

In the folder labeled as follows there are documents, listed below, which were not reproduced in this electronic file. Those documents can be found in the supplementary documents file drawer. Folders in that drawer are arranged alphabetically, then by permit number.

Folder Name: Citrus World
AC 53-135938
AC 53-135940

Period During Which
DOCUMENT WAS
SUBMITTED
(APPLICATION, PD & TE,
FINAL DETERMINATION,
POST PERMIT)

APP 06/19/87

Detailed Description

1. 24"x36" Blueprint:
SIMPLIFIED FLOW
DIAGRAM/ENERGY BALANCE
CITRUS WORLD, INC.
LAKE WALES PLANT
DWG NO. 1300-F-001

→ P 4/10

Check Sheet

Company Name: Citrus World, Inc
Permit Number: ACS 3-135938, 940
PSD Number:
County: Polk
Permit Engineer:
Others involved:

Application:

- Initial Application
- Incompleteness Letters
- Responses
- Final Application (if applicable)
- Waiver of Department Action
- Department Response

Intent:

- Intent to Issue
- Notice to Public
- Technical Evaluation
- BACT Determination
- Unsigned Permit

Attachments:

-
-
-
- Correspondence with:
 - EPA
 - Park Services
 - County
 - Other
- Proof of Publication
- Petitions - (Related to extensions, hearings, etc.)

Final Determination:

- Final Determination
- Signed Permit
- BACT Determination

Post Permit Correspondence:

- Extensions
- Amendments/Modifications
- Response from EPA
- Response from County
- Response from Park Services

P 274 007 658

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

* U.S.G.P.O. 1985-490-794

PS Form 3800, June 1985

Sent to Bennie Mauldin, Eng. Mgr. Citrus World, Inc.	
Street and No. P.O. Box 1111	
P.O. State and ZIP Code Lake Wales, FL 33853	
Postage	S
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	S
Postmark or Date Mailed: 11/6/87 Permits: AC 53-135738 AC 53-135740	

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

- Show to whom, date and address of delivery.
- Restricted Delivery.

3. Article Addressed to: Bennie Mauldin
Engineering Manager
Citrus World, Inc.
P.O. Box 1111
Lake Wales, FL 33853

4. Type of Service:	Article Number
<input type="checkbox"/> Registered <input type="checkbox"/> Insured	P 274 007 658
<input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD	
<input type="checkbox"/> Express Mail	

Always obtain signature of addressee or agent and **DATE DELIVERED.**

- Signature -- Addressee
X
- Signature -- Agent
X F L L A W S O N
- Date of Delivery
NOV 6 1987
- Addressee's Address (ONLY if requested and fee paid)

DOMESTIC RETURN RECEIPT

file

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

Mr. Bennie Mauldin, Engineering Manager
Citrus World, Inc.
Post Office Box 1111
Lake Wales, Florida 33853


November 6, 1987

Enclosed are construction permits Nos. AC 53-135738 and AC 53-135740 for the proposed gas turbine and waste heat boiler at Citrus World, Inc.'s Lake Wales Facility, located in Lake Wales, Polk County, Florida. These permits are issued pursuant to Section 403, Florida Statutes.

Any Party to these permit has the right to seek judicial review of the permits pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date these permits are filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION



C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

Copy furnished to:

Bill Thomas, Southwest District
John W. Bottorf, Jr., P.E.

Final Determination

Citrus World, Inc.
Lake Wales, Florida
Polk County

Source

Permit Number

Gas Turbine
Waste Heat Boiler

AC 53-135738
AC 53-135940

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

October 27, 1987

Final Determination

The Technical Evaluation and Preliminary Determination for the proposed gas turbine and waste heat boiler at Citrus World, Inc.'s Lake Wales facility was distributed on September 30, 1987. Copies of the evaluation were available for public inspection at the Department's offices in Tampa and Tallahassee. The Notice of Proposed Agency Action on the permit applications was published in The Lake Wales News on October 8, 1987.

The applicant's consultant asked what was the legal basis for establishing a NOx standard for the waste heat boiler and that the compliance test requirements for the project be clarified.

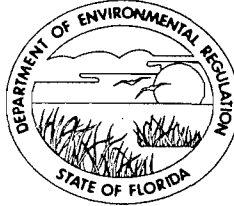
A NOx standard is required for the boiler to document that the project is not subject to the PSD regulations. If the NOx emissions are higher than the quantities estimated by the applicant, the project could be subject to the PSD regulations.

The Department will not require a NOx test on the boiler when it is operating without the turbine because technical literature shows the emission factor used by the applicant is reliable. However, the construction permit requires an initial compliance test (one time only) to determine that this emission factor does not change when the boiler is operated with the gas turbine. The construction permit does not require annual NOx emission tests for the boiler. A NOx test is required for the gas turbine each time the permit to operate is renewed (every 5 years). Annual visible emissions tests are required for both sources.

The final action of the Department will be to issue the permits as proposed in the Technical Evaluation and Preliminary Determination.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

PERMITTEE:
Citrus World, Inc.
P. O. Box 1111
Lake Wales, FL 33853

Permit Number: AC 53-135738
Expiration Date: July 31, 1988
County: Polk
Latitude/Longitude: 27° 54' 41"N
81° 36' 02"W
Project: Gas Turbine

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of a 45.2 MMBtu/hr natural gas fired gas turbine, Solar Turbine Incorporated Model Centaur Type H with a 3449 KW generator, that discharges to a by-pass stack or waste heat boiler at Citrus World, Inc. existing facility located on U.S. Highway 27 North near Lake Wales, Polk County, Florida. The UTM coordinates of this facility are zone 17, 441.0 km E and 3087.3 km N.

This turbine, along with a new waste heat boiler that is being permitted separately, will replace the existing No. 2 boiler (AO 53-54001), gas turbine (AO 53-87175) and gas turbine/waste heat boiler (AO 53-60894).

The construction shall be in accordance with the attached permit application, plans, documents, and drawings except as noted in the Preliminary Determination or the Specific Conditions of this permit.

Attachments:

1. Application for a gas turbine/waste heat boiler received June 19, 1987.
2. DER letter dated July 17, 1987.
3. Seabury-Bottorf Assoc., Inc. letter dated July 23, 1987.
4. Seabury-Bottorf Assoc., Inc. letter dated July 31, 1987.
5. Technical Evaluation and Preliminary Determination for a gas turbine and waste heat boiler dated September 25, 1987.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the Department.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the Department with the following information:

- a. a description of and cause of non-compliance; and
- b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

- () Determination of Best Available Control Technology (BACT)
- () Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.
- c. Records of monitoring information shall include:
- the date, exact place, and time of sampling or measurements;
 - the person responsible for performing the sampling or measurements;
 - the date(s) analyses were performed;
 - the person responsible for performing the analyses;
 - the analytical techniques or methods used; and
 - the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. The unit shall comply with all requirements of 40 CFR 60, Subpart GG-Standards of Performance for Stationary Gas Turbines. Determination of the nitrogen content of the natural gas is not required. The permittee shall obtain the average daily sulfur content of the natural gas from the supplier for the 15th and 30th day of the month for the first six months. If the sulfur content shows consistency and compliance with 40 CFR 60.333, the sulfur content shall be obtained from the supplier on the first day of each quarter for one year. If the analysis continues to show consistency and compliance with 40 CFR 60.333 over this one year period, then the sulfur content shall be obtained on the first day of each six month period and reported in the annual operation report. If the permittee changes natural gas suppliers, the fuel testing requirements will be reexamined.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

SPECIFIC CONDITIONS:

2. Heat input to the gas turbine shall not exceed 45.2 MMBtu/hr which is approximated 44,180 CFH of natural gas. A daily log of the turbine gas meter readings shall be maintained for a minimum of 2 years.

3. The maximum NOx emissions from the turbine shall not exceed the following:

Concentration	lb/hr	TPY
Std = $0.0150(14.4/Y)+F$	32	140

Where: Std = allowable NOx emissions (% by vol. @ 15% O₂, dry)
Y = heat rate (kilojoules per watt hour)
F = allowance for fuel bond N₂ (40 CFR 60.332)

Initial compliance shall be determined by the test methods and procedures specified in 40 CFR 60.335 while the turbine is operating at its permitted capacity. Test facilities shall be installed to measure the turbine emissions prior to the duct burner.

4. Visible emissions, as determined by Reference Method 9, 40 CFR 60, Appendix A, shall not exceed 5 percent opacity (6 minute average).

5. Notify the SW District Office 15 days prior to source testing. Copies of the test report(s) shall be submitted to district within 45 days after completion of testing. Surrender permits to operate the existing No. 2 boiler, gas turbine, and gas turbine/waste heat boiler to the SW District office prior to applying for a permit to operate the new turbine/waste heat boiler.

6. The turbine may operate continuously, 8760 hrs/yr.

7. The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, he must notify the Department in writing 90 days prior to the expiration of the construction permit and submit a new schedule and request for an extension of the construction permit. (FAC Rule 17-4.09)

8. To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit, including all applicable application fees, along with test results and Certificate of Completion, to the SW District office

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

SPECIFIC CONDITIONS:

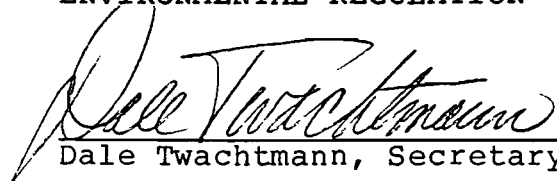
90 days prior to the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date requires a valid permit to operate. (FAC Rule 17-4.22 and 17-4.23)

9. If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application. (FAC Rule 17-4.10)

10. Any permit to operate issued for this source shall require an annual operating report that includes, as a minimum, a recent visible emission test report. An NOx emissions test shall be required on renewal of any permit to operate issued for this source.

Issued this 3 day of Nov, 1987

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION


Dale Twachtmann, Secretary

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

PERMITTEE:
Citrus World, Inc.
P. O. Box 1111
Lake Wales, FL 33853

Permit Number: AC 53-135940
Expiration Date: July 31, 1988
County: Polk
Latitude/Longitude: 27° 54' 41"N
81° 36' 02"W
Project: Waste Heat Boiler

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of a waste heat boiler that uses the flue gas from a 45.2 MMBtu/hr gas turbine along with approximately 89,3000 CFH natural gas (91.36 MMBtu/hr) to produce up to 110,000 lbs/hr of 240 psig saturated steam. The boiler will be located at Citrus World, Inc.'s existing facility on U.S. Highway 27 North near Lake Wales, Polk County, Florida. The UTM coordinates of this facility are zone 17, 441.0 km E and 3087.3 km N.

The waste hear boiler, along with a new gas turbine, will replace the existing No. 2 boiler (AO 53-54001), gas turbine (AO 53-87175) and gas turbine/waste heat boiler (AO 53-60894).

The installation shall be in accordance with the attached permit application, plans, documents, and drawings except as noted in the Preliminary Determination or Specific Conditions of this permit.

Attachments:

1. Application for a gas turbine/waste heat boiler received June 19, 1987.
2. DER letter dated July 17, 1987.
3. Seabury-Bottorf Assoc., Inc. letter dated July 23, 1987.
4. Seabury-Bottorf Assoc., Inc. letter dated July 31, 1987.
5. Technical Evaluation and Preliminary Determination for a gas turbine and waste boiler dated September 25, 1987.
6. BACT determination for Citrus World, Inc.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the Department with the following information:

- a. a description of and cause of non-compliance; and
- b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

- (x) Determination of Best Available Control Technology (BACT)
- () Determination of Prevention of Significant Deterioration (PSD)
- () Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.
- c. Records of monitoring information shall include:
- the date, exact place, and time of sampling or measurements;
 - the person responsible for performing the sampling or measurements;
 - the date(s) analyses were performed;
 - the person responsible for performing the analyses;
 - the analytical techniques or methods used; and
 - the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Steam production by the heat recovery boiler shall not exceed 110,000 lbs/hr of 240 psig steam.
2. Heat input to the duct burner shall not exceed 91.36×10^6 Btu/hr (89,300 CFH) of natural gas.
3. The maximum allowable NOx contribution by the the duct burner alone (not including NOx contribution by the turbine) to the emissions shall not exceed 0.14 lb/MMBtu heat input (54.76 TPY). Emissions from the boiler shall not exceed 5 percent opacity, 6 minutes average. Compliance shall be as determined by reference methods 7, 9, or 20 as described in 40 CFR 60, Appendix A, or any

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

SPECIFIC CONDITIONS:

EPA approved alternative methods that are applicable to this source. Tests shall be conducted at maximum permitted heat input to the duct burner. The company shall obtain prior approval of the test plan that determines the emissions of the turbine and boiler separately.

4. Notify the SW District Office 15 days prior to source testing. Copies of the test report(s) shall be submitted to district within 45 days after completion of testing. Surrender permits to operate the existing No. 2 boiler, gas turbine, and gas turbine/waste heat boiler to the SW District office prior to applying for a permit to operate the new turbine/waste heat boiler.

5. The heat recovery boiler and duct burner may be operated continuously, 8760 hrs/yr.

6. The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, he must notify the Department in writing 90 days prior to the expiration of the construction permit and submit a new schedule and request for an extension of the construction permit. (FAC Rule 17-4.09)

7. To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit, including all applicable application fees, along with test results and Certificate of Completion, to the SW District 90 days prior to the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date requires a valid permit to operate. (FAC Rule 17-4.22 and 17-4.23)

8. If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application. (FAC Rule 17-4.10)

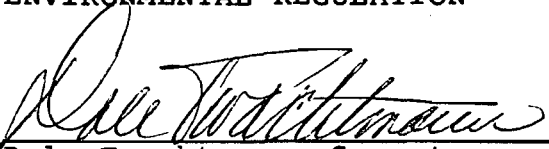
9. Any permit to operate issued for this source shall require an annual operating report that includes as a minimum, a recent visible emissions test report.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

Issued this 2 day of Nov., 1987

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION



Dale Twachtmann, Secretary

The emission rate of nitrogen oxides proposed by the applicant is equivalent to 0.14 pounds per million Btu heat input. A review of other BACT determinations indicates that the proposed emission level is less than the majority of the determinations on record and hence is justified as being BACT for this source.

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Recommended by:

CA Fancy

C. H. Fancy, P.E.
Deputy Bureau Chief, BAQM

10/27/87

Date

Approved by:

Dale Twachtmann

Dale Twachtmann, Secretary

2 Nov 87

Date



Interoffice Memorandum

For Routing To Other Than The Addressee

To: _____	Location: _____
To: _____	Location: _____
To: _____	Location: _____
From: _____	Date: _____

TO: Dale Twachtmann
THRU: Howard Rhodes
FROM: Clair Fancy
DATE: October 27, 1987
SUBJ: Approval of Construction Permits Nos. AC 53-135738
and AC 53-135740
Citrus World, Inc.

Attached for your approval and signature are construction permits for the proposed gas turbine and waste heat boiler at Citrus World, Inc.'s Lake Wales facility, located in Lake Wales, Polk County, Florida. There were no comments received during the public notice period.

Day 90 after which these permits will be issued by default is November 25, 1987.

The Bureau recommends approval and signature.

CHF/MJ/s
attachment

RECEIVED
NOV 3 1987

Office of the Secretary

RECEIVED
NOV 1 1987

Office of the Secretary

Certified Mail

P443 183 786

AC 53-135938
53-135940

PM
9 Oct 1987
Lake Wales, FL

File Copy

AFFIDAVIT OF PUBLICATION THE LAKE WALES NEWS

Published Weekly
LAKE WALES, POLK COUNTY, FLORIDA

STATE OF FLORIDA
COUNTY OF POLK:

Before the undersigned authority personally appeared OWEN B. BRICE, who, on oath, says that he is Editor of The Lake Wales News, a weekly newspaper published at Lake Wales, in Polk County, Florida; that the attached copy of advertisement, being a *Notice*

of Intent
Citrus World, in the *Department's* Court,
was published in said newspaper in the issues of *Office of Genl*
Oct. 8, 1987 *Counsel, Tallahassee*

Affiant further says that the said Lake Wales News is a newspaper published at Lake Wales, in said Polk County, Florida, and that the said newspaper has heretofore been continuously published in said Polk County, Florida, each Thursday and has been entered as second class mail matter at the post office in Lake Wales, in said Polk County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Sworn to and subscribed
before me this *21st*
day of *October*, A. D. 1987.
L. Verner D. Buxie
(SEAL) Notary Public.

My Commission Expires April 11, 1990

Owen B. Brice
DER

OCT 12 1987

BAQM

Copied Willard Hanks - 10/13/87

State of Florida Department of Environmental Reg- ulation

Notice of Intent

The Department gives notice of its intent to issue two permits to Citrus World, Inc. for the replacement of a natural gas/No. 6 fuel oil fired Boiler No. 2, two existing gas turbines, and a waste heat boiler with a 45.2 MMBtu/hr gas turbines and a 91.36 MMBtu/hr waste heat boiler which uses natural gas only as fuel at their existing citrus processing facility (SIC 2037), located on U.S. Highway 27 near Lake Wales, Polk County, Florida. The UTM coordinates of the facility are Zone 17, 441.0 km E and 3087.3 km N.

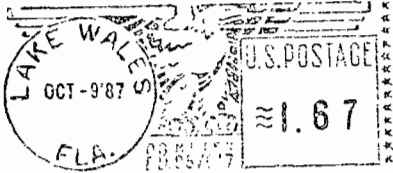
Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009, Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:
Dept. of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Dept. of Environmental Regulation
Southwest District
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 14 days of the publication of this notice will be considered in the Department's final determination.

CERTIFIED
P 443 183 786
MAIL



CITRUS WORLD, INC.

LAKE WALES, FLORIDA 33859-1111



Dept, of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DER

OCT 12 1987

BAQM

Attention: Mr. C. H. Fancy, P.E.
Deputy Chief,

P 274 007 677

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

U.S.G.P.O. 1985-480-794

PS Form 3800, June 1985

Sent to Bennie Mauldin, Eng. Mgr.	
Street and No. Citrus World, Inc.	
P.O. Box 1111	
P.O. State and ZIP Code Lake Wales, FL 33853	
Postage	S
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	S
Postmark or Date Mailed: 10/02/87	
Permits: AC 53-135738 53-135940	

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) or service(s) requested.

OCT 7 1987

- Show to whom, date and address of delivery.
- Restricted Delivery. **BAQM**

3. Article Addressed to:
Mr. Bennie Mauldin, Eng. Mgr.
Citrus World, Inc.
P.O. Box 1111
Lake Wales, FL 33853

4. Type of Service:	Article Number
<input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail	P 274 007 677

Always obtain signature of addressee or agent and **DATE DELIVERED.**

- Signature - Addressee
X
- Signature - Agent
X **ELVA WSON**
- Date of Delivery
OCT 5 1987
- Addressee's Address (ONLY if requested and fee paid)

DOMESTIC RETURN RECEIPT

State of Florida
Department of Environmental Regulation
Notice of Intent

The Department gives notice of its intent to issue two permits to Citrus World, Inc. for the replacement of a natural gas/No. 6 fuel oil fired Boiler No. 2, two existing gas turbines, and a waste heat boiler with a 45.2 MMBtu/hr gas turbine and a 91.36 MMBtu/hr waste heat boiler which uses natural gas only as fuel at their existing citrus processing facility (SIC 2037), located on U.S. Highway 27 near Lake Wales, Polk County, Florida. The UTM coordinates of the facility are Zone 17, 441.0 km E and 3087.3 km N.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

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*Corrected Copy: October 1, 1987

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Dept. of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dept. of Environmental Regulation
Southwest District
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 14 days of the publication of this notice will be considered in the Department's final determination.

*Corrected Copy: October 1, 1987

P 274 007 681

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

U.S.G.P.O. 1985-480-794

PS Form 3800, June 1985

Sent to Bernie Mauldin, Eng. Mgr.	
Citrus World, Inc.	
Street and No. P.O. Box 1111	
P.O., State and ZIP Code Lake Wales, FL 33853	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date Mailed: 09/30/87 Permits: AC 53-135738 53-135940	

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. Show to whom, date and address of delivery.

2. Restricted Delivery.

3. Article Addressed to: **Bernie Mauldin**
Citrus World, Inc.
Post Office Box 1111
Lake Wales, FL 33853

4. Type of Service:	Article Number
<input type="checkbox"/> Registered <input type="checkbox"/> Insured	P 274 007 681
<input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD	
<input type="checkbox"/> Express Mail	

Always obtain signature of addressee or agent and **DATE DELIVERED.**

5. Signature - Addressee
X

6. Signature - Agent
X **FEK LAWSON**

7. Date of Delivery

8. Addressee's Address (ONLY if requested and fee paid)

DOMESTIC RETURN RECEIPT

file copy

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY

September 29, 1987

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Bernie Mauldin, Engineering Manager
Citrus World, Inc.
Post Office Box 1111
Lake Wales, Florida 33853

Dear Mr. Mauldin:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permits to replace the natural gas/No. 6 fuel oil fired Boiler No. 2, two existing gas turbines, and a waste heat boiler with a 45.2 MMBtu/hr gas turbine and a 91.36 MMBtu/hr waste heat boiler which uses natural gas only as fuel at the applicant's existing citrus processing facility (SIC 2037) located on U.S. Highway 27 near Lake Wales, Polk County, Florida.

Please submit, in writing, any comments which you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Quality Management. If you have any questions please contact me at (904) 488-1344.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/bm

Attachments

cc: Bill Thomas, Southwest Dist.
John W. Bottorf, Jr., P.E.

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO
ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION)	Initial
2. file (AC53-135933) - Citrus World	Date
(AC53-135940)	Initial
	Date
3.	Initial
	Date
4.	Initial
	Date

REMARKS:

Reference: Citrus World

On October 1, 1987, I told Roger Caldwell of Seabury-Battore to change the public notice for Citrus World to read comments received in "14 days" (instead of 30) would be considered in the final determination.

INFORMATION

Review & Return
Review & File
Initial & Forward

DISPOSITION

Review & Respond
Prepare Response
For My Signature
For Your Signature
Let's Discuss
Set Up Meeting
Investigate & Report
Initial & Forward
Distribute
Concurrence
For Processing
Initial & Return

FROM:

Willard Hanks

DATE	10/2/87
PHONE	

State of Florida
Department of Environmental Regulation
Notice of Intent

The Department gives notice of its intent to issue two permits to Citrus World, Inc. for the replacement of a natural gas/No. 6 fuel oil fired Boiler No. 2, two existing gas turbines, and a waste heat boiler with a 45.2 MMBtu/hr gas turbine and a 91.36 MMBtu/hr waste heat boiler which uses natural gas only as fuel at their existing citrus processing facility (SIC 2037), located on U.S. Highway 27 near Lake Wales, Polk County, Florida. The UTM coordinates of the facility are Zone 17, 441.0 km E and 3087.3 km N.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative determination (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Failure to file a petition within this time period constitutes a waiver of any right such person has to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the proposed agency action. Therefore, persons who may not wish to file a petition may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Rule 28-5.207, Florida Administrative Code, at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009, Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Dept. of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dept. of Environmental Regulation
Southwest District
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination.

RULES OF THE ADMINISTRATIVE COMMISSION
MODEL RULES OF PROCEDURE
CHAPTER 28-5
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

28-5.15 Requests for Formal and Informal Proceedings

- (1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed, typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.
- (2) All petitions filed under these rules should contain:
 - (a) The name and address of each agency affected and each agency's file or identification number, if known;
 - (b) The name and address of the petitioner or petitioners;
 - (c) All disputed issues of material fact. If there are none, the petition must so indicate;
 - (d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;
 - (e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;
 - (f) A demand for the relief to which the petitioner deems himself entitled; and
 - (g) Such other information which the petitioner contends is material.

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Citrus World, Inc.
Post Office Box 1111
Lake Wales, Florida 33853

DER File Nos. AC 53-135738
53-135940

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue permits (copies attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Citrus World, Inc. applied on June 8, 1987, to the Department of Environmental Regulation for permits to replace the natural gas/No. 6 fuel oil fired Boiler No. 2, two existing gas turbines, and a waste heat boiler with a 45.2 MMBtu/hr gas turbine and a 91.36 MMBtu/hr waste heat boiler which uses natural gas only as fuel at their existing citrus processing facility (SIC 2037) located on U.S. Highway 27 near Lake Wales, Polk County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit was needed for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, FAC, you (the applicant) are required to publish at your own expense the enclosed Notice of Proposed Agency Action on permit application. The notice must be published one time only in a section of a major local newspaper of general circulation in the county in which the project is located and within thirty (30) days from receipt of this intent. Proof of publication must be

provided to the Department within seven days of publication of the notice. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permits.

The Department will issue the permits with the attached conditions unless petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S. A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. Petitions must comply with the requirement of Florida Administrative Code Rules 17-103.155 and 28-5.201 (copies enclosed) and be filed with (received by) the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant must be filed within fourteen (14) days of receipt of this intent. Petitions filed by other persons must be filed within fourteen (14) days of publication of the public notice or within fourteen (14) days of receipt of this intent, whichever first occurs. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes, concerning the subject permit applications. Petitions which are not filed in accordance with the above provisions will be dismissed.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


C. H. Fancy, P.E.

Deputy Chief
Bureau of Air Quality
Management

Copies furnished to:

Bill Thomas, SW Dist.
J. Bottorf, Jr., P.E.

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on Sept. 30, 1987.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to
§120.52(9), Florida Statutes, with
the designated Department Clerk,
receipt of which is hereby
acknowledged.

Martha Wise
Clerk

9-30-87
Date

Technical Evaluation
and
Preliminary Determination

Citrus World, Inc.
Lake Wales, Florida
Polk County

Source

File Number

Gas Turbine
Waste Heat Boiler

AC 53-135738
AC 53-135940

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

September 29, 1987

I. General Information

A. Applicant

Citrus World, Inc.
P. O. Box 1111
Lake Wales, Florida 33853

B. Project and Location

Citrus World, Inc. proposes to replace the natural gas/No. 6 fuel oil fired Boiler No. 2 (AO 53-54001), two existing gas turbines, and a waste heat boiler (AC 53-60894 and AO 53-87175) with a 45.2 MMBtu/hr gas turbine and a 91.36 MMBtu/hr waste heat boiler which uses natural gas only as fuel at their existing citrus processing facility (SIC 2037) located on U.S. Highway 27 near Lake Wales, Polk County, Florida. The UTM coordinates of the facility are Zone 17, 441.0 km E and 3087.3 km N.

C. Emissions

The emissions from the proposed process equipment will be the products of combustion from natural gas fuel. The emissions from the proposed sources and the existing sources that will cease operation are shown in Table 1.

The primary pollutant of concern to the Department in this project is NOx. The proposed emissions of the other criteria pollutants from the new equipment are small.

An examination of the preceding table shows that only NOx emissions from the proposed equipment exceeds the significant emission rates listed in Table 500-2 of Chapter 17-2, FAC.

As a net result of the project, the change in emissions of criteria pollutant will be less than the significant emission rate for the pollutant.

The only pollutant that will be emitted in larger quantities after the project is CO. The increase in CO emissions will be 9.02 TPY. The significant emission rate for CO is 100 TPY.

The Department does not anticipate the reduction in SO₂ emissions indicated in the preceding table will actually occur because the existing Boiler No. 2 that will be shut down burned natural gas as its primary fuel. The change in actual SO₂ emissions from the project will be insignificant.

II. Rule Applicability

A. State Regulations

The proposed project, replacing a fossil fuel boiler, two gas turbines, and a waste heat boiler with a natural gas fired turbine and waste heat boiler, is subject to pre-construction review under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code (FAC).

The facility is located in an area designated unclassifiable for particulate matter (Rule 17-2.430, FAC) and attainment for all other criteria pollutants (Rule 17-2.420, FAC).

The plant is a major facility for the pollutants particulate matter, sulfur dioxide and nitrogen oxides because total emissions of each of these criteria pollutants exceed 100 TPY. Although the potential emissions of each of these pollutants exceeds 250 TPY, the proposed project is not subject to Rule 17-2.500, FAC, Prevention of Significant Deterioration (PSD) regulations, because the emission changes does not result in a significant emission rate increase for any criteria pollutant (Rule 17-2.500(2)(d)4.a.(ii), FAC).

As the area in which the facility is located is not designated nonattainment for any criteria pollutant, the project is not subject to new source review for nonattainment areas (Rule 17-2.510(2)(a)1., FAC).

The project is subject to Rule 17-2.520, FAC, which pertains to sources not subject to PSD or nonattainment requirements. Control of emissions shall be based on 40 CFR 60, Subpart GG, new source performance standards for gas turbines, and Rule 17-2.600(6), FAC, which requires a best available control technology determination for the waste heat boiler.

B. Federal Regulations

The proposed project is a minor modification to a major facility and is not subject to the federal PSD regulations, 40 CFR 52.21. The gas turbine must comply with 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines.

III. Technical Evaluation

The project involves replacing a 70 MMBtu/hr natural gas/No. 6 fuel oil fired boiler, a 21.2 MMBtu/hr natural gas fired turbine, and a 24.6 MMBtu/hr natural gas fired turbine and waste heat boiler with a 45.2 MMBtu/hr natural gas fired turbine and a 91.4 MMBtu/hr natural gas fired waste heat boiler.

Except for CO, the emissions from the proposed equipment will be less than the emissions from the existing equipment that will be taken out of service. The 9.02 TPY increase in CO emission from the project is insignificant.

Regulations require the NOx emissions from the gas turbine to comply with 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines (NSPS). The NOx standard is a function of the efficiency of the turbine and the fuel bound nitrogen. Nitrogen in natural gas is not considered to be fuel bound. Emissions from the turbine will not be allowed to exceed the NSPS for turbines and 32 lbs/hr (requested by the applicant), whichever is most restrictive. The other pollutant emissions will be regulated by a surrogate visible emissions standard of 5% opacity. This standard provides the Department with reasonable assurance that the turbine is being properly maintained and operated.

The emission standards for the waste-heat boiler are established by a best available control technology (BACT) determination. Natural gas is considered to be a clean fuel. Use of this fuel in a boiler of this size is considered to be BACT. As a slight increase in heat input to this boiler could subject it to the new source performance standards for industrial steam generating units (40 CFR 60, Subpart Db), the applicant is encouraged to install low Nox burners that will allow the boiler to comply with this regulation. The emissions of the other criteria pollutants will be regulated by a surrogate visible emissions standard of 5% opacity. This standard provides the Department with reasonable assurance that the waste heat boiler is being maintained and operated properly.

IV. Ambient Air Quality Impact

The project will not result in a significant net emissions increase of any criteria pollutant as set forth in Rule 17-2.500(2)(e)2., FAC. Therefore, no air quality analysis for this project is required by the regulations. The change in the emissions resulting from this project will not have a significant impact on the environment.

V. Conclusion

Based on the information submitted by the applicant, the Department has concluded that the proposed project will comply with all applicable air pollution control regulations. The Department proposed to issue permits to construct the turbine and waste heat boiler. The General and Specific Conditions listed in the draft permits (attached) will assure compliance by this equipment with the air pollution control regulations.

Table 1

Pollutants (a)

<u>Source</u>	<u>Particulate Matter</u>		<u>Nitrogen Oxides</u>		<u>Sulfur Dioxide</u>		<u>Carbon Monoxide</u>		<u>Hydrocarbon</u>	
	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY
New 45.2 MMBtu/hr gas turbine (b)	0.62	2.72	32	140.16	0.027	0.118	5.08	22.25	1.85	8.10
New 91.36 MMBtu/hr gas fired boiler (c)	0.45	1.95	12.5	54.76	0.05	0.23	3.12	13.69	0.52	2.27
Total emissions from new equipment (d)	1.07	4.67	44.5	194.92	0.077	0.348	8.20	45.94	2.37	10.37
Existing 71.7 MMBtu/hr Boiler No. 2 (e)		54.22		115.15		752.7		10.72		0.86
Existing 21.177 MMBtu/hr gas turbine		1.53		45.0		0.03		12.6		4.6
Existing 24.624 MMBtu/hr gas turbine and waste heat boiler		1.65		48.84		0.033		13.6		4.97
Total Emissions from affected existing equipment (f)		57.4		208.99		752.8		36.92		10.43
Net decrease in emissions (g)		52.73		14.07		752.4		(9.02) (h)		0.06

(a) Emissions based on continuous operation

(b) Maximum allowable emissions will be NSPS or 32 lbs NO_x/hr, whichever is lower

(c) Maximum allowable emissions based on AP-42 emission factor for natural gas fired boilers

(d) Only NO_x emissions from the new equipment will exceed the significant emission rates listed in Table 500-2

(e) Maximum allowable emissions based on the combustion of 478 GPH No. 6 fuel oil

(f) Project will not result in a significant emissions rate increase of any criteria pollutant

(g) Allowable emissions from 1985 operation report used to determine net change

(h) Only CO emissions increase

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

PERMITTEE:
Citrus World, Inc.
P. O. Box 1111
Lake Wales, FL 33853

Permit Number: AC 53-135738
Expiration Date: July 31, 1988
County: Polk
Latitude/Longitude: 27° 54' 41"N
81° 36' 02"W
Project: Gas Turbine

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of a 45.2 MMBtu/hr natural gas fired gas turbine, Solar Turbine Incorporated Model Centaur Type H with a 3449 KW generator that discharges to a by-pass stack or waste heat boiler at Citrus World, Inc. existing facility located on U.S. Highway 27 North near Lake Wales, Polk County, Florida. The UTM coordinates of this facility are zone 17, 441.0 km E and 3087.3 km N.

This turbine, along with a new waste heat boiler that is being permitted separately, will replace the existing No. 2 boiler (AO 53-54001), gas turbine (AO 53-87175) and gas turbine/waste heat boiler (AO 53-60894).

The construction shall be in accordance with the attached permit application, plans, documents, and drawings except as noted in the Preliminary Determination or the Specific Conditions of this permit.

Attachments:

1. Application for a gas turbine/waste heat boiler received June 19, 1987.
2. DER letter dated July 17, 1987.
3. Seabury-Bottorf Assoc., Inc. letter dated July 23, 1987.
4. Seabury-Bottorf Assoc., Inc. letter dated July 31, 1987.
5. Technical Evaluation and Preliminary Determination for a gas turbine and waste heat boiler dated September 25, 1987.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the Department.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the Department with the following information:

- a. a description of and cause of non-compliance; and
- b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

- () Determination of Best Available Control Technology (BACT)
- () Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.
- c. Records of monitoring information shall include:
- the date, exact place, and time of sampling or measurements;
 - the person responsible for performing the sampling or measurements;
 - the date(s) analyses were performed;
 - the person responsible for performing the analyses;
 - the analytical techniques or methods used; and
 - the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. The unit shall comply with all requirements of 40 CFR 60, Subpart GG-Standards of Performance for Stationary Gas Turbines. Determination of the nitrogen content of the natural gas is not required. The permittee shall obtain the average daily sulfur content of the natural gas from the supplier for the 15th and 30th day of the month for the first six months. If the sulfur content shows consistency and compliance with 40 CFR 60.333, the sulfur content shall be obtained from the supplier on the first day of each quarter for one year. If the analysis continues to show consistency and compliance with 40 CFR 60.333 over this one year period, then the sulfur content shall be obtained on the first day of each six month period and reported in the annual operation report. If the permittee changes natural gas suppliers, the fuel testing requirements will be reexamined.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

SPECIFIC CONDITIONS:

2. Heat input to the gas turbine shall not exceed 45.2 MMBtu/hr which is approximated 44,180 CFH of natural gas. A daily log of the turbine gas meter readings shall be maintained for a minimum of 2 years.

3. The maximum NOx emissions from the turbine shall not exceed the following:

Concentration.....	lb/hr	TPY
Std = $0.0150(14.4/Y)+F$	32	140

Where: Std = allowable NOx emissions (% by vol. @ 15% O₂, dry)
Y = heat rate (kilojoules per watt hour)
F = allowance for fuel bond N₂ (40 CFR 60.332)

Initial compliance shall be determined by the test methods and procedures specified in 40 CFR 60.335 while the turbine is operating at its permitted capacity. Test facilities shall be installed to measure the turbine emissions prior to the duct burner.

4. Visible emissions, as determined by Reference Method 9, 40 CFR 60, Appendix A, shall not exceed 5 percent opacity (6 minute average).

5. Notify the SW District Office 15 days prior to source testing. Copies of the test report(s) shall be submitted to district within 45 days after completion of testing. Surrender permits to operate the existing No. 2 boiler, gas turbine, and gas turbine/waste heat boiler to the SW District office prior to applying for a permit to operate the new turbine/waste heat boiler.

6. The turbine may operate continuously, 8760 hrs/yr.

7. The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, he must notify the Department in writing 90 days prior to the expiration of the construction permit and submit a new schedule and request for an extension of the construction permit. (FAC Rule 17-4.09)

8. To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit, including all applicable application fees, along with test results and Certificate of Completion, to the SW District office

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135738
Expiration Date: July 31, 1988

SPECIFIC CONDITIONS:

90 days prior to the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date requires a valid permit to operate. (FAC Rule 17-4.22 and 17-4.23)

9. If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application. (FAC Rule 17-4.10)

10. Any permit to operate issued for this source shall require an annual operating report that includes as a minimum, a recent visible emission test report. An NOx emissions test shall be required on renewal of any permit to operate issued for this source.

Issued this _____ day of _____, 19____

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

Dale Twachtman, Secretary

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

PERMITTEE:
Citrus World, Inc.
P. O. Box 1111
Lake Wales, FL 33853

Permit Number: AC 53-135940
Expiration Date: July 31, 1988
County: Polk
Latitude/Longitude: 27° 54' 41"N
81° 36' 02"W
Project: Waste Heat Boiler

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of a waste heat boiler that uses the flue gas from a 45.2 MMBtu/hr gas turbine along with approximately 89,3000 CFH natural gas (91.36 MMBtu/hr) to produce up to 110,000 lbs/hr of 240 psig saturated steam. The boiler will be located at Citrus World, Inc.'s existing facility on U.S. Highway 27 North near Lake Wales, Polk County, Florida. The UTM coordinates of this facility are zone 17, 441.0 km E and 3087.3 km N.

The waste hear boiler, along with a new gas turbine, will replace the existing No. 2 boiler (AO 53-54001), gas turbine (AO 53-87175) and gas turbine/waste heat boiler (AO 53-60894).

The installation shall be in accordance with the attached permit application, plans, documents, and drawings except as noted in the Preliminary Determination or Specific Conditions of this permit.

Attachments:

1. Application for a gas turbine/waste heat boiler received June 19, 1987.
2. DER letter dated July 17, 1987.
3. Seabury-Bottorf Assoc., Inc. letter dated July 23, 1987.
4. Seabury-Bottorf Assoc., Inc. letter dated July 31, 1987.
5. Technical Evaluation and Preliminary Determination for a gas turbine and waste boiler dated September 25, 1987.
6. BACT determination for Citrus World, Inc.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the Department with the following information:

- a. a description of and cause of non-compliance; and
- b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

- Determination of Best Available Control Technology (BACT)
- Determination of Prevention of Significant Deterioration (PSD)
- Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

GENERAL CONDITIONS:

- b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.
- c. Records of monitoring information shall include:
- the date, exact place, and time of sampling or measurements;
 - the person responsible for performing the sampling or measurements;
 - the date(s) analyses were performed;
 - the person responsible for performing the analyses;
 - the analytical techniques or methods used; and
 - the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Steam production by the heat recovery boiler shall not exceed 110,000 lbs/hr of 240 psig steam.
2. Heat input to the duct burner shall not exceed 91.36×10^6 Btu/hr (89,300 CFH) of natural gas.
3. The maximum allowable NOx contribution by the the duct burner alone (not including NOx contribution by the turbine) to the emissions shall not exceed 0.14 lb/MMBtu heat input (54.76 TPY). Emissions from the boiler shall not exceed 5 percent opacity, 6 minutes average. Compliance shall be as determined by reference methods 7, 9, or 20 as described in 40 CFR 60, Appendix A, or any EPA approved alternative

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

SPECIFIC CONDITIONS:

methods that are applicable to this source. Tests shall be conducted at maximum permitted heat input to the duct burner. The company shall obtain prior approval of the test plan that determines the emissions of the turbine and boiler separately.

4. Notify the SW District Office 15 days prior to source testing. Copies of the test report(s) shall be submitted to district within 45 days after completion of testing. Surrender permits to operate the existing No. 2 boiler, gas turbine, and gas turbine/waste heat boiler to the SW District office prior to applying for a permit to operate the new turbine/waste heat boiler.

5. The heat recovery boiler and duct burner may be operated continuously, 8760 hrs/yr.

6. The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, he must notify the Department in writing 90 days prior to the expiration of the construction permit and submit a new schedule and request for an extension of the construction permit. (FAC Rule 17-4.09)

7. To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of the construction permit and submit a complete application for an operating permit, including all applicable application fees, along with test results and Certificate of Completion, to the SW District 90 days prior to the expiration date of the construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date requires a valid permit to operate. (FAC Rule 17-4.22 and 17-4.23)

8. If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application. (FAC Rule 17-4.10)

9. Any permit to operate issued for this source shall require an annual operating report that includes as a minimum, a recent visible emissions test report.

PERMITTEE:
Citrus World, Inc.

Permit Number: AC 53-135940
Expiration Date: July 31, 1988

SPECIFIC CONDITIONS:

Issued this _____ day of _____, 19____

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

Dale Twachtman, Secretary

The emission rate of nitrogen oxides proposed by the applicant is equivalent to 0.14 pounds per million Btu heat input. A review of other BACT determinations indicates that the proposed emission level is less than the majority of the determinations on record and hence is justified as being BACT for this source.

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Recommended by:

C. H. Fancy, P.E.
Deputy Bureau Chief, BAQM

Date

Approved by:

Dale Twachtmann, Secretary

Date

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION



Interoffice Memorandum

FOR ROUTING TO OTHER THAN THE ADDRESSEE

To: _____	Loc: _____
To: _____	Loc: _____
To: _____	Loc: _____
From: _____	Date: _____

TO: Dale Twachtmann
THRU: Howard Rhodes

FROM: Clair Fancy

DATE: September 16, 1987

SUBJECT: BACT Determination for Citrus World, Inc.

Attached please find a BACT determination for a 91.36 MMBtu/hr natural gas fired waste heat boiler located at Lake Wales, Polk County, Florida.

This determination is for a permit under review by the district office. We recommend that you approve and sign the determination, the results of which will be made specific conditions of the construction permit.

CHF/BA/ss



SEABURY-BOTTORF ASSOCIATES, INC.

CONSULTING ENGINEERS

ANALYTICAL LABORATORY

4595 PARKBREEZE CT. ORLANDO, FLORIDA 32808-1057 305-298-0846

July 31, 1987

Project No. 171-7

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Mr. C. H. Fancy, P. E.
Deputy Chief
Bureau of Air Quality Management
Florida Dept. of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Rd.
Tallahassee, Florida 32301-8241

Subject: Polk Co. - AP
Citrus World, Inc.
Gas Turbine/Waste Heat
Boiler Application

Dear Mr. Fancy:

We are in receipt of your letter dated 7/17/87 requesting additional information to complete the referenced application. The information is addressed in the order requested.

1. The September, 1981, construction date was a typographical error. The correct date should have been September, 1987. Now it is estimated that construction will be complete by December, 1987.
2. A complete list of all sources and their emissions operating at the subject facility was submitted on 7/23/87. Boiler #2, Gas Turbine and Gas Turbine/Waste Heat Boiler will be permanently shut down and removed from this facility. With the removal of these three sources and the addition of a new gas turbine/waste heat boiler, there will be a reduction of 9.52 tons/year NO_x emissions as shown below:

DER

AUG 3 1987

BAQM

Copied: Clair Fancy
 Bill Thomas
 Willard Hanks
 Barry Andrews
 Bill Thomas, Tampa

} 8/3/87 wmt

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Mr. C. H. Fancy, P. E.
July 31, 1987
Page 2.

NEW GAS TURBINE/WASTE HEAT BOILER

$$\text{Allowable Turbine Emissions} = 32 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hrs./Yr.}}{2000 \text{ Lbs./Ton}} = 140.16 \text{ Tons/Yr}$$

$$\text{Potential W-H Boiler Emissions} = 12.5 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hrs./Yr.}}{2000 \text{ Lbs./Ton}} = 54.75 \text{ Tons/Yr}$$

$$\text{TOTAL NO}_X \text{ EMISSIONS FROM NEW SYSTEM} = 194.91 \text{ TONS/YR}$$

BOILER #2 TO BE REMOVED (71.7 MMBTU/Hr.)

$$478 \text{ Gals./Hr. \#6 Fuel Oil} \times 55 \text{ Lbs./10}^3 \text{ Gals.} = 26.29 \text{ Lbs./Hr.}$$

$$\times \frac{8760 \text{ Hrs./Yr.}}{2000 \text{ Lbs./Ton}} = \text{NO}_X \text{ EMISSION} = 115.15 \text{ TONS/YR}$$

GAS TURBINE REMOVED (21.177 MMBTU/Hr.)

$$22,820 \text{ Ft.}^3 \text{/Hr. Natural Gas} \times 413 \text{ Lbs./10}^6 \text{ Ft.}^3 = 9.42 \text{ Lbs./Hr.}$$

$$\times \frac{8760 \text{ Hrs./Yr.}}{2000 \text{ Lbs./Ton}} = \text{NO}_X \text{ EMISSION} = 41.28 \text{ TONS/YR}$$

GAS TURBINE W-H BOILER REMOVED (24.624 MMBTU/Hr.)

$$26,534.5 \text{ Ft.}^3 \text{/Hr. Natural Gas} \times 413 \text{ Lbs./10}^6 \text{ Ft.}^3 = 10.96 \text{ Lbs./Hr.}$$

$$\times \frac{8760 \text{ Hrs./Yr.}}{2000 \text{ Lbs./Ton}} = \text{NO}_X \text{ EMISSIONS} = 48.00 \text{ TONS/YR}$$

$$\text{REDUCTION IN NO}_X \text{ EMISSIONS} = 9.52 \text{ TONS/YR}$$

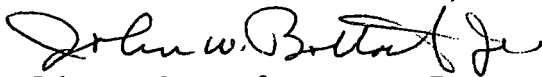
We have enclosed copies of the permits for the three sources being removed to substantiate this data. There will be no significant net emissions' increase of any criteria pollutant.

3. Since there will not be a significant net increase in any criteria pollutant, an ambient air impact analysis will not be required. PSD regulations will not apply to this source.

If you have any questions or need additional information, please call Roger Caldwell at 305/298-0846.

Very truly yours,

SEABURY-BOTTORF ASSOCIATES, INC.



John W. Bottorf, Jr., P. E.

RTC/JWBjr/ac

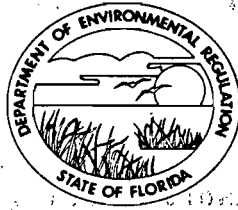
cc: Mr. Bennie Mauldin

Encls: Permits #A053-54001, #A053-60894,
& #A053-87175

REC'D
171-7F
AUG 1 - 1984

DEPARTMENT OF ENVIRONMENTAL REGULATION

SEABURY-BOTTORF
ASSOCIATES, INC.



SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610-9544

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

RICHARD D. GARRITY, PH.D.
DISTRICT MANAGER

PERMITTEE:
Mr. Bennie Mauldin
General Engineer
Citrus World, Inc.
Post Office Box 1111
Lake Wales, FL 33853

PERMIT/CERTIFICATION
Permit No.: A053-87175
County: Polk
Expiration Date: 7/16/89
Project: Gas Turbine

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 & 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the operation of a 3000 HP Caterpillar 5650 natural gas turbine driving a 2135 KW electric power generator, with a maximum load rate of 21.177 MMBTU/hr. The fuel is natural gas at a maximum input rate of 22,820 cubic ft/hr.

Location: U.S. Highway 27 North, Lake Wales, Polk County

UTM: 17-441.0E 3087.3N NEDS NO: 0002 Point ID: 20

Replaces Permit No.: AC53-76702

PERMITTEE:
Citrus World, Inc.

Permit/Certification No.: A053-87175
Project: Gas Turbine

14. (con't)

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Test the emissions for the following pollutant(s) at intervals of 12 months from the date April 24, 1984 and submit a copy of test data to the Air Section of the Southwest District Office within forty five days of such testing (Section 17-2.700 (2), Florida Administrative Code (F.A.C.)).

- | | |
|---|---|
| <input type="checkbox"/> Particulates | <input type="checkbox"/> Sulfur Oxides |
| <input type="checkbox"/> Fluorides | <input type="checkbox"/> Nitrogen Oxides |
| <input checked="" type="checkbox"/> Opacity | <input type="checkbox"/> Hydrocarbons |
| | <input type="checkbox"/> Total Reduced Sulfur |

*Fuel analysis may be submitted for required sulfur dioxide emission test.

2. Testing of emissions must be accomplished at approximately the rates as stated in this permit. Failure to submit the input rates or operation at conditions which do not reflect actual operating conditions may invalidate the data (Section 403.161(1)(c), Florida Statutes).

PERMITTEE:
Citrus World, Inc.

Permit/Certification No.: A053-87175
Project: Gas Turbine

SPECIFIC CONDITIONS (con't):

3. Visible emissions shall not be equal to or greater than 20% opacity in accordance with Subsection 17-2.610(2)(b), F.A.C.

4. This Southwest District Office of the Department of Environmental Regulation shall be notified in writing 15 days prior to compliance testing.

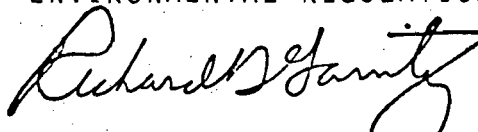
5. Submit for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Section 17-4.14, F.A.C.

- (A) Annual amount of materials and/or fuels utilized.
- (B) Annual emissions (note calculation basis).
- (C) Any changes in the information contained in the permit application.

6. The visible emission compliance test shall be conducted by a qualified observer using DER Test Method #9.

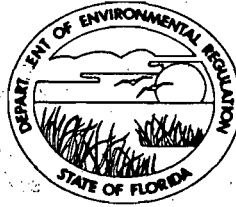
Issued this 26th day of July
1984.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION



Richard D. Garrity, Ph.D.
District Manager

DEPARTMENT OF ENVIRONMENTAL REGULATION



SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610-9544

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WILLIAM K. HENNESSEY
DISTRICT MANAGER

APPLICANT:

Mr. Bennie Mauldin
Citrus World, Inc.
P.O. Box 1111
Lake Wales, Fla. 33853

PERMIT/CERTIFICATION

No.: AO53-54001
County: Polk
Project: Keystone Process
Steam Boiler #2

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the operation of an Erie City Keystone Model 1750 BHP process steam boiler #2 using natural gas with #6 fuel oil as standby.

Located at U.S. Highway 27 North, Lake Wales, Polk County.

UTM: 17-441.0 E 3087.3 N

Replaces Permit No.: AO53-2633 NEDS No.: 0002 Point ID: 05

Expiration Date: April 23, 1987

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth herein are "Permit Conditions", and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.
2. This permit is valid only for the specific processes and operations indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.

DER Form 17-1.122(63) Page 1 of 4.

Appl. Name: Citrus World, Inc.
Project: Keystone Process Steam Boiler
Page 3 of 4 of Permit No. A053-54001

10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.

11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.

12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

13. This permit also constitutes:

- () Determination of Best Available Control Technology (BACT)
- () Determination of Prevention of Significant Deterioration (PSD)
- () Certification of Compliance with State Water Quality Standards (Section 401. PL 92-500)

SPECIFIC CONDITIONS

1. Test the emissions for the following pollutant(s) at intervals of 12 months from the date 2/10/82 and submit a copy of test data to the District Engineer of this agency within fifteen days of such testing (Chapter 17-2.700 (2), Florida Administrative Code (F.A.C.)).

- | | |
|-------------------|--------------------------|
| () Particulates | () Sulfur Oxides |
| () Fluorides | () Nitrogen Oxides |
| (X) Plume Density | () Hydrocarbons |
| | () Total Reduced Sulfur |

*Fuel analysis may be submitted for required sulfur dioxide emission test.

2. Testing of emissions must be accomplished at approximately the rates as stated in the application. Failure to submit the input rates or operation at conditions which do not reflect actual operating conditions may invalidate the data (Chapter 403.161(1)(c), Florida Statutes).

Appl. Name: Citrus World, Inc.
Project: Keystone Process Steam Boiler
Page 4 of 4 of Permit No.: A053-54001

3. Submit for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Chapter 17-4.14, F.A.C.

- (A) Annual amount of materials and/or fuels utilized.
- (B) Annual emissions (note calculation basis).
- (C) Any changes in the information contained in the permit application.

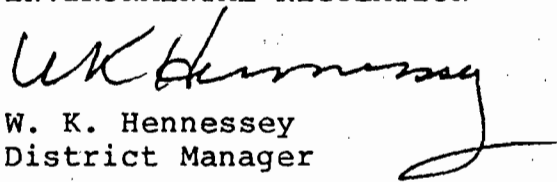
4. The emission limitation for this boiler is set forth in Chapter 17-2.610(2), F.A.C., and must be conducted in accordance with EPA Method #9.

5. The boiler must be tested on oil at yearly intervals from the date of 2/10/82, in accordance with Method 9-Visible Determination of the Opacity of Emissions from Stationary Sources (36FR24895; Federal Register, December 23, 1971).

6. This permit expires 4/23/87 and application is to be made to the appropriate DER office 60 days prior to the permit expiration.

Issued this 30th day of April
1982

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION


W. K. Hennessey
District Manager

EXPIRATION DATE

April 23, 1987

A053-54001
PAID MAR 30 1982



STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
APPLICATION FOR RENEWAL OF
PERMIT TO OPERATE AIR POLLUTION SOURCE(S)

If major alterations have occurred, the applicant should complete the Standard Air Permit Application Form.

Source Type: Process Boiler Renewal of DER Permit No.: AO 53-2633
Company Name: Citrus World, Inc. County: Polk

Identify the specific emission point source(s) addressed in this application (i.e.; Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2. Gas Fired):

Keystone Model Process Steam Boiler with 1750 BHP

Source Location: Street: U. S. Hwy. 27 N. City: Lake Wales

UTM: East 17-441000 North 30-87300

Latitude: 27° 05' 41" N. Longitude: 81° 03' 01" W.

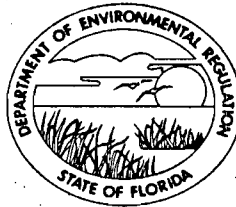
1. Attach herewith a twenty dollar (\$20) check made payable to the "Department of Environmental Regulation."
2. Have there been any alterations to the plant since last permitted? Yes No
If minor alterations have occurred, describe on a separate sheet and attach.
3. Attach the last compliance test report required per permit conditions if not submitted previously.
4. Have previous permit conditions been adhered to? Yes No If no, explain on a separate sheet and attach.
5. Has there been any malfunction of the pollution control equipment during tenure of current permit? Yes No
If yes, and not previously reported, give brief details and what action was taken on separate sheet and attach.
6. Has the pollution control equipment been maintained to preserve the collection efficiency last permitted by the Department?
 Yes No
7. Has the annual operating report for the last calendar year been submitted? Yes No If no, please attach.
8. Please provide the following information if applicable:

A. Raw Materials and Chemical Used in Your Process:

Description	Type	Contaminant	% Wt	Rate	Utilization	lbs/hr
N/A						

B. Product Weight (lbs/hr): 60,000 Lb./Hr. Steam

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION



SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610-9544

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WILLIAM K. HENNESSEY
DISTRICT MANAGER

APPLICANT:

Mr. Bennie Mauldin, General Eng.
Citrus World, Inc.
Post Office Box 1111
Lake Wales, FL 33853

PERMIT/CERTIFICATION

No.: AO53-60894
County: Polk
Project: Waste Heat Boiler

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Chapter 17-2, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

For the operation of a waste heat recovery boiler operating on the hot exhaust of a natural gas fired turbine. The maximum heat input is 24.624 MMBTU/Hr.

Located at U.S. Highway 27, Lake Wales, Polk County

UTM: 17-441.0 E 3087.3 N

Replaces Permit No.: AC53-46742 NEDS No.: 0002 Point ID: 02

Expiration Date: October 26, 1987

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth herein are "Permit Conditions", and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.
2. This permit is valid only for the specific processes and operations indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.

Appl. Name: Citrus World, Inc.
Project: Waste Heat Boiler
Page 3 of 4 of Permit No. AC53-60894

10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.

11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.

12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

13. This permit also constitutes:

- () Determination of Best Available Control Technology (BACT)
- () Determination of Prevention of Significant Deterioration (PSD)
- () Certification of Compliance with State Water Quality Standards (Section 401. PL 92-500)

SPECIFIC CONDITIONS

1. Test the emissions for the following pollutant(s) at intervals of 12 months from the date September 9, 1982 and submit a copy of test data to the Air Section of the Southwest District Office within forty five days of such testing (Section 17-2.700 (2), Florida Administrative Code (F.A.C.)).

- | | |
|------------------|--------------------------|
| () Particulates | () Sulfur Oxides |
| () Fluorides | () Nitrogen Oxides |
| (X) Opacity | () Hydrocarbons |
| | () Total Reduced Sulfur |

*Fuel analysis may be submitted for required sulfur dioxide emission test.

2. Testing of emissions must be accomplished at approximately the rates as stated in the application. Failure to submit the input rates or operation at conditions which do not reflect actual operating conditions may invalidate the data (Section 403.161(1)(c), Florida Statutes).

Appl. Name: Citrus World, Inc.
Project: Waste Heat Boiler
Page 4 of 4 of Permit No.: A053-60894

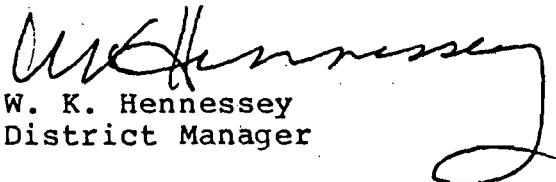
3. Submit for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Section 17-4.14, F.A.C.

- (A) Annual amount of materials and/or fuels utilized.
- (B) Annual emissions (note calculation basis).
- (C) Any changes in the information contained in the permit application.

4. Visible emissions from this source shall not equal or exceed 20% opacity.

Issued this 29th day of October,
1982

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION


W. K. Hennessey
District Manager

EXPIRATION DATE

October 26, 1987

A053
PAID SEP 29 1982



D.E.R.

SEP 29 1982

SOURCE CONTROL

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
AIR POLLUTION SOURCES
CERTIFICATE OF COMPLETION OF CONSTRUCTION*

PERMIT NO. AC 53-46742 DATE: September 21, 1982

Company Name: Citrus World, Inc. County: Polk

Source Identification(s): Waste Heat Boiler operating on Hot Exhaust of Natural Gas Turbine

Actual costs of serving pollution control purpose: Not applicable - Natural Gas Fuel requires no pollution control device

Operating Rates: Up to 4385 Lb./Hr. Design Capacity: 4385 Lb./Hr.

Expected Normal 4385 Lb./Hr. During Compliance Test 4385 Lb./Hr.

Date of Compliance Test: September 9, 1982 (Attach detailed test report)

Test Results:	Pollutant	Actual Discharge	Allowed Discharge
	<u>Particulates</u>		<u>20% Opacity Density except 40% for 2 Minutes in any one hour.</u>

Date plant placed in operation: September 1, 1982

This is to certify that, with the exception of deviations noted**, the construction of the project has been completed in accordance with the application to construct and Construction Permit No. AC 53-46742 dated October 19, 1981

A. Applicant:
Bennie Mauldin, General Engineer
Name of Person Signing (Type)

[Signature]
Signature of Owner or Authorized Representative and Title

Date: 9-23-82 Telephone: 813/676-1411

B. Professional Engineer:
John W. Seabury
Name of Person Signing (Type)
Seabury-Bottorf Associates, Inc.
Company Name

[Signature]
Signature of Professional Engineer
Florida Registration No. 8719
Date: September 21, 1982

3702 Silver Star Rd.
Orlando, Florida 32808
Mailing Address
305/298-0846
Telephone Number

(Seal)

*This form, satisfactorily completed, submitted in conjunction with an existing application to construct permit and payment of application processing fee will be accepted in lieu of an application to operate. Construction Permit Application dated 8/17/81 attached.
**As built, if not built as indicated include process flow sketch, plot plan sketch, and updates of applicable pages of application form.

P 274 007 730

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

* U.S.G.P.O. 1985-480-794

PS Form 3800, June 1985

Sent to	
Bennie Mauldin	
Citrus World, Inc.	
Street and No.	
P.O. Box 1111	
P.O., State and ZIP Code	
Lake Wales, FL 33853	
Postage	S
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	S
Postmark or Date	
Mailed: 07/17/87	
Permits: AC 53-135938	
53-135940	

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

- Show to whom, date and address of delivery.
- Restricted Delivery.

3. Article Addressed to: Bennie Mauldin
Citrus World, Inc.
P.O. Box 1111
Lake Wales, FL 33853

4. Type of Service:	Article Number
<input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail	P 274 007 730

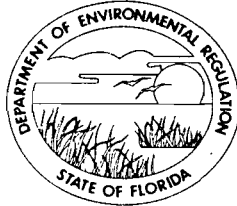
Always obtain signature of addressee or agent and **DATE DELIVERED.**

- Signature - Addressee
X
- Signature - Agent
X F L L A W S O R
- Date of Delivery
JUL 20 1987
- Addressee's Address (ONLY if requested and fee paid)

DOMESTIC RETURN RECEIPT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY

July 17, 1987

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Bernie Mauldin, Engineering Manager
Citrus World, Inc.
Post Office Box 111
Lake Wales, Florida 33853

Dear Mr. Mauldin:

Re: Gas Turbine/Waste Heat Boiler Application

The Department has made a preliminary review of your applications for permit to construct the reference sources. Before these applications can be processed, we need the following information:

1. Is the September, 1981 day of completion of construction correct? If not, when will construction be complete?
2. Please provide a list of all sources that have operated at the plant in the last five years, along with their actual and allowable emissions of criteria pollutants and calculate the contemporaneous emission changes for the facility.
3. For any pollutant having a significant net emissions increase, please submit the ambient air impact analysis required by the PSD regulation.

We will resume processing your applications as soon as we receive the requested information. If you have any questions on this matter, please write to me or call Willard Hanks at (904)488-1344.

Sincerely,

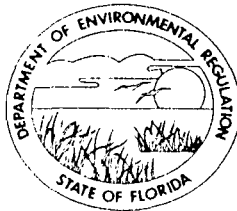
C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/WH/s

cc: B. Thomas
J. Bottorf, Jr.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400



BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY

July 17, 1987

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Bernie Mauldin, Engineering Manager
Citrus World, Inc.
Post Office Box 111
Lake Wales, Florida 33853

Dear Mr. Mauldin:

Re: Gas Turbine/Waste Heat Boiler Application

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1. Is the September, 1981 day of completion of construction correct? If not, when will construction be complete?
2. Please provide a list of all sources that have operated at the plant in the last five years, along with their actual and allowable emissions of criteria pollutants and calculate the contemporaneous emission changes for the facility.
3. For any pollutant having a significant net emissions increase, please submit the ambient air impact analysis required by the PSD regulation.

We will resume processing your applications as soon as we receive the requested information. If you have any questions on this matter, please write to me or call Willard Hanks at (904)488-1344.

Sincerely,

C. H. Fancy

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/WH/s

cc: B. Thomas
J. Bottorf, Jr.

File Copy



SEABURY-BOTTORF ASSOCIATES, INC.

CONSULTING ENGINEERS

ANALYTICAL LABORATORY

4595 PARKBREEZE CT.

ORLANDO, FLORIDA 32808-1057

305-298-0846

July 23, 1987

Project No. 171-4

DER

JUL 27 1987

BAQM

Mr. Willard Hanks
Bureau of Air Quality Management
Florida Dept. of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Polk Co. - AP
Citrus World, Inc.
Gas Turbine/Waste Heat Boiler
Application

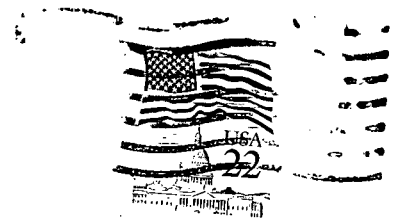
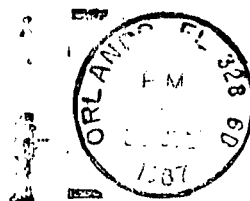
Dear Mr. Hanks:

Here is the emission data we talked about. This data is not being sent to answer your 7/17/87 letter. I will call you next week to discuss possible alternatives to PSD permitting.

Very truly yours,

Roger Caldwell
Roger T. Caldwell

RTC/ac



Encl: Emission Data, 5 pages.

copy: Willard Hanks } copied
Bill Thomas (sw dist) } 7/28/87 *(initials)*

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Citrus World

Pollutant Particulate

Source	Actual (Tons/yr.)					Allowable/Potential (Tons/yr.)				
	1982	1983	1984	1985	1986	1982	1983	1984	1985	1986
Dryer W-H-E #1	12.75	8.89	3.4	4.13	4.52				26.5	
Dryer W-H-E #2	12.87	9.12	5.24	11.2	20.38				48.44	
Dryer W-H-E #3	20.04	6.72	9.01	2.51	4.61				26.06	
Pellet Cooler	1.95		.469	.61	1.21				2.63	
Feed Cooler			.399	.72	2.03				3.10	
Boiler #1	26.67	.14	.558	.24	4.74				27.11	
Boiler #2	.015	.001	.049	.0096	1.25				54.22	
Boiler #3	2.09	.614	.366	.46	7.4				65	
Boiler #5	.719	.208	.551	.387	5.73				65	
Gas Turbine			.319	.35	.078				1.53	
Gas Turbine/W-H-Boiler	.0005	.289	.366	.40	.115				1.65	
Total	51.10	25.98	12.62	21.01	52.06				321.24	

Pollutant NOx

Source	Actual (Tons/yr.)					Allowable/Potential (Tons/yr.)				
	1982	1983	1984	1985	1986	1982	1983	1984	1985	1986
Dryer W-H-E #1	5.08	10.45	14.47	3.67	7.74				64.32	
Dryer W-H-E #2	41.39	26.79	64.18	11.02	12.38				127.92	
Dryer W-H-E #3	44.88	38.15	6.99	4.64	.39				127.92	
Pellet Cooler										
Feed Cooler										
Boiler #1	19.04	11.55	26.05	4.12	13.78				57.57	
Boiler #2 x	.28	.092	2.26	.15	3.13				115.15	
Boiler #3	39.68	36.08	17.09	7.95	18.42				13.8	
Boiler #5	13.66	25.61	25.73	6.63	18.79				138	
Gas Turbine x			14.88	10.3	2.17				45	
Gas Turbine/W-H-Boiler	.025	40.42	17.07	11.83	3.23				48.84	
Total	164.03	189.94	188.72	60.31	80.03				862.72	

Pollutant Hydrocarbon

Source	Actual (Tons/yr.)					Allowable/Potential (Tons/yr.)				
	1982	1983	1984	1985	1986	1982	1983	1984	1985	1986
Dryer W-H-E #1	.022	.087	.062	.07	.166				.48	
Dryer W-H-E #2	.177	.222	.275	.22	.266				.96	
Dryer W-H-E #3	.192	.323	.03	.09	.008				.96	
Pellet Cooler										
Feed Cooler										
Boiler #1	.079	.098	.112	.08	.294				.43	
Boiler #2	.005	.001	.01	.0028	.062				.857	
Boiler #3	.208	.306	.073	.153	.393				1.03	
Boiler #5	.072	.213	.11	.127	.402				1.03	
Gas Turbin			.064	1.05	.047				4.6	
Gas Turbine/W-H-Boiler	.0001	.335	.073	1.2	.07				4.97	
Total	.755	1.58	.809	2.99	1.708				15.317	

Pollutant SO₂

Source	Actual (Tons/yr.)					Allowable/Potential (Tons/yr.)				
	1982	1983	1984	1985	1986	1982	1983	1984	1985	1986
Dryer W-H-E #1	.004	.001	.012	.016	28.56				420.45	
Dryer W-H-E #2	.036	.023	.001	.05	.053				836.2	
Dryer W-H-E #3	.039	.033	.006	.02	.002				836.2	
Pellet Cooler										
Feed Cooler										
Boiler #1	3.79	.812	.022	1.44	64.33				376.36	
Boiler #2	.127	.001	.002	.0656	17.24				752.7	
Boiler #3	18.10	5.05	.015	2.75	102.1				902	
Boiler #5	6.23	.363	.022	2.29	76.54				902	
Gas Turbine			.013	.007	.009				.03	
Gas Turbine/W-H-Boiler	.0001	.035	.015	.008	.014				.033	
Total	28.326	6.32	.108	6.65	288.85				5026	

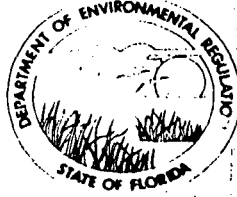
Pollutant CO

Source	Actual (Tons/yr.)					Allowable/Potential (Tons/yr.)				
	1982	1983	1984	1985	1986	1982	1983	1984	1985	1986
Dryer W-H-E #1	.123	.522	.352	.92	1.14				5.98	
Dryer W-H-E #2	1.005	1.34	1.56	2.75	3.1				11.96	
Dryer W-H-E #3	1.09	1.95	.17	1.16	.098				11.96	
Pellet Cooler										
Feed Cooler										
Boiler #1	.50	.579	.633	.99	1.65				5.36	
Boiler #2	.008	.005	.055	.036	.300				10.72	
Boiler #3	1.14	1.83	.415	1.92	1.75				12.87	
Boiler #5	.394	1.29	.625	1.6	2.56				12.87	
Gas Turbine			.361	2.87	.542				12.6	
Gas Turbine/W-H-Boiler	.0006	2.02	.415	3.3	.808				13.6	
Total	4.26	9.54	4.59	15.55	11.95				97.92	

DEPARTMENT OF ENVIRONMENTAL REGULATION

AC 53-135938
AC 53-135940

D. E. P.
JUN 19 1987
SOUTH WEST DISTRICT
TAMPA



ST. JOHNS RIVER DISTRICT

3319 MAGUIRE BOULEVARD
SUITE 232
ORLANDO, FLORIDA 32803-3767

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

A. ALEXANDER
DISTRICT MANAGER

APPLICATION TO ~~RENEW~~ CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Gas Turbine/Waste Heat Boiler New¹ Existing¹

APPLICATION TYPE: Construction Operation Modification

COMPANY NAME: Citrus World, Inc. COUNTY: Polk

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Gas Turbine/Waste Heat Boiler

SOURCE LOCATION: Street _____ Highway 27 City Lake Wales

UTM: East 17-441.0 KM North 3087.3 KM

Latitude 27° 54' 41" N Longitude 81° 36' 02" W

APPLICANT NAME AND TITLE: Bennie Mauldin, Engineering Manager

APPLICANT ADDRESS: P. O. Box 1111, Lake Wales, Florida 33853

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Citrus World, Inc.

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: *Bennie Mauldin*

Bennie Mauldin, Engineering Manager
Name and Title (Please Type)

Date: 6-8-87 Telephone No. 813/676-1411

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

¹ See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed _____

John W. Bottorf, Jr.

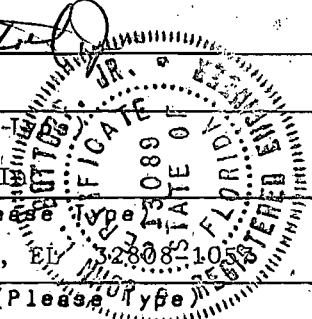
Name (Please Print)

Seabury-Bottorf Associates, Inc.

Company Name (Please Print)

4595 Parkbreeze Ct., Orlando, FL 32808-1010

Mailing Address (Please Print)



Florida Registration No. 13089

Date: 6-15-87

Telephone No. 305/298-0846

SECTION II: GENERAL PROJECT INFORMATION

- A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This project is for the installation of a new gas turbine and waste heat boiler model Centaur Type H, Solar Turbines Incorporated, to replace two existing gas turbines (Permit #A053-60894 & A053-87175). This new system will also have the capacity to fulfill the steam requirements for the entire plant. This project should result in full compliance (see Addendum attached).

- B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction 9/81 Completion of Construction 9/81

- C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

N/A

- D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

None

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed *John W. Bottorf, Jr.*

John W. Bottorf, Jr.

Name (Please Type)

Seabury-Bottorf Associates, Inc.

Company Name (Please Type)

4595 Parkbreeze Ct., Orlando, FL 32808-1057

Mailing Address (Please Type)

Florida Registration No. 13089 Date: 6-15-87 Telephone No. 305/298-0846

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This project is for the installation of a new gas turbine and waste heat boiler model Centaur Type H, Solar Turbines Incorporated, to replace two existing gas turbines (Permit #A053-60894 & A053-87175). This new system will also have the capacity to fulfill the steam requirements for the entire plant. This project should result in full compliance (see Addendum attached).

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Start of Construction 9/81 Completion of Construction 9/81

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

N/A

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

None

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;
if power plant, hrs/yr _____ ; if seasonal, describe: _____

F. If this is a new source or major modification, answer the following questions.
(Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No
 - a. If yes, has "offset" been applied? _____
 - b. If yes, has "Lowest Achievable Emission Rate" been applied? _____
 - c. If yes, list non-attainment pollutants. _____
2. Does best available control technology (BACT) apply to this source?
If yes, see Section VI. Boiler only. Yes
3. Does the State "Prevention of Significant Deterioration" (PSD)
requirement apply to this source? If yes, see Sections VI and VII. No
4. Do "Standards of Performance for New Stationary Sources" (NSPS)
apply to this source? Turbine only. Yes
5. Do "National Emission Standards for Hazardous Air Pollutants"
(NESHAP) apply to this source? No
- H. Do "Reasonably Available Control Technology" (RACT) requirements apply
to this source? No
 - a. If yes, for what pollutants? _____
 - b. If yes, in addition to the information required in this form,
any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justifi-
cation for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

TURBINE ONLY

Name of Contaminant	Emission ¹		Allowed Emission Rate per Rule 17-2	Allowable ³ Emission lbs/hr	Potential ⁴ Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
NO _x	18.25	79.9	NSPS Subpart GG	168 PPMV 32 Lbs./Hr.	159,870	79.9	
Hydrocarbon	1.85	8.13	--	--	16,250	8.13	
CO	5.08	22.25	--	--	44,501	22.25	
Particulate	0.62	2.71	--	--	5,414	2.71	
SO ₂	0.027	0.116	NSPS Subpart GG	.8% S in Fuel 33.22 Lbs./Hr.	233	0.116	

¹See Section V, Item 2.

²Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

³Calculated from operating rate and applicable standard.

⁴Emission, if source operated without control (See Section V, Item 3).

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

TURBINE ONLY

Name of Contaminant	Emission ¹		Allowed Emission Rate per Rule 17-2	Allowable ³ Emission lbs/hr	Potential ⁴ Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
NO _x	18.25	79.9	NSPS Subpart GG	168 PPMV 32 Lbs./Hr.	159,870	79.9	
Hydrocarbon	1.85	8.13	--	--	16,250	8.13	
CO	5.08	22.25	--	--	44,501	22.25	
Particulate	0.62	2.71	--	--	5,414	2.71	
SO ₂	0.027	0.116	NSPS Subpart GG	.8% S in Fuel 33.22 Lbs./Hr.	233	0.116	

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²Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

³Calculated from operating rate and applicable standard.

⁴Emission, if source operated without control (See Section V, Item 3).

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: N/A

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): N/A

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

BOILER ONLY

Name of Contaminant	Emission ¹		Allowed ² Emission Rate per Rule 17-2	Allowable ³ Emission lbs/hr	Potential ⁴ Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
NO _x	12.5	54.76	---	---	109,500	54.76	
Hydrocarbon	0.52	2.27	---	---	4,538	2.27	
CO	3.12	13.69	---	---	27,375	13.69	
Particulate	0.45	1.95	BACT	To be determined	3,907	1.95	
SO ₂	0.05	0.23	BACT	To be determined	464	0.23	

¹See Section V, Item 2.

²Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

³Calculated from operating rate and applicable standard.

⁴Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4) N/A

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Natural Gas (Turbine)	0.043	0.04418	45.2
Natural Gas (Boiler)	0.088	0.08930	91.36

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: .00064% Percent Ash: Nil

Density: Sp. Gr. = 0.576 lbs/gal Typical Percent Nitrogen: .41%

Heat Capacity: BTU/lb 1023 BTU/Ft.³ XXXXXX1

Other Fuel Contaminants (which may cause air pollution):

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average Maximum

G. Indicate liquid or solid wastes generated and method of disposal.

None

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 40 ft. Stack Diameter: 3.958 ft.
 Gas Flow Rate: 40,915 ACFM 27,485 DSCFM Gas Exit Temperature: 326 °F.
 Water Vapor Content: 2 % Velocity: 55.44 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume (ft) ³	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: Cyclone Wet Scrubber Afterburner
 Other (specify) _____

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 40 ft. Stack Diameter: 3.958 ft.
 Gas Flow Rate: 40,915 ACFM 27,485 DSCFM Gas Exit Temperature: 326 °F.
 Water Vapor Content: 2 % Velocity: 55.44 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume (ft) ³	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: Cyclone Wet Scrubber Afterburner
 Other (specify) _____

Brief description of operating characteristics of control devices: _____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
N/A
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made. See Attachment 1
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
See Attachment 1
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.) N/A
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
N/A
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. See Drawing No. 1300-F-001
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
See Attachment 2.
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
See Attachment 3.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.
10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

Yes No **BOILER ONLY**

Contaminant	Rate or Concentration
SO ₂	0.05 Lbs./Hr.
Particulate	0.45 Lbs./Hr.

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

Yes No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
We propose BACT for this waste heat recovery boiler to be the firing of natural gas as the only fuel.	

D. Describe the existing control and treatment technology (if any).

- | | |
|---------------------------|--------------------------|
| 1. Control Device/System: | 2. Operating Principles: |
| 3. Efficiency:* | 4. Capital Costs: |

*Explain method of determining

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.
10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

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Yes No BOILER ONLY

Contaminant	Rate or Concentration
SO ₂	0.05 Lbs./Hr.
Particulate	0.45 Lbs./Hr.

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

Yes No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
We propose BACT for this waste heat recovery boiler to be the firing of natural gas as the only fuel.	

D. Describe the existing control and treatment technology (if any).

- | | |
|---------------------------|--------------------------|
| 1. Control Device/System: | 2. Operating Principles: |
| 3. Efficiency:* | 4. Capital Costs: |

*Explain method of determining

5. Useful Life:

7. Energy:

9. Emissions:

6. Operating Costs:

8. Maintenance Cost:

Contaminant

Rate or Concentration

Contaminant	Rate or Concentration

10. Stack Parameters

- a. Height: ft.
- b. Diameter: ft.
- c. Flow Rate: ACFM
- d. Temperature: °F.
- e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

- a. Control Device:
- b. Operating Principles:
- c. Efficiency:¹
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy:²
- h. Maintenance Cost:
- i. Availability of construction materials and process chemicals:
- j. Applicability to manufacturing processes:
- k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

- a. Control Device:
- b. Operating Principles:
- c. Efficiency:¹
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy:²
- h. Maintenance Cost:
- i. Availability of construction materials and process chemicals:

¹Explain method of determining efficiency.

²Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:¹

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:²

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

¹Explain method of determining efficiency.

²Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:¹

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:²

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:¹

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:²

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

¹Explain method of determining efficiency.

²Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant

Rate or Concentration

(8) Process Rate:¹

b. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant

Rate or Concentration

(8) Process Rate:¹

10. Reason for selection and description of systems:

¹Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data

1. _____ no. sites _____ TSP _____ () SO₂* _____ Wind spd/dir

Period of Monitoring _____ / _____ / _____ to _____ / _____ / _____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

- a. Was instrumentation EPA referenced or its equivalent? Yes No
- b. Was instrumentation calibrated in accordance with Department procedures?
 Yes No Unknown

B. Meteorological Data Used for Air Quality Modeling

- 1. _____ Year(s) of data from _____ / _____ / _____ to _____ / _____ / _____
month day year month day year
- 2. Surface data obtained from (location) _____
- 3. Upper air (mixing height) data obtained from (location) _____
- 4. Stability wind rose (STAR) data obtained from (location) _____

C. Computer Models Used

- 1. _____ Modified? If yes, attach description.
- 2. _____ Modified? If yes, attach description.
- 3. _____ Modified? If yes, attach description.
- 4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	_____ grams/sec
SO ₂	_____ grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

2. Instrumentation, Field and Laboratory

- a. Was instrumentation EPA referenced or its equivalent? Yes No
- b. Was instrumentation calibrated in accordance with Department procedures?
 Yes No Unknown

B. Meteorological Data Used for Air Quality Modeling

- 1. _____ Year(s) of data from _____ / _____ / _____ to _____ / _____ / _____
month day year month day year
- 2. Surface data obtained from (location) _____
- 3. Upper air (mixing height) data obtained from (location) _____
- 4. Stability wind rose (STAR) data obtained from (location) _____

C. Computer Models Used

- 1. _____ Modified? If yes, attach description.
- 2. _____ Modified? If yes, attach description.
- 3. _____ Modified? If yes, attach description.
- 4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	_____ grams/sec
SO ²	_____ grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

ADDENDUM TO SECTION II.A.

This new turbine and waste heat boiler will be fired with natural gas only. The new source performance standards (NSPS) contained in 40CFR60.33, Subpart GG, apply to the NO_x and SO₂ emissions from the gas turbine only. Compliance with the NO_x standard should be demonstrated one time only at startup using EPA reference method 20. Compliance with the SO₂ standard of .8% sulphur in the fuel can be demonstrated with the fuel supplier's natural gas analysis. The sulphur content of natural gas is very low (approximately .00064%). It would appear that the SO₂ standard was set for high sulphur fuels, such as coke oven gas. The nitrogen content in natural gas is also very low (approximately .42%) and will not be a significant factor in NO_x emissions. Because this turbine will be fired with natural gas only having very low sulphur and low nitrogen content, we are requesting a waiver from the daily fuel monitoring found in 40CFR60.334(b)(2).

As already stated, this turbine/boiler cogeneration system will replace two existing turbines and supply the entire plant with steam. Four existing boilers will normally not be in operation when this system is operating. Total facility emissions will not increase; in fact, we will expect a significant reduction in SO₂ and particulate emissions when this system is put on line.

**NATURAL GAS FIRED TURBINE EMISSION CALCULATIONS
(AP42 TABLE 3.3.1-2)**

$$\begin{aligned} \text{NO}_x &= .04418 \text{ MMCF/Hr.} \times 413 \text{ Lbs./MMCF} = 18.25 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hr./Yr.}}{2000 \text{ Lb./Ton}} = 79.9 \text{ TPY} \\ \text{Hydrocarbons} &= .04418 \text{ MMCF/Hr.} \times 42 \text{ Lbs./MMCF} = 1.855 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hr./Yr.}}{2000 \text{ Lb./Ton}} = 8.13 \text{ TPY} \\ \text{CO} &= .04418 \text{ MMCF/Hr.} \times 115 \text{ Lbs./MMCF} = 5.08 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hr./Yr.}}{2000 \text{ Lb./Ton}} = 22.25 \text{ TPY} \\ \text{Particulate} &= .04418 \text{ MMCF/Hr.} \times 14 \text{ Lbs./MMCF} = 0.618 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hr./Yr.}}{2000 \text{ Lb./Ton}} = 2.71 \text{ TPY} \\ \text{SO}_2 &= .04418 \text{ MMCF/Hr.} \times 940 (.00064) \text{ Lbs./MMCF} = .0266 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hr./Yr.}}{2000 \text{ Lb./Ton}} = 0.1164 \text{ TPY} \end{aligned}$$

**NATURAL GAS FIRED BURNER IN WASTE HEAT RECOVERY BOILER EMISSION CALCULATIONS
(AP42 TABLE 1.4-1)**

$$\begin{aligned} \text{NO}_x &= 0.08930 \text{ MMCF/Hr.} \times 140 \text{ Lbs./MMCF} = 12.5 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hr./Yr.}}{2000 \text{ Lb./Ton}} = 54.76 \text{ TPY} \\ \text{Hydrocarbons} &= 0.08930 \text{ MMCF/Hr.} \times 5.8 \text{ Lbs./MMCF} = 0.518 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hr./Yr.}}{2000 \text{ Lb./Ton}} = 2.27 \text{ TPY} \\ \text{CO} &= 0.0893 \text{ MMCF/Hr.} \times 35 \text{ Lbs./MMCF} = 3.125 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hr./Yr.}}{2000 \text{ Lb./Ton}} = 13.69 \text{ TPY} \\ \text{Particulate} &= 0.0893 \text{ MMCF/Hr.} \times 5 \text{ Lbs./MMCF} = 0.446 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hr./Yr.}}{2000 \text{ Lb./Ton}} = 1.95 \text{ TPY} \\ \text{SO}_2 &= 0.0893 \text{ MMCF/Hr.} \times 0.6 \text{ Lbs./MMCF} = .053 \text{ Lbs./Hr.} \times \frac{8760 \text{ Hr./Yr.}}{2000 \text{ Lb./Ton}} = 0.23 \text{ TPY} \end{aligned}$$

TOTAL SYSTEM EMISSIONS

<u>Pollutant</u>	<u>Lbs./Hr.</u>	<u>Tons/Yr.</u>
NO _x	30.75	134.66
Hydrocarbons	2.373	18.45
CO	8.205	35.94
Particulate	1.064	4.66
SO ₂	0.076	0.35

**Table 3.3.1-2. COMPOSITE EMISSION FACTORS FOR 1971
POPULATION OF ELECTRIC UTILITY TURBINES
EMISSION FACTOR RATING: B**

Time basis	Nitrogen oxides	Organics (CH ⁴)	Carbon Monoxide	Particulate	Sulfur oxides
Entire population					
lb/hr rated load ^a	3.84	0.79	2.18	0.52	0.33
kg/hr rated load	4.01	0.36	0.99	0.24	0.15
Gas-fired only					
lb/hr rated load	7.81	0.79	2.18	0.27	0.098
kg/hr rated load	3.54	0.36	0.99	0.12	0.044
Oil-fired only					
lb/hr rated load	9.60	0.79	2.18	0.71	0.50
kg/hr rated load	4.35	0.36	0.99	0.32	0.23
Fuel basis					
Gas-fired only					
lb/10 ⁶ ft ³ gas	113.	42.	115.	14.	940S ^b
kg/10 ⁶ m ³ gas	6615.	673.	1842.	224.	15,000S
Oil-fired only					
lb/10 ³ gal oil	67.8	5.57	15.4	5.0	140S
kg/10 ³ liter oil	8.13	0.668	1.85	0.80	16.8S

^aRated load expressed in megawatts.

^bS is the percentage sulfur. Example: If the factor is 940 and the sulfur content is 0.01 percent, the sulfur oxides emitted would be 940 times 0.01, or 9.4 lb/10⁶ ft³ gas.

**Table 3.3.1-3. PERCENT REDUCTION OF NO_x
EMISSIONS FROM WATER OR
STEAM INJECTION^a**

EMISSION FACTOR RATING: B

Water-to-fuel ratio	Percent reduction of NO _x emissions
0.2	28
0.4	48
0.6	63
0.8	73
1.0	79
1.2	84
1.4	88
1.6	90
1.8	92
2.0	92

^aNot corrected for efficiency variations.

TABLE 1.4-1. UNCONTROLLED EMISSION FACTORS FOR NATURAL GAS COMBUSTION^a

Furnace Size & Type (10 ⁶ Btu/hr heat input)	Particulates ^b		Sulfur ^c Dioxide		Nitrogen ^{d,e} Oxide		Carbon ^{f,g} Monoxide		Volatile Organics			
	kg/10 ⁶ m ³	lb/10 ⁶ ft ³	kg/10 ⁶ m ³	lb/10 ⁶ ft ³	kg/10 ⁶ m ³	lb/10 ⁶ ft ³	kg/10 ⁶ m ³	lb/10 ⁶ ft ³	Nonmethane		Methane	
	kg/10 ⁶ m ³	lb/10 ⁶ ft ³	kg/10 ⁶ m ³	lb/10 ⁶ ft ³	kg/10 ⁶ m ³	lb/10 ⁶ ft ³	kg/10 ⁶ m ³	lb/10 ⁶ ft ³	kg/10 ⁶ m ³	lb/10 ⁶ ft ³	kg/10 ⁶ m ³	lb/10 ⁶ ft ³
Utility boilers (>100)	16-80	1-5	9.6	0.6	8800 ^h	550 ^h	640	40	23	1.4	4.8	0.3
Industrial boilers (10 - 100)	16-80	1-5	9.6	0.6	2240	140	560	35	44	2.8	48	3
Domestic and commercial boilers (<10)	16-80	1-5	9.6	0.6	1600	100	320	20	84	5.3	43	2.7

^aAll emission factors are expressed as weight per volume fuel fired.

^bReferences 15-18.

^cReference 4 (based on an average sulfur content of natural gas of 4600 g/10⁶ Nm³ (2000 gr/10⁶ scf).

^dReferences 4-5,7-8,11,14,18-19,21.

^eExpressed as NO₂. Test results indicate that about 95 weight % of NO_x is NO.

^fReferences 4,7-8,16,18,22-25.

^gReferences 16 and 18. May increase 10 to 100 times with improper operation or maintenance.

^hUse 4400 kg/10⁶ m³ (275 lb/10⁶ ft³) for tangentially fired units. At reduced loads, multiply this factor by the load reduction coefficient given in Figure 1.4-1. See text for potential NO_x reductions by combustion modifications. Note that the NO_x reduction from these modifications will also occur at reduced load conditions.

RECEIVED

MAY 28 1987

FLORIDA GAS TRANSMISSION COMPANY
GAS ANALYSIS ID. NO: 87 361

SEABURY BOYFORD ASSOCIATES INC.

STATION NAME: FLA HYDROCARBON - OUTLET

DIST 7 STA NO: 47188

FIELD DATA TAKEN BY: A. Kattawar

DATE TAKEN 4-28-87

PRESS 597 TEMP 0
BTU 0 WATER 0.00

SP GRAV 0.576
H2S 0.1 gr/hcf
Total Sulfur .3 - .4 gr/hcf
= 6.4 PPM

ANALYSIS DATA: ANALYST Michael P. Campo

DATE ANALYZED 5-10-87

COMPONENT	MOLE %	B.T.U.	GPM	SP. GR.
OXYGEN	0.0000	0.0000	0.0000	0.0000
NITROGEN	0.4160	0.0000	0.0000	0.0040
CARBON DIOXIDE	0.8500	0.0000	0.0000	0.0129
METHANE	96.5200	959.8900	0.0000	0.5347
ETHANE	2.0140	35.0900	0.0000	0.0209
PROPANE	0.1750	4.3400	0.0482	0.0027
iBUTANE	0.0030	0.1000	0.0010	0.0001
nBUTANE	0.0030	0.1000	0.0009	0.0001
iPENTANE	0.0020	0.0800	0.0007	0.0000
nPENTANE	0.0000	0.0000	0.0000	0.0000
HEXANE plus	0.0170	0.8700	0.0075	0.0006
TOTALS:	100.0000	1000.4700	0.0583	0.5760

BTU PER CU FT AT 14.73 PSIA

60 DEG F SAT & CORRECTED FOR Z	CALC	1003	CALORIMETER	1005
60 DEG F DRY & CORRECTED FOR Z	CALC	1021	CALORIMETER	1023
60 DEG F 0.00 LB/MMCF & CORRECTED FOR Z	CALC	1021		
SP GRAV (AIR = 1.0000)	CALC	0.5760	RANAREX	0.576

COMPRESSIBILITY FACTOR Z = 0.9980

SUPERCOMPRESSIBILITY FACTOR

CALC AT 0.576 SP GR 600 PSIG 90 DEG

BY TEST WITH BURNETT APPARATUS*****	1.0349
CALCULATED AGA-NX-19 NO DILUENTS*****	1.0363
CALCULATED AGA-NX-19 ADJUSTED FOR DILUENTS***	1.0351

NOTES:

PHYSICAL CONSTANTS FROM AGA 3
GPM FROM NGPA PUB NO 2145-84
HEXANE PLUS DERIVED FROM ALPHAGAZ REF STANDARD

REMARKS:

3000 cc line pressure spot sample.
Percent difference with respect to Burnett Apparatus
for calculated value using AGA-NX-19 formula and
adjusted for diluents equals (+ 0.019).



SOLAR TURBINES INCORPORATED

SUBSIDIARY OF CATERPILLAR INC.

P.O. Box 85376, San Diego, CA 92138-5376
TEL: (619) 544-5000, TLX: 695045

April 6, 1987

RECEIVED

APR 29 1987

SEABURY BOTTORF ASSOCIATES INC.

Citrus World, Inc.
P.O. Box 1111
Lake Wales, FL 33859-1111

Attention: Richard Kennedy
Energy Manager

Subject: Centaur Type H Cogeneration System P.D. 6039

Dear Dick:

To meet your emission requirements for the above subject job, Solar offers the following guarantee:

NO_x emissions will satisfy the requirements of the Federal New Source Performance Standards (NSPS) as contained in the code of Federal Regulations, Title 40, Section 60, Subpart GG

It is our understanding that this will satisfy the requirements of the State of Florida.

Our calculation indicates that the NSPS limit for this engine is 168 PPMV at 15% O₂ on a dry basis. All of our Centaur Type H engines that have been tested at our factory were significantly below this level when corrected to ISO conditions as required in Section 60.335.

With regard to the duct burner on the supplementary fired waste heat boiler, it will be a Coen burner which has been considered to be BACT by the California Air Resources Board and several California air districts in recent permits.

If we can be of any further assistance, please do not hesitate to contact me.

Yours truly,

Kenneth K. Nolen
Production Services

KKN/Jan
4761j

RECEIVED

MAY 20 1987

SEABURY BOTTORF ASSOCIATES INC.

EMISSIONS GUARANTEE DATA

SOLAR CENTAUR TYPE H GSC

ISO CONDITIONS

- Sea Level
- 59°F Engine Inlet Air Temp.
- 60% Relative Humidity

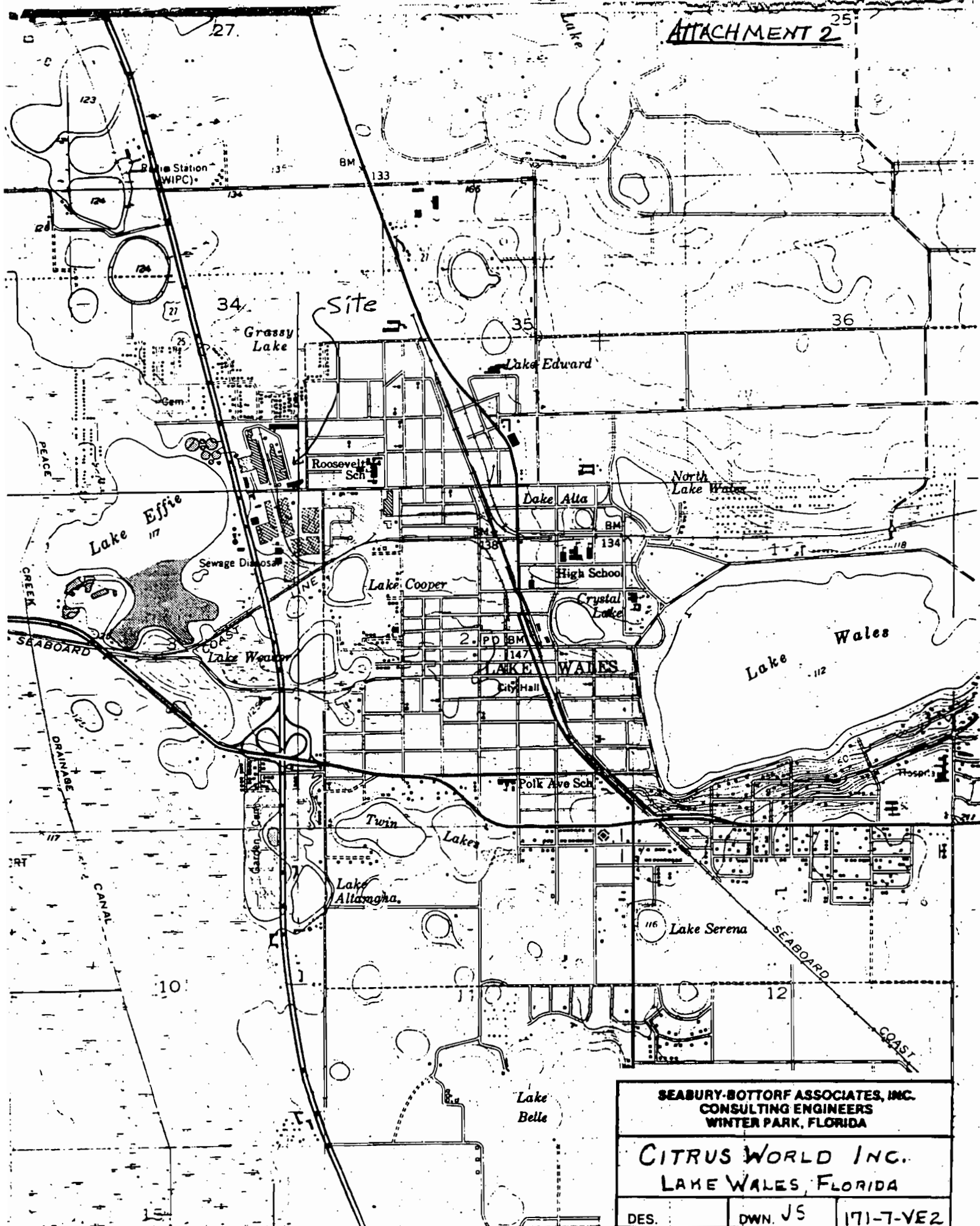
No Water Injection

PPMv @ 15% O₂, Dry Basis

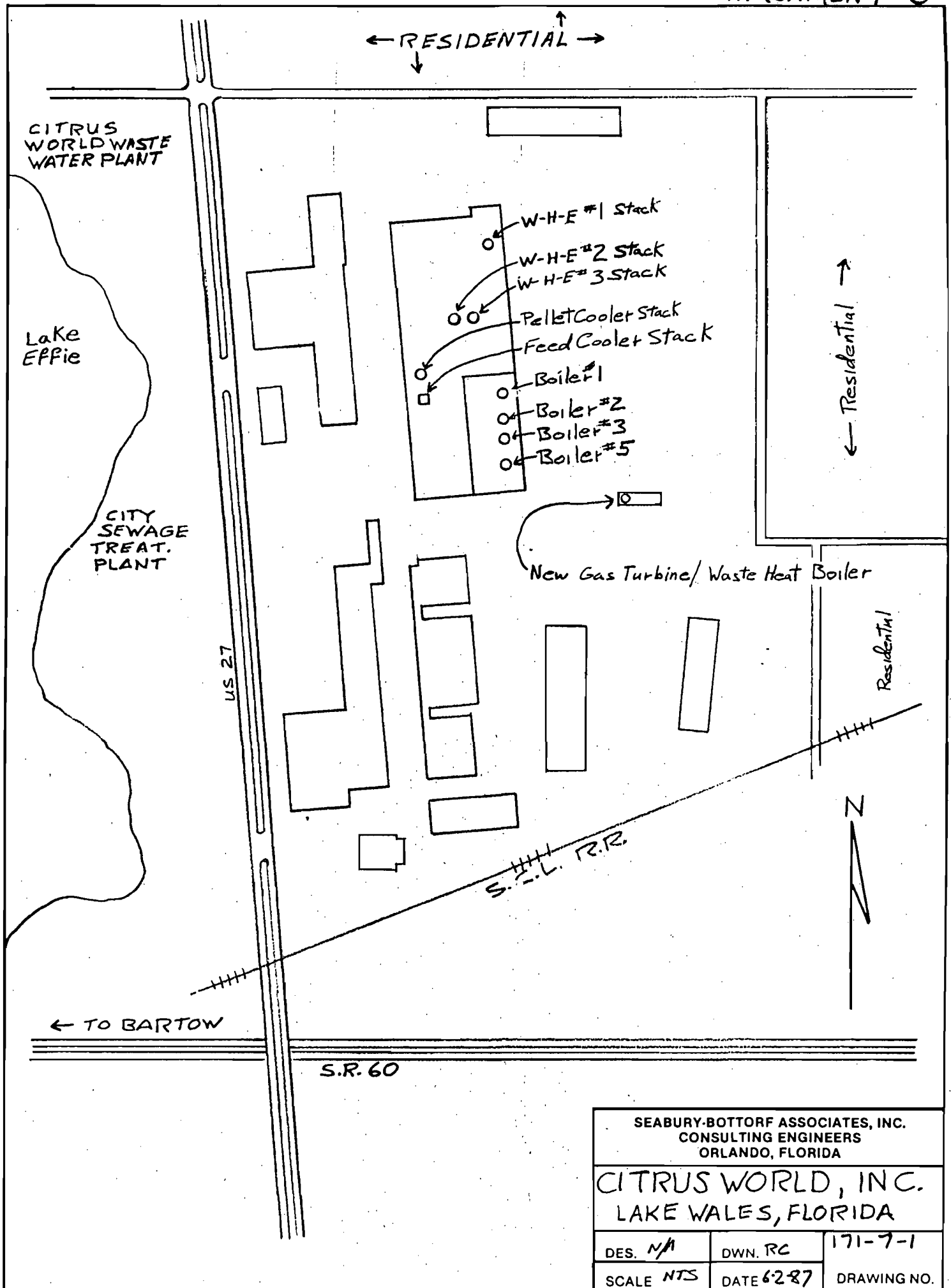
	Utility Natural Gas	Diesel Fuel #2
NOx	150	167
CO	50	50
UHC	20	20

13 May 1987

2762e/2



SEABURY-BOTTORF ASSOCIATES, INC. CONSULTING ENGINEERS WINTER PARK, FLORIDA		
CITRUS WORLD INC. LAKE WALES, FLORIDA		
DES.	DWN. JS	171-7-VE2
SCALE N.S.	DATE 7-30-81	DRAWING NO.



SEABURY-BOTTORF ASSOCIATES, INC.
CONSULTING ENGINEERS
ORLANDO, FLORIDA

CITRUS WORLD, INC.
LAKE WALES, FLORIDA

DES. <i>MA</i>	DWN. <i>RC</i>	171-7-1
SCALE <i>NTS</i>	DATE <i>6-2-87</i>	DRAWING NO.

Introduction

Solar Turbines Incorporated, a subsidiary of Caterpillar Tractor Co., based in San Diego, California, is a world leader in the design and manufacture of industrial turbine powered systems. Today, Solar manufactures power packages ranging from 1200 to 12,600 hp (895 to 9400 kW).

Solar® turbines driving natural gas compressors, pumps and generators are at work the world over. These turbines with continuous-duty ratings up to 12,600 hp (9400 kW) are getting the job done in the most severe environments on earth. In these places, the reliability, toughness, compactness, long life and maintainability of Solar turbine packages make them the logical choice for your turbine-driven application.

COMPLETE PACKAGES WITH SINGLE-SOURCE RESPONSIBILITY

Solar builds complete turbine packages ready to get down to work fast, no matter where the job is. For example, Solar's generator sets are specially packaged for standby and continuous duty applications including cogeneration.

Solar's turbine packages are available in enclosed, self-contained modules that are easy to transport and ready to plug directly into your generator requirement. Solar's turbine packages can be ordered in fully engineered, prefabricated single- or multiple-unit stations ready for quick installation. These stations are self-contained, weatherproof and acoustically lined. They are particularly well suited to rooftop and remote area installations.

Solar designs, builds, and supports its turbine packages. The customer is assured of performance, dependability and long life throughout the package, plus a single-point responsibility for installation, service, parts, overhaul and training.

EFFICIENCY AND DEPENDABILITY

Solar's turbines operate efficiently on a wide variety of fuels. They are offered with natural gas fuel systems or distillate fuel systems, or dual fuel combinations.

Solar's turbine packages can achieve high thermal efficiencies. For example, using the exhaust heat of the gas turbine in addition to the shaft power can provide thermal efficiencies of 70 percent and higher. Turbine exhaust is clean, dry heat that can be used for making steam, space heating, air conditioning, water desalinization or anywhere a large volume of heated air is needed. The exhaust mass flows and temperatures of Solar's continuous duty turbines at full load and 59°F (15°C) are:

Saturn® gas turbine — 813°F (434°C),
49,740 lb/hr (22,560 kg/hr)

Centaur® T-4500 gas turbine — 840°F (449°C),
141,360 lb/hr (64,120 kg/hr)

Centaur Type H gas turbine — 941°F (505°C),
142,800 lb/hr (64,780 kg/hr)

Mars gas turbine — 870°F (466°C),
302,160 lb/hr (137,057 kg/hr)

The Mars gas turbine, with a thermal efficiency of 33 percent, is the most fuel-efficient simple-cycle industrial turbine in its class.

Dependability, toughness and long life are only part of Solar's turbine availability story. These turbines are also designed with facilities for temperature and vibration instrumentation, rapid component removal and easy inspection to speed maintenance and minimize downtime. Even downtime for overhaul can be kept to just a few hours through Solar's turbine exchange program.

Over 7600 industrial Solar gas turbine sets are now at work in more than 70 countries. Their dependability has been demonstrated during 230 million hours of operation.

This technical description presents the basic configuration, available options, ancillary equipment, installation requirements, performance, and service support for the Centaur Type H gas turbine generator set available on the date of publication. Solar reserves the right to make changes in the equipment and services offered herein.

1

Centaur Type H Turbine and Gearbox

BASIC CENTAUR TYPE H TURBINE GENERATOR SET

The basic generator set consists of an industrial Centaur Type H gas turbine and reduction gearbox mounted on a rigid base with the generator and all operating systems.

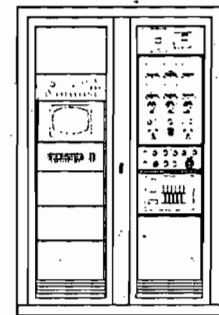
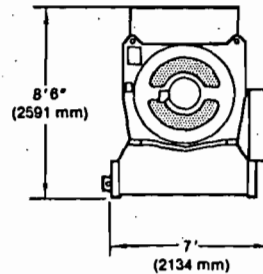
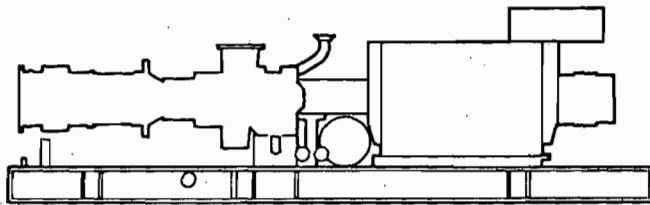
Though specifically designed for industrial service, the generator set is a compact, lightweight unit requiring minimum floor space for installation. Its unique features greatly reduce installation costs, time, materials, and labor. In addition to standard equipment supplied with the generator set, a wide choice of optional equipment is readily available to meet varying installation and operating requirements.

The Centaur Type H gas turbine design includes the fundamental principles of long life and low maintenance. Unlike aircraft designs, there are no extreme requirements for a high power-to-weight

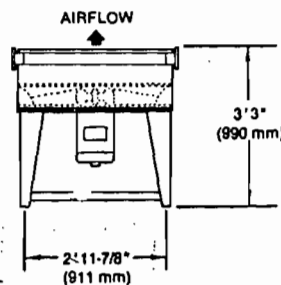
ratio; therefore, the Centaur Type H gas turbine reflects a design philosophy which combines the outstanding performance traits of the turbine with the rugged construction best suited for industrial use and has been designed for a high degree of compliance with American Petroleum Institute (API) requirements.

One of the foremost design parameters of the Centaur Type H gas turbine is for it to operate at gas temperatures and stress levels that provide maximum assurance of long life for the major rotating and stationary components. Another prime design objective is dependability. While many factors contribute to the dependability of the basic turbine, the selection of sophisticated controls and turbine accessories is a major factor.

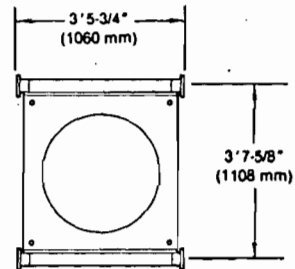
The Centaur Type H gas turbine incorporates the advanced aerodynamic and mechanical technology and designs of the Mars gas turbine, which is a



CONTROL CONSOLE



LUBE OIL COOLERS



APPROXIMATE WEIGHTS:	LB	KG
GAS TURBINE	4,300	1,950
BASE, ACCESSORIES, AND GEARBOX	17,700	8,030
GENERATOR	30,000	13,605
TOTAL PACKAGE WEIGHT	52,000	23,585
CONTROL CONSOLE	900	408
OIL COOLER (EACH)	350	159

Basic Generator Set Weights and Dimensions

proven high-efficiency 12,600-hp (9400-kW) class gas turbine. Engineering principles are such that it is possible to scale turbomachinery designs so that key performance and design parameters remain constant between units of different sizes. This permits the advancements made on the Mars gas turbine to be incorporated into the Centaur Type H gas turbine design.

The structural concept of the Centaur Type H gas turbine is unique in the engineering of gas turbines. With a few exceptions, contemporary machines have been designed to two extremes: either they are designed specifically to aircraft practices of highly sophisticated construction for light weight but short life; or they are designed with the massiveness of industrial steam turbines to ensure long life. Although a gas turbine of aircraft design can be modified and derated to extend the operating life, it is inherently delicate.

On the other hand, detail consideration of factors affecting turbine life, such as, creep, relaxation, distortion, fatigue, and corrosion, does not indicate that massiveness is the only solution for long life. In keeping with an optimum philosophy, Centaur Type H gas turbine construction is between the two extremes. Although designed for long life, only enough material is used in each component to satisfy structural and thermal requirements.

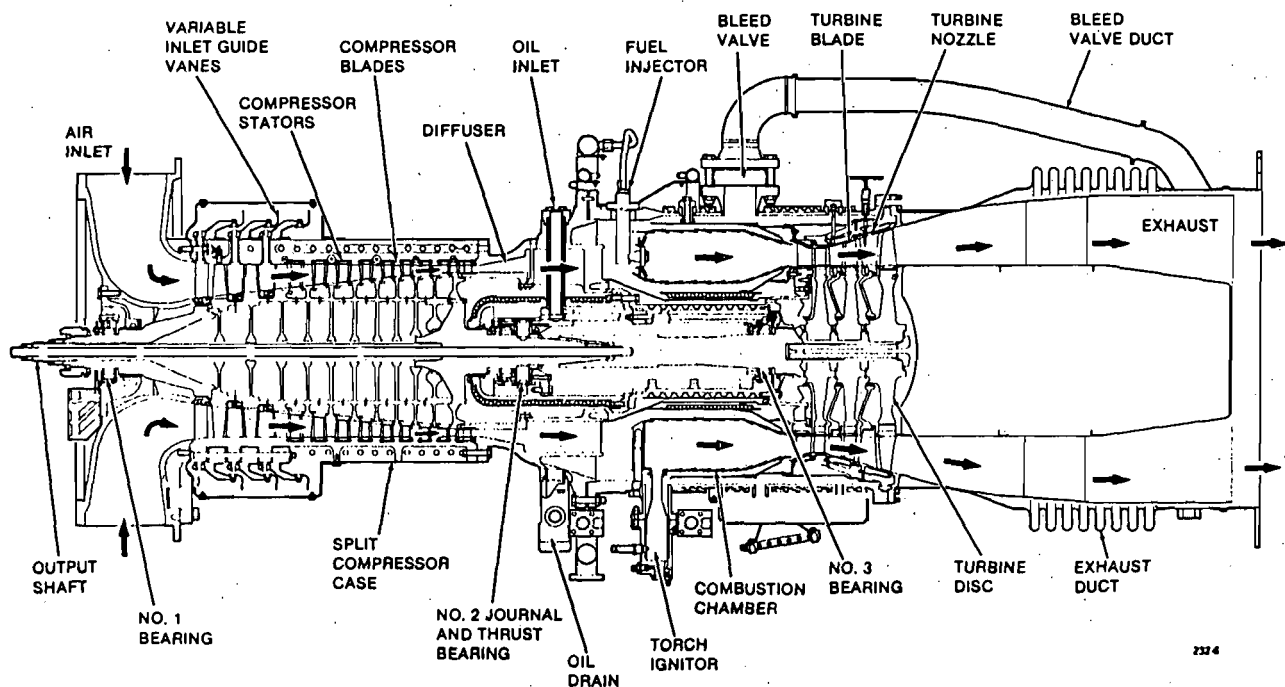
PRINCIPLES OF OPERATION

The gas turbine has a marked advantage over other types of heat engines in that it has a continuous combustion power cycle. In addition, major moving parts have a continuous rotating motion as opposed to the reciprocating motion of diesel and gas engines.

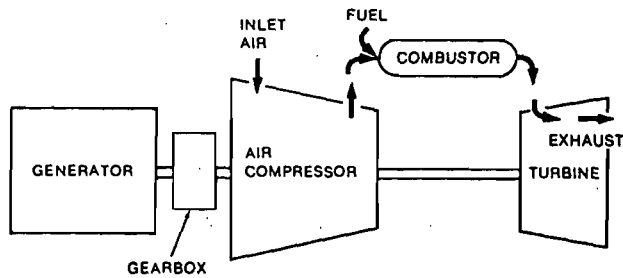
The single-shaft Centaur Type H gas turbine is a self-contained, completely integrated prime mover. This exceptionally compact gas turbine has three basic sections: compressor, combustor, and turbine.

Air is drawn into the air inlet of the Centaur Type H gas turbine and is compressed by the eleven-stage axial-flow compressor. The compressed air is directed into the combustion chamber in a steady flow. Fuel is injected into the pressurized air within the annular combustion chamber. During the turbine starting cycle, this fuel/air mixture is ignited, and continuous burning is maintained as long as there is adequate flow of pressurized air and fuel. The hot, pressurized gas from the combustion chamber expands through the turbine, dropping in pressure and temperature as it drives the turbine. In this way, the energy of the fuel is transformed into the rotating power of the output shaft.

The Centaur Type H gas turbine has an output load shaft which is mechanically tied to both the



Centaur Type H Gas Turbine Airflow



Power Transfer Diagram

compressor, and turbine sections. This feature contributes to the excellent output speed stability with constant and varying loads, which is a highly desirable feature in generator applications where frequency output stability is critical.

The gas turbine requires, for stoichiometric combustion, approximately one-fourth of the total air it compresses. The excess air is used to cool the combustion chamber and mixes with the combustion products to reduce the gas temperature at the inlet to the first turbine stage. The cooling air keeps metal temperatures in the combustion chamber and turbine section at design levels for long life. All cooling is accomplished by air, eliminating the need for cooling water.

MECHANICAL FEATURES

The eleven-stage axial-flow compressor is designed with a tapered rotor diameter and contains four major components: variable stator vane assemblies, split compressor case, stator assemblies and rotor assembly.

The inlet guide vanes and the first two rows of stators are of the variable geometry type; they operate in two positions depending upon turbine compressor discharge pressure. At start, the vanes are in the closed position, which restricts the flow of incoming air. This position allows a fast, smooth acceleration with a relatively low turbine inlet temperature. In this mode, a bleed valve mounted on the combustor housing bypasses a portion of the airflow to the exhaust duct. This modified airflow prevents the compressor from reaching the surge limit during acceleration. The vanes begin to open at about 90 percent speed and reach the full open position prior to full speed. The bleed valve closes at 90 percent speed allowing full airflow through the turbine.

The vane actuator is powered by the turbine lube oil pressure through a directional control valve with the signal originating from the turbine electrical control system. A hydraulic cylinder drives through

a linkage arrangement to move the actuating rings over different angular ranges. The rings, formed from sheet steel, are connected through levers to each vane shaft which is cast integrally with the vane blade.

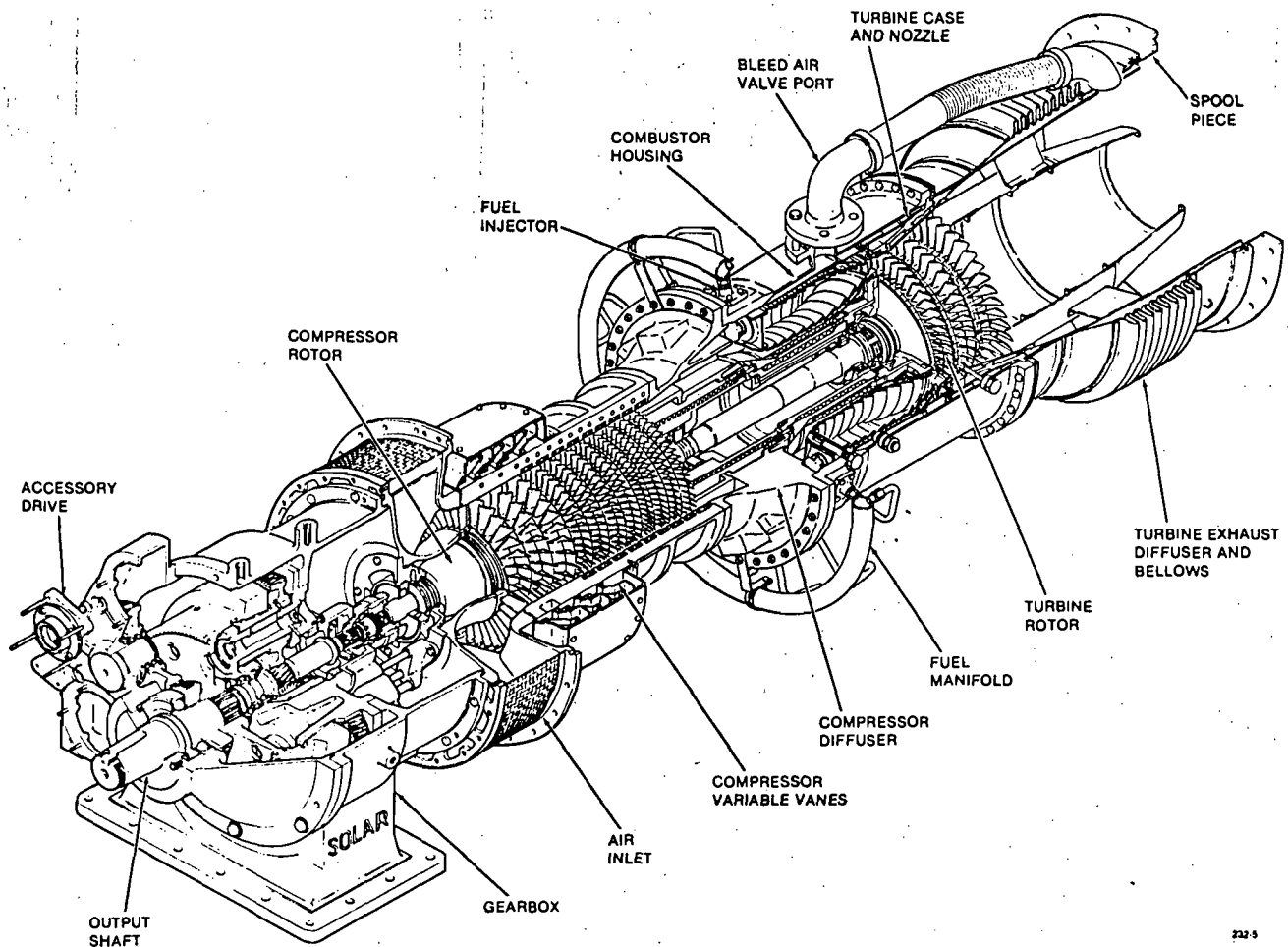
The stator assemblies are of brazed, stainless steel construction. The compressor stator case is split vertically into two halves which are joined at the top and bottom by bolted flanges. This arrangement allows either half to be removed for inspection or maintenance, permits the compressor rotor to be fully assembled and balanced prior to installation, and results in a high degree of API compliance.

The compressor rotor assembly is of drum-type construction, consists of 11 rotor discs, and is supported on two journal bearings. The eleventh-stage disc incorporates the end hub, rear bearings, and oil seal surfaces. The rotor discs are machined from Type 410 stainless steel alloy and the compressor blades are 17-4 PH stainless steel. Additional space has been provided for optional proximity probes near the bearing surfaces for API compliance.

The radial and axial positions of the rotor discs are maintained accurately by Curvic-type couplings. These couplings are toothed rings that project from each side of the disc body and mesh with those on the adjacent rotor. The tooth contours are designed to maintain concentricity and axial location, as well as to transmit torque.

The combustion chamber, a vortex-stabilized annular section, provides a large volume for combustion with resulting high combustion efficiency and a uniform temperature profile at the first-stage turbine nozzle. Three major components comprise the combustor section: combustor case, one-piece combustor liner, and axially oriented fuel injectors. High-temperature alloys used in combination with film air cooling, ensure long combustor-liner life. Ease of maintenance is achieved by fuel injectors designed for individual removal. In this way, a borescope can be inserted into the fuel injector holes to inspect the combustor liner and the first-stage turbine nozzle.

The turbine section has three axial stages with a constant inner diameter and a flaring outer diameter on the second and third stages. The second- and third-stage segmented turbine nozzles are supported in a nozzle casing (cast from Ni-Resist D5B) which is cantilevered from the aft flange of the combustor housing. The first stage is piloted to the bearing housing to provide better tip clearance



Single-Shaft Centaur Type H Turbine Cutaway

control. Each rotor assembly consists of a machined forging that retains the precision cast turbine blades in fir-tree mountings. High temperature alloys are used throughout this assembly for high reliability and long life.

The airfoils in the turbine section are surface optimized, which means that surface slopes and curvatures are carefully controlled to minimize velocity diffusion on the suction side, and to achieve smooth acceleration on the pressure side. The first-stage turbine nozzle vanes and the first-stage turbine blades are cooled. The inner and outer endwalls of the first-stage nozzle are impingement cooled. The first-stage turbine blades are convection cooled. Compressor discharge air is used for the cooling.

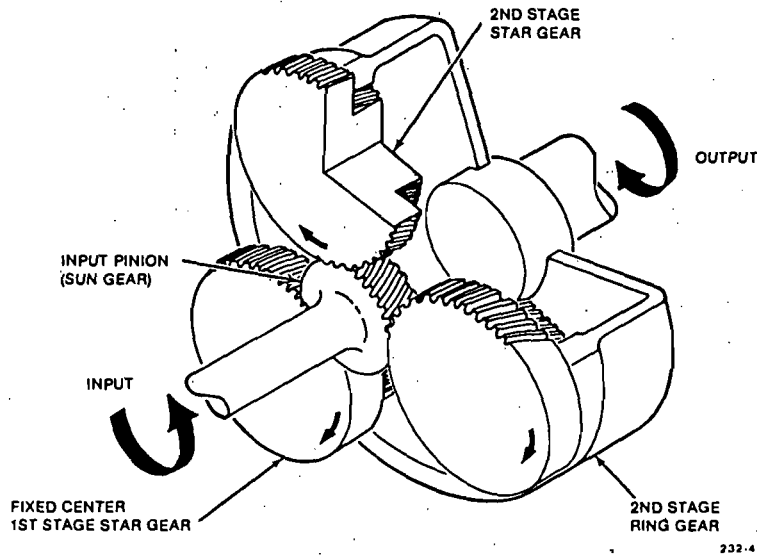
The turbine section is optimized for single-shaft operation. The journal bearings are of Solar's tilting pad design. The assembly provides for optional radial and axial proximity probes for vibration

monitoring. The standard thrust bearing provides for optional resistance temperature detector (RTD) measurement.

REDUCTION GEAR

The reduction gear unit used with the Centaur Type H turbine generator set is a rugged industrial type designed by Solar specifically for this application. The gear unit is of the epicyclic "star-compound" design which has fewer parts than conventional epicyclic gear designs. Assembly and disassembly is thus easier.

The unit is designed for outputs up to 6100 hp (4550 kW) continuous duty operation at output speeds of 1800 rpm for 60-Hz service and 1500 rpm for 50-Hz service. It is rated in excess of standard AGMA design factors at a service factor of 1.10 for generator applications and 10.0 under short circuit conditions. The gearbox is designed to operate at 99 percent reliability for 30,000 hours without an overhaul.



Star Compound Epicyclic Gearbox

The gearbox is bolted to the oil tank on the skid and the gas turbine is bolted directly to the gear unit. This closed-coupled arrangement allows

precision alignment. The gearbox unit has built-in accessory pads which drive the starter, lube pump, and liquid fuel pump (when required).

CENTAUR TYPE H GAS TURBINE SPECIFICATIONS

Compressor	
Type	Axial
Number of Stages	11
Compression Ratio	10.2
Flow	39.02 lb/sec (17.70 kg/sec)
Speed (Design)	14,750 rpm
Combustion Chamber	
Type	Annular
Ignition	Torch
Number of Fuel Nozzles	12
Turbine	
Type	Axial
Number of Stages	3
Speed (Design)	14,750 rpm
Bearings	
Journal Type	Tilting Pad
Thrust Type	Fixed Tapered Land
Materials of Construction	
Air Intake Housing	Ductile Iron
Compressor Case	Ductile Iron
Compressor Blades	17-4PH Stainless Steel
Combustor Liner	Hastelloy X
Combustor Case	Carbon Steel/285
Turbine Nozzle Support Case	Ni-Resist D5B Ductile Iron
Turbine Nozzles, 1st & 2nd Stage	Cast FSX414 Cobalt Base Superalloy
Turbine Nozzles, 3rd Stage	N155 High-Temperature Alloy
Turbine Discs, 1st, 2nd & 3rd Stage	V57 Iron-Base Superalloy
Turbine Blades, 1st & 2nd Stage	IN-738 LC
Turbine Blades, 3rd Stage	IN-792 Cast & HIPed
Exhaust Diffuser	Ni-Resist D5B Ductile Iron
Exhaust Duct	321
Accessory Gear Housing	Ductile Iron
Tilt Pad Bearings	Bronze
Available Coatings	
Compressor Airfoils	SermeTel 725

4

Fuel Systems

NATURAL GAS FUEL SYSTEM

The natural gas fuel system includes all components necessary to control fuel at the proper schedule during starting and operation from no load to full load. The system requires a natural gas supply at a regulated pressure of 175 to 225 psig (1207 to 1551 kPa gauge). An additional 20 psi (138 kPa) supply pressure above that required to carry rated load is required for full transient capability. Gas supply must conform to Solar's Specification ES 9-98. Basically, the gas should have a lower heating value of 800 to 1100 Btu/scf (29,807 to 40,985 kJ/nm³) and should be free of sulfur, contaminants, and entrained water.

The principal components of the natural gas fuel system included with the package are:

- Gas strainer and fuel pressure switch
- Primary fuel valve
- Secondary fuel valve
- Gas fuel control valve
- Main fuel actuator control
- Throttle valve
- Gas fuel manifold and injector nozzle assembly

Fuel gas pressure, as indicated on the fuel pressure gauge, actuates the pressure switch. The electrical contacts in the switch must close to allow a start. The gas fuel must be supplied at 175 to 225 psig (1207 to 1551 kPa gauge) for starting.

The primary fuel shutoff valve is a pneumatically-operated, spring-closed ball valve. Pilot pressure is admitted and exhausted from the operator via an integral solenoid valve. Removal of pilot gas or electrical power will allow the springs to close the main valve.

The secondary fuel shut off valve is operated by dual three-way solenoid valves. When energized, these solenoid valves admit pilot pressure to the main valve operator and exhaust pressure from the closing operator, causing the main spool to shift to the open position. When de-energized, these solenoid valves vent the pilot gas and supply pilot pressure in the closing direction to close the secondary shutoff valve.

The fuel control regulates fuel pressure to the throttle valve during turbine operation, maintains a balance between fuel pressure and compressor

discharge pressure, and senses the load requirements. The assembly is comprised of a diaphragm-operated main poppet valve, controlled by three servo valves operated by three loader diaphragms and a combination filter restrictor. The loaders sense the pressure from the compressor discharge to regulate pressure on the top side of the main poppet valve diaphragm.

The main fuel actuator control governs fuel flow to the turbine during acceleration. Magnetic pickups on the reduction drive gearing sense speed, turbine inlet thermocouples sense temperature, and, as a result, control the available power output. The milliampere reference setting is made manually using the variable speed control rheostat.

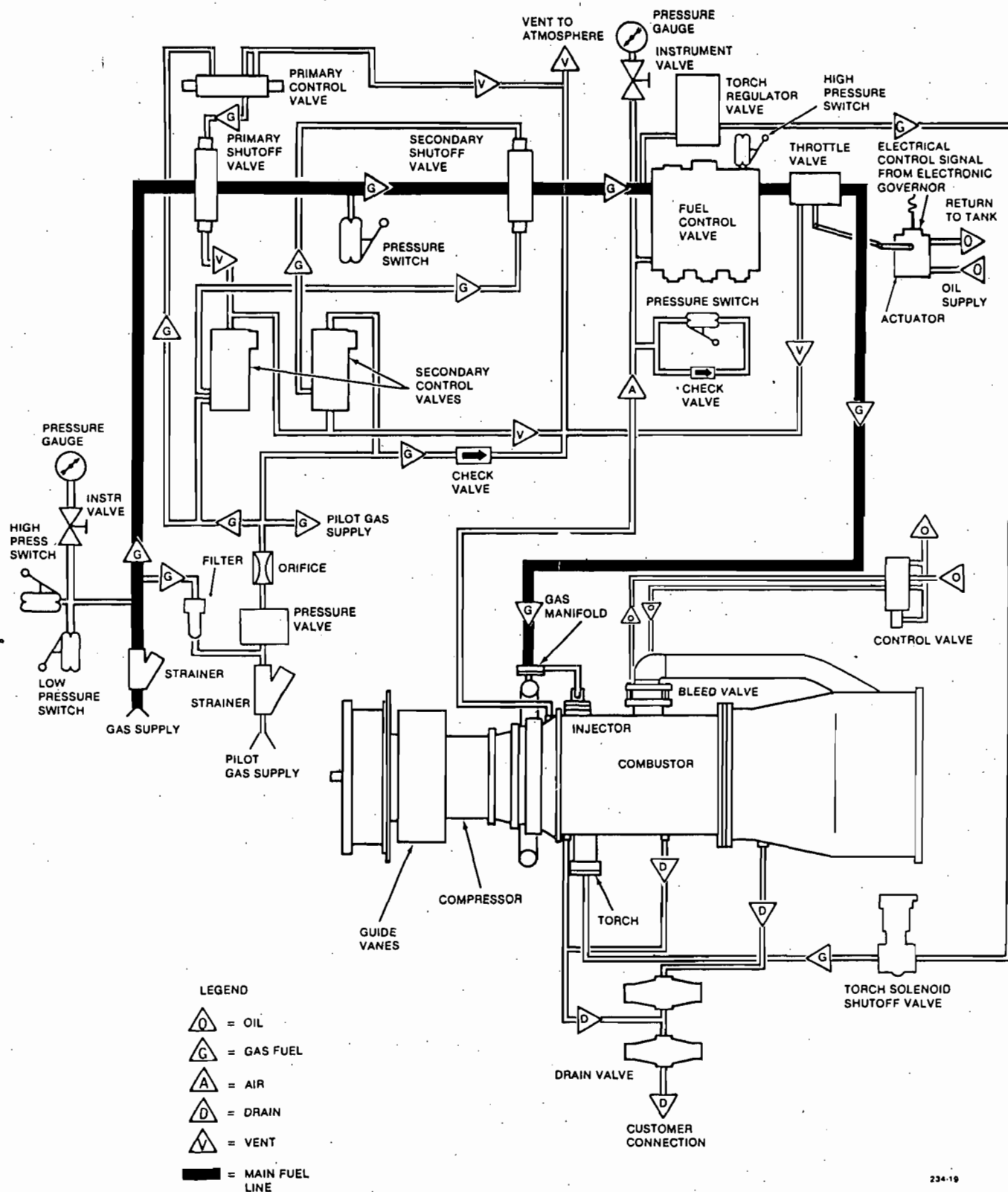
LIQUID FUEL SYSTEM

Acceptable fuels for use with this system include Grades 1 and 2 fuel oil, Grades 1 or 2 diesel, and kerosene (JP-4, JP-5, or commercial grade). The detailed requirements for liquid fuels are listed in Solar's Specification ES 9-98.

This system requires a 70 to 200 psi (483 to 1379 kPa) external air source to furnish fuel atomization at 60 scfm (0.4 nm³/min) for 90 seconds for each start.

The liquid fuel system is completely integrated within the generator package. Fuel passes from the supply connection and through the major part of the fuel system in the following sequence:

- Boost pump (option) and strainer.
- The 10-micron, low-pressure, duplex fuel filter (replaceable-element type).
- Main turbine-driven fuel pump.
- High-pressure filter (25-micron).
- Main fuel control (combines the functions of the acceleration control and the fuel metering valve) controlled by governor actuator.
- Pressurizing valve.
- Valve block which provides manifolding and mounting for shutoff valve, bypass valve, purge valve, and igniter valve.
- The fuel manifold block distributes fuel to the 12 fuel injectors equally spaced in the combustor.



Natural Gas Fuel System

7

Ancillary Equipment

ENCLOSURE

The skid-mounted Centaur Type H gas turbine generator set enclosure is a completely self-contained, weatherproof structure designed to be part of an integrated power system. Optional features include supports of ancillary equipment, safety systems, and maintenance provisions.

Drawings showing basic features of the enclosure and the range of support equipment offered are available.

The all-steel enclosure consists of a series of panels and access doors supported on a heavy-duty frame. These panels can be removed individually for complete access to major components for maintenance or replacement. Each panel is treated with fiberglass material for noise attenuation and thermal insulation, and weather stripping is installed between all panels for sealing and sound attenuation.

All exposed surfaces are painted using Solar's three-coat polyurethane process with a gray finish to match the color of the skid and gas turbine accessories.

Standard Features

Sound Attenuation. The sound attenuated enclosure is intended for use with suitable turbine air inlet and exhaust silencing systems in environments where low noise levels are a requirement. The enclosure ventilation openings are equipped with standard silencers to achieve maximum sound attenuation. Low-profile panel silencers are also available in place of the standard "L" shaped silencers to minimize enclosure width and length.

The actual noise reduction achieved is a function of the noise source, installation considerations, other equipment in close proximity, and the acoustical characteristics of existing buildings and barriers. The intent of the enclosure design is to comply with OSHA standards for eight-hour employee noise exposure. Transmission loss of the panels in decibels is available upon request.

Access. Doors are provided in the enclosure for access, inspection, and maintenance. Side and roof panels are easily removed for component removal by fork lift or overhead crane. The gauge panel containing gauges, package junction box,

malfunction stop button, and crank button is built into the wall of the enclosure so that it is readily accessible from the outside. Additional access doors can be provided.

Exterior Connections. Connections for oil vent lines, enclosure lights and ventilation fan wiring, fire and gas detection/suppression systems, and turbine air inlet and exhaust are terminated at the outside of the enclosure. These connections are defined in detail on the final submittal drawings.

Ventilation. All enclosures are ventilated using a built-in fan to provide the airflow required to ensure that internal temperature remains within acceptable limits. Fan motor wiring is terminated at a junction-box at the enclosure wall. The motor starter is supplied and installed by the customer. Suitable openings are provided so that an adequate, free flow of ventilation is available through the enclosure.

The fan is driven by a 230/460-volt, three-phase, 60-Hz explosionproof motor. Optional voltages and frequencies are available, including a 380-volt, three-phase, 50-Hz motor, as well as a 1.15 service factor motor and high temperature (Class F) insulation.

Optional Features

Lights. Three internal, EP, incandescent lights are available to illuminate the turbine and driven equipment areas inside the enclosure, with an ON/OFF switch conveniently located at an enclosure door. Backup dc lighting is also available with power supplied from the control battery system. This circuitry includes a shutoff timer to avoid drainage of the battery system.

Fire Detection/Suppression System. A CO₂ or Halon 1301 suppression system is available which has been designed in accordance with the National Fire Protection Association (NFPA) Codes 12 and 12A, respectively, and in conjunction with engineers from Walter Kidde Company. The cylinders used in the system are sized to provide the concentrations specified by the NFPA for "flame extinguishant".

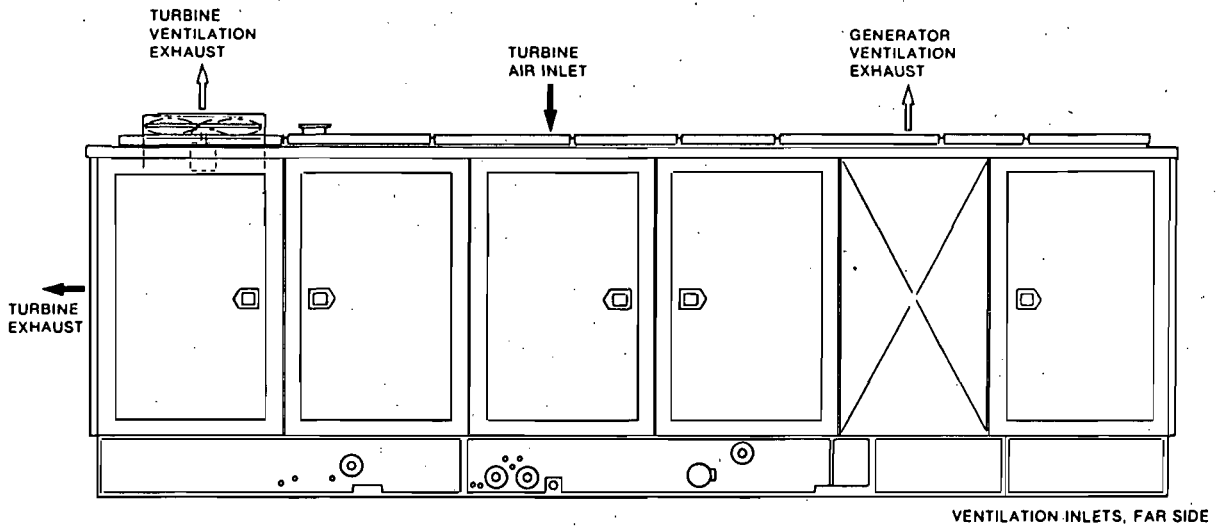
Primary and secondary fire detection is also available. The primary ultraviolet (UV) system consists of a controller and UV detectors designed to provide instantaneous response to flames. An

automatic optical integrity (AOI) feature provides continual visual monitoring of the entire system to ensure that the fire detection system is ready to respond.

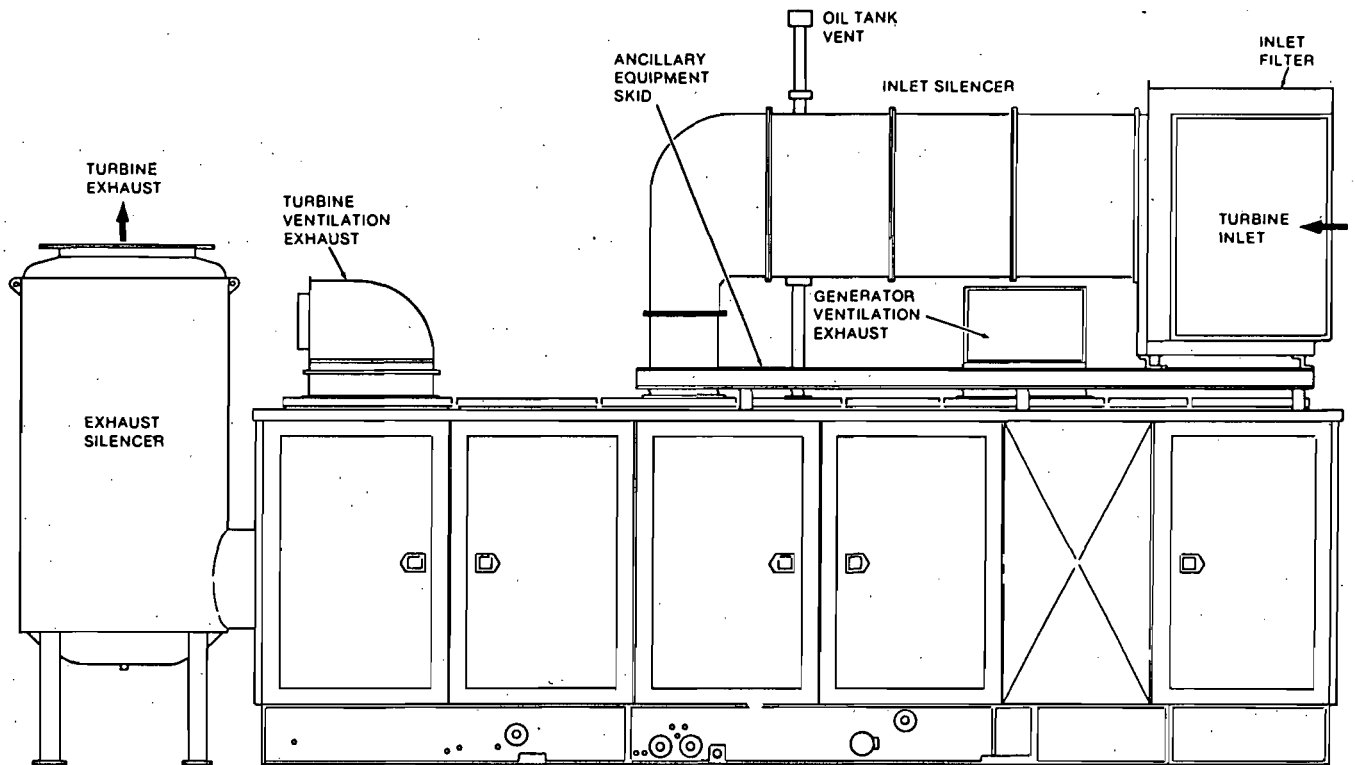
The secondary detection system consists of thermally actuated detectors installed in parallel

with the primary UV detectors. The backup system is designed to provide a fail-safe fire detection system.

A Halon inerting fire system is available to increase the quantity of Halon to 7.7 percent. Another fire system is available to provide metered



BASIC ENCLOSURE



ENCLOSURE WITH ANCILLARY EQUIPMENT SKID AND FLOOR STANDING EXHAUST SILENCER

VENTILATION INLETS, FAR SIDE

2311-2

Enclosure Configurations

quantities of extinguishant along with a second distribution system to extend the concentration time for specified periods. A weatherproof cabinet is also available to house the extinguishant cylinders.

A portable UV light source with built-in charger is available for testing the system. The light activates the UV detector which, in turn, activates the suppression system.

A heat detector, which is completely separate from the fire system thermal detectors, can be mounted in the enclosure. The detector is factory set to give an alarm if enclosure temperatures are abnormally high.

Combustible Gas Monitoring System. This compact system continuously monitors for combustible gases within the enclosure. The system includes visual low level (yellow) and high level (red) alarms on the control console. High level alarm causes gas turbine shutdown.

Detection is provided by either a single-channel monitor with one gas sensor or a dual-channel monitor with two gas sensors.

A portable purge calibration cylinder containing methane is available complete with the regulator, gauge, valve and extension tube used to periodically calibrate the gas monitor.

Fire and Gas System Test Kit. The combustible gas calibration equipment and UV test light are available in a specially designed carrying case.

Special Paint Specification. Painting all exposed surfaces in accordance with most customer color specifications.

Dust Protection. The enclosure system is available with inertial separator blowers and/or barrier-type filters on all ventilation air inlet openings for protection in a desert or high dust environment. For special conditions, enclosure pressurization is also available.

Pressurization Systems. Ventilation systems can be furnished for pressurizing the enclosure to prevent the entry of dust and sand through enclosure seams in hazardous areas. The system consists of the pressurizing fan, manually adjustable damper, Delta-P gauge and switch, Delta-P alarm, purging prior to start and after shutdown, installation of a flow sensor to monitor the fan, and remounting the enclosure fan to blow rather than draw air. The ventilation fan motor is available in several voltages and frequencies, including 230/460 volt, three phase, 60 Hz or 380 volt, three phase, 50 Hz.

External Support and Maintenance Frame. A single-lift ancillary skid is available to mount the air inlet system on the enclosure roof. This skid is shipped complete with all ancillary equipment mounted, preassembled and ready for installation.

Turbine Handling Equipment. A kit is available which consists of a 10-foot (3-meter) external extension to the maintenance frame trolley rail, installed within the enclosure, a single-point lift tool and a four-ton capacity rail hugger chain-fall hoist and trolley. The single-point lift tool, which has an adjustable center of gravity, is designed to attach to the turbine and provide a single-point attachment for the chain-fall, allowing complete removal of the turbine or selected turbine components.

The trolley beam extension allows turbine removal through the side of the enclosure. One end of the beam extension attaches to the inside trolley rail; the other end is floor-standing. The gas turbine is then removed through the side and placed on a truck bed or cart. The hoist, beam extension and single-point lift tool may be purchased as a kit or separately, if desired.

Package Lifting Kit. Also available is a loose-shipped lifting kit containing slings, spreader bars, and assorted hardware to facilitate lifting of the enclosed Centaur Type H gas turbine generator set.

Turbine Water Wash Cart. A water wash cart is available which contains a 68-gallon (257-liter) stainless steel tank and systems capable of supplying 6 to 8 gpm (23 to 30 liters per minute) at 20 to 40 psig (138 to 276 kPa gauge) to the turbine water wash manifold. A storage area is provided on the cart for 20 ft (6.1 m) of hose and 50 ft (15.2 m) of four-wire electrical cable.

AIR INTAKE SYSTEM

The air intake system for the Centaur Type H gas turbine normally consists of an air inlet filter, air inlet silencer, and connecting ducts capable of providing clean air. Solar can recommend and supply suitable filtration, silencers, and duct work for any installation.

An available option is a single-lift ancillary skid to roof-mount the turbine air inlet system. This skid is shipped complete with all ancillary equipment mounted, preassembled, and ready for installation, including gaskets, mounting hardware, and illustrated assembly drawings.

Evaporative cooling can be used where humidity is sufficiently low to give significant temperature reduction. Effectiveness of the cooler is typically

75 percent of the wet-bulb/dry-bulb differential. If water supply is limited, a recirculating cooler should be used, but with provision for regular blowdown of the water system to dispose of accumulated salts and impurities. Evaporative coolers are available from Solar.

TURBINE EXHAUST SYSTEM

When heat exchange equipment or silencers are used, the ducting must be adequately supported and, if necessary, expansion joints can be used to avoid exceeding the allowable loading of the turbine exhaust flange. Typically, the turbine exhaust system will consist of the following components:

Turbine Exhaust Connection. Terminates in a lightweight ANSI flange.

Exhaust Bellows/Flex Section with Spool Piece. Available as a standard modification and incorporated into the turbine exhaust diffuser section. The bellows section will accommodate external growth up to 0.375 in. (9 mm). Included is a standard spool piece terminating in an ASA flange for installation between the exhaust bellows and external ducting. Permits easy removal of turbine for major maintenance.

Exhaust Silencer. Three types of exhaust silencers are available as standard modifications. They differ in sound characteristics and major dimensions. Sound attenuating data and dimensional details are available upon request. The floor-standing silencer provides a vertical exhaust and can support a concentric, vertical load of 2000 lb (908 kg) of exhaust ducting.

EXHAUST HEAT RECOVERY

By using the exhaust heat of the gas turbine, high thermal efficiencies can be obtained. There are basically three methods in which the exhaust heat of the gas turbine can be used. Thermal efficiencies greater than 70 percent can be achieved depending upon the application.

- In a heat exchanger system, such as an exhaust heat boiler, exhaust heat gives up its energy to the medium on the other side of the exchanger. Normally, this medium is water

and the boiler produces either high-temperature water or dry and saturated steam. However, the medium can be process fluid which requires thermal energy.

- The turbine exhaust is 15- to 18-percent oxygen laden and can be used as preheated combustion air in a boiler or furnace. There is sufficient oxygen to support combustion in a 15 psig (103 kPa gauge), 120,000 to 130,000 pph (54,480 to 59,020 kg/hr) steam boiler.
- The exhaust heat energy of the gas turbine can be used directly for a drying or heating process where high-temperature air is necessary. A mixture of turbine exhaust and fresh air can be used in a reduced air temperature process. An air-to-air heat exchanger is required when the process involves any products in the human food chain.

The method in which a particular gas turbine energy system uses the exhaust heat of the turbine can be any one or a combination of all three. For example, an exhaust heat recovery boiler may incorporate a supplementary burner to maintain steam production independent of turbine load.

The design considerations of an exhaust heat recovery system are to minimize back pressures on the gas turbine and to control exhaust flow into the heat recovery equipment.

In most gas turbine heat recovery systems, the back pressure is kept below 6 to 8 in. (152 to 203 mm) of water, with a maximum of 20 in. (530 mm) of water pressure loss in both intake and exhaust. It may be more economical to install a fan system to overcome high back pressure than to lose shaft power. During gas turbine starting, the exhaust back pressure should be less than 1 in. (25.4 mm) of water. This may be achieved by means of a bypass duct around the heat recovery unit.

The exhaust bypass also provides a means of system output control by diverting the exhaust flow to the heat recovery equipment with a modulating valve and a means of 100-percent bypass for maintenance and repair on the heat recovery equipment.