

Environmental Compliance Plan
For
Pensacola Christian College
Pensacola, FL

January 2013

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Introduction

This plan provides additional information demonstrating the owner's commitment to operating this facility in compliance. This Plan provides reasonable assurance that the continued operation of the facility will be in accord with applicable laws and rules.

The detail of the Plan is consistent with the complexity of the system. The Plan was developed in accordance with the unique requirements of the individual facility and provides the operator with adequate information and description regarding the design, operation and maintenance features of the facility. The Plan includes basic engineering design criteria for the facility. In addition, information concerning process control and performance evaluation for the facility, as well as equipment and procedural description (including any notification/report requirements of appropriate agencies) for emergency operating conditions is included. Regular maintenance and repair instructions for plant equipment and monitoring procedures are also included.

Management Commitment

Pensacola Christian College adheres to a strong, facility-wide environmental program which was developed to ensure the highest commitment and quality from the business operation as well as from employees, to protect and enhance the environment. This program includes an environmental policy, environmental auditing procedures and employee education and involvement.

Operator Training

This Plan represents continuing education program for all personnel concerning facility operation, permit and other regulatory requirements. A copy of the approved Plan will be available to the operators and maintenance personnel.

Personnel will be trained to operate facility in accordance to factory training manual and this Plan. Consequently, new employees will be trained within 90 days after commencement of employment and prior to unsupervised plant(s) operation. In addition, periodic safety meetings are planned for all pertinent personnel and often cover environmental topics including air permit requirements.

Environmental education is key to maintaining successful environmental stewardship. Education includes new hire orientation and training sessions. During orientation, new hires are educated about the various permits, permit conditions and monitoring requirements.

Training sessions will teach supervisory personnel and operators about air permit requirements and other environmental topics.

Facility Monitoring

This section established the use of parameters to monitor the Standby Generation Plant. PCC conducts reasonable monitoring to assure continued compliance with the terms and conditions of their permit. The monitoring will be carried out in the manner prescribed in this procedure.

The performance parameters include such physical, chemical or electrical characteristics as are applicable to the particular emissions unit, which are indicators of the condition, operating rates and efficiencies. Such parameters generally include the following indicators:

Standby Generation Facility Standby Generation Facility 1 (EU 005- Engine 9 & 10 & EU003- Engine 11)

Exhaust gas levels

Fuel (natural gas) consumption

Visible emissions

Standby Generation Plant 2 (EU 009- Engines 1-8)

NO_x and CO levels

Fuel (natural gas) consumption

Visible emissions

Density charge factor

Operation and Maintenance Plan

This section establishes a plant specific Operations and Maintenance (O & M) Plan. This element provides reasonable assurance that this facility can be effectively operation and maintained, through reasonable provision for the operation and maintenance of the facility. Routine maintenance of equipment will be performed as needed to assure optimal operation.

The Plan contains inspection and maintenance schedules including periodic assessments of the condition of equipment and schedule for recording of performance parameter data.

Startup (typical for all engines)

- Check cooling system

- Check oil level

- Start/monitor engine

- After engine is at full speed and at operating temperature, generators are loaded

- Check visible emissions

Shutdown (typical for all engines)

- Unload generator

- Stop engine

O & M Plan

E.U 003 & EU 005, engines # 9, #10 & #11

All three engines are tuned yearly by competent service contractor, engine manufacturer representative or equal substitute.

All three engines are tuned for equal NOX-CO emissions. Factory literature recommends that in order to achieve this, excess oxygen (O₂) in exhaust of each engines needs to be 0.3%

Proposed O & M Plan to prove compliance is as follows:

1. Have all 3 engines tuned yearly by competent contractor. Yearly tune-up reports on each engine will indicate O₂ readings.
2. PCC operator will use PCC instrument to read O₂.
3. PCC operator will record O₂ readings each month the engines are loaded and record such readings on attached form
4. Records will be kept in office for a period of 5 years.

Testing:

Once a year visible emissions testing on 3 engines will be conducted by certified VE reader and according to EPA Method 9.

Pensacola Christian College
Standby Generation Facility

O & M Record

Year: _____

| | Engine #1 | Engine #2 | Engine #3 |
|--|-----------|-----------|-----------|
| Tune up Date | _____ | _____ | _____ |
| Service Contractor | _____ | _____ | _____ |
| O₂ Reading by Service Contractor | _____ | _____ | _____ |
| O₂ Reading by PCC Standby Generation Facility Operator | _____ | _____ | _____ |

Pensacola Christian College Standby Generation Facility

Scheduled Maintenance Procedures

Performed by PCC

1. Inspect/replenish engine oil level.

Performed by Outside Contractor

Annual

1. Check 2301 Woodward governor
2. Check plugs. Change plugs as necessary.
3. Set timing
4. Adjust air fuel ratio
5. Check gas regulator water column
6. Compression test
7. Check and replace carburetor diaphragms (if necessary)
8. Adjust valves, check push rods
9. Oil samples taken
10. Check magneto
11. O₂ analyzer test

O & M Plan

EU 009, Standby Generation Plant (engines #1-#8)

Tests measuring CO and NO_x together with accompanying VE tests (conducted during CO and NO_x tests) indicated that each engine is capable of operating at maximum capacity specified in construction permit without exceeding maximum allowable emissions for NO_x and CO. To prove that each engine operated at near maximum capacity during compliance testing, heat inputs were measured by recording natural gas flows and calculating correspondent heat inputs (please note that engine manufacturer's data concerning heat content of natural gas when used in internally combusted engines is 925 BTU/CF). Natural gas flows were recorded two ways, one by recording Energy Services of Pensacola (gas supplier) gas meter at the beginning and at the end of each one-hour test (total of 3) for each engine and by taking instantaneous natural gas flows indicated by engine electronic controller/indicator. Instantaneous gas flows (CF/min) were taken several times during each hour of testing, averaged and multiplied by running time (minutes) to obtain flow in CF/given time. These two readings were close enough so that proposed future heat input readings will be accomplished using engine electronic controllers/indicators. These controllers/indicators also record and display, among other data, charge density factor indicating fuel to air ratio, rpms, temperature, etc. These data can be recorded using computer software. Density charge information(s) recorded during compliance testing are attached. Recording for density charge, NO_x and CO emissions and engine heat inputs (measuring gas flows) are attached. Combustion analyzer shall be calibrated semiannually by manufacturer or equivalent.

Recorded values during compliance testing are as follows:

| | Density Charge | NO _x (lb/hr) | CO (lb/hr) | Gas Flow (cfm) |
|-----------|-------------------|----------------------------|---------------|----------------------|
| Engine #1 | 0.75 | 3.2 | 7.4 | 214 |
| Engine #2 | 0.75 | 3.3 | 7.4 | 212 |
| Engine #3 | 0.76 | 2.9 | 7.4 | 216 |
| Engine #4 | 0.77 | 3.0 | 7.6 | 216 |
| Engine #5 | 0.77 | 3.4 | 7.4 | 218 |
| Engine #6 | 0.76 | 3.1 | 7.7 | 222 |
| Engine #7 | 0.76 | 3.4 | 7.6 | 220 |
| Engine #8 | 0.75 | 3.2 | 7.3 | 215 |
| Average | 0.76 | 3.2 | 7.5 | 217 |

Using all the above data, PCC proposed to conduct following O & M Plan to insure engine(s) optimal operation in lieu of yearly NO_x and CO testing.

When Standby Generation Plant is not used to generate power, PCC plans to run all eight engines at least once a month.

Semiannually Engines #1 through #8 will be tested for the following:

1. Run "Charge Density" test using computer and software furnished by manufacturer (Caterpillar) for 30 minutes to record Charge Density on attached samples.
Allowable Density Charge factor is 0.72-0.80
2. Check NO_x and CO concentrations in exhaust gases with Bacharach PCA2 Combustion Analyzer, or equivalent, instrument. See attached copies of previous tests. Permit Limits are 4.0 lb/hr for NO_x and 10.4 lb/hr for CO.
3. Check visible emissions
4. Recorded gas consumption in CFMs using computer program.
5. Record engine running time
6. Compute engine gas consumption as follows: (test will run at least 30 minutes)
Total CF used during test time= CF/min × test time in minutes.
7. Compute engine heat input
MM BTUH= (60 min / minutes tested) (CF used during test) (925 BTU/CF)
8. Compute operating capacity
Maximum allowable heat input is 6,863 BTU/BHP, hr. $6,863 \times 1,818 \text{ BHP} = 12.5 \text{ MM BTUH}$
Operating Capacity % = (Test MM BTUH / 12.5 MM BTUH) × 100 = % of load
90% = 11.25 MM BTUH
9. $\text{MMBTUH} = (\text{CFM}) \times (60\text{min/hr}) \times (925\text{BTU/CF}) \times 10^{-6}$

Testing:

Once a year visible emissions testing will be conducted on all 8 engines by certified VE tester according to EPA Method 9

**Pensacola Christian College
Standby Generation Facility**

Scheduled Maintenance Procedures

| | |
|---|--|
| Weekly | <ul style="list-style-type: none"> ➤ Check air inlet filter ➤ Verify automatic mode enabled ➤ Check battery charger operation & electrolyte level ➤ Check cooling system coolant level ➤ Inspect visible electrical connections ➤ Inspect electrohydraulic system ➤ Inspect air cleaner service indicator ➤ Check engine oil level ➤ Check fuel filter differential pressure ➤ Check jacket water heater ➤ Conduct walk-around inspection |
| Monthly | <ul style="list-style-type: none"> ➤ Conduct operational engine testing ➤ Record engine charge density versus engine speed ➤ Record fuel consumption |
| Annually (conducted by Caterpillar authorized service technician) | <ul style="list-style-type: none"> ➤ Drain aftercooler condensation ➤ Inspect alternator ➤ Lubricate generator ball bearings ➤ Inspect/adjust/replace belts ➤ Obtain coolant sample for laboratory analysis ➤ Test/add supplemental coolant additive (SCA) ➤ Measure record crankcase blowby ➤ Inspect crankshaft vibration damper ➤ Measure/record cylinder pressure ➤ Change electrohydraulic system oil ➤ Inspect/replace engine air cleaner element ➤ Clean engine mounts ➤ Obtain engine oil sample for laboratory analysis ➤ Change engine oil filter ➤ Conduct engine performance test ➤ Check engine protective devices ➤ Clean/inspect engine speed/timing sensor ➤ Adjust engine valve lash and bridge (at 250 hours) ➤ Inspect exhaust bypass ➤ Inspect exhaust piping ➤ Check fuel metering valve screen ➤ Drain gas pressure regulator condensation ➤ Test generator set |

| | |
|----------------------|--|
| | <ul style="list-style-type: none"> ➤ Inspect generator set vibration ➤ Inspect/replace hoses and clamps ➤ Check/adjust ignition system timing ➤ Inspect inlet air system ➤ Test insulation ➤ Clean radiator ➤ Inspect starting motor ➤ Check stator lead ➤ Measure/record valve stem projection ➤ Inspect water pump |
| Every three years | <ul style="list-style-type: none"> ➤ Check rotating rectifier ➤ Inspect turbocharger |

Records

Records of inspections, maintenance, operating parameter and operating hours for each unit shall be retained for a minimum of two years and shall be made available to DEP upon request. These records are kept in Standby Generation Facility office.

Records requirements shall include:

Records of engine(s) operating parameters

Scheduled O₂ readings for EU 003 and EU 005

Scheduled NO_x and CO readings for EU 009

Scheduled Charge Density factors for EU 009

Scheduled heat intake (gas consumption) recordings

Records of time(s) each engine operated

Operating hours shall not exceed the following

EU 005 Standby Generation Facility engine #1 & #2 – 8,760 hr/yr/each

EU 003- Standby Generation Facility engine #3 – 8,500 hr /yr

EU 009- Standby Generation Plan, engine #1-#8 – 2,300 hr /yr/engine

Records of engine(s) malfunctions or failures and corrective actions taken

Records of scheduled maintenance by PCC and/or outside contractor

Results of compliance tests

Record of combustion analyzer periodic calibration.

Periodic Plan Review

This plan will be review at least annually from date of approval. This review will evaluate the effectiveness of the Plan and will make any changes necessary for the Plan to be continuously administered

The Environmental Compliance Place shall be updated as operations change, but no less frequently that upon renewal of permit. DEP shall be notified of changes to the plan other than those required for routine maintenance. The Environmental Compliance Plan shall be revised when operational procedures change, to reflect any facility alterations performed or to reflect experience resulting from facility operation. PCC will periodically review and revise the operating protocol, as appropriate, to ensure satisfactory system performance.

Abnormal Events

In the event that PCC is temporarily unable to comply with any of the conditions of DEP permit due to breakdown of equipment, power outages, and destruction by hazard of fire, wind or other cause, PCC will notify DEP. Notification shall be made in person, by telephone, or other mean within 24 hours of breakdown or malfunction. The telephone number to call to notify DEP is **(850) 595-8364 ext. 1220**. For emergencies involving a significant threat to human health or the environment, **the number is 850 320-0519**.

A written report of any noncompliance referenced above shall be submitted to the Florida **Department of Environmental Protection, 160 Governmental Center, Pensacola, FL 32502-5794**, within 30 days after its occurrence. The report shall describe the nature and cause of the breakdown or malfunction, the steps being taken or planned to be taken to correct the problem and prevent its reoccurrence, emergency procedures in use pending correction of the problem and time when the facility will again be operating in accordance with permit conditions.

If an emergency arises or there is any condition, which prevents the continued operation or results in non-compliance with applicable regulations, the operator will:

Stop operation immediately

Notify proper official(s), as soon as practically possible, of the time, date and nature of the occurrence and the corrective action(s) taken

Ensure that the engines are in good working order before resuming operation

MEMORY DATA
File #: 25

BACHARACH, INC. #8
PCA 2
SN: LW1013

=====

| | |
|------|----------|
| TIME | 10:40:13 |
| DATE | 10/27/06 |

11:31 A
10/26/12

FUEL

NATURAL GAS

| | |
|---------|-----------|
| O2 | 9.4 % |
| CO | 462 ppm |
| EFF | 56.8 % |
| CO2 | 6.5 % |
| T-STACK | 1010.2 °F |
| T-AIR | 86.9 °F |
| EA | 72.5 % |
| NO | 39 ppm |
| NO2 | 5 ppm |
| NOX | 44 ppm |
| SO2 | *** ppm |
| CO (O) | 839 ppm |
| NO (O) | 71 ppm |
| NO2 (O) | 9 ppm |
| NOX (O) | 80 ppm |
| SO2 (O) | *** ppm |

PRESSURE -3.05 inwc

COMMENTS:

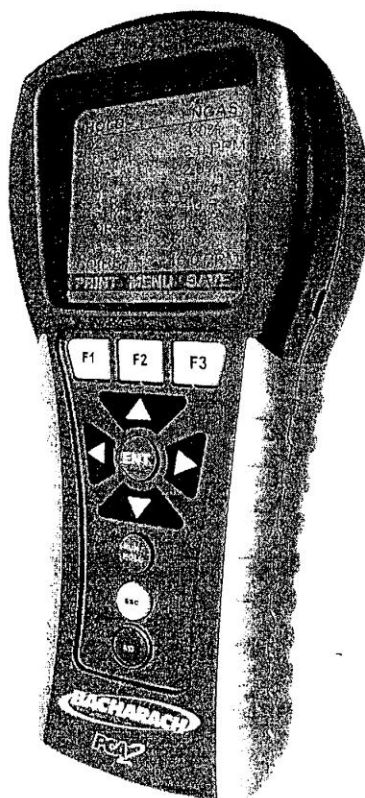


PCA²

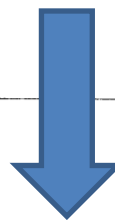
Portable Combustion Analyzer

Instruction 24-9448
Operation & Maintenance

Rev. 0 - September 2006



Product Leadership • Training • Service • Reliability



| Model | 255 | 265 | 275 |
|---|---------|---------|---------|
| Part Number | 24-7304 | 24-7305 | 24-7306 |
| Measurements | | | |
| Oxygen (O ₂) | ✓ | ✓ | ✓ |
| Stack Temperature | ✓ | ✓ | ✓ |
| Primary / Ambient Air Temperature | ✓ | ✓ | ✓ |
| Carbon Monoxide Low (CO _{Low}) | ✓ | ✓ | ✓ |
| Pressure / Draft | ✓ | ✓ | ✓ |
| Carbon Monoxide High (CO _{High}) | | | |
| Nitric Oxide (NO) | | ✓ | ✓ |
| Nitrogen Dioxide (NO ₂) | | ✓ | |
| Sulfur Dioxide (SO ₂) | ✓ | | ✓ |
| Calculations | | | |
| Combustion Efficiency | ✓ | ✓ | ✓ |
| Excess Air | ✓ | ✓ | ✓ |
| Carbon Dioxide (CO ₂) | ✓ | ✓ | ✓ |
| NO _x (NO _x = NO + NO ₂) | | ✓ | |
| NO _x referenced to %O ₂ | | ✓ | |
| CO referenced to %O ₂ | ✓ | ✓ | ✓ |
| NO referenced to %O ₂ | | ✓ | ✓ |
| NO ₂ referenced to %O ₂ | | ✓ | |
| SO ₂ referenced to %O ₂ | ✓ | | ✓ |