SA&I 1-4040 (2000)

Canadian County, Oklahoma
COUNTY PURCHASING OFFICE
Canadian County Court House
El Reno, Oklahoma
Phone: (405) 295-6125

INVITATION TO BID

DATE ISSUED
August 17, 2020

PLEASE REVIEW TERMS AND CONDITIONS ON REVERSE SIDE RELATING TO SUBMISSION OF THIS BID.
Notarized Affidavit completions and signature required on reverse side.

BID NUMBER	BID CLOSING DATE AND HOUR	REQUIRED DELIVERY DATE
#2021-#03 Generator / County Commissioners	09/04/2020 @ 4:00pm	SEE SPECIFICATIONS ____ Days after award of Purchase Order

TERMS	DATE OF DELIVERY
Net, FOB this bid will open 09-07-2020 during Commissioner's Meeting that begins at 9:00am	SEE SPECIFICATIONS

ITEM	QUANTITY	UNIT OF ISSUE	DESCRIPTION	UNIT PRICE	TOTAL
	1 or more		Canadian County Commissioner's office is seeking bids for a generator to provide emergency power. See Specifications attached. The Board of Canadian County Commissioners reserves the right to reject any and all bids or to award all or any portion of the items bid. All data will be considered in the awarding of the bid including the delivery time. *The terms & conditions of this document must be completed and returned or the bid will be rejected.* Contact person: Chris Jackson, Maintenance 201 N Choctaw El Reno, OK 73036 (405) 295-6146		$ _____ Total

APPROVED
Date: 8/12/2020

Officer or Department Head

STATE OF OKLAHOMA
CANADIAN COUNTY
FILED OR RECORDED

AUG 17 2020

SHERRY MURRAY
COUNTY CLERK
200533

TERMS AND CONDITIONS

1. Sealed bids will be opened in the Commissioner's Conference Room, Canadian County Courthouse, 201 N. Choctaw Avenue, El Reno, Oklahoma, at the time and date shown on the invitation to bid form.

2. Late bids will not be considered. Bids must be received in sealed envelopes (one to an envelope) with bid number and closing date written on the outside of the envelope.

3. Unit prices will be guaranteed correct by the bidder.

4. Firm prices will be F.O.B. destination.

5. Purchases by Canadian County, Oklahoma, are not subject to state or federal taxes.

6. This bid is submitted as a legal offer and any bid when accepted by the County constitutes a firm contract.

7. Oklahoma laws require each bidder submitting a bid to a county for goods or services to furnish a notarized sworn statement of non-collusion. A form is supplied below.

8. Bids will be firm until 10/04/2020 (DATE)

AFFIDAVIT: I, the undersigned, of lawful age, being first duly sworn on oath say that he (she) is the agent authorized by the bidder to submit the above bid. Affiant further states that the bidder has not been a party to any collusion among bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding; or with any state official or employee as to quantity; quality or price in the prospective contract or any other terms of said prospective contract; or in any discussions between bidders and any state official concerning exchange of money or other thing of value for special consideration in the letting of a contract; that the bidder/contractor has not paid, given or donated or agreed to pay, give or donate to any officer or employee of the State of Oklahoma (or other entity) any money or other thing of value, either directly or indirectly in the procuring of the award of a contract pursuant to this bid.

Subscribed and sworn before this _____ day

of _____, 20____

(SEAL)

Firm: _____

My commission expires _____

Signed by: _____ Title: _____
(Manual Signature of Undersigned)

_____
NOTARY PUBLIC (CLERK OR JUDGE)

Address: _____ Phone: _____

City: _____ State: _____

Zip: _____

Please mail sealed bids to:
Canadian County Clerk's Office
Attn: Purchasing
PO Box 458
El Reno, OK 73036

Street Address:
201 N Choctaw Avenue
El Reno, OK 73036

NOTE: Other terms and conditions can be added at the discretion of the county officers.

Canadian County
Purchasing

Bid Specifications

Date Issued: August 17, 2020
Bid Number: **2021-#03**
Closing Date: September 4, 2020 at 4:00pm
PO Box 458, 201 N. Choctaw Ave., El Reno, OK 73036
Opening Date: September 7, 2020 during the Commissioner's Meeting that begins at 9:00am
Commissioner's Meeting Room, 201 N. Choctaw Ave., El Reno, OK 73036

~ SPECIFICATIONS~

Generator / County Commissioners

Canadian County Commissioner's office is seeking bids for (1) or more generators to provide emergency power.

Specifications:

See attached Specifications.

For Information Contact:
Contact: Chris Jackson, Maintenance
Phone: (405) 295-6146
Hours: Monday – Friday 8:00am to 4:30pm
Address: 201 N. Choctaw Ave, El Reno, OK 73036

If you have any questions or need additional information, please contact:
Krissi Jensen, Purchasing Agent, 405.295.6125
kjensen@okcana.cogov.net

SECTION 263213.13 - DIESEL EMERGENCY ENGINE GENERATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes packaged diesel engine generators for emergency use with the following features:

1. Diesel engine.
2. Alternator.
3. Unit-mounted radiator.
4. Diesel fuel-oil system.
5. Control and monitoring.
6. Generator overcurrent and fault protection.
7. Generator, exciter, and voltage regulator.
8. Load banks.
9. Outdoor engine generator enclosure.
10. Remote radiator.
11. Vibration isolation devices.
12. Finishes.

B. Related Requirements:
1. Section 263600 "Transfer Switches" for transfer switches, including sensors and relays to initiate automatic-starting and -stopping signals for engine generators.

1.3 DEFINITIONS

A. AREP: Auxiliary winding regulation excitation principle. Voltage support for the AVR comes from independent auxiliary windings located in the main stator.

B. AVR: Automatic voltage regulator.

C. EPS: Emergency power supply.

D. EPSS: Emergency power supply system.

E. Operational Bandwidth: The total variation, from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

F. PMG: Permanent magnet generator. Voltage support for the AVR comes from an independent auxiliary permanent magnet generator which is mounted on the shaft extension of the alternator.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
2. Include thermal damage curve for generator.
3. Include time-current characteristic curves for generator protective device.
4. Include fuel consumption in gallons per hour at 0.8 power factor at 50%, 75%, and 100% generator capacity.
5. Include airflow requirements for cooling and combustion air in cubic feet per minute at 0.8 power factor, and reference air-supply temperature. Provide Drawings indicating requirements and limitations for location of air intake and exhausts.
6. Include generator characteristics, including, but not limited to, kilowatt rating, efficiency, reactances, and short-circuit current capability.

B. Shop Drawings:

1. Include plans and elevations for engine generator and other components specified. Indicate access requirements affected by height of subbase fuel tank.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Identify fluid drain ports and clearance requirements for proper fluid drain.
4. Design calculations for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
5. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and supported equipment. Include base weights.
6. Include diagrams for power, signal, and control wiring. Complete schematic, wiring, and interconnection diagrams showing terminal markings for EPS equipment and functional relationship between all electrical components.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For **[Installer]** and **[manufacturer]**.
1. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

B. Source Quality-Control Reports: Including, but not limited to, the following:

1. Certified summary of prototype-unit test report.
2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
3. Certified Summary of Performance Tests: Certify compliance with specified requirement to meet performance criteria for sensitive loads.

4. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
5. Report of sound generation at octave bands in accordance with ISO 8528-10.
6. Report of exhaust emissions showing compliance with applicable regulations.
7. Certified Torsional Vibration Compatibility: Comply with NFPA 110.

C. Field quality-control reports.

D. Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For engine generators to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
b. Operating instructions mounted adjacent to generator location.
c. Training plan.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.
2. Testing Agency's Field Supervisor: Approved by authority having jurisdiction to supervise on-site testing.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: **2 Years or 3000 Hours** from date of Substantial Completion – whichever comes first.

2. Warranty Type: Full Comprehensive – Parts, Labor, and Travel included

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide MTU Onsite Energy Corporation; or a comparable/equal product by one of the following:

1. MTU Onsite Energy / United Engines
2. Caterpillar.

Any alternate shall be submitted to the consulting engineer in writing at least 10 days prior to bid. Each alternate bid must list any deviations from this specification.

B. Source Limitations:

1. Obtain packaged engine generators and auxiliary components from a single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. NFPA Compliance:

1. Comply with NFPA 37.
2. Comply with NFPA 70.
3. Comply with NFPA 99.
4. Comply with NFPA 110 requirements for Level [1] EPSS.

B. UL Compliance: Comply with UL 2200.

C. Retaining Tier 2 or 3 in "Engine Exhaust Emissions" Paragraph below is dependent on the size of the engine and generator use. Emergency diesel engine generators are exempt from Tier 4 requirements unless used to support load while normal power is available. See discussion in the Evaluations and refer to EPA and manufacturer's documentation. Stationary emergency generators (40 CFR Part 60) typically follow the requirement applications for NFPA 110, NFPA 70-700, -701, -702, and -708 below:

D. Engine Exhaust Emissions: Comply with EPA Tier [2] requirements and applicable state and local government requirements.

E. Noise Emission: Comply with **[applicable state and local government requirements]** for maximum noise level due to sound emitted by engine generator, including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation. Comply with ISO 8528-10 for sound measurements at 23.0 feet.

F. Environmental Conditions: Engine generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

1. Ambient Temperature: **Minus 20 to plus 50 deg C.**
2. Relative Humidity: Zero to 100 percent.
3. Altitude: Sea level to [1000 feet]. Site location Oklahoma

2.3 ENGINE GENERATOR ASSEMBLY DESCRIPTION

A. Factory-assembled and -tested, water-cooled engine, with brushless generator and accessories.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. EPSS Class: Engine generator shall be classified as a [**Class 24**] according to NFPA 110.

D. Service Load: 100kW, 125 kVA.

E. Power Factor: [**0.8**].

F. Frequency: 60 Hz

G. Voltage: [**208**]-V ac.

H. Phase: [**Three-phase,**] [**twelve**]-wire [**wye**].

I. Induction Method: [**Turbocharged**].

J. Governor: Adjustable isochronous, with speed sensing.

K. Mounting Frame: Structural steel framework to maintain alignment of mounted components without depending on concrete foundation. Provide lifting attachments sized and spaced to prevent deflection of base during lifting and moving.

1. Rigging Diagram: Inscribed on metal plate permanently attached to mounting frame to indicate location and lifting capacity of each lifting attachment and engine generator center of gravity.

L. Capacities and Characteristics:

1. Power Output Ratings: Nominal ratings as indicated at 0.8 power factor excluding power required for the continued and repeated operation of the unit and auxiliaries[, **with capacity as required to operate as a unit as evidenced by records of prototype testing**].
2. Nameplates: For each major system component to identify manufacturer's name, model, and serial number, of component.

M. Engine Generator Performance:

1. Steady-State Voltage Operational Bandwidth: 0.25 percent of rated output voltage, from no load to full load, and one-percent for non-PMG alternators.
2. Load Factor: **85-percent load factor according to ISO 8528-1.**

    a. **If below, supplier shall provide updated documents for performance modified to 85% load factor in regards to time before overhaul (TBO) and the respective maintenance schedule.**
3. Transient Voltage Performance: Not more than [20] percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within 3.5-seconds.
4. Steady-State Frequency Operational Bandwidth: 0.25 percent of rated frequency, from no load to full load, and 0.5 percent for mechanical governed engines 20-60 kW.
5. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
6. Transient Frequency Performance: Less than 5 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.
7. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
8. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
9. Start Time: Comply with NFPA 110, **[Type 10]**, system requirements.

2.4 DIESEL ENGINE

A. Fuel: ASTM D 975 diesel fuel oil, Grade 2-D S15.

1. Biodiesel content less than or equal to 7 percent.

B. Rated Engine Speed: 1800 rpm.

C. Lubrication System: Engine or skid mounted.

1. Filter and Strainer: Select according to engine manufacturer's requirements for particle removal.
2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

D. Jacket Coolant Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity and with UL 499.

E. Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine generator mounting frame and integral engine-driven coolant pump.

1. Coolant: Glycol-based antifreeze and water mixture for freeze protection to [0 deg F], with anticorrosion additives as recommended by engine manufacturer.
2. Size of Radiator: Adequate to contain expansion of total system coolant, from cold start to 100 percent load condition.
3. Expansion Tank: Rated to withstand maximum closed-loop coolant-system pressure for engine used. Equip with gage glass and petcock. Replace gage glass with a pressure sensor when gage glass is located more than 8 feet from the floor.
4. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
5. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, UV-, and abrasion-resistant fabric.

    a. Rating: 50-psig maximum working pressure with coolant at 180 deg F (82 deg C), and noncollapsible under vacuum.
    b. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

F. Muffler/Silencer: Critical grade (or better), sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

1. Minimum sound attenuation of 25 dB.
2. Sound level measured at a distance of 23 feet (7 m) from exhaust discharge after installation is complete shall be **80.2**dBA or less.

G. Air-Intake Filter: Engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

H. Starting System: [**12**] V electric, with negative ground.

1. Components: Sized so they are not damaged during a full engine-cranking cycle, with ambient temperature at maximum specified in "Performance Requirements" Article.
2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
3. Cranking Cycle: [**As required by NFPA 110 for system level specified**] [**60 seconds**].
4. Battery: [**Lead acid**] [**Nickel cadmium**], with capacity within ambient temperature range specified in "Performance Requirements" Article to provide NFPA 110 specified cranking cycle without recharging.
5. Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
6. Battery Compartment: Factory fabricated of metal with acid-resistant finish and thermal insulation. Include accessories required to support and fasten batteries in place.
    a. Compartment Ventilation: Provide ventilation to exhaust battery gases.
7. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and [**35-A**] minimum continuous rating.

8. Battery Charger: Current-limiting, automatic-equalizing, and float-charging type designed for **[lead-acid] [nickel-cadmium]** batteries. Unit shall comply with UL 1236 and include the following features:

   a. Operation: Equalizing-charging rate of 6 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
   b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg F (minus 40 deg C) to 140 deg F (plus 60 deg C) to prevent overcharging at high temperatures and undercharging at low temperatures.

   c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
   d. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
   e. Enclosure and Mounting: NEMA 250, Type 1 wall-mounted cabinet.

2.5 DIESEL FUEL-OIL SYSTEM

A. Comply with NFPA 30.

B. Piping: Fuel-oil piping shall be Schedule 40 black steel, complying with requirements in Section 231113 "Facility Fuel-Oil Piping." Cast iron, aluminum, copper, and galvanized steel shall not be used in the fuel-oil system.

C. Main Fuel Pump: Mounted on engine to provide primary fuel flow under starting and load conditions.

D. Fuel Filtering: Remove water and contaminants larger than 5 microns, or as recommended by the engine manufacturer.

E. Relief-Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.

F. Subbase-Mounted, Double-Wall, Fuel-Oil Tank: Factory installed and piped, complying with UL 142 fuel-oil tank. Features include the following:

   1. Tank level indicator.
   2. Fuel-Tank Capacity: Fuel for 24 hours continuous operation at 100 percent rated power output
   3. Leak detection in interstitial space.
   4. Vandal-resistant fill cap.
   5. Containment Provisions: Comply with requirements of authorities having jurisdiction.
   6. Applicable Codes and Regulations

2.6 CONTROL AND MONITORING

A. Automatic-Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of engine generator. When mode-selector switch is switched to the on position, engine generator starts. The off position of same switch initiates engine generator shutdown. When engine generator is running, specified system or equipment failures or derangements automatically shut down engine generator and initiate alarms.

B. Manual-Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts engine generator. The off position of same switch initiates engine generator shutdown. When engine generator is running, specified system or equipment failures or derangements automatically shut down engine generator and initiate alarms.

C. Provide minimum run time control set for **[30]** minutes, with override only by operation of a remote emergency-stop switch.

D. Comply with UL 2200 for stationary engine generator assemblies and UL 508A for ancillary controls, such as Master Control Panel mounted off the generator set.

E. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the engine generator. Mounting method shall isolate the control panel from engine generator vibration. Panel shall be powered from the engine generator battery.

F. Control and Monitoring Panel:

1. Digital controller with integrated LCD display, controls, and microprocessor, capable of local and remote control, monitoring, and programming, with battery backup.

    a. PLC logic incorporating drag and drop ladder logic available for the owner/user. Logic shall be designed such that all parameters within the generator set controller can be used in addition to additional inputs and outputs.

2. Analog control panel with dedicated gages and indicator lights for the instruments and alarms indicated below.
3. Instruments: Located on the control and monitoring panel and viewable during operation.

    a. Engine lubricating-oil pressure gage.
    b. Engine-coolant temperature gage.
    c. DC voltmeter (alternator battery charging).
    d. Running-time meter.
    e. AC voltmeter, **[for each phase] [connected to a phase selector switch]**.
    f. AC ammeter, **[for each phase] [connected to a phase selector switch]**.
    g. AC frequency meter.
    h. Digital generator-voltage-adjusting feature to allow plus or minus 5 percent adjustment.

4. Controls and Protective Devices: Controls, shutdown devices, and common visual alarm and pre-alarm indication as required by NFPA 110 for Level [1] system, including the following:

   a. Cranking control equipment.
   b. Run-Off-Auto switch.
   c. Control switch not in automatic position alarm.
   d. Overcrank alarm.
   e. Overcrank shutdown device.
   f. Low water temperature alarm.
   g. High engine temperature pre-alarm.
   h. High engine temperature.
   i. High engine temperature shutdown device.
   j. Engine exhaust temperature.
   k. High engine exhaust temperature alarm.
   l. Overspeed alarm.
   m. Overspeed shutdown device.
   n. Low-fuel main tank.

      1) Low-fuel-level alarm shall be initiated when the level falls below that required for operation for the duration required for the indicated EPSS class.

   o. Coolant low-level alarm.
   p. Coolant low-level shutdown device.
   q. Coolant high-temperature prealarm.
   r. Coolant high-temperature alarm.
   s. Coolant low-temperature alarm.
   t. Coolant high-temperature shutdown device.
   u. EPS load indicator.
   v. Battery high-voltage alarm.
   w. Low-cranking voltage alarm.
   x. Battery-charger malfunction alarm.
   y. Battery low-voltage alarm.
   z. Lamp test.
   aa. Contacts for local and remote common alarm.
   bb. Low-starting air pressure alarm.
   cc. Low-starting hydraulic pressure alarm.
   dd. Remote manual-stop shutdown device.
   ee. Generator overcurrent-protective-device not-closed alarm.
   ff. Generator overspeed.
   gg. Generator over and under voltage.
   hh. Dead bus.
   ii. Reverse power.
   jj. Ground fault control.

G. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator unless otherwise indicated.

2.7 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. Overcurrent protective devices for the entire EPSS shall be coordinated to optimize selective tripping when a short circuit occurs. Coordination of protective devices shall consider both utility and EPSS as the voltage source.

1. Overcurrent protective devices for the EPSS shall be accessible only to authorized personnel.

B. Generator Circuit Breaker: Molded-case, thermal-magnetic type; complying with UL 489.

1. Tripping Characteristic: Designed specifically for generator protection.
2. Trip Rating: Matched to generator output rating.
3. Mounting: Adjacent to or integrated with control and monitoring panel.

2.8 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1.

B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

C. Electrical Insulation: Class H or Class F.

D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required. Provide [12]-lead alternator.

E. Range: Provide [**limited**] range of output voltage by adjusting the excitation level.

F. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

G. Enclosure: Dripproof.

1. Ingress Protection Rating (IP): Follow IEC 60529.

H. Instrument Transformers: Mounted within generator enclosure.

I. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified and as required by NFPA 110.

1. Digital Adjustment on Control and Monitoring Panel: Provide plus or minus 5 percent adjustment of output-voltage operating band.

J. Windings: [**Two-thirds**] pitch stator winding and fully linked amortisseur winding.

2.9 OUTDOOR ENGINE GENERATOR ENCLOSURE

A. Description: Vandal-resistant, **Level 1**, weatherproof steel housing, wind resistant up to [130 mph]. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Instruments and control shall be mounted within enclosure.

B. Description: Prefabricated or pre-engineered, galvanized-steel-clad, integral structural-steel-framed, skin-tight enclosure, erected on concrete foundation.

C. Structural Design and Anchorage: Comply with ASCE/SEI 7-10 for wind loads of up to [130 mph **(209 km/h)**].

D. Hinged Doors: Manufacturer's standard construction [**with padlocking provisions**].

E. Muffler Location: [**Within**] enclosure.

F. Engine-Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at 100 percent of rated load for two hours with ambient temperature at top of range specified in system service conditions.

2.10 VIBRATION ISOLATION DEVICES

A. Elastomeric Isolator Pads: Oil- and water-resistant elastomer or natural rubber, arranged in single or multiple layers, molded with a nonslip pattern and galvanized-steel baseplates of sufficient stiffness for uniform loading over pad area, and factory cut to sizes that match requirements of supported equipment.

1. Material: [**Elastomeric**] separated by steel shims.
2. Vibration Attenuation: Minimum of 97 percent.

B. Vibration isolation devices shall not be used to accommodate misalignments or to make bends.

2.11 FINISHES

A. Outdoor Enclosures and Components: [**Powder-coated finish over steel**] enclosure.

1. Components: Liquid paint.

2.12 SOURCE QUALITY CONTROL

A. Prototype Testing: Factory test engine generator using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

1. Tests: Comply with NFPA 110, Level 1 Energy Converters and with IEEE 115.

B. Project-Specific Equipment Tests: Before shipment, factory test engine generator and other system components and accessories manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:

1. Test components and accessories furnished with installed unit that are not identical to those on tested prototype to demonstrate compatibility and reliability.
2. Test generator, exciter, and voltage regulator as a unit.
3. Full-load run.
4. Maximum power.
5. Voltage regulation.
6. Transient and steady-state governing.
7. Single-step load pickup.
8. Safety shutdown.
9. Provide 14 days' advance notice of tests and opportunity for observation of tests by Owner's representative.
10. Report factory test results within 5 days of completion of test.

    a. Report factory test results within 48 hours of completion of a customer witness test at the factory.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine generator performance.

B. Examine roughing-in for piping systems and electrical connections. Verify actual locations of connections before packaged engine generator installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify [**Owner**] no fewer than [**two**] working days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without [**Owner's**] written permission.

3.3 INSTALLATION

A. Comply with NECA 1 and NECA 404.

B. Comply with packaged engine generator manufacturers' written installation and alignment instructions and with NFPA 110.

C. Equipment Mounting:

1. Install packaged engine generators on cast-in-place concrete equipment bases. Comply with requirements for equipment bases and foundations specified in **[Section 033000 "Cast-in-Place Concrete."]** or **[Section 033053 "Miscellaneous Cast-in-Place Concrete."]**
2. Coordinate size and location of concrete bases for packaged engine generators. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.
3. Install **[packaged engine generator]** with **[elastomeric isolator pads]** on 6-inch high concrete base. Secure **[sets]** or **[enclosure]** to anchor bolts installed in concrete bases.

D. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.

E. Fuel Piping:

1. Diesel storage tanks, tank accessories, piping, valves, and specialties for fuel systems are specified in Section 231113 "Facility Fuel-Oil Piping."
2. Copper and galvanized steel shall not be used in the fuel-oil piping system.

F. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

3.4 CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping and specialties.

B. Connect fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow space for service and maintenance.

C. Connect cooling-system water piping to engine generator and **[remote radiator]** **[heat exchanger]** with flexible connectors.

D. Connect engine exhaust pipe to engine with flexible connector.

E. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

F. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables." Provide a minimum of one 90-degree bend in flexible conduit routed to the engine generator from a stationary element.

G. Balance single-phase loads to obtain a maximum of 10 percent unbalance between any two phases.

3.5 IDENTIFICATION

A. Identify system components according to Section 230553 "Identification for HVAC Piping and Equipment" and Section 260553 "Identification for Electrical Systems."

B. Install a sign indicating the generator neutral is bonded to the main service neutral at the main service location.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections[**with the assistance of a factory-authorized service representative**].

D. Tests and Inspections:

1. Perform tests recommended by manufacturer and in "Visual and Mechanical Inspection" and "Electrical and Mechanical Tests" subparagraphs below, as specified in the NETA ATS. Certify compliance with test parameters.

    a. Visual and Mechanical Inspection:

        1) Compare equipment nameplate data with Drawings and the Specifications.
        2) Inspect physical and mechanical condition.
        3) Inspect anchorage, alignment, and grounding.
        4) Verify that the unit is clean.

    b. Electrical and Mechanical Tests:

        1) Perform insulation-resistance tests according to IEEE 43.

            a) Machines Larger Than 200 hp (150 kW): Test duration shall be 10 minutes. Calculate polarization index.
            b) Machines 200 hp (150 kW) or Less: Test duration shall be one minute. Calculate the dielectric-absorption ratio.
            c) Test is allowed to be done by the manufacturer during assembly in the case where field test requires disassembly of factory wiring and can void warranty.

        2) Test protective relay devices.
        3) Verify phase rotation, phasing, and synchronized operation as required by the application.
        4) Functionally test engine shutdown for low oil pressure, overtemperature, overspeed, and other protection features as applicable.
        5) Perform vibration test for each main bearing cap.
        6) Conduct performance test according to NFPA 110.
        7) Verify correct functioning of the governor and regulator.

2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here, including, but not limited to, single-step full-load pickup test.

3. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.

   a. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.
   b. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.
   c. Verify acceptance of charge for each element of the battery after discharge.
   d. Verify that measurements are within manufacturer's specifications.

4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
5. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine generator system before and during system operation. Check for air, exhaust, and fluid leaks.
6. Exhaust-System Back-Pressure Test: Use a manometer with a scale exceeding 40-inch wg (120 kPa). Connect to exhaust line close to engine exhaust manifold. Verify that back pressure at full-rated load is within manufacturer's written allowable limits for the engine.
7. Exhaust Emissions Test: Comply with applicable government test criteria.
8. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.
9. Harmonic-Content Tests: Measure harmonic content of output voltage at 25 percent and 100 percent of rated linear load. Verify that harmonic content is within specified limits.

E. Coordinate tests with tests for transfer switches, and run them concurrently.

F. Test instruments shall have been calibrated within the past 12 months, traceable to NIST Calibration Services, and adequate for making positive observation of test results. Make calibration records available for examination on request.

G. Leak Test: After installation, charge exhaust, coolant, and fuel systems and test for leaks. Repair leaks and retest until no leaks exist.

H. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation for generator and associated equipment.

I. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

J. Remove and replace malfunctioning units and [**retest**] as specified above.

K. Retest: Correct deficiencies identified by tests and observations, and retest until specified requirements are met.

L. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component, indicating satisfactory completion of tests.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators.

3.8 LONG TERM STORAGE

A. In the event the packaged engine generator sits for more than one month without being operated, the following provisions shall be followed:

1. Comply with the manufacturer's storage requirements.
2. Provide fuel conditioning and stabilizing for onsite fuel as required.
3. Engage a factory-authorized service technician to put packaged engine generator back into service before running.

END OF SECTION 263213.13

SECTION 263623 – AUTOMATIC TRANSFER SWITCHES

1 PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. *Specification for an Automatic Transfer Switch (ATS) for installation and operation on legally required standby applications for emergency power systems as defined by the National Electrical Code (NEC) or Canadian Electrical Code (CEC).*

2. *It is intended for the Automatic Transfer Switch to operate in the following modes:*

   a. The ATS shall continually monitor the condition of the utility supply voltage/frequency and shall automatically respond to a utility power failure condition by issuing an engine start signal to the emergency standby generators(s) in the system.

   b. The ATS shall automatically transfer the emergency load to the generator supply in the event of a utility supply failure and return the load to the utility supply upon restoration.

   c. The ATS shall perform an open transition power transfer with a neutral delay period between operating generator and the utility supply once the utility power source has been restored.

   d. When an On Load test mode is activated, the ATS shall automatically transfer the emergency load to the generator supply and return the load to the utility supply upon test completion.

   e. The ATS shall perform a closed transition fast transfer power transfer between operating generator and the utility supply once the utility power source has been restored.

3. *All work defined within this specification shall be the responsibility of the Automatic Transfer Switch manufacturer, unless specifically defined as provided and/or installed by others.*

B. The automatic transfer switch shall be manufactured in accordance with this specification and applicable UL, CSA, NEMA, and ANSI standards.

C. Supplier shall be responsible for ensuring the compatibility of all components of the ATS.

D. The contractor shall furnish and install the Automatic Transfer Switch in accordance with local bylaws, the National Electrical Code (NEC) or Canadian Electrical Code (CEC) specification and contract drawings.

E. Include all components, commissioning and services specified or as required to provide and install a complete and operable automatic transfer switch.

F. The Automatic Transfer Switch package shall include the following main components:

1. *ATS Enclosure*
2. *Power Switching Mechanism*
3. *Automatic Transfer Switch Controller:*

    a. Operator Interface Display

    b. Source Voltage & Frequency Sensors

    c. ATS control logic c/w Integrated Time Delays, Inputs & Outputs

    d. Engine Start Output Contact

1.2 APPROVAL SUBMITTALS

A. Two sets of the following information shall be supplied for ATS approval submittal:

1. *ATS Physical Layout (Plan view)*

    a. ATS Ratings

    b. Anchoring Details

    c. Cable Entry/Exit Locations

    d. Cable Connection Sizes

    e. Nameplate Information

2. *ATS Schematic Drawings*

    a. Customer Input/output Electrical Connections

b. Device settings

3. *ATS Product Datasheets*

B. The following shall be shipped with the equipment:

1. *Two sets of As - Built Drawings*

2. *Hard copy of all Installation Guides.*

1.3 CODES & STANDARDS

A. The Automatic Transfer Switch shall be designed, manufactured, tested and listed to the following safety standards:

1. *UL 1008 Edition 7 Automatic Transfer Switches For Use in Emergency Systems*

2. *UL 869A Reference Standard Service Equipment*

3. *CSA- C22.2 No 178.1-12 Automatic Transfer Switches*

B. The ATS Controller shall be designed in accordance with the following performance standards:

1. *Immunity Testing;*

a. EN 61000-4-2:2009, ESD

b. EN 61000-4-3: 2006 RF Immunity

c. EN 61000-4-4: 2006 EFT

d. EN 61000-4-5: 2006 Surge Voltage

e. EN 61000-4-6: 2009 RF Common Mode

f. EN 61000-4-11: 2004 Voltage Dips and Interruptions

g. EN 61000-4-8: 2010 Power Frequency Magnetic Field Immunity

h. ANSI C62.41.2: 2002 Surge 100kHZ Ring Wave & Combination Wave, Category C

2. *Emissions Testing:*

a. FCC CFR Part 15, Subpart B, Class A (Radiated & Conducted Emissions)

b. ICES-001 Issue 4, Class A (Radiated & Conducted Emissions)

c. EN 61000-6-4:2007 (Radiated & Conducted Emissions, Harmonics, Flicker)

1.4 QUALITY ASSURANCE

A. The Transfer Switch shall be designed and manufactured in a facility, which is registered to an ISO 9001:2008 quality system. The supplier shall have a minimum of 30 years experience designing and manufacturing automatic transfer switches.

B. Only new materials and components shall be used and of current manufacture.

C. The unit shall be manufactured in accordance with this specification and applicable UL, CSA, and NEMA standards.

1.5 WARRANTY

A. The equipment shall be free of defects in material, workmanship and operation.

B. The Transfer Switch shall be warranted against defective components, workmanship and operational flaws for the period of one year from the date of startup, not to exceed 18 months after shipment.

C. Date of startup shall be when the manufacturer's representative completes the site startup or when the equipment is put into operation, whichever occurs first.

D. Date of shipment shall be shipment from the supplier or completion of manufacturer in the event the equipment is held at the owner's request.

1.6 ENVIRONMENTAL CONDITIONS

A. The Transfer Switch shall be installed with ambient temperatures between +5° to +122° Fahrenheit (-15° to +50° Celsius) relative humidity from 0-95% non-condensing, and altitude not exceeding 6600 ft (2200M).

2 PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Thomson Power Systems

B. ASCO

C. ABB/Zenith

2.2 RATINGS & CONSTRUCTION

A. Rating of the automatic transfer switch shall be **400** AMP, **208** VAC, **60** Hz, **3** PHASE, **4** WIRE.

B. The transfer switch shall comprise of **3** switching poles plus a solid neutral.

C. The automatic transfer switch shall be rated for **Service Entrance applications** and shall contain a **400** Amp standard or 100% rated over current device for the utility power switching device as indicated on the drawings. The generator power switching device shall be rated for 100% continuous load without de-rating. The automatic transfer switch shall be suitable for control of motors, electric discharge lamps, tungsten filament lamps, and electric heating equipment where the sum of motor full-load ampere ratings and the ampere ratings of other loads do not exceed the ampere rating of the switch and the tungsten load does not exceed 30 percent of the switch rating.

D. Fault withstand current rating (WCR) of the complete assembly shall be ____Kamps RMS. The interrupting and closing rating shall be equal to or exceed the required withstand rating. This rating shall be obtained with standard upstream over current protection devices.

E. The automatic transfer switch must be listed or certified to the following safety standards:

UL 1008 Edition 7 Automatic Transfer Switches For Use in Emergency Systems

CSA- C22.2 No 178.1-12 Automatic Transfer Switches

F. The complete ATS assembly shall be mounted in a NEMA 3R rated enclosure suitable for outdoor application.

G. All materials and parts used in the unit shall be new, of current

manufacture, of best industrial grade, and free from defects and imperfections.

H. The transfer switch mechanism shall provide a simple means of manual operation.

I. All internal control devices used in the automatic transfer switch shall be capable of being de-energized and isolated from the system by use of an accessible isolation plug for servicing procedures as required.

J. The automatic transfer switch design shall provide front accessible components and wiring for easy serviceability. Power or control connections, which are not readily serviceable while the transfer switch is mounted in its enclosure, are not acceptable.

K. All power contacts used shall operate in a quick-make / quick-break manner, the speed of which shall be independent of supply voltage and / or speed of operation by manual means.

L. The enclosure shall consist of a 14 gauge steel angle or channel framework and be of adequate strength and rigidity to endure normal conditions of use and to support all equipment mounted within. Bolt-on steel panels and hinged doors shall form the outer shell of the enclosure.

M. SEISMIC ANCHORING

1. *The Transfer Switch shall be designed and constructed to withstand seismic events when correctly anchored to the building structure.*

2. *The Transfer Switch assembly shall comply with the relevant section of the International Building code standard IBC 2012 and shall be type tested on a shaker table to ACC 156 Standard.*

3. *The Transfer Switch shall successfully withstand a seismic event with a spectral acceleration of minimum 200%.*

4. *Specific Transfer Switch anchoring detail drawings shall be furnished by the Transfer Switch supplier to the contractor for compliance of seismic ratings.*

5. *Transfer Switch supplier shall provide a seismic certificate of compliance upon request.*

N. ENCLOSURE FINISH

1. *The surface shall be free of nicks and abrasions and all sharp edges broken in preparation for painting the surface. The surface shall then be prepared with iron phosphate treatment and primer. The final coat to be UL approved electrostatically applied powder coat ASA 61 Grey.*

2.3 AUTOMATIC TRANSFER SWITCH FEATURES

A. The transfer switch shall be supplied with multi-voltage capability to allow use on a variety of standard system voltage levels without replacement of components. The transfer switch shall be field configurable to operate on the following nominal system voltages; 208V, 240V, 380V, 480V, 600V.

B. Transfer switch control power shall be obtained from the source being transferred to. The controls shall not require any connection to external power sources for normal automatic operation. Transfer switches requiring control power solely from the engine starting (or other) batteries are not acceptable.

C. A control circuit isolation plug shall be provided to isolate all control circuitry inside the transfer switch to facilitate maintenance procedures. When isolated, there shall be no voltage present on the control circuitry.

D. The transfer switch shall have control plugs for all interconnection to provide superior serviceability. Separate plugs shall be provided for voltage sensing, ATS controller, engine start outputs, programmable I/O and communications. All plugs shall be keyed to prevent incorrect installation.

E. The automatic transfer switch shall include a fully integrated microprocessor-based Transfer Switch Controller which shall provide the following key features:

1. *Graphical 7" Color Touch Screen Operator Interface Display*
2. *Open and/or Closed Transition Transfer Control*
3. *Utility/Gen Voltage and Frequency Metering*
4. *Load Bus 3 Phase Power Metering (Optional)*
5. *Modbus™ RTU Serial Communication*
6. *Modbus™ TCP/IP Ethernet Communication (Optional)*
7. *8 Programmable Relay Output Contacts*
8. *16 Programmable Digital Inputs*
9. *Engine Start Output Contact*

F. The transfer switch controller shall include an operator interface graphical color touch screen display which shall be door mounted. The display shall contain the following features:

1. *7.0 inch Diagonal Color Display Screen*
2. *Capacitive Touchscreen*
3. *Resolution 800 x 480 (WVGA)*
4. *Wide Viewing Angle*
5. *Serial, Ethernet, USB Ports*
6. *SD Card Memory Card*

G. The transfer switch controller display shall provide easy to navigate software menu screens for all ATS system information and control. The following information shall be displayed within the software menuing system:

1. *System Time/Date*
2. *ATS Power Mimic Bus*
3. *Source Available/ATS Position Indication*
4. *Utility supply metering – 3 phase voltage and frequency*
5. *Generator supply metering – 3 phase voltage and frequency*
6. *ATS Load metering – 3 phase voltage*
7. *Timer countdown display*
8. *ATS Control Modes (Auto/Off/Manual/Engine Start)*
9. *Data Logging of Events*
10. *Alarm Summary*
11. *Alarm Logs*
12. *Event Logs*
13. *Virtual Synchroscope*
14. *Calendar-Based Exercise Scheduler*

H. The Transfer Switch Controller shall be an Intelligent Electronic Device (IED) which shall have a unique Internet Protocol (IP) Address for programming/configuring and remote communication.

I. The Transfer Switch Controller shall be capable of operating in conjunction with other ATS controllers on a common Ethernet

communication network.

J. Password Security: The transfer switch controller software program shall include a three (3) level security password system for access to all programming functions. Specific password levels shall be provided for "read only", "read/write" and "administrator". Password security shall allow for users to be named with individual user names and login passwords.

K. All programming/configuring of the transfer switch controller set points including voltage, frequency and time delays shall be software programmable from the front door mounted graphical display screen.

L. Utility/Gen Metering: Digital and Analog (i.e. graphical representative) metering shall be provided by the transfer switch controller for the Utility and Generator supplies. The transfer switch controller shall have an accuracy of +-0.5% (Full Scale) for all voltage and frequency readings. The following standard metering features shall be provided for the utility and generator supplies:

1. *Digital and graphical analog display of AC voltages*
2. *Three phase or single phase voltages (Line to Line & Line to Neutral)*
3. *Phasor diagram showing graphical phase relationship and voltage magnitude*
4. *Symmetrical Component Diagrams (Positive, Negative & Zero sequence display)*
5. *Voltage phase rotation indication*
6. *Frequency display to 0.1Hz resolution*

M. Voltage/Frequency Sensing: The ATS controller shall provide the following voltage and frequency sensing control features for the utility and generator supplies:

1. *The Transfer Switch controller shall have fully integrated 120-600V, 3 phase true RMS AC voltage sensing on the Utility Supply, generator supply and ATS Load bus for operation and monitoring. Programmable set points shall be provided for utility/generator source under voltage, overvoltage and phase unbalance.*
2. *AC voltage sensing shall utilize advanced symmetrical component algorithms to determine positive, negative and zero sequence voltages. This shall provide the capability to detect true phase loss/unbalance (i.e. single phasing) protection on 3 phase systems where re-generative phase voltages maybe present due to failed 3 phase transformers or motor loads.*

3. *AC Voltage sensing shall be fully configurable to allow operation on 3 phase 3 wire or 3 phase 4 wire systems without use of additional potential transformers on systems 600VAC or below.*

4. *Phase Sequence & Phase Reversal Protection: Phase Sequence/Phase reversal protection shall be provided to inhibit transfer between alternate sources should an incorrect phase sequence condition exist between connected sources. The Transfer Switch controller shall provide capability to program either A-B-C or C-B-A phase rotation.*

5. *Under Voltage Sensing: Three phase under voltage sensing shall be provided for both utility and generator supplies. Activation of an abnormal under voltage condition on any phase shall initiate a load transfer to the alternate source or shall inhibit a transfer to a source until its voltage levels are within normal limits. The under voltage sensor shall be user adjustable from 70-100% of nominal and shall be based on a falling (i.e. drop-out) voltage. The under voltage sensor shall be factory set for drop-out at 85% nominal voltage. The under voltage sensor shall reset (i.e. pick-up) 5% above the dropout setting and shall be adjustable. The under voltage sensor shall include an adjustable transient time delay feature.*

6. *Over Voltage Sensing: Three phase over voltage sensing shall be provided for both utility and generator supplies. Activation of an abnormal over voltage condition on any phase shall initiate a load transfer to the alternate source or shall inhibit a transfer to a source until its voltage levels are within normal limits. The over voltage sensor shall be user adjustable from 100-130% of nominal and shall be based on a rising (i.e. pick-up) voltage. The over voltage sensor shall be factory set for pick-up at 115% nominal voltage. The over voltage sensor shall reset (i.e. drop-out) 5% below the pick-up setting and shall be adjustable. The over voltage sensor shall include an adjustable transient time delay feature.*

7. *Phase Unbalance/Phase Loss Sensing: Voltage phase unbalance/phase loss sensing shall be provided for the generator and utility supplies. Activation of an abnormal utility phase unbalance condition shall initiate the generator to start and to transfer on load. The voltage phase unbalance sensor shall be user adjustable from 3-30% of nominal and shall be factory set for pick-up at 5% nominal voltage. The voltage phase unbalance sensor shall include an adjustable transient time delay feature.*

8. *Under Frequency Sensing: Under frequency sensing shall be provided for both utility and generator supplies. Activation of an abnormal under frequency condition shall initiate a load transfer to the alternate source or shall inhibit a transfer to a source until its frequency levels are within normal limits. The under frequency sensor shall be user adjustable from 70-100% of nominal and shall be based on a falling (i.e. drop-out) frequency. The under frequency sensor shall be factory set for drop out*

at 80% nominal frequency. The under frequency sensor shall reset (i.e. pick-up) 10% above the dropout setting and shall be adjustable. The under frequency sensor shall include an adjustable transient time delay feature.

9. *Over Frequency Sensing: Over frequency sensing shall be provided for both utility and generator supplies. Activation of an abnormal over frequency condition shall initiate a load transfer to the alternate source or shall inhibit a transfer to a source until its frequency levels are within normal limits. The over frequency sensor shall be user adjustable from 100-130% of nominal and shall be based on a rising (i.e. pick-up) frequency. The over frequency sensor shall be factory set at 115% nominal voltage. The over frequency sensor shall reset (i.e. drop-out) 5% below the pick-up setting and shall be adjustable. The over frequency sensor shall include an adjustable transient time delay feature.*

N. Time Delays: The following time delay functions shall be provided within the transfer switch controller:

1. *Engine Start - A time delay on engine start shall be provided to delay the engine start signal after failure of the utility source. The time delay shall be user adjustable 0 - 60 seconds, factory set at three (3) seconds.*

2. *Engine Warmup - A time delay for engine warm up shall be provided which permits transfer to the generator supply after generator voltage and frequency have reached acceptable limits. The time delay shall be user adjustable 0 - 60 minutes, factory set at two (2) seconds.*

3. *Utility Return - A time delay for return to utility shall be provided which permits a re-transfer back to the utility supply only after stable voltage and frequency condition exists for the specified time period. The time delay shall be user adjustable 0 - 60 minutes, factory set at two (2) minutes.*

4. *Engine Cooldown - A time delay for engine cooldown shall be provided which delays the engine stop signal after load has re-transferred back to the utility source. The time delay shall be user adjustable 0 - 60 minutes, factory set at two (2) minutes.*

5. *Neutral Delay - A time delay for neutral position shall be provided in the open transition mode to minimize the effect of out-of-phase transfer due to connected motor load. The time delay shall be user adjustable 0 - 120 seconds, factory set at three (3) seconds.*

6. *Gen Commit to Transfer Delay - A time delay for Gen Commit to Transfer position shall be provided. Should the generator fail to transfer on load with the "commit to transfer" feature enabled, the ATS shall automatically re-transfer back to the utility supply if within nominal limits following expirary of the "Gen Commit to Transfer" timer. The time delay shall be user adjustable 0 - 600 seconds, factory set at three hundred*

(300) seconds.

7. *Transfer Fail Delay - A time delay for Transfer Fail delay shall be provided. The timer shall activate a fail alarm condition if the transfer switch fails to successfully transfer within the transfer fail time delay setting. The time delay shall be user adjustable 0 - 600 seconds, factory set at thirty (30) seconds.*

O. Timer Bypass: The transfer controller shall provide a timer bypass function to automatically bypass unwanted delays during testing or maintenance procedures. The timers shall automatically reset on the next operation sequence to their original setting. The following time delays shall have a user initiated bypass feature:

1. *Engine Warmup Delay*
2. *Utility Return Timer*
3. *Engine Cooldown Timer*
4. *Neutral Delay Timer*

P. Real-Time Clock: The transfer controller shall provide a real-time clock to display system time and date for use by event logging and the ATS exercise scheduler. The real-time clock shall have automatic shifting of date/time for daylight savings and leap year occurrences. The real-time time clock shall be powered by an independent 10 year life battery to maintain all time/date settings upon loss of control power.

Q. ATS Status Indication: The transfer switch controller shall provide the following indication lights/icons on a common screen for simple visual indication of ATS status:

1. *Utility/Gen Source available*
2. *Load Bus Energized*
3. *ATS Position: Utility or Generator Source Connected to Load*
4. *Engine Start Signal Initiated*
5. *ATS in TEST or Exercise Mode*
6. *Load Shed is active*
7. *Current ATS Operating Mode (Auto/Off/Man/Test)*
8. *Common alarm (Flashing Icon)*
9. *Security Access Locked/Unlocked*

R. Alarm Annunciation: The transfer switch controller shall provide an alarm annunciation screen to indicate the status of all individual alarm conditions on the ATS. The alarm screen shall have an alarm reset function.

S. Alarms Log: The transfer switch controller shall provide an alarm log screen to indicate a history of recent alarms. All alarm logs shall be provided with a time/date stamp and the name of user who reset the alarm. Alarm logs can be filtered by calendar date.

T. Events Log: The transfer switch controller shall provide an event log screen to indicate a history of recent events. All event logs shall be provided with a time/date stamp and the name of user who activated/deactivated a specific event. Event logs can be filtered by calendar date.

U. Virtual Synchroscope: For transfer switches equipped with open transition -fast transfer or closed transition transfer mechanisms, the transfer controller display shall indicate the operating status of the "in-sync" transfer operation. Operating status shall include the following display features:

1. *Virtual Synchroscope showing graphical phase degree and speed (slow-fast) representation between the two sources prior to transfer operation.*
2. *Voltage Difference meter displayed in % system voltage*
3. *Slip Frequency meter displayed in % of system frequency*
4. *Generator and Utility Phase A-N voltage*
5. *Generator and Utility frequency*

V. ATS Control Mode: The transfer switch controller shall provide 7 selectable operating modes available from the main operating screen. The following operating modes shall be provided:

1. *Auto: ATS shall operate automatically during a utility power failure*
2. *Off: ATS shall not start engine or transfer load during a utility power failure*
3. *Manual: ATS can be operated manually to the desired source.*
4. *On Load Test: ATS shall be selected to operate in On-Load test mode and permit load transfer*
5. *Off Load Test: ATS shall be selected to operate in Off-Load test mode and shall not permit load transfer*

6. *Timed Test: ATS shall be selected to operate in a Timed test mode*

7. *Closed Transition: ATS shall be selected to operate in a Closed Transition Transfer mode*

W. Utility Retransfer Operation Selection: The operator interface display shall provide a selection for Utility Re-transfer operation. The utility re-transfer operation shall be user selectable for Automatic, or Manual re-transfer operation. When Manual re-transfer mode is selected, the user can initiate when the re-transfer to utility power shall occur.

X. Test Modes: The transfer switch controller shall provide the following user selectable test modes and features:

1. *On Load/Off Load: The operator interface shall provide selection of "OFF-LOAD" testing (i.e. load does not transfer to generator) or "ON-LOAD" testing (i.e. load transfers to generator) modes*

2. *Automatic Timed Test Modes: Automatic timed test mode shall be provided to allow for tests to be manually initiated and automatically terminated. Timed test modes shall be user adjustable (0-999 minutes). The load shall automatically re-transfer back to the utility supply should the generator fail on load.*

3. *Automatic Gen Exerciser: A calendar based automatic exercise time function shall be provided for generator testing. The Exercise scheduler shall be fully programmable for; start/stop date & time, duration of the test and type of test mode (i.e. On-Load or Off-Load). The exercise timer shall utilize the transfer controller's internal time clock for referencing all timing functions. The transfer switch shall automatically re-transfer back to the utility supply if the generator set fails during an exercise period.*

Y. Scheduler: A calendar based scheduler shall be provided by the transfer switch controller. The scheduler shall operate based on the transfer switch controller real-time clock. The scheduler shall allow users to program over 25 specific event schedules to be added. Each event can be edited individually and it operating status can be monitored. The scheduler shall allow the following programming functionality:

1. *Schedule Event Start Date/Time*

2. *Event Period (Day/Week/Month/Year)*

3. *Schedule Event Stop Date/Time*

4. *Event Duration (mins/hours)*

5. *Event Operation Type (Off-Load Test, On-Load Test)*

6. *Number of Re-occurring Events (one-time or number of events)*

Z. Transfer to Generator Inhibit: The transfer controller shall provide a programmable digital input to inhibit transfer to generator until external signal is removed. Transfer to Generator inhibit shall be automatically bypassed should the utility source fail and the generator source is available within normal limits.

AA. Transfer to Utility Inhibit: The transfer controller shall provide a programmable digital input to inhibit transfer to utility until external signal is removed. Transfer to Utility inhibit shall be automatically bypassed should generator source fail and the utility source is available within normal limits

BB. Generator Source Trip Inhibit: The transfer controller shall provide a programmable digital input to inhibit opening of the generator power switching device until external input signal is removed. Trip inhibit shall be automatically bypassed should generator source fail and utility source is available and/or max parallel time is exceeded.

CC. Transfer Switch Fail Logic: The following transfer switch failure logic and alarming shall be provided during open or closed transition transfer sequences

1. *Transfer Fail: Control logic shall be provided for sensing a transfer switch failure in open or closed transition mode. When an alarm condition is activated, the transfer controller shall automatically force a transfer to the alternate source if available.*

2. *Power Switching Device Fail: Control logic shall be provided to detect if a power switching device fails to close or open during an open or closed transition operating sequence. Should a power switching device fail to close or open for any reason within a pre-set time period (adjustable), an alarm light and alarm relay contact shall be activated.*

3. *Gen Failure: Control logic shall be provided for immediate transfer to the utility supply (if within acceptable limits) should the generator set fail during any activated test mode.*

DD. Gen Commit to Transfer Logic: Programmable control logic shall be provided to select whether or not the load shall be transferred to the generator (following a utility power failure) if the utility supply is restored immediately before the generator transfers on load. With the feature programmed as NO (DISABLED), the transfer switch shall not commit a transfer to the generator after the engine start delay has expired, but shall return to the utility supply if immediately restored. With the feature programmed as YES (ENABLED), the transfer switch shall commit a transfer to the generator after the engine start delay has expired. This feature shall be automatically cancelled after expirary of the Gen Commit

to Transfer timer (5 mins adjustable) should the generator fail to start.

EE. Load Disconnect Contact (LDC): Control logic shall be provided to signal an external load (e.g. elevator) of an impending transfer to and from the generator supply. A single normally open output contact shall be supplied and shall be rated 2A, 120VAC, 28Vdc resistive. The contact shall close prior to a transfer and remain closed until the transfer is completed and the post transfer delay time has expired. A pre-transfer delay function shall be provided, programmable 0 - 30 seconds. A post transfer delay function shall be provided, programmable 0 - 30 seconds.

FF. Engine Start Contacts: Two (2) engine start contacts shall be provided which shall close to initiate starting of the engine. The engine start contact shall be rated 7A, 120/240VAC, 28Vdc resistive.

GG. Load Shed: The transfer controller shall have provisions to provide a load shed output contact via assignment of one of the programmable output contacts. The Load shed output shall be activated whenever the generator transfers on load and shall reset once the utility supply retransfers back on load. If the ATS is equipped with ATS Load bus power metering option, the Load shed feature shall be programmable based on a generator kW load set point.

HH. User Programmable Digital Inputs: Sixteen (16) user programmable digital inputs shall be provided by the transfer controller. The digital inputs shall accept a dry (isolated) logic contact to switch to DC negative (ground). Each input shall allow mapping to over 30 different control or monitoring functions as available within the transfer controller database. The following inputs shall be mapped as factory defaults:

1. *Remote Test - Utility Power Fail Simulate (Close to Test)*
2. *Remote Alarm Reset (Momentary Close to Reset)*
3. *Service Disconnect Mode Activated (External Control Switch)*
4. *Utility Power Switching Device (USD) Tripped*
5. *Generator Power Switching Device (GSD) Tripped*
6. *Transfer Control in Manual (External Control Switch)*
7. *Transfer Control in Closed Transition Mode (External Control Switch)*
8. *Utility Power Switching Device (USD) Open*
9. *Generator Power Switching Device (GSD) Open*
10. *Generator Bypass Switch (GB) Closed*

11. *Utility Bypass Switch (NB) Closed*

12. *Load Isolate Switch (LI) Closed*

13. *Generator Isolate Switch (GI) Closed*

14. *Utility Isolate Switch (NI) Closed*

15. *Inhibit Transfer to Utility (Source 1)*

16. *Inhibit Transfer to Generator (Source 2)*

II. User Programmable Output Contacts: Eight (8) user programmable output contacts shall be provided by the transfer controller. The contacts shall be rated 2A, 120/240VAC, 28Vdc resistive, Form C. Each output contact shall be user programmable. The following outputs shall be mapped as factory defaults:

1. *Load on Utility (AUX U)*

2. *Load on Generator (AUX G)*

3. *Load Disconnect Contact (LDC)*

4. *Fail to Transfer (FTT)*

5. *ATS Not in Auto*

6. *ATS in Auto*

7. *Utility Power Available (UPA)*

8. *Generator Power Available (GPA)*

JJ. In-Sync Transfer Sensor: For transfer switches equipped to operate in a fast "open" or "closed" transition transfer sequence, the transfer switch controller shall provide an integrated "in-sync" transfer sensor to safely permit in-sync transfers to occur when both sources are available. The in-sync transfer sensor shall provide adjustable voltage and frequency thresholds to only permit transfers when the two sources are safely in phase. The in-sync sensor shall also provide a zero degree closing angle target by utilization of anticipatory closing angle control logic for different levels of slip frequency.

KK. Closed Transition-Fast Transfer: The transfer controller shall provide integrated closed transition control logic to allow the following operating conditions;

1. *The transfer controller shall be capable of either open or closed transition operation as selected by operator interface control switch.*

2. *Closed transition transfer shall only be permitted if both sources are*

available and the sources are in synchronism (via in-sync sensor permissive signal) prior to interconnection of the two sources.

3. *Should an "in-sync" condition not be achieved within a pre-selected time period, an alarm condition shall be activated.*

4. *If only one source of power is available, and the transfer switch is called to transfer, it shall automatically revert to open transition mode.*

5. *Under normal operation, both sources of supply shall be inhibited from staying interconnected (in parallel) for longer than 100 milliseconds.*

6. *Circuitry shall be provided to detect an extended parallel operation time greater than 100 milliseconds. Should the two sources stay interconnected in parallel for longer than 100 milliseconds due to an abnormal condition and independent supervisory circuit shall separate the two sources via alternate tripping signals to ensure the two sources are not interconnected in parallel for longer than a maximum of 500 milliseconds.*

LL. Modbus TCP Ethernet Communication: The transfer switch controller shall provide a 100BaseT Ethernet port for customer connection to a remote data monitoring device such as PLC, building automation system or desktop PC. The Ethernet Port shall provide Modbus TCP protocol with data registers defined in the Modbus Communication Manual. The Modbus port shall provide the following main data register information:

1. *ATS Position Status*
2. *ATS Source and Load Status*
3. *Alarm status*
4. *Utility/Generator 3 Phase Voltage*
5. *ATS Load Bus voltage*
6. *ATS Load Bus Power Metering (kW, kVA, kVAR, PF) when power metering option is provided).*
7. *Event logging data*

MM. Data Logging Memory: The transfer controller shall provide data logging and shall store the data in non-volatile memory on a removable SD memory card. The following events shall be recorded and stored:

1. *Total Number of Transfers*
2. *Total Number of Transfers due to source failure*
3. *Number of Hours Controller is energized*

4. *Number of Hours Load is on Utility*

5. *Number of Hours Load is on Generator*

NN. OPTIONAL CONTROL FEATURES

1. *Enclosure Strip Heater c/w Thermostat (TS-H2): An enclosure strip heater shall be supplied inside the Transfer Switch enclosure and shall be controlled by an adjustable thermostat. Power for the strip heater shall be to be connected to the transfer switch load bus via suitably sized power transfer.*

3 PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation Codes/Permits: Suitable permits shall be required by local authorities having jurisdiction prior to installing standby generator sets and automatic transfer switches.

B. Application: The Transfer Switch shall be Listed by Underwriters Laboratories (UL) to Safety Standard UL 1008 for Transfer Switches for Emergency Standby applications. The transfer switch shall be intended for installation and operation on legally required standby applications for emergency power systems as defined by the National Electrical Code (NEC).

C. Installation Location: The transfer switch shall be installed in an environment where the temperature range is within +5° to +122° Fahrenheit (-15° to +50° Celsius) and humidity range not exceeding 5%-95% non-condensing. The transfer switch shall not be installed in a location where it is subjected to direct sunlight on the front of the transfer switch door. In these applications, an optionally available sun-shade kit shall be installed.

D. Power Cabling: All power cabling entering/exiting the transfer switch enclosure shall be installed in suitably sized conduit per NEC/CEC requirements. Ampacity, type and voltage rating of all power conductors shall also comply with NEC/CEC requirements and local authorities having jurisdiction. To ensure satisfactory installation of this equipment, all power cabling connections shall utilize approved lugs and shall be adequately torqued as specified by the ATS manufacturer. All mechanical and electrical connections shall be checked for tightness prior to placing this equipment in service to ensure proper operation and to validate applicable warranty coverage.

E. Control Wiring: All control wiring for engine start, load shed, alarm and remote test shall be installed in separate conduits from all power cabling and shall be suitably sized conduits per NEC/CEC requirements. All control wiring shall be sized for minimum #18 AWG. Control wiring type and voltage rating shall also comply with NEC/CEC requirements and local authorities having jurisdiction. All field wiring/communication cabling that maybe field installed directly onto any ATS door mounted components shall be suitably routed and protected across the door hinge to prevent possible mechanical damage upon door opening and/or door closing.

F. Generator Set Automatic Starting: The transfer switch shall operate in conjunction with any generator set with remote automatic starting capabilities utilizing a 2 wire, remote start control contact input. A dry contact shall be provided for remote generator starting control (contact shall close to start generator and shall opens to stop generator).

G. Load Types: The ATS shall be connected to loads for control of motors, electric discharge lamps, tungsten filament lamps, and electric heating equipment where the sum of motor full-load ampere ratings and the ampere ratings of other loads do not exceed the ampere rating of the switch and the tungsten load does not exceed 30 percent of the switch rating.

H. Upstream Overcurrent Protection: Non-Service Entrance Rated transfer switch models do not contain any integral over current protection and shall require upstream over current protection devices for both Utility and Generator sources.

I. Upstream Overcurrent Protection: Service Entrance rated transfer switch models contain integral over current protection for the Utility source as standard. Service Entrance rated transfer switches do not contain any integral over current protection for the generator source and shall require upstream generator source over current protection. The Service Entrance rated transfer switch shall be rated for 80% maximum continuous loading of load types.

J. Withstand/Interrupting Current Ratings: Refer to transfer switch manufactures published electrical ratings for withstand/Interrupting current ratings.

K. Integral Over current Protection: For models of transfer switch with integral over current protection, the over current protection shall be set prior to operation. The equipment shall be supplied from the ATS manufacturer with a long-time current setting of 100% (of the equipment rating) and maximum short-time/instantaneous current and time delay settings.

L. For transfer switches equipped with multi-voltage capability, the installer shall configure the ATS for the correct operating voltage on all transformer taps and shall program the transfer switch controller as required.

M. All changes to the factory default setting changes shall be recorded by the installer on a blank calibration label supplied with the transfer switch.

N. Remote Start Contact Field Wiring: As a minimum, the remote engine start control field wiring shall conform to the local regulatory authority on electrical installations. Field wiring of a remote start contact from a transfer switch to a control panel shall conform to the following additional guidelines to avoid possible controller malfunction and/or damage:

1. *Minimum #14 AWG (2.5mm^2) wire size shall be used for distances up to 100ft (30m)[1]).*
2. *Remote start contact wires shall be run in a separate conduit.*
3. *Avoid wiring near AC power cables to prevent pick-up of induced voltages.*
4. *An interposing relay shall be required if field-wiring distance is excessively long (i.e. greater than 100 feet (30m)) and/or if a remote contact has a resistance of greater than 5.0 ohms.*
5. *The remote start contact shall be voltage free (i.e. dry contact).*

O. Dielectric Testing: All high voltage dielectric testing on the transfer switch shall be performed with the transfer switch controller isolated from the test source.

P. Seismic Anchoring: The transfer switch shall be installed per the anchoring details provided for seismic qualification by the ATS manufacturer. The following anchoring guidelines shall be adhered to:

1. *Anchoring shall be designed according to IBC 2012 or latest version.*
2. *If wall anchors are utilized in concrete, applicable concrete type concrete anchors shall be used.*
3. *If expansion anchors are utilized, they shall be installed according to manufacturer's recommendation.*

3.2 FACTORY TESTING

The automatic transfer switch shall be factory tested prior to delivery to the purchaser. The following tests shall be conducted by qualified factory personnel:

A. Visual Inspection: Electrical and Mechanical inspections to verify installed components are of correct ratings; meet the requirements of the project specifications and to ensure regulatory and quality requirements are met.

B. Mechanical Tests: As a minimum, the following mechanical tests shall be performed on the transfer switch:

1. *Power Conductor Torque Verification*
2. *Verification of Mechanical Interlock*
3. *Manual ATS Mechanism Operation/Adjustment*
4. *All Mechanical Fasteners/Wire Connections Tight*

C. Electrical Tests: As a minimum, the following electrical tests shall be performed on the transfer switch:

1. *Adjustment/Setting All Timers & Voltage Sensors*
2. *Verification of Electrical Interlock*
3. *Function Test-Normal Operation-3 Complete Cycles*
4. *Mechanism Adjustment*
5. *Dielectric Test*

D. Final Inspection: As a minimum, the following final inspection tasks shall be performed on the transfer switch:

1. *Calibration Label/Equipment labels Installed & Correct*
2. *All safety/warning labels attached*
3. *All wiring straight, neatly bundled and adequately protected.*
4. *All options supplied as specified*
5. *Enclosure is clean, no paint imperfections*
6. *Final Documentation is Enclosed (Drawing, O&M Manual)*

E. The transfer switch manufacturer shall provide upon request of the project engineer, four (4) copies of certified Factory Test Reports for the transfer switch supplied.

3.3 FIELD TESTING/COMMISSIONING

The automatic transfer switch shall be tested once installed at the project site to confirm proper operation of the system. Schedule and witness testing activities shall be coordinated with the project engineer, site contractor, and owner as required in advance of the testing. Qualified local factory-trained field service representatives shall conduct the following tests:

A. Visual Inspection: Electrical and Mechanical inspection to verify the installation is correct as recommended by the transfer switch manufacturer and as per NEC/CEC requirements.

B. Mechanical Tests: As a minimum, the following mechanical tests shall be performed on the transfer switch:

1. *Power Conductor Torque Verification*
2. *Verification of Mechanical Interlock*
3. *Manual ATS Mechanism Operation*
4. *All Mechanical Fasteners/Wire Connections Tight*
5. *Confirmation of correct transfer switch voltage, current and withstand ratings as is required for the application.*

C. Electrical Tests: As a minimum, the following electrical tests shall be performed on the transfer switch:

1. *Meggar Testing the Power Cabling to the transfer switch*
2. *Verification of correct power cabling phasing and phase rotation, prior to energization.*
3. *Confirmation of settings for all Timers & Voltage Sensors*
4. *Full Function Test-Normal Operation-3 Complete Cycles of failing the utility supply, and transfer load to/from the generator set.*
5. *Verification of all Test Modes operate correctly*

D. Qualified factory-trained field service personnel shall provide upon request of the project engineer two (2) copies of field test reports noting any deficiencies that require corrective action.

Canadian County
Purchasing

Affidavit / Proof of Mailing

Date Issued: August 17, 2020
Bid Number: **2021-#03**
Closing Date: September 4, 2020 at 4:00pm
PO Box 458, 201 N. Choctaw Ave., El Reno, OK 73036
Opening Date: September 7, 2020 during the Commissioner's Meeting that begins at 9:00am
Commissioner's Meeting Room, 201 N. Choctaw Ave., El Reno, OK 73036

~ AFFIDAVIT~

Generator / County Commissioners

State of Oklahoma)
County of Canadian) §

I, Lindsey Garrett, Assistant Purchasing Agent, in and for said County and State, do hereby certify that "Invitations to Bid" were sent to the following:

Bid Clerk
projects@bidclerk.com

Bid News
projects@isqft.com

Clifford Power Systems Inc
7300 Melrose Lane
Oklahoma City, OK 73127

Cummins Southern Plains LLC
PO Box 910509
Dallas, TX 75391-0509

Elite Power Services
8001 N Classen Blvd, Suite A
Oklahoma City, OK 73118

ePlan
1400 Forum Blvd. Ste 7B
Columbia, MO 65203

Faith Electric Inc
6712 N Coltrane
Edmond, OK 73013

Francis Tuttle Vo-Tech Center
Attn: Bid Assistant – Judy Robbins
12777 N. Rockwell
Oklahoma City, OK 73142

King Electric LLC
1507 S. Shepard Ave.
El Reno, OK 73036

Luckinbill Inc
409 W Centennial Blvd
Edmond, OK 73013

Moisant Electric Inc
1100 SW 22nd
Oklahoma City, OK 73109

Online Data Services
5425 Peachtree Parkway
Peachtree Corners, GA 30092

Reed Construction Data
30 Technology Pkwy South, Ste. 100
Norcross, GA 30092

S & W Power Systems
4100 S Eastern Avenue
Oklahoma City, OK 73129

Sooner State Generators LLC
Attn: Steve Elias
720 W Main Street, Suite A
Collinsville, OK 74021

United Engines
5555 W Reno
Oklahoma City, OK 73127

Imajenus Incorporated
322 N Main
Broken Arrow, OK 74012

Western Plains Electric, LLC
2901 N. Cedar Road
Calumet, OK 73014

Above All Electrical Solutions
104727 S Hwy 177
McLoud, OK 74851
Attn: Jess Steele

Tony Brown Plumbing
302 E Columbia
Okemah, OK 74859

Witness my hand and seal this 17th day of August, 2020.

Lindsey Garrett, Assistant Purchasing Agent
(SEAL)

CANADIAN COUNTY CLERK
OFFICIAL SEAL
EL RENO, OKLAHOMA

Canadian County
Purchasing

BID CHECKLIST

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TO HELP PREVENT BIDS FROM BEING REJECTED FOR LACK OF COMPLETION
PLEASE CHECK FOR THE FOLLOWING:

Is the Invitation to Bid Signed and Notarized?_____

Is the bid bond or cashier's check enclosed?_____

Is the Business Relationships Affidavit enclosed?_____

Is the Non-Collusion Bidding Certificate enclosed?_____

Are all applicable spaces filled in?_____

Are all necessary papers enclosed?_____

Is the Bid # and Opening Date on outside of return envelope?_____

Thank You,

Krissi Jensen, Purchasing Agent

BUSINESS RELATIONSHIPS AFFIDAVIT

_____ (PROJECT NAME)

STATE OF OKLAHOMA)
)SS
COUNTY OF _____)

_____, of lawful age, being duly sworn, on oath says that he or she is the agent authorized by the bidder to submit the attached bid. Affiant further states that the nature of any partnership, or other business relationship presently in effect, of which existed within one (1) year prior to the date of this statement with the architect, engineer, or other party to the project is as follows:

Affiant further states that any such business relationship presently in effect of which existed within one (1) year prior to the date of this statement between any officer or director of the bidding company and any officer or director of the architectural or engineering firm or other party to the project is as follows:

Affiant further states that the names of all persons having any such business relationships and the positions they hold with their respective companies or firms are as follows:

(If none of the business relationships herein above mentioned exist, affiant should so state.)

_____
(Signature of Affiant)

Subscribed and sworn to before me this _____ day of _____, 20 ___

Notary Public _____

My Commission Expires _____

NON-COLLUSION BIDDING CERTIFICATION

_____ (PROJECT NAME)

STATE OF OKLAHOMA)
)SS
COUNTY_____)

A. For purposes of competitive bids, I certify:

1. I am the duly authorized agent of _____, the bidder submitting the competitive bid which is attached to this statement, for the purpose of certifying the facts pertaining to the existence of collusion among bidders and between bidders and state officials or employees, as well as facts pertaining to the giving or offering of things of value to government personnel in return for special consideration in the letting of any contract pursuant to the bid to which this statement is attached;

2. I am fully aware of the facts and circumstances surrounding the making of the bid to which this statement is attached and has been personally and directly involved in the proceedings leading to the submission of such bid; and

3. Neither the bidder nor anyone subject to the bidder's direction or control has been a party to the following:
   a. Any collusion among bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding;
   b. Any collusion with any state official or employee as to quantity, quality or price in the prospective contract, or as to any other terms of such prospective contract; and
   c. Any discussions between bidders and any state official concerning exchange of money or other thing of value for special consideration in the letting of a contract.

B. I certify, if awarded the contract, whether competitively bid or not, that neither the Contractors nor anyone subject to the Contractor's direction or control has paid, given, or donated or agreed to pay, give, or donate to any officer or employee of the State of Oklahoma any money or other thing of value, either directly or indirectly, in procuring the contract to which this statement is attached.

Certified this _____ day of _____, 20___.

_____
(Signature)

_____ _____
(Print Name) (Position in the Company)