



City of Norwich

Norwich Public Utilities
100 Broadway, Room No. 105
Norwich, CT 06360

Phone: (860)823-3706

Fax: (860)823-3812

E-mail: whathaway@cityofnorwich.org

INVITATION FOR BIDS

Bid No.: 7637

Due Date and Time: October 25, 2019 at 2:00 P.M.

Title: Voltage Regulators and Reclosers

Special Instructions:

The following information must appear in the lower left hand corner of the envelope:

Sealed Bid No: 7637

Not to be opened until **October 25, 2019** at 2:00 P.M.

Return Bids to:

William R. Hathaway, Purchasing Agent
City of Norwich
100 Broadway, Room 105
Norwich, CT 06360-4431



CITY OF NORWICH, CONNECTICUT
PLEASE RETURN THIS FORM IMMEDIATELY!

Acknowledgement: Receipt of Bid Documents

Bid No.: 7637
Title: Voltage Regulators and Reclosers

Please take a moment to acknowledge receipt of the attached documents. Your compliance with this request will help the City of Norwich to maintain proper follow-up procedures and will ensure that your firm will receive any addendum that may be issued.

Date Issued: 10/01/2019
Date Documents Received: _____ / _____ / _____
Do you plan to submit a response? _____ Yes _____ No

Print or type the following information:

Company Name: _____
Address: _____

Telephone: _____ Fax: _____
E-mail Address: _____
Received by: _____

Note: Faxed or e-mailed acknowledgements are requested.

Fax No.: (860)823-3812
E-mail: whathaway@cityofnorwich.org

Fax or e-mail this sheet only. A cover sheet is not required.

DO NOT FAX OR E-MAIL YOUR RESPONSE TO THIS BID



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Bid No.: 7637

The Purchasing Agent for the City of Norwich, on behalf of Norwich Public Utilities, will receive sealed bids for **Voltage Regulators and Reclosers** until 2:00 P.M. prevailing time on **October 25, 2019**, at which time all bids will be publicly opened and read aloud. All bids are to be delivered to William R. Hathaway, Purchasing Agent, City of Norwich, 100 Broadway, Room 105, Norwich, CT 06360.

Bid surety in the form of a bid bond, certified or bank check in the amount equal to five per cent (5%) of the total bid amount is required at the time of bid.

The bid documents may be downloaded from the following websites:

City of Norwich	http://www.norwichct.org/bids.aspx
State of Connecticut	http://das.ct.gov/SCP_Search/Default.aspx

Addenda, if any, will be posted on the websites listed above. All bidders, prior to submitting their bids, should check the websites to ensure they have received all issued addenda.

Requests for information (RFIs) must be submitted in writing no later than 12:00 P.M. on **October 11, 2019**. RFIs must be sent to William R. Hathaway, Purchasing Agent via fax to (860)823-3812, e-mail to whathaway@cityofnorwich.org or U.S. Postal Service to City Hall, 100 Broadway, Room 105, Norwich, CT 06360-4431.

Norwich Public Utilities reserves the right to reject any and all bids, in whole or in part, to waive technical defects, minor irregularities and omissions if, in its judgment, the best interests of Norwich Public Utilities will be served.

No Bidder may withdraw its bid within sixty (60) days of the bid opening date. Should there be reason why the contract cannot be awarded within the specified time, the time may be extended by mutual agreement between the City of Norwich and the designated, qualified low bidder.

All final awards of the bid shall be in compliance with City of Norwich Code of Ordinances §7-46 Delinquent Tax Setoff Against Money Due Bidder or Contractor.

All bidders must submit an original and one (1) copy of their bid in a sealed envelope bearing the name and address of the bidder and the bid number.

Responding bidders must ensure that employees and applicants for employment are not discriminated against because of their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender, identity or expression, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such bidder that such disability prevents performance of the work involved.



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Standard Bid and Contract Terms and Conditions

All Invitations for Bids issued by the City of Norwich ("City") will bind Bidders to the terms and conditions listed below, unless specified otherwise in any individual Invitation for Bids.

The contractor agrees to comply with the statutes and regulations as they exist on the date of this contract and as they may be adopted or amended from time to time during the term of this contract and any amendments thereto.

Submission of Bids

1. Bids must be submitted on forms supplied by the City Purchasing Department. Telephone or facsimile Bids will not be accepted in response to an Invitation for Bids.
2. Bidders shall bear any and all costs associated with response to this invitation to Bid, including the costs for any presentation and/or demonstrations (if applicable).
3. The time and date Bids are to be opened is given in each Bid issued. Bids received after the specified time and date of Bid opening given in each Bid shall not be considered. **Bid envelopes must clearly indicate the Bid number** as well as the date and time of the opening of the Bid. The name and address of the Bidders shall appear in the upper left hand corner of the envelope.
4. If it becomes necessary to revise any part of this request or if additional data is necessary to enable interpretation of provisions of this document, revisions or addenda will be provided to all prospective firms who receive this document; such revisions or addenda will additionally be posted on the following websites:
<http://www.norwichct.org/bids.aspx>
http://das.ct.gov/SCP_Search/Default.aspx
5. This document includes an acknowledgement page; this page must be faxed back to the Purchasing Department, to ensure proper notification of changes to the published documents. The City of Norwich does not assume responsibility for any vendor that does not receive revisions or addenda, where the vendor has not acknowledged receipt of any portion thereof.
6. Incomplete Bid forms may result in the rejection of The Bid. Amendments to Bids received by the City after the time specified for opening of Bids, shall not be considered. Bids shall be computer prepared, typewritten or handwritten in ink. All Bids shall be signed by a person duly authorized to sign Bids on behalf of the Bidders. Unsigned Bids shall be rejected. Errors, alterations or corrections on both the original and copy of the Bid schedule to be returned must be initialed by the person signing the Bid or their authorized designee. In the event an authorized designee initials the correction, there must be written authorization from the person signing the Bid to the person initialing the erasure, alterations, or correction. Failure to do so shall result in rejection of Bid for those items erased, altered or corrected and not initialed.
7. The City of Norwich reserves the right to accept or reject any and all Bid responses, in whole or in part, to waive technical defects, irregularities and omissions if, in its judgment, the best interests of the City will be served. Determination of the best interests of the City shall include consideration of pending civil litigation between the City and any firm submitting a Bid to the City or its subcontractor or supplier. The City also reserves the right to make multiple awards.
8. Conditional Bids are subject to rejection in whole or In part. A conditional Bid is defined as one which limits, modifies, expands or supplements any of the terms and conditions and/or specifications of the invitation for Bids.
9. Alternate Bids will not be considered, unless specifically authorized in the invitation to Bid. An alternate Bid is defined as one which is submitted in addition to the Bidders primary response to the invitation for Bids.
10. Prices should be extended in decimal, not fraction, to be net, and shall include transportation and delivery charges fully prepaid by the Contractor to the destination specified in the Bid, and subject only to cash discount. In the event of a



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discrepancy between the unit price and the extension, the unit price shall govern.

11. Pursuant to Section 12-412 of the Connecticut General Statutes, municipalities are exempt from the payment of excise, transportation and sales taxes imposed by the Federal Government and/or the State. Such taxes must not be included in Bid prices.
12. By its submission the Bidder represents that the Bid is not made in connection with any other Bidders submitting a Bid for the same commodity or commodities and is in all respects fair and without collusion or fraud.
13. All Bids will be opened and read publicly and upon award are subject to public inspection, subject to the provisions of Section 1-210 of the Connecticut General Statutes (Freedom of Information). Copies of information resulting from any Bid opening are generally not available until a contract has been formally awarded.
14. Bid and or performance bonds may be required, if specifically required within the specifications. Bonds must meet the following requirements:

Corporation - must be signed by an official of the corporation above their official title and the corporate seal must be affixed over the signature; **Firm or Partnership** - must be signed by all the partners and indicate they are "doing business as"; **Individual** - must be signed by the owner and indicated as "Owner". The surety company executing the bond or countersigning must be licensed in Connecticut and the bond must be signed by an official of the surety company with the corporate seal affixed over their signature. Signatures of two witnesses for both the principal and the surety must appear on the bond. Power of attorney for the official signing the bond for the surety company must be submitted with the bond.

15. The City requires the Contractor to carry commercial general liability insurance to protect it from loss. The following minimum limits shall be met:
Bodily Injury and Property Damage: \$1,000,000 each occurrence; \$2,000,000 aggregate
Products or Completed Operations: \$1,000,000 each occurrence; \$2,000,000 aggregate and be written with a per project aggregate.
Professional Liability (Errors and Omissions): \$2,000,000 each occurrence
Commercial Automobile Coverage including owned, non-owned, leased and hired vehicles (if used on City property): \$1,000,000 combined single limit for each accident
Workers' Compensation: Shall be in accordance with State of Connecticut requirements at the time of Bid.
Umbrella/Excess Liability: \$2,000,000 each occurrence; \$2,000,000 aggregate and providing coverage over the Commercial General Liability, Commercial Automobile Liability and the Employer Liability section of the Workers Compensation coverage..

The Contractor shall provide the City with a Certificate of Insurance before any work is performed. The City of Norwich, its officers (both elected and appointed), employees, and agents shall be named as additional insured on all policies, except Professional Liability and Workers Compensation, on a primary and non-contributory basis.

All policies, except Professional Liability, shall contain a waiver of subrogation in favor of the City of Norwich, executed by the insurance company.

Thirty (30) days' notice of cancellation is required and must be provided to the City of Norwich via certified mail.

Samples

16. Accepted Bid samples do not supersede the Specifications for quality unless sample is superior in quality. All deliveries shall have at least the same quality as the accepted Bid sample. Samples are furnished free of charge. Samples may be held for comparison with deliveries.



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Award

17. Award will be based on quality of the articles or services to be supplied, their conformance with specifications, delivery terms, price, administrative costs, past performance, and financial responsibility. The Purchasing Department may correct inaccurate awards resulting from clerical or administrative errors.
18. The Purchasing Agent may reject any Bidders in default of any prior contract or guilty of misrepresentation or any Bidders with a member of its firm in default or guilty of misrepresentation.

Delinquent Tax Set Off

19. In accordance with §7-46 of the City of Norwich Code of Ordinances, the award of any contract for the performance of any work, or the furnishing of any services and/or materials or equipment, any vendor or successful bidder shall agree that any taxes, landfill fees or special assessments due from the vendor or successful bidder to the City of Norwich, unless previously paid, may be set off against any monies that may be due from the City of Norwich to the vendor or successful bidder for the performance of work or the furnishing of services and/or materials or equipment under said contract.
20. Any person, vendor or successful bidder performing any work or furnishing any services or material or equipment to the City or any department, board or agency thereof, shall, as a condition of doing such or furnishing services or material or equipment, agree that any delinquent taxes, landfill fees or special assessments due from him, her or it to the City, unless previously paid, may be set off against any monies that may be due from the City to such person, vendor or successful bidder for the performance of such work or the furnishing of services or materials or equipment.

Contract

21. The existence of the contract shall be determined in accordance with the requirements set forth above. However, the award of the contract is not an order to ship.
22. The Contractor shall not assign or otherwise dispose of their contract or their right, title or interest, or their power to execute such contract to any other person, firm or corporation without the prior written consent of the Purchasing Department.
23. Bidders have ten days after notice of award to refuse acceptance of the award; after ten days the award will be binding on the Contractor. If the Contractor refuses to accept the award within the ten day period, the award will be made to the next lowest responsible qualified Bidders.
24. Failure of a Contractor to deliver commodities or perform services as specified will constitute authority to purchase said commodities or services on the open market. Contractor agrees to promptly reimburse the City for excess cost of these purchases. The purchases will be deducted from the contracted quantities.
25. The Bidders hereinafter referred to as persons requesting the use of city facilities of the City of Norwich, or in contracting with the City of Norwich for goods, services, materials, labor and the like with the City of Norwich and its respective officers, agents, servants and employees agrees to indemnify, defend and save harmless from and against any and all claims, damages, losses, litigation expenses, counsel fees and compensation arising out of any injuries (including death) sustained by, or alleged to have been sustained by, the servants, employees or agents of the City of Norwich and its respective officers, agents, servants and employees, or of the Bidders or of any participant or spectator, and from injuries including death) sustained by, or alleged to have been sustained by, the public or any persons on or near the site or on any other person or damage to property, real or personal, including property of the City of Norwich and their respective officers, agents, servants and employees, caused in whole or in part by the acts or omission of the Bidders or any participant or spectator or anyone directly or indirectly employed or working for the Bidders while engaged in the activity in the City of Norwich.



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26. Notwithstanding any provision or language in this contract to the contrary, the purchasing agent may terminate this contract whenever he/she determines in his/her sole discretion that such termination is in the best interests of the City. Any such termination shall be effected by delivery to the Contractor of a written notice of termination. The notice of termination shall be sent by registered mail to the Contractor address furnished to the City for purposes of correspondence or by hand delivery. Upon receipt of such notice, the Contractor shall both immediately discontinue all services affected (unless the notice directs otherwise) and deliver to the City all data, drawings, specifications, reports, estimates, summaries, and such other information and materials as may have been accumulated by the Contractor in performing his duties under this contract, whether completed or in progress. All such documents, information, and materials shall become the property of the City. In the event of such termination, the Contractor shall be entitled to reasonable compensation as determined by the Office of Corporation Counsel for the City of Norwich, however, no compensation for lost profits shall be allowed.
27. Notwithstanding any provision or language in this contract to the contrary, the purchasing agent may terminate this contract for cause in the event of any default by the Contractor, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the City, upon request, with adequate assurances of future performance. In the event of termination for cause, the City shall not be liable to the Contractor for any amount of supplies or services not accepted, and the Contractor shall be liable to the City for any and all rights and remedies provided by law. If it is determined that the City improperly terminated this contract for default, such termination shall be deemed a termination for convenience.
28. The individual signing this submittal hereby declares that no person or persons other than members of his/her own organization are interested in this Project or in the contract proposed to be taken; that it is made without any connection with any other person or persons making a Bid for the same work and is in all respects fair and without collusion or fraud; that no person acting for or employed by the City of Norwich is directly or indirectly interested therein, or in the supplies or works to which it relates or will receive any part of the profit or any commission therefrom in any manner which is unethical or contrary to the best interests of the City of Norwich.

Delivery

29. All products and equipment delivered must be new, and shall include any and all manufacturer warranties, unless otherwise stated in the Bid specifications.
30. Delivery will be onto the specified City loading docks by the Contractor unless otherwise stated in the Bid specifications.
31. Payment terms are net 30 days after receipt of goods or properly executed invoice, whichever is later, unless otherwise specified. A contractor may quote payment discount terms which may be considered in making the award.

Saving Clause

32. The Contractor shall not be liable for losses or delays in the fulfillment of the terms of the contract due to wars, acts of public enemies, strikes, fires, floods, acts of God or any other acts not within the control of or reasonably prevented by the Contractor. The Contractor will give written notice of the cause and probable duration of any such delay.

Advertising

33. Contractors may not reference sales to the City for advertising and promotional purposes without the prior specific approval of the Purchasing Department.

Rights

34. Any and all data collected by the contractor relative to either the performance of services or delivery of materials shall remain the sole property of the City of Norwich. Such data includes historic usage of materials and services as collected by the contractor, as it relates to Norwich purchasing activity. The City has sole and exclusive right and title to all printed material produced for the City, whether acceptable or unacceptable, and the contractor shall not copyright any printed matter produced under the contract.



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35. The Contractor assigns to the City all rights title and interests in and to all causes of action it may have under Section 4 of the Clayton Act, 15 USC 15, or under Chapter 624 of the general statutes. This assignment occurs when the Contractor is awarded the contract.
35. Contractor agrees that it is in compliance with all applicable federal, state and local laws and regulations, including but not limited to Connecticut General Statutes Sections 4a-60 and 4a-60a, 4a-60g, and 46a-68b through 46a-68f, inclusive, as amended by the June 2015 Special Session Public Act No. 15-5, as well as the provisions of Title VI of the Civil Rights Act of 1964 and all amendments thereto. The Contractor also agrees that it will hold the City harmless and indemnify the City from any action which may arise out of any act by the contractor concerning lack of compliance with these laws and regulations. All purchases will be in compliance with Section 22a-194 to Section 22a-194g of the Connecticut General Statutes related to product packaging.
36. This contract is subject to provisions of Executive Order No. Three of Governor Thomas J. Meskill promulgated June 16, 1971, the provisions of Executive Order No. Seventeen of Governor Thomas J. Meskill promulgated February 15, 1973 and section 16 of Public Act 91-58 nondiscrimination regarding sexual orientation, and the provisions of Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999 regarding Violence in the Workplace Prevention Policy.

TECHNICAL SPECIFICATIONS 15KV AND 38KV CLASS ALL SOLID DIELECTRIC INTERRUPTER (RECLOSER)

SCOPE

This Specification covers the mechanical and electrical requirements for a Solid Dielectric Interrupter (Recloser), both a 15KV Class and a 38 KV Class. The Recloser shall be a NOVA15 for 15KV class or NOVA38 for 38KV class or an approved equal.

CONSTRUCTION

Solid Dielectric Insulation. Cycloaliphatic epoxy shall be utilized as the dielectric insulating medium and be highly resistant to ozone, oxygen, moisture, contamination and ultraviolet light. No coatings or UV protective covers are acceptable. The cycloaliphatic epoxy shall provide complete encapsulation of the internal vacuum interrupter. The encapsulation shall also be completely bonded to the source and load side bushing terminals. The recloser bushings shall be designed utilizing alternating minor and major skirts to increase creepage distance.

Compatibility. The recloser interrupter shall be compatible with a Cooper Form 6 or SEL-651 Recloser Controller.

Animal Guards. Animal Guards should be provided to prevent accidental contact with wild life on the exposed bushings.

Voltage Inputs. The recloser must have source side voltage sensing based on a resistive sensor technology and not a capacitive sensor technology. This should be accurate with +/- 1.5% over the entire voltage range.

Interrupting Capability. The Interrupting Capability shall be a minimum of 12.5KA at both 15KV and 38KV.

Creepage.

Rating	15KV Class	38 KV Class
Creepage Distances	mm (in)	mm (in)
Terminal to Terminal	1052 (41.5)	1052 (41.5)
Lower Terminal to Ground	673 (26.5)	950 (37.5)

Closing Power. The closing power must be low voltage and compatible with the Cooper Form 6 or SEL-651R

Lightning Arresters. Lightning arresters are to be provided on the source side and pre-wired with animal protection. Lighting arrester mounts are to be provided on the load side to be added on later if need be.

Voltage.

Rating	15KV Class	38KV Class
Maximum Design Voltage (kV)	15.5	38.0
Nominal Operating Voltage (kV)	14.4	34.5
Basic Insulation Level (kV)	110/125	170
60 Hertz Withstand Voltage (kV)		
Dry, one minute	50	70
Wet, ten seconds	45	60
Radio Influence Voltage (RIV)		
100 µV Maximum (kV)	9.4	23.0

Mounting. The Recloser shall be pole mountable using standard line construction work practices.

Duty Cycle.

Percent of Maximum Circuit Interrupting Rating	Maximum X/R Ratio	Number of Unit Operations at 12.5 kA
15-20	4	88
45-55	8	112
90-100	15	<u>32</u>
		Total 232

Mechanical Life. The mechanical Life should consist of a Minimum of 10,000 Operations

Sensing CT. The sensing CT shall be 1000:1 ratio and shall be integral to the recloser.

Mechanical Counter. A Mechanical Counter shall be provided to indicate the number of recloser operations.

Lock-Out. A shot gun stickable lock out handle shall be provided so that when manually pulled it will open the recloser and disable any controller driven commands.

Visual Open/Close Indicator. A Visual Open/Close Indicator shall be provided to show the status of the interrupter. This indicator shall be mechanically driven.

Temperature Range. The recloser shall have an operating range of -40 to + 55 Centigrade.

Closing Signal. All Closing actions shall be driven by the controller only.

Close and Trip Capacitors. These Capacitors shall be used to hold the charge necessary for operating the magnetic actuator

Operating from Control Power. When Operating from Control Power the recloser shall be capable of operating for at least one four-shot sequence of operations after loss of primary control voltage for dead line operation. The battery must be in good condition and not off-charge for an extended period of time.

3-Phase Operated. The recloser mechanism shall be 3-phase gang operated.

CT-Clamping Circuit. The recloser shall have a CT-Clamping Circuit to allow the control cable to be disconnected from the controller and not permit high voltages from having an open CT.

Porcelain. Porcelain shall not be used for any part of the recloser.

Recloser Tank. The recloser tank shall be painted Munsell Notation 5BG7.0/0.4, ANSI 70 Gray.

Vacuum Interrupters. The Interrupters shall be Axial-Magnetic interrupters to ensure high fault-interrupting capability, provide fast low energy arc interruption and minimize heat generation. Current interrupting shall occur in vacuum interrupters, providing minimum and even contact wear, long life and maximum reliability and quality.

Operating Power. The Recloser shall have provisions for operating from the following sources. 120V or 240 Vac auxiliary power, 48, 125, 250 Vdc auxiliary power and 48 Vdc control power.

Recloser Tank Coating system. The Coating system shall meet or exceed IEEE Std C57.12.31-2010 standard coating system requirements for pole-mounted equipment.

Certified. Certified test data shall be furnished upon request. This data shall include the Interrupter ratings per IEEE Std C37.60-2003 standard, Load current, line charging and cable charging interruptions per IEEE Std C37.60-2003 standard, Dielectric ratings (BIL, Dry and Wet withstand, and Partial Discharge) Per IEEE Std C37.60-2003 Standard, Continuous current heat run per IEEE Std C37.60-2003 standard and Mechanical Life per IEEE Std C37.60-2003 standard.

Recloser Production Testing. The Recloser shall be subjected to the following production tests Functional test to assure unit is operating, Electrical TCC trip test, High-potential withstand test to determine dielectric strength of the unit, Partial discharge test to verify integrity of the insulation, contact resistance test.

Bushing Terminals. Bushing Terminals Shall be NEMA 4-hole flat pad bushing design.

Service. The manufacturer of the recloser shall have regional service centers located within two hour flight time of Norwich, CT and service personnel shall be factory trained in commissioning and routine service of quoted reclosers. They must also provide a round the clock including all holidays hotline that will be able to assist NPU in any troubleshooting or service related work over the phone. Troubleshooting or Technical Support shall not cost NPU for the life of the unit.

Recloser Controller

SCOPE

This specification covers the mechanical, electrical and SCADA requirements for a Recloser Controller. The Controller shall be SEL-651R (Part number 0651R24BXDAXAE11231402) or approved Equal.

CONSTRUCTION

The microprocessor-based recloser control shall provide a combination of functions including protection, monitoring, control, fault locating, and automation. Recloser control self-checking functions shall be included. Specific operational and functional requirements are as follows:

Remote Mounting Kit. 40' control cables shall be provided so the controller and be mounted at the base of the pole.

Compatibility. The recloser control shall be compatible with Control-Power Kyle® NOVA or G&W Control Power Viper-S.

Cabinet Heater. 100 Watt Cabinet Heater shall be thermostatically controlled.

Voltage Inputs. The recloser control shall have six voltage inputs in order to monitor three-phase voltage on both sides of the recloser. Controller must be compatible with Internal Voltage Sensors or Low Energy Analog voltage inputs.

Autoreclosing. The recloser control shall provide up to four reclosures in an autoreclosing sequence. Autoreclose parameters such as reclose initiation, drive-to-lockout, and reclose supervision shall be settable, for realization of unique auto-reclosing schemes. Sequence coordination shall be provided to keep reclosers in step for fast and delay curve operation, thus avoiding overtripping.

Power Supply. The recloser control shall have a 120 Vac power supply.

Auxiliary Power Supply. A 12 Vdc, 40 W continuous (60 W surge) power supply shall be available to power such auxiliary equipment as a radio.

Coordination With Upstream or Downstream Reclosers. The recloser control shall include 38 standard recloser curves, plus 5 U.S. and 5 IEC time-overcurrent curves.

Phase Fault Overcurrent Protection. The recloser control shall incorporate phase and negative-sequence overcurrent elements for detection of phase faults. Each phase shall have independent phase overcurrent elements available, with separately settable pickup, curve, and time-dial settings. For added security, the recloser control shall provide load encroachment logic, and torque-control capability (internal and external).

Ground Fault Overcurrent Protection. The recloser control shall incorporate residual-ground and neutral overcurrent elements for detection of ground faults. For added security, the recloser control shall include torque-control capability (internal and external).

High-Impedance Fault Detection. The relay shall include the ability to provide for an optional high-impedance fault detection algorithms capable of detecting HIF signatures without being affected by loads and other system operation conditions. The relay shall make high-impedance fault summary and history information available in ASCII format and up to sixty minutes of fault data shall be stored in COMTRADE file format.

Harmonic Blocking. The relay shall provide second harmonic blocking to block various protection elements during transformer inrush.

Directional Elements. The recloser control shall trip securely for forward or reverse faults with phase and ground directional elements applied to the overcurrent protection.

Under- and Overvoltage Elements. The recloser control shall incorporate undervoltage and overvoltage elements for creating protection and control schemes, including but not limited to the following: voltage checks (e.g., hot bus/dead line) for reclosing; blown transformer high-side fuse detection logic; control schemes for capacitor banks.

Sequence Voltage Elements. The recloser control shall incorporate positive-, negative-, and zero-sequence voltage elements that can be logically configured for either under- or overvoltage applications.

Under- and Overfrequency Protection. The recloser control shall incorporate six levels of under- and overfrequency elements for detection of power system frequency disturbances. Each setting level shall use an independently set timer for load shedding or generator tripping schemes.

Rate-of-Change-of-Frequency Protection. The relay shall include four levels of ROCOF elements with each level having independent pickup/dropout timers and increasing/decreasing frequency detection.

Synchronism Check. The recloser control shall include two synchronism check elements with separate maximum angle settings (e.g., one for autoreclosing and one for manual closing). The synchronism check function shall compensate for close time and constant phase angle differences between the two voltage sources used for synchronism check (constant phase angle differences settable in 30-degree increments).

Operator Controls. The recloser control shall include 12 configurable operator controls on the recloser control front panel; these functions shall also be accessible in the recloser control logic. The operator-control pushbuttons shall include LEDs with programmable functions and indications and configurable labels.

Event Reporting and Sequential Events Recorder (SER). The recloser control shall be capable of automatically recording disturbance events of 15, 30, or 60 cycles with settable prefault duration and user-defined triggering. Events shall be stored in nonvolatile memory. The recloser control shall provide all event reports in Compressed ASCII and COMTRADE file formats. The recloser control shall include an SER that stores the latest 1000 entries. The events shall be made available via communications using Fast SER protocol.

Status and Trip Target LEDs. The recloser control shall include 26 status and trip target LEDs, 24 of which are programmable.

Overload and Unbalance Alarms. The recloser control shall include user-settable demand-current thresholds for phase, negative-sequence, neutral, and residual demand measurements.

Recloser Wear Monitor. The recloser control shall include a recloser wear monitor with user-definable wear curves, operation counter, and accumulated interrupted currents by phase.

Battery Monitor. The recloser control shall measure and report the battery voltage, current, and status.

Fault Locator. The recloser control shall include a fault-locating algorithm to provide an accurate estimate of fault location without communications channels, special instrument transformers, or pre-fault information.

Relay-to-Relay Digital Communications. The recloser control shall have eight transmit and eight receive logic elements in each of two communications ports for dedicated recloser control-to-recloser control communications. These elements shall be available for use in control logic.

Automation. The recloser control shall include 16 local control elements, 32 remote control logic points, 32 latching logic points, 16 counters, 32 display messages in conjunction with a local display panel, and 64 timers. The recloser control shall have the ability to display custom messages.

Power Elements. The recloser control shall include four independent directional three-phase power elements that can respond to either real or reactive power.

Voltage Sag/Swell/Interruption Report. The recloser control shall include automatic monitoring of system disturbances, triggered by settable, adaptive voltage thresholds as a percentage of the predisturbance voltage. The report shall be stored in nonvolatile memory.

Recloser Control Logic. The recloser control shall include programmable logic functions for a wide range of user-configurable protection, monitoring, and control schemes (e.g., automatic network reconfiguration).

Time of Year/Week/Day Parameters. The recloser control shall include the means to vary logic according to time of year/week/day. Such logic variations handle seasonal environment or load changes (e.g., fire season, pumping season, peak load time).

Metering. The recloser control shall include metering functions for all connected currents and voltages; power, demand, energy, and symmetrical components calculations on fundamental quantities; average power, rms voltage and current, total harmonic distortion (THD), and harmonics measurement up to the 16th. The THD metering values shall be available for logic functions, such as alarming.

Web Server. The recloser control shall allow inspection of settings, metering reports, self-test reports, and configuration via an integrated web server. The control shall allow firmware upgrade via web server at engineering access level only.

Communication. The recloser control shall include three independent EIA-232 serial ports, two Ethernet ports for external communication, and a USB port.

Distributed Network Protocol (DNP). The recloser control shall incorporate compliant DNP3 Serial and LAN/WAN outstation protocol communications capability for up to six simultaneous sessions.

Modbus TCP or Modbus RTU Protocol. The recloser control shall incorporate Modbus protocol with availability on serial or Ethernet ports for up to three simultaneous sessions.

IEC 61850. The recloser control shall have the capability to offer IEC 61850 MMS and GOOSE, with up to 24 GOOSE subscriptions and seven simultaneous MMS sessions.

File Transfer. File transfer protocol (FTP) is provided for high-speed data collection. The recloser control shall make events (regular and COMTRADE) and reports available via Ymodem, File Transfer Protocol (FTP), and Manufacturing Message Specification (MMS).

IRIG-B. The recloser control shall include an interface port for a demodulated IRIG-B time synchronization input signal.

Simple Network Time Protocol (SNTP). The recloser control shall be capable of synchronizing the internal timekeeping to a network time source.

PC Software. The recloser control shall include compatibility with a PC software program for use in programming control settings and logic functions, and retrieving event data. The PC software shall be provided, but not be required to use the recloser control.

Settings Assistance. The recloser control shall have a method for storing simplified settings templates.

Specification Compliance. The recloser control shall comply to IEEE C37.90 standards including, but not limited to, Electromagnetic Compatibility Immunity, Environmental, and Safety categories of tests. The recloser control shall be tested for compliance with the most recent version of ANSI/IEEE C37.60.

Operating Temperature. The recloser control shall be rated to operate between -40° and $+55^{\circ}\text{C}$, allowing 15°C rise from sunlight without additional coolers or heaters.

Synchrophasors. The recloser control shall include operation as a phasor measurement unit (PMU) compliant with IEEE Standard C37.118.

Digitally-Signed Firmware. Firmware files shall be compressed and contain a digital signature computed using the Secure Hash Algorithm 1 (SHA-1).

Reliability. The vendor shall supply the actual measured Mean-Time Between Failures (MTBF) for the device upon request.

Service. The device shall include no-charge technical support for the life of the product.

Manufacturer. The manufacturer shall design and assemble all components including the printed-circuit boards in a wholly-owned manufacturing facility within the United States.

Warranty Return. The vendor shall support a 72-hour turn-around on all warranty repairs.

Warranty. The device shall include a ten-year, no-questions-asked warranty for all material and workmanship defects. In addition, the warranty shall cover accidental customer-induced damage.

Voltage Regulator

SCOPE

This specification covers the mechanical and electrical requirements for a Voltage Regulator. This will be ordered in the following sizes. 100 amp, 219 amp, 328 amp and 419 amp. The Voltage Regulator in this specification must be compatible with SEL-2431(24310111X1217XXXXXX) Voltage Regulator Controller. The Voltage Regulator Shall be capable of being part of a bank configuration (Delta and Wye) with Eaton Cooper Power System's Quick Drive Regulator System.

CONSTRUCTION

ANSI Standard. The voltage regulator furnished under this specification shall be designed and manufactured in accordance with ANSI standard C57.15, latest revision.

Standard Internal Tap Settings. Voltage Regulators shall be capable of being tapped for use on 7970 V_{L-N} or 4800 V_{L-L} . The standard tap sent from the factory shall be set per NPU's request at time of order.

OIL. The voltage regulator shall be furnished with ANSI Type II mineral oil per ASTM D-3487. The oil shall contain less than 1 part per million PCB's at the time of manufacture and this shall be stated on the voltage regulator nameplate. FR3 oil is also acceptable.

Untanking. The voltage regulators shall be designed such that they can be partially or completely untanked for inspection and maintenance without disconnecting any internal electrical or mechanical connections. After the unit is untanked, it shall be possible to operate the voltage regulator mechanism and test the control panel from an external 120 volt source without any reconnections between the control and the regulator.

Tap Changing Mechanism. The tap changing mechanism shall be of the motor driven, quick break type and shall be completely oil immersed.

Regulator Tank Design. The voltage regulator shall be of sealed-tank design and construction to permit operation at 65°C rise without increasing the oxidation rate of the oil.

Pressure-relief. The voltage regulator shall be supplied with a pressure-relief device, which vents at approximately 4 psig.

Tap changer Motor Capacitors. All voltage regulators shall have the tap changer motor capacitors mounted inside the control enclosure.

External Parts Coating. The external parts of the tank and control enclosure shall be painted ANSI#70 gray. The voltage regulator shall be powder coat painted to comply with ANSI C57.12.31.

External Hardware. The voltage regulators external hardware is to be stainless steel.

Core and coil assembly. The Core and coil assembly to be provided with patterned epoxy-coated insulation paper with a minimum of two sheets of insulation between all series and exciting windings layers.

BIL. The BIL of the bushings shall be compatible with the BIL of the BIL of the voltage regulator and all bushings shall have a minimum creep distance of 17 inches. The bushing designations (S,L, SL) shall be stamped or embossed on the voltage regulator cover adjacent to the bushings. The S, L, and SL bushings must be interchangeable with each other.

Line Terminals. For voltage regulators less than 300A Conductor Size Range must be capable of connecting to #2 to 477 MCM Conductor size and for Regulators between 301A and 668A they must be capable of connecting to #2 to 800 MCM.

MOV. All voltage regulators shall be provided with an external metal oxide varistor (MOV) bypass arrester connected across the series winding.

Oil Sight. An external oil sight gauge shall be provided which indicates oil level at 25°C ambient and oil color.

External Position Indicator. An external position indicator, which is mounted above the oil level of the voltage regulator, shall be included to indicate the tap changer position. The position indicator shall be furnished with reflecting numbers and a plexiglass face plate and shall be slanted at a 45-degree angle for ease of reading when the voltage regulator is pole mounted.

Voltage regulators rated 668 amps and below shall include the VARI-AMP feature which will permit additional current carrying capabilities at reduced voltage regulation as shown in the table below, but not to exceed 668 amps. The VARI-AMP adjustment shall be located inside the position indicator faceplate.

Regulation (percent)	Current (percent of 55 Centigrade Rating)
+/- 10.0	100
+/- 8.75	110
+/- 7.5	120
+/- 6.25	135
+/- 5	160

LA Mounting. Mounting bosses shall be provided for the addition of lightning arresters to the source (S), load (L), and source-load (SL) bushings. Mounting bosses shall be fully welded around their circumference. Spot welding will not be acceptable.

Oil Sampling Valve. All voltage regulators shall be furnished with an oil-sampling valve.

Mounting. Voltage regulators rated 250 KVA and below shall be pole-mounted and provided with welded-on hanger brackets. Voltage regulators rated 167 KVA and above shall be provided with a base

suitable for securing them to a pad or elevating structure. All voltage regulators must be capable of being secured to an elevating structure.

Nameplates. Every voltage regulator shall be provided with two laser-etched nameplates. One nameplate will be mounted on the control enclosure and the other mounted on the voltage regulator tank.

Voltage Regulator Controller

SCOPE

This specification covers the mechanical and electrical requirements for a Voltage Regulator Controller. The Voltage Regulator Controller shall be SEL-2431(Part Number 24310111X1217) or approved equal.

CONSTRUCTION

Remote Mounting Kit. 40' control cables shall be provided so the controller and be mounted at the base of the pole.

Cabinet. The cabinet shall have a minimum rating of a NEMA 3R enclosure and shall be pole mountable.

Load Profile Recorder. The regulator control shall store load profile data with 16 selectable analog quantities and a configurable recording rate.

USB Flash Drive Interface. The regulator control shall be capable of settings uploads, settings downloads, and firmware upgrades from a USB flash drive.

USB Expanded Memory. The regulator control shall have a Type A USB port that allows a USB flash drive to stay connected during normal operation. The regulator control shall write event records, load profile data, and tap-change records to the USB flash drive.

Front-Panel Visualization. The regulator control shall be capable of displaying measured values, calculated values, I/O statuses, device status, and configuration parameters on a front-panel LCD display. The display shall have a rotating capability to display custom messages and data. Thirty-two display messages shall be provided. The front panel shall also have a minimum of seven user-programmable LEDs and seven user-programmable pushbutton controls.

SELogic Programming Language. The regulator control shall be capable of implementing a wide variety of logic and control functions using the tools available in the SELogic programming language.

Automation. The regulator control shall include 8 local control logic points, 16 remote control logic points, 8 latching logic points, 8 counters, 8 logic variables, and 8 timers.

Convenient Form Factor. The regulator control shall have a die-cast aluminum case with quick-disconnect connectors for all connections.

Additional I/O. The regulator control shall be configurable with four additional inputs and three additional outputs.

Selectable Reset Characteristics for First-Tap Definite-Time Delay. The regulator control shall have a selectable reset characteristic for the first-tap definite-time delay. The reset characteristic selections shall be fast (traditional), induction-disc, delay, and delay-freeze.

Sequential Events Recorder. A chronological report shall be provided by the regulator control to help determine the order and cause of events and assist in troubleshooting. The last 1000 input, output, and element events shall be recorded with 1 ms resolution. The report shall be optionally written to a connected USB flash drive to record more than 1000 events.

Event Record. The regulator control shall store as many as 30 cycles of data per event record with 4-sample/cycle resolution. As many as 32 most recent event records shall be time-stamped and stored in nonvolatile memory. A connected USB drive shall be used to store more than 32 events.

Tap-Change Record. The regulator control shall store tap counts for each individual tap position. The regulator control shall record as many as 32,767 counts per tap position.

Voltage Inputs. The regulator control shall provide one voltage input as standard with a second voltage input being optional.

Current Input. The regulator control shall provide one current input.

DNP3. The regulator control shall be capable of operating as a DNP3 Slave Level 2 serial or LAN/WAN. The device shall allow configuration of any incoming data or data calculated within the device to be available through a customizable DNP data map. All control points within the regulator control shall be available as DNP3 control points using latch on/latch off, pulse on/pulse off, or trip/close control functions. The control shall support a DNP fiber ring configuration.

Synchrophasors. The regulator control shall include operation as a phasor measurement unit (PMU) compliant with IEEE C37.118-2005.

PC Software. The regulator control shall include compatibility with a PC software program for use in programming control settings and logic functions and retrieving event data. The PC software shall be included, but not required, to use the regulator control.

Operating Temperature. The regulator control shall have an operating temperature range of -40° to $+85^{\circ}\text{C}$ (-40° to $+185^{\circ}\text{F}$) and a power supply input operating voltage range of 80–145 Vac.

Reliability. The vendor shall supply the actual measured mean time between failures (MTBF) for the device upon request.

Service. The device shall include no-charge technical support for the life of the product.

Manufacturer. The manufacturer shall design and assemble all components including the printed circuit boards in a wholly owned manufacturing facility within the United States.

Conformal Coating. The device shall have optional conformal coating to protect the circuit boards from harsh environments.

Warranty Return. The vendor shall support a 72-hour turn-around on all warranty repairs.

Warranty. The device shall include a ten-year, no-questions-asked warranty for all material and workmanship defects. In addition, the warranty shall cover accidental customer-induced damage.



Please quote Norwich Public Utilities your prices for the commodities or services listed below.

All prices must be FOB Destination. You must show Unit Price and Total Price or your bid may be rejected.

Website:
<http://www.norwichpublicutilities.com>

Norwich Public Utilities is exempt from the payment of Federal Excise taxes and the State of Connecticut Sales tax.

Norwich Public Utilities reserves the right to reject in whole or in part any or all submitted bids.

Vendor Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

THIS IS NOT A PURCHASE ORDER. Fill in and return to the address below.

Page 1 of 1

ISSUED BY: City of Norwich, Connecticut	(RETURN BID TO THE ATTENTION OF) William R. Hathaway	BID NUMBER 7637
ADDRESS 100 Broadway, Room 105 Norwich, CT06360-4431		DATE ISSUED October 1, 2019
		DATE AND TIME BID REQUIRED October 25, 2019 at 2:00 P.M.
DELIVERY ADDRESS As requested by Norwich Public Utilities	TELEPHONE NUMBER (860)823-3706	

VOLTAGE REGULATORS AND RECLOSERS

ITEM NO.	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL PRICE
1.	15KV class all solid dielectric interrupter (recloser)	2		
2.	38KV class all solid dielectric interrupter (recloser)	2		
3.	Recloser Controller	2		
4.	100 amp. Voltage Regulator	4		
5.	219 amp. Voltage Regulator	4		
6.	328 amp. Voltage Regulator	4		
7.	419 amp. Voltage Regulator	4		
8.	Voltage Regulator Controller	4		
			Grand Total	

NAME (SIGNED)	TITLE	TELEPHONE NO. & EXTENSION
NAME (PRINTED)	FEIN/SSN	DISCOUNT PAYMENT TERMS ____%, _____ days, Net 30
EMAIL ADDRESS	FAX NO.	

NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

State of _____)
) ss.
County of _____)

_____, being first duly sworn, deposes and says that:

- (1) He is (owner, partner, officer, representative or agent) of _____, the Bidder that has submitted the attached bid;
- (2) He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;
- (3) Such Bid is genuine and is not a collusive or sham Bid;
- (4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from Bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price or the Bid price of any other Bidder or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Owner or any person interested in the proposed Contract; and
- (5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) _____

(Title)

Subscribed and sworn to before me
this _____ day of _____ 20_____
_____.

(Title)
My Commission expires _____, 20____.