April 15, 2019

FORMAL BID REQUEST

Department: Electric Department

Material: Substation Regulators

Location: Town of Waynesville – Calhoun Substation

The following documents are attached and are to be utilized for this bid request:

- Regulator Bid Sheet
- Voltage Regulator Specifications

Bid proposals will be opened publically and are due back within two weeks on Monday April 29th by 2:00 PM. Should you have any questions regarding this request, please contact Purchasing Supervisor Garry Fox or Town Engineer Preston Gregg at (828) 456-3706.

Thank You,

Preston Gregg

Preston Gregg, PE
Town Engineer

Ec: David Foster, Public Services Director
Lisa Burnett, Purchasing Manager
Garry Fox, Purchasing Supervisor
Willie Smith, Electric Superintendent

Project:	Town of Waynesville - Calhoun Substation 7.62 kV Single-Phase Voltage Regulators
Specification Number:	181103-01
Bidder:	0

Proposal for ten (10) 7.62 kV Single-Phase Voltage Regulators for the Calhoun Substation.
The undersigned bidder, having read and examined the attached specifications and specification data for the designed equipment, does hereby propose to furnish the equipment and provide the services set forth in UTEC Specification 181103-01.
The undersigned hereby declares that the following list states any and all variations from and exceptions to the requirements of the attached specifications and specification data and that, otherwise, it is the intent of this Proposal that the above designated equipment will be furnished in strict accordance with these documents. (Insert additional rows if necessary.)

The undersigned hereby declares that the following list states the conditions and terms of the Contractor's warranty for the 7.62 kV Single-Phase Voltage Regulator.

Lump Sum Prices

Calhoun Substation

The undersigned bidder hereby proposes to provide ten (10) 7.62 kV Single-Phase Voltage Regulators for Calhoun Substation f.o.b. job site, Waynesville, North Carolina, in accordance with the attached specifications and specification data for the firm lump sum price of: $ -

Delivery Schedule

The undersigned bidder hereby proposes to provide the specified equipment to the job site on or before the date shown below:

Project:	Town of Waynesville - Calhoun Substation 7.62 kV Single-Phase Voltage Regulators
Specification Number:	181103-01
Bidder:	0

Bidder Information

The undersigned hereby declares that only the persons or firms interested in the proposal as principal or principals are named herein, and that no other persons or firms than herein mentioned have any interest in this Proposal or in the contract to be entered into; that this Proposal is made without connection with any other person, company, or parties likewise submitting a bid or proposal; and that it is in all respects for and in good faith, without collusion or fraud.

Name of Bidder:	
Signature:	
Company:	
Title:	
Business Address:	
Phone Number:	
State of Incorporation:	
Address of	
Principal Office:	
Federal ID#:	

Town of Waynesville
Waynesville, North Carolina

Bid Issue

CALHOUN SUBSTATION
7.62 KV SINGLE-PHASE
VOLTAGE REGULATORS

SPECIFICATIONS

181103-01

prepared by

UTILITY TECHNOLOGY
ENGINEERS-CONSULTANTS

ASHEBORO, NORTH CAROLINA
SPARTANBURG, SOUTH CAROLINA

April 2019

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1. GENERAL REQUIREMENTS

1.1 General

These specifications are for furnishing F.O.B. job site, Waynesville, North Carolina, ten (10) 7.62 kV Single-Phase Voltage Regulators, SEL-2431 voltage regulator controls, and substation stands, for use in the existing Calhoun Substation.

The equipment shall be furnished complete and ready for installation, connection, and immediate service.

1.2 Codes and Standards

Except where specifically stated otherwise, all equipment furnished under these specifications shall conform to the latest applicable standards of ASTM, NEMA, NESC, ANSI, IEEE, NEC, and EEI and shall be in accordance with the applicable requirements of the Federal "Occupational Safety and Health Standards.

The requirements of the drawings and the written text of these specifications shall govern in case of conflict between them and any of the referenced codes and standards except the mandatory standards which shall govern in all cases. Any conflict between standards shall be referred to the Engineer who will determine which standard shall govern.

1.3 Schedule

Time is a basic consideration in this proposal. The Contractor shall schedule submittal of drawings and engineering data as outlined in Section 2 of these specifications. Equipment delivery shall on or before June 1, 2019. Please notify Waynesville if delivery date is expected to be past June 1, 2019.

1.4 Delivery

The equipment shall be delivered F.O.B. job site, Waynesville, North Carolina, by truck shipment and unloaded by others. Exact delivery locations will be provided to the successful bidder after award of the contract. The Owner shall receive a shipping notice for the equipment at least 48 hours before delivery is made.

The Contractor shall submit to the Owner duplicate copies of shipping notices describing each shipment of material or equipment. All equipment should be delivered at one time. Partial shipments are not to be made.

In addition, the Contractor shall telephone the City designated representative at least 72 hours prior to arrival of the equipment at the delivery sites, to notify the Owner of the method of shipment and date of arrival. This telephone notification shall be made only between 8:30 a.m. and 5:00 p.m., Monday through Friday.

The Contractor shall pay all demurrage costs resulting from delays in unloading, if those delays are caused by failure of the Contractor to notify the Owner of shipment or to schedule as specified above.

1.5 Shipping Requirements

All materials shall be suitably protected to prevent damage and loss during shipment. Special care shall be exercised in loading the equipment for shipment to assure that the equipment will not be damaged and that wearing of the surfaces will not occur during shipment.

The control cabinet for the voltage regulator shall be shipped assembled.

Each bidder shall furnish with his proposals, under the proposal data tab of the bid sheet, a list of the items that will require field assembly. All small items shall be bagged, identified and shipped in boxes or crates. The contents of all boxes and crates shall be identified with a packing slip.

1.6 Identification

All correspondence, shipping notices, shop drawings, specifications, engineering data, and other documents pertaining to the equipment and materials furnished under these specifications shall be identified by the Owner's name, the UTEC specification number 181103-01, and the name of the item of equipment or material.

1.7 Correction Of Manufacturing Errors

Equipment and materials shall be complete in all respects within the limits herein outlined. All manufacturing errors or omissions required to be corrected in the field shall be done by the manufacturer or his duly authorized representative and at the Supplier's expense.

1.8 Service Conditions

Equipment furnished under this specification shall be suitable for operation outdoors in direct sunlight under the following conditions:

- Minimum temperature: -22º F
- Maximum temperature: 103º F
- Average Relative Humidity 88% at 7am
- Altitude 2,752 feet

2. ENGINEERING DATA

2.1 General

This section covers the requirements for manufacturer's drawings, instruction manuals, and other engineering data, which the Contractor shall submit to the Engineer for design information and review.

2.2 Correspondence

Correspondence forwarding drawings, instruction manuals, and other engineering data shall be addressed as follows:

Engineer:

Utility Technology Engineers-Consultants
775 Spartan Blvd
Suite 207
Spartanburg, SC 29301
Mrs. Heather M. Sudduth
hsudduth@utilitytec.com

Owner:

Town of Waynesville
P.O. Box 100
Waynesville, NC 28786
Mr. Preston Gregg, PE
Pgregg@waynesvillenc.gov

All correspondence shall be identified with the Specification number and manufacturer's order number.

2.3 Drawings

Shop drawings covering all fabricated materials furnished under this Specification shall be submitted to the Engineer for information within 60 days after award of contract. Drawings shall be a maximum of 22 by 34 inches.

Drawings and necessary data which show the kind, size, arrangement, weights of each component, and operation of component materials and devices; the external connections, anchorage, and supports required; and the dimensions needed for installation and correlation with other materials and equipment shall be submitted to the Engineer for review.

If submitting drawings and data through the mail, three copies of each drawing and data shall be submitted to the Engineer. One copy of each drawing and data, preliminary or certified, shall be submitted to the Owner. When catalog pages are submitted, the applicable items shall be indicated.

All drawings and data shall become a part of the contract documents and the work shown or described thereby shall be performed in conformity therewith unless otherwise required by the Owner or the Engineer.

Submittals shall also be required on a timely basis for the following:

- Outline and Assembly Drawings showing size and location of major components and all principal dimensions.
- Bill of Material.
- Details of bushing and bushing terminal connectors.
- Certified test reports.
- Control Schematic Diagram.
- Control Wiring Diagram.

2.4 Instruction Manuals

The Contractor shall furnish three (3) sets of Operation and Maintenance manuals when the equipment is shipped containing a complete set of the drawings listed above plus the following.

- Installation instructions.
- Maintenance instructions.
- Renewal parts catalog.
- Certified test reports.
- Drawings.
- Component instruction books, including relays and controls.

The Operation and Maintenance manuals shall be shipped as follows:

- One set with the equipment
- One set to the Engineer:
- Three sets to the Owner:

Manuals shall be assembled and bound in binders, which are suitable for rough usage.

Wiring diagrams shall show each device and terminal block with approximate physical detail of terminals. Each wire destination and designation for each terminal shall be shown.

Each external interconnection terminal shall be noted on schematic diagrams with a terminal block number and a descriptive designation.

3. CONSTRUCTION DETAILS

3.1 General

Outdoor voltage regulators shall be suitable for outdoor operation and shall be single-phase, oil immersed, 55/65°C temperature rise by resistance, step-type voltage regulators designed and constructed for operation on a 3 phase, 60 Hz system. The voltage regulators must provide +/- 10% voltage regulation in thirty-two (32) steps of 5/8% each.

The regulators must be completely self-contained and designed and manufactured in accordance with IEEE standard C57.15, latest revision. Unless stated otherwise the voltage regulator units will be set on the below underline factory default taps. Taps of operation are as indicated in Table 3-1.

Table 3-1, Regulator Voltage Ratings

Voltage Rating (60 Hz)	Standard Internal Tap Settings							
2,500 V	2,500	2,400						
7,620 V	8,000	7,970	7,620	7,200	6,930	4,800	4,160	2,400
13,800 V	13,800	13,200	12,470	12,000	7,970	7,620	7,200	6,930
14,400 V	14,400	13,800	13,200	12,000	7,970	7,620	7,200	6,930
19,920 V	19,920	17,200	16,000	15,242	14,400	7,970	7,620	7,200
34,500 V	34,500	19,920						

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

Each single-phase voltage regulator shall include an outdoor galvanized steel elevating structure suitable for substation installation. The elevating structures shall raise the voltage regulator to provide a minimum of 9'-0" clearance from ground to the lowest live part.

3.2 Ratings

Regulators shall be rated as indicated in Table 3-2. The voltage regulators shall meet all ratings as defined in IEEE C57.15, current edition.

Table 3-2, Voltage Regulator Ratings

Nominal voltage class	7,620 / 13,200Y Volts
Basic impulse insulation level, BIL	95 kV
Rated kVA	333 kVA
Cooling Class	ONAN
Rated line amperes	438 A @ 7,620 V

3.3 Construction Design

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.

The tap changing mechanism shall be of the motor driven, quick break type and shall be completely oil immersed. 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. The voltage regulator shall be supplied with a pressure-relief device.

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 IEEE C57.12.31.

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 winding layers.

3.4 External Accessories

The terminal block shall not be under oil inside the tank. The terminal block shall be externally located with a removable gasketed cover for easy accessibility.

A single polarized jack plug should be provided. The plug shall automatically short the current transformer when disconnecting the supply.

The BIL (basic impulse level) of the bushings shall be compatible with 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.

The voltage regulators shall be equipped with line terminals per the criteria in Table 3-3.

Table 3-3, Line Terminals

Nameplate Line Current Rating	Conductor Size Range or Threaded Size Range
50A to 300A	#2 to 477 MCM
301A to 668A	#2 to 800 MCM
669A to 1200A	1.125-12 UNF-2A
1201A to 2000A	1.500-12 UNF-2A

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

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

An external position indicator, which is mounted above the oil level of the voltage regulator, shall be included to indicate the tap changer position.

Voltage regulators rated 668 amps and below shall permit additional current carrying capabilities at reduced voltage regulation as shown in Table 3-4, but not to exceed 668 amps. The adjustment shall be located inside the position indicator faceplate.

Table 3-4, Regulation

Regulation (%)	Current (% of 55°C rating)
+/- 10.0	100
+/- 8.75	110
+/- 7.50	120
+/- 6.25	135
+/- 5.00	160

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

Voltage regulators 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.

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

3.5 Voltage Regulator Control

The voltage regulator control shall be an SEL-2431 manufactured by Schweitzer Engineering Laboratories, Inc. The control shall include the following:

- Type A USB Flash Drive Interface
- Toggle Switch Raise/Lower Operators

3.6 Control Enclosure

A weatherproof, dust resistant enclosure shall be furnished for the SEL-2431 voltage regulator control and associated interface equipment. The enclosure door shall be completely weatherproof and shall have a handle with a double latching mechanism. Handle/latch mechanism shall be furnished with padlocking provisions. Bolted door covers will not be acceptable. Doors shall have provisions for blocking in the opened position.

If practicable, access to terminal blocks for external wiring and to the back of the control panel shall be provided by a removable cover or door. If such access is not practicable, the control panel shall be hinged to provide access to the back of the panel and terminal blocks.

The enclosure must be of sufficient size to accommodate customer SCADA wiring.

4. FACTORY TESTS

All voltage regulators shall be tested in accordance with the latest IEEE C57.15 standards.