TOTH & ASSOCIATES
1550 East Republic Road
Springfield, MO 65804
tothassociates.com
417.888.0645

April 14, 2023

Mitch Krysa
Independence Power and Light
17221 E. 23rd St. South
Independence, MO 64051

Re: Substation M Breaker Replacement Project – Engineering Services Proposal

Dear Mitch,

Toth has prepared an estimate of costs to perform engineering services at IPL's Substation M based on the scope of work contained herein. The estimate is a not-to-exceed (NTE) amount with time billed to IPL on an hourly basis per the attached rates according to actual effort and expenses.

Toth accepts the City's terms and conditions as agreed upon per the pre-qualified A&E list (RFQ #20098).

Thank you for allowing Toth to provide a proposal for this work. Please contact me if you have any questions regarding this proposal.

Sincerely,

Joe Tierney, PE
Vice President

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Substation M Breaker Replacements – Project Description

The Substation M Breaker Replacements project is planned to replace 69kV Breakers M-069-2, M-069-5, and M-069-8 and associated field cables and jumpers. Relaying for Breaker M-069-8, Breaker M-069-11, and Substation M-to-J line will be replaced. Existing Relay Panels 6, 7, 8 will be replaced with new panels 6 and 7. A design package for the breaker and relay replacements has already been completed by others; however, some updated drawings are required for the project. To prepare for the Substation M ring bus outage, Toth will provide temporary relay set points for the line from Substation H through Substation M to Substation J.

In the first phase of the Substation M Breaker Replacement project IPL will remove existing Breaker M-069-8 and replace it with a new breaker and new field cables. Breaker M-069-8 has maintenance issues and is critical to replace. The existing M-to-J line relaying panel, Breaker M-069-11, and Breaker M-069-8 control panels will be removed. New relay panels for Breaker M-069-11 control and breaker failure, Breaker M-069-8 control and breaker failure, and Substation M to Substation J line relaying will be installed per design package provided by others. Toth will create set points, logic, and documentation for the new Substation M-to-J line relay panel and breaker control panel. SCADA points list changes and SCADA wiring changes will also be documented, along with DNP points added in relay programming, as needed. Toth will provide relay drawing updates if needed for relay settings design. Toth will provide a testing and commissioning document for this phase of the project.

The second phase of the project, replacing Breaker M-069-5 and Breaker M-069-2 with new 69kV breakers and cabling, will be completed by IPL when convenient. Toth will provide a testing and commissioning document for this phase of the project.

Scope of Services

Sub “M” Electrical Control Design:

1. Prepare SCADA wiring tab sheets, SCADA points list changes, and DNP programming of any COMM SCADA points into the relays.
2. ASPEN studies, updated setting sheets, and SEL files with updated relay set points at Substation H and Substation J ends of temporary 69 kV line through Substation M for use during Substation M 69 kV outage. Including SEL 311L and SEL 311C at Substation J and SEL 387L along with electromechanical relays at Substation H.
3. Review and create set points as needed, along with relay logic and documentation for four (4) new SEL relays on new Panel 6 and Panel 7 according to IPL settings philosophy. This includes the SEL relay programming files for the 311L-MJ, 311C-MJ, 751A-11, 751A-8 relays on new Panel 6 and Panel 7, along with logic and I/O list document for each of the relays.

4. Update existing IPL drawings for communications and settings changes.
    a. 87L fiber connections MUX device.
    b. 311C mirrored bits connection to MUX device.
    c. Update DTT wiring.
    d. Update CT ratio for breaker M-069-8 relay 311-8(SEL 751A).
5. Prepare two (2) separate testing and commissioning documents. One testing and commissioning procedure for M-069-8 and one testing and commissioning procedure for M-069-2 and M-069-5.

Sub "M" Physical Substation Design:

1. Revise plan view and elevation INSTALL drawings (MY311 and MY312) with double 500 MCM copper jumpers per phases, including transition plates. Includes jumper ampacity calculations.
2. Revise material list drawing MY420 with the breaker jumper material updates including cables, terminals, transition plates, and oxide inhibitor, as required.
3. Provide cable quantity counts for new cables identified in drawing MA0010.
4. One two-hour teleconference meeting with three Toth engineers to review Toth-generated drawings prior to construction.

The following work is excluded from this proposal:

- Review and revision of all other drawings and design components that is not identified as Toth's scope of work herein (this was completed by previous engineer).
- Construction specifications.
- Material procurement support and review of material specifications/drawings from manufacturer.
- Sizing low voltage cables and breakers (this was completed by previous engineer).

TOTH has not verified the A2V drawings nor the IPL drawings for accuracy, as TOTH has not visited the project site to confirm existing conditions. Any further engineering required for the implementation of the breaker and relaying replacements at Sub M is outside of the scope of this proposal. No site visits, meetings, construction review, site observation, or construction support are included in the scope of this proposal unless otherwise stated above.

Total Not-to-Exceed Cost of Proposal: $122,407.00.

JOE TIERNEY P.E.

VICE PRESIDENT, PROFESSIONAL ENGINEER | jtierney@tothassociates.com

Registrations:
Arkansas P.E. #15673
Idaho P.E. #18491
Illinois P.E. #062.066431
Kansas P.E. #26627
Minnesota P.E. #56683
Missouri P.E. #PE-2014012028
Nebraska P.E. #E-17861
Ohio P.E. #PE.84894
Oklahoma P.E. #27147
Oregon P.E. #89319PE
Texas P.E. #131458
Washington P.E. #56605
Wisconsin P.E. #46667-6

Education:
Bachelor of Science in Electrical Engineering
University of Missouri – Columbia

Experience:
Joe possesses over 15 years of experience in the engineering field and has designed numerous switch stations and substations for electric cooperatives in multiple states. His substation design experience includes projects ranging in scope from smaller projects such as feeder additions, transformer upgrades, oil circuit breaker replacements, voltage conversions, and temporary wood pole substations, to larger projects such as greenfield switch stations and substations with voltages ranging from 4.16 kV to 230 kV, and single substation design capacities up to 672 MVA. Whether the project is large or small, his attention to detail is evident, as he draws from an extensive knowledge pool to produce quality designs that are accurate, thorough, and exemplary.

Joe works with each client to understand their preferences and standards to incorporate those elements into the overall design; which ultimately leads to a facility that is familiar to the client's personnel while giving functionality and operational flexibility to the client's system. Joe has worked on projects setup with traditional delivery methods, as well as design-build style projects, and understands the critical-path tasks that must be accomplished to complete projects on-time and within budget.

Affiliations and Honors

- Institute of Electrical and Electronics Engineers Member
- IEEE Power & Energy Society Member

Representative Project Experience:

- Franklin County PUD – Franklin Substation Rebuild
- City of Independence, MO – Sub K Rebuild
- Umatilla Electric Cooperative – East Wilson Substation Expansion
- Umatilla Electric Cooperative – Blalock Substation Transformer Addition
- Umatilla Electric Cooperative – Juniper Canyon West Substation
- Umatilla Electric Cooperative – Heritage Trail Substation
- Umatilla Electric Cooperative – Hermiston Butte Substation Distribution Upgrade
- Umatilla Electric Cooperative – Hermiston East Substation Transformer Addition
- Umatilla Electric Cooperative – Oregon Trail Substation
- Umatilla Electric Cooperative – Quarry Substation
- Umatilla Electric Cooperative – Cottonwood Substation
- Umatilla Electric Cooperative –Hermiston Butte Substation Upgrade
- Umatilla Electric Cooperative – Hermiston East Substation
- Umatilla Electric Cooperative – Blalock, East Wilson, and Freeway Substation Upgrades
- Umatilla Electric Cooperative – Tumbleweed Substation
- Umatilla Electric Cooperative – Juniper Canyon Substation
- Umatilla Electric Cooperative – Foster Substation
- Umatilla Electric Cooperative – Port of Morrow Substation
- Umatilla Electric Cooperative – Chemical Substation
- Western Farmers Electric Cooperative – Payne Switch Station
- Western Farmers Electric Cooperative – Dover Switch Station
- Western Farmers Electric Cooperative – Twin Lakes Switch Station
- People's Electric Cooperative – Monte Vista Station
- C&L Electric Cooperative Corporation – Sheridan South Substation

DAVID FORREST P.E.

STATION DEPARTMENT MANAGER, PROFESSIONAL ENGINEER |

Registrations:
Missouri P.E. #2012000753
Arkansas P.E. #15306
California P.E. #20358
Oregon P.E. #88546
Colorado P.E. #0046900
Illinois P.E. #062065106
Oklahoma P.E. #26069
North Carolina P.E. #043526

Education:
Bachelor of Science Degree in Electrical Engineering; Magna Cum Laude
University of Missouri – Rolla

Experience:
David has accumulated nearly 30 years of work experience in the electrical industry. He has designed the physical aspects and the protection and control schemes, as well as developed relay settings for a variety of situations, playing an integral role in the engineering of over 50 station projects in four states. Designs range from breaker additions to complete new station facilities for urban and rural distribution substations, industrial substations, bulk power stations, and transmission switching stations. He has experience in the many aspects of station design – from site selection to commissioning – plus equipment procurement and project management. David has led the TOTH station design team since 2013.

Affiliations and Honors

- Institute of Electrical and Electronics Engineers Member

Representative Project Experience:

- City of Nixa, MO – Feeder Protection Coordination
- Mississippi County Electric Cooperative – Lepanto North Substation
- Southwestern Electric Cooperative, Inc. – Hookdale Substation
- Western Farmers Electric Cooperative – Bradley Transmission Breaker Addition
- Rich Mountain Electric Cooperative, Inc. – Weyerhaeuser Substation
- Southwest Arkansas Electric Cooperative – Gin City Substation
- Southwest Arkansas Electric Cooperative – Lake Erling Circuit Switcher Addition
- Prairie Power, Inc. – Tolono Substation
- Prairie Power, Inc. – St. Joseph Substation
- Prairie Power, Inc. – Loda Substation
- Western Farmers Electric Cooperative – Payne Switch Station
- Rich Mountain Electric Cooperative, Inc. – Crystal Hill Substation
- Rich Mountain Electric Cooperative, Inc. – Potter Substation

MARK OLSON P.E.

PROFESSIONAL ENGINEER | molson@tothassociates.com

Registrations:
Missouri P.E. #2019011812
Oregon P.E. #94935PE
Wyoming P.E. #PE 15940

Education:
Bachelor of Science in Electrical Engineering; Summa Cum Laude
South Dakota School of Mines & Technology

Experience:
Mark is a professional electrical engineer with over 10 years of experience in the engineering field. At TOTH, he is responsible for many aspects of substation design, including project management and equipment procurement. His previous work experience includes time at a US Army Corps of Engineers hydropower plant, Bechtel Marine Propulsion Corporation working in support of the Naval Nuclear Propulsion Program, and Black and Veatch, where he focused on substation electrical, physical, and protection and control design. His background provides extensive knowledge into many aspects of the electrical engineering field, including a focus on the engineering, procurement, and construction of transmission and distribution substations ranging in voltages from 12.47 kV to 345 kV. Mark draws from this knowledge base and collaborates with a team of engineers to provide quality designs that are delivered on time and within budget.

Representative Project Experience:

- Umatilla Electric Cooperative – Westland Substation 115 kV Additions
- Umatilla Electric Cooperative – Oregon Trail Substation 115 kV Breaker Addition
- Umatilla Electric Cooperative – Foster West Substation
- Umatilla Electric Cooperative – Buttercreek North Substation
- City of Independence, MO – Substation K Rebuild
- Umatilla Electric Cooperative – Hermiston East Substation Transformer Addition
- Umatilla Electric Cooperative – Oregon Trail Substation
- American Transmission Company – Port Washington Switchyard Upgrades*
- American Transmission Company – West Marinette Substation Upgrades*
- American Transmission Company – Highway V Substation Rebuild*
- American Transmission Company – North Appleton Substation*

* Denotes professional experience prior to joining TOTH

JEFF WOOLDRIDGE P.E.

PROFESSIONAL ENGINEER | jwooldridge@tothassociates.com

Registrations:
Missouri P.E. #2007020348

Education:
Bachelor of Science in Electrical Engineering
Missouri University of Science & Technology

Experience:
Jeff has provided services as a protection and planning engineer on variety of projects. His experience has included transmission relay settings and logic programming, transmission relay coordination studies, distribution protection coordination, relay settings and logic review, NERC audit preparation and participation, SCADA points list creation and documentation with RTAC and communications processor programming, distribution load flow studies, transmission mis-operation analysis and reporting, and power quality recording and analysis. Jeff has experience with AutoCAD, ASPEN OneLiner, CAPE, SKM Power Tools, and SEL relay programming and event report analysis software, among other software programs.

Affiliations and Honors:

- Grainger Power Engineering Award
- Missouri Society of Professional Engineers

Transmission Relay Logic and Settings Experience:

- Monte Vista, OK – 3-Terminal 138kV Ring Bus – All 138kV Relay Panels
- Claremore, MO – 69kV Cap bank resize & SEL-487V protection redesign*
- Columbus, KS – 5-Terminal 69kV Ring Bus – All 69kV Relay Panels*
- Marietta – 3-Terminal 138kV Ring Bus with Autotransformer, Two 138kV Lines and Two 138kV Cap Banks – All 138kV and 69kV Relay Panels*
- Hugo, OK –Two New 138kV Breaker-and-a-Half Line Panels*
- Many individual 34.5kV thru 161kV Line, Transformer, and Bus Protection Panels during time at Empire District Electric Company*

Transmission Relay Coordination Study Experience:

- Nixa, MO – 69kV Coordination Study – All 69kV Line Panels
- Monte Vista, OK. – 138kV Area Coordination Study and scenarios for protection of three and four terminal line arrangements with comm. Scheme.
- Cleveland, OK – Area Coordination Study - Addition of 345/16kV Autotransformer*

Relay Settings and Logic Review Experience:

- Asbury, MO – 5-Terminal 161kV Ring Bus – All relay panel logic and settings – Asbury 349 Substation*
- Webb City, MO – Two 161kV line panels and an autotransformer panel – All relay panel logic and settings – Fir Road 417 Substation*
- Ozark, MO – Two 69kV line panels, 69kV Bus Diff, and two Transformer Panels – All relay panel logic and settings – Ozark 330 Substation*
- Empire District Service Territory – many 12kV distribution circuits – Worst Performing Circuit Review*
- Documentation of Relay Connections, Control, Lockouts, Trip, Close Supervision, and Functional Description for all GRDA Relay Panels, 69kV and up, for Line protection, Bus Protection, and Transformer Protection*

SCADA Points List, RTU and Comm. Processor Experience:

- SEL-2032 and/or SEL-RTAC Programming with SCADA Points List Documentation for Many Empire District Electric System Substations, including Joplin #59 Substation, Bolivar #602 Substation, Bolivar #367 Substation, Joplin #477 Substation, Quapaw #377 Substation, Fir Road #417 Substation, Marionville #437 Substation, Republic #359 Substation, Fairland #363 Substation, Ozark #434 Substation, Ozark #415 Substation, and Hockerville #404 Substation*

Distribution Load Flow Study Experience:

- City of Bolivar, MO – All 12kV Substations and Circuits, including proposal of new circuits and optimized cap bank locations*
- City of Ozark, MO – All 12kV Substations and Circuits, including proposal of new circuits and optimized cap bank locations*
- City of Republic, MO – All 12kV Substations and Circuits, including proposal of new circuits and new substation location*
- City of Joplin, MO – All 4kV Downtown Substations and Circuits, including optimized cap bank locations and proposal for future 12kV conversion*

*Denotes professional experience prior to joining TOTH

MELANIE PARKER, P.E.

ELECTRICAL ENGINEER, PROFESSIONAL ENGINEER | mparker@tothassociates.com

Registrations:
Illinois P.E. # 062070502
Missouri P.E. # 2018000256

Education:
Bachelor of Science in Electrical Engineering
Missouri University of Science & Technology

Master of Science in Engineering Management
Missouri University of Science & Technology

Experience:
Melanie serves as an Electrical Engineer with over six years of electrical engineering experience. Her substation design experience includes protection and controls design for substations with voltages ranging from 12.5 kV to 345 kV.

Representative Project Experience:

- City of Lebanon – Relay Replacements
- Franklin County PUD – Franklin Substation Rebuild
- C&L Electric Cooperative Corporation – Sheridan South Substation
- Southwestern Electric Cooperative – Maple Grove Substation
- Ameren Illinois – Gateway Program Remote Ends *
- Ameren Illinois – West Mount Vernon, IL Substation *
- Ameren Illinois – Greenville, IL Substation *

* Work performed prior to working at TOTH

Unit Fee Schedule

Base Hourly Rates
The following "Base" hourly charges will be applicable for services provided:

Engineer Principal $255

Engineer PE-3 ..... $235
Project Manager-3

Engineer PE-2 ..... $210
Engineer-3
Project Manager-2
Rate Analyst-3

Construction Review-2 ..... $195
Project Manager-1
ROW Administrator

Construction Review-1 ..... $180
Designer-4
Engineer PE-1
Engineer-2
Grants-3
Professional Land Surveyor
ROW-2

Designer-3 ..... $160
Rate Analyst-2
ROW-1

Contract and Procurement-2 ..... $145
Designer-2
Engineer-1
GIS-3
Grants-2
Project Administrator-2

Drafter-3 ..... $130
GIS-2
Survey Technician

Contract and Procurement-1 ..... $120
Designer-1
Project Administrator-1
Rate Analyst-1

Drafter-2 ..... $110
Field Representative-3
GIS-1
Grants-1

Drafter-1 ..... $85
Field Representative-2
GIS Aide
Staff Assistant

Field Representative-1 ..... $75

Expenses
MILEAGE and LODGING* - will be charged at the allowable rate as established by the IRS.
MEALS* - current TA allowance to include three (3) meals: $40.00
* Daily expenses may be billed at direct cost for lodging and meals.

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Unit Fees - Supplemental Items

1. Total Billing

Total Billing will be equal to the following:

Base Hourly rate for Normal working Hours X Hours directly worked

+ Directly Attributed Expenses

Bills are due and payable within 30 days after receipt of statement unless otherwise so provided. A fee of .67% per month shall be charged for unpaid bills beginning 30 days from receipt of statement by client.

2. Overtime Work

Overtime rates will apply to hours worked beyond the normal 8-hour day or 40-hour week as well as to work performed during holidays. Overtime rates will only be charged when the client has approved overtime work.

3. Directly Attributed Expenses

"Directly Attributed Expenses" (DAE) will include items such as outside printing directly required for the job. A 10% adder will be permitted on Directly Attributed Expenses.

4. Subcontracted Services

When supplemental labor (labor that is subcontracted for) is utilized, the above listed base rates will apply to time worked by the supplemental employees.

5. Other

The appropriate personnel at the appropriate skill level will be utilized.

Only hours directly attributable to the job will be charged to the job.

The Engineer reserves the right to adjust the Unit Fee Schedule and charges from time to time to compensate for increases in costs.