



MERCED IRRIGATION DISTRICT
MID-IFB-2018-15
Propane Engine Generator Set

Notice is hereby given that the Merced Irrigation District (MID) calls for an Invitation for Bids (IFB) to furnish a Propane Engine Generator Set.

1. The bid specifications contained in the Equipment Bid Form provides in detail the District's requirements for the equipment. Equipment Bid Forms are available by contacting Merced Irrigation District in writing at Ms. Annmarie Felsing, 744 W. 20th Street, Merced, California 95340, by telephone at (209) 354-2817, or by email at AFelsing@mercedid.org.
2. Each bid shall be made on the Equipment Bid Form furnished by Merced Irrigation District.
3. The bid amount shall include the furnishing of all labor, supervision, equipment, supplies, transportation, taxes, fees, and all other items necessary to perform the work and services requested.
4. Bid documents must be received in a sealed, opaque envelope clearly labeled with "Propane Engine Generator Set" and the name of the Bidder printed on the outside of the envelope. Bids received unsealed or unlabeled will not be considered. Bids submitted by facsimile (fax) transmission or by email will not be considered. Any bids received after the bid submittal deadline specified below shall be returned to the bidder unopened.
5. Bids should be delivered to Merced Irrigation District, 744 W. 20th Street, Merced, California, 95340, either by mail or in person. To be considered, bids must be **received** by the MID no later than **2:00 pm on Tuesday, January 8, 2019.**
6. If awarded, this IFB will be awarded by January 22, 2019. An award letter will be sent out at that time.
7. The successful bidder will be required to furnish Propane Engine Generator Set meeting the Bid Specifications no later than 2:00 p.m. Friday, March 22, 2019.

Peter Wade, P.E., Hydro Department Manager
Merced Irrigation District

EQUIPMENT BID FORM
MID-IFB-2018-15 - Propane Engine Generator Set
MERCED IRRIGATION DISTRICT

I. BID ITEM

The Merced Irrigation District is requesting bids for a brand-new Propane Engine Generator Set.

II. MINIMUM BID SPECIFICATIONS

Refer to Attachment A for the technical specification describing the minimum bid specifications for the equipment being procured by this IFB.

Product Manuals and Documentation

Three bound copies of all product manuals including manuals for additional equipment shall be provided with the equipment. Additionally, one set of digital documents shall be submitted either on Flash Drive or CD, with the digital documents being in PDF format.

Delivery and Installation

The equipment shall be delivered to the New Exchequer Hydroelectric Operations Facility at Lake McClure, 9188 Village Drive, Snelling, CA 95369. If the shipped Propane Engine Generator Set weighs no more than 3,000 pounds, then the District can unload it; otherwise, the supplier should provide for unloading of the equipment. Prior to delivery, the supplier shall identify and specify if and/or how any space heaters that are supplied with the equipment must be energized while the equipment is in storage and prior to MID installing and putting the equipment into service: space, electrical, and anchoring requirements will be coordinated no less than one month in advance of supplier's delivery schedule.

Schedule

The Propane Engine Generator Set shall be delivered to the District no later than 2:00 p.m. on Friday, March 22, 2019. With the Bid the supplier shall submit a written schedule detailing major milestones. For scheduling purposes supplier shall use two (2) weeks after date of bid submission as anticipated award date. Any significant deviation from this award assumption will result in a revised schedule submittal requirement by the supplier.

Warranty

All equipment provided shall be warrantied against defects in manufacturing or installation for a period of no less than one year from installation and first operation. The District expects to install the equipment sometime between April 1, 2019, and March 31, 2020.

<p>BIDDERS: Bid prices quoted below MUST include all applicable taxes and all related fees, including, but not limited to, sales tax, tire fees (if applicable), and transfer fees (if applicable), and permitting fees (if applicable). Merced Irrigation District is not exempt from sales taxes or any other applicable fees. Bids will be firm for 45 days, from date of IFB close.</p>
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III. EXCEPTIONS

Bidder shall explain any and all exceptions identified in Section II, above (attach additional sheets if necessary). Bidder shall submit with the Bid any technical submittal(s) associated with a request for substitution of the specification articles, devices, equipment, products, materials, fixtures, patented processes, forms, methods, or types of construction.

IV. BID

I agree to furnish Merced Irrigation District with the equipment specified on this Equipment Bid Form for the Prices indicated below:

1. SUBTOTAL for Propane Engine Generator Set	\$
2. Additional Equipment	\$
3. Delivery and temporary storage set up, if applicable.	\$
Total Bid Price	\$

BIDDER:

Supplier Name: _____

Contact Name: _____

Address: _____

City / State / Zip: _____

Phone Number: _____ Fax Number: _____

Email Address: _____

V. CERTIFICATION

In submitting this bid, I understand that Merced Irrigation District reserves the right to reject any and all bids and/or reject any and all items of such bids and/or waive any irregularities in a bid. By signature on this bid document, I agree that the equipment specified above will be delivered by 2:00 p.m. Friday, March 22, 2019. I certify that I am an authorized agent for the above supplier.

Signed: _____

Title: _____

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VI. BID SUBMITTAL

Please submit your bid in a SEALED, OPAQUE envelop labeled with “Propane Engine Generator Set” and the name of the Bidder printed on the outside of the envelope.

Refer to the section titled “Minimum Bid Specifications” for what is the minimum the Bid shall contain. Bids received unsealed or unlabeled will not be considered. Bids submitted by facsimile (fax) transmission or email will not be considered. Any bids received after the bid submittal deadline specified below shall be returned to the bidder unopened. Bids must be submitted by the time and date specified above in the IFB Notice on page 1, Item 5. Submit bids as specified in the IFB Notice to Merced Irrigation District, 744 W. 20th Street, Merced, California, 95340.

VII. QUESTIONS

Should a bidder find discrepancies in, or omissions from, the specifications contained herein, or should bidder be in doubt as to their meeting, he or she shall at once notify Ms. Annmarie Felsing, Purchasing Analyst, at (209) 354-2817 or AFelsing@mercedid.org, and should it be found necessary, a written addendum will be posted on the MID website.

No representative of Merced Irrigation District is authorized to give oral instructions, interpretations, or explanations of these specifications, and a submission of a bid constitutes agreement by the bidder that he or she has placed no reliance on any such oral instruction, interpretation, or explanation. Oral instructions may, however, be given by Merced Irrigation District upon inquiry by a bidder to direct the bidder’s attention to the location in the specifications or IFB that cover the subject of the inquiry.

Please refer all questions regarding this Equipment Bid Form or the specifications contained herein to Ms. Annmarie Felsing, Purchasing Analyst, in writing at AFelsing@mercedid.org.

TECHNICAL SPECIFICATION – PROPANE ENGINE GENERATOR SET

PART 1 -- GENERAL

1.1 GENERAL

- A. This specification describes the minimum technical requirements for the Propane Engine Generator Set, herein referred to as “standby generator” or “emergency standby generator”.
- B. The following is not included as part of the bid specifications:
 - 1. Propane storage vessel.
 - 2. Piping, valves, or other appurtenances required to connect the flow of LPG to the genset other than that which is supplied by the genset vendor as standard.
 - 3. Transfer switches.

1.2 CODES AND STANDARDS

- A. Generally, the latest editions of the following codes and standards are used in the design, selection of equipment, and materials:
 - 1. ANSI American National Standards Institute
 - 2. NFPA 30 Flammable and Combustible Liquids Code
 - 3. NFPA 37 Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
 - 4. NFPA 58 Liquefied Petroleum Gas Code
 - 5. NFPA 70 National Electric Code (NEC)
 - 6. NFPA 110 Standard for Emergency and Standby Power Systems
 - 7. IEEE C37.102 Guide for AC Generator Protection
 - 8. IEEE C57.13 Standard Requirements for Instrument Transformers
 - 9. NEMA MG1, Part 32 Motors and Generators
 - 10. UL 508 Standard for Industrial Control Equipment
 - 11. UL 1236 Standard for Battery Chargers for Charging Engine-Starting Batteries
 - 12. UL 2200 Stationary Engine Generator
 - 13. U.S. Environmental Protection Agency – National Emissions Standards

1.3 SUBMITTALS

A. Submittal Format and Organization:

1. The submittal package shall be transmitted electronically in “.pdf” format and distributed by email from the CONTRACTOR to the OWNER. The OWNER shall be responsible for distributing the submittal package to all reviewers and for receiving and compiling all review comments generated.
2. Submittal package shall be accompanied by OWNER’s standard submittal transmittal form, an electronic copy of which is available from the OWNER.
3. Cutsheets and product data shall be on sheets sized 8-1/2- by 11-inches. Shop drawings shall be on sheets sized 11- by 17-inches. All sheets shall be submitted in one pdf file and arranged. Bookmarks shall be provided in the pdf file for each major equipment subsection (e.g. genset controller, line circuit breaker, shop drawings, etc.).
4. Clearly mark on cutsheets and shop drawings proposed models, options, accessories, ratings, dimensions, weights, electrical stub-up areas, and anchorage requirements.
5. Disorganized submittals or submittals without sufficient level of detail presented will be returned without review.

- B. The OWNER will return comments (in pdf format) by email to the CONTRACTOR within 21 calendar days following original receipt by the OWNER. It is considered reasonable that the CONTRACTOR will make a complete and acceptable submittal to the OWNER by the first resubmittal. The OWNER reserves the right to withhold monies due to the CONTRACTOR to cover additional costs of the OWNER’S ENGINEER’s review beyond the first resubmittal. The ENGINEER’s and OWNER’s combined maximum review period for each submittal or resubmittal will be 21 calendar Days.

C. Submittal Review Marking:

1. **NO EXCEPTIONS TAKEN.** If a submittal is returned to the CONTRACTOR marked “NO EXCEPTIONS TAKEN,” formal revision and resubmission will not be required.
2. **MAKE CORRECTIONS NOTED.** If a submittal is returned marked “MAKE CORRECTIONS NOTED,” CONTRACTOR shall make the corrections on the submittal, but formal revision and resubmission will not be required.
3. **REVISE-RESUBMIT.** If a submittal is returned marked “REVISE-RESUBMIT,” the CONTRACTOR shall revise it and shall resubmit the required number of copies. Resubmittal of portions of multi-page or multi-drawing submittals will not be allowed. For example, if a Shop Drawing submittal consisting of 10 drawings contains one drawing noted as “REVISE - RESUBMIT,” the submittal as a whole is deemed “REVISE - RESUBMIT,” and all 10 drawings are required to be resubmitted.
4. **REJECTED-RESUBMIT.** If a submittal is returned marked “REJECTED-RESUBMIT,” it shall mean either that the proposed material or product does not satisfy the

specification, or the submittal is so incomplete or disorganized that it cannot be reviewed. In either case, the CONTRACTOR shall prepare a new submittal and resubmit.

- D. Submittals shall be carefully reviewed by an authorized representative of the CONTRACTOR prior to submission to the OWNER. Each submittal shall be dated and signed by the CONTRACTOR as being correct and in conformance with the Specifications. Any deviations from the Contract Documents shall be noted on the transmittal sheet. The OWNER will only review submittals that have been so verified by the CONTRACTOR. Non-verified submittals will be returned to the CONTRACTOR without action taken by the OWNER, and any delays caused thereby shall be the total responsibility of the CONTRACTOR.
- E. Furnish the following data for review:
1. Specification compliance statement, describing differences between specified and proposed equipment.
 2. **Shop Drawings:**
 - a. Dimensioned outline drawings showing plan and elevations of standby generator set.
 - b. Engine and generator weight.
 - c. Anchoring requirements.
 - d. Schematic and wiring diagrams for the following:
 - 1) Controller.
 - 2) Main generator.
 - 3) Voltage regulator.
 - 4) Battery charging system.
 - 5) Governing system.
 - 6) Enclosed electrical components.
 3. **Cutsheets:**
 - a. Catalog information and technical descriptions.
 - b. Complete list of accessories provided.
 - c. Performance curves showing engine efficiency (fuel consumed per kWh output), gross fuel consumption rate, and kW output at design rated output, 50% load, and 25% load.
 - d. Transient and subtransient reactances (in per unit).

- e. Output waveform and telephone interference factor.
- f. Line circuit breaker data, including make and model, catalog number, settings, electronic trip unit data, and time current curves.
- g. Warranty.
- h. Motor starting capability and percent voltage dip curves at each load step specified.
- i. Block heater size and voltage.
- j. Battery charger product data.
- k. Controller product data.
- l. Enclosure product data.
- m. Noise data for enclosed generator set at 50%, 75%, and full load.

4. Operation and Maintenance Manual:

- a. Furnish two complete copies of the Operation and Maintenance Manual.
- b. Provide the name, phone and fax numbers, and email address of the contractor, manufacturer, and a distributor where spare parts and filters can be purchased.
- c. Include the following:
 - 1) Instructions on the installation, operation, maintenance, repair, troubleshooting, and warranty of the systems.
 - 2) Manufacturer's Certificate of Compliance with EPA, state, and local emissions requirements.
 - 3) Factory Test Reports.
 - 4) Diagrams listing all system components, part numbers, and a list of recommended spare parts and maintenance procedures.
- d. The following identification shall be inscribed on the covers:

OPERATING AND MAINTENANCE INSTRUCTIONS
Emergency Standby Generator Set
Merced Falls Dam
 Name of the Contractor
 Contract Number

1.4 QUALITY ASSURANCE

- A. As a complete unit, the standby generator set shall be listed to UL 2200.

B. Manufacturer shall be certified to ISO 9001.

1.5 SPARE PARTS

A. Furnish, tag, and box for shipment and storage the following spare parts:

1. One air cleaner filter.
2. One oil filter.
3. One pint of touch-up paint for each major color used.

1.6 MANUFACTURER'S SERVICES

A. Installation of standby generator set will occur within 12 months of procurement, at which time the OWNER's installing contractor will request services from manufacturer for the procured standby generator set. These services, while not part of this Procurement Package, will require the manufacturer's representative to be present at the Site at a future date for the following:

1. Installation assistance and inspection.
2. **Functional and Performance Testing:**
 - a. Conforming to NFPA 110.
 - b. Minimum 2 hours performance test, demonstrating ability of generator to carry specified loads and standby generator set safety shutdowns. Manufacturer's representative shall make necessary adjustments during test.
 - c. After completion of performance testing, manufacturer shall make final adjustments, replace fuel and oil filters, and check belt drive tensions.
 - d. Demonstration of proper operation of automatic control and transfer between normal power and standby power in both directions, including all shunt operation of non-essential loads.
3. Completion of Manufacturer's Certificate of Proper Installation, to be inserted into Operation and Maintenance Manual provided under this Specification.
4. Any training of OWNER's personnel, as required.
5. Facility startup.

PART 2 -- PRODUCTS

2.1 MANUFACTURERS

- A. Kohler.
- B. Cummins.

C. Caterpillar.

2.2 SERVICE CONDITIONS

- A. Ambient Temperature Range at Air Intake: 0 to 120 degrees F maximum.
- B. Ambient Temperature Range at Engine Generator Set: 0 to 120 degrees F maximum.
- C. Site Elevation: 348 feet above sea level.

2.3 DESIGN REQUIREMENTS

- A. Emergency standby generator set shall include:
 - 1. Liquefied Petroleum Gas (LPG) (propane) vapor withdrawal spark-ignited internal combustion-engine generator.
 - 2. Self-contained, steel, weatherproof, sound-attenuated enclosure.
 - 3. Local control panel, complete with Local/Remote selector switch and Modbus RTU communication capability.
 - 4. Line circuit breaker, rated 100% with electronic 'LSI' trip.
 - 5. Starting battery and float/equalize battery charger.
 - 6. Exhaust system complete with exhaust silencer internal to enclosure.
 - 7. Generator ventilation and cooling system complete with radiator, fans, pumps and jacket water heaters.
 - 8. All other equipment and facilities required for outdoor use.
 - 9. All standard vendor-supplied appurtenances required for connection to a propane storage vessel.
- B. **Emissions:** Engine shall meet US EPA standard emission requirements as well as all applicable California state and local requirements.

2.4 ENCLOSURE

- A. The standby generator shall be housed in a self-contained, outdoor enclosure that shall be acoustically designed per NFPA 110 so that the measured peak sound level shall not exceed 73 dBA radially at 23 feet from the engine exhaust pipe and the enclosure at any time.
- B. The standby generator shall be cooled by a radiator mounted on the enclosure.
- C. The generator, engine, and all auxiliaries shall be mounted on a common skid in accordance with the specified seismic anchoring and restraint requirements. Connections to the engine shall be with flexible couplings.

- D. Enclosure shall have hinged access doors on both sides for ease of maintenance. Each access door shall have a lockable door handle, with identical locks. A minimum of ten (10) key sets shall be provided to the OWNER with the standby generator.
- E. Openings shall have screens and/or guards designed to limit access of rodents into the enclosure.

2.5 PERFORMANCE REQUIREMENTS

- A. The standby generator shall meet the following performance requirements:
 - 1. The standby generator shall have a Standby power rating for emergency power applications where:
 - a. Power is supplied for the duration of 48 hours; and,
 - b. Where no utility parallel operation is permitted under the rating.
 - 2. The standby generator’s alternator shall be rated for uninterrupted operation for the following load steps, assuming across-the-line starting of gate motors:

Table 1: Load Step Schedule

Load Step #	Equipment	Voltage	Full Load Amps (FLA), Running	Load Power Factor	Starting Amps
1	Powerhouse ac Station Service Bank #2	480V, 3ph	36	0.80	36
	Future 30 kVA Station Service Bank	480V, 3ph	36	0.80	36
	Radial Gate 3	480V, 3ph	11	0.77	66
2	Radial Gate 2	480V, 3ph	11	0.77	66
3	Radial Gate 1	480V, 3ph	11	0.77	66
4	Crane or New Trash Rack Cleaning Machine, on VFD ⁽¹⁾	480V, 3ph	40	0.90	40

(1) These loads will never run simultaneously and neither exceeds the power requirements shown.

2.6 ELECTRICAL REQUIREMENTS

- A. Alternator shall comply with the requirements of NEMA MG1 Part 32.
- B. **Standby alternator ratings:**
 - 1. 480 Vac, 3-phase, 12 lead, 60 Hz, 137 kW (171 kVA) for LPG at a minimum power factor of 0.80. Vendor shall validate ratings per the specified Table 1: Load Step Schedule in section Performance Requirements and inform OWNER’s ENGINEER of ratings validation results prior to final procurement.
 - 2. Generator shall be wye-connected with grounded ‘C’ phase (corner-grounded wye with unbonded neutral) to match electrical system to be served.

- C. Synchronous type with 2/3 pitch, revolving field, drip-proof construction, air cooled by a direct drive centrifugal blower fan.
- D. **Insulation:** Class H, with a maximum rise of 130 degrees C over 40-degree C ambient in accordance with NEMA MG 1.
- E. **Excitation:**
 - 1. Field brushless or permanent magnet type exciter.
 - 2. PMG and Controls: Capable of sustaining short-circuit current of up to 300% of rated current for up to 10 seconds.
- F. **Overspeed Capability:** 125%.
- G. **Stator Windings:** Vacuum-impregnated with epoxy varnish, and skewed for smooth voltage waveform.
- H. **Telephone Interference Factor:** 50 maximum.
- I. **Total Harmonic Current and Voltage Distortion:** 5% maximum, measured at generator line circuit breaker.
- J. **Voltage and Frequency Regulation:**
 - 1. Solid state, three-phase sensing type.
 - 2. Adjustable output voltage level to $\pm 5\%$.
 - 3. Provisions for proper voltage regulation for future variable frequency drives (VFDs) as part of generator load.
 - 4. The control system shall maintain the voltage within $\pm 1\%$ under 0 to 110% steady state load conditions and the frequency within ± 1.5 Hz at steady state operation.
 - 5. The voltage dip from no load to full load (step load) shall not exceed 30% overall and shall not exceed 15% in any load step listed above.
 - 6. Alternator shall recover to rated voltage and frequency within 2 seconds following initial load application.

2.7 LINE CIRCUIT BREAKER

- A. The standby generator circuit breaker shall be housed inside the standby generator enclosure and shall be readily accessible from the exterior of the enclosure through a door.
- B. The circuit breaker shall be 100% rated and equipped with an adjustable electronic 'LSI' trip sensor unit with the following functions:
 - 1. Adjustable long-time current pickup.

2. Adjustable long-time delay.
 3. Adjustable short-time current pickup.
 4. Adjustable short-time delay.
 5. Adjustable instantaneous trip.
- C. The frame rating of the circuit breaker shall be manufacturer's standard for the generator set supplied.
- D. **Interrupt Rating:** Manufacturer's standard at 480V.

2.8 CONTROLS

- A. The standby generator local control panel shall be housed inside the standby generator enclosure and shall be readily accessible from the exterior of the enclosure through a door.
- B. Emergency stopping of the standby generator shall cause the engine to shut down immediately and shall not allow for a cooldown period.
- C. The standby generator local control panel shall include the following functions:
1. Manual/auto selector switch.
 2. Start/stop pushbuttons.
 3. Emergency stop pushbutton.
 4. Running indication.
 5. Trouble indication.
 6. Test indication.
 7. Fail to start indication.
 8. Fault reset pushbutton.
 9. Alarm silence pushbutton.
 10. Panel lamp test.
- D. The following I/O shall be associated with the standby generator:

#	Description	Type	Connected Device
1	Generator Start and Stop	Discrete inputs	Automatic Transfer Switch
	Generator Emergency Stop	Discrete input	Plant Controller
2	Alarms & Status:		

	(a) Running	Discrete output	Plant Controller
	(b) Trouble	Discrete output	Plant Controller
	(c) Fail	Discrete output	Plant Controller
	(d) Low fuel level	Modbus RTU	Plant Controller
	(e) Low oil pressure	Modbus RTU	Plant Controller
	(f) High oil temperature	Modbus RTU	Plant Controller
	(g) Low oil level	Modbus RTU	Plant Controller
	(h) High coolant temperature	Modbus RTU	Plant Controller
	(i) Low coolant level	Modbus RTU	Plant Controller
	(j) High bearing temperature	Modbus RTU	Plant Controller
	(l) Over speed	Modbus RTU	Plant Controller
	(m) Over cranking	Modbus RTU	Plant Controller
	(n) Battery failure	Modbus RTU	Plant Controller
	(o) Charger failure	Modbus RTU	Plant Controller

E. All I/O shall be available via Modbus RTU communication with the plant controller.

2.9 CONSTRUCTION

- A. The standby generator set shall be mounted on a heavy-duty steel base to maintain alignment between components. The base shall incorporate a battery tray with hold-down clamps within the rails.
- B. All switches, lamps, and meters in the control system shall be oil-tight and dust-tight, and the enclosure doors shall be gasketed. There shall be no exposed points in the control (with the doors open) that operate in excess of 50 volts.

2.10 CONNECTIONS

- A. The standby generator set load connections shall be composed of silver or tin-plated copper bus bars, drilled to accept mechanical or compression terminations of copper conductors sized at 115% of rated genset kW. Sufficient lug space shall be provided for use with up to three parallel sets of feeder conductors.
- B. Power connections to standby generator set auxiliary devices shall be made at the devices by the installing contractor at the time of installation, with required protection provided by plant distribution panels. Knockout provisions in the genset skid shall be made to access such connections.
- C. Standby generator set control interfaces to other system components shall be made on a common, permanently labeled terminal block assembly.

2.11 FACTORY TESTS

- A. Conform to NFPA 110.
- B. **Steady Load Test:** Test standby generator set at steady load for 60 minutes minimum duration at 100% full load.
- C. **Transient Load Test:** Demonstrate ability to meet load pickup and load release requirements specified.
- D. **Harmonic Test:** Conduct at full load conditions.
- E. **Report:**
 - 1. Strip chart recording and full harmonic analysis measuring up to 50th harmonic for both voltage and current and three phases simultaneously.
 - 2. Transient response.
 - 3. Load/speed stability.
 - 4. Engine fuel consumption.
 - 5. Power output.

PART 3 -- EXECUTION (NOT USED)

- END OF SECTION -

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