Board of Directors
Monterey Regional Waste Management District

RESOLUTION NO. 2007-12

A RESOLUTION AUTHORIZING THE PURCHASE OF ONE JENBACHER 420 LANDFILL GAS ENGINE/GENERATOR WITHOUT COMPETITIVE BIDDING
-oOo-

WHEREAS, the Monterey Regional Waste Management District has a requirement for one landfill gas engine/generator; and

WHEREAS, when competitive bidding would be unavailing, would not produce an advantage and would, therefore, not be in the public interest, such procedure is not required; and

WHEREAS, the selection of any other engine size would require at this time a cost prohibitive, extensive and time consuming alteration to the infrastructure of the existing landfill gas building as referenced in the staff report; and,

WHEREAS, information has been provided to the Board this date which indicates that by virtue of special or unique equipment specifications, characteristics, parts and service availability, reliability, and cost effectiveness, a Jenbacher 420 Landfill Gas Engine/Generator would best meet the needs of the District and the purchase of similar equipment through competitive bidding would not produce an advantage to the public and would, therefore, not be in the public interest; and

WHEREAS, the cost for the repair of the existing engine would not be cost effective as the cost to repair the existing engine would be more than half the purchase price of a new engine; and

WHEREAS, a Jenbacher 420 would produce an additional 425kW in electrical generating capacity; and would produce an additional $210,000 in annual revenues from the sale of the additional electricity; and,

WHEREAS, the projected annual return on the District's investment to purchase the new engine/generator would be approximately 18%, and its payback period approximately 3.5 years; and,

WHEREAS, the Jenbacher 420 is the only engine/generator set that allows for the maximum sale of electricity within the capacity limits of the existing transformer connecting the LFG facility to the utility grid (PG&E).

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Monterey Regional Waste Management District, as follows:

1. That the Board does hereby find that because of special or unique equipment specifications, characteristics, parts and service availability, reliability, and cost effectiveness, a Jenbacher 420 Landfill Gas Engine/Generator would best meet the needs of the District, and purchase of similar equipment through competitive bidding would not produce an advantage to the public and would, therefore, not be in the public interest.

2. That the General Manager is authorized to purchase a Jenbacher 420 Landfill Gas Engine/Generator with listed optional items for a price not to exceed $790,000, from Western Energy Systems of Philadelphia, PA, as described in that Company's proposal dated December 12, 2007.

PASSED AND ADOPTED at a regular meeting by the Board of Directors of the Monterey Regional Waste Management District duly held on December 21, 2007, by the following votes:

AYES:

NOES:

ABSENT:

_____

Leo Laska
Chair

ATTEST:

_____

William M. Merry
General Manager

Memorandum
MONTEREY REGIONAL WASTE MANAGEMENT DISTRICT

Reviewed by _____ Date 12/14/07
General Manager

DATE: December 14, 2007

TO: General Manager

FROM: Assistant General Manager / Information Systems Manager

SUBJECT: Purchase of New Jenbacher JGS 420 Engine/Generator

RECOMMENDATION 1: That the Board adopt Resolution 2007-12 authorizing the purchase of a new General Electric Jenbacher JGS 420 engine without competitive bidding.

RECOMMENDATION 2: That the Board authorize the purchase of the General Electric Jenbacher JGS 420 engine with synchronous 1425 kW generator, and listed items, for the quoted price of $736,126, in accordance with the proposal from Western Energy Systems, of Philadelphia, PA, dated December 12, 2007 (attached). The total purchase price including tax is $789,495.

RECOMMENDATION 2: That the Board approve the Project Budget (attached) and Authorize Modifications to the Landfill Gas to Energy Project. This project replaces an existing 1-megawatt (mW) Jenbacher 320 engine/generator with a new 1.4 mW Jenbacher 420 engine/generator. This is a new capital expenditure request which was not included in the Capital Improvements portion of the FY 2006/2007 budget. Initial funding for this project will come from the FY 2006/2007 Capital Repair funds originally allocated for repair work on the engine to be replaced. The balance will be covered through a multi-year financing agreement.

BACKGROUND

The District currently operates the landfill gas to energy project, generating 4.6 megawatts of continuous power, using four internal combustion engine/generators:

Unit #	Engine Model	Generator Rated Output	Year Installed	Power Purchaser
1	Caterpillar 3516LE	1,600 kW	2006	3Phase
2	Jenbacher JGS320	1,057 kW	2002	3Phase
3	Jenbacher JGS320	987 kW	1998	PG&E
4	Jenbacher JGS320	987 kW	1997	PG&E
kW = Kilowatts				

The District's landfill gas to energy project has been on-line since 1983, and has been owned and operated by the District since the mid-1980s. The District has used its own electrical power to power on-site operations since 1994. Staff has considerable experience and knowledge in the operation of this system.

The 1997 Jenbacher JGS320 engine/generator is reaching the end of its useful life. At 70,000 hours, it is past due for another major overhaul (due at 60,000 hours) at an estimated cost of over $410,000.

DISCUSSION OF OPTIONS

Although the District is more constrained financially than it has been, staff recommends replacing this 10 year old engine rather than undertaking the expensive overhaul.

The overhauled engine would have an additional 4-6 years of useful life. However, its switch gear components would be 16 years old at the completion of that cycle. Furthermore, staff believes a substantial upgrade to the generator will be required in the next few years. Additionally, the engine/generator set to be replaced is almost identical to engine #3, which is one year newer. As component parts are more difficult to source for these older engines, staff has negotiated with Western Energy to allow the District to keep key parts from engine #4 as spares for engine #3 and still receive compensation for a returned "core" or engine block. Finally, the increase in revenue from the additional 425 kW the new generator will produce over the old unit, will pay back the additional project costs in less than three and a half years.

The District's options on the selection of a replacement engine/generator set are extremely limited.

The transformer the District uses to deliver electricity to the utility grid has a rated capacity of 5,000 kW. This is the maximum amount of power the District may export to the grid utility. With the purchase and installation of the new 1,425 kW Jenbacher 420, the District's total power production will be right at 5,000 kW. District staff projects the landfill to generate an adequate supply of LFG to power the increased capacity.

The purchase of another 1,600 kW Caterpillar 3520 (the same unit purchased in 2005) would exceed the capacity of the transformer and force the District to invest a considerable amount of time and money in upgrading our facilities immediately and would require an expensive and time consuming interconnection study by PG&E. Caterpillar does not make a 1,400 kW engine/generator set.

Only Caterpillar and Jenbacher, whose machines are currently on-site, are considered by the District for supplying engine generators compliant with California emission requirements. The main reasons to focus on just these two vendors are:

1. Parts and Service

   Having worked with both vendors for many years the process to obtain parts in time of failure is well established. The District also maintains an inventory of critical parts for the Caterpillar and Jenbacher engines. Jenbacher has changed its parts and service team on the West Coast in the past 18 months to a company called Western Energy Systems. Support and inventory access has greatly improved, returning to the level of service the District experienced in the past.

2. Engines Built For LFG

   The Jenbacher engine in particular has been built to operate on biogas and landfill gas. These are the leading brands for generating electricity from landfill gas.

3. Experience

   The District has many years of operational experience with the engines and control technologies of these two manufacturers, staff feels it is very important to purchase either a Jenbacher or a Caterpillar to build on past training and experience.

Given the District's current power plant infrastructure, and the significant costs to modify the infrastructure, the purchase of the Jenbacher 420 is the best, and only reasonable, choice for the District. The Jenbacher 420 will not require any modification to the foundations, framing, or electrical power generator infrastructure. The selection of any other engine type would require extensive modifications to the facility. Modifications to the facility are anticipated when the District moves into its next module of the landfill and/or when a joint project with the MRWPCA is undertaken.

As the District's landfill continues to grow, expansion of our power generation facilities will need to be undertaken. Of immediate concern, after this upgrade, is the repair or replacement of Unit 3, installed in 1998. Staff is studying options for the expansion of the LFG plant to include working with the MRWPCA on a joint gas to power venture. This will most likely require a new and separate facility.

JENBACHER/WESTERN ENERGY SYSTEMS

Since Jenbacher selected Western Energy Systems as their West Coast product support team in early 2006, the District has experienced a significant improvement in the quality of support for parts and service. The GE/Jenbacher staff is aware of past issues with the District and has corrected the situation. Western Energy was able to fast track the engine replacement for unit #2 this summer. Western Energy has just recently engaged a local service support representative and will be assigning him to the District, at no cost to the District, for a period of four to eight weeks. Staff is very satisfied with Western Energy's offer to allow the District to have a local full time mechanic on this new model engine.

DELIVERY/INSTALLATION

GE/Jenbacher is committed to moving the District's order up in the production cycle and having the engine shipped from Austria as soon as possible. After shipping and installation the new engine could be selling power by September 2008.

CONNECTING WITH PG&E

To deliver the additional 425 kW to the grid, staff will file a Generator Interconnection Application with PG&E. This is PG&E's process to ensure that the grid can support the additional electricity and determine what, if any, improvements may need to be made to the system. On past projects this has led to some large expenditures for the District, including $150,000 for a new transfer trip at the Castroville substation during the 2002 engine installation. However, based on staff's experience with PG&E on the 2006 engine installation, no major expenses are expected. Therefore, staff is allocating $50,000 in the project budget for PG&E work.

ELECTRICAL ENGINEERING SERVICES

To assist staff with electrical engineering design services on this project, staff will engage the services of Rick Kuchenig, P.E. Mr. Kuchenig has worked for the District on past projects and is very familiar with our power plant. Authorization for his scope of work will be presented to the Board at a future meeting.

PROJECT BUDGET

The estimated project budget, prepared by staff, is attached for your information and approval. The engine/generator purchase is budgeted at $790,000 including tax and freight. An additional $50,000 is allocated for PG&E. Installation is appoximately $310,000 including contingency, for a total of $1,150,000 to purchase and install the engine/generator.

MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT (MBUAPCD)

Because the District is at its emissions offset threshold limit for the landfill gas to energy project, and is receiving offset credit from the MBUAPCD, we will need to modify our Permit to Operate with the MBUAPCD. Similarly, as a Title 5 facility, this change in equipment on our Title 5 air permit will require a modification of our Title 5 permit. Staff will be working with the MBUAPCD on these changes which require public notice but not a public hearing.

POWER SALES

We are currently selling the 1,600 kW from the Caterpillar engine and the 1,057 kW from Jenbacher #2 to 3 Phase Energy. PG&E is purchasing 2,000 kW (less site usage) from engines #3 and #4. The District cannot replace the current engine #4 with the new engine #4 in the PG&E contract. The additional 425 kW is too large an increase for the new restrictions on contract modifications at PG&E. However, the District can swap engines #2 and #3 in the respective contracts. This will keep PG&E with 2,000 kW (less site usage) and increase 3 Phases power purchase to a total of 3,000 kW. Both PG&E and 3 Phases accept and support this configuration and supporting contract modifications will be developed.

Because the current Jenbacher Unit 4 is producing 1,000 kW, the new 1,425 kW unit will increase electricity sales by 425kW. The District will receive approximately 6.3¢ per kW-hr for this power, providing $211,000/year in additional revenue. With an estimated project cost of $1,150,000, the annual return on investment will be 18%. In the current situation requiring $410,000 of overhaul expenditures and no increased capacity, the marginal expenditures for the increased capacity is $740,000 or a 3.5 year payback.

FINANCING

Upon placement of the order, $115,000 (15% of purchase price) will be paid with cash. These funds will come from the $200,000 in the current fiscal year's capital repair budget on the engine being replaced. Staff is proposing to utilize GE Credit Capital, or similar financing, for the balance of this project.

Tim Flanagan
Assistant General Manager

Don Prescott
Information Systems Manager

Attachments:
Project Budget
Western Energy Proposal

WESTERN™
ENERGY SYSTEMS
Power Systems Specialists

December 12, 2007

Mr. Mario Van Cleave
Monterey Regional Waste Management District
14201 Del Monte Boulevard
P.O. Box 1670
Marina, California 93933-1670
Re: Marina LFG Project

Dear Mr. Van Cleave,

Western Energy Systems (WES) is pleased to present the enclosed proposal for a GE Jenbacher JGS 420 engine generator rated at approximately 1425 kW, 1.0 P.F., 4160 Volt, 3 phase, 60 Hz equipped for landfill gas operation. Our proposal is F.O.B. job site on open top trucks with rigging and removal required by others. The proposal includes all ocean and inland freight as well as U.S. Customs duty. No provisions are made for local taxes, permits, or fees.

The base package includes the auxiliary heat rejection equipment and silencer. The following presents our proposed scope of equipment and services for the Marina LFG project.

GE Jenbacher JGS 420 engine generator basic package

1. One (1) GE Jenbacher JGS 420 engine generator equipped for landfill gas operation
2. One (1) GE Jenbacher DIA.NE generator set control system
3. One (1) GE Jenbacher DIA.NE WIN communication package with software & firewall
4. One (1) Vibration sensor package
5. One (1) Seismic 4 tie down package
6. One (1) Horizontal remote radiator package
7. One (1) Radiator fan motor
8. One (1) Fan control panel with vibration controls
9. One (1) Radiator braid package
10. One (1) Radiator 3way thermostatic valve package
11. One (1) L/T circuit pump with disconnect
12. One (1) H/T circuit pump with disconnect
13. One (1) L/T expansion tank
14. One (1) H/T expansion tank
15. One (1) Critical grade silencer
16. Engineering integration services for equipment to be supplied.
17. Training
18. Startup and commissioning service

Engine Generator Performance Guarantees

Ratings are per ISO-ICFN continuous power with the following standard reference conditions

- Barometric pressure 14.5 PSI, or 328 feet above sea level
- Air temperature 77 ° F
- Relative humidity 30 %

- Electric Output - 1419 kW @ 4160 volt 60Hz three phase 1.0 PF (tolerance +/- 5%)
- Fuel Input - 12,349,000 BTU/Hr @ LHV 365 BTU/CF (tolerance +/- 5%)
- Gas Volume - 33,832 SCFHR (tolerance +/- 5%)
- Proposed Guaranteed Emissions
  - NOx: .6 g/bhp-hr
  - CO: 3.0 g/bhp-hr
  - NMHC 0.2 g/bhp-hr

WES will draw fuel gas samples in January or February as well during startup and commissioning.

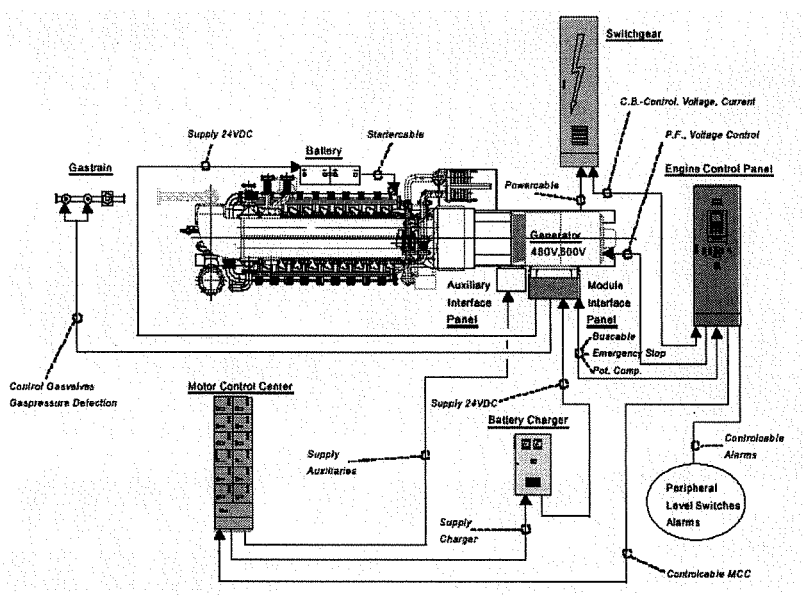
The equipment is proposed with a GE Jenbacher two (2) year warranty. Details follow for each of the equipment and services categories to be supplied. NOTE: All components shipped loose for installation by others.

The following presents the basic description for the JGS 420 engine generator package

a. GE Jenbacher JGS 420 four (4) stroke LEANOX® gas engines incorporate state of the art technology, are designed specifically for gaseous fueled, stationary non-intermittent operation, and are characterized by extremely high degrees of efficiency, low exhaust gas emission rates, durability and a high level of reliability.
b. GE Jenbacher generator sets are highly efficient machines. The **JGS 420** exhibits an electrical efficiency of 39.0%.
c. A single piece crankcase and cylinder block constructed of a special high tensile casting with individual removable crankcase covers for inspection of the crankshaft, connecting rod, and crankshaft bearings.
d. A drop-forged precision ground, surface hardened, statically and dynamically balanced crankshaft with drilled oil passages for pressurized lubrication of connecting rods. Main crankshaft bearings are high quality, three-component friction bearings.
e. Pistons are of single piece, light metal alloy construction with piston ring carriers and oil passages for cooling. Individually replaceable wet cylinder liners are of chromium alloy gray cast iron construction. Engine piston and liner technology incorporates a scraper ring integrated in the cylinder liner. This design prevents carbon deposit on the piston crown, improves combustion and engine performance, provides stabilized lube oil consumption, reduces the risk of piston seizures, leads to reduced piston skirt, crown, and cylinder liner wear, and improves partial load performance. Connecting rods are of drop forged, heat treated design with diagonally split, serrated crankshaft journal ends for high load bearing capacity.
f. The valve train camshaft, with replaceable bushings, is driven off the crankshaft intermediate gear train and splash lubricated via the rocker arms.
g. The combustion air-fuel gas system includes a GE Jenbacher designed and engine mounted gas mixer featuring low-pressure losses and high efficiency at full load operation. The motorized carburetor adjusts automatically according to fuel characteristics and is integrated into the engine control system.

h. The exhaust gas system includes a dry exhaust manifold, easily accessible for maintenance, and individual cylinder thermocouples. High efficiency turbochargers with electronically controlled turbocharger bypass valves. The electronic bypass valve provides for dynamic control throughout the operating range including isolated operations. This results in improved capacity for load add-load shed during varying load conditions.
i. LEANOX® lean mixture combustion controls, developed and patented by GE Jenbacher, guarantees the correct air/gas ratio throughout operating ranges in order to provide lowest achievable gas emission rates while enabling stable engine performance at the same time.
j. Microprocessor controlled ignition systems are connected from the engine to the GE Jenbacher DI.ANE control system via CAN bus. Firing points can be controlled and directed depending upon operating conditions and/or the type fuel used.
k. Knock control systems are integrated between engine and DI.ANE controls to adjust engine performance and provide system protection through a series of specific firing point, engine output, and fuel mixture temperature controls.
l. Engine-generator sets are skid mounted on heavy-duty base frames and provided with integral vibration isolation between the engine-generator assembly and the base frame. Machinery isolation pads are shipped loose for installation between the base and foundation.
m. Engine cooling water circuits include a plate and frame heat exchanger for heat recovery of engine jacket water and intercooler heat; the engine jacket water pump, engine mounted intercooler and engine oil cooler, stainless steel flexible connections and steel flanges for the intercooler and engine jacket water circuits. Flexible connections and flanges will be shipped loose for installation by others.
n. Engine jacket water preheating systems will be preinstalled with isolation valves.
o. Electric starters are provided with engine starting batteries, battery racks, battery cables, and float-equalize battery chargers shipped loose for installation by others.
p. The engine lube oil system includes a gear-type oil pump; pressure control valve, pressure relief valve, and full flow lube oil filters. Lube oil level inspection gauges will be installed with a float valve, minimum/maximum level switches, and a sight glass.

1. The GE Jenbacher generator set and control package provides an integrated electrical control system. This proposal includes all equipment and apparatus illustrated in the electrical system diagram shown herein. Installation, wire, cables, and terminations are by others.
   - Generator sets
   - Starting systems
   - Interface panels
   - Control panels
   - Motor control centers
   - Generator circuit breakers



The DI.ANE (Dialog-Network) freestanding control panel provides an engine-generator management system featuring a membrane touchpad display for interface and operation of the generator set equipment.

The DI.ANE system includes:

- Central engine and control module.
- An industrial grade computer with 10" VGA TFT color graphics display, 10 function keys, display selection keys, 10-key numeric keyboard for input of operating parameters, auxiliary keys for START, STOP, lamp test, and special functions. A RS485 serial port interfaces to the central computer and multi-transducer.

Dimensions for the DI.ANE panel are 87"high x 32" wide x 24" deep.

Main displays available from the DI.ANE panel include:

- Generator set interconnection electrical values:
  - Phase current
  - Neutral current
  - Voltage (Phase-to-Phase and Phase-to-Neutral)
  - Active power
  - Reactive power
  - Apparent power
  - Power factor
  - Frequency

(Options are available for generator winding temperature and generator bearing temperature display.)

- Engine oil pressure and temperature
- Jacket water circuit pressure and temperature
- Exhaust gas temperatures
- Engine controller
- Auxiliary PID controller
- Auxiliary status
- Operational data such as operating hours, service hours, number of starts, active power demand (kWh), reactive power demand (kVArh), and measured values required for the operational logbook.
- System set-up
- Graphical data logging and trending for up to sixteen (16) measured values
  - Long term trending of data for 30 second intervals up to one (1) month duration
  - Short term trending provides data for troubleshooting
- PLC base central engine management which controls the following:
  - Speed control in no load and isolated operation
  - Power output control in a parallel operation.
  - LEANOX® control system for control of boost pressure relative to generator terminal output and fuel mixture temperature via the GE Jenbacher engine driven air-gas mixer.
  - Knocking controls enable adjustment of the ignition point, power output, and potentially the mixture temperature in the event of a knocking condition.
  - Loadsharing between generator sets is isolated operations.
  - Proportional power reduction as a result of a fault
  - Generator set logic control
  - Generator monitoring of up to eight (8) functions simultaneously:
    - Overload/short-circuit [51], [50]

        - Over voltage [27]
        - Undervoltage [59]
        - Asymmetric voltage [64], [59N]
        - Unbalance current [46]
        - Failure Excitation [40]
        - Overfrequency [81>]
        - Underfrequency [81<]
- Three (3) position lockable operation mode selector switch
    - "OFF"- Unit is disabled
    - "MANUAL"- unit is manually operable
    - "AUTOMATIC"- Full automatic operation is enabled via remote signal. A remote stop is enabled with a cooldown period following signal. Auxiliary equipment will continue to operate for a period following engine shutdown.
- Three (3) position demand switch
    - External demand OFF
    - External demand
    - Override external demand
- The following shut down functions are displayed:
    - Low lube oil pressure
    - Low lube oil level
    - High lube oil level
    - High lube oil temperature
    - Low jacket water pressure
    - High jacket water pressure
    - High jacket water temperature
    - Overspeed
    - Emergency stop
    - Gas train failure
    - Start failure
    - Stop failure
    - Engine start blocked
    - Engine operation blocked
    - Misfiring
    - High mixture temperature
    - Measuring signal failure
    - Overload/output signal failure
    - Generator overload/short circuit
    - Generator over/under voltage
    - Generator over/under frequency
    - Generator asymmetric voltage
    - Generator unbalanced power
    - Generator reverse power
    - High generator winding temperature (Optional)
    - synchronizing failure
    - Knocking failure
- The following alarms are displayed:
    - Low jacket water temperature
    - CPU battery failure
- Operational functions displayed:

- Ready to start
- Operation
- Generator circuit breaker "ON"

- Four (4) auxiliary contacts are available for remote start, shut down, operation, and a common alarm.
- Additional contacts are optionally available for start/stop controls, thermal processes, and electrical synchronization.

The GE Jenbacher DIA.NE WIN system provides for remote operation and monitoring of the generator set and related auxiliaries via a PC station as well as remote monitoring via I/P address. The DIA.NE WIN system enables:

- Remote monitoring of operating parameter and alarm displays, trend data.
- Management, starting and stopping of generator set and auxiliaries along with remote acknowledgement of error/alarm messages.
- Connection options include modem, Internet, and LAN.
- Remote host computers and monitors are optional. All I/P fees and costs are by others.

2. Integration services to be provided will include:

a. Development of sequence of electrical operations in association with GE Jenbacher and Marina Landfill for synchronizing, paralleling, and load sharing of the generator sets.
b. Develop and customize engine, generator, and associated mechanical-electrical equipment drawings for all equipment outlined in this scope. Installation and interface drawings along with technical data will be prepared for use by others to develop integrated installation and point-to-point wiring diagrams required for installation of equipment.
c. Coordinate with and provide engineering assistance for integration of the DIA.NE XT
d. Provide emissions data and support for air permitting.
e. Develop and customize DIA.NE panel operating systems for site specific conditions and parameters.
f. Develop and provide six (6) sets of submittal documentation in hard copy and CD format for review by construction managers and sub-contractors.
g. Develop and provide six (6) sets of as-built documentation, following final startup and commissioning, in hard copy and CD format for the owners use.

3. Startup and Commissioning Services and Training

WES will provide delivery inspection, perform an installation review for installation services provided by others, and will provide the pre-commissioning, startup, and testing as required to support the new installation. Typical startup and training services are included for a maximum of ten (10) days per unit however we will provide additional services as required to support the installation.

Services will be scheduled after receipt of completed installation checklists. Services required beyond allowed time will be subject to additional, negotiated charges. In addition WES/Jenbacher personnel will provide 40 hours of operator training. The following presents an overview of our typical startup and commissioning plan.

1. Preliminary remarks, checking shock protection precautions and important syst. components

1.1 Other inspection and reporting documentation
1.2 General information on inspection procedure and completing this check list
1.3 Mechanical checks
1.4 Checking shock protection precautions

11.2 Overvoltage | undervoltage function
11.3 Overfrequency | underfrequency function
11.4 KU-Function

12. Synchronizing, power control, Leanox control

12.1 Preparations | PLC
12.2 Synchronizing selector switch to position "0"
12.3 Synchronizing selector switch to position "Manual"
12.4 Synchronizing selector switch S1 to postion "Automatic"
12.5 Monitoring systems (----------)
12.6 Power control
12.7 Leanox control

13. Monitoring equipment (testing while genset is running or under load)

13.1 Monitoring equipment general
13.2 Closed safety current loop
13.3 Faults that result in shutdown (operating current)
13.4 Faults that result in warnings

14. Stand-by generating duty (isolated operation) and re-synchronization

14.1 Stand-by generating duty
14.2 Re-synchronization

15. Alternator

15.1 Checking voltage adjusting range
15.2 Checking basic setting of droop
15.4 Adjusting automatic voltage matching (NEWAGE)
15.5 cosφ-controller
15.6 Neutral conductor current
15.8 Adjusting knee-point voltage (only at sites with island mode)
15.9 Underspeed protection (only at sites without island mode)
15.10 Test alternator deeexcitation

16. Concluding operations, measurements, recording

16.3 Engine control recipes | parameters
16.4 Generator equipment
16.5 Earthing
16.6 Visualization screens
16.7 Recording changes carried out
16.10 Down load of Log files after test run
16.11 Down load of Log files after commissioning

All prices are quoted F.O.B. Job site on a truck with rigging and removal required by others. No provisions are made for local taxes, permits, or fees. This proposal is subject to Western Energy Systems Equipment Sales Contract and Terms and Conditions.

Delivery of equipment will be seven to eight months from receipt of approved purchase order. Submittals for non-Jenbacher supplied equipment will be 4 to 5 weeks from receipt of approved purchase order. Formal Jenbacher supplied equipment drawings, wiring diagrams, interface, alarm lists will require approximately sixty to seventy days from receipt of firm purchase order.

This proposal is valid until December 27, 2007. We will need a notice to proceed in writing from MRWMD.

Payment terms will be net thirty (30) days from date of invoice on the following basis:

1. Upon notice to proceed.....15%
2. Upon delivery of submittals and engineering documentation for installation design.....10%
3. Upon delivery of Equipment to MRWMD.....65%
4. Upon completion of startup and commissioning.....10%

WES will provide equipment and services identified in this proposal for a firm fixed price of $736,126.00

We sincerely appreciate this opportunity to submit our proposal for your review. If you have any questions please don't hesitate to call me at 858-527-8982 or email shall@weesys.com

Sincerely Yours

Steven Hall

Steven Hall
Sales Engineer

MONTEREY REGIONAL WASTE MANAGEMENT DISTRICT

Project Budget for Installation of New Jenbacher 420 Engine/Generator

Cost Estimate Based on Installation of Caterpillar 3520 (2005/2006)

INSTALLATION OF NEW ENGINE/GENERATOR (1.4 MW)	MRWMD ESTIMATE	ACTUAL COSTS			
		Outside Vendors	Materials	Labor	Total
1. Jenbacher 420 Engine/Generator; Delivered/Commissioned	$737,000				
Tax (7.25%)	53,000				
No. 1 Subtotal	**790,000**				
2. PG&E					
a) PG&E Interconnection / Facility Studies	50,000				
No. 2 Subtotal	**50,000**				
3. Installation					
a) Radiator Pad Retrofit	20,000				
b) Switchgear Modifications/Enercon	80,000				
c) Electrical Wiring	15,000				
d) Mechanical - Including new exhaust system	35,000				
e) District Materials - Engine specific parts	15,000				
f) Testing by Power Systems	15,000				
g) Crane Services & Miscellaneous	10,000				
No. 3 Subtotal	190,000				
4. Design & Testing					
a) AQMD Permit Application	10,000				
b) Seismic/Structural	5,000				
c) Electrical Design	15,000				
d) Mechanical Design	10,000				
e) High Voltage Electrical	20,000				
f) Project Management	20,000				
No. 4 Subtotal	80,000				
Subtotal (3+4)	270,000				
5. Contingency ($270,000 x 15%)	40,000				
6. Subtotal	**$310,000**				
GRAND TOTAL (1+2+6)	**$1,150,000**				