November 16, 2026

Bidder:

Traverse City Light & Power (TCL&P) will receive sealed bids in the office of TCL&P, 1131 Hastings Street, Traverse City, Michigan, 49686, until **Wednesday, December 2, 2026, at 2:00 PM** for the following project:

Six-Year Substation Maintenance
(specifications attached)

It is the sole responsibility of the Bidder to check the website for updates and addenda prior to the bid being submitted. Updates can be found using the following link: http://www.tclp.org/Display/Items/RFPs.

TCL&P reserves the right to accept or reject any or all bids, waive irregularities, and to accept the bids either on an entire or individual basis that is in the best interest of TCL&P.

TCL&P accepts no responsibility for any expense incurred by the Bidder in the preparation and presentation of a bid. Such expenses shall be borne exclusively by the Bidder.

Only the Successful Bidder will be notified. If you desire, you may call for results.

You must indicate on the outside of the sealed envelope that the bid is for the "Substation Maintenance" project.

You must submit **A SEALED COPY** of the bid to TCL&P prior to the above-indicated time and date or the bid will not be accepted. **Alternatively, E-Mailed bids will be accepted**. Please indicated in the subject line of you e-mail that you are submitted a "Sealed Bid" together with the project description, "**Six-Year Substation Maintenance**," and submit your e-mailed bid to purchasing@tclp.org.

Please note that if you have previously submitted an informal quote, you will still need to submit a sealed bid prior to the date and time specified above in order to be considered. Please ensure that all requirements listed in the specifications are met.

All questions must be submitted by Monday, November 30, 2026, via email to Purchasing@tclp.org with the email subject "**Six-Year Substation Maintenance Questions**".

PLEASE SUBMIT BID TO: Jeff Schwarz, Manager of Operational Support
Traverse City Light & Power
1131 Hastings Street
Traverse City, MI 49686

A. SPECIFICATIONS

1. Scope of Work

TCL&P is requesting bids to provide all labor necessary for the preventative maintenance and testing of all of their substations, including yearly battery testing and DGA oil samples on transformers. This includes maintenance on (11) transformers, (13) 69 kV breakers, (10) 69 kV circuit switchers, and one 138 kV circuit switcher. Contractor is responsible for providing a ladder or man-lift and any other required equipment or tools, as this will not be paid as a separate line item for the preventative maintenance portion. All equipment information and tests/maintenance to be performed have been included as Attachment A.

TCL&P is also requesting bidders include a sheet detailing hourly rates for corrective maintenance for the following:

- NETA certified technician
- Non-NETA certified technician
- Van/Truck (includes basic tools to do most tasks and a ladder)
- Trailer (includes more advanced/specialized tools, pump, and oil container)
- Vacuum oil processing rig
- Man-lift
- Nitrogen and SF6 gas leak detector
- Thermal camera

The project is located at the following sites:

- Barlow – 525 Barlow St within the City of Traverse City, MI.
- Cass – 2313 Sybrandt Rd within Garfield Township, MI.
- East - 1638 Four Mile Rd within East Bay Township, MI.
- Hall – 130 Hall St within the City of Traverse City, MI.
- Parsons – 2463 North Aero Park Ct within the City of Traverse City, MI.
- South – 2760 LaFranier Rd within Garfield Township, MI.

All bidders must familiarize themselves with the site conditions prior to submitting a bid for this project.

Reports must be provided for all work completed detailing test results and any findings for preventative maintenance. A report must also be provided for corrective maintenance certifying that work was completed to fix an identified issue.

All technicians do not have to be NETA certified, but a NETA certified technician must supervise all work performed by a non-NETA certified technicians.

The Successful Bidder will be required to submit a Certificate of Insurance meeting the requirements stated herein along with a Performance and Payment Bond (for the Total Project Cost) prior to commencing the work. These Bonds shall remain in effect at least until one year after the date when final payment becomes due.

Bids must be submitted on a unit price basis on the attached forms. All sales, consumer, use and other similar taxed required by law to be paid by the bidder shall be included in the bid price.

2. Corrective Maintenance

A. Contractor shall provide an estimate for approval prior to starting work.

B. TCL&P will not be obligated to use contractor if they cannot commit to meeting TCL&P's required schedule.

3. Instructions to Bidders

A. All bids must be submitted on the forms provided. Complete and return ONLY the following forms:

1. Section C – Iran Economic Sanctions Act
2. Section E – Submission Form
3. Section F – Bid Sheet.

B. Successful Bidder invoicing will be completed on a monthly basis based on the work completed to date. All invoicing will be on a unit basis and will show the total bid unit quantity, completed units to date, amount billed to date, and current billing amount.

C. The Successful Bidder will submit all invoices directly to the Engineer for payment. All invoices must show Traverse City Light & Power as the invoiced party.

D. Permitting, with the exception of traffic control, will be completed by the Owner.

4. Completion Date

A. Each substation to be completed by July 1st of the year indicated. Contractor will have flexibility to schedule work accordingly. Oil samples and battery testing may be scheduled anytime, but there must be a minimum of 10 months between testing or samples.

5. Site Restoration

A. In the event the contractor fails to, TCL&P will restore or replace when any public or private property is damaged by the Successful Bidder's work, equipment or employees, to a condition at least equal to that existing immediately prior to the beginning of Successful Bidder's operations. This includes all highway, driveway, walk or landscaping, etc. TCL&P will invoice Successful Bidder for said site restoration work.

6. Safety Rules

A. The Successful Bidder shall have a written safety program in place to adequately protect their employees from workplace hazards. Written documentation of the safety program and employee trainings shall be made available to Owner upon request. The Successful Bidder is ultimately responsible for the safety of all Successful Bidder employees while completing the project(s).

B. The Owner reserves the right to stop work on the project(s) immediately following any Successful Bidder related injury or accident during the accident investigation period.

7. Compliance Rules

A. TCLP is subject to NERC compliance rules. As such winning bidder will have to abide by TCLP's CIP-003 standards. These have been attached to the bid for your review.

8. Leaving the Project(s) for Extended Time Periods

A. Following commencement of work on the project(s), the Successful Bidder shall not abandon the Project for an extended length of time unless granted written permission from the Owner. The Owner will review the project schedule to verify that the Successful Bidder has provided sufficient crews and equipment to keep the project on schedule prior to granting permission to leave for an extended period. The Owner's intent is to ensure the Successful Bidder is progressing throughout the duration of the Project.

B. Should the Successful Bidder abandon the Project for greater than five working days, the Successful Bidder must leave the Project in a safe and reliable state. This includes but is not limited to:

   a. All excavations backfilled and compacted to grade.
   b. All pavement removals backfilled and temporary patched with MDOT 22A gravel, "cold-patch" or concrete.
   c. All equipment box pads covered and material moved to a secure area.
   d. All Successful Bidder owned vehicles and equipment removed from the project site and moved to an area approved by the Owner.

C. Should the Successful Bidder leave the project and not comply with the items above, the Owner retains the right to complete those incomplete items and charge the Successful Bidder for all labor and equipment time and material utilized. This includes payment to outside Successful Bidders to complete the required work.

9. Contract Date Extensions

A. All requests for contract date extensions shall be written requests and submitted to the Owner.

B. Extensions requests based on weather related delays shall include documentation provided by the Successful Bidder of non-working days due to inclement weather.

B. INSURANCE REQUIREMENTS

The following insurance requirements must be met throughout the project:

A. The Successful Bidder shall file with TCL&P satisfactory certificates of insurance prior to commencement of construction. The form, content and limits of such insurance, together with the insurer thereof in each case, shall be acceptable to TCL&P (Best rating of A or better.) Advance written notice will be given to TCL&P before any material modification, cancellation, or expiration of any policy covered thereby. Notice of policy material modification, cancellation, or expiration shall be made by certified mail to TCL&P.

B. Should any of the insurance requirements stated herein be terminated by the Insurer, the Insurer will mail thirty days written notice to TCL&P. Failure to mail by the Insurer will not waive the obligation or liability of any kind upon the insurer affording coverage. These requirements must be stated on all certificates of insurance. Modifications of the standard cancellation clause is acceptable.

C. All certificates shall list any exclusions that are nonstandard within the industry as they appear on the policy.

D. Each insurance policy shall have an Additional Insured endorsement naming TCL&P, its officers, agents, directors, and employees (including the Engineer). The issuing company for comprehensive general liability and excess liability shall waive subrogation of all claims against parties named as additional insureds.

E. The worker's compensation, automobile liability, and general liability insurance specified shall apply to all Successful Bidders on site.

F. For insurance purposes, the title of ownership of the equipment, if any, furnished by the Successful Bidder shall remain with the Successful Bidder until official acceptance of the work by TCL&P.

G. Insurance types and coverages:

1. *Workers' Compensation:* The parties shall maintain suitable workers compensation insurance pursuant to Michigan law and Successful Bidder shall provide a certificate of insurance or copy of state approval for self-insurance to TCL&P upon execution of this Contract.

2. *Comprehensive General Liability Insurance Coverage:* Naming the City Of Traverse City and TCL&P as additional insured's:

Limits for bodily injury or death not less than $2,000,000 for each person $2,000,000 for each incident.

This insurance must cover timber trespass

3. *Owners and Successful Bidders Protective Liability Insurance Coverage* $2,000,000.00 minimum coverage.

The Successful Bidder agrees not to change such insurance and agrees to maintain such insurance throughout the period of performance of this Agreement. Upon execution of this Agreement, the Successful Bidder must provide a certificate of insurance to the TCL&P Controller. Such certificate shall name TCL&P as an additional insured with the broad form endorsement for ongoing operations and completed operations on the insurance policies for general liability, excess liability, and Successful Bidder liability. Successful Bidder shall also provide Additional Insured Endorsement CG 20330413 or its equivalent. If any of the required insurance is not renewed or canceled, the Successful Bidder and all sub-contractors shall cease operations and shall not resume until new insurance is obtained. Successful Bidder shall obtain Third Party Notice Endorsement IL 79901010 for each required policy requiring the insurer to give Owner 30 days' notice of non-renewal or cancellation.

4. *Comprehensive Automobile Liability Insurance Coverage:* On all self-propelled vehicles used in connection with the contract whether owned, non-owned, or hired in the minimum coverage amount of $2,000,000.

Property damage limit shall not be less than $1,000,000 for each incident.

C. IRAN ECONOMIC SANCTIONS ACT

Sworn and Notarized Affidavit of Compliance
Iran Economic Sanctions Act
Michigan Public Act No. 517 of 2012

All bidders must submit the following certification statement in compliance with Public Act No. 517 of 2012 (the "Iran Economic Sanctions Act") and attach this form to the bid. **Traverse City Light & Power shall not accept any bid that does not include this sworn and notarized certification of statement.**

The undersigned, the owner or authorized officer of _____ (the Bidder), hereby certifies, represents and warrants that the Bidder (including its officers, directors and employees) is not an "Iran linked business" within the meaning of the Iran Economic Sanctions Act, and that in the event the Bidder is awarded a contract for the Six-Year Substation Maintenance, the Bidder will not become an "Iran linked business" at any time during the course of performing the work or any services under the contract.

The Bidder further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than $250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification is made, whichever is greater, the cost of Traverse City Light & Power's investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on a Request for Proposal for 3 years from the date it is determined that the person has submitted the false certification.

BIDDER

_____

By: _____

Its: _____

Date: _____

STATE OF _____)

COUNTY OF _____)

This instrument was acknowledged before me on the _____ day of _____ , _____ ,by

_____ .

_____

_____ , Notary Public

_____ County, _____

My Commission Expires: _____

Acting in the County of: _____

D. BID SUMMARY

Bidder – Please complete and return

TITLE: Six-Year Substation Maintenance

DUE DATE: December 2, 2026, at 2:00 PM

Having carefully examined the specifications and any other applicable information, the bidder proposes to furnish all items necessary for and reasonably incidental to the proper completion of this bid. Bidder submits this bid and agrees that the bid may not be withdrawn for a period of thirty (30) days from the actual date of the opening of the bid.

Bidder understands and agrees, if selected as the Successful Bidder, to accept a Contract (Attachment B) from TCL&P and to provide proof of any required insurance.

Bidder submits this bid and agrees to meet or exceed all TCL&P's requirements and specifications unless otherwise indicated in writing and attached hereto.

Bid forms are to be completed, including bid sheet, and submitted. Additional sheets may be used and submitted with bid.

Bidder understands that TCL&P reserves the right to accept any or all bids in whole or in part and to waive irregularities in any bid in the best interest of TCL&P. The bids will be evaluated and awarded on the basis of the best value to TCL&P. Criteria used will include, but not be limited to, bidder/Successful Bidder's proximity, experience working with TCL&P, cost, and overall capability meeting the needs of TCL&P. TCL&P has created a form to evaluate bidders based on the criteria listed. TCL&P is sales tax exempt – Government.

Bidder shall pay all sales, consumer, use and other similar taxes required to be paid by Bidder in accordance with the Laws and Regulations of the place of the Project that are applicable during the performance of the work.

The Bidder certifies that it is in compliance with the City of Traverse City's Nondiscrimination Policy as set forth in Administrative Order No. 47 and Chapter 605 of the City's Codified Ordinances.

The Bidder certifies that none of the following circumstances have occurred with respect to the Bidder, an officer of the Bidder, or an owner of a 25% or more share in the Bidder's business, within 3 years prior to the bid:

a) conviction of a criminal offense incident to the application for or performance of a contract;

b) conviction of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or any other offense which currently, seriously and directly reflects on the Bidder's business integrity;

c) conviction under state or federal antitrust statutes;

d) attempting to influence a public employee to breach ethical conduct standards; or

e) conviction of a criminal offense or other violation of other state, local, or federal law, as determined by a court of competent jurisdiction or an administrative proceeding, which in the opinion of the City indicates that the bidder is unable to perform responsibility or which reflects a lack of integrity that could negatively impact or reflect upon TCL&P, including but not limited to, any of the following offenses or violations of:

    i. The Natural Resources and Environmental Protection Act.

    ii. A persistent and knowing violation of the Michigan Consumer Protection Act.

    iii. Willful or persistent violations of the Michigan Occupational Health and Safety Act.

    iv. A violation of federal, local, or state civil rights, equal rights, or non-discrimination laws, rules or regulations.

    v. Repeated or flagrant violations of laws related to the payment of wages and fringe benefits.

f) the loss of a license or the right to do business or practice a profession, the loss or suspension of which indicates dishonesty, a lack of integrity, or a failure or refusal to perform in accordance with the ethical standards of the business or profession in question.

Terms: Payment will be made as soon as possible after invoicing.

Bidder certifies that as of the date of this bid, Bidder’s company or Bidder is not in arrears to TCL&P or the City of Traverse City for debt or contract and is in no way a defaulter as provided in Section 152, Chapter XVI of the Charter of the City of Traverse City.

Bidder agrees that the bid may not be withdrawn for a period of thirty (30) days from the actual date of the opening of the bid.

E. SUBMISSION FORM

By submitting a response to this RFP you acknowledge that TCL&P may be required from time to time to release records in its possession under the Michigan Freedom of Information Act. By submitting a response, you hereby give permission to TCL&P to release any records or materials submitted by you as TCL&P may be requested to do so as permitted by the Freedom of Information Act, MCL 15.231 et seq.

Submitted by:

Signature	Company Name
Name and Title (Print)	Company Address
Phone Fax	City, State, Zip
	Sole proprietorship/partnership/corporation
	If corporation, state of corporation

REFERENCES: (include name of organization, contact person, and daytime phone number).

1.

Name of Organization

Contact Person Phone Number

2.

Name of Organization

Contact Person Phone Number

3.

Name of Organization

Contact Person Phone Number

F. BID SHEET

❖ **Preventive Maintenance**

Substation	Equipment	Quantity	Unit Price	Extended Price
South (2027)	Transformer	2	$	$
	69 kV Circuit Switcher	2	$	$
	69 kV Circuit Breaker	2	$	$
	15 kV Disconnect Switch	24	$	$
	15 kV Tandem Switch	24	$	$
	69 kV GOAB	9	$	$
	15 kV GOAB	3	$	$
	69 kV Insulator	21	$	$
	15 kV Insulator	60	$	$
	69 kV Arrester	15	$	$
	15 kV Arrester	12	$	$
	69 kV Breaker CT	24	$	$
	Transformer CT	24	$	$
	69 kV PT	5	$	$
	SEL 311B	2	$	$
	SEL 311C	2	$	$
	SEL 351R	4	$	$
	SEL 351S	2	$	$
	SEL 501	2	$	$
	SEL 587	2	$	$
	SEL 587Z	1	$	$
Hall (2028)	Transformer	2	$	$
	69 kV Circuit Switcher	2	$	$
	69 kV Circuit Breaker	3	$	$
	15 kV Circuit Breaker	10	$	$
	69 kV GOAB	10	$	$
	69 kV Insulator	18	$	$
	69 kV Arrester	12	$	$
	69 kV Breaker CT	33	$	$
	Transformer CT	24	$	$
	69 kV PT	8	$	$
	SEL 311A	4	$	$
	SEL 311B	2	$	$
	SEL 351S	10	$	$
	SEL 501	4	$	$
	SEL 587	2	$	$
Parsons (2029)	Transformer	2	$	$
	69 kV Circuit Switcher	2	$	$
	69 kV Circuit Breaker	2	$	$
	15 kV Disconnect Switch	24	$	$
	15 kV Tandem Switch	24	$	$

	69 kV GOAB	8	$	$
	15 kV GOAB	3	$	$
	69 kV Insulator	9	$	$
	15 kV Insulator	68	$	$
	69 kV Arrester	6	$	$
	15 kV Arrester	21	$	$
	69 kV Breaker CT	24	$	$
	Transformer CT	24	$	$
	69 kV PT	8	$	$
	SEL 311C	4	$	$
	SEL 351R	7	$	$
	SEL 351S	2	$	$
	SEL 501	2	$	$
	SEL 587	2	$	$
	SEL 587Z	1	$	$
Barlow (2030)	Transformer	2	$	$
	69 kV Circuit Switcher	2	$	$
	69 kV Circuit Breaker	2	$	$
	15 kV Disconnect Switch	18	$	$
	15 kV Tandem Switch	18	$	$
	69 kV GOAB	8	$	$
	15 kV GOAB	3	$	$
	69 kV Insulator	12	$	$
	15 kV Insulator	54	$	$
	69 kV Arrester	6	$	$
	15 kV Arrester	15	$	$
	69 kV Breaker CT	24	$	$
	Transformer CT	24	$	$
	69 kV PT	8	$	$
	SEL 311C	4	$	$
	SEL 351R	5	$	$
	SEL 351S	2	$	$
	SEL 501	2	$	$
	SEL 587	2	$	$
	SEL 587Z	1	$	$

East (2031)	Transformer	1	$	$
	138 kV Circuit Switcher	1	$	$
	69 kV Circuit Breaker	2	$	$
	138 kV GOAB	1	$	$
	69 kV GOAB	4	$	$
	69 kV Insulator	9	$	$
	138 kV Arrester	3	$	$

	138 kV PT/CT Metering Combo Unit	3	$	$
	69 kV Breaker CT	24	$	$
	Transformer CT	19	$	$
	69 kV PT	6	$	$
	SEL 311B	1	$	$
	SEL 311C	1	$	$
	SEL 351S	1	$	$
	SEL 387	2	$	$
	SEL 587Z	1	$	$
Cass (2032)	Transformer	2	$	$
	69 kV Circuit Switcher	2	$	$
	69 kV Circuit Breaker	2	$	$
	15 kV Disconnect Switch	18	$	$
	15 kV Tandem Switch	18	$	$
	69 kV GOAB	9	$	$
	15 kV GOAB	3	$	$
	69 kV Insulator	21	$	$
	15 kV Insulator	54	$	$
	69 kV Arrester	12	$	$
	15 kV Arrester	18	$	$
	69 kV Breaker CT	24	$	$
	Transformer CT	15	$	$
	Aux Transformer CT	3	$	$
	69 kV PT	5	$	$
	SEL 311A	1	$	$
	SEL 311B	2	$	$
	SEL 311C	2	$	$
	SEL 351R	6	$	$
	SEL 501	2	$	$
	SEL 587	2	$	$
ALL	Transformer DGA Oil Sample (Main & LTC)	66	$	$
	Battery Bank Testing	36	$	$
			TOTAL	$

❖ **Corrective Maintenance Rates (use straight time rates)**

Item	**Hourly Rate**
NETA Certified Technician	$
Non-NETA Certified Technician	$
Van/Truck (Includes basic tools to do most tasks and a ladder)	$
Trailer (Includes more advanced/specialized tools, pump, and oil container)	$
Vacuum Oil Processing Rig	$

Manlift	$
Nitrogen and SF6 Gas Leak Detector	$
Thermal Camera	$

ATTACHMENT A – SCOPE OF WORK

Transformers:

- TTR on all phases of LTC
- Busing power factor & capacitance
- Winding power factor and capacitance
- Winding excitation on neutral LTC position
- DC winding resistance on all LTC positions
- Insulation resistance of windings and core (if accessible)
- Power factor surge arresters
- Check pressure relief devices for proper operation
- Check sudden pressure relays for proper operation
- Check main tank oil level gauge for proper operation
- Check nitrogen system for proper pressure and tank fill pressure
- Visual check of the breather and replacement of silica-gel if necessary
- Replace LTC oil filter (if equipped)
- Visual inspection and replacement of LTC internals as required (for non Reinhausen units only)
- Inspect grounding
- Verify/clean bushings
- Verify correct liquid level in tanks and bushings
- Verify bolted electrical connections
- Verify alarms are operational
- Verify connections in control cabinet, tighten if loose
- Touchup paint as needed

Circuit Switchers:

- Inspect physical condition
- Inspect grounding
- Clean unit
- Perform all mechanical operational tests
- Perform contact / pole resistance test
- Inspect bolted electrical connections for high resistance
- Verify operation of SF6 or vacuum interrupters in accordance with manufacturer's published data (if applicable)
- Test and verify alarms and pressure limit switches
- Test SF6 gas for moisture, purity, and SO2 in accordance with manufacturer's published data or Table 100.13 of NETA MTS (if applicable)
- Verify appropriate lubrication on all moving parts
- Verify operation of heaters
- Verify connections in lower control cabinet, tighten if loose

Circuit Breakers:
- Inspect physical condition
- Inspect grounding
- Clean unit
- Perform all mechanical operational tests
- Perform contact / pole resistance test
- Inspect bolted electrical connections for high resistance
- Verify operation of SF6 or vacuum interrupters in accordance with manufacturer's published data
- Test and verify alarms and pressure limit switches
- Test SF6 gas for moisture, purity, and SO2 in accordance with manufacturer's published data or Table 100.13 of NETA MTS
- Verify appropriate lubrication on all moving parts
- Verify operation of heaters
- Verify connections in control cabinet, tighten if loose

15 kV MEB Breakers:
- Inspect physical condition
- Perform maintenance according to Square D recommendations

15 kV Disconnect Switches:
- Inspect physical condition
- Lubricate moving parts as required
- Clean contacts and insulators

15 kV Tandem Switches:
- Inspect physical condition
- Lubricate moving parts as required
- Clean contacts and insulators

GOAB Switches:
- Inspect physical condition
- Clean unit
- Verify blade alignment, blade penetration, travel stops, arc interrupter operation, and mechanical operation
- Inspect bolted connections for high resistance
- Verify connections in control cabinet, tighten if loose (if applicable)
- Lubricate if required

Insulators:
- Inspect physical condition
- Clean unit

Arresters:
- Inspect physical condition
- Power factor

69 kV Breaker CT, Transformer CT, Aux Transformer CT, 69 kV PT, and 138 kV PT/CT Metering Combo Unit:

- Inspect physical and mechanical condition.
- Inspect bolted electrical connections for high resistance using one or more of the following methods:
    - Use of a low-resistance ohmmeter.
    - Verify tightness of accessible bolted electrical connections by calibrated torque wrench.
- Use appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
- Perform resistance measurements through bolted connections with a low-resistance ohmmeter in accordance with Section 7.10.1.A.4.1.
- Perform insulation-resistance test of each current transformer and wiring to ground at 1000 volts dc for one minute. For units with solid-state components that cannot tolerate the applied voltage, follow manufacturer's recommendations.
- Perform insulation-resistance tests on the primary winding with the secondary grounded. Test voltages shall be in accordance with Table 100.5.
- Perform insulation power factor or dissipation factor
    - Power factor to only be performed on 69 kV PTs.
- Verify that current circuits are grounded and have only one grounding point in accordance with IEEE C57.13.3.

Relay Testing:

- Record model number, style number, serial number, firmware revision, software revision, and rated control voltage.
- Download the sequence of events, maintenance data, and statistical data prior to testing the relay.
- Verify operation of light-emitting diodes, display, and targets.
- Clean the front panel and remove foreign material from the case.
- Check tightness of connections.
- Verify that the frame is grounded in accordance with manufacturer's instructions.
- Download settings and logic from the relay. Print a copy of the settings for the report and compare the settings to those specified in the coordination study.
- Verify relay displays the correct date and time. Compare relay time to actual time and record the differential.
- Check with owner for applicable firmware updates and product recalls.
- Inspect, clean, and verify operation of shorting devices.
- Apply voltage or current to all analog inputs and verify correct registration of the relay meter functions.
- Protection Elements.
    - Check functional operation of each element used in the protection scheme as described for electromechanical and solid-state relays in 7.9.1.B.3.
- Control Verification.
- Check operation of all active digital inputs.
- Check all output contacts or SCRs, preferably by operating the controlled device such as circuit breaker, auxiliary relay, or alarm.

- Check all internal logic functions used in the protection scheme.
- For pilot schemes, perform protection system communication tests.
- Upon completion of testing, reset all min/max records and fault counters. Delete sequence-of-events records and all event records.
- Verify trip and close coil monitoring functions.

Oil Testing:

- Main & LTC tank
- DGA analysis & recommendations

Battery Bank Testing:

- Verify the battery area ventilation system is operable.
- Verify existence of suitable eyewash equipment.
- Inspect physical and mechanical condition.
- Inspect battery support racks, mounting, battery spill containment system, anchorage, clearances, alignment, and grounding.
- Verify electrolyte level. Measure electrolyte specific gravity and temperature levels.
- Verify presence of flame arresters.
- Test Hydrogen detector.
- Neutralize acid on exterior surfaces and rinse with water.
- Inspect bolted electrical connections for high resistance using one or more of the following methods:
    - Use of a low-resistance ohmmeter.
    - Verify tightness of accessible bolted electrical connections by calibrated torque wrench.
- Perform resistance measurements through all bolted connections with a low-resistance ohmmeter.
- Measure charger float and equalizing voltage levels. Adjust to battery manufacturer's recommended settings.
- Measure each monoblock/cell voltage and total battery voltage with charger energized and in float mode of operation.
- Measure intercell connection resistances.
- Perform internal ohmic measurement tests.
- Measure the battery system voltage from positive-to-ground and negative-to-ground.

❖ Equipment List

Substation	Equipment	Manufacturer	Part #	Serial #
Barlow	Transformer #1	Delta Star		E4887
	Transformer #1 LTC	Reinhausen	RMV-II	1933510
	Transformer #2	Delta Star		E4888
	Transformer #2 LTC	Reinhausen	RMV-II	1933509
	BW-122 Relay	SEL	311C	3200770191
	BW-122 Relay Backup	SEL	311C	3200770189

	BW-322 Relay	SEL	311C	3200770192
	BW-322 Relay Backup	SEL	311C	3200770190
	Breaker BW-122	Siemens	SPS2	3008237899-2
	Breaker BW-322	Siemens	SPS2	3008237899-1
	Circuit Switcher BW-129	Siemens	CPV2V	3008247386-1
	Circuit Switcher BW-329	Siemens	CPV2V	3008247386-2
	Transformer #1 Differential	SEL	587	1201020002
	Transformer #1 Overcurrent	SEL	501	1201020004
	Transformer #2 Differential	SEL	587	1200900196
	Transformer #2 Overcurrent	SEL	501	1200700194
	BW422 Decoupler	S&C	AS-10	20-10099
	BW522 Decoupler	S&C	AS-10	20-10144
	BW622 Decoupler	S&C	AS-10	20-10189
	BW422 Relay	SEL	351S	3200770213
	BW522 Relay	SEL	351S	3200770214
	BW21 Recloser	SEL	351R	5201120185
	BW22 Recloser	SEL	351R	2007016175
	BW23 Recloser	SEL	351R	2004215022
	BW30 Recloser	SEL	351R	2005102094
	BW31 Recloser	SEL	351R	2005102097
	69kV Bus Relay	SEL	587Z	1200700192
	GPS Satelite Clock	SEL	2407	1200760634
	Substation Annunciator	SEL	2523	3200770184
	RTAC	SEL	3530	1200630138
Cass	Transformer #1	GE		M122299
	Transformer #1 LTC	GE	LRT-200	
	Transformer #2	GE		R280039A
	Transformer #2 LTC	GE	LRT-200	
	Breaker CD-122	Siemens	SPS2	54263-2
	Breaker CD-322	Siemens	SPS2	54263-1
	CD-122 Relay	SEL	311C	2004211180
	CD-122 Relay	SEL	311B	2004211181
	Communication Switch	SEL	2030	1171561052
	CD-322 Relay	SEL	311C	2004211185
	CD-322 Relay	SEL	311B	2004211186
	RIS Event Capture Unit	RIS	CIU	
	CD-622 Relay	SEL	311A	2004211183
	Transformer #1 Differential	SEL	587	2004211182

	Transformer #1 Overcurrent	SEL	501	2004212073
	Transformer #2 Differential	SEL	587	2004211184
	Transformer #2 Overcurrent	SEL	501	2004212074
	CD129 Circuit Switcher	Siemens	CPV2	54262-1
	CD329 Circuit Switcher	Siemens	CPV2	54262-2
	CD 622 Decoupler	S&C	AS-10	04-3756
	CD 522 Decoupler	S&C	AS-10	04-3757
	CD 422 Decoupler	S&C	AS-10	04-3755
	CD31 - Recloser	SEL	351R	2005102095
	CD30 - Recloser	SEL	351R	2005102101
	CD24 - Recloser	SEL	351R	1172490340
	CD23 - Recloser	SEL	351R	2004215023
	CD22 - Recloser	SEL	351R	2004215019
	CD21 - Recloser	SEL	351R	2005102098
East	Transformer #1	Delta Star		E40870213
	Transformer #1 LTC	Reinhausen	RMV-II	1315664
	Breaker EH-122	Siemens	SPS2	30105534-2
	Breaker EH-222	Siemens	SPS2	30105534-1
	Circuit Switcher HL-329	Siemens	CPV2	30105529-1
	Transformer #1 Differential 87T1-A	SEL	387	1121840309
	Transformer #1 Differential 87T1-B	SEL	387	1122440349
	Transformer #1 69kV Metering	SEL	735	1121840485
	EH122 Relay	SEL	351S	1121840242
	EH222 Relay - Backup	SEL	311B	1121840141
	EH222 Relay	SEL	311C	1121840142
	69kV Bus Relay	SEL	587Z	1121840467
	GPS Satelite Clock	SEL	2407	1121840069
	Substation Annunciator	SEL	2523	1121840120
	RTAC	SEL	3530	1121840282
Hall	Transformer #1	Delta Star		F68510402
	Transformer #1 LTC	Reinhausen	RMV-II	
	Transformer #2	Delta Star		F68500402
	Transformer #2 LTC	Reinhausen	RMV-II	
	Breaker HL-122	Siemens	SPS2	52985-3
	HL-122 Relay	SEL	311B	2002130047
	HL-122 Relay Backup	SEL	311A	2002130049
	HL-122 Communication Switch	SEL	2020	2002130046

	HL-322 Relay	SEL	311B	2002130044
	HL-322 Relay Backup	SEL	311A	2002130048
	HL-322 ISERI	RIS	ISM	
	HL-222 Relay	SEL	311A	2002130050
	HL-222 Relay Backup	SEL	311A	2002130045
	HL-222 Overcurrent	SEL	501	2002130051
	Breaker HL-222	Siemens	SPS2	52985-2
	Breaker HL-322	Siemens	SPS2	52985-1
	Circuit Switcher HL-129	Siemens	CPV2	53046-2
	Circuit Switcher HL-329	Siemens	CPV2	53046-1
	HL422 Differential	SEL	587	2002241001
	HL422 Overcurrent	SEL	501	2002241004
	HL522 Differential	SEL	587	2002241002
	HL522 Overcurrent	SEL	501	2002241003
	HL622 Overcurrent	SEL	501	2002252075
	HL34 - Recloser	SEL	351S	2005332382
	HL33 - Recloser	SEL	351S	2005332381
	HL32 - Recloser	SEL	351S	2005332390
	HL31 - Recloser	SEL	351S	2005332388
	HL30 - Recloser	SEL	351S	2005332385
	HL24 - Recloser	SEL	351S	2005332389
	HL23 - Recloser	SEL	351S	2005332386
	HL22 - Recloser	SEL	351S	2005332387
	HL21 - Recloser	SEL	351S	2005332383
	HL20 - Recloser	SEL	351S	2005332384
Parsons	Transformer #1	Delta Star		N2429
	Transformer #1 LTC	Reinhausen	RMV-II	2943361
	Transformer #2	SPX		GM053114
	Transformer #2 LTC	SPX	UZD	U0508-05
	Breaker PC-122	Siemens	SPS2	3007187155-2
	Breaker PC-322	Siemens	SPS2	24249-1
	Circuit Switcher PC-129	Siemens	SPS2	3007187155-1
	Circuit Switcher PC-329	Siemens	SPS2	3006134161-1
	PC23 - Recloser	SEL	351R	2005102099
	PC22 - Recloser	SEL	351R	2005102096
	PC21 - Recloser	SEL	351R	2004215018
	PC20 - Recloser	SEL	351R	5201220002
	PC30 - Recloser	SEL	351R	2004215021
	PC31 - Recloser	SEL	351R	2004216024

	PC32 - Recloser	SEL	351R	1110340207
	PC522 - Decoupler	S&C	AS-10	18-9532
	PC622 - Decoupler	S&C	AS-10	18-9531
	PC422 - Decoupler	S&C	AS-10	18-9533
	PC122 - 69kV Line Relay	SEL	311C	3183180212
	PC122 - 69kV Line Relay (Backup)	SEL	311C	3183180210
	Transformer #1 Differential	SEL	587	1183050337
	Transformer #1 Overcurrent	SEL	501	1183050305
	PC422 Relay	SEL	351S	3183180261
	69kV Bus Relay	SEL	587Z	1183050346
	GPS Satelite Clock	SEL	2407	1183050376
	Substation Annunciator	SEL	2523	3183170345
	RTAC	SEL	3530	1183160073
	Transformer #2 Differential	SEL	587	1183050307
	Transformer #2 Overcurrent	SEL	501	1183050338
	PC522 Relay	SEL	351S	3183180262
	PC322 - 69kV Line Relay	SEL	311C	3183180213
	PC322 - 69kV Line Relay (Backup)	SEL	311C	3183180211
South	Transformer #1	SPX		GT-02771
	Transformer #1 LTC	SPX	UZD	
	Transformer #2	SPX		GT-02776
	Transformer #2 LTC	SPX	UZD	U1509-05
	Breaker SS-122	Siemens	SPS2	30139749-1
	Breaker SS-322	Siemens	SPS2	30139749-2
	Circuit Switcher SS-129	Siemens	CPV2	30139747-2
	Circuit Switcher SS-329	Siemens	CPV2	30139747-1
	SS-122 311B Relay	SEL	311B	1141480278
	SS-122 311C Relay	SEL	311C	1141470313
	SS-322 311B Relay	SEL	311B	1141480281
	SS-322 311C Relay	SEL	311C	1141470314
	69kV Bus Relay	SEL	587Z	1141430388
	Transformer #1 Differential	SEL	587	1141480279
	Transformer #1 Overcurrent	SEL	501	1141480280
	SS-422 Relay	SEL	351S	14-7986/1141470312
	Transformer #2 Differential	SEL	587	1141480282
	Transformer #2 Overcurrent	SEL	501	1141480283
	SS-522 Relay	SEL	351S	14-7985/1141470315
	SS-20 Relay	SEL	351R	1141550013

	SS-21 Relay	SEL	351R	1141550014
	SS-30 Relay	SEL	351R	1141550016
	SS-31 Relay	SEL	351R	1141550015
	RTAC	SEL	3530	1141470311
	GPS Satelite Clock	SEL	2407	1141430389
	Substation Annunciator	SEL	2523	1141480284