



ELECTRIC OPERATIONS
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STEVE MEISBURG
Mayor Pro Tem

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City Manager
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City Attorney
SAM M. McCALL
City Auditor

February 28, 2002

HAND DELIVERY

Mr. Jeffrey Koerner, PE
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Mail Station 5505

RECEIVED

FEB 27 2002

BUREAU OF AIR REGULATION

**Re: Permit Revision Request
Unit 8 Combined Cycle Combustion Turbine and Auxiliary Boiler
Permits PSD-FL-239, 1290001-002-AC, and 1290001-003-AV
Site Certification PA 97-35
Sam O. Purdom Generating Station**

Dear Mr. Koerner:

The City has received FDEP's request for additional information. At this time, the City is submitting responses to items 1, 4, 5 and 7 of the request, including a professional engineer's certification of the information contained herein (see Attachment A). In addition, the City is requesting an additional 30-day period to allow for response to the remaining three items.

In response to Item No. 1, the City understands the 30-day comment period that is required for the modification to the construction permit. However, the City would like to clarify that the 8.5 percent heat input increase, while firing natural gas, is the resultant increase at ISO conditions and is based on a 4 percent increase from the current permit limit (1467.7 mmBtu/hr LHV at 95°F, 60%RH, and 14.7 psi). This increase is related to the unit achieving a higher electrical output than originally guaranteed and variations in operational characteristics over time. The increase in maximum heat input rate for fuel oil combustion was less. But, similarly, 4 percent of the requested increase from the current permit limit (1659.5 mmBtu/hr at 95°F, 60%RH, and 14.7 psi) is related to the electric output and variations over time, and the balance of the increase is related to adjustments to ISO conditions.

In response to Item No. 4, initial performance testing, as required pursuant to 40 CFR 60, was conducted at base load on September 15, 2000, while firing natural gas, and on July 4, 2001, while firing No. 2 fuel oil. The heat input rate achieved during the three test runs conducted on September 15, 2000, averaged 1553.4 mmBtu/hr HHV at an inlet temperature of 86°F, which is approximately 12.5 percent less than the requested

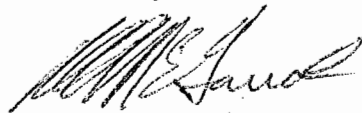
maximum heat input rate. Likewise, the heat input rate achieved during the three test runs conducted on July 4, 2001, averaged 1793.3 mmBtu/hr HHV at an inlet temperature of 78°F, which is approximately 6.9 percent less than the requested maximum heat input rate. Test data and related performance curve information is provided in Attachment B. The City recognizes that additional emission testing will be required to permit firing natural gas at the requested maximum heat input rate. However, as testing has already been completed for natural gas firing at 1553.4 mmBtu/hr HHV at 86°F, the City prefers to limit operation "by adjusting the entire heat input vs. combustor inlet temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for compressor inlet conditions) and 110 percent of the value reached during the test until a new test is conducted."

In response to Item No. 5, the City has compiled continuous emissions monitoring system data that represents the linked events that caused prolonged periods of high oxides of nitrogen readings. The compiled data is presented in Attachment B. A description of the linked events is provided to the right of each day's data. Please note, in order to reduce the length of Attachment C, only ten days of data are presented.

In response to Item No. 7, the City has rendered units 5 and 6 permanently inoperable. Removing reference to these units in the Title V permit would be appropriate.

If you have any questions regarding the additional information provided above, please feel free to contact either myself at (850) 891-5534 or Ms. Jennette Curtis at (850) 891-8850.

Yours truly,



R. E. McGarrah, Manager
Electric Production Division
Responsible Official

Attachments

cc: Hamilton Oven, DEP
Sandra Veazey, DEP
Al Linero, DEP
Scott Sheplak, DEP ✓
Greg Worley, EPA
John Bunyak, NPS
G. King, COT
B. Cowart, COT
J. Curtis, COT
K. Bauer, COT

ATTACHMENT A

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

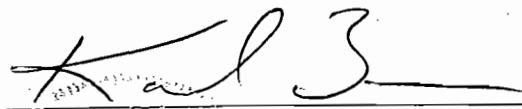
(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

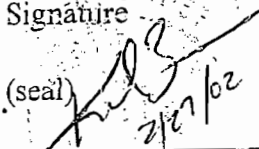
If the purpose of this application is to obtain a Title V source air operation permit (check here [X] if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X] if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [] if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.


Signature

2/27/02
Date

(seal) 
2/27/02

* Attach any exception to certification statement.

ATTACHMENT B

**INITIAL PERFORMANCE TEST DATA
NATURAL GAS**

Table 2. Emission Summary
 Combustion Turbine Unit 8 - Gas Fired - Full Load
 City of Tallahassee Sam O. Purdom Plant
 Tallahassee, Florida
 September 15, 2000

| Run Number | Time | Oxygen % | NOx Emissions | | | | | CO Emissions | | | CT | | SO2 lbs/hr |
|------------------|-----------|----------|---------------|------------|-----------|--------|-----------|--------------|--------|-----------|--------------------|-----------------------|------------|
| | | | ppm | ppm 15% O2 | ppm @ ISO | lbs/hr | lbs/MMBTU | ppm | lbs/hr | lbs/MMBTU | Gas Flow 100scf/hr | Heat Input MMBTUH HHV | |
| Full Load | | | | | | | | | | | | | |
| 1 | 1303-1403 | 13.61 | 10.84 | 8.77 | 10.55 | 50.70 | 0.032 | 0.88 | 2.52 | 0.002 | 15169 | 1568.9 | 0.900 |
| 2 | 1418-1518 | 13.70 | 10.83 | 8.87 | 11.15 | 50.71 | 0.033 | 0.86 | 2.45 | 0.002 | 15005 | 1552.0 | 0.890 |
| 3 | 1529-1629 | 13.63 | 10.58 | 8.59 | 10.92 | 48.71 | 0.032 | 0.80 | 2.24 | 0.001 | 14882 | 1539.3 | 0.880 |
| Average | --- | 13.65 | 10.75 | 8.74 | 10.87 | 50.04 | 0.032 | 0.85 | 2.40 | 0.002 | 15019 | 1553.4 | 0.890 |

Natural Gas Fd-Factor = 8710 MMBTU/dscf

lbs/hr = ppm(2.595 x 10⁻⁹)MW (20.9/20.9-%O2)(Fd)(Heat Input HHV)

MW NOx = 46 lbs/lb-mole

MW CO = 28 lbs/lb-mole

Allowable Emissions

NOx = 12 ppmvd @ 15%O2

CO = 25 ppmvd

Heat Input HHV = (gas flow)(gross calorific value)/10E06

September 15, 2000.
Purdom Unit 8 Combustion Turbine
compressor inlet temperature during
stack testing.

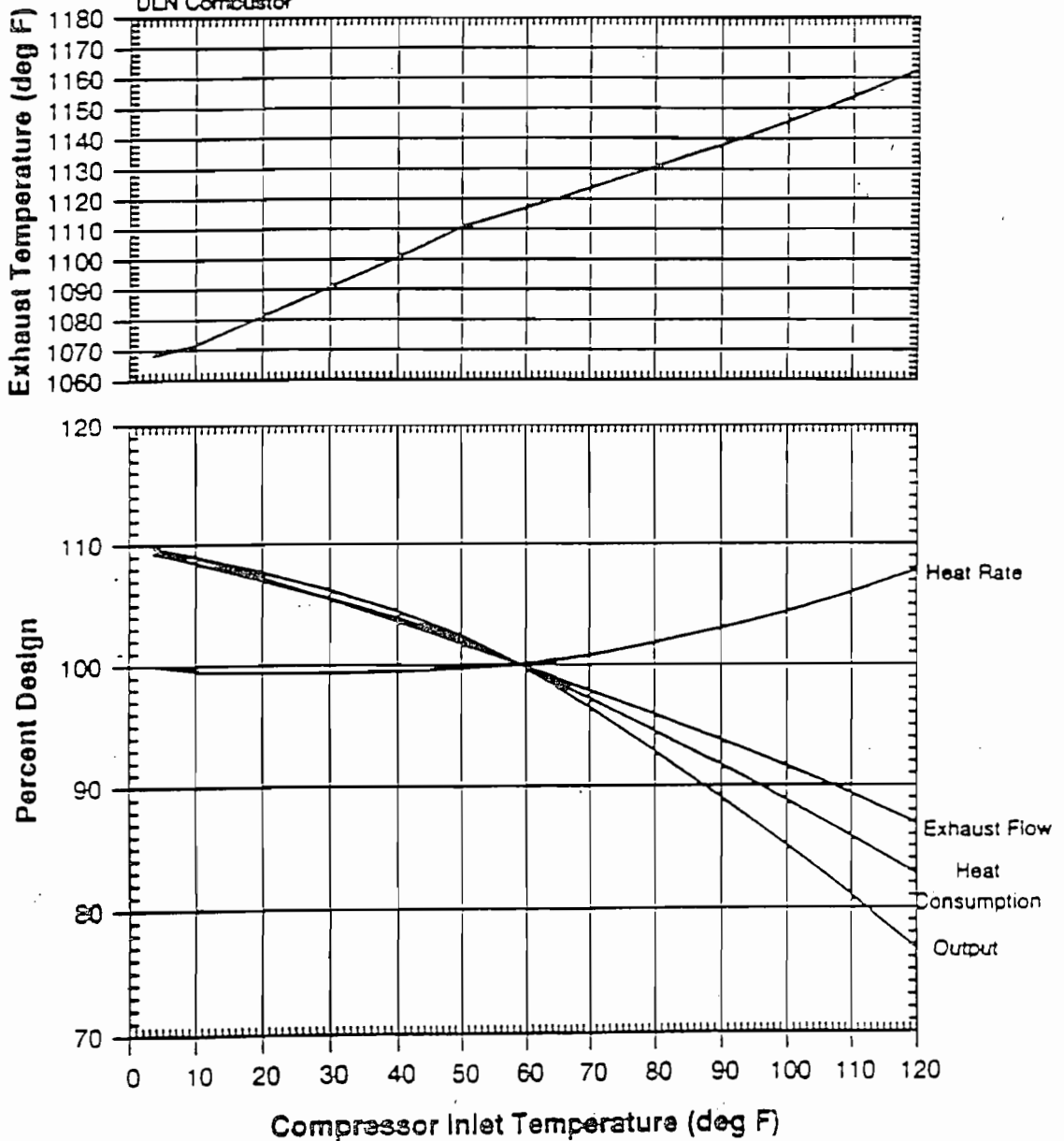
| TIME | TEMP °F |
|-------|---------|
| 13:00 | 86 |
| 13:05 | 86 |
| 13:10 | 86 |
| 13:15 | 86 |
| 13:20 | 87 |
| 13:25 | 87 |
| 13:30 | 87 |
| 13:35 | 87 |
| 13:40 | 87 |
| 13:45 | 87 |
| 13:50 | 87 |
| 13:55 | 86 |
| 14:00 | 87 |
| 14:05 | 87 |
| 14:10 | 86 |
| 14:15 | 86 |
| 14:20 | 85 |
| 14:25 | 85 |
| 14:30 | 85 |
| 14:35 | 85 |
| 14:40 | 85 |
| 14:45 | 85 |
| 14:50 | 86 |
| 14:55 | 85 |
| 15:00 | 85 |

| TIME | TEMP °F |
|-------|---------|
| 15:05 | 86 |
| 15:10 | 86 |
| 15:15 | 85 |
| 15:20 | 85 |
| 15:25 | 86 |
| 15:30 | 85 |
| 15:35 | 86 |
| 15:40 | 86 |
| 15:45 | 87 |
| 15:50 | 86 |
| 15:55 | 86 |
| 16:00 | 86 |
| 16:05 | 86 |
| 16:10 | 85 |
| 16:15 | 86 |
| 16:20 | 85 |
| 16:25 | 85 |
| 16:30 | 85 |
| 16:35 | 85 |
| 16:40 | 85 |
| 16:45 | 85 |
| 16:50 | 85 |
| 16:55 | 85 |
| 17:00 | 86 |

GENERAL ELECTRIC MODEL PG7241(FA) GAS TURBINE

Effect of Compressor Inlet Temperature on
Output, Heat Rate, Heat Consumption, Exhaust Flow
And Exhaust Temperature at Baseload

Fuel: Methane
Design Values on Curve 522HA851 Rev 0
DLN Combustor



F. Brooks
1/24/97

522HA852
Rev - 0

WEB

**INITIAL PERFORMANCE TEST DATA
No. 2 FUEL OIL**

Table 1. Emission Summary
Combustion Turbine Unit 8 - Oil Fired
City of Tallahassee Sam O. Purdom Plant
Tallahassee, Florida
July 3 and 4, 2001

| Run Number | Time | Oxygen % | NOx Emissions | | | | | CO Emissions | | | CT | Heat Input MMBTU/HHV | SO2 lbs/hr |
|---|-----------|----------|---------------|------------|-----------|--------|-----------|--------------|--------|-----------|-----------------|----------------------|------------|
| | | | ppm | ppm 15% O2 | ppm @ ISO | lbs/hr | lbs/MMBTU | ppm | lbs/hr | lbs/MMBTU | Oil Flow lbs/hr | | |
| Low Load - 60 MW Runs 1 & 2 (7/3/01), 65 MW Run 3 (7/4/01) | | | | | | | | | | | | | |
| 1 | 0816-0851 | 13.67 | 46.88 | 38.26 | 48.67 | 136.45 | 0.149 | 1.26 | 2.23 | 0.0024 | 47261 | 917.8 | 37.81 |
| 2 | 0905-0948 | 13.69 | 48.48 | 39.67 | 46.88 | 141.24 | 0.154 | 1.07 | 1.90 | 0.0021 | 47176 | 916.2 | 37.74 |
| 3 | 0812-0848 | 13.42 | 43.30 | 34.15 | 40.35 | 128.75 | 0.133 | 1.22 | 2.21 | 0.0023 | 49953 | 970.1 | 39.96 |
| Average | --- | 13.59 | 46.22 | 37.36 | 45.30 | 135.48 | 0.145 | 1.18 | 2.11 | 0.0023 | 48130 | 934.7 | 38.50 |
| Base Load - 168 MW (7/4/01) | | | | | | | | | | | | | |
| 1 | 0929-1029 | 12.42 | 50.60 | 35.21 | 44.16 | 245.79 | 0.137 | 1.44 | 4.26 | 0.0024 | 92514 | 1796.6 | 74.01 |
| 2 | 1054-1154 | 12.49 | 51.85 | 36.38 | 43.92 | 252.90 | 0.141 | 1.38 | 4.10 | 0.0023 | 92129 | 1789.2 | 73.70 |
| 3 | 1215-1315 | 12.44 | 52.02 | 36.28 | 43.81 | 252.94 | 0.141 | 1.04 | 3.08 | 0.0017 | 92386 | 1794.1 | 73.91 |
| Average | --- | 12.45 | 51.49 | 35.95 | 43.96 | 250.54 | 0.140 | 1.29 | 3.81 | 0.0021 | 92343 | 1793.3 | 73.87 |

Fuel Oil F Factor = 9190 dscf/MMBTU

lbs/hr = ppm(2.595 x 10⁻⁹)MW (20.9/20.9-%O2)(Fd)(Heat Input HHV)

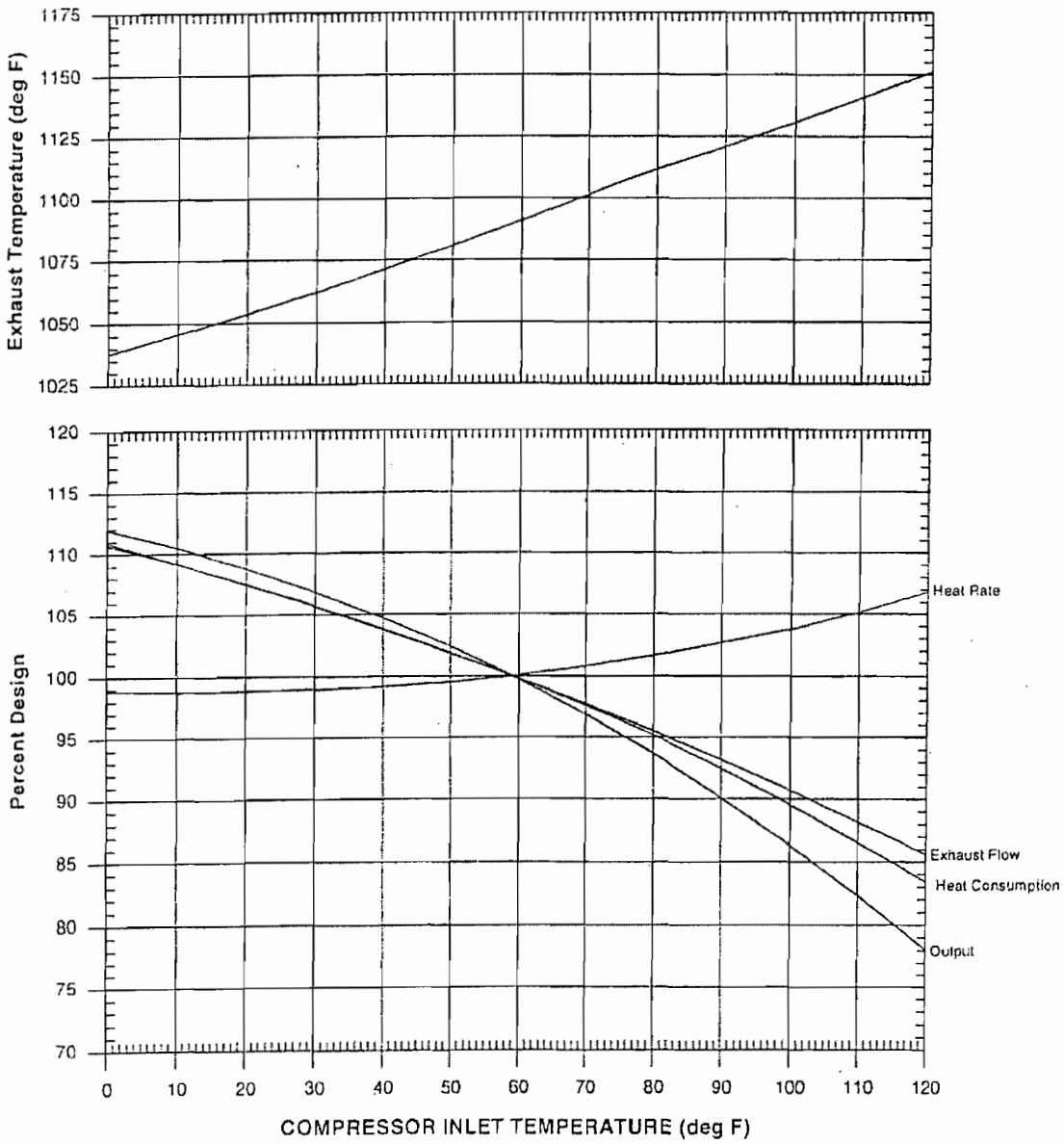
MW NOx = 46 lbs/lb-mole MW CO = 28 lbs/lb-mole

Heat Input HHV = (oil flow)(gross calorific value)/10E06

GENERAL ELECTRIC MODEL PG7241FA GAS TURBINE

Effect of Compressor Inlet Temperature on
Output, Heat Rate, Heat Consumption, Exhaust Flow
And Exhaust Temperature at Baseload

Fuel: Distillate
Combustor: DLN



ATTACHMENT C

Continuous Emissions Monitoring Data
 Sam O. Purdom Generating Station
 Unit 8

| Year | Month | Day | Hour | NOx Reading (ppm) |
|------|-------|-----|------|-------------------|
| 0 | 10 | 2 | 12 | 26.7 |
| 0 | 10 | 2 | 13 | 47.9 |
| 0 | 10 | 2 | 14 | 35.7 |
| 0 | 10 | 2 | 15 | 37.3 |
| 0 | 10 | 2 | 17 | 15.6 |
| 0 | 10 | 2 | 19 | 37 |
| 0 | 10 | 2 | 20 | 44.8 |
| 0 | 10 | 2 | 21 | 25 |
| 0 | 10 | 2 | 22 | 31.9 |
| 0 | 10 | 2 | 23 | 51.5 |
| Year | Month | Day | Hour | NOx Reading (ppm) |
| 0 | 10 | 3 | 0 | 51.6 |
| 0 | 10 | 3 | 1 | 64.8 |
| 0 | 10 | 3 | 4 | 38 |
| 0 | 10 | 3 | 5 | 44.7 |
| 0 | 10 | 3 | 6 | 54.4 |
| 0 | 10 | 3 | 7 | 17.4 |
| 0 | 10 | 3 | 8 | 10.5 |
| 0 | 10 | 3 | 9 | 10.1 |
| 0 | 10 | 3 | 10 | 9.5 |
| 0 | 10 | 3 | 11 | 9 |
| 0 | 10 | 3 | 12 | 8.8 |
| 0 | 10 | 3 | 13 | 8.9 |
| 0 | 10 | 3 | 14 | 9 |
| 0 | 10 | 3 | 15 | 9 |
| 0 | 10 | 3 | 16 | 10.9 |
| 0 | 10 | 3 | 17 | 11.9 |
| 0 | 10 | 3 | 18 | 9.1 |
| 0 | 10 | 3 | 19 | 9.2 |
| 0 | 10 | 3 | 20 | 9 |
| 0 | 10 | 3 | 21 | 9.3 |
| 0 | 10 | 3 | 22 | 9.4 |
| 0 | 10 | 3 | 23 | 9.4 |
| Year | Month | Day | Hour | NOx Reading (ppm) |
| 0 | 11 | 1 | 20 | 39.8 |
| 0 | 11 | 1 | 21 | 39.5 |
| 0 | 11 | 1 | 22 | 39.6 |
| 0 | 11 | 1 | 23 | 36.6 |

Notes
 Cold startup followed by two automated shutdowns for low IP steam drum level and turbine synchronization difficulty.

Lost steam turbine due to high hotwell level. Restarted and achieved normal operation by 8:00AM

Warm startup at 7:20PM. Shutdown at 10:30PM due to low IP drum level.
 11/02/00 due to low IP drum level. Restarted unit again

| Year | Month | Day | Hour | NOx Reading (ppm) |
|------|-------|-----|------|-------------------|
| 0 | 11 | 2 | 0 | 34.7 |
| 0 | 11 | 2 | 1 | 59.1 |
| 0 | 11 | 2 | 5 | 34.6 |
| 0 | 11 | 2 | 6 | 40.8 |
| 0 | 11 | 2 | 7 | 49.8 |
| 0 | 11 | 2 | 8 | 21.4 |
| 0 | 11 | 2 | 9 | 9 |
| 0 | 11 | 2 | 10 | 8.7 |
| 0 | 11 | 2 | 11 | 9.6 |
| 0 | 11 | 2 | 12 | 9.2 |
| 0 | 11 | 2 | 13 | 9.2 |
| 0 | 11 | 2 | 14 | 9.2 |
| 0 | 11 | 2 | 15 | 9.1 |
| 0 | 11 | 2 | 16 | 9.1 |
| 0 | 11 | 2 | 17 | 9.1 |
| 0 | 11 | 2 | 18 | 9.1 |
| 0 | 11 | 2 | 19 | 9.1 |
| 0 | 11 | 2 | 20 | 8 |
| 0 | 11 | 2 | 21 | 8 |
| 0 | 11 | 2 | 22 | 10.3 |
| 0 | 11 | 2 | 23 | 10.2 |

Shutdown again at 1:35AM due to low IP drum level.
Restarted unit at 4:48AM.

| Year | Month | Day | Hour | NOx Reading (ppm) |
|------|-------|-----|------|-------------------|
| 0 | 11 | 20 | 0 | 32.5 |
| 0 | 11 | 20 | 5 | 48 |
| 0 | 11 | 20 | 6 | 52.3 |
| 0 | 11 | 20 | 7 | 21.7 |
| 0 | 11 | 20 | 8 | 62.6 |
| 0 | 11 | 20 | 9 | 21.5 |
| 0 | 11 | 20 | 10 | 10.4 |
| 0 | 11 | 20 | 11 | 10.3 |
| 0 | 11 | 20 | 12 | 9.9 |
| 0 | 11 | 20 | 13 | 9.5 |
| 0 | 11 | 20 | 14 | 9.5 |
| 0 | 11 | 20 | 15 | 10.7 |
| 0 | 11 | 20 | 16 | 11.1 |
| 0 | 11 | 20 | 17 | 10.7 |
| 0 | 11 | 20 | 18 | 10 |
| 0 | 11 | 20 | 19 | 10.1 |
| 0 | 11 | 20 | 20 | 11.6 |
| 0 | 11 | 20 | 21 | 28.2 |
| 0 | 11 | 20 | 22 | 39 |

Elected to shutdown unit at 12:07AM to test auxiliary equipment. Restarted unit at 4:30AM. Unit shutdown due to high vibration on steam turbine bearings
At 8:50PM, unit ramped down to 23MW due to low fuel gas temp.

| Year | Month | Day | Hour | NOx Reading (ppm) |
|------|-------|-----|------|-------------------|
| 0 | 11 | 21 | 3 | 37.1 |
| 0 | 11 | 21 | 4 | 54.3 |
| 0 | 11 | 21 | 5 | 45.4 |
| 0 | 11 | 21 | 6 | 41.8 |
| 0 | 11 | 21 | 7 | 43.4 |
| 0 | 11 | 21 | 8 | 91.7 |
| 0 | 11 | 21 | 9 | 13.6 |
| 0 | 11 | 21 | 10 | 11.6 |
| 0 | 11 | 21 | 11 | 11.4 |
| 0 | 11 | 21 | 12 | 11.4 |
| 0 | 11 | 21 | 13 | 11.2 |
| 0 | 11 | 21 | 14 | 11.1 |
| 0 | 11 | 21 | 15 | 11.1 |
| 0 | 11 | 21 | 16 | 11.1 |
| 0 | 11 | 21 | 17 | 11.2 |
| 0 | 11 | 21 | 18 | 11 |
| 0 | 11 | 21 | 19 | 11.1 |
| 0 | 11 | 21 | 20 | 11.3 |
| 0 | 11 | 21 | 21 | 11.4 |
| 0 | 11 | 21 | 22 | 11.5 |
| 0 | 11 | 21 | 23 | 11.6 |

Hot startup at 3:25AM. Unit loading delayed due to high vibration on steam turbine bearing. Restarted unit. Normal operation achieved at 8:53AM

| Year | Month | Day | Hour | NOx Reading (ppm) |
|------|-------|-----|------|-------------------|
| 0 | 12 | 13 | 7 | 25.9 |
| 0 | 12 | 13 | 10 | 42.3 |
| 0 | 12 | 13 | 11 | 46.8 |
| 0 | 12 | 13 | 12 | 48.1 |
| 0 | 12 | 13 | 13 | 50.8 |
| 0 | 12 | 13 | 14 | 57.6 |
| 0 | 12 | 13 | 15 | 37.2 |
| 0 | 12 | 13 | 16 | 41.1 |
| 0 | 12 | 13 | 17 | 56.5 |
| 0 | 12 | 13 | 18 | 69.8 |
| 0 | 12 | 13 | 19 | 74.6 |
| 0 | 12 | 13 | 20 | 75 |
| 0 | 12 | 13 | 21 | 74.5 |
| 0 | 12 | 13 | 22 | 51.7 |
| 0 | 12 | 13 | 23 | 44.6 |

Cold startup after two week outage. GE tuning DLN controls after combustor changeout. Tuning lasts until 1:30PM on 12/14/00

| Year | Month | Day | Hour | NOx Reading (ppm) |
|------|-------|-----|------|-------------------|
| 0 | 12 | 14 | 0 | 55.4 |
| 0 | 12 | 14 | 1 | 75.8 |
| 0 | 12 | 14 | 2 | 77.1 |
| 0 | 12 | 14 | 3 | 76 |
| 0 | 12 | 14 | 4 | 76.2 |
| 0 | 12 | 14 | 5 | 75.4 |
| 0 | 12 | 14 | 6 | 75 |
| 0 | 12 | 14 | 7 | 83.1 |
| 0 | 12 | 14 | 8 | 95.2 |
| 0 | 12 | 14 | 9 | 61.2 |
| 0 | 12 | 14 | 10 | 26 |
| 0 | 12 | 14 | 11 | 22.7 |
| 0 | 12 | 14 | 12 | 9.4 |
| 0 | 12 | 14 | 13 | 9.1 |
| 0 | 12 | 14 | 14 | 9 |
| 0 | 12 | 14 | 15 | 10 |
| 0 | 12 | 14 | 16 | 10 |
| 0 | 12 | 14 | 17 | 9.5 |
| 0 | 12 | 14 | 18 | 9.1 |
| 0 | 12 | 14 | 19 | 9.1 |
| 0 | 12 | 14 | 20 | 9 |
| 0 | 12 | 14 | 21 | 10 |
| 0 | 12 | 14 | 22 | 11.6 |
| 0 | 12 | 14 | 23 | 10.3 |

GE DLN tuning ends at 1:30PM

| Year | Month | Day | Hour | NOx Reading (ppm) |
|------|-------|-----|------|-------------------|
| 0 | 12 | 23 | 0 | 11.3 |
| 0 | 12 | 23 | 1 | 11.3 |
| 0 | 12 | 23 | 2 | 11.4 |
| 0 | 12 | 23 | 3 | 11.5 |
| 0 | 12 | 23 | 4 | 11.7 |
| 0 | 12 | 23 | 5 | 11.8 |
| 0 | 12 | 23 | 6 | 16.8 |
| 0 | 12 | 23 | 7 | 42.4 |
| 0 | 12 | 23 | 9 | 44.2 |
| 0 | 12 | 23 | 10 | 63.4 |
| 0 | 12 | 23 | 11 | 2.5 |
| 0 | 12 | 23 | 13 | 40.2 |
| 0 | 12 | 23 | 14 | 53.5 |
| 0 | 12 | 23 | 15 | 48.9 |
| 0 | 12 | 23 | 16 | 81 |
| 0 | 12 | 23 | 18 | 40 |
| 0 | 12 | 23 | 19 | 45.3 |
| 0 | 12 | 23 | 20 | 61 |
| 0 | 12 | 23 | 21 | 14.1 |

Shutdown at 6:40AM due to fuel gas heater temp controller freezing. Restarted at 9:49AM. Shutdown at 10:35AM due to high exhaust temp spread. Restarted at 10:50AM. Shutdown at 11:10AM due to lost aux. transformer. Restarted at 1:15PM. Shutdown at 2:35PM due to low IP drum level. Restart unit at 2:58PM. Shutdown at 4:20PM due to high exhaust temp spread. Restarted unit at 6:08PM. Shutdown at 8:55PM due to low level in IP drum. Left unit off until 12/24/00

| Year | Month | Day | Hour | NOx Reading (ppm) |
|------|-------|-----|------|-------------------|
| 0 | 12 | 24 | 8 | 35.5 |
| 0 | 12 | 24 | 9 | 45.7 |
| 0 | 12 | 24 | 10 | 50.8 |
| 0 | 12 | 24 | 11 | 43.9 |
| 0 | 12 | 24 | 12 | 12.2 |
| 0 | 12 | 24 | 13 | 12.1 |
| 0 | 12 | 24 | 14 | 12.2 |
| 0 | 12 | 24 | 15 | 12.3 |
| 0 | 12 | 24 | 16 | 12.4 |
| 0 | 12 | 24 | 17 | 12.5 |
| 0 | 12 | 24 | 18 | 11.1 |
| 0 | 12 | 24 | 19 | 11.6 |
| 0 | 12 | 24 | 20 | 12.5 |
| 0 | 12 | 24 | 21 | 12.6 |
| 0 | 12 | 24 | 22 | 12.7 |
| 0 | 12 | 24 | 23 | 12.7 |

Hot startup. Shutdown due to high vibrations.
Restart at 9:55AM