

*Limestone  
County Commission*

*Chairman  
Mark Yarbrough*

*Administrator  
Pam Ball*

*Commissioners:  
Stanley Hill  
Steve Turner  
Jason Black  
Ben Harrison*



August 6, 2018

**INVITATION FOR BIDS  
Proposal No. 2656**

**2 or More New Generators  
EMA**

Notice is hereby given that the Commission of Limestone County, Alabama will receive competitive bids for 2 New Generators. Please see the attached specifications for same.

**TAX:** All applicable taxes must be included in the amount of bid price.

F.O.B.: Athens, Alabama.

Date of Delivery: Within 30 days from the date of the Purchase Order.

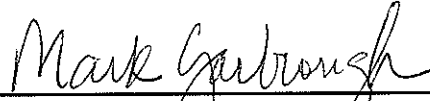
Terms: Net 30 days.

The right to reject any items or materials not of quality or under any provisions of this act is reserved.

Bids will be opened on **Tuesday**, the **28<sup>th</sup>** day of **August 2018** at **10:00 a.m.** and awarded on **Tuesday**, the **4<sup>th</sup>** day of **September 2018** at **10:00 a.m.**

**REQUIREMENT:** Pursuant to Alabama Code 31-13-9, as a condition of the award of any contract, the business entity or employer, and any of its subcontractors, shall provide a sworn affidavit and documentation that it will not knowingly employ, hire for employment, or continue to employ an unauthorized alien; that it is enrolled in the E-Verify program; and, during the contract period, it will participate in the E-Verify program and will verify every employee that is required to be verified under applicable state and federal laws. During the performance of the contract, the business entity or employer shall participate in the E-Verify program and shall verify every employee that is required to be verified according to the applicable federal rules and regulations.

All bids must be sealed and the word "BID", name of item, proposal number, and opening date should be marked on the outside of the envelope.



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**MARK YARBROUGH, Chairman**  
**Limestone County Commission**

# **Specifications for Proposal 2656 2 or More New Generators**

## **GENERATOR SET (60kW, 3 Phase, NATURAL GAS)**

### **1. Scope of Work**

- 1.1. It is the intent of this specification to secure an engine-driven generator set that has been factory built, production-tested, and site-tested together with all accessories necessary for a complete installation as shown on the plans and drawings and specified herein.
- 1.2. Any and all exceptions to the published specifications shall be subject to the approval of the engineer.
- 1.3. The power system shall be furnished by a single manufacturer who shall be responsible for the design, coordination, and testing of the complete system. The entire system shall be installed as shown on the plans, drawings, and specifications herein.
- 1.4. The equipment shall be produced by a manufacturer who has produced this type of equipment for a period of at least 10 years and who maintains a service organization available twenty-four hours a day throughout the year.
- 1.5. The equipment shall be supported by a local distributor who has had local facilities for at least 5 years and who maintains a local service organization available twenty-four hours a day throughout the year.

### **2. General Requirements**

- 2.1. It is the intent of this specification to secure a generator set system that has been tested during design verification, in production, and at the final job site. The generator set will be a commercial design and will be complete with all of the necessary accessories for complete installation as shown on the plans, drawings, and specifications herein. The equipment supplied shall meet the requirements of the National Electrical Code and applicable local codes and regulations.
- 2.2. All equipment shall be new and of current production by a national firm that manufactures the generator sets and controls and transfer switches, and assembles the generator sets as a complete and coordinated system. There will be one-source responsibility for warranty, parts, and service through a local representative with factory-trained servicemen.

### **3. Submittal**

- 3.1. The submittal shall include specification sheets showing all standard and optional accessories to be supplied; schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required interconnection between the generator set, the transfer switch, and the remote annunciator panel if it is included elsewhere in these specifications.

#### **4. Codes and Standards**

- 4.1. The generator set shall be ETL certified to UL 2200 standards or submitted to an independent third party certification process to verify compliance as installed.
- 4.2. The generator set shall conform to the requirements of the following codes and standards:
  - 4.2.1. CSA C22.2, No. 14-M91 Industrial Control Equipment.
  - 4.2.2. EN50082-2, Electromagnetic Compatibility-Generic Immunity Requirements, Part 2: Industrial.
  - 4.2.3. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
  - 4.2.4. IEC8528 part 4, Control Systems for Generator Sets.
  - 4.2.5. IEC Std 61000-2 and 61000-3 for susceptibility, 61000-6 radiated and conducted electromagnetic emissions.
  - 4.2.6. IEEE446 Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
  - 4.2.7. NFPA 70, National Electrical Code, Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
  - 4.2.8. NFPA 99, Essential Electrical Systems for Health Care Facilities.
  - 4.2.9. NFPA 110, Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit. Component level type tests will not substitute for this requirement.

## 5. Testing

- 5.1. To ensure that the equipment has been designed and built to the highest reliability and quality standards, the manufacturer and/or local representative shall be responsible for two separate tests: final production tests and site tests.
- 5.2. **Final Production Tests.** Each generator set shall be tested under varying loads with guards and exhaust system in place. Tests shall include:
  - 5.2.1 Single-step load pickup
  - 5.2.2 Transient and steady-state governing
  - 5.2.3 Safety shutdown device testing
  - 5.2.4 Voltage regulation
  - 5.2.5 Rated Power @ 0.8 PF
  - 5.2.6 Maximum power
  - 5.2.7 Upon request, a witness test, or a certified test record sent prior to shipment.
- 5.3. **Site Tests.** The manufacturer's distribution representative shall perform an installation check, startup, and 2 hour full load test utilizing a resistive type load bank. The engineer, regular operators, and the maintenance staff shall be notified of the time and date of the site test. The tests shall include:
  - 5.3.1 Fuel, lubricating oil, and antifreeze shall be checked for conformity to the manufacturer's recommendations, under the environmental conditions present and expected.
  - 5.3.2 Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. These shall include: block heaters, battery chargers, alternator strip heaters, remote annunciators, etc.
  - 5.3.3 Generator set startup under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during operation, normal and emergency line-to-line voltage and frequency, and phase rotation.

- 5.3.4. Automatic start by means of a simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper system coordination. Engine coolant temperature, oil pressure, and battery charge level along with generator set voltage, amperes, and frequency shall be monitored throughout the test.

## 6. Warranty and Maintenance

- 6.1. The generator set shall include a standard two year warranty to guarantee against defective material and workmanship in accordance with the manufacturer's published warranty from date of startup. Optional warranties shall be available upon request.
- 6.2. The generator set manufacturer and its distributor shall maintain a 24-hour parts and service organization. This organization shall regularly engage in maintenance contract programs to perform preventive maintenance and service on equipment similar to that specified. A service agreement shall be available and shall include system operation under simulated operating conditions; adjustment to the generator set, transfer switch, and switchgear controls as required, and certification in the owner's maintenance log of repairs made and function tests performed on all systems.

## 7. Equipment

- 7.1. The generator set shall provide 60 kW/75 kVA when operating at 208/230 volts, 3 phase, 60 Hz, .8 power factor. The generator set shall be capable of a Standby 130°C rating while operating in an ambient condition of less than or equal to 77° F and a maximum elevation of 328 feet above sea level.
- 7.2. Motor starting performance and voltage dip determinations shall be based on the complete generator set. The generator set shall be capable of supplying 220 SKVA at the specified voltage for starting motor loads with a maximum instantaneous voltage dip of 30%, as measured by a digital RMS transient recorder in accordance with IEEE standard 115. Motor starting performance and voltage dip determination that does not account for all components affecting total voltage dip i.e. engine, alternator, voltage regulator and governor will not be acceptable
- 7.3. Vibration isolators shall be provided between the engine-alternator and heavy-duty steel base.

## 8. Engine

- 8.1. The displacement engine shall have the proper HP to deliver 60kW at a governed engine speed of 1800 rpm (engines that operate above 1800 rpm

are not acceptable), and shall be equipped with the following:

- 8.1.1. Electronic isochronous governor capable of 0.5% steady-state frequency regulation.
- 8.1.2. 12-volt positive-engagement solenoid shift-starting motor.
- 8.1.3. 70-ampere automatic battery charging alternator with solid-state voltage regulation.
- 8.1.4. Positive displacement, full-pressure lubrication oil pump, cartridge oil filters, dipstick, and oil drain.
- 8.1.5. Dry-type replaceable air cleaner elements for normal applications.
- 8.2. The naturally aspirated engine shall be fueled by *natural gas*
- 8.3. The engine shall have a minimum of 8 cylinders and be liquid-cooled by Unit Mounted Radiator 122°F/50°C.
- 8.4. The engine shall be EPA certified from the factory, and shall not require a site performance test.

## 9. Alternator

- 9.1. The alternator shall be salient-pole, brushless, 2/3-pitch, 12 lead, self-ventilated with drip-proof construction and amortisseur rotor windings and skewed for smooth voltage waveform. The ratings shall meet the NEMA standard (MG1-32.40) temperature rise limits. The insulation shall be class H per UL1446 and the varnish shall be a fungus resistant epoxy. Temperature rise of the rotor and stator shall be limited to . The excitation system shall be of brushless construction controlled by a solid- state voltage regulator capable of maintaining voltage within  $\pm 1.0\%$  at any constant load from 0% to 100% of rating. The AVR shall be capable of proper operation under severe nonlinear loads and provide individual adjustments for voltage range, stability and volts-per-hertz operations. The AVR shall be protected from the environment by conformal coating. The waveform harmonic distortion shall not exceed 5% total RMS measured line-to-line at full rated load. The TIF factor shall not exceed 50.
- 9.2. The generator shall be inherently capable of sustaining at least 250% of rated current for at least 10 seconds under a 3-phase symmetrical short circuit without the addition of separate current-support devices.

## 10. Controller

10.1. The generator shall have a Digital Controller which is a highly advanced integrated genset control system. The controller shall combine rugged construction with microprocessor technology to offer a product that will hold up to any environment and flexible enough to meet they system needs.

10.1.1. The controller shall have front panel navigation keys and large LCD display. It shall incorporate easy to navigate menus for setup and configuration without the use of additional PLC's or computer connection. All program functions and software shall be NON-proprietary. Any controller(s) provided with proprietary software shall be provided to the owner with all unlocking keys, required hardware and complete writeable software program free of charge.

10.1.2. Features shall include,

- a. Generator Metering
- b. Engine Metering
- c. Genset Control
- d. Generator Protection (27, 59, 81O,81U)
- e. BESTCOMSPlus or Equivalent software(included at no additional cost)

- Programming and setup software
- Intuitive and powerful
- Remote control and monitoring
- Programmable Logic
- USB communications

- f. Suitable for use on rental gensets with
- g. Hi/Lo line sensing
- h. Single or three phase sensing override
- i. SAE J1939 Engine ECU communications
- j. Multilingual capability
- k. Remote communications to our RDP-110 Remote Annunciator
- l. Battery Backup for Real Time Clock
- m. LCD Heater
- n. Extremely rugged, fully encapsulated design
- o. 16 programmable contact inputs
- p. 2 Contact outputs: (1) 30 Adc Gen. Run (1) Programmable 1 Adc rated contracts
- q. Wide Ambient Temperature range
- r. Additional (8) Programmable 2 Adc contacts (optional)
- s. Remote Dial-out and Dial-in capability with Internal Modem (optional)
- t. Enhanced Generator Protection 51 and 47
- u. Modbus Communications with RS-485
- v. Expandable I/O capability via J1939 CANBUS (optional)
- w. UL recognized, CSA certified, CE approved
- x. HALT (Highly Accelerated Life Tests) tested
- y. IP 54 Front Panel rating with integrated gaskets
- z. NFPA110 Level Compatible



### 10.1.3. Description

- A. A microprocessor based generator set control shall incorporate advanced technology and features into a user friendly, rugged design. It provides front panel and PC programmability. It can sense engine parameters directly via analog senders, or it can communicate with the engine's ECU using SAE J1939 CANBUS communications. This device offers programmable inputs and outputs and programmable logic to allow the users easily customize the operation as desired.
  
- B. The controller shall have the capability to be configured to have eight additional output contacts, an internal RS-485, an internal industrial modem for remote communications and dialing out to a pager when the controller detects trouble. Controller shall have optional features for enhanced generator protection.

### 10.1.4. Functions

#### A. GENSET PROTECTION:

##### Standard Protection

- Undervoltage (27)
- Overvoltage (59)
- Underfrequency (81U)
- Overfrequency (81O)

##### Enhanced Protection

- Phase Imbalance (47)
- Generator Overcurrent (51)

#### B. All Generator Protection features are programmable as Alarms or Pre-alarms.

- a. Engine Alarms (Shutdowns)
- b. Low Oil Pressure
- c. High Coolant Temperature
- d. Low Coolant Temperature
- e. Overspeed
- f. Overcrank
- g. Engine Sender Unit Failure
- h. Emergency Stop
- i. Battery Charger Failure

#### C. Pre-Alarms (Warnings)

- a. Low Oil Pressure
- b. High Coolant Temperature
- c. Low Coolant Temperature
- e. Battery Overvoltage
- f. Weak Battery
- g. Battery Charger Failure

- h. Engine Sender Unit Failure
- i. Engine kW Overload
- j. Maintenance Interval Timer
- k. Low Coolant Level
- l. High Fuel Level
- m. Low Fuel Level
- n. Fuel Leak Detect

D. All Alarms and Pre-Alarms can be enabled or disabled via the BESTCOMSPlus or equivalent PC software or the front panel.

#### E. GENSET METERING

- a. Metered generator parameters include voltage, current, Hz, real power (watts), apparent power (VA), and power factor.
- b. Metered engine parameters include oil pressure, coolant temperature, RPM, battery voltage, fuel level, engine runtime, and various J1939 supported parameters.

#### 10.1.5. ENGINE CONTROL

- A. Cranking Control: Cycle or Continuous (Fully Programmable)
- B. Engine Cooldown: Smart Cooldown function saves fuel and engine life.
- C. Successful Start Counter: Counts and records successful engine starts
  - Timers:
    - a. Engine Cooldown Timer
    - b. Engine Maintenance Timer
    - c. Pre-Alarm Time Delay for Weak/Low Battery Voltage
    - d. Alarm Time Delay for Overspeed
    - e. Alarm Time Delay for Sender Failure
    - f. Arming Time Delays after Crank Disconnect:
      - Low Oil Pressure
      - High Coolant Temperature
    - g. Pre-Crank Delay
    - h. Continuous or Cycle Cranking Time Delay
- D. Provide Keyed cranking panel that bypasses the controller and safeties to crank the engine in the event the controller fails.

#### 10.1.6 EVENT RECORDING

- A. The DGC has an event recorder that provides a record of alarms, pre-alarms, engine starts, engine runtime loaded, engine runtime unloaded, last run date, and many other events that are all date and time stamped to help the user determine the cause and effect of issues related to the generator set.

## B. BATTERY BACKUP FOR REAL TIME CLOCK

A ten-year (typical life) lithium battery is used to provide long term maintenance for the real time clock setting. This battery is serviceable by removing the rear cover. All settings, programming, and even records are saved in non-volatile memory and do not require battery backup.

## 11. Accessories

- 11.1. **Battery Charger.** A 6-Ampere automatic float and equalize battery charger with +/- 1% constant voltage regulation from no load to full load over +/-10% AC input line variation, current limited during engine cranking and short circuit conditions, temperature compensated for ambient temperatures from -40°C to +60°C, 5% accurate voltmeter and ammeter, fused, reverse polarity and transient protected.
- 11.2. **Battery Rack and Cables.** Battery rack and battery cables capable of holding the manufacturer's recommended batteries shall be supplied.
- 11.3. **Block Heater.** The block heater shall be thermostatically controlled and sized to maintain manufacturers recommended engine coolant temperature to meet the start-up requirements of NFPA 99 and NFPA 110, Level 1.
- 11.4. **Circuit Breaker.** A UL 489 listed, 200 Amp, 100% rated line circuit breakers, molded-case type, generator-mounted with load side lugs.
- 11.5. **Critical Silencer.** The engine exhaust silencer shall be temperature and rust resistant, and rated for critical applications. The silencer will reduce total engine exhaust noise by 25-35 db(A).
- 11.6. **Flex Exhaust Tube.** The exhaust piping shall be gas proof, seamless, stainless steel, flexible exhaust bellows with threaded NPT connection.
- 11.7. **Flexible Fuel Line.** The flexible fuel line shall have a fitting for the engine inlet and a threaded pipe fitting for connection to the stationary piping
- 11.8. **Standard Air Cleaner.** The air cleaner shall provide engine air filtration which meets the engine manufacturer's specifications under typical operating conditions.

- 11.9 **Remote Annunciator.** Flush Mount Remote Annunciator meeting NFPA-110 requirements.
- 11.10 **Remote Emergency Stop Switch.** Break-Glass Type, provided loose for mounting in location specified by engineer.
- 11.11 **Oil and Coolant Drains with Valves.** Piped to edge of skid
- 11.12 **Manual Key Bypass Switch.** Provide manual key override bypass switch that allows starting of the generator manually in the event of control systems failure.

## 12. Standard Weather Enclosure

- 12.1. All enclosures are to be constructed from high strength galvalume.
- 12.2. The enclosure shall be finish coated with powder baked paint for superior finish, durability, and appearance. Enclosures will be finished in the manufacturer's standard color.
- 12.3. The enclosures must allow the generator set to operate at full load in an ambient temperature of 40 - 45°C with no additional derating of the electrical output.
- 12.4. Enclosures must be equipped with sufficient side and end doors to allow access for operation, inspection, and service of the unit and all options. Minimum requirements are two doors per side. When the generator set controller faces the rear of the generator set, an additional rear facing door is required. Access to the controller and main line circuit breaker must meet the requirements of the National Electric Code.
- 12.5. Doors must be hinged with stainless steel hinges and hardware and be removable.
- 12.6. Doors must be equipped with lockable latches. Locks must be keyed alike.
- 12.7. A duct between the radiator and air outlet must be provided to prevent recirculation of hot air.
- 12.8. The complete exhaust system shall be internal to the enclosure

**Please enclose brochure with specifications of the generator that you are submitting for this bid.**

Bid award will be to the lowest responsible bidder that meets specifications.

Contact Eddie Gilbert at 256-232-2631 with any additional questions regarding the above mentioned Specifications.

**Delivery date of finished product must be within thirty (30) days from the date of the Purchase Order.**

**TOTAL PER GENERATOR:  
(Minimum purchase of 2  
generators)**

**\$ \_\_\_\_\_**

**NAME OF COMPANY:**

\_\_\_\_\_

**CONTACT NAME:**

\_\_\_\_\_ **Please print**

**ADDRESS:**

\_\_\_\_\_

**E-MAIL:**

\_\_\_\_\_

**PHONE:**

\_\_\_\_\_