 365 days a year.

2. **Cost for Shared Monitoring Services.** City shall pay to Sho-Me the sum of Two Thousand Dollars (\$2,000) per month for shared monitoring services ("Monitoring Fee") commencing on the date that Sho-Me provides electric Facility Use service to the City under the Facilities Use Agreement and on that same date each month through the term of this Operating Agreement. The Monitoring Fee will be increased by no more than 3% annually, said increase to commence on the anniversary date set by the first payment made by City hereunder.

3. **Direct Labor Costs.** City shall pay Sho-Me for direct labor costs related to the normal and customary operations and maintenance of the Facilities ("Direct Labor Costs"). For clarity, Sho-Me will only charge the City for labor costs (ie., engineering or field work) performed on or related to the Substation equipment and facilities dedicated to providing transmission service to the City, not to the REC or any other third party. Labor rates shall be set by Sho-Me's policy and procedures, then in effect, for "Work for Others", a copy of which is attached hereto as SCHEDULE 1 (the "Policy"). Currently, the labor

rate under the Policy is \$150/ hr., and is subject to increase as reasonably determined by Sho-Me, but in no event greater than fifteen percent (15%) every five (5) years. Work on dual use equipment that serves both the City and the REC ("Dual Use Equipment") shall be completed by Sho-Me and shall not be charged to the City, nor shall the cost of any materials or the supply of Sho-Me equipment be charged to the City related to Dual Use Equipment.

4. **Billing and Invoicing.** Billing and invoicing for sums due under this Operating Agreement shall be timely issued by Sho-Me to the City with sufficient descriptive detail on all such charges due within ten (10) days after the end of each billing cycle, and shall be paid by the City within twenty-five (25) days of invoice. Interest on any amount that is past due shall accrue at a rate equal to one and a half percent (1.5%) per month. Should any tax, federal, state or local, in addition to such taxes as may now exist, be levied upon the service provided hereunder, such tax shall be paid by the party directly liable for the payment of same; however, City agrees not to impose any new tax on Sho-Me or the Facilities that does not already exist as of the date of this Operating Agreement.

5. **Sho-Me's Substation Inspection and Maintenance Program.** Sho-Me has developed a substation inspection and maintenance program (the "Program") that essentially provides inspection and maintenance guidelines and procedures for its facilities of this nature, a copy of which is attached hereto as SCHEDULE 2. The Program, as amended from time to time, shall be implemented for the Substation and the Facilities. Direct Labor Costs for the Program are currently estimated based on two hundred and fifty (250) hours of labor, or an annual estimated total of Thirty-Seven Thousand Five Hundred Dollars (\$37,500). The City may elect to pay Direct Labor Costs as they are incurred and invoiced at regular intervals by Sho-Me, or may include the monthly estimated amount for Direct Labor Costs along with the Monitoring Fee (initial monthly payment of \$5,125), subject to an annual "true up" of sums due-to-or-from either party prepared by Sho-Me and provided to the City timely once those figures are determined. Any payment due from one party to the other will be made promptly thereafter.

6. **Term of Operating Agreement.** The term of this Operating Agreement shall be governed and controlled by the term of the Facilities Use Agreement executed by the Parties. Accordingly, if the Facility Use Agreement is in force and effect in executory nature, then this Operating Agreement shall be also. Likewise, should the Facility Use Agreement be terminated as set forth therein, then this Operating Agreement shall be contemporaneously terminated as well since this Operating Agreement is dependent and conditioned upon use of the Facilities by the City. The provisions of this paragraph shall not otherwise limit the rights of the Parties to terminate this Operating Agreement in accord with the terms set forth below on that subject, and in the event this Operating Agreement is terminated, so to shall the Facilities Use Agreement as set forth therein.

7. **Operating Requirements**

7.1. **Minimum Power Factor Requirements.** Suitable instruments will be used to measure power factor at each metering point. Should such measurements indicate the power factor in the hour of the maximum demand at that metering point for a given month is less than 97%, a power factor penalty shall be applied in that month. This penalty shall be determined by calculating the kW demand necessary to achieve a 97% power factor, subtracting from the month's actual peak kW demand, and multiplying the difference by \$10. This penalty shall be billed and paid each month for one year, unless exceeded by a higher power factor penalty.

7.2 **Load Control.** The City shall not impose any unusual load upon the Facilities in excess of the safe and proper capacity of the Facilities as determined by Sho-Me. The City shall notify the Sho-Me dispatcher before intentionally taking energy to an extent that might affect Sho-Me's service or voltage for the Facilities. If emergency conditions arise on the City's electric power system that overload the Facilities, the City shall take steps immediately to reduce the load to the safe operating capacity of the Facilities, even though this may involve dropping or shedding load.

7.3 **Continuity of Interconnections.** If synchronous operation of the Parties' electrical systems through the Facilities becomes disrupted, the Parties shall cooperate to remove the cause of the disruption as soon as practicable and to restore their systems to normal interconnected operating condition.

7.4 **Inadvertent Interchange.** The City shall exercise good utility practice to ensure that its entire load at its delivery point is served from energy that the City has purchased and scheduled for delivery through the Facilities or generated with its own resources. The Parties shall provide on their respective systems, at their own expense, the necessary communications, telemetering and control facilities and elements and shall operate their respective systems so as to minimize, to the extent practicable, differences between net actual interchange and net scheduled interchange of electric power and energy through the Facilities.

8. ***Transfer of Power and Energy Through Other Systems.*** Since Sho-Me's electric system and the Facilities are and will be, directly and indirectly connected with other electric systems, the physical and electrical characteristics of the Facilities may cause power delivered under this Operating Agreement to flow through such other systems ("loop flow"). The Parties shall advise other electric systems as deemed appropriate of scheduled transfers pursuant to this Operating Agreement and to attempt to maintain good relationships with affected third parties. If Sho-Me is charged by another electrical system for loop flow charges in connection with the transmission of energy to the City through the Facilities, the City shall indemnify Sho-Me for such costs.

9. ***Ancillary Services the Responsibility of City.*** The City is responsible for making the necessary arrangements and paying all costs associated with the receipt of ancillary services required by a provider of transmission services in connection with the delivery of energy to the City through the Facilities, and/or the supplier of capacity and energy purchased by the City for its electric load. Such ancillary services may include scheduling, system control and dispatch service, reactive supply and voltage control, regulation, and frequency response service, energy imbalance service, spinning and supplemental reserve service. Sho-Me shall not be responsible for the costs related to any of these ancillary services.

10. ***Operations Committee.***

10.1 **Establishment of Committee.** The Parties agree that an Operations Committee should be established to review and analyze all matters related to the use of the Facilities, the Substation, and the services provided in this Operating Agreement on at least an annual basis, targeting April of each year for an annual meeting of this nature. Representatives from the City and Sho-Me shall be required for calling, coordinating, and conducting committee meetings, and the City's Electrical Engineer, along with representatives from the Missouri Joint Municipal Electric Utility Commission (MJMEUC) and Associated Electric Cooperative Incorporated (AECI), are encouraged to attend for their input and perspectives related to Sho-Me's ancillary services, use of the Facilities by the City, and matters of mutual interest.

10.2 **Duties of Committee.** The principal duties of the Operating Committee shall be as follows: (a) to establish scheduling, communications and meter testing procedures and control procedures; (b) to adopt operating rules and procedures as necessary to assure that, as completely as practicable, the delivery and receipt of real and reactive power and energy are accomplished efficiently, reliably and in a manner that causes the least interference with interconnected systems and the Facilities; (c) to coordinate maintenance schedules; (d) to establish accounting and billing procedures; and (e) to perform such other duties as may be required for the proper functioning of this Operating Agreement and operations of the Facilities. If the Operating Committee is unable to agree on any matter within its scope of duties, that matter shall be referred to the chief executives of the Parties or their designated representatives.

10.3 **Load Forecasting.** As part of the committee process, the City shall provide to Sho-Me by September 30 of each year a load forecast for the following year. Such load forecast shall be made in accordance with good utility practice. The City shall inform Sho-Me in a timely manner of any changes to its circumstances that cause its forecast to be inaccurate by more than five percent (5%). The City shall provide additional data needed for the safe and reliable operation of the Facilities to the extent the City has such data. Sho-Me will treat all such load forecasts and other information as confidential.

10.4 **Authority of Committee Limited.** The Operations Committee may make recommendations for consideration by the Parties, but it shall have no power to bind them, nor is it authorized to commit or spend any funds for consultants or for outside studies or work without the express approval of the Parties.

11. ***Indemnity***

11.1 Each Party, to the fullest extent permissible by law, shall indemnify, defend, and hold harmless the other Party, and such other Party's affiliates, directors, officers, agents, members, contractors, officials, and employees (collectively, "Indemnified Parties") from and against any claim, damage, cost, liability, expense, loss, and cause of action, including but not limited to any injury or death caused by contact with energized electrical lines and/or facilities, said indemnity to also include all reasonable attorney's fees, expert fees, litigation expenses and costs, to the extent such claim, damage, cost, liability, expense, loss, or cause of action arises from such Party's performance of this Operating Agreement and/or the obligations contained herein, or is caused, in whole or in part, by such Party's acts or omissions to the extent allowed by law; provided, however, that neither Party shall indemnify or hold the other Party harmless from and against any claim, damage, cost, liability, expense, loss, and cause of action, including all reasonable attorney's fees, expert fees, litigation expenses, and costs to the extent such claim, damage, cost, liability, expense, loss, or cause of action arises solely from such other Party's own intentional and/or negligent acts or omissions or the negligent acts or omissions of any one or more Indemnified Parties claiming by or through such Party.

11.2 Each Party shall have the right, at its sole cost and discretion, to provide for its own defense to whatever extent such Indemnified Party deems necessary to protect its own interest or that of other Indemnified Parties and shall cooperate fully with the other Party in any such indemnity claim participation or proceeding.

11.3 Nothing in this Section 11 shall be construed as waiver of the City's sovereign immunity.

12. Insurance.

12.1 During the course of performing services under this Agreement, Sho-Me agrees to maintain the following minimum levels of insurance coverage:

a. General Liability Insurance, with bodily injury and property damage limits of \$1,000,000 for each occurrence with a \$2,000,000 general aggregate and \$2,000,000 products and completed operations aggregate,

b. Professional Liability or Errors and Omissions Insurance, with a limit of \$1,000,000 annual aggregate,

c. Comprehensive Automobile Liability Insurance, with a minimum combined limit of \$1,000,000 each occurrence for bodily injury and property damage, and

d. Workers' Compensation Insurance, as statutorily required.

12.2 The provision of insurance shall not be construed, nor is intended, to be a waiver of sovereign immunity or any other defense available to the City, its officers, agents, or employees except to the extent insurance coverage is provided.

12.3 The City is to be named as an additional insured on Sho-Me's insurance required under this Operating Agreement and the limits of insurance coverage referenced above shall operate as a cap on liability for any indemnity claim(s) hereunder. All policies for insurance must be endorsed to contain a provision giving the insured and any additional insured at least thirty (30) days' prior written notice of any cancellation of the policy or material change in coverage. Sho-Me's insurance shall be primary, and any insurance or self-insurance maintained by the City shall be excess for the City and not contribute with the coverage maintained by Sho-Me.

13. **Limitation of Liability.** Except for indemnification pursuant to Section 11 above or a violation of applicable law, neither party shall be liable to the other, or any of their respective agents, officials, directors, members, representatives, contractors, or employees, for any special, indirect, incidental, punitive, or consequential loss or damage, including any lost revenue, lost profits, loss of technology, rights or services, loss of data, or interruption or loss of use of service, even if advised of the possibility of such damages, whether under theory of contract, tort (including negligence), strict liability or otherwise. The obligations of this Section shall survive the expiration or other termination of this Operating Agreement.

14. Termination of Operating Agreement for Default.

14.1 If the City fails to comply with any of the terms and conditions of this Operating Agreement and fails within thirty (30) days after the date written notice is received by the City to correct such noncompliance or default, Sho-Me may, at its option and in addition to any other rights or remedies it may have, immediately terminate this Operating Agreement.

14.2 Notwithstanding the provisions of Section 14.1 above, Sho-Me may immediately terminate this Operating Agreement for failure to cure a monetary default within fifteen (15) days after the date written notice is received by the City to correct such monetary default.

14.3 If Sho-Me fails to comply with any of the terms and conditions of this Operating Agreement and fails within thirty (30) days after the date written notice is received by Sho-Me from the City to correct such non-compliance or default, the City may, at its option and in addition to any other rights or remedies it may have, immediately terminate this Operating Agreement.

14.4 Nothing contained herein, however, shall be construed to preclude either party from pursuing any other remedy provided by law for the collection of any indebtedness or enforcement of any obligation or covenant under this Operating Agreement.

15. **No Right of Access to Facilities.** Nothing in this Operating Agreement is intended nor shall it give the City or any of its contractors, agents, or employees, permission to access the Facilities. The Parties acknowledge the extreme risk of danger associated with the Facilities, and Sho-Me shall, at all times, remain in the exclusive control of the Facilities.

16. **Force Majeure.**

16.1 Neither Party shall be liable or responsible to the other party, nor be deemed to have defaulted under this Operating Agreement, for any failure or delay in fulfilling or performing any term of this Operating Agreement (except for any obligations to make payments to the other party hereunder), when and to the extent such party's (the "Impacted Party") failure or delay is caused by or results from the following force majeure events ("Force Majeure Events"): (a) acts of God; (b) flood, fire, earthquake, epidemic, pandemic, quarantine, or explosion; (c) war, invasion, hostilities (whether war is declared or not), terrorist threats or acts, riot, or other civil unrest; (d) government order, law, or action; (e) embargoes, or blockades in effect on or after the date of this Operating Agreement; (f) national or regional emergency; (g) strikes, labor stoppages or slowdowns, or other industrial disturbances; (h) shortage of adequate electric power or electric transmission facilities; and (i) any other similar events or circumstances beyond the reasonable control of the Impacted Party.

16.2 The Impacted Party shall give notice of the Force Majeure Event as soon as practicable to the other party, stating the period of time the occurrence is expected to continue. The Impacted Party shall use diligent efforts to end the failure or delay and ensure the effects of such Force Majeure Event are minimized. The Impacted Party shall resume the performance of its obligations as soon as reasonably practicable after the removal of the cause.

17. **Service of Notices.** Any notice required or provided for in this Operating Agreement shall be in writing and shall be mailed by certified mail, postage prepaid, return receipt requested. Notice shall be effective on the date delivered.

To Sho-Me:

SHO-ME POWER ELEC. COOPERATIVE
CEO & General Manager
P.O. Drawer D
Marshfield, MO 65706

to City:

CITY OF WAYNESVILLE
c/o Dr. Jerry W. Brown
100 Tremont Center
Waynesville, MO 65583

With Copy To:
LAUBER MUNICIPAL LAW, LLC

18. Disputes.

18.1 General. Any controversy or claim (except any claim for damages because of bodily injury including death at any time resulting therefrom, sustained by any person or persons, and except any claim for damages because of damage to or destruction of property) arising out of, or relating to this Operating Agreement or its breach which may arise between the City and Sho-Me, and which is not resolved by the authorized representatives of the parties, shall be noticed in writing by the complaining party as provided in Section 17 above. Such controversy or claim shall subsequently be reviewed and discussed between Sho-Me, or its legal counsel designee, and the City, or its legal counsel designee, as a condition precedent to any litigation or submittal to any other governing authority with proper jurisdiction to provide legal relief of the dispute.

18.2 Expenses. The prevailing party in any controversy or claim between Sho-Me and the City shall be entitled to recover from the other party, in addition to any other recovery awarded, reasonable attorneys' fees, litigation expenses, expert witness fees and expenses, court costs, and/or arbitration expenses (should the parties agree to arbitrate the matter) through the appellate process and actually incurred by such prevailing party in connection with or incident to the controversy or claim.

19. Miscellaneous.

19.1 Choice of Law/Venue. This Operating Agreement is made and entered into in the State of Missouri and shall in all respects be interpreted, enforced and governed pursuant to and under the substantive and procedural laws of the State of Missouri. This Operating Agreement shall be enforced in the Circuit Court of Greene County, Missouri and it sets forth all understandings between the Parties related to its subject matter with recitals deemed express covenants herein.

19.2 This Operating Agreement shall inure to the benefit and burden of each of the Parties and each and all of their respective successors, affiliates, representatives, agents and assigns, and any and all other persons and entities now, heretofore or hereafter having any involvement or interest whatsoever with respect to the subject matter of this Operating Agreement.

19.3 Amendment. No supplement, modification or amendment of this Operating Agreement shall be effective or binding unless executed in writing by the Parties.

19.4 Successors and Assigns. This Operating Agreement shall not be assigned without the express written consent of each of the Parties which shall not be unreasonably withheld.

19.5 Waiver. No waiver of any of the provisions of this Operating Agreement shall be deemed to constitute a waiver of any other provision, whether or not similar, nor shall any one waiver constitute a continuing waiver. No waiver shall be effective or binding unless executed in writing by each of the Parties.

19.6 Multiple Counterparts. This Operating Agreement may be executed in one or more duplicate original counterparts, each of which shall be deemed an original, but all of which shall together constitute but one and the same instrument.

19.7 **Electronic Execution.** An executed copy and/or facsimile copy of this Agreement is and shall be deemed an original for all intents and purposes. The Parties further agree that signature pages of the Agreement may be exchanged via facsimile transmission or e-mail and that a facsimile or electronic signature of any of the Parties hereto shall be the same as an original.

19.8 **Authority.** Each of the Parties unconditionally and irrevocably represents, warrants and covenants that it has the authority and power to enter into and be bound by this Operating Agreement and that the person signing on its behalf is authorized to do so.

19.9 **Titles.** All section titles or captions contained in this Operating Agreement are for convenience only and shall not be deemed part of the context nor effect the interpretation of this Operating Agreement. The Parties represent and warrant that they will take all steps reasonably necessary to effectuate, perform, enforce and evidence the provisions of this Operating Agreement.

19.10 **Advice of Counsel/Interpretation.** The Parties have sought advice from their respective counsel before executing this Agreement. In construing and interpreting this Agreement, no provision of this Agreement shall be construed or interpreted against any party because such provision, or this Agreement as a whole, was purportedly prepared or requested by such party.

19.11 **Severability.** If any provision of this Operating Agreement, or the application of such provision to any person or circumstance, shall be held invalid, the remainder of this Operating Agreement, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

20. **Waiver of Jury Trial.** EACH PARTY HERETO WAIVES ITS RESPECTIVE RIGHT TO A TRIAL BY JURY OF ANY CLAIM OR CAUSE OF ACTION BASED UPON OR ARISING OUT OF OR RELATED TO THIS OPERATING AGREEMENT, ANY ASSIGNMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY, IN ANY ACTION, PROCEEDING OR OTHER LITIGATION OF ANY TYPE BROUGHT BY ANY PARTY AGAINST THE OTHER PARTY, WHETHER WITH RESPECT TO CONTRACT CLAIMS, TORT CLAIMS, OR OTHERWISE. EACH PARTY HERETO AGREES THAT ANY SUCH CLAIM OR CAUSE OF ACTION SHALL BE TRIED BY A COURT TRIAL WITHOUT A JURY. WITHOUT LIMITING THE FOREGOING, THE PARTIES FURTHER AGREE THAT THEIR RESPECTIVE RIGHT TO A TRIAL BY JURY IS WAIVED BY OPERATION OF THIS SECTION AS TO ANY ACTION, COUNTERCLAIM OR OTHER PROCEEDING WHICH SEEKS, IN WHOLE OR IN PART, TO CHALLENGE THE VALIDITY OR ENFORCEABILITY OF THIS OPERATING AGREEMENT, ANY ASSIGNMENT OR ANY PROVISION HEREOF OR THEREOF. THIS WAIVER SHALL APPLY TO ANY SUBSEQUENT AMENDMENTS, RENEWALS, SUPPLEMENTS OR MODIFICATIONS TO THIS OPERATING AGREEMENT OR ANY PERMITTED ASSIGNMENT OF IT.

[Signature Pages Follow]

Missouri law requires that all contracts entered into by a city be in writing and that the authority for such contracts must also be in writing. Specifically, Section 432.070, RSMo. provides:

No county, city, town, village, school township, school district or other municipal corporation shall make any contract, unless the same **shall be within the scope of its powers** or be expressly authorized by law, nor unless such contract be made upon a consideration wholly to be performed or executed subsequent to the making of the contract; and such contract, including the consideration, **shall be in writing and dated** when made, and **shall be subscribed by the parties thereto, or their agents authorized by law and duly appointed and authorized in writing.** (Emphasis added).

Accordingly, by signature set forth below, the City of Waynesville, Missouri, acting through its duly elected City Council Members, represents that this Operating Agreement is within the scope of its powers to enter, has authorized the City to make and enter into this Operating Agreement, and that said authorization and approval of the execution of this Operating Agreement appears in the certified Minutes of a public meeting held on the 20th day of MAY, 2021 and referenced as City Ordinance 2466.

IN WITNESS WHEREOF, the Parties hereto execute this Agreement effective as of the date first set forth above.

CITY OF WAYNESVILLE, MISSOURI

By: Dr. Jerry W. Brown
Dr. Jerry Brown, Mayor


I, MICHELE BROWN, City Clerk of the City of Waynesville, Missouri do hereby attest and certify that Dr. Jerry Brown, Mayor of the City of Waynesville, has executed this Operating Agreement on behalf of the City of Waynesville with proper authority for the purposes herein acknowledged and stated on this 20th day of May, 2021.

Michele L. Brown
[Signature]

[Municipal Seal]



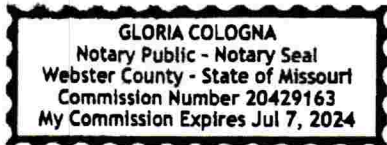
SHO-ME POWER ELECTRIC COOPERATIVE

By: 
John T. Richards, CEO & General Manager

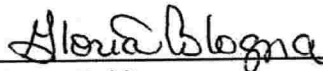
STATE OF MISSOURI)
) ss.
COUNTY OF Webster)

On this 20 day of May, 2021, before me, a Notary Public, personally appeared John T. Richards, the CEO & General Manager of Sho-Me Power Electric Cooperative, to me known to be the person described in and who executed the foregoing Operating Agreement, and acknowledged that he executed the same in his official capacity so noted, with proper authority, as the free act and deed of the Electric Cooperative, for the purposes therein stated.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal in the county and state aforesaid, the day and year first above written.



[Notary Stamp]


Notary Public

Gloria Cologna
(Print Name)

My Commission Expires:

July 7, 2024

Schedules Attached

- SCHEDULE 1 – Sho-Me Work for Others Policy and Procedures (the “Policy”)
- SCHEDULE 2 – Sho-Me Substation Inspection and Maintenance Program (the “Program”)

FACILITIES USE AGREEMENT

This FACILITIES USE AGREEMENT ("Agreement") is made effective the 1st day of June, 2021 by and between SHO-ME POWER ELECTRIC COOPERATIVE, a Missouri rural electric cooperative ("Sho-Me"), and the CITY OF WAYNESVILLE, MISSOURI, a municipality validly organized and existing under Missouri law (the "City"). Both Sho-Me and the City are referred to collectively herein as the "Parties".

WHEREAS, the City was an "all requirements" electric customer of Sho-Me Power Corporation, and its successor, Sho-Me Power Electric Cooperative, for many years, and due to the close proximity of the City to a Rural Electric Cooperative ("REC") member of Sho-Me, an electric distribution substation (the "Substation") was built by Sho-Me to be able to serve both the REC and the City;

WHEREAS, this dual service method enabled Sho-Me to serve both customers far more economically than by constructing dedicated facilities for each;

WHEREAS, the City no longer purchases electric power from Sho-Me, but instead contracts with the City's Power Supplier, the Missouri Joint Municipal Electric Utility Commission ("MJMEUC") for such power and delivery, and MJMEUC, in turn, contracts with Sho-Me and Associated Electric Cooperative, Inc. ("AECI") for transmission service to deliver the needed power to the City;

WHEREAS, at the time the joint use substation serving the City was originally constructed, it was interconnected to Sho-Me's 69,000 volt (69 kV) electric transmission system; however, that system has now been upgraded to a 161 kV system, thereby providing the City with a potential to interconnect with AECI for its electric power needs, even though AECI does not own the line serving the Waynesville substation, because AECI does have contractual rights to the use of all Sho-Me transmission lines operated at 161 kV;

WHEREAS, In 2019, Sho-Me prepared various options available to the City to make the method of power delivery to the City more economical, including (a) the City's construction of a new substation to interconnect with AECI directly, (b) performing an engineering study to establish a new method of allocating wheeling costs, or (c) changing the contractual relationships between the City, Sho-Me and MJMEUC so the City could contract directly with Sho-Me to provide the facilities necessary for the City to connect to AECI through a Facilities Use Agreement and a separate Operating Agreement whereby Sho-Me would continue to operate the facilities serving the City;

WHEREAS, after a course of negotiations and discussions on the alternatives developed, a collective decision was made between the City, Sho-Me, and MJMEUC to proceed with a plan that allows the City to directly contract with Sho-Me for power delivery through a Facilities Use Agreement and an Operating Agreement for such use, acknowledging that the Transmission Service Agreement between Sho-Me and MJMEUC would no longer require the City to be a party to that agreement under this new arrangement, but the City's agreement with MJMEUC for purchased power would remain; and

WHEREAS, the City and Sho-Me now desire to memorialize their understanding and the terms and covenants, each to the other, under the new agreements.

NOW THEREFORE, be it agreed between the Parties, in exchange for good and valuable consideration, the receipt, adequacy and sufficiency of which is hereby acknowledged, as follows:

1. **Facilities and Equipment Supplied by Sho-Me Power.** Sho-Me shall provide all electric facilities and equipment required for the transformation of electric power to be delivered to the City through the Waynesville Substation owned by Sho-Me (the "Facilities")¹ in accordance with the terms of this Agreement. Should any Sho-Me owned Facilities fail or require repair and/or replacement, then Sho-Me shall timely make such repairs or replacements as necessary to restore and/or maintain electric service to the City, with the City only responsible for reimbursing Sho-Me for the labor associated with such work. Power supply to the City will be obtained by the City from its selected electric power generator supplier.

2. **Substation Upgrades.** The Substation was designed to utilize certain "dual use" equipment serving both the City and the REC and equipment designed for the City's sole use. The equipment dedicated to the City was designed to serve a City load no larger than 22 megawatts (MW). Sho-Me agrees to complete Substation upgrades at its cost that will (a) increase the size of the transformer primarily serving the City to 37 MVA, and (b) upgrade the bus tie that currently exists between the City and the REC, with such upgrades triggered by the City reaching a peak of 19.3 MW (the "Substation Upgrades"). The City may request additional Substation upgrades beyond those referenced above, and if a request is so made, then Sho-Me will coordinate with the City on engineering plans and studies in order for the Parties to consider a potential amendment to this Agreement, each to negotiate in good faith with the other in that circumstance.

3. **Facility Use Charge.** The City shall pay to Sho-Me as an annual charge for the Facilities ("Facility Use Charge") the sum of One Hundred Fifty Thousand Dollars (\$150,000.00) with the first payment due on the date that Sho-Me provides service via the Facilities to the City under this Agreement, and on that same date each year through the term of this Agreement. When the Substation Upgrades described above are completed and the City has reached a peak load equal to or greater than 19.3 MW, the Facility Use Charge will be increased to the annual sum of Two Hundred Eighty-Five Thousand Dollars (\$285,000).

4. **Billing and Invoicing.** Billing and invoicing for sums due under this Agreement shall be timely issued by Sho-Me to the City with sufficient descriptive detail on all such charges due within ten (10) days after the end of each billing cycle, and shall be paid by the City within twenty-five (25) days of invoice. Interest on any amount that is past due shall accrue at a rate equal to one and a half percent (1.5%) per month. Should any tax, federal, state or local, in addition to such taxes as may now exist, be levied upon the service provided hereunder, such tax shall be paid by the party directly liable for the payment of same; however, City agrees not to impose any new tax on Sho-Me or the Facilities that does not already exist as of the date of this Agreement.

5. **Initial Term of Agreement.** The initial term of this Agreement shall be for a period of twenty-five (25) years, provided no Substation Upgrades are completed by Sho-Me based on the City's then existing peak load. During this initial 25-year term, either party may terminate this Agreement provided a written notice is delivered to the other of such intent no sooner than two (2) years from the end of the initial term, nor later than one (1) year from the end of the initial term, otherwise this Agreement shall automatically renew for an additional 5-year term with two (2) additional automatic renewal terms of five (5) years each, unless, during any renewal period, either party provides the other

¹ With the exception of the City owned distribution feeder breakers and controls attached to Sho-Me's low side distribution bay that exclusively serves the City. See Exhibit A.

with at least one (1) years' notice in advance of the then current term of their intention not to renew this Agreement.

6. **Adjustment of Term upon Substation Upgrades.** Should Substation Upgrades be required, then the term of this Agreement shall be extended an additional thirty-five (35) years from the completion and in-service use date of such Substation Upgrades, and the Facility Use Charge will be adjusted to the increased sum of \$285,000 as referenced above. During this 35-year subsequent term, either party may terminate this Agreement provided a written notice is delivered to the other of such intent no sooner than five (5) years from the end of the term, nor later than four (4) years from the end of the term, otherwise it shall automatically renew for an additional 10-year term, with two (2) additional automatic renewal terms of 10 years each, unless, during any renewal period, either party provides the other with at least one (1) years' notice in advance of the then current term of their intention not to renew this Agreement.

7. **Dual Use of Substation Permitted.** Sho-Me shall be allowed to continue the dual use of the Substation to serve its REC member at all times relevant herein. It is the intent of the parties that neither the City nor the REC "subsidize" the other in relation to the costs associated with the dual use of the Facilities. Accordingly, Sho-Me shall use its best efforts to ensure that the direct costs associated with REC's use of the Facilities are not paid by City, in whole or in part, and likewise, the direct costs associated with the City's use of the Facilities are not paid by the REC.

8. **Continuity of Service.** Sho-Me shall operate the Substation in accordance with good utility practice and shall not interrupt the delivery of electric power through the Substation and to the City for economic reasons, but Sho-Me reserves the right to curtail such service as a result of system reliability conditions, including but not limited to, outages and weather conditions causing excessive demands on Sho-Me's electric power system and/or the Facilities. Sho-Me shall not discriminatorily curtail service to the City through the Facilities and shall inform the City as soon as practicable of any curtailment of service to the City, and shall also provide the City periodic updates concerning the resumption of service should such events occur.

9. **Character of Service.** All electric energy delivered under this Agreement through the Facilities shall be of the character commonly known as three-phase, sixty cycle energy and shall be delivered at the nominal voltage and transformer capacity as set forth below:

Delivery Voltage	Transformer Capacity At 65° C (before Substation Upgrades)	Transformer Capacity At 65° C (after Substation Upgrades)
13.2 kV	22.4MVA	37.3MVA

10. **Indemnity**

10.1 Each Party, to the fullest extent permissible by law, shall indemnify, defend, and hold harmless the other Party, and such other Party's affiliates, directors, officers, agents, members, contractors, officials, and employees (collectively, "Indemnified Parties") from and against any claim, damage, cost, liability, expense, loss, and cause of action, including but not limited to any injury or death caused by contact with energized electrical lines and/or facilities, said indemnity to also include all

reasonable attorney's fees, expert fees, litigation expenses and costs, to the extent such claim, damage, cost, liability, expense, loss, or cause of action arises from such Party's performance of this Operating Agreement and/or the obligations contained herein, or is caused, in whole or in part, by such Party's acts or omissions to the extent allowed by law; provided, however, that neither Party shall indemnify or hold the other Party harmless from and against any claim, damage, cost, liability, expense, loss, and cause of action, including all reasonable attorney's fees, expert fees, litigation expenses, and costs to the extent such claim, damage, cost, liability, expense, loss, or cause of action arises solely from such other Party's own intentional and/or negligent acts or omissions or the negligent acts or omissions of any one or more Indemnified Parties claiming by or through such Party.

10.2 Each Party shall have the right, at its sole cost and discretion, to provide for its own defense to whatever extent such Indemnified Party deems necessary to protect its own interest or that of other Indemnified Parties and shall cooperate fully with the other Party in any such indemnity claim participation or proceeding.

10.3 Nothing in this Section 10 shall be construed as waiver of the City's sovereign immunity.

11. **Limitation of Liability.** Except for indemnification pursuant to Section 10 above or a violation of applicable law, neither party shall be liable to the other, or any of their respective agents, officials, directors, members, representatives, contractors, or employees, for any special, indirect, incidental, punitive, or consequential loss or damage, including any lost revenue, lost profits, loss of technology, rights or services, loss of data, or interruption or loss of use of service, even if advised of the possibility of such damages, whether under theory of contract, tort (including negligence), strict liability or otherwise. The obligations of this Section shall survive the expiration or other termination of this Agreement.

12. **Termination of Agreement for Default.**

12.1 If City fails to comply with any of the terms and conditions of this Agreement or any other written agreement between the Parties and related to the Facilities, and fails within thirty (30) days after the date written notice is received by City to correct such noncompliance or default, Sho-Me may, at its option and in addition to any other rights or remedies it may have, immediately terminate this Agreement.

12.2 Notwithstanding the provisions of Section 12.1 above, Sho-Me may immediately terminate this Agreement for failure to cure a monetary default hereunder, or a monetary default in any other written agreement between the Parties and related to the Facilities, within fifteen (15) days after the date written notice is received by City to correct such monetary default.

12.3 If Sho-Me fails to comply with any of the terms and conditions of this Agreement, and fails within thirty (30) days after the date written notice is received by Sho-Me from City to correct such non-compliance or default, City may, at its option and in addition to any other rights or remedies it may have, immediately terminate this Agreement.

12.4 Nothing contained herein, however, shall be construed to preclude either party from pursuing any other remedy provided by law for the collection of any indebtedness or enforcement of any obligation or covenant under this Agreement.

13. **Limited Right of Access to Facilities.** Nothing in this Agreement is intended nor shall it give City or any of its contractors, agents, or employees, permission to access to the Facilities without notifying Sho-Me in advance of their entry into the Waynesville substation. The Parties acknowledge the extreme risk of danger associated with the Facilities, the presence of video surveillance and security alarms to alert Sho-Me of any unauthorized entry into the substation to interrogate and maintain the City owned distribution feeder breakers and controls.

14. **Force Majeure.**

14.1 Neither Party shall be liable or responsible to the other party, nor be deemed to have defaulted under this Agreement, for any failure or delay in fulfilling or performing any term of this Agreement (except for any obligations to make payments to the other party hereunder), when and to the extent such party's (the "Impacted Party") failure or delay is caused by or results from the following force majeure events ("Force Majeure Events"): (a) acts of God; (b) flood, fire, earthquake, epidemic, pandemic, quarantine, or explosion; (c) war, invasion, hostilities (whether war is declared or not), terrorist threats or acts, riot, or other civil unrest; (d) government order, law, or action; (e) embargoes, or blockades in effect on or after the date of this Agreement; (f) national or regional emergency; (g) strikes, labor stoppages or slowdowns, or other industrial disturbances; (h) shortage of adequate electric power or electric transmission facilities; and (i) any other similar events or circumstances beyond the reasonable control of the Impacted Party.

14.2. The Impacted Party shall give notice of the Force Majeure Event as soon as practicable to the other party, stating the period of time the occurrence is expected to continue. The Impacted Party shall use diligent efforts to end the failure or delay and ensure the effects of such Force Majeure Event are minimized. The Impacted Party shall resume the performance of its obligations as soon as reasonably practicable after the removal of the cause.

15. **Service of Notices.** Any notice required or provided for in this Agreement shall be in writing and shall be mailed by certified mail, postage prepaid, return receipt requested. Notice shall be effective on the date delivered.

To Sho-Me:

SHO-ME POWER ELEC. COOPERATIVE
CEO & General Manager
P.O. Drawer D
Marshfield, MO 65706

to City:

CITY OF WAYNESVILLE
c/o Dr. Jerry W. Brown
100 Tremont Center
Waynesville, MO 65583
With Copy To:

16. **Disputes.**

16.1 **General**

Any controversy or claim (except any claim for damages because of bodily injury including death at any time resulting therefrom, sustained by any person or persons, and except any claim for damages because of damage to or destruction of property) arising out of, or relating to this Agreement or its breach which may arise between the City and Sho-Me, and which is not resolved by the authorized representatives of the parties, shall be noticed in writing by the complaining party as provided in Section 15 Service of Notices above. Such controversy or claim shall subsequently be reviewed and discussed between the Sho-Me, or its legal counsel designee, and the City, or its legal counsel designee, as a condition precedent to any litigation or submittal to any other governing authority with proper jurisdiction to provide legal relief of the dispute.

16.2 **Expenses**

The prevailing party in any controversy or claim between Sho-Me and the City shall be entitled to recover from the other party, in addition to any other recovery awarded, reasonable attorneys' fees, litigation expenses, expert witness fees and expenses, court costs, and/or arbitration expenses (should the parties agree to arbitrate the matter) through the appellate process and actually incurred by such prevailing party in connection with or incident to the controversy or claim.

17. **Operating Agreement for Facility Use.** The Parties shall enter into a separate operating agreement that will govern and concern the operation of the Facilities by Sho-Me and the provision of ancillary services related thereto. It is the intent of the parties that the operating agreement be tethered to this Agreement such that should this Agreement be validly terminated, then the operating agreement shall also be terminated. A copy of the form operating agreement is attached hereto as **EXHIBIT B**.

18. **Miscellaneous.** This Agreement is made and entered into in the State of Missouri and shall in all respects be interpreted, enforced and governed pursuant to and under the substantive and procedural laws of the State of Missouri. This Agreement shall be enforced in the Circuit Court of Greene County, Missouri and it sets forth all understandings between the Parties related to its subject matter with recitals deemed express covenants herein. This Agreement shall inure to the benefit and burden of each of the Parties and each and all of their respective successors, affiliates, representatives, agents and assigns, and any and all other persons and entities now, heretofore or hereafter having any involvement or interest whatsoever with respect to the subject matter of this Agreement. No supplement, modification or amendment of this Agreement shall be effective or binding unless executed in writing by the Parties, nor shall this Agreement be assigned without the express written consent of the other party which shall not be unreasonably withheld. No waiver of any of the provisions of this Agreement shall be deemed to constitute a waiver of any other provision, whether or not similar, nor shall any one waiver constitute a continuing waiver. No waiver shall be effective or binding unless executed in writing by the party making and burdened by such waiver. This Agreement may be executed in one or more duplicate original counterparts, each of which shall be deemed an original, but all of which shall together constitute but one and the same instrument. Facsimile or PDF signatures and copies shall be valid as originals. Each of the Parties unconditionally and irrevocably represents, warrants and covenants that it has the authority and power to enter into and be bound by this Agreement and that the person signing on its behalf is authorized

to do so. All section titles or captions contained in this Agreement are for convenience only and shall not be deemed part of the context nor effect the interpretation of this Agreement. The Parties represent and warrant that they will take all steps reasonably necessary to effectuate, perform, enforce and evidence the provisions of this Agreement. This Agreement or any section thereof shall not be construed against any party due to the fact that said Agreement or any section thereof was drafted by said party. If any provision of this Agreement, or the application of such provision to any person or circumstance, shall be held invalid, the remainder of this Agreement, or the application of such provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

WAIVER OF JURY TRIAL

EACH PARTY HERETO WAIVES ITS RESPECTIVE RIGHT TO A TRIAL BY JURY OF ANY CLAIM OR CAUSE OF ACTION BASED UPON OR ARISING OUT OF OR RELATED TO THIS AGREEMENT, ANY ASSIGNMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY, IN ANY ACTION, PROCEEDING OR OTHER LITIGATION OF ANY TYPE BROUGHT BY ANY PARTY AGAINST THE OTHER PARTY, WHETHER WITH RESPECT TO CONTRACT CLAIMS, TORT CLAIMS, OR OTHERWISE. EACH PARTY HERETO AGREES THAT ANY SUCH CLAIM OR CAUSE OF ACTION SHALL BE TRIED BY A COURT TRIAL WITHOUT A JURY. WITHOUT LIMITING THE FOREGOING, THE PARTIES FURTHER AGREE THAT THEIR RESPECTIVE RIGHT TO A TRIAL BY JURY IS WAIVED BY OPERATION OF THIS SECTION AS TO ANY ACTION, COUNTERCLAIM OR OTHER PROCEEDING WHICH SEEKS, IN WHOLE OR IN PART, TO CHALLENGE THE VALIDITY OR ENFORCEABILITY OF THIS AGREEMENT, ANY ASSIGNMENT OR ANY PROVISION HEREOF OR THEREOF. THIS WAIVER SHALL APPLY TO ANY SUBSEQUENT AMENDMENTS, RENEWALS, SUPPLEMENTS OR MODIFICATIONS TO THIS AGREEMENT OR ANY PERMITTED ASSIGNMENT OF IT.

[Signature Pages Follow]

Missouri law requires that all contracts entered into by a city be in writing and that the authority for such contracts must also be in writing. Specifically, Section 432.070, RSMo. provides:

No county, city, town, village, school township, school district or other municipal corporation shall make any contract, unless the same **shall be within the scope of its powers** or be expressly authorized by law, nor unless such contract be made upon a consideration wholly to be performed or executed subsequent to the making of the contract; and such contract, including the consideration, **shall be in writing and dated** when made, and **shall be subscribed by the parties thereto, or their agents authorized by law and duly appointed and authorized in writing.**

Accordingly, by signature set forth below, the City of Waynesville, Missouri, acting through its duly elected City Council Members, represents that this Operating Agreement is within the scope of its powers to enter, has authorized the City to make and enter into this Operating Agreement, and that said authorization and approval of the execution of this Operating Agreement appears in the certified Minutes of a public meeting held on the 20TH day of May, 2021 and referenced as City Ordinance 2466.

IN WITNESS WHEREOF, the Parties hereto execute this Agreement effective as of the date first set forth above.

CITY OF WAYNESVILLE, MISSOURI

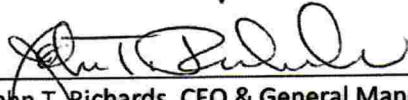
By: Dr. Jerry W. Brown
Dr. Jerry Brown, Mayor

I, MICHELE BROWN, City Clerk of the City of Waynesville, Missouri do hereby attest and certify that Dr. Jerry Brown, Mayor of the City of Waynesville, has executed this Operating Agreement on behalf of the City of Waynesville with proper authority for the purposes herein acknowledged and stated on this 20TH day of May, 2021.

Michele R. Brown
[Signature]

{Municipal Seal}


SHO-ME POWER ELECTRIC COOPERATIVE

By: 
John T. Richards, CEO & General Manager

STATE OF MISSOURI)
) ss.
COUNTY OF Webster)

On this 20 day of may, 2021, before me, a Notary Public, personally appeared John T. Richards, the CEO & General Manager of Sho-Me Power Electric Cooperative, to me known to be the person described in and who executed the foregoing Operating Agreement, and acknowledged that he executed the same in his official capacity so noted, with proper authority, as the free act and deed of the Electric Cooperative, for the purposes therein stated.

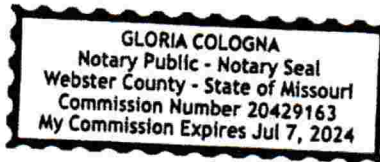
IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal in the county and state aforesaid, the day and year first above written.


Notary Public
Gloria Cologna
(Print Name)

[Notary Stamp]

My Commission Expires:

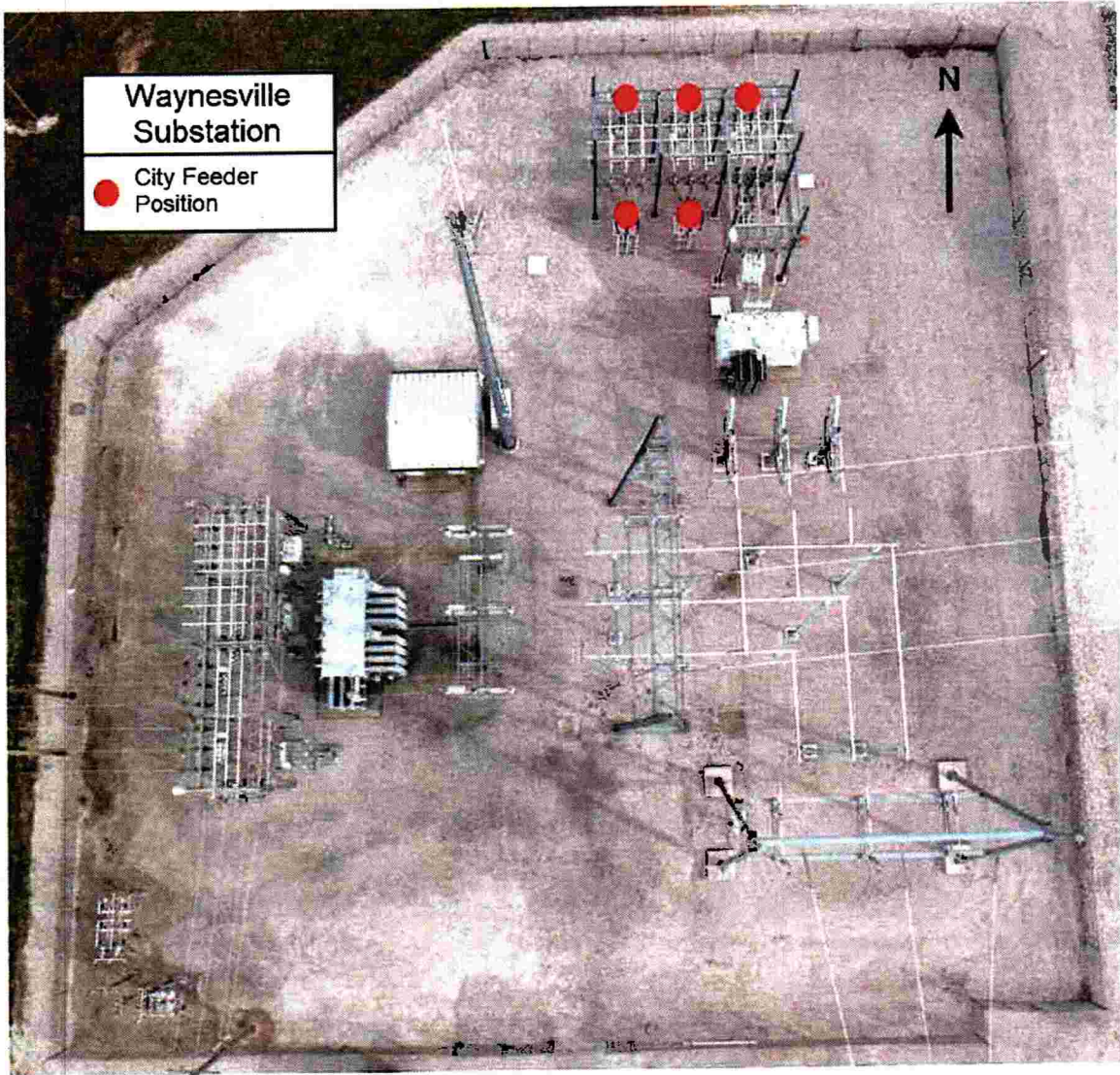
July 7, 2024



Exhibits Attached

- EXHIBIT A** – Picture of Waynesville substation with City owned equipment highlighted
- EXHIBIT B** – Form Operating Agreement (Facility Use Ancillary Services)

EXHIBIT A





Sho-Me Power Electric Cooperative

A Touchstone Energy® Cooperative 

POLICY NO.	POLICY TITLE
308	WORK FOR OTHERS POLICY

Approval Date: 2/27/2020

I. OBJECTIVE

To ensure that Sho-Me Power Electric Cooperative (“Sho-Me Power”) is adequately compensated when providing services to any organization other than the Rural Electric Cooperative member owners of Sho-Me Power.

II. CONTENT

A. Sho-Me Power and Sho-Me Technologies are periodically requested to provide services to various organizations.

1. Sho-Me Technologies has frequent requests to provide various services to customers outside of an existing contract.

a. Customer requests for services outside of an existing contract require either the execution of a contract or an addendum to a Service Level Agreement.

b. Requests from parties that are not customers should be acted upon only after the receipt of a signed estimate prepared by a Department Manager or their designee.

2. Organizations requesting services other than wheeling or power supply from Sho-Me Power will first be referred to the local rural electric cooperative, unless the member REC has provided prior instructions regarding referrals.

B. If the requested service is referred to Sho-Me by the member cooperative:

The most current version of this document will always reside on Sho-Me’s Corporate Intranet and will supersede all printed copies.

1. The General Manager will determine if Sho-Me Power resources are available to provide the requested service at the time requested by the non-member.
2. The appropriate Department Manager¹ will prepare a cost estimate of the requested services, utilizing the current Work for Others worksheet found on the Contract Center within the Powersource.
3. The Cost Estimate shall include the following statement:

“Sho-Me Power Electric Cooperative’s (“Sho-Me Power”) core business will take priority in regards to any use of Sho-Me Power’s resources. The above estimate is not a firm bid, but only an estimate of charges necessary to complete the task requested. Sho-Me Power shall determine when the requested service can be performed. Upon completion of the work requested, an invoice will be issued reflecting this estimate; however, if actual hours required exceed this estimate, a revised billing will be prepared reflecting actual hours worked, and said invoice will be due on receipt. Invoices not paid within 30 days of being issued are subject to late payment penalty charges of 1.5% per month.

An authorized signatory of the Requesting Party hereby authorizes the above described service to be performed and agrees to the above conditions included therein.”
4. A copy of the cost estimate, signed by the Requesting Party, shall be provided to the Financial Services Department prior to beginning the work described. A work order will be assigned and all labor, out-of-pocket costs and materials will be charged to the above work order.
5. When the requested work is completed, the Department Manager shall notify the Finance & Administration Department. Equipment use shall be confirmed and an invoice shall be issued by the Finance & Administration Department in a timely fashion.

III. RESPONSIBILITY

The CEO & General Manager is responsible for administering this policy.

¹ The Department Manager is responsible, but may delegate authority within their department
The most current version of this document will always reside on Sho-Me’s Corporate Intranet and will supersede all printed copies.

Rev. No.	Revision Summary	Date
0	Adopted and Approved by Board of Directors	11/20/2007
1	Reviewed and Approved by Board of Directors. Policy was condensed with remaining details to be provided in an accompanying procedure.	4/1/2010
2	Reviewed and Approved by Board of Directors. Changed policy title, and referenced a worksheet for completion when requesting services.	12/2/2014
3	Reviewed and Approved by Board of Directors. Changed department name to Finance & Administration Department.	2/27/2020

The most current version of this document will always reside on Sho-Me's Corporate Intranet and will supersede all printed copies.



Sho-Me Power Electric Cooperative

A Touchstone Energy® Cooperative 

PROCEDURE NO.	PROCEDURE TITLE
308-1	WORK FOR OTHERS

Approval Date: 2/27/2020

I. OBJECTIVE

To provide guidelines when requested to perform work for or provide material to non-members.

II. PROTOCOL

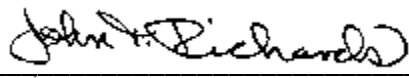
- A. Emergency restoration services provided to members of the Association of Missouri Electric Cooperatives (“AMEC”) will be invoiced according to the AMEC Emergency Assistance Guidelines.
- B. Service requests should be referred to either the employee’s Department Manager or a Director or Superintendent previously designated by the Department Manager to act on such requests. The Department Manager will determine if the request can be honored within the requested time frame of the requesting party, and if the work will be performed, the Department Manager, or their designee, should prepare a Work for Others worksheet (can be found within the Contract Center on the Powersource) and forward to the Finance & Accounting Department in order for a work order to be assigned.
- C. Other assistance will be charged as follows:
 - a. Regular Labor Hours at \$150 per hour
 - b. Regular Overtime Hours at \$200 per hour
 - c. Sundays & Holiday Hours at \$300 per hour
 - d. Out-of-pocket costs at Actual Cost
 - e. Vehicle mileage will be at maximum Federal reimbursement rate
 - f. Materials issued will be charged at the higher of replacement cost or average inventory cost, + 10% handling charge + Missouri State & local sales tax

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g. Heavy Equipment Cost will be charged as follows:

Equipment Type	Daily Rental Rate
6 x 6 Boom Truck	\$600 per day
Digger Derrick	\$600 per day
Truck Mounted Crane	\$600 per day
Bulldozer	\$500 per day
Large Bucket Truck	\$400 per day
Backhoe/Loader	\$400 per day
Underground Fault Finder	\$200 per day
Small Bucket Truck	\$100 per day

h. A contingency factor of 10% is to be applied to all estimates.

Approved by: 
CEO & General Manager

Date: February 27, 2020

Rev. No.	Revision Summary	Date
1	Reviewed by General Manager, Gary Fulks	10/27/2014
2	Reviewed by CEO & General Manager, John T. Richards	2/27/2020

The most current version of this document will always reside on Sho-Me's Corporate Intranet and will supersede all printed copies.



Sho-Me Power Electric Cooperative

A Touchstone Energy® Cooperative 

Substation Inspection & Maintenance Program

Revision Date 12/20/2019

Revision Number Rev. 0

Document Control Number SUBOPS 10.01P

Effective Date 01/01/2020

APPROVALS

RESPONSIBLE MANAGER	NAME	SIGNATURE	DATE
Substation Superintendent	Jeff Bowling	<small>DocuSigned by:</small> <i>Jeff Bowling</i>	12/20/2019
Manager, System Operations	Jarrold Murdaugh	<small>BE1C03C193744E2...</small> <small>DocuSigned by:</small> <i>Jarrold Murdaugh</i>	12/20/2019
Manager, Civil Engineering	Josh Holland	<small>7540FDFAF0FF4AE...</small> <small>DocuSigned by:</small> <i>Josh Holland</i>	12/20/2019
Director, Security & Remote Facilities	Ryan Walker	<small>C5CCABDF53C1412...</small> <small>DocuSigned by:</small> <i>Ryan Walker</i>	12/20/2019
Director, Purchasing & Facilities	Steve Aldridge	<small>4E808E6548E14C1...</small> <small>DocuSigned by:</small> <i>Steve Aldridge</i>	12/23/2019
Chief Financial Officer	Denise Stevens	<small>5D8B5D4482E9472...</small> <small>DocuSigned by:</small> <i>Denise Stevens</i>	12/20/2019
Chief Operating Officer	Chris Bolick	<small>810745E901964B7...</small> <small>DocuSigned by:</small> <i>Chris Bolick</i>	12/20/2019
Chief Compliance Officer	Peter Dawson	<small>58D84C0587354A6...</small> <small>DocuSigned by:</small> <i>Peter Dawson</i>	12/20/2019

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PLAN REVIEW AND REVISION LOG

Review Date	Revision Made	Date	Signature
12/02/2019	Initial release of document, incorporating various previous documents	12/20/2019	DocuSigned by: <i>Jarrold Murdaugh</i> 7540FDFAF0FF4AE...

Substation Design, Inspection, Testing and Maintenance Program

SUBOPS 10.01P

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Purpose

This Program provides a systematic approach addressing the inspection, testing, and maintenance and at Sho-Me substations. This procedure will identify the type of equipment to be tested and maintained as well as the actual tests necessary for each piece of equipment. It will provide a time table for when a specific equipment type must be tested.

It is essential that inspections of substation equipment, structures, and other devices be planned and conducted with a pre-determined frequency. In addition to frequent and periodic inspections, other inspections may be required to ascertain the cause of particular problems, when equipment is placed in service, or when the substation, or portions thereof, are taken out of service.

Scope and Applicability

This program covers all Sho-Me Power owned substations and three AECL owned substations. Sho-Me Power owns and operates over 150 substations which include 69 KV, 161 KV and 138 KV primary voltages and 4.16 KV, 13.2 KV and 26.4 KV secondary voltages.

AECL owns three substations rated at 345/161 KV which are operated and maintained by Sho-Me.

Background

Effective maintenance of substation equipment is essential in maintaining a safe, reliable, and economic power system. Sho-Me Power's goal is to continue to reduce our member outages while keeping safety and cost in mind. Historically, over 30% of substation outages on Sho-Me's system can be attributed to equipment failure. This number does not include equipment failures related to weather or animal contact.

There are essentially two basic types of substation maintenance methods used to determine when equipment should be maintained. One is based on a time schedule and the other is condition based. A time-based system will typically use the manufacturer's recommendations to test and perform maintenance on a particular piece of equipment. This might be 5 years for a transformer, 7 years for a breaker and 10 years for an instrument transformer. The condition-based method uses many factors to determine equipment maintenance. The number of operations of equipment (such as breakers, regulators, LTC's etc.), the age of the equipment and history of problems are some of the components of this method. Many companies with limited resources may choose to maintain their system based on a reactive mode where equipment is only worked on when it fails to operate properly or must be replaced. Condition based maintenance requires an extensive amount of data and analysis. Sho-Me doesn't have the resources to go to a full condition-based system, although we have used DGA oil analysis as a form of condition-based maintenance for many years. Tap changers and breakers may not operate enough to reach the recommended maintenance limits for several years and this equipment may need attention before these limits are reached.

A time-based maintenance program makes the most sense for Sho-Me. Sho-Me's biggest limitation for performing time-based maintenance is scheduling equipment out of service. Since our system is in a rural area, back-feeding substations is usually not an option, and a mobile substation has to be installed at all distribution substations in order to test and maintain circuit switchers, transformers and load tap changers. Installing and removing a mobile at a typical substation will require a minimum of 100 man hours. Transmission substations won't need a mobile substation, but an outage request must be submitted prior to removal of the equipment. In either case, careful work planning is required.

Applicable Policies, Regulations and Standards

7 CFR 1730 - RUS "Electric System Operation and Maintenance"

7 CFR 1726 – RUS "Electric System Construction Policies and Procedures"

29 CFR 1910.269 and 1926 Subpart V – OSHA Electrical Safety Standards

ANSI Std. C2, National Electric Safety Code ('NESC')

NFPA 70B, Section 18-16, "Infrared Inspection"

IEEE Std. C57.106, "Guide for Acceptance and Maintenance of Insulating Oil in Equipment

IEEE Std. 1268-2016 – Mobile Sub Installation

NERC Standard PRC-005-2

AECI's System Planning, Design, Maintenance, and Operating Criteria [SPDMOC]¹

¹ AECI's SPDMOC is an operations and maintenance guide developed by AECI and the six G&T's. This guide spells out periodic maintenance required at the 161/69 KV, 138/69 KV and 345/161 KV substations.

Substation Maintenance Roles & Responsibilities ²	Substation Personnel	Substation Foremen	Substation/M&R Superintendent	Manager, System	Chief Operating Officer	Director, Purchasing &	Facilities Personnel	Director, Security &	Security Personnel	Engineering Personnel	Right of Way Personnel
Development and Maintenance of this Program		I	C	R		C		C			
Program Approval & Accountability				S	R	S		S			
Establishing inspection, testing, and maintenance frequency		I	C	R		C		C			
Establishing Annual Substation Maintenance schedule	C	C	R	I	I	I		I			
Frequent Inspections - Scheduling								R			
Frequent Inspections - Performance								S	R		
Frequent Inspections - Issue Reporting								S	R		
Frequent Inspections - Issue Resolution ³	R	R					R		R	R	R
Detailed Inspections - Scheduling		I	R	I	I						
Detailed Inspections – Performance	R	R									
Detailed Inspections – Issue Reporting	R	R	I	I							
Detailed Inspections – Issue Resolution ³	R	R	C	I	I	I	R			R	
Testing – Scheduling		I	R	I							
Testing - Performance	R	R	I	I							
Testing – Equipment Procedure Development		I	C	R							
Testing – Analyzing Results			R								
Maintenance – Substation Electrical Equipment	R	R	I								
Maintenance – Control Buildings			I			S	R				
Maintenance – Substation Facility grounds ⁴ condition						S	R				
Ordering and Monitoring Materials availability to Support this Program		S	R	A	A	A	R	R		R	
Coordination regarding mobile substation installation	R	R	C	I							

Table 1

² RASIC Chart: Responsible, Approves, Supports, Informed, Consulted

³ Issue resolution responsibility is dependent on issue category

⁴ This refers to conditions associated with the physical grounds not electrical grounds

I. SUBSTATION INSPECTION

<u>INSPECTION TYPE</u>	<u>FREQUENCY</u>	<u>METHOD</u>
FREQUENT INSPECTIONS	MONTHLY	Visual by trained personnel, documented with paper or digital inspection form
DETAILED INSPECTIONS	ANNUAL	Including, Infrared Inspection (<i>'Thermography'</i>)
SEASONAL INSPECTIONS	BI-ANNUALLY	Visual by trained personnel

Table 2

1. Frequent Inspections

Each substation and switch station shall be inspected once a month and appropriate forms are completed. See Appendix A For a representative inspection report. Reports are reviewed and maintenance is scheduled as required.

The monthly substation inspection includes the following items:

- A visual inspection of the fence/gate condition, signs, gate locks, lights, rock level, vegetation condition, material storage, and control building condition.
- A visual inspection for each piece of equipment within the substation, including grounding connections.

Visual inspections encompass the total substation area including the site, the control building, equipment, and structures. The substation is typically energized. Therefore, most inspections are performed from ground level to ensure adequate safety clearances from energized parts. Use of binoculars and other visual aids allow for view of buses and other equipment located on structures.

Use special care when ground connections are checked, since a high voltage could develop across any gap created between a ground cable and a piece of equipment, particularly under fault conditions. For this reason, do not remove ground connections for any reason while the substation is energized.

Sho-Me performs a monthly inspection of all substations. To see the results of the monthly inspections go to <http://smpsp/security/Lists/InspectionIssuesdoForms/Issues.aspx>. You can filter by "Assigned To" to get a full list of corrective items for each individual.

2. Detailed Inspections

The Substation Department shall be responsible for conducting detailed inspections. These inspections will focus on operational items and tasks in which substation mechanics have been specifically trained to evaluate. Substation equipment will remain energized and the inspection will cause no impact to customer load. Therefore, only equipment that can be bypassed or that do not directly affect customer load will be operated.

The inspection forms will be completed using MinMax SMARTest software on company approved devices. The forms can be found at <https://minmaxsmart.com/Login.aspx?ReturnUrl=%2f>. The software will also store all past inspection records.

The detailed inspection will include the following items:

- Log and reset Operational Counters on inspection sheet and within device cabinet
- Operate Load Tap Changer [LTC]
- Operate Regulators

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- Perform Infrared Scan
- Perform battery test (DC)
- Check Motor Operators (disengage from switch to inspect motor only)
- Test Operate breakers including low volt mains [LVMs]

3. Seasonal Inspections

The substation department shall be responsible for conducting seasonal inspections. These inspections will focus on items within the substation that need to be prepared in anticipation of summer and winter weather conditions. The spring inspection will be performed late enough that air temperatures below 40°F are no longer anticipated, but early enough that air temperatures above 90°F are not forecasted. Conversely, fall inspections will be performed after air temperature above 90°F are no longer anticipated, but early enough prior to temperatures below 40°F.

Currently, there is no documented form completed for seasonal inspections. However, substation mechanics will communicate with Dispatch when capacitor bank statuses have changed and Dispatch will record the changes in SCADA.

The season inspection will include the following items:

- Control Building HVAC status
- Distribution Capacitor bank status
- Transformer Fan Operation status

4. Internal Inspections

Internal inspections require considerable time out of service for the equipment involved. Therefore, they should be scheduled, whenever possible, to coincide with planned substation outages. Since large equipment is frequently required for use in disassembly operations, it is essential that all aforementioned safety precautions be rigidly followed. Details of these inspections can be found under the MAINTENANCE Section of this Program.

II. SUBSTATION TESTING & MAINTENANCE PRACTICES

Sho-Me Power has a preventive substation maintenance program that will thoroughly test all substation equipment and allow Sho-Me Power to monitor and trend the results over time. The current schedule calls for tests to be performed whenever a substation can be de-energized.

1. Testing & Maintenance Administration

The yearly testing and maintenance schedules on a substation basis can be found in the MinMax program. This schedule will be developed yearly and modified as needed.

The seven year maintenance schedule will be developed during the fall and winter months for the following year. This schedule will be based on a seven year cycle and will include flexibility due to emergent needs such as DGA oil test results, known problems, and emergency situations. For secondary substations where an outage would impact customer load, a mobile transformer will be installed so that all required testing can be performed without a major impact to customer load.

2. Transformers

All transformers will be Doble tested on a seven year cycle **with the exception of 345/161 KV units, which will be tested every five years**. Included with the Doble test will be a ratio test, a core ground test and Doble tests of the high and low side lightning arresters. The sudden pressure device should be fully tested as well.

DGA oil tests will be taken yearly on both the main tank and LTC. Replacement of bushings and arresters will be based on the test performed, age and type (type U bushings for example or silicon carbide arresters). All gauges should be inspected and SCADA alarm points tested with dispatch. If not already present, fall protection brackets should be welded on the top of the transformer. Any oil leaks identified should be repaired if possible. The transformer should be painted on an as needed basis.

3. Load Tap Changers

While the mobile substation is installed any load tap changer should be inspected. The tap changer oil should always be replaced. Moving and stationary contacts should be inspected and replaced as needed along with any other parts that are worn or damaged. It will be important that replacement contacts, gaskets and other parts be in stock for that particular tap changer type. The tap changer should be operated on all taps including 16R and 16L to verify the limit switch and reversing switch is working properly. Remote indication of tap positions should be verified with dispatch.

4. Breakers

Breakers from 69 KV to 345 KV should be tested and maintained according to the instruction manual. All breakers should always be timed and Doble tested during the 7 years schedule. Contact resistance shall be tested and compared to the manufacturer's tolerance range (if available). Follow manufacturer recommendations for lubrication. The breaker should be operated locally and by SCADA. All 345kV single pole breakers should have the pole disagreement circuit checked to verify proper synchronization between phases. Any SF6 gas breaker that has any history of leaks should be checked with the gas detector. The breaker should be painted as needed.

AECI's SPDMOC requires Primary Breakers to be exercised annually.

4.1 **Line Breakers**

Transmission line breakers that are part of a looped transmission service can be switched out for maintenance and testing without affecting customer loads. Additionally, most transmission line breakers feeding radial lines have bypass switches that allow the breakers to be maintained without a disruption to service.

Line breakers on radial lines without a bypass switch can only be taken out of service with the assistance of a mobile substation or through proper outage coordination with the impacted customer.

4.2 **Transformer Breakers**

Most transformer breakers on distribution transformers do not have the capability to be bypassed. Therefore, these breakers can only be tested during the 7 year schedule.

If a bypass is available, these breakers can be tested with normal switching as needed.

4.3 **Low Volt Main (LVM) Breakers**

LVM breakers always have bypass switches installed to allow for maintenance and testing without interruption to customer load.

LVM vacuum breakers should be maintained according to the instruction manual. Contact gap and spring over-travel should be measured and adjusted per manufacturer recommendations. Vacuum bottles should have a hi-pot test performed at the voltage level specified in the manual. Contact resistance should be measured per specification. Follow manufacture recommendations for lubrication. The breaker should be operated manually and by SCADA during the detailed substation inspection.

5. **Circuit Switchers**

Most circuit switchers on distribution transformers rarely get operated unless a bypass switch is available. Adding a bypass switch should be considered on vertical mounted circuit switchers during the seven year maintenance cycle. Horizontally mounted circuit switchers may need consideration for replacement due to age and unavailability of parts. The circuit switcher should include a high potential test of the interrupter. Contact resistance should be measured according to manufacturer recommendation. Recommended manufacturer procedures for lubrication should be followed. Several S&C 161 KV circuit switchers on Sho-Me's system have a notice on leaking insulating support columns. These columns should be inspected yearly for any leaking.

6. **Switches**

If possible, substation switches should be operated and checked for adjustment. In particular, line switches should be operated since they play an important role in sectionalizing lines during outage situations. Recloser bypass and disconnect switches will be operated on their five year maintenance cycle and will not need to be considered unless there is a known problem.

6.1 Motor Operated Switches (MOS)

When possible, crews should annually de-couple MOS from the motor and operate manually and by SCADA to ensure proper control capability.

7. Regulators

Regulator maintenance should be performed every 7 years. Because of the time constraints, it will normally be necessary to change out the regulator if an overhaul of the mechanism is required. The number of operations, age of the regulator and history will determine if it requires replacement. Once replaced, the regulator will be shipped to a company that specializes in regulator repair. If it is decided to leave the regulator in service it should be operated on all taps (assuming it can be operated to neutral for bypassing) and the oil changed along with any other manufacturer recommendations.

8. Fuses

All substation fuses should be replaced on the seven years cycle. All 69 kV fuse tubes should be replaced on the seven year cycle. All distribution level capacitor bank fuses should be inspected and replaced as needed.

9. Instrument Transformers

Instrument Transformers such as current transformers (CTs), potential transformers (PTs), and coupling capacitor voltage transformers (CCTVs) may not normally be tested by substation mechanics but because of age and visual indicators, may need to be replaced. Because of the ability to bypass 15 kV CTs and PTs replacing those won'tt always be necessary during the seven year maintenance cycle. At distribution substations with 69 kV PTs, consideration should be taken while the mobile substation is in service to replace these if needed, especially if no switch is available to disconnect the PTs. At Primary substations it is recommended to replace PTs, CTs and CCVTs once they reach 40 years old.

10. DC Supply**10.1 Batteries at BES Facilities**

Crews will test battery banks at primary facilities every six months. Since all Sho-Me substation batteries are valve regulated, the test is limited to impedance testing of each cell and interconnection straps. Crews will perform a visual inspection on each battery observing any cracking, leaking or swelling of the battery case. In addition, the battery terminals and interconnecting straps should be checked for corrosion and cleaned if needed.

10.2 Batteries at NON-BES Facilities

Crews will test battery banks at secondary facilities every year during the detailed substation inspection. The test will include impedance testing of each cell and interconnection straps. Crews will perform a visual inspection on each battery observing any cracking, leaking or swelling of the battery case. In addition, the battery terminals and interconnecting straps should be checked for corrosion and cleaned if needed.

10.3 Battery Chargers

Crews will inspect battery chargers at the same intervals as their corresponding battery banks. Inspection will include evaluation of appropriate voltage charge levels as well as any alarms displayed on the chargers.

11. Capacitor Banks

Crews will visually inspect capacitors for signs of damage or failure.

Distribution capacitor bank oil switches should be operated both locally and through SCADA.

12. Reactors

Reactors should be tested and maintained according to the manufacturer recommendations. DGA oil tests will be taken twice yearly. Replacement of bushings and arresters will be based on the test performed, age and type. All gauges should be inspected and SCADA alarm points tested with dispatch. Any oil leaks identified should be repaired if possible. The reactor should be painted on an as needed basis.

13. Distribution Reclosers

Reclosers should be tested and maintained according to the instruction manual. Reclosers will inspected and tested every four years by a third party contractor. Visual inspections will be performed. Additionally, testing of the mechanism, control, and cabling will be performed. The breaker should be operated locally and by SCADA.

14. Ground Grid

Because of the complexity and time involved, testing of the substation ground grid will normally be done by a contractor. Sho-Me substation crews may be involved in assisting the contractor with substation locations, identifying safety hazards and possibly switching particular lines out of service. The grounds grids will be tested every ten years.

15. Miscellaneous Equipment

Other components of the substation requiring periodic inspections include insulators, connectors, jumpers, bus work, and structural steel. Each of these components should be inspected and replaced as needed.

16. Unscheduled Maintenance

While a robust maintenance program helps to minimize unplanned work, unscheduled maintenance will be required as system and equipment conditions continually change. Unplanned maintenance that has an immediate impact on customer load or system stability will receive the highest priority and receive immediate attention. Maintenance that has not yet affected the system but has a high probability to do so if not addressed will be scheduled as soon as possible as determined by management. Other emerging maintenance will be evaluated based on crew schedules, potential impacts, and the likelihood of issues to determine the best course of action.

17. Critical and Spare Equipment Inventory

Sho-Me's Operations Department will maintain a list and inventory of critical and spare equipment. An adequate supply of equipment shall be distributed across the service territory to ensure a quick response time.

All substation crews will maintain a supply of parts and equipment necessary to respond to regular maintenance as well as emergency situations. In addition, spare parts are located at Camdenton, Gainesville 2 and Licking substations to allow quicker access to crews responding to outages. Spare fuses and fuse holders are supplied at all distribution substations. Certain substations may house equipment or parts that are rarely used at other locations (26 KV arresters for example).

18. Manufacturer Recalls and Technical Service Bulletins

Sho-Me will evaluate, distribute and respond accordingly to manufacturer recalls and technical service bulletins.

Response will be based upon the severity of the equipment and issue involved.

III. Training

So that all inspection procedures may be fulfilled safely and properly, it is essential that all personnel be thoroughly trained in proper and safe procedures. This includes but is not limited to the following:

- Familiarity with operating procedures for the substation, capabilities of the equipment, and and proper use of equipment grounding techniques.
- Familiarity with the applicable safety rules and regulations such as, but not limited to, the following:
 - o ANSI C2, National Electrical Safety Code
 - o OSHA 29 CFR 1910, Subpart S, Electrical Safety Related Work Practices
 - o OSHA 29 CFR 1910.269, Electric Power Generation, Transmission and Distribution
 - o OSHA 29 CFR 1910.137, Electrical Protective Equipment
 - o OSHA 29 CFR 1926, Subpart K, Electrical Safety Related Work Practices
 - o Applicable state and local safety operating procedures
- Familiarity with protective and interlocking schemes.
- The proper use of safety equipment and first aid procedures and equipment.
- The prompt repair of any defects or improper conditions as soon as possible after they are noted.
- Observation of Sho-Me safety rules at all times. Proper distances have to be maintained from energized equipment. See the following standards as guidelines for the minimum clearance distances that have to be maintained between personnel and energized equipment:
 - o ANSI C2, NESC, Sections 43-44
 - o OSHA 29 CFR 1910.333, Selection and Use of Work Practices
- Use of proper safeguards such as danger signs, temporary barriers, etc., for the safety of persons close to, but not engaged, in the work to be performed.

IV. Records & Recordkeeping

All maintenance and testing shall be documented, with such documentation including (at minimum):

1. date / time of maintenance or testing,
2. description of equipment maintained or tested,
3. any deficiencies found, and
4. corrective actions taken.

In addition, each RUS borrower is responsible for maintaining records of the physical and electrical condition of its electric system. Any or all of these records may be reviewed by RUS during its review and evaluation. Such records include, but are not limited to⁵:

<u>RECORD</u>	<u>LOCATION</u>
Equipment Records	Network Drives, E&O Document Vault
Inspection Records	MinMax, DoForms
Testing Records	Network Drives, E&O Document Vault
Service interruption and power supply outage reports.	Powersource
Avian protection/contact records	

Table 3

** All Sho-Me Operational Records shall be kept indefinitely*

⁵ RUS Bulletin 1730-1 Section 2. a. Records

V. Program Review

1. External Review

RUS will conduct a periodic review and evaluation of each borrower's O&M programs and practices. The purpose of this review is to assess loan security and to determine borrower compliance with RUS policy as outlined in Part 7 CFR 1730. The General Field Representative (GFR) is responsible, within the GFR's assigned territory, for initiating and conducting a periodic review and evaluation of each borrower's O&M programs, practices, and records. This review and evaluation is normally done at least once every three years.

2. Internal Review

This program will be reviewed annually. Annually a work plan shall be developed.

VI. References

ASTM Std. D877, "Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes."

ASTM Std. D971, "Test Method for Interfacial Tension of Oil Against Water by the Ring Method."

ASTM Std. D974, "Test Method for Acid and Base Number by Color-Indicator Titration."

ASTM Std. D1500, "Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)."

ASTM Std. D1816, "Test Method for Dielectric Breakdown Voltage of Insulating Oils of Petroleum Origin Using VDE Electrodes."

ASTM Std. D2285, "Test Method for Interfacial Tension of Electrical Insulating Oils of Petroleum Origin Against Water by the Drop-Weight Method."

IEEE Std. C57.104, "Guide for Interpretation of Gases Generated in Oil-Immersed Transformers."

IEEE Std. C57.106, "Guide for Acceptance and Maintenance of Insulating Oil in Equipment."

APPENDIX A: Substation Inspection Form**A. Substation Fence, Yard & Signage**

- Verify the existence of appropriate danger and informational warning signs.
- Check indoor and outdoor lighting systems for burned-out lamps or other component failures.
- Check for minimal gap under the fence or under the gate. A reasonable rule of thumb would be less than 4 inches under the fence and gate.
- Ensure the fence fabric is intact and there is no rust.
- Check that the barbed wire is taut.
- Ensure the gate latches are operable.
- Ensure flexible braid-type connections are intact.
- Verify that no wire fences are tied directly to the substation fence
- Observe the general condition of the substation yard, noting the overall cleanliness and the existence of low spots that may have developed.
- Inspect the area for weed growth, trash, and unauthorized equipment storage.⁶
- Observe the condition of Oil-filled equipment and spill containment structures.
- Verify that there is an adequate supply of spare parts and fuses.

B. Grounding System

- Check all above-grade ground connections at equipment, structures, fences, etc.
- Observe the condition of any flexible braid type connections.

C. Foundations, Busswork and Structures

- Inspect for signs of settlement, cracks, spalling, honeycombing, exposed reinforcing steel, and anchor bolt corrosion. Inspect all structures for loose or missing bolts and nuts.
- Check for bird nests or other foreign materials in the vicinity of energized equipment, buses, or fans.
- Observe any damaged paint for galvanizing or signs of corrosion. Inspect for deterioration, buckling, and cracking.

D. Control Building

- Visual Check
- Test phone and alarm

⁶ (See ANSI C2, NESC Rule 110B2 for information regarding storage).

Substation Design, Inspection, Testing and Maintenance Program

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AutoNumberId
19120211463836
Date
12/02/2019 Today
Sub Name *
Alton ✎
Crew
Willow
Inspector *
Eddie Goins ✎
- Main (1)
Category
Substation ✎
Responsible Parties
Jeff Bowling
Issue
Washouts ✎
Notes
Picture 1
Upload

Figure 1 - Example Substation Form

APPENDIX B: Substation Equipment Maintenance Chart

	DOBLE	RATIO	CORE GROUND	DGA	INSPECT	TIMING	CONTAC T RESIST.	OPERATE	TEST & MTC
ALL SUBS - Routine inspection					1 MO				
ALL SUBS - Detailed inspection					1 YR				
TRANSFORMERS	7 YRS	7 YRS	7 YRS	1 YR	1 YR				
345 KV XFMRS	5 YRS	5 YRS	5 YRS	6 MO	1 YR				
ALL XFMRS ≥ THAN 40 YEARS	7 YRS	7 YRS	7 YRS	6 MO	1 YR				
TRANSFORMER ARRESTERS	7 YRS				1 YR				
ARRESTERS ON 345KV XFMRS	5 YRS				1 YR				
LOAD TAP CHANGERS	7 YRS			1 YR	1 YR				7 YRS
BREAKER (SF6)					1 YR	7 YRS	7 YRS	1 YR	
LOW VOLT MAIN BKR -13.2/26.4 KV					1 YR			1 YR	
CIRCUIT SWITCHERS					1 YR		7 YRS	1 YR ⁷	
MOTOR OPERATED SWITCHES								1 YR ⁸	
REGULATORS				1 YR	1 YR			1 YR	7 YRS
RECLOSERS								1 YR	4 YRS
INSTRUMENT XFMRS (26 KV OR LESS)		2 YRS							
INSTRUMENT XFMRS (69KV AND UP)		7 YRS							
69KV FUSE					1 YR ⁹				
GROUND GRID TEST									10 YRS
MOBILE SUBS	3 YRS	3 YRS	3 YRS	1 YR	1 YR				

Table 4

⁷ If bypass not available, operate every 7 years⁸ Motor only each year, switch every 7 years⁹ Replace 69kV fuses every 7 years

APPENDIX C: Cross-references

<u>RUS Bulletin 1730-1 Conditions for RUS Form 300</u>		
1	<u>SUBSTATIONS (TRANSMISSION AND DISTRIBUTION)</u>	
a	<u>Safety, Clearance Code Compliance:</u> No known violations of RUS, or NESC requirements are present in any substation, including clearances, grounding, and separations. All substations are accessible by authorized personnel only. Operating manual and one-line diagram are available for each substation. Appropriate safety equipment and operational tools are serviceable and available on site.	Section I.2
b	<u>Physical Condition – Structure, Major Equipment, and Appearance:</u> Utility is able to present records that reflect rare instances of rust, weeds, dangerous insects, and bird nesting exist; only minor material associated with maintenance of the substation equipment are stored in yard; no leaks, no temporary bus or grounding being used on an ongoing basis; no debris inside or around the substation; no openings under fence greater than three inches (76 mm); and no broken insulators exist. Power transformers are properly fault-protected. Circuits, phases, and airbreak switch handles are properly identified.	Section I.1
c	<u>Inspection Records of Each Substation:</u> Written monthly inspection reports are completed and reviewed by responsible personnel.	Section I.1
1	Infrared inspection of all connectors, arrestors and other applicable apparatus as recommended by manufacturer;	Section I.2
2	Dielectric, dissolved gas, and interfacial tension (IFT) tests of oil-filled equipment performed as recommended by manufacturer;	Section II
3	Annual Power factor tests of all applicable equipment;	Section II
4	Protective relays are functionally tested annually. Additional tests may be required per regulatory and/or manufactures recommendations and acceptable industry practice	Sho-Me Relay Testing Program