Amendment No. 3
To
Contract No. NA130000072
For
Preventative & Corrective Maintenance Agreement
for Biogas Generator at Hornsby Bend
Between
Innio Jenbacher North America, LLC
and the
City of Austin

1.0 The City hereby executes a holdover of the above referenced contract for a period of 180 days. The term for the holdover will be March 11, 2021 to September 7, 2021.

2.0 The City hereby amends the contract to increase authorization by $1,171,225. The total contract authorization is recapped below:

Action	Action Amount	Total Contract Amount
Initial Term: 03/11/2013 – 03/10/2021	$1,619,200.00	$1,619,200.00
Amendment No. 1: Vendor Change 06/26/2020	$0.00	$1,619,200.00
Amendment No. 2: Administrative Increase 02/07/2021	$62,000.00	$1,681,200.00
Amendment No. 3: 180-day holdover 03/11/2021 – 09/07/2021 Adding remaining funding per Exhibit A – RCA Meeting date 05/26/2011, Agenda Number 37 3/1/2021	$1,171,225.00	$2,852,425.00

3.0 MBE/WBE goals do not apply to this contract.

4.0 By signing this Amendment the Contractor certifies that the vendor and its principals are not currently suspended or debarred from doing business with the Federal Government, as indicated by the GSA List of Parties Excluded from Federal Procurement and Non-Procurement Programs, the State of Texas, or the City of Austin.

5.0 All other terms and conditions remain the same.

BY THE SIGNATURES affixed below, this amendment is hereby incorporated into and made a part of the above-referenced contract.

Sign/Date: March 2, 2021

Thomas Jaud
Managing Director

Innio Jenbacher North America, LLC
11330 Clay Road
Houston, Texas 77041-5587
(770) 712-1385

Sign/Date: Matthew Duree Digitally signed by Matthew Duree Date: 2021.03.05 13:46:30 -06'00'

Matthew Duree
Procurement Manager

City of Austin
Purchasing Office
124 W. 8th Street, Ste. 310
Austin, Texas 78701

Attached:
Exhibit A – RCA

Amendment No. 2
To
Contract No. NA130000072
For
Preventative & Corrective Maintenance Agreement
for Biogas Generator at Hornsby Bend
Between
Innio Jenbacher North America, LLC
and the
City of Austin

1.0 The City hereby exercises an administrative increase in the amount of $62,000.00 to the subject contract. The administrative increase will become effective on February 7, 2021.

2.0 The total contract authorization is recapped below:

Action	Action Amount	Total Contract Amount
Initial Term: 03/11/2013 – 03/10/2021	$1,619,200.00	$1,619,200.00
Amendment No. 1: Vendor Change 06/26/2020	$0.00	$1,619,200.00
Amendment No. 2: Administrative Increase 02/07/2021	$62,000.00	$1,681,200.00

3.0 MBE/WBE goals do not apply to this contract.

4.0 By signing this Amendment the Contractor certifies that the vendor and its principals are not currently suspended or debarred from doing business with the Federal Government, as indicated by the GSA List of Parties Excluded from Federal Procurement and Non-Procurement Programs, the State of Texas, or the City of Austin.

5.0 All other terms and conditions remain the same.

BY THE SIGNATURES affixed below, this amendment is hereby incorporated into and made a part of the above-referenced contract.

Sign/Date: February 23, 2021

Printed Name: Thomas Jaud
Managing Director

Innio Jenbacher North America, LLC
11330 Clay Road
Houston, Texas 77041-5587
(770) 712-1385

Sign/Date: Matthew Duree
Digitally signed by Matthew Duree
Date: 2021.02.26 09:54:16 -06'00'

Matthew Duree
Procurement Manager

City of Austin
Purchasing Office
124 W. 8th Street, Ste. 310
Austin, Texas 78701

Amendment No. 1
to
Contract No. NA130000072
For
Preventative & Corrective Maintenance Agreement
for Biogas Generator at Hornsby Bend
Between
Smith Power Products, LLC
and the
City of Austin

1.0 The Contract is hereby amended as follows: Change the vendor information as requested and documented by the vendor.

	From	To
Vendor Name	Smith Power Products, LLC	Innio Jenbacher North America, LLC
Vendor Code	VS0000035237	V00000968738
FEIN	[redacted]	[redacted]

2.0 All other terms and conditions of the Contract remain unchanged and in full force and effect.

BY THE SIGNATURE affixed below, this Amendment No. 1 is hereby incorporated into and made a part of the Contract.

Linell Goodin-Brown Digitally signed by Linell Goodin-Brown Date: 2020.06.26 12:30:06 -05'00'

Linell Goodin-Brown
Procuement Supervisor
City of Austin, Purchasing Office

Date

M E M O FOR RECORD

DATE: 4/15/16

SUBJECT: NA130000072 Smith Power Products

RCA was approved for an amount of $1,563,200 for maintenance of the engine generator however when the contract was awarded and created there was an administrative increase of $56,000 added to the contract amount. There was a clause that stated that the City would return to Council for additional authorization within the next 6 months and request additional funding to allow for price escalation listed in the Preventive and Corrective Maintenance Agreement. There has not been a requirement to go back to Council at this time.

Georgia Billela
Senior Buyer

Financial and Administrative Service Department
Purchasing Office
PO Box 1088, Austin, Texas, 78767

March 8, 2013

Smith Power Products, Inc
Brent Sandberg
15603 W. Hardy Rd
Houston, TX, 77060

Dear Brent:

The Austin City Council approved the execution of a contract with your company for a preventative & corrective maintenance agreement for the Biogas Generator at Hornsby Bend in accordance with the referenced solicitation.

Responsible Department:	Austin Water
Department Contact Person:	Ken Lockard
Department Contact Email Address:	Ken.Lockard@austintexas.gov
Department Contact Telephone:	(512) 972-1953
Project Name:	Preventative & Corrective Maintenance Agreement for Biogas Generator at Hornsby Bend
Contractor Name:	Smith Power Products, Inc
Contract Number:	**MA-2200-NA130000072**
Contract Period:	March 11, 2013 through March 11, 2021
Dollar Amount:	Not-to-exceed $1,619,200
Requisition Number:	RQM-2200-13022700233
Solicitation Number:	SMH0117
Agenda Item Number:	37
Council Approval Date:	May 26, 2011

Thank you for your interest in doing business with the City of Austin. If you have any questions regarding this contract, please contact me at (512) 505-7351.

Sincerely,

Shawn M. Willett

Shawn M. Willett
Supervising Senior Buyer
Purchasing Office
Finance and Administrative Services Department

CONTRACT BETWEEN THE CITY OF AUSTIN ("City")
AND
SMITH POWER PRODUCTS, INC ("Contractor")
for
Preventative and Corrective Maintenance Agreement for Hornsby Bend GE Jenbacher Unit
MA-2200-NA130000072

The City accepts the Contractor's Offer (as referenced in Section 1.1.3 below) for the above requirement and enters into the following Contract.

This Contract is between Contractor having offices at Houston, Texas 77060, and the City, a home-rule municipality incorporated by the State of Texas, and is effective as of the date executed by the City ("Effective Date").

Capitalized terms used but not defined herein have the meanings given them in Solicitation Number SMH0117.

1.1 **This Contract is composed of the following documents:**

1.1.1 This Contract between the City and Contractor.

1.1.2 The provisions relating to the proposed maintenance agreement in the City's Solicitation, Request for Proposal (RFP) SMH0117, including all documents incorporated by reference.

1.1.3 The provisions relating to the proposed maintenance agreement in Contractor's Offer, dated April 1, 2011, including subsequent clarifications.

1.1.4 The Preventative and Corrective Maintenance Agreement as agreed upon and signed by both parties.

1.2 **Order of Precedence.** Any inconsistency or conflict in the Contract documents shall be resolved by giving precedence in the following order:

1.2.1. This Contract between the City and Contractor.

1.2.2 The Preventative and Corrective Maintenance Agreement as agreed upon and signed by both parties.

1.2.3 The provisions relating to the proposed maintenance agreement in the Contractor's Offer as referenced in Section 1.1.3, including subsequent clarifications.

1.2.4 The provisions relating to the proposed maintenance agreement in the City's Solicitation, Request for Proposal (RFP) SMH0117, including all documents incorporated by reference.

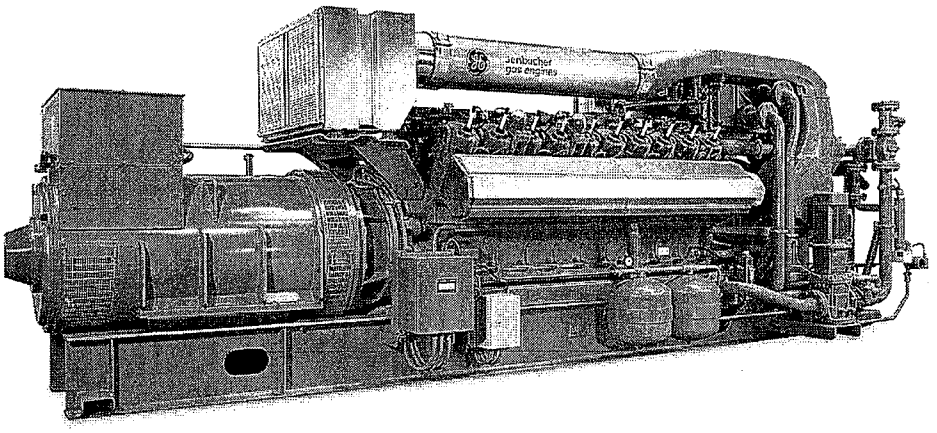
1.3 **Compensation.** The Contractor shall be paid a total Not-to-Exceed amount of $1,619,200 for the Contract term which includes an administrative increase of $56,000. The City will return to Council for additional authorization within the next 6-months and request additional funding to allow for adjustments pursuant to the price escalation provisions in the Preventive and Corrective Maintenance Agreement. Contingent upon the approval of the Austin City Council, the contract will be amended to add this additional funding. Payment shall be made as outlined in the Preventative and Corrective Maintenance Agreement.

This Contract (including any Exhibits) constitutes the entire agreement of the parties regarding the subject matter of this Contract and supersedes all prior and contemporaneous agreements and understandings, whether written or oral, relating to such subject matter. This Contract may be altered, amended, or modified only by a written instrument signed by the duly authorized representatives of both parties.

In witness whereof, the City has caused a duly authorized representative to execute this Contract on the date set forth below.

SMITH POWER PRODUCTS, INC.	**CITY OF AUSTIN**
BRENT D. SANDBERG	Shawn M. Willett
Printed Name of Authorized Person	Printed Name of Authorized Person
Signature	Shawn M Willett Signature
SR. V.P./C.F.O.	Supervising Senior Buyer
Title:	Title:
3/7/2013	3-7-2013
Date:	Date:

Jenbacher gas engines



City of Austin

Preventative and Corrective Maintenance Agreement

for One (1) GE Jenbacher Units

and Associated Equipment

located at Hornsby WWTP Site

PREVENTIVE AND CORRECTIVE MAINTENANCE AGREEMENT

THIS PREVENTIVE AND CORRECTIVE MAINTENANCE AGREEMENT (this "Agreement") is made and entered into by and between Smith Power Products, Inc., a Delaware corporation, with its principal place of business located at 3065 West California Avenue, Salt Lake City Utah, 84104 (the "Contractor"), and City of Austin, with offices at 2210 South FM 973, Austin, Texas 78725 (the "Customer").

In consideration of the mutual promises to be kept and performed and other valuable consideration, it is hereby agreed as follows:

1. Definitions

1.1 The following terms shall have the meaning set forth below when used in this Agreement: "Term of Agreement" means 0 to 60,000 operating hours (OPH) or up to 8 Years whichever occurs first, including the major overhaul.

1.2 "Planned Maintenance Program" means the Contractor's Level 3 Program providing Scheduled and Unscheduled Maintenance for the Covered Units as defined in Sections 1.5 and 2.

1.3 "Contractor Taxes" means any and all corporate and individual taxes that are measured by net income or profit imposed by any government authority of any country on Contractor, its employees or subcontractors, due to the performance of or payment for work under this Agreement but specifically does not include all other taxes, fees, or other charges of any nature, which shall be paid by Customer.

1.4 "Covered Unit" means the engines/modules supplied under the City of Austin, Texas Requisition No RQM-1100-11030900239 and its associated Purchase Agreements and subsequent Agreements and as illustrated in Final Shop Drawings submitted July 7, 2012, including State Manufacturing Drawing SE-13833 and as further detailed in Section 2 with the specific engine identified as follows:

Type:	JGS 316 GS-B.L C81
Design No.:	J L603
Engine No.(s):	1046906
Oph at start of contract: 0 oph	

1.5 "Customer Taxes" means any and all taxes, fees, or other charges of any nature (including, but not limited to, ad valorem consumption, excise, franchise, gross receipts, import, export, license, property, sales, stamp, storage, transfer, turnover, use or value-added taxes, and any and all items of withholding, deficiency, penalty, addition to tax, interest, or assessment related thereto), other than Contractor Taxes, imposed by any governmental authority. Products exported from the United States are presumed to be exempt from Customer Taxes levied within the United States.

1.6 "Extra Work" means goods or services that Contractor provides apart from the goods and services that Contractor has agreed to provide under the terms of this Agreement. Extra Work shall be provided pursuant to the terms of Section 3.8. Contractor shall

provide a written price quote for any Extra Work and shall demonstrate that the cost of Extra Work is fair and equitable.

1.7 "Facility" means the Hornsby Bend Biosolids Management Facility in which the Covered Unit is located. The Facility is located at 2210 South FM 973, Austin, Texas 78725.

1.8 "Hazardous Materials" means toxic substances, hazardous substances or hazardous wastes, as such terms are defined in any law, statute, ordinance or regulations promulgated by any national, federal, state, provincial or local government authority or the country of the Site.

1.9 "Insolvent" means that:

1.9.1 a party makes an assignment for the benefit of creditors, or petitions or applies for or arranges for the appointment of a trustee, liquidator or receiver, or commences any proceeding relating to itself under any bankruptcy, reorganization, arrangement, insolvency, readjustment of debt, dissolution or liquidation or similar law of the country under which the insolvent party is organized or a country in which the insolvent party conducts business, now or hereafter in effect (collectively "Bankruptcy Laws"), or shall be adjudicated bankrupt or insolvent in such a country; or

1.9.2 a party gives its approval of, consent to, or acquiesces in, any of the following: the filing of a petition or application for the appointment of a trustee, liquidator or receiver against that party; the commencement of any proceeding under any Bankruptcy Laws against that party; or the entry of an order appointing any trustee, liquidator or receiver; or

1.9.3 a party is generally unable to pay its debts when due or if not excused from paying under Section 6 below is late in making two or more consecutive payments required under this Agreement.

1.10 "Monitoring & Performance System" means a system or systems which belong to Customer but which may be used from time to time by Contractor for monitoring of the Covered Unit and/or provision of performance information and support, generally consisting of hardware, software, and a connection to a source of technical oversight or review.

1.11 "Parts" means new, repaired or refurbished parts, materials, components and other goods furnished by Contractor, or its subcontractors or suppliers, under this Agreement for the Covered Unit.

1.12 "Scheduled Maintenance" means scheduled maintenance services and necessary Parts in accordance with the maintenance specifications and schedules attached hereto as Appendix 1 for the equipment scope pursuant to Section 2.

1.13 "Site" means the real property upon which the Facility is located.

1.14 "Unscheduled Maintenance" means the Parts and labor, including the Contractor's employees and/or subcontractor's travel and living expenses, shipping, equipment,

trouble shooting, and all other related services, equipment and materials required for corrective maintenance as requested by Customer in writing on the Covered Unit. Unscheduled Maintenance shall include all corrective repair work required to restore proper functionality and operation to the Covered Unit pursuant to Section 3.6.

2. Scope of Supply

The Contractor shall provide the Scheduled Maintenance, Unscheduled Maintenance and necessary Parts according to this Agreement for the components of the Covered Unit as set forth below:

- All Engine and Generator Set Equipment as shown in GEJ Drawings and ACS drawings, including mechanical, electrical instrumentation, including the Dia.Ne control system, and wiring contained within the Enclosure to a point where Customer piping and wiring connections occur.
- All External Equipment Connected to the Enclosure as shown in ACS Drawings including heat exchangers, exhaust system and control valve(s), and connected piping and appurtenances to the Customer piping and wiring connections. Weather Proof Sound Attenuated Enclosure and all Fixtures attached.
- Thomson Switchgear and Battery Equipment as shown on Thompson Switchgear Drawings and State Manufacturing Drawing SE-13833.
- All Cooling System components including decoupled heat exchanger, exhaust heat exchanger, engine water jacket, oil cooler, 1st stage intercooler, 2nd stage intercooler, internal coolant pumps, and external radiators.

Customer agrees to make reasonable access to Contractor for providing Scheduled and Unscheduled Maintenance under this Agreement. Customer agrees to promptly notify Smith Power Products of any operational issues or irregularities that may require attention or repair.

3. Obligations of the Contractor

3.1 Availability Guarantee.

The Scheduled and Unscheduled Maintenance of the Covered Unit shall be completed by Contractor in order to meet the Level 3 Availability Guarantee of 87% per Gen-Set according to the formula below. For every hour of down time below this guaranteed availability the Customer shall be compensated at the rate of $27.50 per hour. This compensation shall be limited to 10% of the yearly billing amount of this Agreement.

The Formula for Calculation of Availability

$$A = [(TI + TM + TF) / 8760] * 100$$

Where:

TM= Down time for preventive maintenance

TF= Standstill hours which are not within the limits of responsibility of Contractor (e.g. notification period, no demand, periphery failure, Customer required shutdown for purposes other than maintenance concern/trip/fault/alarm, fuel gas supply and/or conditioning system failure, Austin Energy Electrical Grid conditions that do not allow power production).

TI = Effective Operating Hours (according to service hour meter)

A = Availability in %

3.2 Customer Oversight.

In a good faith effort to assist the Customer, Contractor shall periodically review log entries of Customer and provide written comments and instructions to Customer regarding fulfilment of Customer's obligations. However, Contractor's oversight obligations in this Section 3.2 are being provided in an effort to assist the Customer in fulfilling its obligations and shall not be a basis to impose any liability or responsibility upon the Contractor. Nevertheless, Contractor shall not instruct Customer to take any action that will void the warranty or invalidate any part of the work covered under this Agreement.

3.3 Scheduled Maintenance and Parts.

The Contractor shall be responsible to carry out the Scheduled Maintenance on the Covered Units and to provide the necessary Parts. Subject to the condition of components of the Covered Unit, Contractor may vary intervals and scope stated in the maintenance specifications and schedules (Appendix 1). Both parties will agree in writing on the exact date for carrying out Scheduled Maintenance.

3.4 Spark Plugs / Cylinder Heads / Oil Filters.

Spark plugs (not exceeding 8 sets of 16 pieces per Covered Unit), oil filters and cylinder heads are considered to be Parts according to Section 3.3.

3.5 Overhauls.

The Contractor shall be responsible for carrying out scheduled minor overhauls in accordance with maintenance specifications and the GEJ schedules (Appendix 1) and to provide the necessary Parts. A major overhaul consisting of a complete overhaul of the Engine, Generator cleaning and bearing replacement, refurbish as needed the Engine Control Systems as detailed in Appendix 1, shall be completed by Contractor on or before the 60,000 OPH period. In such case that major equipment experiences premature failure short of its Manufacturer's Recommended Time Before Overhaul of 60,000 OPH by 10% or less (or between 54,000 oph and 60,000 oph) and upon written agreement of the parties, Contractor may perform the major overhaul earlier than the 60,000 OPH. A Certified Factory Remanufactured Engine may be substituted for

complete overhaul of the Engine. Both parties will agree in writing on the date of any overhauls at least one (1) month in advance of starting any work.

As part of the major overhaul, the Contractor will perform the following services:

3.5.1 Prepare complete module frame for removal from container;

3.5.2 Dismount generator from module and send to generator rebuild shop for repair;

3.5.3 Remove engine assembly from module frame;

3.5.4 Refurbish plate heat exchangers;

3.5.5 "A" control panel refurbishing and repair wiring;

3.5.6 "M" control panel refurbishing and repair wiring;

3.5.6 Clean and touch up paint on generator bases;

3.5.7 Repair engine base accessories and brackets;

3.5.8 Mount and connect new factory rebuilt engine (including rewiring as needed);

3.5.9 Remount repaired generator and align as needed;

3.5.10 Prepare complete unit for installation back into container;

3.5.11 Reconnect unit once back into container and prepare for commissioning; and

3.5.12 Prepare, wrap and ship the used engine long block cores back to Austria.

3.6 Unscheduled Maintenance and Parts.

The Contractor shall carry out necessary repairs of the Covered Units, including supplying Parts for such repairs. Contractor may anticipate Scheduled Maintenance events under this Agreement, in order to combine such services with necessary repairs. The same applies for the major overhaul, which is also covered under this Agreement Upon written agreement of the parties, Contractor may perform the major overhaul earlier and invoice the service to the Customer separately, with Contractor bearing the cost for the repair portion of the work.

Customer must immediately notify Contractor of any operational issues or irregularities requiring Unscheduled Maintenance. Customer shall initiate requests for Unscheduled Maintenance by contacting the Contractor via the service hotline on a 24-hour/365-day basis; the Contractor shall provide support via the telephone in an effort to resolve the issue; if the parties cannot remedy the Unscheduled Maintenance need via telephone consultation, the Contractor shall provide factory qualified and properly equipped service technicians to the Site within 48-hours of the telephone request by Customer for site assistance, subject to Site accessibility. Customer personnel shall cooperate with Contractor in an effort to diagnose problems and remedy any minor issues such as the

exchange of minor components (e.g., pressure and temperature transmitter, thermometer, gauges, ignition coils, etc.) and the elimination of insignificant leaks not being detrimental for a safe operation.

3.7 If the Customer agrees in writing that certain Unscheduled Maintenance does not materially affect the operation and/or performance of the Covered Unit or the Facility, and waives any potential claims relating thereto, such Unscheduled Maintenance may be performed during Contractor's next Scheduled Maintenance visit to the Site or as schedules otherwise conveniently permit. All Unscheduled Maintenance is included in the $/OPH price set forth in Section 6.1.

3.8 Extra Work.

Contractor may agree to furnish Parts and services needed to perform work beyond the Scope of Supply set forth in this Agreement, including, but not limited to, commercially available conversions and modifications or upgrades to a Covered Unit. Upon Customer's written request, Contractor will submit a written price quote for any Extra Work. Contractor shall have no obligation to perform any Extra Work unless it has accepted a separate written purchase order from Customer for such Extra Work.

3.9 Remote Service and Hotline.

Contractor shall provide a service hotline on a 24-hour/365-day basis and carry out remote service from time to time, by making use of the Monitoring & Performance System. Remote service may include performance of remote diagnosis, fault location on Covered Units and the inspection of existing data stock. Remote Service does not include permanent monitoring of the Covered Units.

3.10 Lube Oil.

Contractor shall be responsible to provide the necessary lube oil for the Covered Unit (not to exceed 841 liters of fresh oil) and to dispose of used oil (not to exceed 600 liters of oil) every 2,000 oph in accordance with appropriate specifications. All costs for lube oil analysis shall be borne by the Contractor, except for cost for taking oil samples and forwarding these oil samples to a laboratory named by the Contractor. The prices set forth in this Agreement are based on current lube oil prices which are currently at the as delivered price of $13.24 per gallon based on list price of Mobil Pegasus 710 as priced by Allied Sales, Austin, Texas or other supplier agreed to by Contractor and Customer located in Austin, Texas. At the start of each calendar year, the list price of oil shall be identified in writing to the Customer. In the event of an increase in lube oil prices of greater than 5% in any given calendar year, the price to be paid by Customer to Contractor will be equitably increased for the new calendar year to reflect those additional increased costs during said year.

3.11 Use of Certain Refurbished Parts.

In performance of the Scope of Supply under this Agreement, Contractor may use Certified Parts meeting Original Equipment Manufacturer (OEM) specifications which have been previously installed at a power generation facility other than the Facility and subsequently refurbished,

provided, such refurbished Parts shall be subject to the warranty provisions of Section 12 and the ongoing maintenance requirements of this Agreement.

3.12 Contractor shall be responsible to provide delivery, transport, and disposal of the lube oil.

3.13 Contractor is responsible for the accuracy of the written instructions it provides to the Customer.

4. Not included in the Obligations of the Contractor

The following are expressly beyond the scope of the Contractor's obligations under this Agreement and are therefore not a part of this Agreement:

4.1 Conversion and/or modification of the Covered Units.

4.2 Storage and disposal of commodities necessary for the operation of Covered Units as given in the technical instructions, including, but not limited to, fuel gas, flushing compounds, battery acid, anti-freezing compound, glycol coolant, and solvents used for cleaning. Customer shall also assist Contractor in receiving and storing lubrication oil.

4.3 Additional expenditures due to shut-down of Covered Units for reasons other than due to Scheduled or Unscheduled Maintenance of the Covered Unit as covered in this Agreement, as well as cost for mounting / demounting and transport of Covered Units during a major overhaul.

4.4 Services associated with the rigging and removal of the Engine and Generator (e.g. construction or rebuilding activities cost for cranes, etc.) required to facilitate major overhaul, as well as similar cost for rigging and installing Factory Remanufactured Engine and Generator back into Weather Proof Enclosure. Contractor shall make the Engine and Accessories ready to remove and shall connect and return Engine and Accessories to service.

4.5 Shipping costs related to shipping Factory Remanufactured Engine to the Site and the engine core back to the manufacturer as part of the Major Overhaul. To the extent that there is a Factory Authorized Rebuilding Site located in the United States, the Customer shall only be responsible for those shipping costs related to shipping to and from the Factory Authorized Rebuilding Site located in the United States as part of the Major Overhaul.

4.6 Any repair necessary because of damages not caused by the engineered design or damages due to any kind of force, water or fire, corrosion, contamination, caused by conditions exceeding the engineered designed scope of supply, or an Excusable Event as described in Section 21 or Customer's failure to comply with technical instructions in accordance with Appendix 2. These instructions form an integral part of this Agreement and any repairs necessary because of Customer's failure to comply with such instructions are beyond the scope of the Contractor's obligations under this Agreement and shall constitute Extra Work. Intervention by unauthorized persons or third parties shall void any warranty or claims under this Agreement, including, but not limited to claims for warranty or corrective maintenance.

4.7 Troubleshooting, implicating rather simple activities like the exchange of minor components (e.g., pressure and temperature transmitter, thermometer, gauges, ignition coils, etc.) and the elimination of insignificant leaks not being detrimental for a safe operation. Contractor shall not instruct Customer to take any action that will void the warranty or invalidate any part of the work covered under this Agreement.

4.8 Any activities on components that are not explicitly defined to be within Scope of Supply agreed upon (e.g., Gas skid and supply, etc.).

4.9 Material not scheduled but which must be changed due to adverse changes in the specific operating conditions

4.10 Contractor shall not be responsible for the cost of removal or replacement of systems, structures or parts of the Facility other than the Covered Unit and such work and such costs beyond the opening and closing of the Covered Unit as necessary for the performance of Scheduled Maintenance, Unscheduled Maintenance and the major overhaul, as well as Contractor's Warranty obligations shall be paid as Extra Work pursuant to Section 3.8.

5. Obligations of the Customer

The Customer shall be responsible for the following:

5.1 Performance and recording of operation, inspection and maintenance works, which in accordance with the operation log and maintenance schedule, are obligations of the Customer. Customer shall keep the operation log daily.

5.2 Performances of maintenance work identified on page 1 of Appendix 1 of the GEJ maintenance schedules.

5.3 To Maintain Minimum gas quality as defined in TA 1000 - 0300 (with catalytic converter operation without warranty limitation). Maintenance necessary due to gas quality, not in accordance with the above, shall be charged separately as Extra Work.

5.4 To provide Contractor promptly with the fuel gas analysis which must be carried out by the Customer every three (3) months. Contractor is not liable for damages resulting from an unacceptable gas quality. If the gas quality changes remarkably, the Contractor reserves the right to request increased fuel gas analysis frequency and/or demand a gas analysis by an authorized laboratory.

5.5 Provision of a secured room suitable for storage at Site free of charge. The Customer has a room of approximately 180 square feet available to the Contractor.

5.6 Customer is obliged to make any modifications or manipulation to the plant operations to minimize the impact of an emergency with possible physical harm to people or damage to the plant, including without limitation, using the E-Stop feature on the Engine-Generator and calling the Contractor as soon as possible. Any other manipulations and modifications require written approval by the service manager in charge of Contractor.

5.7 To permit the Contractor to carry out the maintenance and repair works during the normal working time from 7.30 a.m. to 5.00 p.m. from Monday to Friday, without assertion of any compensation.

5.8 To strictly meet the requirements for engine lubrication oil or the oil changes, parameters for Jenbacher Gas engines, cooling water quality and anti-freezing compound and anti-corrosion compound and fuel gas quality, all according to the technical instructions (see Appendix 2).

5.9 Customer shall install an internet connection or a telephone modem and two telephone connections directly at the modem server for the Covered Unit. The second telephone connection, which serves to provide communications with the Customer's personnel in the course of a remote diagnostic procedure, can also be realised by means of mobile telephone. The costs for this shall be borne by the Customer.

5.10 Customer shall accept online monitoring that allows the Contractor to take off-site readings of the status of the oph and certain relevant performance measurements. The Contractor has the right to take on-site readings for accounting purposes or ask for written records of the performed operating hours.

5.11 Storage and disposal of commodities necessary for the operation of Covered Units as given in the technical instructions, including, but not limited to, fuel gas, flushing compounds, battery acid, anti-freezing compound, or cleaning materials. Customer shall also assist Contractor in receiving and storing lubrication oil.

6. Price

The price to be paid by Customer to Contractor is set forth in this Section 6. Customer shall not be entitled to perform and/or carry-out withholdings, discounts, reductions or offsets of any amounts owed to Contractor, including, but not limited to, those derived or supposedly derived from claims (present or future alleged or effective and including claims derived from supposed objective liability or negligence of Contractor) of Customer against Contractor in accordance with this Agreement or derived from another cause.

6.1 Price for Services.

As charges for the services carried out by the Contractor according to this Agreement the following price, exclusive of VAT and any additional taxes other than "Contractor Taxes", is agreed upon:

USD $22.81 /operating hour (oph) per Covered Unit excluding Lube oil services
USD $ 4.50 /operating hour (oph) additional cost per Covered Unit for Lube oil services

This price is valid until December 31, 2013. The price for 2014 and each year thereafter will be adjusted according to the price variation clause given in Section 6.4. See section 3.10 for additional Lube oil price variation.

6.2 Customer Payments.

The Customer shall be responsible to pay the charges as described in Section 6.1 for each Covered Unit subject to this Agreement within forty-five (45) days after receipt of Contractor's invoice. Billing shall take place monthly based on actual oph's. The standard built-in operating hour counters are the basis for the billings.

All payments to be made under this Agreement must be made by Customer to: (i) the bank account number: 4121532659. Bank: Wells Fargo Bank. Branch office: 299 South Main, 9Th Floor, S.L.C., UT 84111. ABA number: 121000248. Swift number: WFBIUS6S or (ii) any other bank account notified by Contractor in writing pursuant to Section 28 below. All payments under this Agreement will be considered made upon receipt of the agreed amounts in immediately available funds in Contractor's bank account identified hereinabove.

6.3 Price Escalation.

The price per operating hour stated in Section 6.1 shall be escalated in accordance with this Section 6.4. The said price per operating hour shall be adjusted on an annual basis beginning on January 1, 2014, and on January 1st of each year thereafter, by an amount determined in accordance with the definitions and formulas described in this Section 6.3.

Escalation Procedure: The adjusted price per operating hour for each year, beginning January 1, 2014, shall be computed as early in that year as the indices are available and effective as to all payments for goods and services provided commencing January 1st of that year. In the event the indices are published as "preliminary," invoices and/or payments shall be calculated and submitted according to such "preliminary" indices and shall be adjusted as necessary once the "final" indices are published and invoices issued for the retroactive amounts.

Definitions: The following definitions shall apply:

For escalation purposes, the $/oph set forth in Section 6.1 shall be made up of 60% Material Index and 40% Labor Index. The Material Index shall be the annual change in the Index of the German Statistical Federal Authority for "combustion engines and turbines", No. GP-2811 in October of each year.

For determining Base and Actual Exchange Rate the daily interbank Euro/US Dollar exchange rates shall be sourced from the website: http://www.oanda.com/convert/fxhistory. In case such website ceases to exist, a similar, mutually agreed website will be identified.

The annual Labor Index shall be the annual percentage change in the Producer Price Index Industry Data:

Series ID: PCU811310811310
Industry: Commercial machinery repair and maintenance
Product: Commercial machinery repair and maintenance

Formula:

The Current Year Price ("CYP") shall be determined with the following formula using the Previous Year Price ("PYP"):

CYP = [(PYP x 0.40) x (annual % increase in Labor Index)] + [(PYP x 0.60) x (annual % increase in Material Index)],

Where annual % increase in labor or material Index value = (Index Value this year – Index Value last year)/100

In the event that the specified indices are discontinued, or the basis of this calculation is materially modified, equivalent indices shall be substituted by mutual agreement of the parties.

6.4 If, during the term of this Agreement, any new legislation, taxes or regulations are established that are related to oil and/or other waste removal requirements or fees, then Contractor shall be entitled to pass on such charges to Customer at cost without mark up if such services form a part of this Agreement. If oil services are included and the price of oil will change for more than twenty percent (20%), then, an equitable adjustment will be negotiated between the parties.

6.5 In case Unscheduled Maintenance, within the responsibility of the Contractor, must be done on Saturdays, Sundays, holidays or working days (Monday to Friday) beyond the normal working time, which is 7:30 a.m. to 5:00 p.m., the actually consumed working time and costs incurred will be additionally invoiced based on the difference between Contractor's standard normal working hour fees and standard overtime fees as set forth in Contractor's Annual Labor Rate Sheet attached as Appendix 6 (to be updated annually). Contractor will not charge Customer any overtime fees for Scheduled Maintenance.

6.6 Extra Work shall be provided pursuant to Section 3.8 at time and material rates in effect at the time the work is performed. Contractor shall submit invoices for Extra Work as such work is performed and as Parts for such work are shipped. Customer shall make payment for Extra Work within forty-five (45) days after the date of Contractor's invoices.

6.7 In addition to the foregoing, Customer shall pay interest to Contractor, at the rate of one percent (1%) per month (or any fraction thereof), not to exceed the lesser of twelve percent (12%) per annum or the maximum amount permitted by applicable law, on all amounts not timely paid in accordance with this Agreement.

7. Term of Agreement

7.1 This Agreement is valid from 0 operating hours for the Covered Unit and shall end without the need for a notice of termination when the Covered Unit reaches 60,000 operating hours or 8,000 starts, whichever occurs first, and the major overhaul has been completed.

This Agreement shall become effective upon the date of signature of both parties. Rendering of services shall commence with the first operating hour performed under this Agreement.

7.2 Minimum Operating Hours Provision.

Both parties understand by signing this Agreement that the prices quoted are based upon a certain minimum expected operating hours during the term of this Agreement. The defined yearly minimum operating hours for this Agreement are 6,600 operating hours per year for each Covered Unit. If the actual yearly operating hours for a Covered Unit fall short by more than twenty percent (20%) of the minimum expected operating hours, and the cause is outside the Contractor's control, Contractor will have the right to bill up to eighty percent (80%) of the minimum expected operating hours for such unit.

8. Termination

8.1 Termination for Default and/or Insolvency.

Either party (the "Non-Defaulting Party") may terminate this Agreement if the other party (the "Defaulting Party") (i) becomes Insolvent or (ii) the Defaulting Party commits a material breach of this Agreement and fails to cure the breach within thirty (30) days of notice from the Non-Defaulting Party, or if it is not possible to cure such breach within thirty (30) days of such notice, fails to commence to cure the breach within thirty (30) days and fails to thereafter continue diligent efforts to complete the cure as soon as reasonably possible. For any default other than a default in payment under Section 6, this provision for Termination for Default may only be exercised by notice in writing within ninety (90) days of the event(s) giving rise to the default and effective thirty (30) days from such written notice.

In the case of Termination for Default and/or Insolvency pursuant to this Section, the Defaulting Party shall pay the Non-Defaulting Party the Termination Amount as specified in Section 8.2. In addition, all payments required under this Agreement for Contractor's performance prior to the effective date of such termination and all payments due prior to such termination date shall also be paid in accordance with this Agreement. Moreover, in the event that Termination is the result of Default or Insolvency by the Customer, Contractor shall also be entitled to recover all out-of-pocket costs and expenses incurred by the Contractor in performing its obligations under this Agreement if incurred prior to the termination date. The foregoing specified in this Section 8.1 shall be the sole exclusive rights and liabilities of the Non-Defaulting Party and Defaulting Party, respectively, on account of Termination for Default and/or Insolvency and the breach giving rise to such termination.

8.2 Termination Amount.

In the event that the Customer is the Defaulting Party, the Contractor shall be entitled to retain as the "Termination Amount" any and all amounts paid by the Customer under this Agreement, including without limitation, any amounts that have been paid by the Customer toward the major overhaul as of the effective date of such termination.

In the event that the Contractor is the Defaulting Party, the "Termination Amount" shall be twenty percent (20%) of the total amount that has been paid by the Customer pursuant to Section 6 as of the effective date of such termination (excluding the amounts paid for Lube oil services - $4.50/oph pursuant to Section 6.1), less any amounts that Contractor has committed toward the major overhaul as of the effective date of such termination.

The parties agree that the damages likely to be incurred by a Non-Defaulting Party or Non-Terminating Party in the event of termination will be difficult to measure, that the Termination Amount is reasonable, and that the Termination Amount shall be paid as liquidated damages in lieu of all such actual damages and not as a penalty.

If this Agreement is terminated on account of an Excusable Event as defined in Section 21.1, Customer shall pay to Contractor all payments required under this Agreement for Contractor's performance prior to the effective date of such termination and all payments due prior to such termination date. In the event this Agreement is terminated on account of an Excusable Event, payment of the Termination Amount specified in this Section 8.2 is not required.

8.3 Obligations Prior to Termination.

Termination or expiration of this Agreement shall not relieve either party of any obligation arising out of work performed prior to termination.

9. Technical Instructions

Development works carried out by the manufacturer of the Covered Unit(s) may result in new findings as to optimization of the operation and maintenance, which might cause modifications of the maintenance schedules and technical instructions. As soon as reasonably practicable after these documents are released, the Contractor will provide the Customer with the latest edition of these documents and adjust the maintenance accordingly. The Contractor will inform the Customer about changes, if any, in the maintenance procedure and whether and to which extent the new measures will be applied to this Agreement.

10. Insurance Coverage

10.1 Insurance Requirements.

The Contractor shall carry insurance in the types and amounts indicated below for the duration of the Agreement:

10.1.1. Workers' Compensation and Employers Liability coverage with limits consistent with statutory benefits outlined in the Texas Workers' Compensation Act (Act. 8308-1.01 et seq Tex. Rev. Civ. Stat.) and minimum policy limits for employers liability of $100,000 bodily injury each accident, $500,000 bodily injury by disease policy limit and $100,000 bodily injury by disease each employee. The following endorsements shall be added to the policy:

a) A Waiver of Subrogation in favor of the City of Austin

b) A 30 day Notice of Cancellation/Material Change in favor of the City of Austin

10.1.2. Commercial General Liability Insurance with a minimum bodily injury and property damage per occurrence limit of $500,000 for coverages A (bodily injury and property damage) & B (personal and advertising injury). Coverage for products and

completed operations shall also be provided with a limit of $500,000. The policy shall contain the following provisions:

b) City of Austin listed as additional insured

c) 30 day Notice of Cancellation in favor of the City of Austin

d) Waiver of Transfer Right of Recovery Against Others in favor of the City of Austin

10.1.3. Business Automobile Liability Insurance for all owned, non-owned and hired vehicles with a minimum combined single limit of $500,000 per occurrence for bodily injury and property damage. The policy shall contain the following endorsements in favor of the OWNER:

a) Waiver of Subrogation endorsement

b) 30 day Notice of Cancellation endorsement

c) Additional Insured endorsement

General Requirements

The Contractor must complete and forward the Customer's standard certificate of insurance to the Customer before the Agreement is executed as verification of coverage required in subparagraphs above. The Contractor shall not commence work until the required insurance has been obtained and until such Insurance has been reviewed by the Customer.

The Contractor's insurance coverage is to be written by companies licensed to do business in the State of Texas at the time the policies are issued and shall be written by companies with A.M. Best Ratings of B+ VII or better.

All endorsements naming the Customer as additional insured, waivers and notices of Cancellation endorsements as well as the certificate of insurance shall indicate: City of Austin, attn.: _____, P.O. Box 1088, Austin, Texas 78767.

The "other" insurance clause shall not apply to the Customer where the Customer is an additional insured shown on any policy. It is intended that policies required in the Agreement, covering both the Customer and Contractor, shall be considered primary coverage as applicable.

If coverage is underwritten on a claims made basis, the retroactive date shall be coincident with the date of this Agreement and the certificate of insurance shall state that the coverage is claims made and the retroactive date shall be shown. The Contractor shall maintain coverage for the duration of this Agreement and for a two year period following the end of this Agreement. Upon request, the Contractor shall provide the Customer annually with a certificate of insurance as evidence of such insurance.

If insurance policies are not written for amounts specified above, the Contractor shall carry Umbrella or Excess Liability Insurance for any differences in amounts specified. If Excess Liability Insurance is provided, it shall follow the form of the primary coverage.

The Contractor shall not cause any insurance to be canceled nor permit any insurance to lapse during the term of the Agreement or as required in the Agreement.

The Contractor shall be responsible for premiums, deductibles, self-insured retentions, if any, stated in policies. All deductibles or self-insured retentions shall be disclosed on the certificate of insurance.

The Contractor shall provide the Customer thirty (30) days written notice of erosion of the aggregate limits below occurrence limits for all applicable coverages indicated within the Agreement.

The insurance coverages required under this Agreement are required minimums and are not intended to limit the responsibility or liability of the Contractor.

10.2 Customer's Insurance.

During the Term of this Agreement, Customer shall maintain the following insurance coverage:

10.2.1 Workers' Compensation and any other statutory insurance required by law with respect to work-related injuries or disease of employees of Customer applicable to Customer's employees in such form(s) and amount(s) as required by all applicable laws.

10.2.3 Commercial General Liability or Public Liability ("CGL") insurance for Customer's protection, in broad form including coverage for liability assumed under contract, providing coverage for bodily injury and property damage with a combined single limit of not less than Five Million US Dollars ($5,000,000) cumulative total of underlying and excess coverage.

10.2.3 Contractor understands that Customer is self-insured for all liability exposures.

10.3 Failure to Maintain Insurance.

Failure of either of the parties to maintain any insurance required under this Section 10 shall constitute an event of material breach for the purposes of Section 8.1 and, in addition to termination rights, either party shall have the right to immediately suspend performance and delivery until such breach is cured. The suspending party shall give written notice of said suspension within twenty-four (24) hours of suspension.

10.4 Performance Bond

The Contractor shall provide an annual performance bond in the initial amount of $171,075, which shall be renewed and updated in the amounts set forth below on an annual basis during the term of the Contract. The Customer will accept an annual performance bond; however, neither non-renewal or cancellation by the surety, nor failure of the Contractor to file a replacement bond in the event the surety exercises its right to not renew or cancel the bond, shall itself be a breach of this Agreement and will not serve as a basis for a claim against the bond or any extension thereof. If any conflict exists between the surety's obligations or undertakings as described in the bond and this Agreement, then the terms of the bond shall prevail.

Year	Amount of Bond
1	$171,075
2	$239,505
3	$273,720
4	$307,935
5	$342,150
6	$376,365
7	$410,580
8	$444,795

The Customer is responsible to pay the costs associated with the performance bond after being furnished a copy of the invoice from Contractor's surety. The Contractor shall pass those costs along to the Customer without any mark-up as part of its monthly billing immediately following the annual renewal of the bond. The Contractor's surety has agreed to provide Contractor and Customer with at least sixty (60) days written notice in the event that the surety elects not to renew the bond. In the event of nonrenewal by the surety, Contractor will work expeditiously to provide alternative security in a form acceptable to Customer, which acceptance shall not unreasonably be withheld.

11. Taxes and Duties

Contractor shall be responsible for, and shall pay directly all Contractor Taxes.

If Customer intends to claim any exemption from taxes or duties related to this Agreement or its performance, Customer agrees to furnish without charge evidence of tax or duty exemption acceptable to the taxing or customs authorities. Furthermore, if Customer arranges for export shipment, Customer agrees to provide Contractor, without charge, an export bill of lading.

12. Warranty

The sole and exclusive warranties under this Agreement are the Limited Warranty on New GE Jenbacher Equipment attached hereto as Appendix 3 and the Limited Warranty on Service Exchange Products attached as Appendix 4. The Parts provided by Contractor hereunder are covered by Appendix 3 and the long block provided as part of the major overhaul is covered by Appendix 4.

In fulfilling its warranty responsibilities as described in this Section, Contractor shall be responsible for the cost of opening and closing of the Covered Unit in order to access Parts for warranty repair or replacement, but Contactor shall not be responsible for removal or replacement of systems, structures or parts of the Facility other than the Covered Unit.

The preceding paragraphs of this Section set forth the exclusive remedies for all claims based on failure of, or defect in, the Parts and services provided under the Agreement or Contractor's performance, whether the failure or defect arises before or during the applicable warranty period and whether a claim, however instituted, is based on contract, indemnity, warranty, tort (including negligence), strict liability or otherwise. The foregoing warranties and guarantees are exclusive and are in lieu of all other warranties and guarantees whether written, oral, implied or statutory. NO IMPLIED WARRANTY OF ANY TYPE,

INCLUDING BUT NOT LIMITED TO, THE STATUTORY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY.

13. Delivery, Title Transfer, Risk of Loss

13.1 Delivery.

13.1.1. General Delivery Terms.

Contractor shall be responsible for scheduling delivery of Parts for the Scheduled Maintenance and Unscheduled Maintenance under this Agreement, pursuant to any work schedule discussed and agreed with Customer. Partial deliveries will be permitted.

13.1.2. Shipment to Storage.

If any of the Parts cannot be delivered to Customer when ready, due to any cause not attributable to Contractor, Contractor may ship such Parts to storage. If such Parts are placed in storage, including storage at the facility where manufactured or at the Site, the following conditions shall apply: (a) risk of loss shall pass to Customer,; (b) any amounts otherwise payable to Contractor upon delivery or shipment shall be payable upon presentation of Contractor's invoices; and (c) all expenses incurred by Contractor, such as for preparation for and placement into storage, handling, inspection, preservation, insurance, storage, removal charges and any taxes shall be payable by Customer upon submission of Contractor's invoices.

13.1.3. Delivery of Parts.

Parts shall be delivered Freight On Board (FOB) the Site.

13.2 Passage of Title.

13.2.1 Passage of Title to Customer.

Title to Parts shall not pass to Customer until they are installed on the Covered Units at the Site. Title to service work in progress at Site shall pass when such services are performed and completed in accordance with this Agreement.

13.2.2 Passage of Title to Contractor.

Contractor shall have the right, at its option, to take title to and possession of, and remove from Site, any parts or components of the Covered Unit which have been replaced with Parts supplied by the Contractor under this Agreement. Title to such parts and components shall pass from Customer to Contractor at Site upon completion of the outage during which the replacement Part is installed. Contractor shall be responsible for packing such parts and components at the Site.

13.3 Risk of Loss.

Risk of Loss or damage to Parts supplied by Contractor shall pass to Customer when delivered to the Site.

14. Repair Services Logistics, Inventory Utilization

14.1 Repair Services Conducted at Off-Site Repair Facilities.

If Customer retains title to parts and components of a Covered Unit that are removed from a Covered Unit and which are to be repaired or refurbished at a facility or location other than the Site ("Repair Facilities") and returned to Customer, the following provisions, Sections 14.1.1, 14.1.2 and 14.1.3 shall apply:

14.1.1. Contractor shall be responsible for all actions and costs related to packing and transporting the parts and components of the Covered Unit to and from the Site and the Repair Facilities. Notwithstanding any other provisions in this Agreement, including any reference to INCOTERMS, Contractor shall bear risk of loss and related insurance costs for the parts and components of the Covered Unit while in transit to or from the Repair Facilities and while at the Repair Facilities.

14.1.2. When the repair services at Repair Facilities for parts and components owned by Customer have been completed, Contractor shall arrange for shipment to the Site. In the event that Customer is not able to accept delivery of repaired parts and components from the Repair Facilities at such time and shipment is postponed, Customer shall reimburse Contractor at Contractor's then current storage rate for the additional days the parts and components of the Covered Unit remain at the Repair Facilities.

14.1.3. Customer parts and components at the Repair Facilities shall be subject to Contractor's lien rights under this Agreement or arising under the law. All scrap and used parts and components which have been replaced during repair services made at the Repair Facilities shall be the property of Contractor.

14.2 Services Conducted at the Site.

Contractor shall retain title to any Contractor equipment, tools, systems and materials ("Contractor Equipment") utilized by Contractor in connection with this Agreement, or loaned or made available to Customer, at the Site. Contractor shall be responsible for transit costs and risk of loss and insurance costs for such Contractor Equipment to and from the Site. Under no circumstances shall Contractor be obligated to loan or make any Contractor Equipment available to Customer.

The GE Jenbacher Unit and other associated equipment purchased from the Contractor is the property of the US Department of Energy until such time title is passed to the City of Austin. Nevertheless, Customer represents and warrants that it has the requisite power and authority to enter into this Agreement for the maintenance of the Covered Unit. The execution, delivery, and performance of this Agreement have been duly and validly authorized and no other proceedings or actions on the part of Customer are necessary to authorize this Agreement or the services to be provided hereunder.

14.3 Inventory Utilization.

Customer shall permit Contractor to utilize parts, which Customer has in storage and that Contractor has procured. Except as set forth in this Section 14.3, Contractor shall be responsible for delivering replacement parts at Contractor's expense within a reasonable time (considering among other things the repair and transportation time and anticipated Scheduled Maintenance) after Contractor has used Customer's spare parts. Contractor may at its option, replace such parts with new, refurbished or repaired Parts. Customer shall retain title to and properly keep and store the Customer spare parts at the Site during the Term of this Agreement.

Upon termination or expiration of this Agreement, Contractor shall have the right to remove any parts, equipment, tools, systems and materials remaining at the Site to which Contractor has title.

15. Health and Safety, Hazardous Materials

15.1 Customer will take necessary precautions for the safety and security of Contractor's personnel and property at the Site, including, but not limited to, complying with all health and safety laws and regulations. This includes, but is not limited to, provision for review by Contractor of, and instruction by Customer on, Customer's safety practices, proper and safe handling and disposal of hazardous substances and protection of Contractor's personnel from exposure thereto, energization/ de-energization of all power systems (electrical, mechanical and hydraulic) using a safe and effective lock-out tag procedure, and conducting periodic safety meetings.

15.2 Contractor shall comply with reasonable health and safety requirements established from time to time by Customer at the Facility, provided, however, that if Customer imposes unusual or new requirements, or requirements that materially impact Contractor's costs or performance, the parties will negotiate appropriate amendments to this Agreement to address such impact, including an equitable adjustment in price and/or payment terms.

15.3 Contractor may, from time to time, conduct safety audits to insure safe conditions exist and make recommendations to Customer concerning same. Neither the conduct or non-conduct of safety audits nor the making of any recommendation by Contractor shall relieve Customer of the responsibility to provide a safe place to work. If Contractor personnel require medical attention, local Customer first aid facilities will be made available to Contractor personnel for the duration of such needs at Contractor's expense.

15.4 If, the safe execution of services at the Site is, or is apt to be, imperiled by local conditions, Contractor may remove some or all of its personnel from the Site and/or supervise performances of all or any part of its services and/or evacuate its personnel and Customer shall assist in said evacuation, any of which shall be considered to be an Excusable Delay.

15.5 The operation of equipment at the Site is the responsibility of Customer not the Contractor.

15.6 If, at the Site, Contractor encounters any Hazardous Material which requires special handling and/or disposal, Customer shall immediately take whatever precautions are required to legally eliminate such hazardous conditions so that the work under the Agreement may safely proceed. If any such Hazardous Materials cause an increase in

Contractor's cost of or the time required for performance of any part of the work, an equitable adjustment shall be made in the price and schedule. Customer agrees to properly dispose of all Hazardous Materials produced or generated in the course of Contractor's work at the Site. Customer is responsible for any and all claims, damages, losses, causes of action, demands, judgments and expenses arising out of or relating to (i) the presence of any Hazardous Materials which are present on the Site prior to the commencement of Contractor's work; or (ii) improperly handled or disposed of by Customer; or (iii) brought on to the Site or produced thereon by parties other than Contractor.

15.7 Contractor shall not be responsible for any costs in any manner related to Hazardous Materials, for remediation or otherwise, unless such Hazardous Materials were brought onto the Site or produced thereon by Contractor.

16. Assignment of Services

Neither party may transfer or assign, in whole or in part, any of its rights or obligations under this Agreement without the express written consent of the other party, such consent not to be unreasonably withheld. Any transfer or assignment, or attempted transfer or assignment, in contravention of this Section16, whether by operation of law or otherwise, shall be null and void.

Nothing in this Section 16 shall restrict Contractor from subcontracting portions of its work, provided that Contractor shall remain responsible and liable to Customer for performance of subcontracted work.

17. Indemnification

Contractor agrees to indemnify and hold harmless Customer from and against any loss or expense by reason of tangible, physical damage to the property of third parties or bodily injury, including death, of persons to the extent such damage or injury results directly from the negligence of Contractor or its subcontractors while engaged in the performance of this Agreement. To the extent allowed by Texas law, Customer agrees that it is responsible to the exclusion of any such responsibility of Contractor for its own proportionate share of any loss or expense by reason of tangible, physical damage to the property of third parties or bodily injury, including death, of persons to the extent such damage or injury results directly from the negligence of Customer or its other contractors while engaged in the performance of this Agreement and as determined by a court of competent jurisdiction. In the event such damage or injury is caused by the joint or concurrent negligence of Customer (or its other contractors) and Contractor (or its subcontractors), Contractor shall only be responsible for its proportionate share of any loss or expense to its degree of negligence or the degree of negligence of its subcontractors.

18. Changes

Each party may, from time to time, propose changes to this Agreement, which changes will be subject to mutual written and express agreement of the parties. Contractor will advise Customer if any proposed change will result in a change in the price or payments, anticipated schedule of performance, or have other cost or performance impacts. Contractor shall not be obligated to proceed with any change until the parties have agreed upon its effect and signed a written amendment or change order document.

19. Contractor's Suspension Right

In addition to its other rights, if Customer fails to fulfil any of the payment conditions in this Contract (if Customer is not excused from paying under Section 6) or becomes generally unable to pay its debts when they become due, or sustains a material deterioration of its financial condition, Contractor may suspend performance of services and delivery of Parts and/or thereafter require full or partial payment in advance. Any cost incurred by Contractor in accordance with such suspension (including storage costs) shall be payable by Customer upon submission of Contractor's invoices.

20. Laws, Codes and Standards

20.1 The prices set forth in this Agreement are based on Contractor's manufacture and delivery of the Parts and performance of the services pursuant to (i) its manufacturing processes and procedures and quality assurance program; (ii) those portions of industry specifications, codes and standards, in effect as of the date of Contractor's proposal to Customer, which Contractor has deemed applicable to the Parts and services; and (iii) applicable laws, rules and regulations in effect on the date of Contractor's proposal to Customer.

20.2 The prices will be equitably increased to reflect additional costs incurred by Contractor resulting from a change in industry specifications, codes, standards, laws, rules or regulations described in Section 20.1 after the date of Contractor's proposal to Customer which affect the Parts and services. Reasonable adjustments will also be made to the delivery date, Service performance dates, and other provisions as may be appropriate on account of compliance with the foregoing.

21. Excusable Events

21.1 Neither Customer nor Contractor shall have any liability or be considered to be in breach or default of its obligations under this Agreement to the extent that performance of such obligations is delayed or prevented, directly or indirectly, due to: (i) causes beyond its reasonable control; or (ii) acts of God, act (or failure to act) of governmental authorities or third parties not engaged by the party claiming Excusable Delay, fires, severe weather conditions, earthquakes, strikes or other labor disturbances, floods, war (declared or undeclared), epidemics, civil unrest, riot, acts of terrorism; or (iii) acts (or omissions) of the other party including failure to promptly perform its obligations under this Agreement; or (iv)inability on account of causes beyond its reasonable control to obtain necessary materials, necessary Parts or services. The party claiming Excusable Delay shall notify the other party in writing of any such delay. The date of delivery or of performance shall be extended for a period equal to the time lost by reason of delay, provided that the Term of this Agreement shall not be extended due to any Excusable Event, unless mutually agreed upon in writing by the parties. If Contractor is delayed by acts or omissions of Customer, or by the prerequisite work of Customer's other contractors or suppliers, Contractor shall also be entitled to any equitable price adjustment.

21.2 If any delay excused by Section 21.1 extends for more than one hundred eighty (180) days and the parties have not agreed upon a revised basis for continuing the Agreement at the end of the delay, including an equitable price adjustment, then either party (except where delay is caused by acts or omissions of a party, in which event only the non-breaching party), upon thirty (30) days written notice, may terminate this Agreement in accordance with Section 8.2 of this Agreement.

22. Limitation of Liability

22.1 The total liability of Contractor, on all claims of any kind accruing during any calendar year, whether in contract, extra work, warranty, indemnity, tort (including negligence), strict liability, or otherwise, arising out of the performance or breach of this Agreement, or the use of any Parts or the provision of any services, shall not exceed the average billing amount per year, calculated as anticipated oph of the respective year multiplied by the oph charge of the same year. In no event shall the cumulative total liability of Contractor on all such claims of any kind arising from or relating to this Agreement, until the time all such liability ends, exceed the total amount to be billed to Customer under this Agreement. Notwithstanding anything to the contrary, all Contractor liability shall end upon expiration of the applicable warranty period, and, in no event, no later than one (1) year following termination or expiration of this Agreement, whichever is earlier.

22.2 In no event, whether as a result of breach of contract, warranty, indemnity, tort (including negligence), strict liability, or otherwise, shall the Contractor or its related contractors, subcontractors or suppliers be liable for loss of profit or revenues, loss of use of the Facility or the Covered Unit(s) or any associated equipment, cost of capital, cost of substitute equipment, facilities, services or replacement power, downtime costs, claims of Customer's customers for such damages, or for any special, consequential, incidental, indirect, punitive or exemplary damages.

22.3 If Contractor furnishes Customer with advice or assistance concerning any products, systems or work which is not required pursuant to this Agreement, the furnishing of such advice or assistance will not subject Contractor to any liability, whether in contract, warranty, indemnity, tort (including negligence), strict liability or otherwise.

22.4 For the purpose of this Section 22, the term "Contractor" shall mean Contractor, its parent, affiliates, subcontractors and suppliers of any tier, and their respective agents and employees, whether individually or collectively. The provisions of this Section 22 shall prevail over any conflicting or inconsistent provision contained in any of the documents comprising this Agreement, except to the extent that such provisions further restrict Contractor's liability.

23. Dispute Resolution

23.1 All disputes arising in connection with this Agreement shall be settled, if possible, by negotiation of the parties. If the matter is not resolved by such negotiations, either party may, by the giving of written notice, cause the matter to be referred to a meeting of appropriate higher management of the parties. Such meeting shall be held within ten (10) business days following the giving of the written notice.

23.2 If the matter is not resolved within twenty (20) business days after the date of the notice referring the matter to appropriate higher management, either party may proceed pursuant to Section 24 below.

24. Place of Jurisdiction/Governing Law

This Agreement and the parties' relationship there under shall be governed exclusively by and construed in accordance with the laws of the State of Texas. Venue for any claim or cause of action shall lie solely and exclusively in Travis County, Texas..

25. Confidential Information

Information, suggestions or ideas transmitted in connection with performance hereunder are not to be regarded as secret or submitted in confidence except in accordance with this Section 25. Any information disclosed by either party in connection with this Agreement and designated in writing, by label, stamp or other written communication by the disclosing party as "confidential" or "proprietary" at the time of disclosure shall be treated as "Confidential Information." The recipient party agrees to (i) treat such Confidential Information as confidential and not disclose it to third parties other than Contractor affiliate entities as necessary for performance of this Agreement; (ii) restrict the use of such Confidential Information to matters relating to the recipient party's performance of this Agreement; and (iii) restrict access to such information to employees of the recipient party and Contractor's affiliate entities whose access is necessary in the implementation of this Agreement. All copies of written Confidential Information will be returned to the disclosing party upon request (i) except to the extent that an item of such information is designated to be retained by the recipient party pursuant to a specific provision of this Agreement, and (ii) Contractor may retain one copy of Customer Confidential Information until such time as all its liability under this Agreement terminates. Information shall not be considered to the Confidential Information, and the recipient party shall not be liable for the use and disclosure thereof, if such information: (i) was in the public domain at the time of disclosure, or thereafter comes into the public domain through no fault of the recipient party; or (ii) is otherwise available to the recipient party without restrictions on the recipient party's use and disclosure similar to those restrictions contained in this Agreement; or (iii) is independently developed by the recipient party; or (iv) is required to be disclosed by law or an order of any court or other government authority with proper jurisdiction, provided that the recipient party promptly notifies the disclosing party before disclosing such information so as to permit the disclosing party reasonable time to seek an appropriate court order.

26. General Conditions

26.1 Customer and Contractor are each independent of the other and nothing in this Agreement is intended, or shall be deemed, to create a partnership or joint venture of the parties.

26.2 The provisions of this Agreement are for the benefit of the parties hereto and not for any other or third party.

26.3 Notwithstanding anything to the contrary, Contractor shall have the right, in its discretion, to gather and use data and information concerning Parts, Covered Unit and Facility performance, so long as Contractor does not disclose to any party not a Contractor affiliate entity an identification of the Customer in connection with a particular item of data or information. Contractor's rights under this Section 26.3 include, without limitation, the right to interface directly to the Facility distributed control system and to utilize a dedicated network or internet connection or telephone line.

26.4 No modification, amendment, rescission, waiver or other change shall be binding on a party unless agreed in writing by that party. This Agreement represents the entire agreement between the parties. Any oral or written representation, warranty, course of

dealing or trade usage not contained or referenced herein shall not be binding on either party. Each party agrees that it has not relied on, or been induced by, any representations of the other party not contained in this Agreement.

26.5 The invalidity in whole or in part of any portion of this Agreement shall not affect the validity of the remainder of this Agreement. The rights and remedies set forth in this Agreement are the exclusive rights and remedies of each party with respect to this Agreement, its performance or breach.

26.6 The language of this Agreement, and all documents, materials and training, if any, to be supplied by Contractor under this Agreement shall be English.

26.7 Subject to liability time limitations contained herein, the following Sections shall survive termination of the Agreement: Section 8 (Termination), Section 11 (Taxes and Duties), Section 12 (Warranty), Section 16 (Assignment of Services), Section 20 (Laws, Codes and Standards), Section 21 (Excusable Events), Section 22 (Limitation of Liability), Section 23 (Dispute Resolution), Section 24 (Place of Jurisdiction/Governing Law), Section 25 (Confidential Information) and Section 26 (General Conditions).

26.8 This Agreement may be signed in counterparts with the same effect as if all signing parties had signed the same document. All counterparts shall be construed together and constitute one and the same contract.

27. Appendices

These Appendices form an integral part of this Agreement. In the event of any conflict between the terms of this Agreement and the Appendices, the terms and conditions of this Agreement shall prevail. The provisions of the remaining Appendices listed below shall prevail in the order listed above.

1) Maintenance specifications and schedules (attached)
2) Technical Instructions: (see Section 19 in submittal book for all Technical Instructions)
3) Limited Warranty on New GE Jenbacher Equipment: (see Section 16 of submittal book)
4) Limited Warranty on Service Exchange Products
5) Matrix / Content of Silicon (attached)
6) Smith Power Products Annual Labor Rate Sheet (to be updated annually) (attached)
7) Technical Overhaul Description (subject to revision by GE Jenbacher) (attached)

28. Notice

The parties will send all notices or communications necessary under this Agreement in writing to the following addresses:

To Contractor:

In care of:

Smith Power Products, Inc.
3065 California Ave
Salt Lake City, UT 84104

With a copy to: Michael R. Carlston
Snow, Christensen & Martineau
10 Exchange Place, 11th Floor
P.O. Box 45000
Salt Lake City, UT 84145

To Customer:

In care of: _____
_____
_____
_____

29. Signatures

The parties hereby acknowledge and accept the terms and conditions contained in this Agreement and agree to be bound by the terms and conditions contained herein and the Appendices. This Agreement shall become effective upon the date of signature of both parties.

CUSTOMER:
CITY OF AUSTIN

By: Shawn Willett Date: 3/7/13
Name:
Its:

D.V.S.
2-7-13

CONTRACTOR:
SMITH POWER PRODUCTS, INC.

By: _____ Date: 3/7/2013
Name: BRENT W. SANDBERG
Its: Sr. V.P./C.F.O

CITY OF AUSTIN, TEXAS
Purchasing Office
REQUEST FOR PROPOSAL (RFP)
Offer Sheet

SOLICITATION NO: SMH0117

DATE ISSUED: March 14, 2011

REQUISITION NO.: RQM-1100-11030900239

COMMODITY CODE: 2853740, 2853952

FOR CONTRACTUAL AND TECHNICAL ISSUES CONTACT:

Ms. Shawn M. Harris

Supervising Senior Buyer
Phone: (512) 505-7351

COMMODITY/SERVICE DESCRIPTION: Engine Generator for Hornsby Bend Biogas Project

PRE-PROPOSAL CONFERENCE TIME AND DATE: N/A

LOCATION: N/A

PROPOSAL DUE PRIOR TO: 2:00 PM on April 5, 2011

COMPLIANCE PLAN DUE PRIOR TO: N/A

PROPOSAL CLOSING TIME AND DATE: 2:00 PM on April 5, 2011

LOCATION: MUNICIPAL BUILDING, 124 W 8th STREET
RM 310, AUSTIN, TEXAS 78701

It is the policy of the City of Austin to involve certified Minority Owned Business Enterprises (MBEs) and Woman Owned Business Enterprises (WBEs) in City contracting. MBE and WBE goals for this Solicitation are contained in Section 0900.

All Contractors and Subcontractors must be registered to do business with the City prior to submitting a response to a City Solicitation. In the case of Joint Ventures, each individual business in the joint venture must be registered with the City prior to submitting a response to a City solicitation. If the Joint Venture is awarded a contract, the Joint Venture must register to do business with the City. Prime Contractors are responsible for ensuring that their Subcontractors are registered. Registration can be done through the City's on-line vendor registration system. Log onto https://www.cityofaustin.org/purchase and follow the directions.

SUBMIT 1 ORIGINAL (Marked as "ORIGINAL") AND 6 SIGNED COPIES (Marked as "Copy") OF RESPONSE

SOLICITATION TO:

Insert Vendor Name & Address

Signature of Person Authorized to Sign Offer

DARRELL MANUEL VP
Signer's Name and Title: (please print or type)

FEDERAL TAX ID NO. [redacted] Date: 4-1-2011

Company Name: SMITH POWER PRODUCTS, INC.

Address: 15603 W. HARDY RD. SUITE 340

City, State, Zip Code HOUSTON, TX 77060

Phone No. (281) 931-0877 Fax No. (281) 931-0878

BELOW INFO MUST MATCH THE NAME AND ADDRESS ON INVOICE AND IN COMPANY PROFILE WITH CITY

Company "Remit To" Name: SMITH POWER PRODUCTS, INC.
Remit to Address: P.O. BOX 27527
City, State, Zip Code SALT LAKE CITY, UT 84127
Email Address MWINKLER@SMITHPPI.COM

Table of Contents

All other Sections may be viewed at: ***https://www.cityofaustin.org/purchase*** by clicking the link to "Vendor Self Service (VSS)", sign in if registered, register, or use public access to follow the links to "Business Opportunities" and "Search for Solicitation."

RETURN FOLLOWING DOCUMENTS WITH BID/PROPOSAL/QUOTE/RESPONSE/SUBMITTAL**

- Cover Page — Offer Sheet
- Section 0500 — All required submittals as per the Scope of Work
- Section 0600 — Proposal
- Sections 0800 - 0835 — Certifications and Affidavits (return all applicable Sections)
- Section 0900 — No Goals Utilization Plan

**** See also Section 0200, Solicitation Instructions, Section 0400, Supplemental Purchase Provisions, and Section 0500, Scope of Work/Specification, for additional documents that must be submitted with the Offer.**

NOTES:

The Vendor agrees, if this Offer is accepted within 120 calendar days after the Due Date, to fully comply in strict accordance with the Solicitation, specifications and provisions attached thereto for the amounts shown on the accompanying Offer.

*** INCORPORATION OF DOCUMENTS. Section 0100, Standard Purchase Definitions**; **Section 0200, Standard Solicitation Instructions**; and **Section 0300, Standard Purchase Terms and Conditions** are hereby incorporated into this Solicitation by reference, with the same force and effect as if they were incorporated in full text. The full text versions of these Sections are available, on the Internet at the following online address: http://www.ci.austin.tx.us/purchase/standard.htm.

If you do not have access to the Internet, you may obtain a copy of these Sections from the City of Austin Purchasing Office at the below address. Please have the Solicitation number available so that the staff can select the proper documents. These documents can be mailed, expressed mailed, or faxed to you.

When sending a sealed Offer and/or Compliance Plan, use the proper address for the type of service desired, as shown below.

P.O. Address for US Mail	Street Address for Hand Delivery or Courier Service
City of Austin	City of Austin, Purchasing Office
Purchasing Office	Municipal Building
P.O. Box 1088	124 W 8th Street, Rm 310
Austin, Texas 78767-8845	Austin, Texas 78701
	Reception Phone: (512) 974-2500

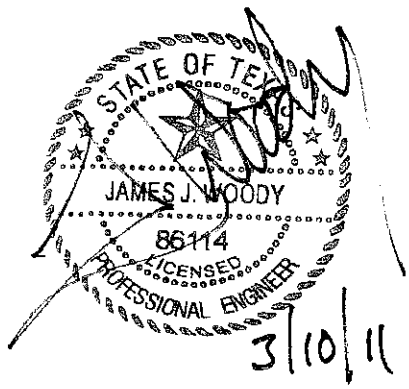
Notes: Offers (including Compliance Plans) that are not submitted in a sealed envelope or container will not be considered. Unless authorized in the Solicitation, telegraphic or facsimile Offers will not be accepted.

SEALS PAGE

Seals placed on this page are subject to the following:

These documents are released for the procurement of equipment proposals only. The information herein shall not be used for construction purposes.

01010	Summary of Work
01300	Contractor Submittals
11231	Engine Generator System (Mechanical)



SEALS PAGE

Seals placed on this page are subject to the following:

These documents are released for the procurement of equipment proposals only. The information herein shall not be used for construction purposes.

Generator sizing is based on biogas availablility and not a utility load analysis.

11231	Engine Generator System (Electrical)
16000	Electrical - General Provisions
	City of Austin Electrical Specifications

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The WORK to be performed under this Contract shall consist of furnishing equipment for the fulfillment of the Contract in strict accordance with the Procurement Package. The WORK shall be complete, and all work, materials, and services not expressly indicated or called for in the Contract Documents which may be necessary for the complete and proper construction of the WORK in good faith shall be provided by the Engine-Generator (EG) System Vendor as though originally so indicated, at no increase in cost to the OWNER'S REPRESENTATIVE.

* Note that for the work contained herein the designation OWNER'S REPRESENTATIVE means "Chevron Energy Solutions Company (CES)". CES may also assign duties of the OWNER'S REPRESENTATIVE to other parties (i.e. shop drawing review, field services, etc.) at its' sole discretion. The designation ENGINEER may also be used in these specifications to represent the services provided by CES.

** OWNER shall refer to the City of Austin or Austin Energy

*** Installing CONTRACTOR shall refer to the contractor or contractors installing items outside the scope of the EG System Vendor.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The WORK of this Contract comprises the supply of an engine-generator operating on biogas only, including miscellaneous improvements, cogeneration system (hot water piping and heat exchangers), and installation of associated appurtenances.

B. The WORK is located at the OWNER's Hornsby Bend Biosolids Management Plant (HBBMP), 210 South FM 973, Austin, TX 78725.

C. This project occurs in an extremely corrosive and high moisture environment and special considerations are required for system wide exposed to corrosive atmospheric conditions. Special precautions, such as tinning of unprotected exposed wire, and use of corrosive resistant conduits, as well as protective coatings for equipment is required.

1.3 CONTRACT METHOD

A. The WORK hereunder shall be purchased as a single lump sum contract between the OWNER. Installation, except as described in Section 11231, shall be by through the OWNER's REPRESENTATIVE.

B. If applicable, MBE, DBE or WBE status shall be maintained throughout the term of the Work in accordance with City of Austin Small and Minority Business Resources Department (SMBRD) requirements.

1.4 WORK BY OTHERS

A. Where 2 or more contracts are being performed at one time on the same Site or adjacent land in such manner that work under one contract may interfere with work under another, the OWNER'S REPRESENTATIVE will determine the sequence and order of the Work in either or both contracts. When the Site of one contract is the necessary or convenient means of access for performance of work under another, the OWNER'S REPRESENTATIVE may grant privilege of access or other reasonable privilege to the contractor so desiring, to the extent, amount , and in manner and at time that the OWNER'S REPRESENTATIVE may determine. No OWNER'S REPRESENTATIVE determination of method or time or sequence or order of the work or access privilege shall be the basis for a claim for delay or damage except under provisions of the contract for temporary suspensions of the work. The EG System Vendor shall conduct its operations so as to cause a minimum of interference with the work of such other contractors, and shall cooperate fully with such contractors to allow continued safe access to their respective portions of the Site, as required to perform work under their respective contracts.

B. Interference With Work On Utilities: The EG System Vendor shall cooperate fully with all utility forces of the OWNER'S REPRESENTATIVE or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the WORK, and shall schedule the WORK so as to minimize interference with said relocation, altering, or other rearranging of facilities.

1.5 USE OF SITE

A. The EG System Vendor's use of the Site shall be limited to its construction operations, including on-Site storage of materials, on-Site fabrication facilities, and field offices.

B. The EG System Vendor shall only use portions of the Site as indicated for any of its construction operations.

1.6 OUTAGE PLAN AND REQUESTS

A. Unless the Contract Documents indicate otherwise, the EG System Vendor shall not remove from service, de-energize, or modify settings for any existing operational pipeline, valve, channel, equipment, structure, road, or any other facility without permission from the OWNER'S REPRESENTATIVE.

1. Outages and service connections shall be performed when directed by the OWNER'S REPRESENTATIVE.

2. The maximum duration of any outage shall be 4 hours.

3. The minimum time between outages shall be 48 hours.

B. Where the WORK requires modifications to existing facilities or construction of new facilities and connection of new facilities to existing facilities, the EG System Vendor shall submit a detailed outage plan and schedule for the OWNER'S REPRESENTATIVE approval a minimum of 2 weeks in advance of the time that such outage is planned.

C. A completed System Outage Request form (blank furnished by the OWNER'S

REPRESENTATIVE) shall accompany each outage plan. The outage plans shall be coordinated with the construction schedule and shall meet the restrictions and conditions of the Contract Documents. The outage plan shall describe the EG System Vendor's method for preventing bypassing of other treatment units; the length of time required to complete said operation; any necessary temporary power, controls, instrumentation or alarms required to maintain control, monitoring, and alarms for the treatment plant processes; and the manpower, plant, and equipment which the EG System Vendor will furnish for proper operation of associated treatment units. All costs for preparing and implementing the outage plans shall be at no increase in cost to the OWNER'S REPRESENTATIVE.

D. The OWNER'S REPRESENTATIVE shall be notified in writing at least one week in advance of the required outage if the schedule for performing the work has changed or if revisions to the outage plan are required.

E. The EG System Vendor shall provide written confirmation of the shutdown date and time 2 working days prior to the actual shutdown.

1.7 OWNER USE OF THE SITE

A. The OWNER may utilize all or part of the existing facilities during the entire period of construction for the conduct of the OWNER's normal operations. The EG System Vendor shall cooperate and coordinate with the OWNER'S REPRESENTATIVE to facilitate the OWNER's operations and to minimize interference with the EG System Vendor's operations at the same time. In any event, the OWNER shall be allowed access to the Site during the period of construction.

1.8 PARTIAL UTILIZATION OF THE WORK BY OWNER

A. The OWNER will take continue to operate the plant during the planned improvements.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.1 GENERAL

A. All Proposal documents must be submitted directly to the OWNER.

B. All submittals after award of the Work, i.e. shop drawings, technical manuals, etc. shall be sent to the OWNER'S REPRESENTATIVE.

1.2 SHOP DRAWINGS

A. The EG System Vendor shall furnish Four copies plus one electronic reproducible copy submitted for each Shop Drawing submittal. Shop Drawings may include detail design calculations, shop-prepared drawings, fabrication and installation drawings, erection drawings, lists, graphs, catalog sheets, data sheets, and similar items. Whenever the EG System Vendor is required to submit design calculations as part of a submittal, such calculations shall bear the signature and seal of an engineer registered in the appropriate branch and in the state the work is to be performed.

B. Shop Drawing submittals shall be accompanied by the OWNER'S REPRESENTATIVE standard submittal transmittal form, a reproducible copy of which is available from the OWNER'S REPRESENTATIVE. A submittal without the form or where applicable items on the form are not completed will be returned for resubmittal.

C. Organization

1. On the transmittal form, index the components of the submittal and insert tabs in the submittal to match the components. Relate the submittal components to specification paragraph and subparagraph, Drawing number, detail number, schedule title, room number, or building name, as applicable.

2. Unless indicated otherwise, terminology and equipment names and numbers used in submittals shall match those used in the Contract Documents.

D. Format

1. Minimum sheet size shall be 8-1/2 inches by 11-inches (for printed text only). Drawings need to be 11-inches x 17-inches or 24-inches x 36-inches and reproduced to 11-inches x 17-inches maintaining ½ scale reduction. Every page in a submittal shall be numbered in sequence. Each copy of a submittal shall be collated and stapled or bound, as appropriate. The OWNER'S REPRESENTATIVE will not collate sheets or copies.

2. Where product data from a manufacturer is submitted, clearly mark which model is proposed, with complete pertinent data capacities, dimensions, clearances, diagrams, controls, connections, anchorage, and supports. Sufficient level of detail shall be presented for assessment of compliance with the Contract Documents.

3. Each submittal shall be assigned a unique number. Submittals shall be numbered sequentially, and the submittal numbers shall be clearly noted on the transmittal. Original submittals shall be assigned a numeric submittal number followed by a decimal point and a numeric digit to distinguish between the original submittal and each resubmittal. For example, if submittal 25.1 requires a resubmittal, the first resubmittal will bear the designation “25.2” and the second resubmittal will bear the designation “25.3” and so on.

E. Disorganized submittals that do not meet the requirements of the Contract Documents will be returned without review.

F. Except as may otherwise be indicated or directed, the OWNER’S REPRESENTATIVE will return submittal review comments to the EG System Vendor with comments noted thereon, within 30 Days following receipt by the OWNER’S REPRESENTATIVE. It is considered reasonable that the EG System Vendor will make a complete and acceptable submittal to the OWNER’S REPRESENTATIVE by the first resubmittal on an item. The OWNER’S REPRESENTATIVE reserves the right to withhold monies due to the EG System Vendor to cover additional costs of the OWNER’S REPRESENTATIVE review beyond the first resubmittal. The OWNER’S REPRESENTATIVE maximum review period for each submittal or resubmittal will be 30 Days. Thus, for a submittal that requires 2 resubmittals before it is complete, the maximum review period could be 90 Days.

G. If a submittal is returned to the EG System Vendor marked "NO EXCEPTIONS TAKEN," formal revision and resubmission will not be required.

H. If a submittal is returned marked "MAKE CORRECTIONS NOTED," EG System Vendor shall make the corrections on the submittal, but formal revision and resubmission will not be required.

I. If a submittal is returned marked "AMEND-RESUBMIT," the EG System Vendor 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 "AMEND - RESUBMIT," the submittal as a whole is deemed "AMEND - RESUBMIT," and 10 drawings are required to be resubmitted.

J. If a submittal is returned marked "REJECTED-RESUBMIT," it shall mean either that the proposed material or product does not satisfy the specification, the submittal is so incomplete that it cannot be reviewed, or is a substitution request that will not be reviewed because it is submitted after award of the Contract. In the first 2 cases, the EG System Vendor shall prepare a new submittal and shall submit the required number of copies.

K. Resubmittal of rejected portions of a previous submittal will not be allowed. Every change from a submittal to a resubmittal or from a resubmittal to a subsequent resubmittal shall be identified and flagged on the resubmittal.

L. Fabrication of an item may commence only after the OWNER’S REPRESENTATIVE has reviewed the pertinent submittals and returned copies to the EG System Vendor marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED." Corrections

indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as changes to the contract requirements.

M. Submittals shall be carefully reviewed by an authorized representative of the EG System Vendor prior to submission to the OWNER'S REPRESENTATIVE. Each submittal shall be dated and signed by the EG System Vendor as being correct and in strict conformance with the Contract Documents. In the case of Shop Drawings, each sheet shall be so dated and signed. Any deviations from the Contract Documents shall be noted on the transmittal sheet. The OWNER'S REPRESENTATIVE will only review submittals that have been so verified by the EG System Vendor. Non-verified submittals will be returned to the EG System Vendor without action taken by the OWNER'S REPRESENTATIVE, and any delays caused thereby shall be the total responsibility of the EG System Vendor.

N. Corrections or comments made on the EG System Vendor's Shop Drawings during review do not relieve the EG System Vendor from compliance with Contract Drawings and Specifications. Review is for conformance to the design concept and general compliance with the Contract Documents only. The EG System Vendor is responsible for confirming and correlating quantities and dimensions, fabrication processes and techniques, coordinating WORK with the trades, and satisfactory and safe performance of the WORK.

1.4 SAMPLES

A. The EG System Vendor shall submit the number of samples indicated by the Specifications. If the number is not indicated, submit not less than 3 samples. Where the amount of each sample is not indicated, submit such amount as necessary for proper examination and testing by the methods indicated.

B. Samples shall be individually and indelibly labeled or tagged, indicating the salient physical characteristics and manufacturer's name. Upon acceptance by the OWNER'S REPRESENTATIVE, one set of the samples will be stamped and dated by the OWNER'S REPRESENTATIVE and returned to the EG System Vendor, one set of samples will be retained by the OWNER'S REPRESENTATIVE, and one set shall remain at the Site in the OWNER'S REPRESENTATIVE field office until completion of the WORK.

C. Unless indicated otherwise, the OWNERS'S REPRESENTATIVE will select colors and textures from the manufacturer's standard colors and standard materials, products, or equipment lines. If certain samples represent non-standard colors, materials, products, or equipment lines that will require an increase in Contract Times or Price, the EG System Vendor shall clearly state so on the transmittal page of the submittal.

1.5 TECHNICAL MANUAL

A. The EG System Vendor shall submit technical operation and maintenance information for each item of mechanical, electrical, and instrumentation equipment in an organized manner in the Technical Manual. It shall be written so that it can be used and understood by the OWNER's operation and maintenance staff.

B. The Technical Manual shall be subdivided first by specification section number; second, by equipment item; and last, by "Category." The following "Categories" shall be addressed (as applicable):

1. Category 1 - Equipment Summary

    a. Summary: A table shall indicate the equipment name, equipment number, and process area in which the equipment is installed.

    b. Form: The OWNER'S REPRESENTATIVE will supply an Equipment Summary Form for each item of mechanical, electrical, and instrumentation equipment in the WORK. The EG System Vendor shall fill in the relevant information on the form and include it in Part 1.

2. Category 2 - Operational Procedures

    a. Procedures: Manufacturer-recommended procedures on the following shall be included in Part 2:

        Installation
        Adjustment
        Startup
        Location of controls, special tools, equipment required, or related instrumentation needed for operation
        Operation procedures
        Load changes
        Calibration
        Shutdown
        Troubleshooting
        Disassembly
        Reassembly
        Realignment
        Testing to determine performance efficiency
        Tabulation of proper settings for pressure relief valves, low and high pressure switches, and other protection devices
        List of all electrical relay settings including alarm and contact settings

3. Category 3 - Preventive and Corrective Maintenance Procedures

    a. Procedures: Preventive and corrective maintenance procedures shall include manufacturer-recommended procedures to be performed on a periodic basis, both by removing and replacing the equipment or component, and by maintaining the equipment in place.

    b. Schedules: Recommended frequency of preventive maintenance procedures shall be included. Lubrication schedules, including lubricant SAE grade, type, and temperature ranges, shall be covered.

4. Category 4 - Parts List

    a. Parts List: A complete parts list shall be furnished, including a generic description and manufacturer's identification number for each part. Addresses and telephone numbers of the nearest supplier and parts warehouse shall be

included.

b. Drawings: Cross-sectional or exploded view drawings shall accompany the parts list. Part numbers shall appear on the drawings with arrows to the corresponding part.

5. Category 5 - Wiring and Loop Diagrams

a. Diagrams: Category 5 shall include complete internal and connection wiring and loop diagrams for electrical and control equipment items.

6. Category 6 - Shop Drawings

a. Drawings: This category includes approved shop or fabrication drawings with OWNER'S REPRESENTATIVE comments and corrections incorporated, complete with dimensions.

7. Category 7 - Safety

a. Procedures: This category describes the safety precautions to be taken when operating and maintaining the equipment or working near it.

8. Category 8 - Documentation:

a. Equipment warranties, affidavits, certifications, calibrations, laboratory test results, etc. required by the Technical Specifications shall be placed in this category.

C. Format

1. Each Technical Manual shall be bound in standard size 3 ring hardcover binders labeled on the spine and cover with project name, OWNER'S project number, specification section number, equipment name, and equipment identification number

2. Each Binder shall contain its own detailed table of contents at the front, plus a summary level table of contents information for the other binders in a multi-binder set.

3. Documents in binders shall be 3 hole punched, no text shall be punched out, and pages larger than 8-1/2 by 11 shall be folded to 8-1/2 by 11.

4. Each final set of Technical Manuals shall include a CD with electronic files:

a. Project specific files created in Adobe Acrobat searchable portable document format (.PDF), or other software required by the specifications.

b. Manufacturer literature in Adobe Acrobat searchable portable document format.

D. Review Process

1. The EG System Vendor shall furnish 5 draft Technical Manuals for each Specification Section that requires a Manual, along with one comprehensive searchable electronic Technical Manual in .PDF format. The OWNER'S REPRESENTATIVE will retain one copy, will forward three copies to the OWNER, and will return one copy to the EG System Vendor with review comments.

2. The EG System Vendor shall incorporate comments into the draft and submit 5 identical copies of the final Manual and one searchable electronic manual Technical Manual .PDF format for acceptance.

E. Schedule

1. WORK under this Contract involves start-up and commissioning of equipment in multiple areas of the facility at independent times within the project schedule. Manuals shall be complete for each piece of equipment prior to final acceptance of the equipment by the OWNER. Except where indicated otherwise, draft manuals shall be submitted for review in final form a minimum of 30 Days prior to delivery. Final manuals shall be completed after comment from OWNER'S REPRESENTATIVE. Discrepancies found by the OWNER'S REPRESENTATIVE shall be corrected within 30 Days from the date of written notification by the OWNER'S REPRESENTATIVE.

F. Manuals that are incomplete or unacceptable at the schedule criterion above will constitute sufficient justification for the OWNER'S REPRESENTATIVE to retain the amount in paragraph "Technical Manual Submittals" of Section 01700 - Project Closeout, from any monies due the EG System Vendor.

1.6 SPARE PARTS LIST

A. The EG System Vendor shall furnish to the OWNER'S REPRESENTATIVE six (6) identical sets of spare parts information for mechanical, electrical, and instrumentation equipment. The spare parts list shall include those spare parts that each manufacturer recommends be maintained by the OWNER in inventory.

1. Sources and Pricing: The spare parts list shall include a current list price of each spare part. Each manufacturer or supplier shall indicate the name, address, and telephone number of its nearest outlet of spare parts to assist the OWNER in ordering.

2. Format: The EG System Vendor shall cross-reference spare parts lists to the equipment numbers designated in the Contract Documents. The spare parts lists shall be bound in standard size, 3 ring, loose-leaf, vinyl plastic hard cover binders suitable for bookshelf storage. Binder ring size shall not exceed 2-1/2 inches. Each copy of the spare parts lists shall be accompanied by a CD containing the lists in electronic format, in files created under Microsoft Office 2000.

1.7 RECORD DRAWINGS

A. The EG System Vendor shall maintain one set of Drawings at the Site for the preparation of record drawings. On these, it shall mark every project condition, location, configuration, and any other change or deviation which may differ from the Contract Drawings at the time of award, including buried or concealed construction and utility features that are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of buried utilities that differ from the locations indicated, or that were not indicated on the Contract Drawings. Said record drawings shall be supplemented by any detailed sketches as necessary or as EG System Vendor is directed, to fully indicate the WORK as actually constructed. These record drawings are the EG System Vendor's representation of as-built conditions, shall

include revisions made by addenda, requests for information (RFI's) and change orders, and shall be maintained up-to-date during the progress of the WORK. Red ink shall be used for alterations and notes. Notes shall identify relevant RFI and Change Orders by number and date.

B. Paper copies of the record drawings shall be submitted with every third month application for payment after the month in which the Notice to Proceed is given as well as at completion of WORK. Failure to submit complete record drawings on or before the every third month application for payment will reason to not approve application for payment.

C. In the case of those drawings that depict the detailed requirement for equipment to be assembled and wired in the factory, such as motor control centers and the like, the record drawings shall be updated by indicating those portions which are superseded by change order drawings or final Shop Drawings, and by including appropriate reference information describing the RFIs and change orders by number and the Shop Drawings by manufacturer, drawing, and revision numbers.

D. Disorganized or incomplete record drawings will not be accepted. The EG System Vendor shall revise them and resubmit within 10 Days.

E. Record drawings shall be accessible to the OWNER'S REPRESENTATIVE during the construction period.

F. Final payment will not be acted upon until the record drawings have been completed and delivered to the OWNER'S REPRESENTATIVE. Said up-to-date record drawings shall be in the form of a set of prints with carefully plotted information overlaid and an electronic form under Adobe Acrobat Version.

G. Information submitted by the EG System Vendor will be assumed to be correct, and the EG System Vendor shall be responsible for the accuracy of such information.

1.8 QUALITY CONTROL (QC) SUBMITTALS

A. Quality control submittals are defined as those required by the Specifications to present documentary evidence to the OWNER'S REPRESENTATIVE that the EG System Vendor has satisfied certain requirements of the Contract Documents.

B. Unless otherwise indicated, QC submittals shall be submitted:

1. Before delivery and unloading, for the following types of submittals:

a. Manufacturers' installation instructions

b. Design calculations

c. Affidavits and manufacturers' certification of compliance with indicated product requirements

d. Laboratory analysis results

e. Factory and final assembly test reports

2. Within 30 Days of the event documented for the following types of submittals:
    a. Manufacturers' field representative certification of proper installation
    b. Field measurement
    c. Field test reports
    d. Receipt of permit
    e. Receipt of regulatory approval

C. The OWNER'S REPRESENTATIVE will record the date that a QC submittal was received and review it for compliance with submittal requirements, but the review procedures above for Shop Drawings and samples will not apply.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -

SECTION 11231 – ENGINE GENERATOR SYSTEM

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

A. The requirements specified in GENERAL - general requirements of this project apply to and govern the work under Division 1, except where indicated in the following articles. Provide in accordance with the Contract Documents, one Engine Generator (EG) system fueled only by biogas from wastewater treatment plant anaerobic digesters. One EG system shall be provided – a second EG system is shown on the Figures for future installation and is not part of this Work. All technical documents originally furnished by vendor before the actual bid, but specifically for this project, shall be considered as part of the body of Work.

1. See Division 16 for additional requirements

2. See Figures for additional requirements

B. The complete EG system (including engine, generator, base, and cooling system shall be designed, built, and assembled as a complete unit by the engine manufacturer) shall be complete in all respects and shall include all equipment and controls necessary for a fully operational power supply. The EG System Vendor shall provide a complete system able to sustain its own operation, manage and protect itself and isolate itself from the electrical grid as required to protect itself and the Austin Energy (AE) grid. The EG System Vendor shall also provide labor to land all electrical and control wiring necessary to connect all supplied equipment and provide Instrumentation & Control (I&C) checks as necessary to make the system compete and functional. Work supplied by others shall include unloading the supplied EG System Vendor equipment from the shipping truck at the jobsite, and the materials and labor required to have the equipment installed at the equipment pad, to install biogas feed piping to the container, hot water supply and return piping (including all valves and instrumentation to be provided by the EG System Vendor) from the container to the remote cooling radiator, assemble exhaust system, install all underground and above ground electrical and control conduit from the EG Container and equipment base to supplied external electrical equipment, switchgear, and pull wire to termination points of the EG System Vendor supplied packages. The EG system (excluding items specifically outlined on the Figures as separate from the main skid) shall be a single skid base system transportable as a single unit with a housing enclosure. The EG system vendor shall provide an ATS to switch between the local power and generator power. This is for for serving the EG system auxiliaries. The EG system vendor is responsible to provide all the combination starters (in EG vendor furnished MCCs or in separate enclosures), circuit breakers, etc.

C. Approved Manufacturers: Subject to compliance with specification requirements, manufacturers offering power generation system that includes the following:

1. Caterpillar

2. GE Jenbacher

3. OWNER'S REPRESENTATIVE Approved Equal

D. American Recover and Reinvestment Act (ARRA) Requirements: This project is being partially funded through an ARRA grant and requirements are included in the City of Austin front-end documents. Manufacturer shall verify that they meet the requirements of the "Buy American" provision of these requirements as part of the proposal.

E. The electrical one line diagram and the SCADA network configuration diagram are attached figures. The EG manufacturer shall meet the requirements of these figures and requirements described in this specification.

F. The EG manufacturer shall provide the necessary process flow and instrumentation diagrams for the scope of supply and shall coordinate with Engineer.

G. All shop drawings and documentation must be in English language and conform to ANSI standard. Enclosure drawings shall be stamped by a license engineer in the state of Texas.

H. All equipment and components must be UL listed and meet or exceed UL508, NEMA, ANSI, NFPA 70, NFPA 70E, and IEEE standards. All testing to conform with National Electrical Testing Association (NETA) Standards.

I. The generator will be connected to Austin Energy Utility System and therefore all equipment and protective devices must meet the Austin energy Interconnection Guide for Customer-Owned Power Production Facilities, a copy of which is provided with these specifications.

J. All instrumentation and meter readings and calibration units of measurement must be in the English system and not in metric system.

K. All proposers must provide with their proposal a marked up copy of this document to indicate what specific exceptions are taken. Without such documentation the proposal will not be considered.

L. All components and assembled equipment must comply with City of Austin Electrical Specifications, a copy of which is included in this procurement package. Contractor to identify any discrepancy to receive written direction prior to proceeding.

M. All electrical power and I&C equipment such as the main circuit breaker, AC and DC power distribution panels EG control panels, metering and monitoring system, etc., must be housed in a separate partitioned space from the main EG area to ensure no electrical hardware is exposed to hazardous area of the EG system.

N. The EG System Vendor shall perform a power system study pertaining to the EG package and complete a fault current, protective device coordination, and arc flash study as well. The power system and related studies must be performed with SKM power tools and all the relevant files must be furnished to Engineer for review. This excludes relay settings outside of the EG package. The submitted report shall be sealed and signed by a professional engineer licensed in the State of Texas.

1.2 WORK INCLUDED

A. EG System Vendor shall provide all labor, materials, tools and services, and equipment to furnish, commission, and place in operation, the power generation system in a weatherproof, sound attenuating enclosure, for automatic and manual operation for the transfer of electrical power, including all related systems and accessories in accordance with the contract documents, manufacturer's drawings, and installation instructions for a complete working installation in place. These specifications also describe requirements for the design, fabrication, and testing of the power generation system. Requirements are shown in Attachment A to this section.

B. It is the intent of these Specifications that there is a single source of supply and responsibility for the entire specified EG system to include the new EG set and associated accessory equipment. Due to the coordination required between the related systems and their installation, the EG System Vendor shall be the responsible party, through the Installing CONTRACTOR, and supply the entire system as a complete unit, less installation materials, labor and installation furnished by the Installing CONTRACTOR. EG System Vendor shall coordinate with the Installing CONTRACTOR for installation requirements and actual equipment dimensions for foundation installation and access walkway fabrication (if necessary) and installation.

C. The EG system will generate power for interconnection to the Austin Energy utility grid. The 15 kV recloser and step up transformer required for interconnection to the grid are not part of this EG supply package but EG scope of supply shall include the 480 V switchgear and coordination with AE. Operation of the system shall allow either automatic or manual with normal operations allowing the gen-set to match output to fuel supply as required on a continuous basis.

D. The work covered by this Specification consists of the supply and testing of a Base Load Continuous Duty rated bio-gas engine and generator system with continuous duty ratings as indicated herein. The entire EG system shall be furnished by the EG System Vendor which shall include, but not necessarily limited to, the following basic components:

1. Bio-Gas Engine
2. Electric Generator
3. EG and auxiliaries mounting system
4. Heat exchanger(s) for cooling system and exhaust gas heat recovery
5. Weather protected, sound attenuating enclosure and appurtenances
6. Exhaust system with high degree sound attenuating silencer as specified herein
7. Generator starting / control battery and automatic battery charger
8. Vibration isolators
9. EG set system accessory equipment items
10. Generator system status annunciation signals

11. Generator set accessories

12. Engine water jacket heater

E. The EG System Vendor shall perform a power system study pertaining to the EG package and complete a fault current, protective device coordination, and arc flash study. The Power System Study shall be limited to EG system vendor furnished equipment only. However the relay coordination study, in addition to generator protection relays, shall include the relay settings at the re-closer provided by Austin Energy. Study shall be as follows.

1. The studies shall be performed by an Electrical Engineering Services firm, who is regularly engaged in power system studies. The studies shall be performed by a Professional Electrical Engineer licensed in the State of Texas with proficiency in electrical power systems engineering and shall seal and sign the final completed power system studies.

2. The studies shall be performed using SKM Power Tools Electrical Engineering Analysis Software for Windows.

3. Short Circuit and Coordination Study

   a. Provide a complete short circuit study. Include three phase and phase-to-ground calculations. Provide an equipment interrupting or withstand evaluation based on the actual equipment and model numbers provided on this project. Generic devices are not acceptable. Normal system operating method, alternate operation, and operations that could result in maximum fault conditions, shall be thoroughly addressed in the study. The study shall assume all motors are operating at rated voltage with the exception that motors, identified as "standby," shall not be included. Electrical equipment bus impedances shall be assumed as zero. Short circuit momentary duties and interrupting duties shall be calculated on the basis of maximum available fault current at the switchgear busses, switchboard busses, motor control centers and panelboards.

   b. A protective device coordination study shall be performed to determine appropriate relay settings. The study shall include all electrical equipment provided under this contract. The study shall show transformer damage curves, cable short circuit-withstand curves and motor curves. Include all medium voltage switchgear, distribution switchboards, motor control centers, and 480 Volt panelboard main circuit breakers. Complete the short circuit study, down to and including, the main breaker or largest feeder on all 480 Volt panelboards. Panel board branch circuit devices need not be considered. The phase overcurrent and ground-fault protection shall be included as well as settings for all other adjustable protective devices. All relays and protective or monitoring devices that are a part of a supplier’s equipment, such as soft starters or adjustable frequency drives, shall be included. Include the last protective device in the Electric Utilities system feeding each facility being considered.

   c. An equipment evaluation study shall be performed to determine the adequacy of the fault bracing of all bus from the panel board level up to the main switchgear or protective device. Include circuit breakers, controllers, surge arresters,

busway, switches, and fuses by tabulating and comparing the short circuit ratings of these devices with the available fault currents.

d. Selective device coordination is required between protective devices in equipment specified in each Section of the Electrical Specifications, and between each piece of electrical equipment, including existing equipment, supplied for this project. If the Study Engineer, in the course of his work, determines that selective coordination cannot be obtained in or between pieces of equipment as specified, he shall immediately notify the Contractor, provide his supporting information to the Contractor, who shall transmit the information to the Owner/Engineer for resolution of the problem.

e. As a minimum, each short circuit study shall include the following:

   i. One-Line Diagram:

      - Location and function of each protective device in the system, such as relays, direct-acting trips, fuses, etc.
      - Type designation, current rating, range or adjustment, manufacturer's style and catalog number for all protective devices.
      - Power and voltage ratings, impedance, primary and secondary connections of all transformers. Use the ratings of the actual transformers being provided where available.
      - Type, manufacturer, and ratio of all instrument transformers energizing each relay.
      - Nameplate ratings of all motors and generators with their sub transient reactance.
      - Sources of short circuit currents such as utility ties, generators, synchronous motors, and induction motors. Provide short circuit studies using each source of power separately. The study shall determine if there is sufficient short circuit current to adequately cause interruption of a protective device using the weaker power source (typically local generation), and shall determine if the equipment can safely interrupt the fault if the greater power source is connected. Additional short circuit calculations shall include emergency as well as normal switching conditions as well as normal and emergency power sources described here in.
      - All significant circuit elements such as transformers, cables, breakers, fuses, reactors, etc shall be included.
      - The time-current setting of existing adjustable relays and direct-acting trips, if applicable.

   ii. Impedance Diagram:

      - Available MVA or impedance from the utility company.
      - Local generated capacity impedance.
      - Transformer and/or reactor impedances.
      - Cable impedances.

- System voltages.
- Grounding scheme (resistance grounding, solid grounding, or no grounding).

iii.. Calculations:

- Determine the paths and situations where short circuit currents are the greatest. Assume bolted faults and calculate the 3-phase and line-to-ground short circuits of each case.
- Calculate the maximum and minimum fault currents.

f. Provide Time-Current Curves on 8-1/2 x 11 log-log paper. Do not put more than one branch of protective devices on any one coordination curve. Include a one-line diagram and the names of each protective device in the branch on the coordination curve drawing. Provide separate drawings for ground fault coordination curves. Use the names designated in the Contract Documents. Include motor and transformer damage curves, and cable short circuit withstand curves.

4. Arc Flash Study

a. The Power System Study shall include an Arc Flash Hazard Study that shall present the level of arc flash hazard for each item of electrical equipment, and the appropriate level of protection required per OSHA standards.

b. The analysis shall be performed with the aid of computer software intended for the purpose, in order to calculate Arc-Flash Incident Energy (AFIE) levels and flash protection boundary distances.

c. The analysis shall be performed under worst-case Arc-Flash conditions, and the final report shall describe, when applicable, how these conditions differ from worst-case bolted fault conditions.

d. The calculations shall be performed in accordance with IEEE 1584-2004 and safe approach requirements determined in accordance with NFPA-70E-2004.

e. Results of the Analysis shall be submitted in tabular form, and shall include, device or bus name, bolted fault and arcing fault current levels, flash protection boundary distances, personal-protective equipment and AFIE levels.

f. Immediately after approval of the Study, The Study Engineer shall furnish to the Contractor such labels as may be required for each item of electrical equipment furnished on the project. Each label shall clearly identify the equipment on which the label is to be affixed. The type of location shall be in such detail that the recommendation includes signs on front, side, back, inside, outside, etc. A typical warning sign shall be submitted with the Study for approval, and as shown below.

i. Flash Hazard Protection Boundary.

ii. Limited Approach Boundary.

iii. Restricted Boundary.

iv. Prohibited Boundary.

v. Incident Energy Level.

vi. Required Personal Protective Equipment Class.

vii. Type of Fire Rated Clothing.

g. Provide an Arc Flash Warning Label, printed in color and affixed to the front of each panel provided.

h. Size of each label shall be not less than 8 inches wide and 6 inches tall.

i. Each label shall be clearly identify the equipment on which the label is to be affixed. The type of location shall be in such detail that the recommendation includes signs on front, side, back, inside, outside, etc. A typical warning sign shall be submittal shall be submitted with the Study for approval, and as shown below:

1.3 SYSTEM DESCRIPTION

A. The EG system shall be continuous rated and have the design criteria as specified herein.

1. Number of Units: 1

2. Minimum System Uptime Requirements: 87%

3. Output Range: 50 to 100% continuous operation (dependent upon biogas availability)

4. Rating: Nominal 848 kW at 0.8 PF @ site conditions

5. Minimum Electrical Output Efficiency at 100% Load: 36.5%

6. Minimum Heat Recovery: 3.4 MBH

B. Engine: The engine shall be designed for biogas use and not converted from diesel or diesel blend applications, equipped with electronic spark ignition, electronic controlled

air/biogas fuel mixture, turbocharged, and after-cooled system with the following design requirements:

1. Fuel type: Biogas Only

2. Radiators: Remote mounted

3. The EG system shall include a heat recovery system. The heat generated from the engine jacket, oil cooler, inner/after coolers, and exhaust shall be transferred and tied into the existing plant's process hot water circulation system.

C. Enclosure: The EG system enclosure will include sound attenuated, aluminum exterior, weather protected enclosure(s) designed for outdoor installation. Enclosures shall contain all auxiliaries such as all heat exchangers, pumps, fans, controls etc. to operate as a complete package. Enclosure shall have the following maximum dimensions:

1. Length: 40 ft

2. Width: 10 ft

3. Height: 9 ft

4. Color: Green

D. Site Conditions:

1. Altitude: 500 ft

2. Outdoor temperature, design without engine de-rating: 104°F (for EG performance), 110°F (for enclosure design)

3. Outdoor temperature, min: 10 °F

4. Installation type: Inside of a weather protective enclosure/skid mounted packaged system

5. Cooling system type: Heat exchanger/cogeneration

6. Exhaust system: Outside generator enclosure

E. Emissions: Emissions requirements are based upon a current understanding of regulatory requirements for this specific project. EG to be certified in accordance with Texas Commission on Environmental Quality (TCEQ) requirements and to not exceed the following requirements:

Nitrogen Oxide (NOx): <0.7 grams/brake horsepower-hour (bhp-hr)

Carbon Monoxide (CO): <3.5 grams/bhp-hr

Volatile Organic Compounds (VOC): <1.0 grams/bhp-hr

EG System Vendor shall be responsible for meeting these emissions limitations without the use of specific exhaust treatment through a selective catalytic reduction (SCR) unit. The EG System Vendor shall provide submittals as required to meet the permitting process.

F. Biogas Quality: Fuel for the EG system will be biogas from the digesters. Biogas will be cleaned in a treatment system and fuel consumption shall be based on biogas with the following characteristics. Note that methane and energy content can vary and minimum values are shown in parenthesis next to the anticipated range and that all equipment should be designed to continue operation if minimum values occur.

Digester Biogas Methane (CH4) Content:	+/-55-60% (minimum = 50%)
British Therm Unit (BTU) (LHV):	560 (minimum = 500)
BTU (HHV):	620
Moisture Content:	≤50%
Siloxanes:	≤5 micrograms per liter (ug/L)
Hydrogen Sulfide (H2S):	≤50 parts per million (ppm)

G. Performance: The EG system shall conform to the following general performance criteria:

1. Rating - Engine brake horsepower at the generator terminals shall be sufficient to deliver full rated generator set kW/kVA when operated at rated conditions as specified herein with all accessories running.

2. Conditions - The rating shall be based on ISO 3046 and standard reference conditions of DIN 6271, respectively.

H. Generator: The generator shall be built with rotating field exciter and a permanent magnet pilot exciter. The generator shall be as specified in this document.

1.4 SYSTEM FUNCTIONALITY

A. Other than normal and required EG system operating and malfunction/trouble conditions, provide the capability of automatically controlling generator set operation based on data from the Plant SCADA system, which will control engine generator start and stop and output throughout the operating range based upon available fuel.

B. In manual or auto modes, the control system shall automatically engage the cranking motor, sense engine starting speed, disengage the motor, and arm the engine protection circuit.

C. Immediately shut down the EG system in the event of engine over speed, low oil pressure, high jacket water temperature, low coolant level, over temperature and over crank. Indicate cause of shutdown with lighted annunciator. With system logic, prevent restart until fault is cleared. Provide provisions for manual shutdown and emergency

stop.

D. Shut-down of the system will also be initiated based upon a power outage in the utility grid. This functionality shall be coordinated with the local power utility.

1.5 QUALITY ASSURANCE

A. The complete EG system shall be the product of a single manufacturer who has been regularly engaged in the production of complete EG systems for at least twenty (20) years. The complete system shall have been factory fabricated, assembled, and production tested as performed by the EG System Vendor. The naming of a specific manufacturer does not waive any requirements of this specification.

B. Responsibility: The responsibility for performance to this specification shall not be divided among individual component manufacturers, but must be assumed solely by the EG system manufacturer. This includes generating system design, manufacturing, testing, and having a local supplier responsible for service, parts, and warranty for the total system.

C. Sub-Assembly and Packaging: Generator set mounted subassemblies, such as cooling system, base, air intake system, exhaust outlet fittings, and generator set mounted controls and switchgear, shall also be designed, built, and assembled as a complete unit by the EG system manufacturer, or authorized third party, unless specifically called out elsewhere.

D. The EG system specified herein must not be a prototype, but a system manufactured successfully in the past. The EG system manufacturer must be able to certify that engine, generator, controls, auxiliaries and sub-assemblies/sub-systems have been tested as a complete EG system at the specified rating.

E. Production Tests: The manufacturer or EG System Vendor shall perform postproduction tests on the generator set supplied. A certified report of these tests shall be available when requested at the time of the generator set order.

F. Verification: The system manufacturer shall provide printed specification sheets and performance curves that, when compared to the certified production test report, confirm that the generator set performs as advertised.

G. Drawings/Schematics: All installation drawings and wiring diagrams for the EG system, controls, and switchgear must conform to the format specified under the submittal requirements outlined herein.

H. All parts and materials for the EG system shall be new and unused of current design. The generator set package and enclosure shall be manufactured, assembled and shipped by the EG System Vendor only after the EG system Shop Drawings have been reviewed and approved by the ENGINEER and OWNER.

1.6 REFERENCES

A. This specification includes applicable considerations of:

1. American Society of Mechanical Engineers (ASME)
2. Electrical Generating Systems Association (EGSA)
3. Institute of Electrical and Electronics Engineers (IEEE)
4. International Standards Organization (ISO) 9000
5. National Electrical Code (NEC)
6. National Electric Manufacturers Association (NEMA, NEMA MG-1)
7. National Fire Protection Association (NFPA)
8. Occupational Safety and Health Act (OSHA)
9. Society of Automotive Engineers (SAE)
10. United States Military Standards for Generators and Controls (MIL-STD)
11. Underwriters Laboratories (UL)
12. Texas Commission on Environmental Quality (TCEQ)
13. American National Standards Institute (ANSI)
14. American Welding Society (AWS)
15. Environmental Protection Agency (EPA)
16. National Electrical Testing Association (NETA)
17. Electric Reliability Council of Texas (ERCOT)
18. American Petroleum Institute (API)

1.7 SUBMITTALS

A. Submittals for approval shall be made in accordance with Division 1.

B. The following information shall be provided for all furnished equipment:

1. A copy of this specification section, and all referenced and applicable sections with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check-marks (√) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the CONTRACTOR, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined shall signify compliance on the part of the CONTRACTOR with the specifications. The submittal shall be accompanied by a detailed, written justification for each

deviation.

2. A listing and summary of all parasitic loads. This must also be submitted with the Proposal.

C. Submittals shall include but not be limited to:

1. Component List - A breakdown of all components and options.

2. Technical Data - Manufacturer produced generator set specification or data sheet identifying make and model of engine and generator, and including relevant component design and performance data as determined from Factory prototype testing of the specific EG system package to be furnished.

3. Major System Equipment (EG system skid mounted package; exhaust muffler; radiators; aluminum outdoor weather protected, sound attenuated enclosure; etc.):

   a. Dimensions:

      1) Length
      2) Width
      3) Height

   b. Weight:

      1) Dry
      2) Wet

4. Engine:

   a. Type, aspiration, compression ratio, and combustion cycle
   b. Bore, stroke, displacement, and number of cylinders
   c. Engine lubricating oil capacity
   d. Engine coolant capacity without radiator
   e. Engine coolant capacity with radiator
   f. Coolant pump external resistance (maximum)
   g. Coolant pump flow at maximum resistance

5. Radiator:

   a. Model
   b. Type
   c. Fan drive ratio
   d. Coolant capacity, radiator
   e. Coolant capacity, radiator and engine
   f. Weight, dry wet

6. Generator:

   a. Insulation class
   b. Number of leads

c. Excitation type
d. Temperature rise rating
e. Synchronous speed (rpm)
f. Armature winding
g. Rotor winding and excitor
h. Generator enclosure type
i. Form wound, VPI insulation
j. Harmonic, SCR loading capability
k. Generator set at rated load, voltage, and power factor
l. Efficiency at 0.80 PF for: 50 % load, 75 % load, 100% load
m. Time constants, short circuit transient (T'D)
n. Time constants, armature short circuit (TA)
o. Reactance, subtransient - direct axis (X"D)
p. Reactance, transient - saturated (X'D)
q. Reactance, synchronous - direct axis (XD)
r. Reactance, negative sequence (X2)
s. Reactance, zero sequence (X0)
t. Fault current, 3-phase symmetrical
u. Thermal Damage Curve
v. Decrement curve
w. Short circuit ratio
x. Stator winding coil pitch

7. Provide the following Manufacturer's EG set package technical data based on SAE J1349 standard conditions, ISO 3046 and standard reference conditions of DIN 6271 for the following minimum operating loads: 1/2, 3/4, and at full load:

a. Engine horsepower rating (BHP) at 0.8 power factor
b. Generator set electrical KW and kVA output at prime rating
c. Standard condition fuel consumption
d. Combustion air inlet flow rate and temperature
e. Cooling air flow
f. Maximum cooling air flow restriction
g. Exhaust gas flow rate
h. Exhaust stack temperature
i. Exhaust system backpressure restriction (maximum)
j. Exhaust emissions data at varying loads.
k. Heat rejection to atmosphere from generator
l. Heat rejection to atmosphere from engine
m. Heat rejection to:

    1) Coolant
    2) Intercoolers
    3) Heat exchanger lube oil
    4) Decoupling heat exchanger
    5) Exhaust

n. Mechanical sound data (Overall and at different frequencies and varying distances).
o. Exhaust sound data (Overall and at different frequencies and varying distances).

8. Provide EG set manufacturer's transient analysis graphs indicating generator set maximum and minimum instantaneous transient response of frequency and voltage, relative to time, for the generator set when imposing the following electrical single step block load changes on the generator set at rated power factor:

    a. 0 to 50% to 0%
    b. 0 to 75% to 0%
    c. 0 to 100% to 0%

9. Auxiliary Equipment - Specifications and data sheets and drawings, including, but not necessarily limited to, weather protected, sound attenuating enclosure; vibration isolators; EG coupling; voltage regulator; engine heat recovery exchanger; exhaust gas heat recovery exchanger; battery charger; generator starting/control battery; jacket water heaters; exhaust muffler; exhaust flex; exhaust system components; AC service load center, lighting, etc.

10. Drawings – Drawings shall be provided for the project in the format indicated previously. Clear demarcations indicating connection (locations, flange type and dimensions, pipe sizes, electrical, control wiring, etc.) between the EG System Vendor and the Installing CONTRACTOR shall be shown. All systems and subsystems provided by the EG System Vendor shall be included. These documents shall be revised to be as-built as necessary by the generator supplier after satisfactory equipment site commissioning and testing and included in the generator supplier's generator set equipment parts and operation manuals to be furnished to the Owner.

    a. Structural and Dimensional Drawings: Provide detailed dimensional drawings showing overall EG set; weather protected, sound attenuating enclosure; engine and exhaust heat recovery exchanger(s); complete cooling system; exhaust and other components. Structural drawings and calculations of the weather protected, sound attenuated enclosure assembly shall be signed and sealed by a Professional Engineer Registered in the State of Texas certifying that the design and construction of these assemblies will meet the requirements of the applicable building codes.

    b. Mechanical Drawings: The EG System Vendor shall provide complete details (i.e. cooling system, oil makeup etc.), including manufacturer specification data sheets for each component, including all exchangers, pumps, valves, sensors, and flexible connectors. Provide mechanical operational schematics indicating all components including identification of each item by manufacturer and part number, identifying component operating parameters.

    c. Electrical Wiring and Control Diagrams – Provide electrical wiring diagrams, schematic diagrams, PID drawings, and control panel outline drawings published by the manufacturer for EG set controls and for the associated electrical accessory equipment items including weather protected, sound attenuated enclosure electrical systems; all interconnections for remote automatic control, transfer, and communication. Show, and properly identify, point to point electrical interconnections and logic diagrams of the entire EG and enclosure assembly for ENGINEER review and for applicable wiring. A detailed electrical wiring termination drawing indicating locations and identifying numbered termination

points with appropriate shall be furnished. A single electrical schematic drawing shall be furnished indicating all enclosure AC wiring. DC control wiring schematics indicating point to point terminations for all generator and enclosure installed equipment items shall be furnished by the enclosure manufacturer.

11. Warranty Statements – Provide details of the EG System Vendor's (including weather protected, sound attenuating enclosure) furnished warranty coverage to OWNER including warranty information as published by the respective manufacturers of the furnished component equipment. In no case shall the warranty coverage for the complete furnished system be less than specified herein.

12. Service – Provide details of location and description of EG System Vendor's parts and service facility and number of qualified EG System Vendor service personnel and contact information.

13. Maintenance Contract – Provide detailed outline and description of the EG System Vendor's service maintenance contract to be furnished for the generator set equipment as specified herein. Include details of the items and services covered within the maintenance service contract. Proposed maintenance contract must be provided with the proposal.

14. Engine Oil Sampling Service – Provide description of recommended frequency of analysis service, and details of procedures necessary for these samples to be correctly taken in the field.

15. The EG set and weather protected enclosure shall not be manufactured until the shop drawings are approved by the ENGINEER and OWNER.

16. Testing reports as required elsewhere in the specification.

17. Exhaust data for air quality permitting.

1.8 EQUIPMENT ALTERNATIVES

A. In addition to submittal requirements contained in other parts of this specification, data for substitute equipment shall included with the Proposal submittal and shall include the following:

1. Plan Drawing - Verification that substitute equipment will fit into the space allocated and allow for removal and service.

2. Airflow Requirements - Provision for combustion, ventilating, and radiator cooling air.

3. Connections - Wiring and piping diagrams describing interconnect changes.

4. Load Study - Complete load review to confirm that generating equipment operates satisfactory and complies with original specification during all phases of operation, including motor starting and transient loading capabilities.

5. Specifications - Specification sheets and support literature to show that alternate equipment is in compliance with all specifications.

6. Certification - List of projects using similar equipment for the last five years.

7. Exceptions - A complete listing of all deviations from these specifications indicated by a marked up copy of this document.

1.9 MINIMUM SERVICE AND WARRANTY QUALIFICATIONS

A. The manufacturer shall have a local authorized dealer who can provide factory-trained servicemen, the required stock of replacement parts, technical assistance, and warranty administration.

1. Proximity to Job Site: The manufacturer's authorized dealer shall have a parts and service facility within 200 miles of the jobsite.

2. Warranty Terms - 1 Years: The manufacturer's and dealer's warranty shall in no event be for a period of less than one (1) years from date of acceptance by the owner of the system and shall include repair parts, labor, reasonable travel expense necessary for repairs at the jobsite, and expendables (lubricating oil, filters, antifreeze, and other service items made unusable by the defect) used during the course of repair. Applicable deductible costs shall be specified in the manufacturer's warranty. Running hours shall not be a limiting factor for the system warranty by either the manufacturer or servicing dealer. Submittals received without written warranties as specified will be rejected in their entirety.

3. Mechanics and Equipment: The EG System Vendor shall have factory trained service representatives, tooling and resources necessary to install, test, maintain, and repair all provided equipment.

1.10 PAYMENT TERMS AND CONDITIONS

A. Payment for the equipment shall be in accordance with the following schedule after proper invoicing:

1. 25% down on purchase order

2. 65% Equipment arrival FOB destination, Hornsby Bend Biosolids Facility, Austin, Texas after completion of performance testing and authorization by OWNER

3. 10% upon successful commissioning and OWNER acceptance of the unit using digester biogas

PART 2 – PRODUCTS

2.1 ENGINE

A. The combustion engine shall be a 4 stroke, air/biogas mixture turbocharged, aftercooled, and high performance electric spark ignition system. The air/biogas mixture system shall be electronically controlled with lean-burn capability.

B. The engine shall be equipped with air filters, lubricating oil cooler, filters, and pressure gauge, water pump and temperature gauge, service hour meter, flywheel, and flywheel

housing when applicable.

1. Sensors: jacket water temperature, jacket water pressure, lube oil temperature, lube oil pressure, mixture temperature, charge pressure, minimum and maximum lube oil level, exhaust gas thermocouple for each cylinder, RTDs, vibration sensors and monitoring, knock sensors and gas mixer/gas dosing valve positioning.

2. Actuators – throttle valve, bypass-valve for turbocharger and actuator control of the gas mixer/gas dosing valve.

C. Lubrication System:

1. Provide a full pressure lubricating oil system arranged to lubricate and cool the pistons and to distribute oil to all moving parts of the engine including the turbocharger bearings. Provide a sump type crankcase arrangement of sufficient capacity to suit the requirements of the engine, equipped with an easily accessible valved oil drain outlet.

    a. The lubrication system shall include full flow oil filters of the replaceable element type, easily accessible for removal and replacement. Provide a spring loaded, engine located, by-pass valve on the filters as an insurance against stopping of lubricating oil circulation in the event the filters become clogged. Provide a shell and tube type oil cooler with an automatic temperature regulating valve. Mount the oil filtration and cooling system on the engine skid. Furnish flexible pipe connections for all piping connections (cooling water and oil) between the engine and the oil cooler heat exchanger.

    b. Provide an engine driven lubricating oil circulating pump. The pump shall be of the positive displacement type and shall have ample capacity to circulate the amount of lubricating oil and cooling oil required by the engine and turbocharger. Furnish a pressure relief valve on the pump discharge.

2. Pistons shall be single-piece, made of light metal alloy, with piston ring carrier and oil passages for cooling; piston rings made of high quality material, main combustion chamber specially designed for lean burn operation.

3. Crankcase breather connected to combustion air intake system

4. Fresh and used oil shall be piped to reservoir storage as shown on the figures and specified elsewhere.

D. Engine Control System

1. Control of engine fuel and spark timing shall be through an electronic engine control module to provide isochronous and droop speed control and enhanced performance from variable spark ignition timing and duration. The electronic control module shall operate on 24 volt DC power supply from the engine starting batteries. The control module shall provide idle and rated speed settings; adjustable monitoring of vital engine parameters; timing control for load and fuel quality; integrated temperature sensing for cylinder exhaust port, turbocharger inlet/outlet, average for left and right cylinder banks; and adjustable air/fuel ratio control to

account for humidity and atmospheric pressure. The control shall include an oxygen sensor and detonation sensor.

2. Furnish one PLC with manual and automatic synchronizer and load share control unit to perform speed and phase matching, synchronizing, paralleling, load sensing, load control for parallel operation with the utility power system. The control shall provide safe dead bus closure, true RMS power metering, bumpless transfer, programmable breaker retry, adjustable ramps for loading and unloading, digital power factor control, process import/export control, digital tuning of alternator voltage output, and shall be easily programmable using a laptop computer. The digital synchronizer and load share control shall provide control to the electronic speed controller, and shall operate on 24 volt DC power from the engine starting batteries. The EG Control PLC shall include all generator protection devices as specified on the Figures. The EG system PLC controller shall be capable of communicating with the plant SCADA system DCS network of Modicon Quantum Series PLC's.

   a. Provide Modbus TCP/IP protocol with Ethernet connection for remote communications with Plant SCADA System.

   b. A Graphical Display (with keypad) shall be included that provides all metering and totalizing access.

3. Furnish also a separate overspeed shutdown device which shall, in case of predetermined overspeed or the operation of various protective devices as later specified, instantly stop the engine.

E. Cooling System:

1. The manufacturer shall be responsible for the complete design, provision, and coordination with contractor for installation for the entire engine cooling system including all EG set and site installed equipment (with the exception of piping connections to remote radiators), in accordance with the engine manufacturer's and specified requirements to allow proper cooling of the engine and to assure that proper and rated generator set engine performance is achieved during any range of generator set normal operation within the specified project site conditions. The required coolant system design, including flow rates and supply and return temperatures, shall be the responsibility of the EG System Vendor and coordinated with the Engineer for the layout of piping and system components and subsequent pump requirements.

2. Excess heat from the engine will be used to supplement heat to the digester hot water loop and will include heat from the engine jacket water, engine lube oil and the engine's turbocharger intercooler through hot water supply and return piping connections through a decoupling heat exchanger. Incorporate provisions in the hot water circulating loop through a decoupling heat exchanger for exhaust heat recovery and provide exhaust gas heat recovery unit.

3. The engine jacket cooling system shall be an independent closed-loop water system with heat exchangers, pumps, piping, controls, sensors, valves, flexible connectors,

and generator set mounted fluid expansion tanks for the engine jacket water, engine oil cooling, and charge air cooling water circuits and the second system for the aftercooler, separately connected to a remote located radiator unit. Size the cooling system, consisting of the radiators, engine cooling jackets and heat exchangers, and coolant circulating pumps to provide adequate cooling to the engine when operated continuously at full rated output, with 104 degrees F outdoor ambient temperature at the radiator. If site conditions exceed the 104 degrees F the EG should continue to operate at a de-rated output. De-rating factor should be specified as a percent of output power at various temperatures above the 104 degrees in the EG shop drawings.

4. The remote radiator shall be located outdoors. The radiator shall be dual core (handle both engine circuits), horizontal (vertical up air flow), quiet design, and multi-fan design. The coolant shall be an ethylene-glycol anti-freeze solution. The fin-tube area should be designed for a dirty, dusty, wet, and high sulfide environment with compatible metallurgy and/or coating systems while maintaining the required ease of cleaning and heat transfer performance. Coils should be electro-fin coated, structure should be hot-dipped galvanized, with anodized/stainless steel fan hubs and hardware. Motors should be severe-duty rated.

5. Provide a thermal expansion tank incorporating properly sized pressure relief cap/device and be suitably sized for the volume of the cooling system at sustained full load generator set operation without overspill of the engine cooling fluid. Each cooling circuit shall have its own expansion tank mounted on and connected to the coolant circuit at the radiator or the engine.

6. Provide ON/OFF starter and control for the electric motor driven fans based on a signal from an integrally supplied and installed temperature sensor on the radiator.

7. Provide thermostatically controlled heater(s) for the engine jacket water system to maintain appropriate engine jacket water temperature to assure quick start and load transfer with an ambient temperature of minus 10 degrees F.

8. Provide a valved drain on the cooling system, piped to the exterior of the enclosure for easy access to drain the cooling system. Drain shall be with Schedule 40 black steel pipe and threaded fittings. Provide flexible connectors at the connection of off-skid piping to the engine. Also provide isolation valves within cooling circuits to allow for opening portions of the circuit without draining the entire system for access to the coolant pumps, jacket heater, radiator and engine.

9. Provide visual indication of coolant level in the system.

10. Provide the engine/heat exchanger pressurized closed loop cooling systems with a water/ethylene glycol base coolant mixture as per the engine manufacturer's recommendations for the generator set in its installed location, environment, and within the specified site conditions.

F. Biogas Fuel Train: Provide complete gas train with valves, filters, gauges, regulators, leak detectors, flexible connections and safety apparatus to comply with NFPA and all local regulations.

G. Combustion Air System: The engine air cleaner shall be engine mounted with dry element requiring replacement no more frequently than once every 90 days. If external ducting is required, maximum restriction to the combustion air inlet shall be 6.7 kPa (27 in H2O) at the required airflow.

H. Exhaust System:

1. Silencer mounting shall be coordinated with any covers, canopies or building roofs. The exhaust silencer and the exhaust piping shall be covered with appropriate high temperature insulation and shielding inside of the generator enclosure.

2. The engine exhaust system shall be installed to discharge combustion gases quickly and silently with minimum restriction. System including silencer shall be designed for minimum restriction, and in no case shall backpressure exceed 6.7 kPa (27 in H2O) imposed on the engine at full operating load, or exceed the engine manufacturer's maximum allowable exhaust backpressure limits.

3. The exhaust system will include a completely integrated exhaust gas heat recovery system to transfer heat to the hot water circulating system via a heat exchanger. All controls, sensors, valves instrumentation and hardware to enable exhaust gas flow through or bypass of the heat exchanger shall be provided.

4. The generator exhaust silencer is to be installed outside of the generator weather protective enclosure and the exhaust outlet extended to the outside of the enclosure roof through an installed aluminum or stainless steel construction rain skirt and terminated with an aluminum construction, brass collared and counter weighted exhaust outlet rain cap. The exhaust silencer and associated piping shall be installation supported and braced to prevent weight or thermal growth from being transferred to the engine. Flexible expansion fittings shall be provided to accommodate thermal growth. Vibration isolation shall be included where necessary to isolate damaging vibrations. All exhaust system piping, insulation materials, and the complete installation of the entire exhaust system shall be provided by the enclosure manufacturer.

5. The exhaust silencer (muffler) shall be a minimum of "critical" grade to provide extreme noise attenuation for environments with low background noise where slight noise emissions would be objectionable. The silencer shall be stainless steel body construction, integrally insulated by the silencer manufacturer and minimally capable of up to 35 - 40 dBA attenuation at between 125 and 2000 Hz octave band center frequencies. The exhaust silencer shall be selected and furnished so that the exhaust sound / noise from the generator set engine at any range of generator set normal operation is to be attenuated by the installed silencer and generator weather protective enclosure in order to meet the requirements of all local codes and ordinances.

6. The silencer shall be furnished with inlet and outlet weld on type ANSI companion flanges, gaskets and bolts / nuts, and an appropriately sized stainless steel bellows type engine expansion flex connector for connection to the engine. The silencer shall be furnished with a NPT drain fitting. Suitable rated high temperature resistant gaskets shall be utilized for all exhaust system flanged connections.

I. Engine Starting System

1. Provide an engine mounted, 24 volt DC, solenoid shift electric starter(s), capable of withstanding four consecutive continuous cranking periods of 15 seconds duration each separated by 15 seconds rest periods before shutting down completely and sounding the overcrank alarm.

2. The starting batteries shall be low maintenance, long life, lead acid type, especially designed for biogas engine cranking service. Batteries shall be of a capacity as recommended by the battery manufacturer for cranking the engine being furnished, for the necessary break-away current, cold cranking amperes, and ampere hour capacity for four consecutive 15 seconds of cranking without being recharged, with a battery temperature of 45 degrees F and with the SAE 30 oil in the engine maintained at 60 degrees F.

3. Furnish and install the required battery cables with insulated terminals and connectors for connecting the batteries to the electric starter. Furnish all connectors and hardware, cables, grease, and battery lifting device.

4. Furnish a completely automatic battery charger for charging the batteries being supplied. The charger shall be UL listed, fully automatic, solid state, temperature compensating, float/equalize-type, designed for maximum battery service life with minimum battery maintenance. Charger shall be for 120 volt, single phase, 60 Hertz alternating current input, with voltage regulation within one percent with plus or minus ten percent fluctuations of the input voltage. Direct current output shall be not less than 20 amperes and shall be current limited at 120 percent of rated output. The charger shall have automatic voltage sensing determined by the state of the battery and reducing to milliamp current on a fully charged battery. Accessories shall include direct current ammeter and voltmeter (panel type; 2 percent accuracy), float and equalize indication, A.C. and D.C. fuses, and A.C. power indicating light. Furnish alarms including A.C. power failure, high D.C. voltage, and low D.C. voltage. Alarm conditions shall have individual indicator lights on the face of the charger panel and shall operate a common alarm relay for remote transmission of alarm. Alarm wiring will run directly to the SCADA system and will not require an annunciator point in the generator control panel. The charger shall be LaMarche, Sens, Nife, or equal. The battery charger shall provide control power to the generator control panel when the generator is not running, with the correct voltage and current output to provide proper battery charge rate for maximum battery life and control panel power requirements. Arrange the battery charger for wall mounting.

5. Furnish an engine driven battery charging alternator to charge the starting batteries and provide all power requirements of the engine, control panel, and engine mounted auxiliaries during engine operation Including EG system I&C, metering/monitoring and remote SCADA communications.

2.2. GENERATOR

A. The alternator shall be designed for the following criteria:

1. IP 23 (general purpose) enclosure and designed for connection to the engine
2. Continuous rated 850 kW
3. Wye connected, solidly grounded neutral
4. Three-phase, 60 Hz, 4-wire, 480 Volt
5. 2/3 Pitch
6. Revolving field, synchronous, brushless excitation, six lead
7. Speed = 1,800 RPM
8. Insulation Class H, with a Class F temperature rise
9. Generator Efficiency = 96%
10. Power Factor 80% lagging minimum
11. Total Harmonic Distortion (THD) to be compliant with IEEE-519 and NEMA MG-1 Standards, but in no greater than 1.5%.
12. Windings and bearing Resistance Temperature Detectors (RTD's)

B. The alternator shall be mechanically and torsionally matched to the engine. The alternator shall be provided with PMG support for 300% rated current for 10 secs or 3 phase symmetrical short circuit. The alternator shall be by Stamford-Newage; Caterpillar; Kato; Marathon Electric Company. The alternator shall conform to the applicable parts of the following standards, unless otherwise specified:

1. NEMA MG1, Motors and Generators
2. IEEE 43, Recommended Practice for Insulation Testing of Large ACE Rotating Machinery
3. CSA C22.2-100 Designation ABL3
4. Testing shall be in accordance with IEEE-115 and NEMA MG-1 standards

C. The alternator windings shall be copper, insulation and excitation system shall be braced to withstand any possible short circuit stresses and shall be designed to withstand overheating or stresses caused by harmonics.. The unit shall be "Radio Interference Proof" (RIP) and the "Telephone Influence Factor" (TIF) shall be within the limits of Section 9, ANSI C50.12.

D. The alternator shall be brushless with a rotating permanent magnet generator type exciter rotor system with Class H insulation and temperature rise not to exceed 80 degrees C.

E. The voltage regulator shall be within plus or minus one percent of rated voltage from no load to full load. The voltage regulator shall provide for manual voltage adjustment of a minimum of plus or minus 5 percent from rated voltage while the unit is in operation.

F. The alternator stator shall be fabricated bar and plate steel construction. Machine the frame to tolerance to provide alignment with the rotor. Stator coils shall be random or form wound and inserted in insulated core slots. Wound core shall be vacuum impregnated with fungus resistant thermosetting synthetic varnish and baked for maximum moisture resistance, high dielectric strength and high bonding qualities. Armature lamination followers and frame ribs shall be welded integral with the frame. Enclosure shall be drip-proof guarded and shall include stainless steel rodent screens.

G. Alternator rotor poles shall be built up of individually insulated steel punchings. Poles shall be form wound and bonded with high strength varnish, then baked. Braze cage

connections for strong construction and permanent electrical characteristics. Bolt each pole to the rotor shaft.

H. Provide a directional blower on the rotor shaft to draw cooling air from the exciter end, over the rotor poles and through louvered openings in the drive end.

I. The alternator shall have a permanently lubricated anti-friction bearing. The designed bearing life, based on the B-10 curve of the American Bearing Manufacturers Association, shall be not less than 75,000 hours.

J. Provide an automatic thermostatically controlled winding space heater to maintain not less than 90 degrees F temperature with an ambient temperature of 50 degrees F.

K. The digital voltage regulator shall be hermetically sealed, solid state type and shall employ a true three phase sensing. The voltage regulator shall provide automatic protection of the entire unit on the three phase short-circuits. The voltage regulator shall include automatic over excitation and under frequency protection.

L. Provide an excitation controller for the alternator, to modulate the alternator voltage and reactive current output by controlling the field excitation via the exciter's output. The following function shall be included in the overall control system. These functions shall be provided by a single unit or as separate coordinated devices.

1. Voltage regulation
2. Power factor control
3. Under-frequency / over voltage protection
4. Paralleling compensation

M. The alternator shall be of either single or independent two bearing design type. It shall have a shaft extension and close coupled adaptor suitable for direct connection to the engine output shaft with a flexible coupling.

N. The complete alternator unit shall be dynamically balanced. The vibration displacement shall not exceed 3 mils peak in accordance with NEMA standards, at the manufacturer's test stand.

O. At any balanced load between 75 and 100 percent rated output, the difference in line-to-neutral voltage among the three phases shall not exceed one percent of the average line-to-neutral voltage. Under an unbalanced load, consisting of 25 percent load at 1.0 power factor placed between any phase and neutral and zero load on each of the other two phases, the maximum simultaneous difference in voltage between the three line-to-neutral phases shall not exceed three percent of rated line to neutral voltage.

P. The manufacturer's detailed torsional analysis and factory testing of a similar production unit shall demonstrate that the generator set model to be furnished shall operate free from excessive torsional vibrations and is to be submitted to the ENGINEER for review prior to generator set manufacture.

Q. All generator mounted potential transformers and current transformers shall be U.L. labeled and recognized.

R. Provide and install proper surge protective devices (SPDs) compliant with UL1492, Third Edition, inside of the generator housing and at the 480 V switchgear.

S. Provide 100 ohm platinum resistance temperature detectors (RTD) for each generator bearing and two (2) 100 ohm platinum RTD's per each generator phase imbedded into the generator stator windings by the generator set manufacturer prior to shipment from the factory. Factory terminate all RTD wiring on a terminal point strip to be located inside of the generator's low voltage junction box. Provide the RTD monitor and trip signal to the circuit breaker. Vibration sensing and monitoring shall also be provided.

T. All wiring points for remote low AC and DC control voltage interconnections between the generator set and remote equipment shall be through a single junction box mounted on the side of the generator housing by the manufacturer with numbered terminal strips for all interconnections wiring. The junction box shall have provisions for top or bottom conduit entry. All required interface wiring for generator control and plant remote signal provision/ monitoring shall be wired to the enclosure exterior mounted NEMA 4X 316 stainless steel junction box in conduit by the enclosure manufacturer.

U. All device and wiring enclosures inside the EG enclosure shall be 12 gauge painted aluminum for sizes 12" x 12" and smaller. Enclosures larger than 12" x 12" shall be 316 stainless steel.

2.3 ENGINE GENERATOR SET CONTROL METERING AND ALARM

A. The generator set shall include a combination engine-alternator monitoring/control panel, to be included in the main generator controller. The control panel shall be all electronic type, with alpha-numeric and digital displays visible in any lighting condition. House the control panel in a unit-mounted NEMA 12 enclosure. Panel construction shall conform to UL 508 for industrial control panels. Provide all interconnecting wiring between the engine-alternator set and the control panel. Direct communication with the control panel shall be with an environmentally sealed membrane keypad. Furnish with the generator all software, instructions, and interconnecting cables required for PC communication/programming with the EG control system. The control panel shall be oriented for easy viewing when entering the generator control room.

1. The panel shall include, but not be limited to, the following indications:

a. Lubricating oil pressure.

b. Jacket water and aftercooler water temperature.

c. Lubricating oil temperature

d. Diagnostics for servicing

e. Emergency shutdown condition indication lamps for each shutdown condition with logic to maintain lockout condition and fault light until reset.

f. Engine operating temperature and/or cylinder exhaust gas temperature

2. Operators on the panel shall include:

    a. Emergency stop push button

    b. MANUAL-OFF-AUTO selector switch

    c. Phase selector switch

    d. Voltage control potentiometer

    e. Lamp test pushbutton

    f. Alarm acknowledge/horn silence pushbutton

    g. Audible and visual alarm indication

3. The panel shall also include:

    a. Current and potential transformers.

    b. Generator voltage regulator, digital type, adjustable, volts per Hertz.

    c. Engine control module

4. The EG Manual-Off-Auto functionality shall be as follows:

    a. Manual Mode: This mode shall allot the EG to be manually started with a "START" pushbutton and stopped with a "STOP" pushbutton. In addition, these shall be speed and voltage control potentiometers for voltage and frequency control. Using these potentiometers and manually closing the main circuit breaker shall allow the generator to be synchronized with the Utility bus. Also, the VAR controller shall be capable of manually adjusting the power flow.

    b. Off Mode: In this mode, the engine shall be locked out and the respective generator circuit breaker opened.

    c. Auto Mode: This mode shall allow automatic starting/stopping of the engine, adjusting the voltage and frequency by way of motorized potentiometers, synchronizing to the Utility bus, and automatically closing the main circuit breaker. The setpoints set the VAR controller and kW output shall be automatically controlled by the EG Management system.

    d. In either Manual or Auto mode, upon a stop command the engine will go through a routine cool-down period. An E-STOP pushbutton will be provided that will cause the engine to stop immediately without cool-down.

5. Provide external visual and audible alarms to annunciate common alarm condition. Provide pushbutton to silence alarm.

B. Switchgear:

1. The scope of supply by EG System Vendor shall include the switchgear for operation of two paralleling 848 kW EG units. Switchgear shall be NEMA 3R aluminum construction. Package shall include an outdoor, two section free standing metal enclosure listed to UL 891. Space shall be included for future switch.

2. The switchgear shall be in two sections of 30" wide each and 3000 amp main tin plated copper bus braced for 65KA. The switchgear shall include a 3000AF/3000AT main draw out breaker for tie in to the utility step up transformer and 1-1600AF/1600AT draw out circuit breakers one generator. The circuit breaker for the second generator will be installed in the switchgear at a later date (not under this contract) The main circuit breaker shall be provided with a Multilin 750/760 feeder protection relay which shall have protection features of 25, 27, 32, 50/51, 50/51G, 59, 81O/U relay devices, full metering, ethernet modbus TCP output, breaker control switches, and indicator lights. Provide 120V control power for the Multilin 750/760. Connect the ML750/760 modbus TCP output to the Ethernet switch provided in the generator enclosure as shown in the Figures. All circuit breakers shall be provided with 24V control power for shunt and capacitor trips and 120V AC Close coils. Provide all auxiliary alarm contacts and a lockout relay (86) for each generator circuit breaker. Provide all miscellaneous control relays, fuses, terminal blocks. Provide anti-condensation heaters and also provide 120V power for it as well.

C. The AC and DC power distribution system shall also provide 120 VAC circuit breaker close coil power and 24 VDC trip coil power for the 3000 AMP circuit breaker in outdoor switchgear.

D. The EG control panel shall include the following:

1. The engine control module shall provide automatic cyclic cranking for a total of at least four 15 second cranking periods separated by 15 second rest periods. If the engine fails to start after the last cranking cycle, the cranking limiter shall terminate further cranking and activate the overcrank alarm.

2. The generator controls shall include an automatic cool-down timer, to allow the engine to continue to operate after it trips from the main prior to automatic shutdown.

E. The control panel shall include an emergency stop pushbutton, and the controls shall be arranged to accept operation of a remote contact to provide for emergency stop. Emergency stop shall over-ride all other controls to immediately shut off the fuel supply and stop the engine. Furnish loose, for installation outside of the Generator Room, a remote emergency stop switch housed in a NEMA 4X wall mount enclosure, permanently labeled as "Generator Emergency Stop".

F. Provide automatic shutdowns with fault indication for the following conditions:

1. High jacket water/aftercooler water temperature

2. Low lubricating oil pressure
3. High lubricating oil temperature
4. Engine overspeed
5. Overcrank
6. Fail to crank
7. Over voltage
8. Under voltage
9. Under frequency
10. High engine coolant temperature
11. Low coolant
12. Emergency stop

G. The controls shall include automatic pre-alarms for the following conditions with fault indication for each:

1. Low coolant temperature
2. Low oil pressure warning
3. High coolant temperature warning
4. Switch not in AUTO position
5. Low battery voltage
6. High battery voltage
7. Generator Winding RTD temperature

H. The control panel shall include an audible alarm to signal any of the alarm shut down or pre-alarm conditions. Alarms shall not reset and the alarm shall not shut off until manually acknowledged, and fault lights shall not reset until the fault is resolved. Audible alarm silence command shall be provided.

I. The controls shall incorporate a means to positively disable and lock out the generator from starting during maintenance. This provision shall take the form of a lockable battery disconnect switch, a lockable disconnect switch on the battery cable to the starter, a lockable stop switch on the control panel, or a lockable switch on the starter solenoid power supply.

J. The control panel shall include provision for remote status monitoring by the SCADA system. Furnish a communication module in the generator control panel to provide remote monitoring of all status and alarms, and all gauge readings (panel indications) as listed above. The communication module shall provide for remote PLC monitoring of all “real time” engine and generator parameters, remote monitoring of all alarms, shutdowns, and diagnostic codes, remote start/stop control, remote fault set. The communication module shall communicate to the SCADA system via Modbus TCP/IP Protocol. The control panel shall provide for remote monitoring of any parameter as to be coordinated with the Owner. At a minimum, the following parameters are to be provided for remote monitoring:

1. Status of all alarms
2. Run Status and accumulated runtime since last reset
3. MANUAL-OFF-AUTO Switch Position
4. Real time values including:
   a. Phase Voltages (L-L and L-N)

b. Line currents
c. kW, kVAR, and kVA
d. Battery voltage
e. Engine Oil Pressure
f. Engine Coolant Temperature
g. Frequency
h. Power Factor
g. Generator winding and bearing RTD temperatures

5. kWH and kVARH since last reset
6. Acceptance of remote signals including:
   a. Available Gas Supply
   b. Remote STOP Command
7. Timer pre-set and remaining time for all delay control timers, such as cool-down run period.
8. Other parameters to be recommended by the EG System Vendor and coordinated with the Owner at a minimum:
   a. Twelve more status points
   b. Twelve more analog points

K. The generator control panel shall provide for control of all generator auxiliary loads in and on the enclosure required to operate the unit including remote radiator fans, coolant pumps, lubrication oil pumps, ventilation fans, and jacket heaters, by providing contact closure relay outputs to the individual motor starters for each item of motor driven equipment.

L. The engine starting batteries and charger shall be sized such that there is adequate DC power to all the circuit breakers including the 52GU1 for trip control. 120V AC power from the utility panel shall be provided for the circuit breakers for breaker close operation.

M. In addition to the engine control panel (ECP), provide PLCs for each EG unit for integrating alarm graphical display for monitoring purposes and communication to to the plant SCADA and AE remote control systems

N. Provide engine starting battery sizing and charger sizing calculations with the shop drawing submittal.

O. All electrical, control and instrumentation and power wiring external to the EG package shall be pulled by the Installing CONTRACTOR, but termination within the EG enclosure shall be by the EG System Vendor, unless this specification indicates that certain terminations are to be by the Installing CONTRACTOR outside the enclosure.

P. The EG control panel shall include, as a minimum, the following features and functions:

1. A reset switch to clear a fault and allow restarting the generator set after it has shut down for any fault condition unless the fault condition continues to exist.
2. A lamp test switch to cause the entire control panel to be lighted with DC control power. The panel lamps shall automatically be switched off within 15 minutes after the switch is depressed, or after the switch is depressed a second time.

3. Panel illumination lights (24 VDC operated) with panel mounted ON/OFF switch shall be furnished for the control panel.
4. Unlimited event logging of generator alarms, events, and trips accessible from an LED or liquid crystal display screen for event or alarm or repair diagnosis. Events, alarms or trips shall be recorded by calendar date and time of occurrence, not on engine running time. The event log shall be able to be downloaded to a laptop computer for printing and analysis.
5. The control panel shall include a true RMS sensing with 0.5% electrical characteristic accuracy metering package with the following monitoring and display parameters:
6. Digital (LCD) Graphical User Interface Display Panel shall provided display of each of the following:

    a. AC voltage – 3 Phase (L-L, and L-N)
    b. AC Amps (3 Phase and Total)
    c. KW (total and per phase)
    d. kWH
    e. kVA (total)
    f. kVAR
    g. kVARH
    h. Power Factor (average total and per phase)
    fi Frequency
    j. DC voltage (24V control)
    k. Coolant temperature
    l. Oil pressure
    m. Engine operating RPM
    n. Engine running hours (Elapsed Time Meter (ETM) – 6 ½ digits)

Q. The EG control panel shall incorporate the following protective devices.

1. Undervoltage
2. Overvoltage
3. Phase Over current
4. Phase loss
5. Over Frequency
6. Under Frequency
7. Over kW
8. Fault conditions
9. Reverse power
10. Ground fault
11. Generator bearing and winding RTDs

R. Provide a VAR/PF controller.

S. Provide all requirements as shown on Figures.

T. The EG System Vendor shall be responsible for incorporating appropriate plant signals into the control package for proper engine operation. These signals will include items such as biogas availability, remote equipment status, and shutdown commands.

U. Manual/Auto Synchronizer: Provide in each engine control panel a manual and auto synchronizer for synchronizing to live bus and dead bus and the generator circuit breaker close operation signal. The synchronizer shall be suitable for future addition of a engine generator.

V. The Engine control panel shall consist of an EG Management and engine control module. All protective relays, auto/manual synchronizer and metering system shall be incorporated in the EG Management system. Each EG shall be equipped with a separate control system. These equipment shall be located in the EG enclosure.

2.4 ENGINE GENERATOR BASE

A. Engine generator base requirements

1. The engine and generator shall be assembled to a common base to provide suitable mounting on any solid level surface. The base shall be constructed of heavy-duty structural steel, designed, and built to resist deflection and maintain alignment during skidding, lifting and operation and minimize resonant linear vibration during any range of normal generator set operation.

2. Furnish required quantity of generator manufacturer supplied vibration isolators installed between the bottom of the EG set base and the top of the mounting surface. The isolators shall bolt to the generator base with manufacturer furnished securing / leveling bolts, and have a waffled or ribbed pad on their bottom mounting surface. The pads shall be resistant to heat and age, and impervious to oil, coolant, and cleaning compounds. The isolators shall provide a minimum of one (1) inch static deflection while limiting the maximum vibration transmissibility to 10% during all ranges of generator set operation.

3. Electrical grounding lugs shall accommodate two-hole lugs for the cable sizes shown on the Figures. The main generator ground lugs shall match grounding conductor size specified.

2.5 WEATHER PROTECTED ENCLOSURE

A. The skid mounted generator unit, engine starting batteries, battery charger, pumps, tanks, gas trains and engine accessories shall be enclosed in a sound attenuated weather proof walk-in type enclosure designed to meet the conditions set forth below. The enclosure shall include a separate room to house the generator control panel, electrical switchgear and controls to support the generator. The base enclosure construction shall consist of an ISO container modified as required to accommodate the generator and accessories to allow for 24” clearance between the engine and the enclosure walls. The enclosure shall be in compliance with the National Electrical Code (NEC) and the National Fire Protection Association (NFPA) for clearance around electrical equipment as specified. The enclosure shall conform to the following design criteria and comply with local building codes:

1. Rigidity wind test equal to 115 mph
2. Roof load equal to 50 lbs per sq. ft.
3. Floor load equal to 200 lbs per sq. ft.
4. Rain test equal to 4-in per hour

5. All exterior surfaces to be constructed of aluminum

Test data on similar construction by the manufacturer shall be available upon request. Structural design drawings for the enclosure shall be stamped by a registered structural engineer in the state of Texas.

B. The enclosure shall have an interior width as required to provide not less than 24" access space on each side of the EG set. The dimensions of the enclosure shall be such as to provide space for NEC clearances of the EG set and controls.

C. The enclosure shall consist of a roof, floor and underframe, two side walls, and two end walls. It shall incorporate intake/exhaust hoods/plenums as required for ventilation and to reduce source noise sufficiently.

D. Insulation in the walls and roof shall be semi-rigid, thermo-acoustic, thickness as required to meet the noise criteria specified. Lining shall be perforated, mill-finish aluminum. Self-adhesive foam, loose and/or bat-type insulating materials shall not be acceptable.

E. Provide two double personnel access doors, one on each side of the enclosure. Doors shall consist of a steel frame with skin material matching the enclosure. Provide a single personnel access door on the end of the container to access the control room and an additional single door for access from the control room to the engine room. Doors shall be fully gasketed to form a weathertight perimeter seal.

F. Air handling during operation of the generator set shall be as follows: Air shall enter the enclosure through a sound attenuating box and louvers at the top of the enclosure. Provide a motor operated damper on the intake louver, wired to open upon engine startup. Electric motor driven ventilation fans shall provide forced air (positive pressure) into the enclosure, to exhaust through end dampers and louvers, and into a sound attenuating discharge plenum. The fans shall be VFD controlled by engine room temperature sensing. The ventilation system shall be oriented such that the fresh (first in the air stream) air hits the engine alternator end first.

G. The enclosure shall include all necessary hardware required to roof mount the specified exhaust silencer, plumbing and maintain the weatherproof integrity of the system.

H. The resulting housing, in combination with the engine exhaust silencer, with EG in operation at full load, shall reduce transmitted noise to 65 dB at 32 feet, or as required by local ordinance. It shall be the responsibility of the generator unit manufacturer to choose thickness of insulation, number of baffles, etc. to meet the aforementioned sound criteria.

I. Provide a complete electrical supply and distribution system within the enclosure to provide three phase to the generator auxiliary equipment such as ventilation fans, coolant pumps, lubrication pumps, heaters and single phase power for lighting and heaters and receptacles where required.

J. The enclosure shall be finish coated with a long lasting coating suitable for the site conditions outlined. Both internal and exterior protective coatings are required. Coating

system shall be as follows and applied in strict accordance with manufacturer's requirements:

1. Surface Prep: Aluminum shall be prepared by SSPC - SP1 Solvent Cleaning. Please refer to SSPC Standards

2. Prime Coat: Prime with 1 coat of Carbocrylic/Sanitile 120 at 1.0 to 2.0 mils dft.

3. Finish Coat: Finish with 2 coats of Carbothane 133 LH at 2.0 to 2.5 mils dft per coat.

K. A separate control room shall be provided as part of the enclosure with an isolatable ventilation system.

L. Floor shall be designed as an oil and fluid containment pan. Floor shall be provided with a non-slip surface.

M. Fluorescent lights shall be installed within the enclosure and strategically located on both sides, and the generator end of the generator set to provide a minimum of 40 footcandles (fc) of uniform light throughout the enclosure. The light fixture shall use energy saving electronic ballasts and lamps. One exterior fluorescent light fixture, suitable for outdoor use and protected from windblown damage, shall be installed at each access door and controlled by a photocell with override switch.

N. Provide and install duplex GFCI receptacles on the inside of the enclosure on wall opposite of entry doors and one in the control room area. Provide and install a minimum of two GFCI receptacles on the exterior of the generator enclosure with weather resistant covers. All receptacles shall be GFCI type.

O. The OWNER will provide 480V, 3 phase, 60A service to each engine generator enclosure. The EG System Vendor shall provide 480V distribution, 480 to 120/208V transformer and 120/208V, 3 phase panel boards for power distribution.

P. All panel boards, transformers and associated wiring for receptacles, lights and other power distribution shall meet UL and NEC Standards. All device and wiring enclosures inside the EG enclosure shall be 12 gauge painted aluminum for sizes 12" x 12" and smaller. Enclosures larger than 12" x 12" shall be 316 stainless steel.

Q. Provide enclosure ventilation fans, 120 VAC with thermostatically controlled switch for automatic thermostatic on/off control operation of the fan(s). All wiring for the thermostat and fan system to provide a workable system shall be provided and connected to the AC distribution panel as required by the enclosure manufacturer.

R. All container enclosure wiring shall be in accordance with Division 16, City of Austin Electrical Specifications, and in compliance with all NEC requirements and NEMA WC 3, WC 5, and WC 7 requirements.

S. All internal wiring for the battery charger, jacket water heater, lighting and generator control panel shall be pre-wired at the factory by the enclosure manufacturer. Install all

enclosure AC power and control wiring as required for a complete and operating system.

T. Provide a means of automatically switching (ATS) from engine generated power to local power, and vice versa, for operation of auxiliary equipment operated from the EG system.

2.6 APPURTENANCES

A. Provide the following supplemental items:

1. Used Oil Storage Tank: 640 gallons w/ integral pump. Tank to be A36 carbon steel constructed to API 650 specification. All controls and power supply to be provided through the EG System Vendor.

2. Fresh Oil Storage Tank: 640 gallons w/ integral pump. Tank to be A36 carbon steel constructed to API 650 specification. All controls and power supply to be provided through the EG System Vendor.

3. Make-up Glycol Storage Tank: +/- 50 gallon drums on containment skid w/ integral pump. All controls and power supply to be provided through the EG System Vendor.

PART 3 – EXECUTION

3.1 TESTING AND INSPECTION

A. Engine Generator Set

1. The EG set manufacturer shall perform factory testing and quality control inspections on the specific EG set at the assembly location. OWNER and OWNER'S REPRESENTATIVE shall be present for final system testing. The manufacturer's certified report of these tests and inspections shall be submitted to the ENGINEER prior to delivery of the unit to the site.

2. Manufacturer shall include in their proposal travel costs for five (5) parties to attend the testing.

3. The engine, generator, and EG set shall be subjected to the factory testing and quality control inspections to insure reliable operation. Include torsional analysis report from factory. These tests and inspections shall include, but not necessarily be limited to, the following:

a. Engine Tests: Carried out as combined Engine and Module test according to DIN ISO 3046 The following tests are made at 100%, 75% and 50% load, and the results are reported in a test certificate:

i. Engine output

ii. Fuel consumption

iii. Jacket water temperatures

iv. Lube oil pressure

v. Lube oil temperatures

vi. Boost pressure

vii. Exhaust gas temperatures, for each cylinder

viii. Engine Emissions

b. Generator tests

i. Carried out on the premises of the generator supplier.

c. Module tests

i. Functional tests of control system.
   a. Starting in manual and automatic mode of operation
   b. Power control in manual and automatic mode of operation
   c. Function of all safety systems on module
   d. Measurements at 100%, 75% and 50% load:
      - Frequency
      - Voltage
      - Current
      - Generator output
      - Power factor
      - Fuel consumption
      - Lube oil pressure
      - Jacket water temperature
      - Boost pressure
      - Mixture temperature

ii. Exhaust emission (NOx) field conditions at the time of testing shall be noted and shall include:
   a. Barometric pressure
   b. Inlet air temperature

d. All electrical components, including switchgear, cables, circuit breakers, panel boards, transformers, etc. shall be insulation tested as per NETA Standards.

4. Confirm through actual testing, and include verification in the testing report, that the generator set physically shuts down in the event of simulation of each of the following generator set shutdown conditions without putting the equipment at actual risk:

a. Overspeed

b. Overcrank

c. High water temperature

d. Low oil pressure

e. Coolant level low

f. Emergency shutoff switch

g. Overcurrent

5. The reactive load banks utilized for testing of the generator set at the factory shall not be dependent on the generator control instruments to read amperage and voltage on each phase. Rather, the test instrumentation shall serve as a check of the generator set meters. Confirmation of comparable readings of the generator control panel display parameters with the load bank testing instrumentation shall be indicated on the furnished factory test reports.

6. Testing shall be for a minimum of four (4) hours, two (2) hours at the generator set's prime power rating load, and consecutively at two (2) hours under full generator set power rating load to demonstrate operational efficiencies. All above indicated measurements shall be recorded in ten (10) minute increments and included in the test reports to be furnished. The testing shall be restarted from the beginning in the event of a generator set shutdown during the testing, unless waived by the ENGINEER.

7 The EG manufacturer shall furnish all consumables necessary for manufacturer factory testing.

8. Any generator equipment defects that become evident during the Factory testing shall be corrected by the engine manufacturer at their own expense prior to factory shipment of the generator set, no exceptions.

3.2 INSTALLATION

A. Refer to Part 1 for additional requirements. The generator set equipment shall be installed by the Installing CONTRACTOR as indicated on the figures and per the manufacturer's recommended procedures and guidelines. The Installing CONTRACTOR shall properly protect and store the delivered generator equipment as recommended by the generator set manufacturer and the EG System Vendor.

B. The EG System Vendor will be responsible for providing a field service technician to oversee the Installing CONTRACTOR's installation of the system, including setting, assembly, exterior piping, and mechanical connections.

C. After installation by others, the EG System Vendor shall provide the services of competent factory trained and experienced service engineers to provide installation instructions to the Installing CONTRACTOR, and to coordinate the installation completion of the equipment. They shall assist in placing the equipment into operation and provide instruction, as required, to the persons who are delegated to operate the equipment. EG System Vendor services shall include a minimum of six (6) visits by the factory service engineers as follows:

1. Pre-installation coordination meeting to coordinate the installation and interconnection of the main interconnection breaker, EG equipment and all interface equipment.

2. Initial checkout of the installation of the equipment prior to start up and testing.

3. Post-installation start-up and testing to confirm proper operation prior to system turnover. This trip may include multiple, not necessarily consecutive days and shall include all services required to checkout, startup, load bank test and test the emergency power system at the facility.

4. Generator set equipment operation demonstration for the ENGINEER and OWNER'S representatives and any other applicable approval Jurisdictions.

5. Initial Instruction period for initial EG system operating personnel.

6. Within four (4) months after generator system turnover, provide an additional two (2) day instructional period for the OWNER'S operating and maintenance personnel on complete operation and maintenance of the EG system equipment as described herein and as coordinated with the OWNER. It is anticipated that 4 hours each day will be devoted to operations and 4 hours each day will be devoted to technician concerns.

D. The EG System Vendor shall maintain a local competent and responsible factory authorized service and parts organization that is available to the OWNER for service and parts procurement on a 24-hour / 365 day call basis. EG System Vendor availability shall be within 24 hours.

3.3 FIELD QUALITY CONTROL

A. Technical representatives of the EG System Vendor shall check the complete installation for procedural and operational compliance. The CONTRACTOR shall note any installation deficiencies for prompt correction or appropriate remedial action. Any EG equipment operational deficiencies shall be promptly corrected by the EG System Vendor.

B. The EG System Vendor shall be available to assist the Installing CONTRACTOR during installation delivery of the generator system equipment.

C. The EG System Vendor shall perform EG system start-up procedures, systems checks, provide necessary adjustments, and provide site testing required after the installation is complete as coordinated with the ENGINEER.

D. The initial service fill of engine lubricating oil and ethylene glycol based antifreeze coolant solution, as recommended by the engine manufacturer, shall be provided and installed by the EG System Vendor.

3.4 SYSTEM START-UP AND OPERATIONAL TESTING

A. The EG System Vendor shall perform and document all testing, startup, and synchronizing of the generator to the Utility to meet the Utility and ERCOT Standards

and requirements. The City of Austin, Austin Energy, and ERCOT may witness these tests.

B. The EG System Vendor's manufacturer trained field service technician shall be responsible for field start-up and testing of the furnished generator system. The manufacturer shall furnish the ENGINEER with written certification assuring that each item of equipment is complete, in good condition, free from damage and properly installed, connected, adjusted and operating properly.

C. The Installing CONTRACTOR shall provide the required and immediate assistance to the EG manufacturer's field service technician during start-up and testing. This assistance shall be generally limited to tasks directly associated with the installation of the EG and interface wiring, not with the internal components or inherent function of the EG equipment.

D. System start-up and operational testing procedures shall not be limited to those specified herein. Others shall be performed as required to prove that the system functions as described and required by these specifications.

E. EG operational testing shall be performed by the EG System Vendor in conjunction with technical representatives of the controls equipment, and the Installing CONTRACTOR in the presence of the ENGINEER. EG Vender shall provide vibration and alignment checks (and any remedies required) upon field installation of EG system. The same aforementioned personnel shall perform system start-up but it is not necessary to perform start-up functions and procedures in the presence of the ENGINEER unless specifically noted or required otherwise. Two (2) weeks advance written notice shall be given to the ENGINEER and OWNER for all EG system start-up and testing procedures.

F. Operational Testing

1. The EG System Vendor shall provide temporary dry type, resistive load banks and cables for the generator set testing as specified herein. The Installing CONTRACTOR shall be responsible for connection and disconnection of the temporary load bank cables to the equipment.

2. Load testing - Cold start block load the generator set at the full load 100% rating in one step and operate sustained load for two (2) hours continuous. Remove the load from the generator set and allow to cool down for five (5) minutes, then reapply full 100% rating block load in one step and operate sustained load for additional two (2) hours continuous for a combined load testing period of four (4) hours. Record each of the generator block loading transient high and low voltage and frequency levels and actual recovery time to achieve to steady state operation and stabilized voltage and frequency levels. Record the following readings in five (5) minute increments for the first fifteen (15) minutes at the initiation of each block load testing and at fifteen (15) minute increments thereafter for the duration of the testing.

   a. Voltage (3 phases)
   b. Amperage (3 phases)
   c. Frequency
   d. Kilowatts
   e. Power Factor

f. Fuel pressure, oil pressure and water temperature
g. Exhaust gas temperature at engine exhaust outlet
h. Ambient temperature
i. Battery charger amperage rate
j. Time at each recorded measurement

3. Check and demonstrate proper operation of the EG system controls, generator set alarms and shutdowns, and safety devices in the presence of the ENGINEER.

4. Provide generator equipment testing including, but not limited to, generator set cycle cranking and overcrank shutdown testing, and other EG system safety alarm / shutdown testing.

5. Should these tests fail or indicate that the equipment does not meet the specified performance requirements, the cost of all corrective measures shall be borne by the EG System Vendor if equipment related and by the Installing CONTRACTOR if installation related. Once corrective measures are implemented, the operational testing shall be repeated at the cost of the responsible party, whether EG System Vendor or Installing CONTRACTOR.

6. Provide eight (8) copies of Certified test reports of the complete generator equipment field testing as required herein after satisfactory completion of startup and testing of the generator set equipment by the EG System Vendor. The certified generator equipment testing documentation and reports to be furnished must be include all recorded information as required by NFPA 110, Level 1 of these specifications. Electronic copies shall be provided on CD/DVD media in US based pdf format.

G. Engine Generator Pre-start Checks

1. Engine oil level

2. Engine coolant system and coolant water level

3. Equipment fluid leakage

4. Vibration isolator adjustment

5. Enclosure installation, wiring and appurtenances

6. Battery connections, voltage and charge conditions

7. Engine to controls and all equipment electrical interface interconnections

8. EG intake /exhaust air obstructions

9. EG system AC power connections

10. Removal of all packing materials

11. EG system installation acceptance

3.5 Spare parts

A. The EG System Vendor shall furnish the following spare parts at the time of completion of satisfactory generator set startup to be maintained at the facility by the OWNER:

1. Oil filter cartridges (4 each of all styles used)

2. Spark plugs, protective cap, rubber spring assemblies (4 each)

3. Spark plug socket/carrier (8 each)

4. Suction valve rod end assemblies, bushings, shaft, intercooler seal, throttle valve, adaptor cable, and filter insert o-ring (1 each)

5. Air filter and intake: air filter and filter mat, sub-filters and sub-filter mats, actuating mechanism, sensor, air filter seals (2 each)

6. Gas train filter insert and gasket kit (2 each)

7. Module control panel filter mat (1 piece)

8. Thermoelement (cylinder exhaust gas temperature – 1 piece)

9. Sealing ring for thermoelement (1 piece)

3.6 INSTALLATION, OPERATION AND MAINTENANCE

A. Parts, Operation Instructions, and Maintenance Manuals

1. Within 30 Days prior to delivery five (5) draft copies of the generator equipment Parts, operation instructions, maintenance manuals and drawings presenting full details for care and maintenance of each item of equipment provided under this Contract. See Division 1 for additional requirements.

2. Each manual shall contain the information and documentation for the generator system equipment as indicated in other sections of these Specifications and must include operating and maintenance information and parts lists for all equipment provided under this Contract. When necessary, provide supplemental drawings to show system operation and servicing and maintenance points. For all electrical components, provide complete, as field installed and wired electrical wiring and connection diagrams. Manuals shall include instructions required to accomplish specified operation and functions. Data shall be neat, clean, legible copies. drawings larger than standard size notebook paper shall be accordion folded. Non-applicable information shall not be included or must be sufficiently crossed out.

3. In general the manual shall include, but not necessarily be limited to, the following:

   a. Operating Instructions - with description and illustration of the EG set, engine and generator controls and any other controls and indicators.
   b. Parts Books / information- that illustrate and list all assemblies, subassemblies and components, including gaskets, hoses and fastening hardware (nuts, bolts,

washers, etc.). All EG system parts shall be clearly identified by description and associated part numbers.

c. Detailed sequence of operation instructions for both manual and automatic operation of the complete EG system equipment.
d. Preventative Maintenance Instructions - on the complete system that cover daily, weekly, monthly, and annual maintenance requirements and schedules including a complete lubrication chart and information.
e. Routine Test Procedures - for all EG system equipment including all electronic and electrical circuits and for the main AC generator.
f. Troubleshooting Chart - covering the complete EG set showing description of trouble, probable cause, and suggested remedy.
g. Recommended Spare Parts List - showing all consumables anticipated to be required during normal operation, routine maintenance and testing, including pricing and quantities recommended to be maintained on hand at the OWNER'S facility.
h. Project specific as field installed and EG system tested electrical schematics including Wiring Diagrams with point to point interconnection diagrams for all interface equipment - showing function and operational sequences of all electrical components and electrical systems.

4. Manuals shall be furnished in suitably sized, maximum three inch, three ring binders, each binder shall be adequately labeled on the outside and inside with the project name and location and the contents clearly indexed. Include model, arrangement, and serial number identification for all equipment furnished. Manuals not containing all of the information as indicated herein shall be returned to the EG System Vendor for compliance provision. Five (5) sets of approved manuals shall be transmitted to the ENGINEER for final distribution to the OWNER after completion of the work and satisfactory start-up and testing of the equipment at the project site. Approved manuals are required for final acceptance of the work.

5. Supply complete manuals in electronic format via CD/DVD in format that is operable on PC based Windows XP Professional computer system. Include accompanying documentation and the latest versions of any viewing or printing software required.

3.7 TRAINING

A. The EG System Vendor shall provide for complete training for the OWNER'S engineering, operation and maintenance personnel. Training shall include hands-on instructions. Topics covered shall include complete EG system manual and automatic operation, control operation, schematics, wiring diagrams, metering operations, indicators, warning lights, shutdown system, routine maintenance, remedial trouble shooting procedures, maintenance contract and warranty explanations and details. Allow two (2) complete man-days split between two shifts for this OWNER'S initial training upon system startup.

B. EG System Vendor shall conduct additional training two months after startup on-site in a classroom and field environment. This training will serve to allow the OWNER to ask questions based on actual operations experience in a hands on environment. Training shall also include a recap of the system and normal operating procedures as well as a review of operational data from the initial two-month startup period. Allow two (2) complete man-days split between two shifts for this training component.

3.8 SERVICE CONTRACT

A. Provide a binding service contract proposal by the manufacturer approved provider through the first major overhaul (60,000 hours shall be used as a baseline for this project). This contract will be implemented by the OWNER. Service contract to include all scheduled, defined manufacturer recommended maintenance, services, and component replacement by factory trained and qualified technicians. Owner personnel shall perform routine daily, weekly, monthly inspections and services per manufacturer recommended maintenance schedules, independent of the number of operating hours. Proposal shall include all details of the offered service contract.

B. Contract to present costs in terms of dollars per operating hours on an annual basis. Annual operating costs will be adjusted based on the local Consumer Price Index (CPI) using the date of the proposal as the basis for contract initiation. If multiple engines are provided the service contract shall be presented in terms of cost per operating hour of each engine such that if one engine is not used on a continuous basis service costs would not accrue for that unit.

C. Service contract shall include the following inspections, services and activities by factory trained and qualified technicians:

1. Perform planned maintenance, inspections, component replacement, minor, and major overhauls.

2. Factory trained and qualified technicians will perform the following inspections and services at the manufacturer recommended 2,000 operating hours (OPH) intervals:

    a. Review owner daily operating logs
    b. Inspect controls, program settings, download operating systems for trend analysis and review of system performance.
    c. Inspect, adjust and record data for:
        1) Intake and exhaust valve to valve lifter clearances.
        2) Intake and exhaust valve lash adjustments.
        3) Intake and exhaust valve system projection (recession).
        4) Inspect rocker arms, valve lifters, adjusting screws, tappets, and lock nuts.
        5) Inspect valve cover gaskets and replace as required.
        6) Inspect, maintain, and adjustments to ignition systems inclusive of:
            i. Inspect and tighten connections and terminals at ignition box.
            ii. Inspect ignition harness.
            iii. Inspect ignition pickups for debris, clean as required, inspect mounting distance.
            iv. Inspect ignition coils and record ignition voltages.
            v. Inspection ignition plug sockets and springs.
            vi. Inspection, regapping, and changing of spark plugs.
            vii Inspect and clean crankcase ventilation system, replace filter cartridge and media.
            viii. Inspect, clean, adjust, and lubricate regulator rod linkage as required.
            ix. Inspect, clean, and adjust throttle valve.
            x. Inspect, clean, and lubricate exhaust scavenging valve.

xi. Inspect, clean, lubricate, and adjust throttle valve: actuator control rod assemblies.

2. Provide corrective maintenance (and necessary repairs and parts)

3. Cost proposals shall include all expenses including labor and materials not specifically excluded herein

4. Provide spare parts on-site for preventive maintenance activities including spark plugs, oil filters and original manufacturer equipment for other items.

5. Provide lube oil sample kits for use by owner to draw oil samples per manufacturer recommendations. Review lube oil samples for owner and provide comment as required.

6. Conduct coolant testing on an annual basis and provide report to owner.

7. Provide remote failure analysis and support, including analysis of available logged data as required.

8. Provide minor overhauls at 20,000 hour and 40,000 hour intervals.

9. Provide major overhaul at 60,000 hour interval. A 60,000 hour overhaul shall bring the EG system to like-new operating condition.

10. Provide complete maintenance service contract reports to the OWNER in hard copy format (4 sets) and in electronic format (CD/DVD) on an annual basis.

D. Owner responsibilities:

1. Perform lube oil and filter changes at defined manufacturer maintenance intervals, subject to lube oil analysis and lube oil condition.

2. Provide all lube oil and other liquids including battery acid, coolants, cleaning materials, etc.

3. Manufacturer recommended daily/weekly/monthly inspections and routine activities including inspection of filters, inspection and lubrication of bearings, gapping of spark plugs, measurement and recording of pressures and other operating variables, maintenance of daily logs, etc.

E. An availability guarantee shall be provided that will compensate the OWNER for EG system downtime which does not meet the uptime requirements described in this technical specification. The guarantee shall be based on the authorized servicing center providing the level of service described herein and the OWNER maintaining the system in accordance with the responsibilities described above. The guarantee shall be provided on a dollar per operating hour basis.

F. Service provider shall also provide an hourly cost for a service technician to provide services outside the scope of this work, such as additional training. Costs shall be provided on a per day basis and shall include expenses to and from the site. This item

is for work would be considered outside the scope of the normal service contract and exercised at the option of the OWNER.

G. Service provider shall include as an alternate the costs of providing oil change service for the engine. This shall be provided on a per operating hour basis and shall include costs for the following:

1. Perform lube oil and filter changes at defined manufacturer maintenance intervals, subject to lube oil analysis and lube oil condition.

2. Provide all lube oil and other liquids including battery acid, coolants, cleaning materials, etc.

3. Disposal of lube oil and other liquids.

END OF SECTION

ATTACHMENT A – DIVISION OF RESPONSIBILITIES

Activity	EG System Vendor		Contractor		Engineer	City
	Supply	Install	Supply	Install		
Design and Permitting					X	
Civil and Architectural Design					X	
Electrical Utilities Design					X	
Mechanical Design					X	
Interconnection Design and Implementation						X
Building and Construction Permits					X	
Air Emissions Permitting						X
Generator Set	X			X		
Generator Set Control Module	X					
Engine Starting Batteries	X					
Battery Chargers	X					
Exhaust System						
Exhaust Silencer	X			X		
Mounting Bracket for Silencer	X			X		
Flex Connection	X			X		
Pipe, Fittings and Supports Inside Container				X		
Pipe, Fittings and Supports Outside Container			X	X		
Exhaust Gas Heat Exchanger	X			X		
Fuel Gas System						
Fuel Gas Train	X	X				
Thermocouple and Pressure Transducers	X	X				
Flexible Connections	X	X				
Gas Piping and Supports Inside Container	X	X				
Gas Piping and Supports Outside Container			X	X		
Pipe Identification				X		
Generator Set Cooling System						
Engine Radiators	X			X		
Flexible Connection at Engine	X					
Pipe, Fittings and Supports Inside Container	X	X				
Pipe, Fittings and Supports Outside Container			X	X		
Pipe Identification			X	X		
3-way Thermostatic Valve	X					

Activity	EG System Vendor		Contractor		Engineer	City
	Supply	Install	Supply	Install		
Surge Tanks	X					
Coolant Make-up Pump	X			X		
Coolant Containment for Make-up Tank			X	X		
Lube Oil System						
Lube Oil Make-up Tanks	X			X		
Lube Oil Pumps	X			X		
Lube Oil Piping System Inside Container	X	X				
Lube Oil Piping System Outside Container			X	X		
Lube Oil Containment for Make-up Tanks			X	X		
Electrical						
All Cabling, Conduit, Flexes, Fittings and Terminations not Part of Container			X	X		
Genset Motor Control Center	X					
Auxiliary Motor Control Center	X					
Main Step-up Transformer						X
System Control and Utility Control Protection and Breaker Section switchgear	X		X			
Gas Present Alarms	X					
Fire Alarms	X					
Station Transformer 100KVA 480/110V	X					
Batteries for Switchgear & Charger	X					
Civil Site Work						
Foundation pads for building, tanks, blower skid, exterior switchgear radiators and piping			X	X		
Painting of exterior pipe and supports			X			
Piping from gas skid to container			X	X		
Utility service to generating facility			X	X		
Fuel Gas Skid						
Fuel Gas Blower & Conditioning Skid			X	X		
Miscellaneous						
Freight for EG System Vendor Supplied Equipment	X					
Freight for Contactor Supplied Equipment			X			
Off-loading at Sight			X			

Activity	EG System Vendor		Contractor		Engineer	City
	Supply	Install	Supply	Install		
Testing of Soil, Concrete or Steel			X			
Startup and Commissioning						
SU & C of Generator Set and Controls	X					
SU & C of Switchgear	X					
SU & C of Fuel Gas Skid			X			
SU & C of Gas Cleanup Skid			X			
Initial Coolant Fill Generator Set	X					
Initial Oil Fill Generator Set	X					
Initial Coolant Fill Make-up Tank		X				
Initial Oil Fill Make-up Tank		X				
High Voltage Testing						X
Utility Side Testing						X
One Day on Site Training	X					

SECTION 16000 - ELECTRICAL - GENERAL PROVISIONS

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. All equipment described herein shall be submitted and furnished as an integral part of equipment specified elsewhere in these Specifications. See Section 11231 for other requirements and specific detail of scope of supply.

B. The work shall include furnishing, installing and testing the equipment and materials detailed. Work and materials shall meet ARRA requirements outlined elsewhere.

C. The attachments contains City of Austin Electrical Specifications, which are deemed a part of the Division 16 requirements. The contractor shall conform to the specifications specific to this project as well as the City of Austin Electrical Specifications. In case of conflict between this specification, Section 11231 or the City of Austin Electrical Specifications, the issues shall be referred to the Engineer for resolution.

D. The work shall include furnishing and installing the following:

1. Conduit, wire and field connections for all motors, motor controllers, control devices, control panels and electrical equipment furnished under other Divisions. The EG System Vendor shall coordinate his construction schedule and electrical interface with the supplier of electrical equipment specified under other Divisions.

2. Conduit, wiring and terminations for all field-mounted instruments furnished and mounted under other Divisions, including process instrumentation primary elements, transmitters, local indicators and control panels. Lightning and surge protection equipment wiring at process instrumentation transmitters.

1.2 RELATED WORK

A. Where references are made to the Related Work paragraph in each Specification Section, referring to other Sections and other Divisions of the Specifications, the EG System Vendor shall provide such information or work as may be required in those references, and include such information or work as may be specified.

B. All raceways, power and control wiring related to Mechanical Division equipment that is shown on the Electrical Figures, shall be provided under Division 16.

C. All electrical work provided under any Division of the Specifications shall fully comply with the requirements of Division 16.

1.3 SUBMITTALS

A. Submit in accordance with Division 1 and 11 requirements, for equipment, materials and all other items furnished under each Section of Division 16, except where specifically stated otherwise.

1.4 REFERENCE STANDARDS

A. Electric equipment, materials and installation shall comply with the National Electrical Code (NEC) and with the latest edition of the following codes and standards:

1. National Electrical Safety Code (NESC)
2. Occupational Safety and Health Administration (OSHA)
3. National Fire Protection Association (NFPA)
4. National Electrical Manufacturers Association (NEMA)
5. American National Standards Institute (ANSI)
6. Insulated Cable Engineers Association (ICEA)
7. Instrument Society of America (ISA)
8. Underwriters Laboratories (UL)
9. Factory Mutual (FM)
10. City of Austin Electrical Code

B. Where reference is made to one of the above standards, the revision in effect at the time of proposal opening shall apply.

C. All material and equipment, for which a UL standard exists, shall bear a UL label. No such material or equipment shall be brought onsite without the UL label affixed.

D. If the issue of priority is due to a conflict or discrepancy between the provisions of the Contract Documents and any referenced standard, or code of any technical society, organization or association, the provisions of the Contract Documents will take precedence if they are more stringent or presumptively cause a higher level of performance. If there is any conflict or discrepancy between standard specifications, or codes of any technical society, organization or association, or between Laws and Regulations, the higher performance requirement shall be binding on the EG System Vendor, unless otherwise directed by the Owner/Engineer.

E. In accordance with the intent of the Contract Documents, the EG System Vendor accepts the fact that compliance with the priority order specified shall not justify an increase in Contract Price or an extension in Contract Time nor limit in any way, the EG System Vendor's responsibility to comply with all Laws and Regulations at all times

1.5 ENCLOSURE TYPES FOR AREA CLASSIFICATIONS

A. Unless otherwise specified herein or shown on the Figures, electrical enclosures and associated installations shall have the following ratings:

1. Provide NEMA 12 enclosures for dry, indoor above grade locations. Unless otherwise specified or shown on the Figures, these areas shall be limited to electrical rooms, administration areas, control rooms and storage rooms.

2. Provide NEMA 7/8 combination enclosures for either indoor or outdoor use in hazardous (classified as Class 1, Division 1, Groups B, C and D), as defined in NFPA 70.

3. Provide NEMA 4X 316 Stainless Steel enclosures for outdoor, wet locations and process areas. In addition NEMA 4X Aluminum enclosures will be allowed on an individual basis, but only where specifically designated herein or specifically shown on the Figures.

4. Provide Non-metallic type NEMA 4X enclosures, of PVC or fiberglass reinforced polyester, for Chlorine, Caustic and other Chemical Rooms. Fiberglass enclosures shall not be used in the presence of sodium hypochlorite.

5. NEMA 1 or 1A enclosures will not be permitted, unless specifically stated on the Figures.

6. All enclosures shall be lockable.

7. Provide a flange mounted, or through the door, disconnect operating handle with mechanical interlock having a bypass that will allow the enclosure door to open only when the circuit breaker or switch is in the OFF position. The circuit breaker or switch shall have the capability of being bypassed after the door has been opened.

1.6 SERVICE AND METERING

A. See Section Division 1 and Section 11231 for scope of work by Austin Energy and EG System Vendor.

1.7 HAZARDOUS AREAS

A. Equipment, materials and installation in areas designated as hazardous on the Figures shall comply with NEC Articles 500, 501, 502 and 503.

B. Equipment and materials installed in hazardous areas shall be UL listed for the appropriate hazardous area classification.

1.8 CODES, INSPECTION AND FEES

A. Equipment, materials and installation shall comply with the requirements of the local authority having jurisdiction.

B. Comply with interconnect requirements attached to this document.

1.9 SIZE OF EQUIPMENT

A. Investigate each space in the structure through which equipment must pass to reach its final location. Coordinate shipping splits with the manufacturer to permit safe handling and passage through restricted areas in the structure.

B. The equipment shall be kept upright at all times during storage and handling. When equipment must be tilted for passage through restricted areas, brace the equipment to ensure that the tilting does not impair the functional integrity of the equipment.

1.10 RECORD DRAWINGS

A. Submit in accordance with Division 1 and 11 requirements.

1.11 EQUIPMENT INTERCONNECTIONS

A. Review shop drawings of equipment furnished under other related Divisions and prepare coordinated wiring interconnection diagrams or wiring tables. Submit copies of wiring diagrams or tables with Record Drawings.

B. Furnish and install all equipment interconnections.

1.12 MATERIALS AND EQUIPMENT

A. Materials and equipment shall be new, except where specifically identified on the Figures to be re-used.

B. The EG System Vendor shall not bring onsite, material or equipment from a manufacturer, not submitted and approved for this project. Use of any such material or equipment, will be rejected, removed and replaced by the EG System Vendor, with the approved material and equipment, at his own expense.

C. Material and equipment shall be UL listed, where such listing exists.

D. The EG System Vendor shall be responsible for all material, product, equipment and workmanship being furnished by him for the duration of the project. He shall replace the equipment if it does not meet the Contract Documents.

1.13 DELIVERY, STORAGE AND HANDLING

A. Equipment and materials shall be handled and stored in accordance with the manufacturer's instructions, and as specified in the individual Specification Sections.

1.14 WARRANTIES

A. Manufacturer's warranties shall be as specified in each of the Specification Sections.

1.15 EQUIPMENT IDENTIFICATION

A. Identify equipment (disconnect switches, separately mounted motor starters, control stations, etc) furnished under Division 16 with the name of the equipment it serves. Motor control centers, control panels, panelboards, switchboards, switchgear, junction or terminal boxes, transfer switches, etc, shall have nameplate designations.

B. Nameplates shall be engraved, laminated impact acrylic, black lettering on a white background, matte finish, not less than 1/16-in thick by 3/4-in by 2-1/2-in, Rowmark 322402. Nameplates shall be 316 SS screw mounted to all enclosures except for NEMA 4 and 4X. Nameplates for NEMA 4 and 4X enclosures shall be attached with double faced adhesive strips, TESA TUFF TAPE 4970, .009 X ½", no equal. Prior to installing the nameplates, the metal surface shall be thoroughly cleaned with 70% alcohol until the metal surface residue has bee removed. Epoxy adhesive or foam tape is not acceptable.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 INTERPRETATION OF FIGURES

A. The Figures are not intended to show exact locations of conduit runs. Coordinate the conduit installation with other trades and the actual supplied equipment.

B. Install each 3 phase circuit in a separate conduit unless otherwise shown on the Figures.

C. Unless otherwise approved by the Owner/Engineer, conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.

D. Where circuits are shown as "home-runs" all necessary fittings and boxes shall be provided for a complete raceway installation.

E. Verify the exact locations and mounting heights of lighting fixtures, switches and receptacles prior to installation.

F. Except where dimensions are shown, the locations of equipment, fixtures, outlets and similar devices shown on the Figures are approximate only. Exact locations shall be determined by the EG System Vendor and approved by the Owner/Engineer during construction. Obtain information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Owner/Engineer and furnish all labor and materials necessary to complete the work in an approved manner.

G. Circuit layouts are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting and other electrical systems shown.

H. Redesign of electrical or mechanical work, which is required due to the EG System Vendor's use of a pre-approved alternate item, arrangement of equipment and/or layout other than specified herein, shall be done by the EG System Vendor at his/her own expense. Redesign and detailed plans shall be submitted to the Owner/Engineer for approval. No additional compensation will be provided for changes in the work, either his/her own or others, caused by such redesign.

I. Raceways and conductors for lighting, switches, receptacles and other miscellaneous low voltage power and signal systems as specified are not shown on the Figures. Raceways and conductors shall be provided as required for a complete and operating system. Refer to riser diagrams for signal system wiring. Homeruns, as shown on the Figures, are to assist the EG System Vendor in identifying raceways to be run exposed and raceways to be run concealed. Raceways installed exposed shall be near the ceiling or along walls of the areas through which they pass and shall be routed to avoid conflicts with HVAC ducts, cranes hoists, monorails, equipment hatches, doors, windows, etc. Raceways installed concealed shall be run in the center of concrete floor slabs, above suspended ceilings, or in partitions as required.

J. The EG System Vendor shall run all conduit and wire to RTU and/or PLC termination cabinets, where designated..

K. Install conductors carrying low voltage signals (typically twisted shielded pair cables) in raceways totally separate from all other raceways containing power or 120 volt control conductors.

L. Raceways and conductors for low voltage (120 Volts) thermostats controlling HVAC unit heaters, exhaust fans and similar equipment are not shown on the Figures. Provide raceways and conductors between the thermostats, the HVAC equipment and the motor starters for a complete and operating system. All raceways and power conductors shall be in accordance with Division 16. Raceways shall be installed concealed in all finished space and may be installed concealed or exposed in process spaces.

M. Raceways and conductors for the fire alarm, sound and page party systems are not shown on the Figures. Provide raceways and conductors as required by the system manufacturer for a complete and operating system. All raceways and power conductors shall be in accordance with Division 16. Raceways shall be installed concealed in all finished spaces and may be installed exposed or concealed in process spaces.

3.2 EQUIPMENT PADS AND SUPPORTS

A. Electrical equipment pads and supports, of concrete or steel including structural reinforcing and foundations, are to be detailed at a later date.

3.3 SLEEVES AND FORMS FOR OPENINGS

A. Provide and place all sleeves for conduits penetrating floors, walls, partitions, etc. Locate all necessary slots for electrical work and form before concrete is poured.

B. Exact locations are required for stubbing-up and terminating concealed conduit. Provide shop drawings and templates to locate conduit before any slab is poured.

3.4 CUTTING AND PATCHING

A. Cutting and patching shall be done in a thoroughly workmanlike manner. Saw cut all concrete and masonry prior to breaking out sections.

B. Core drill holes in concrete floors and walls as required. EG System Vendor shall obtain written permission from the Owner/Engineer before core drilling any holes larger than 2 inches.

C. Install work at such time as to require the minimum amount of cutting and patching.

D. Do not cut joists, beams, girders, columns or any other structural members.

E. Cut opening only large enough to allow easy installation of the conduit.

F. Patching to be of the same kind and quality of material as was removed.

G. The completed patching work shall restore the surface to its original appearance or better.

H. Patching of waterproofed surfaces shall render the area of the patching completely waterproofed.

I. Remove rubble and excess patching materials from the premises.

J. When existing conduits are cut at the floor line of wall line, they shall be filled with grout of suitable patching material.

3.5 INSTALLATION

A. Any work not installed according to the Figures and this Section shall be subject to change as directed by the Owner/Engineer. No extra compensation will be allowed for making these changes.

B. All dimensions shall be field verified at the job site and coordinated with the work of all other trades.

C. Electrical equipment shall be protected at all times against mechanical injury or damage by water. Electrical equipment shall not be stored outdoors. Electrical equipment shall be stored in dry permanent shelters as required by each Specification Section. Do not install electrical equipment in its permanent location until structures are weather-tight. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and tested as directed by the Owner/Engineer, or shall be replaced at no additional cost at the Owner/Engineer's discretion.

D. Equipment that has been damaged shall be replaced or repaired by the equipment manufacturer, at the Owner/Engineer's discretion.

E. Repaint any damage to the factory applied paint finish using touch-up paint furnished by the equipment manufacturer. If the metallic portion of the panel or section is damaged, the entire panel or section shall be replaced, at no additional cost to the Owner.

3.6 PHASE BALANCING

A. The Figures do not attempt to balance the electrical loads across the phases. Circuits on motor control centers and panelboards shall be field connected to result in evenly balanced loads across all phases.

3.7 MANUFACTURER’S SERVICE

A. Provide manufacturer's services for testing, training and start-up of the equipment as listed in each individual Specification Section.

3.8 TESTS AND SETTINGS

A. Test systems and equipment furnished under Division 16 and repair or replace all defective work. Make adjustments to the systems as specified and/or required.

B. Prior to energizing electrical equipment, make all tests as required by the individual specification Sections. Submit a sample test form or procedure. and submit the required test reports and data to the Owner/Engineer for approval within 30 days after the test. Include names of all test personnel and initial each test.

C. Check motor nameplates for correct phase and voltage. Check bearings for proper lubrication.

D. Check wire and cable terminations for tightness.

E. Check rotation of motors prior to energization. Disconnect driven equipment if damage could occur due to wrong rotation. If the motor rotates in the wrong direction, the rotation shall be immediately corrected, or tagged and locked out until rotation is corrected.

F. Verify all terminations at transformers, equipment, capacitor connections, panels, and enclosures by producing a 1 2 3 rotation on a phase sequenced motor when connected to "A", "B" and "C" phases.

G. Mechanical inspection, testing and setting of circuit breakers, disconnect switches, motor starters, control equipment, etc for proper operation.

H. Check interlocking, control and instrument wiring for each system and/or part of a system to prove that the system will function properly as indicated by schematic and wiring diagrams.

I. Check the ampere rating of thermal overloads for motors and submit a typed record to the Owner/Engineer of same, including MCC cubicle location and load designation, motor service factor, horsepower, full load current and starting code letter. If inconsistencies are found, new thermal elements shall be supplied and installed.

J. Verify motor power factor capacitor ratings.

K. Testing shall be scheduled and coordinated with the Owner/Engineer at least two weeks in advance. Provide qualified test personnel, instruments and test equipment.

L. Refer to the individual equipment sections for additional specific testing requirements.

M. Make adjustments to the systems and instruct the Owner's personnel in the proper operation of the systems.

3.9 TRAINING

A. The EG System Vendor shall provide manufacturer’s training as specified in each individual section of the Specifications.

- END OF SECTION -

City of Austin, Texas
NON-SUSPENSION OR DEBARMENT CERTIFICATION
SOLICITATION NO. SMH0117

The City of Austin is prohibited from contracting with or making prime or sub-awards to parties that are suspended or debarred or whose principals are suspended or debarred from Federal, State, or City of Austin Contracts. Covered transactions include procurement contracts for goods or services equal to or in excess of $25,000.00 and all non-procurement transactions. This certification is required for all Vendors on all City of Austin Contracts to be awarded and all contract extensions with values equal to or in excess of $25,000.00 or more and all non-procurement transactions.

The Offeror hereby certifies that its firm and its principals are not currently suspended or debarred from bidding on any Federal, State, or City of Austin Contracts.

Contractor's Name: SMITH POWER PRODUCTS, INC.

Signature of Officer or Authorized Representative: [signature] Date: 4-4-11

Printed Name: DARRELL MANUEL

Title VP

City of Austin, Texas
EQUAL EMPLOYMENT/FAIR HOUSING OFFICE
NONDISCRIMINATION CERTIFICATION
SOLICITATION NO. SMH0117

I hereby certify that our firm conforms to the Code of the City of Austin, Section 5-4-2 as reiterated below:

Chapter 5-4 of the Code of the City of Austin (Discrimination in Employment by City Contractors) requires that at all times while acting as a Contractor (as defined under Chapter 5-4) a Contractor must agree:

(1) Not to engage in any discriminatory employment practice defined in this chapter (including any later amendments or modifications).
(2) To take affirmative action to ensure that applicants are employed and that employees are treated during employment, without discrimination being practiced against them as defined in this chapter including affirmative action relative to employment, promotion, demotion or transfer, recruitment or recruitment advertising; layoff or termination, rate of pay or other form of compensation and selection for training or any other terms, conditions or privileges of employment.
(3) To post in conspicuous places, available to the employees and applicants for employment, notices to be provided by the City setting forth the provisions of this chapter.
(4) To state in all Solicitations or advertisements for employees placed by or on behalf of the Contractor, that all qualified applicants will receive consideration for employment without regard to race, creed, color, religion, national origin, sexual orientation, gender identity, disability, sex or age.
(5) To obtain a written statement from any labor union or labor organization furnishing labor or service to Contractors in which said union or organization has agreed not to engage in any discriminatory employment practices as defined in this chapter and to take affirmative action to implement policies and provisions of this chapter.
(6) To cooperate fully with the City's Human Rights Commission in connection with any investigation or conciliation effort of said Human Rights Commission to insure that the purpose of the provisions against discriminatory employment practices are being carried out.
(7) To require compliance with provisions of this chapter by all subcontractors having fifteen or more employees who hold any subcontract providing for the expenditure of $2,000 or more in connection with any contract with the City subject to the terms of this chapter.

Please check one of the following:

☐ Our firm's nondiscrimination policy conforms to the requirements of City Code, Chapter 5-4-2-B, items (1) through (7) and will be sent to the City upon request.

☒ Our firm does ~~not~~ have an established nondiscrimination policy and will adopt the City's minimum standard shown below. Our firm will send the adopted policy on company letterhead to the City upon request.

Minimum Standard Nondiscrimination in Employment Policy:
As an Equal Employment Opportunity (EEO) employer, the _____ (company name) will conduct its personnel activities in accordance with established federal, state and local EEO laws and regulations.

The _____ (company name) will not discriminate against any applicant or employee based on race, creed, color, national origin, sex, age, religion, veteran status, gender identity, disability, or sexual orientation. This policy covers all aspects of employment, including hiring, placement, upgrading, transfer, demotion, recruitment, recruitment advertising, selection for training and apprenticeship, rates of pay or other forms of compensation, and layoff or termination.

Employees who experience discrimination, sexual harassment, or another form of harassment should immediately report it to their supervisor. If this is not a suitable avenue for addressing their complaint, employees are advised to contact another member of management or their human resources representative. No employee shall be discriminated against, harassed, intimidated, nor suffer any reprisal as a result of reporting violation of this policy. Furthermore, any employee, supervisor or manager who becomes aware of any such discrimination or harassment should immediately report is to executive management or the human resources office to ensure that such conduct does not continue.

Sanctions:
Our firm understands that non-compliance with Chapter 5-4 may result in sanctions, including termination of the contract and suspension or debarment from participation in future City contracts until deemed compliant with this chapter.

Contractor's Name: _____

Signature of Officer or Authorized Representative: _____ Date: 4-4-11

Printed Name: DARRELL MANUEL

Title VP

CITY OF AUSTIN
NON-COLLUSION,
NON-CONFLICT OF INTEREST, AND ANTI-LOBBYING AFFIDAVIT

SOLICITATION NO. SMH0117

FOR
Engine Generator for Hornsby Bend Biogas Project

State of Texas

County of Travis

The undersigned "Affiant" is a duly authorized representative of the Offeror for the purpose of making this Affidavit, and, after being first duly sworn, has deposed and stated and hereby deposes and states, to the best of his or her personal knowledge and belief as follows:

The term **"Offeror"**, as used herein, includes the individual or business entity submitting the Offer and for the purpose of this Affidavit includes the directors, officers, partners, managers, members, principals, owners, agents, representatives, employees, other parties in interest of the Offeror, and anyone or any entity acting for or on behalf of the Offeror, including a subcontractor in connection with this Offer.

1. **Anti-Collusion Statement.** The Offeror has not in any way directly or indirectly:

   a. colluded, conspired, or agreed with any other person, firm, corporation, Offeror or potential Offeror to the amount of this Offer or the terms or conditions of this Offer.

   b. paid or agreed to pay any other person, firm, corporation Offeror or potential Offeror any money or anything of value in return for assistance in procuring or attempting to procure a contract or in return for establishing the prices in the attached Offer or the Offer of any other Offeror.

2. **Preparation of Solicitation and Contract Documents**. The Offeror has not received any compensation or a promise of compensation for participating in the preparation or development of the underlying Solicitation or Contract documents. In addition, the Offeror has not otherwise participated in the preparation or development of the underlying Solicitation or Contract documents, except to the extent of any comments or questions and responses in the solicitation process, which are available to all Offerors, so as to have an unfair advantage over other Offerors, provided that the Offeror may have provided relevant product or process information to a consultant in the normal course of its business.

3. **Participation in Decision Making Process.** The Offeror has not participated in the evaluation of Offers or other decision making process for this Solicitation, and, if Offeror is awarded a Contract hereunder, no individual, agent, representative, consultant, subcontractor, or subconsultant associated with Offeror, who may have been involved in the evaluation or other decision making process for this Solicitation, will have any direct or indirect financial interest in the Contract, provided that the Offeror may have provided relevant product or process information to a consultant in the normal course of its business.

4, **Present Knowledge.** Offeror is not presently aware of any potential or actual conflicts of interest regarding this Solicitation, which either enabled Offeror to obtain an advantage over other Offerors or would prevent Offeror from advancing the best interests of the City in the course of the performance of the Contract.

5. **City Code.** As provided in Sections 2-7-61 through 2-7-65 of the City Code, no individual with a substantial interest in Offeror is a City official or employee or is related to any City official or employee within the first or second degree of consanguinity or affinity.

6. **Chapter 176 Conflict of Interest Disclosure.** In accordance with Chapter 176 of the Texas Local Government Code, the Offeror:

   a. does not have an employment or other business relationship with any local government officer of the City or a family member of that officer that results in the officer or family member receiving taxable income;

b. has not given a local government officer of the City one or more gifts, other than gifts of food, lodging, transportation, or entertainment accepted as a guest, that have an aggregate value of more than $250 in the twelve month period preceding the date the officer becomes aware of the execution of the Contract or that OWNER is considering doing business with the Offeror.

c. as required by Chapter 176 of the Texas Local Government Code, Offeror must file a Conflict of Interest Questionnaire with the Office of the City Clerk no later than 5:00 P.M. on the seventh (7th) business day after the commencement of contract discussions or negotiations with the City or the submission of an Offer, or other writing related to a potential Contract with the City. The questionnaire is available on line at the following website for the City Clerk: http://www.ci.austin.tx.us/cityclerk/coi.htm

There are statutory penalties for failure to comply with Chapter 176.

If the Offeror cannot affirmatively swear and subscribe to the forgoing statements, the Offeror shall provide a detailed written explanation in the space provided below or, as necessary, on separate pages to be annexed hereto.

7. **Anti-Lobbying Ordinance.** As set forth in the Solicitation Instructions, Section 0200, paragraph 7N, between the date that the Solicitation was issued and the date of full execution of the Contract, Offeror has not made and will not make a representation to a member of the City Council, a member of a City Board, or any other official, employee or agent of the City, other than the Authorized Contact Person for the Solicitation, except as permitted by the Ordinance.

OFFEROR'S EXPLANATION:

Contractor's Name: SMITH POWER PRODUCTS, INC.

Printed Name: DARRELL MANUEL

Title: Vice President Energy Services

Signature of Officer or Authorized Representative: [signature]

Subscribed and sworn to before me this 19 day of April, 2011.

RAOUL JERALDO CORTES
NOTARY PUBLIC
STATE OF TEXAS
MY COMM. EXP. 02/12/15

[signature]
Notary Public

My Commission Expires 2/12/15

City of Austin, Texas
NONRESIDENT BIDDER PROVISIONS
SOLICITATION NO. SMH0117

A. Bidder must answer the following questions in accordance with Vernon's Texas Statutes and Codes Annotated Government Code 2252.002, as amended:

Is the Bidder that is making and submitting this Bid a "Resident Bidder" or a "Non-resident Bidder"?

Answer: Texas Resident

(1) Texas Resident Bidder – A Bidder whose principal place of business is in Texas and includes a Contractor whose ultimate parent company or majority owner has its principal place of business in Texas.

(2) Nonresident Bidder – A Bidder who is not a Texas Resident Bidder.

B. If the Bidder is a "Nonresident Bidder" does the state, in which the Nonresident Bidder's principal place of business is located, have a law requiring a Nonresident Bidder of that state to bid a certain amount or percentage under the Bid of a Resident Bidder of that state in order for the nonresident Bidder of that state to be awarded a Contract on such bid in said state.

Answer: _____ Which State:

C. If the answer to Question B is "yes", then what amount or percentage must a Texas Resident Bidder bid under the bid price of a Resident Bidder of that state in order to be awarded a Contract on such bid in said state?

Answer: _____

Bidder's Name: Smith Power Products, Inc.

Signature of Officer or Authorized Representative: _____ Date: 04/15/2011

Printed Name: Brent D. Sandberg

Title: Senior Vice President / C.F.O

MINORITY- AND WOMEN-OWNED BUSINESS ENTERPRISE (MBE/WBE)
PROCUREMENT PROGRAM
NO GOALS FORM

SOLICITATION NUMBER: RFP SMH0117

PROJECT NAME: Engine Generator for Hornsby Bend Biogas Project

The City of Austin has determined that no goals are appropriate for this project. Even though no goals have been established for this solicitation, the Bidder/Proposer is required to comply with the City's MBE/WBE Procurement Program, if areas of subcontracting are identified.

If any service is needed to perform the Contract and the Bidder/Proposer does not perform the service with its own workforce or if supplies or materials are required and the Bidder/Proposer does not have the supplies or materials in its inventory, the Bidder/Proposer shall contact the Small and Minority Business Resources Department (SMBR) at (512) 974-7600 to obtain a list of MBE and WBE firms available to perform the service or provide the supplies or materials. The Bidder/Proposer must also make a Good Faith Effort to use available MBE and WBE firms. Good Faith Efforts include but are not limited to contacting the listed MBE and WBE firms to solicit their interest in performing on the Contract; using MBE and WBE firms that have shown an interest, meet qualifications, and are competitive in the market; and documenting the results of the contacts.

Will subcontractors or sub-consultants or suppliers be used to perform portions of this Contract?

No ✓ **If no, please sign the No Goals Form and submit it with your Bid/Proposal in a sealed envelope.**

Yes_____ **If yes, please contact SMBR to obtain further instructions and an availability list and perform Good Faith Efforts. Complete and submit the No Goals Form and the No Goals Utilization Plan with your Bid/Proposal in a sealed envelope.**

After Contract award, if your firm subcontracts any portion of the Contract, it is a requirement to complete Good Faith Efforts and the No Goals Utilization Plan, listing any subcontractor, subconsultant, or supplier. Return the completed Plan to the Project Manager or the Contract Manager.

I understand that even though no goals have been established, I must comply with the City's MBE/WBE Procurement Program if subcontracting areas are identified. I agree that this No Goals Form and No Goals Utilization Plan shall become a part of my Contract with the City of Austin.

SMITH POWER PRODUCTS, INC.
Company Name

DARRELL MANUEL V.P
Name and Title of Authorized Representative (Print or Type)

_____ 4-19-11
Signature **Date**

GE Power & Water

Roger George
GE Power & Water Jenbacher Gas Engines

5244 North Sam Houston Parkway East
Houston, TX 77032-4009
USA

T 832 295 5620
Roger.George@ge.com

June 3, 2010

5244 North Sam Houston Parkway East
32-14-01A-08
Houston, TX 77032-4009

To:
Mr. Ramesh Swaminathan
City of Austin
Austin Water Utility
625 E 10th Street, Ste. 415
Austin, TX 78701

SUBJECT: Hornsby Bend Biosolids Management Plant Digester Improvements and Sustainability Project Letter for Indemnification for ARRA Buy American

To Whom It May Concern:

As a follow up to GE's letter dated March 4, 2010 and our letter to you dated March 20, 2010, GE hereby represents and warrants that the GE Jenbacher reciprocating engine cogeneration system, described in GE's March 4th, 2010 letter to Chevron Energy Solutions, satisfies all applicable American Recovery and Reinvestment Act ("ARRA") Buy American requirements in 2 CFR 176 and referenced EPA policy guidance and is eligible for use in the ARRA-funded Hornsby Bend Biosolids Management Facility Project (the "Project"). GE recognizes that any Chevron Energy Solutions recommendations to the City of Austin that it should use the above referenced GE Jenbacher system in the Project will be based on GE's assurances, representations and warranties and such supporting information as GE may provide, that the GE Jenbacher system satisfies all applicable ARRA Buy American requirements and is eligible for use in ARRA-funded projects.

Accordingly, GE hereby agrees that in the event that the GE Jenbacher system is found by the appropriate regulatory body to violate the applicable ARRA Buy American requirements and thus ineligible for use in ARRA-funded projects, GE shall, to the fullest extent allowed by law, indemnify and hold harmless Chevron Energy Solutions and its parent companies, subsidiaries, affiliates, officers, directors, members, consultants, agents, and employees for any direct expenses incurred or damages suffered resulting from such violation including reasonable attorney's fees and expenses.

Notwithstanding the foregoing, the indemnity` contained herein shall not exceed the lesser of (i) the purchase order price of the GE Jenbacher supplied goods given rise to the claims, or (ii) the amount of the fines imposed by any auditing agency. In no instance, shall GE be liable for loss of profit or revenues, interruption of business, cost of capital, downtime costs, increased operating costs, costs, expenses or fees associated with any claim raised or damages incurred by a third party, or for any special, consequential, incidental, indirect, punitive or exemplary damages.

Respectfully,

Roger George
GE Jenbacher Ltd.

MINORITY- AND WOMEN-OWNED BUSINESS ENTERPRISE (MBE/WBE) PROCUREMENT PROGRAM NO GOALS UTILIZATION PLAN

(Please duplicate as needed)

SOLICITATION NUMBER: RFP SMH00117

PROJECT NAME: Engine Generator for Hornsby Bend Biogas Project

PRIME CONTRACTOR/CONSULTANT COMPANY INFORMATION

Name of Contractor/Consultant	Smith Power Products, Inc.		
Address	3065 West California Ave		
City, State Zip	Salt Lake City, Utah 84104		
Phone	801-415-5000	Fax Number	801-415-5700
Name of Contact Person	Mike Winkler		
Is company City certified?	Yes ☐ No ☒ MBE ☐ WBE ☐ MBE/WBE Joint Venture ☐		

I certify that the information included in this No Goals Utilization Plan is true and complete to the best of my knowledge and belief. I further understand and agree that the information in this document shall become part of my Contract with the City of Austin.

TRENT D SUNDBERG SENIOR V.P / C.F.O

Name and Title of Authorized Representative (Print or Type)

Signature

04/15/2011

Date

Provide a list of all proposed subcontractors/subconsultants/suppliers that will be used in the performance of this Contract. **Attach Good Faith Efforts documentation if non MBE/WBE firms will be used.**

Sub-Contractor/Consultant			
City of Austin Certified	MBE ☐ WBE ☐	Ethnic/Gender Code:	☐NON-CERTIFIED
Vendor ID Code			
Contact Person		Phone Number:	
Amount of Subcontract	$		
List commodity codes & description of services			

Sub-Contractor/Consultant			
City of Austin Certified	MBE ☐ WBE ☐	Ethnic/Gender Code:	☐NON-CERTIFIED
Vendor ID Code			
Contact Person		Phone Number:	
Amount of Subcontract	$		
List commodity codes & description of services			

FOR SMALL AND MINORITY BUSINESS RESOURCES DEPARTMENT USE ONLY:

Having reviewed this plan, I acknowledge that the proposer (HAS) or (HAS NOT) complied with City Code Chapter 2-9A/B/C/D, as amended.

Reviewing Counselor _____ **Date** _____ **Director/Deputy Director** _____ **Date** _____

TO: Veronica Lara, Director
Department of Small and Minority Business Resources

FROM: Shawn M. Harris, Supervising Senior Buyer
DATE: February 28, 2011

SUBJECT: Approval to use for Solicitation No. SMH0028

Project Name:	Purchase of Engine Generator for Hornsby Bend Biogas Project
Commodity Code(s):	2853740
Estimated Value:	$900,000

The Purchasing Office has determined that the following Goals are appropriate for this Commodity solicitation:

__X__ No Goals (Goal of 0%)

This determination is based on the following reasons:

This solicitation will be bid by and awarded to a prime contractor. No subcontracting opportunities have been identified.

This is a commodity purchase for an engine generator; all installation will be performed through another contract with Chevron which has already been awarded.

Per paragraph 8.2.1 of the Rules Governing the Minority and Women Owned Business Enterprise Procurement Program, please approve the use of the above goals by completing and returning the below endorsement. If you have questions, please call me at 505-7351

__✓__ Approval is hereby granted to use the above Goals.

_____ Approval is hereby denied. Recommend the use of the following goals based on the below reasons:

a. Goals: _____% MBE _____% WBE

b. Subgoals _____% African American _____% Hispanic

_____% Native/Asian American _____% WBE

This determination is based on the following reasons: This is a commodity purchase. There are very limited subcontracting opportunities.

Joe Sandoval for

Veronica Lara, Director

Date: 3-1-11

cc: Lorena Resendez, DSMBR
Lynda Thorpe, Purchasing