

State of Florida summary checklist for initial Title V permit applications for 'existing' Title V Sources

Facility Owner/Operator Name: Fort Pierce Utilities Authority
Facility ID No.: 1110003 Site Name: H.W. King Power Plant
County: Saint Lucie
application receipt date 6/14/96

I. Preliminary scanning of application submitted.

- a. Was application submitted to correct permitting authority? Y N
- b. Was an application filed? Y* N
- c. Was the application filed timely? Y* N

- d. Application format filed [check one].
Hard copy of official version of form? ELSA? 1.3(4)
A facsimile of official version of form? Some combination?

- e. 4 copies (paper/electronic) submitted? Y N

- f. Electronic diskettes protected/virus scanned/checked? Y N N/A Has a virus - to send us new disc
by YKZ date 6/26/96
YKZ 6/26/96 RM

- g. Entire hard copy of Section I. provided (Pages 1-8 of form)? Y N
Facility identified (Page 1)? [if not complete a Page 1] Y* [Attached
- R.O. certification signed and dated (Page 2)? Y* N
- P.E. certification signed and dated (Page 7)? Y* N

- h. Any confidential information submitted? Y N
If yes, R.O. provided hard copy to us and EPA? Y* N
If yes, hard copy locked up and note filed with application? Y* N

- i. Type of application filed.
TV application for 'existing' Title V Source only? Y N
Any units subject to acid rain? Y N

Note(s): [*] = mandatory.

Comment(s): Virus on disc - a new one is to be resubmitted.
*Note: New Discs rec'd 6-24-96 - virus v'd 6-26-96 by YKZ.
1110003 uploaded to EARS 7/12/96 by E. Surr

Reviewer's initials RA date 6/17/96 Concurrence initials _____ date ____/____/____

[Date]

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Richard W. Thomas
Director of Operations
Fort Pierce Utilities Authority
P. O. Box 3191
Fort Pierce, Florida 34948

003

Re: DRAFT Title V Permit No.: 1110003-~~XX~~-AV
H.D. King Power Plant

Dear Mr. Thomas:

One copy of the DRAFT Title V Air Operation Permit for the H.D. King Power Plant located at 311 North Indian River Drive, Fort Pierce, St. Lucie County, is enclosed. The permitting authority's Intent to Issue Title V Air Operation Permit and the "PUBLIC NOTICE OF INTENT TO ISSUE TITLE V AIR OPERATION PERMIT" are also included.

The "PUBLIC NOTICE OF INTENT TO ISSUE TITLE V AIR OPERATION PERMIT" must be published within 30 (thirty) days of receipt of this letter. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

Please submit any written comments you wish to have considered concerning the permitting authority's proposed action to Mr. Scott M. Sheplak at the above letterhead address. If you have any other questions, please contact [Project Engineer] at 904/488-1344.

Sincerely,

C. H. Fancy, P.E.
Chief,
Bureau of Air Regulation

CHF/m

Enclosures.

cc: Gracy Danois, U.S. EPA, Region IV
Isidore Goldman, FDEP, SED
John Moulton, FDEP SED Branch Office
[D.R., if not the R.O.]
Ivan Clark, PE, R. W. Beck

1110003i.DOC

In the Matter of an
Application for Permit by:

Mr. Richard W. Thomas
Director of Operations
Fort Pierce Utilities Authority
P. O. Box 3191
Fort Pierce, Florida 34948

DRAFT Permit No.: 1110003-xxx -AV
H.D. King Power Plant
St. Lucie County

INTENT TO ISSUE TITLE V AIR OPERATION PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue a Title V air operation permit (copy of DRAFT Permit enclosed) for the Title V source detailed in the application specified above, for the reasons stated below.

The applicant, Fort Pierce Utilities Authority, applied on June 14, 1996 to the Department for a Title V air operation permit for the H.D. King Power Plant located at 311 North Indian River Drive, Fort Pierce, St. Lucie County.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, 62-213, and 62-214. This source is not exempt from Title V permitting procedures. The Department has determined that a Title V air operation permit is required to commence or continue operations at the described facility.

The Department intends to issue this Title V air operation permit based on the belief that reasonable assurances have been provided to indicate that operation of the source will not adversely impact air quality, and the source will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-214, 62-256, 62-257, 62-281, 62-296, and 62-297, F.A.C.

Pursuant to Sections 403.815 and 403.0872, F.S., and Rules 62-103.150 and 62-210.350(3), F.A.C., you (the applicant) are required to publish at your own expense the enclosed "PUBLIC NOTICE OF INTENT TO ISSUE TITLE V AIR OPERATION PERMIT." The notice shall be published one time only within 30 (thirty) days in the legal advertisement section of a newspaper of general circulation in the area affected. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 904/488-1344; Fax: 904/922-6979), within 7 (seven) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the Title V PROPOSED Permit, and subsequent Title V FINAL Permit, in accordance with the conditions of the enclosed Title V DRAFT Permit unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of "PUBLIC NOTICE OF INTENT TO ISSUE TITLE V AIR OPERATION PERMIT." Written comments should be provided to the permitting authority office. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit, the Department shall issue a Revised DRAFT Permit and require, if applicable, another Public Notice.

In addition, any 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, F.S. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000 (Telephone: 904/488-9730; Fax: 904/487-4938). Petitions filed by the permit applicant and the parties listed below must be filed within 14 (fourteen) days of receipt of this intent. Petitions filed by other persons must be filed within 14 (fourteen) days of publication of the public notice or within 14 (fourteen) days of the receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. 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, F.S.

The petition shall contain the following information: (a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the proposed source will operate; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by petitioner, if any; (e) A statement of facts which the petitioner contends warrant reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes the petitioner contends require reversal or modification of the Department's action or proposed action; and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wants the Department to take with respect to the Department's action or proposed action.

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 position taken by it in this DRAFT Permit. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above, and be filed (received) within 14 (fourteen) days of receipt of this intent in the Office of General Counsel at the address referenced above. Failure to petition within the allowed time frame constitutes a

waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 60Q-2.010, F.A.C.

Executed in Tallahassee, Florida.

**STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION**

C. H. Fancy, P.E.
Chief,
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF INTENT TO ISSUE TITLE V AIR OPERATION PERMIT (including the PUBLIC NOTICE and the DRAFT permit) and all copies were mailed by certified mail before the close of business on _____ to the person(s) listed below.

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

(Clerk)

(Date)

Copies Furnished To:

Mr. Richard W. Thomas, Fort Pierce Utilities Authority

[D.R. if not the R.O.]

[third party, if any]

PUBLIC NOTICE OF INTENT TO ISSUE TITLE V AIR OPERATION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Title V DRAFT Permit No.: 1110003-xxx -AV
H.D. King Power Plant
St. Lucie County

The Department of Environmental Protection (Department) gives notice of its intent to issue a Title V air operation permit to Fort Pierce Utilities Authority for the H.D. King Power Plant located at 311 North Indian River Drive, Fort Pierce, St. Lucie County. The applicant's name and address are: Mr. Richard W. Thomas, Director of Operations, Fort Pierce Utilities Authority, P. O. Box 3191, Fort Pierce, Florida 34948.

The Department will issue the Title V PROPOSED Permit, and subsequent Title V FINAL Permit, in accordance with the conditions of the enclosed Title V DRAFT Permit unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments concerning the proposed Title V DRAFT Permit issuance action for a period of 30 (thirty) days from the date of publication of this Notice. Written comments should be provided to the Department's Bureau of Air Regulation, 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in this DRAFT Permit, the Department shall issue a Revised DRAFT Permit and require, if applicable, another Public Notice.

In addition, any person whose substantial interests are affected by this proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes (F.S.). The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000 (Telephone: 904/488-9730; Fax: 904/487-4938), within 14 (fourteen) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. 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, F.S.

The Petition shall contain the following information; (a) The name, address, and the telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed; (b) A statement of how and when each petitioner received notice of the Department's action or proposed action; (c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action; (d) A statement of the material facts disputed by petitioner, if any; (e) A statement of facts which petitioner contends warrants reversal or modification of the Department's action or proposed action; (f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and, (g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

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A complete project file 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:

Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 904/488-1344
Fax: 904/922-6979

Department of Environmental Protection
Southeast District Office
400 North Congress Avenue
West Palm Beach, Florida 33416-5425
Telephone: 407/681-6600
Fax: 407/681-6790

Department of Environmental Protection
Southeast District Branch Office
1801 Southeast Hillmoor Drive, Suite 204
Port St. Lucie, Florida 34952
Telephone: 407/871-7662
Fax: 407/871-7666

The complete project file includes the Draft Permit, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact Mr. Scott M. Sheplak at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 904/488-1344, for additional information.

Application Worksheet

Owner :	Thomas W. Richards		
City :	Fort Pierce		
County :	St. Lucie		
Status :	A	Major Group SIC :	49
AOR Required?		Ozone SIP Facility?	
Title V?	Y		
NSPS?	Y		
NESHAP?	N		

**STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR RESOURCES MANAGEMENT
APPLICATION FOR AIR PERMIT - LONG FORM**

I. APPLICATION INFORMATION

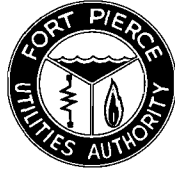
Identification of Facility Addressed in This Application

Fort Pierce Utilities Authority
H.D. King Power Plant
311 North Indian River Drive
Fort Pierce, Florida 34950
Facility I.D. 50WPB560003
AIRS I.D. 1110003

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official : Name : Thomas W. Richards Title : Director of Operations
2. Owner or Authorized Representative or Responsible Official Mailing Address : Organization/Firm : Fort Pierce Utilities Authority Street Address : P.O. Box 3191 City : Fort Pierce State : FL Zip Code : 34948-____
3. Owner/Authorized Representative or Responsible Official Telephone Numbers : Telephone : (407)466-1600 Fax : (407)465-6984
4. Owner/Authorized Representative or Responsible Official Statement : <i>I, the undersigned, am the owner or authorized representative* of the facility (non-Title V source) addressed in this Application for Air Permit or the responsible official, as defined in Chapter 62-213, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. Further, I agree to operate and maintain the air pollutant emissions units and air pollution control equipment described in this application so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. If the purpose of this application is to obtain an air operation permit or operation permit revision for one or more emissions units which have undergone construction or modification, I certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.</i> _____ Signature _____ Date

* Attach letter of authorization if not currently on file.



H. D. KING POWER PLANT

311 North Indian River Drive
Fort Pierce, Florida 34950
(407) 464-5792

RECEIVED

JUN 14 1996

BUREAU OF
AIR REGULATION

RECEIVED

JUN 14 1996

BUREAU OF
AIR REGULATION

June 13, 1996

Mr. John Brown
Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation
2600 Blair Stone Road, Mail Station #5500
Tallahassee, Florida 32399-2400

**SUBJECT: Title V Operating Permit Application for the Fort
Pierce Utilities Authority-H. D. King Power Plant**

Dear Mr. Brown:

In compliance with the requirements of Chapter 62-213, FAC, we have prepared and enclosed an application for a Title V Operating Permit for the H. D. King Power Plant. Specifically, we have enclosed four copies of the application for air permit: four computer disks using ELSA version 1.3a, accompanied by four hard copies of Section I, and the Attachments and Figures portions of the application.

If you have any questions, or need additional information regarding this submittal, please call me at 561-466-1600, Ext. 3400.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas W. Richards".

Thomas W. Richards, P.E.
Director of Operations

TWR:HL/s

Enclosures

pc: Ivan Clark, R.W. Beck Associates



H. D. KING POWER PLANT

311 North Indian River Drive
Fort Pierce, Florida 34950
(407) 464-5792

RECEIVED

JUN 24 1996

BUREAU OF
AIR REGULATION

June 19, 1996

Mr. John Brown
Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation
2600 Blair Stone Road, Mail Station #5500
Tallahassee, Florida 32399-2400

**SUBJECT: Resubmission of Title V Operating Permit Application for
the Fort Pierce Utilities Authority-H. D. King Power Plant**

Dear Mr. Brown:

The Fort Pierce Utilities Authority is resubmitting the four (4) disks required for Title V. We have checked these disks with the McAfee Virus Screen program.

If you have any questions, or need additional information regarding this submittal, please call me at 561-466-1600, Ext. 3400.

Sincerely,

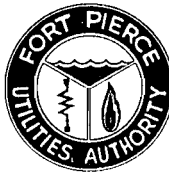
A handwritten signature in black ink, appearing to read "TWR", is written over a faint, larger version of the signature.

Thomas W. Richards, P.E.
Director of Operations

TWR:HL/s

Enclosures

pc: Ivan Clark, R.W. Beck Associates



H. D. KING POWER PLANT

311 North Indian River Drive
Fort Pierce, Florida 34950
(407) 464-5792

June 13, 1996

Mr. John Brown
Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation
2600 Blair Stone Road, Mail Station #5500
Tallahassee, Florida 32399-2400

**SUBJECT: Title V Operating Permit Application for the Fort
Pierce Utilities Authority-H. D. King Power Plant**

Dear Mr. Brown:

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If you have any questions, or need additional information regarding this submittal, please call me at 561-466-1600, Ext. 3400.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas W. Richards".

Thomas W. Richards, P.E.
Director of Operations

TWR:HL/s

Enclosures

pc: Ivan Clark, R.W. Beck Associates

Application Contact

1. Name and Title of Application Contact : Name : Harry Lamb Title : Superintendent/Power Resources
2. Application Contact Mailing Address : Organization/Firm : Fort Pierce Utilities Authority Street Address : 311 North Indian River Drive City : Fort Pierce State : FL Zip Code : 34950-____
3. Application Contact Telephone Numbers : Telephone : (407)464-5792 Fax : (407)465-7596

Application Comment

This application contains certain information and data on unregulated units which was included prior to the FDEP's permit simplification changes, but is no longer required. Due to the cumbersome nature of the electronic software (ELSA) and time constraints, this information was not deleted. The information is not displayed in the ELSA software, but is displayed when the application forms are printed out. Such information has not been updated or verified, may be inaccurate, and should not be reviewed or relied upon in any way.

Additionally, note that this application is submitted using ELSA version 1.3a because it was finalized prior to the FDEP's decision not to release this version. Section III G, Emissions Unit Pollutants, does not print out correctly and information for pollutants from one specific unit may be printed out in the table for another unit.

DEP Facility Comment :

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Facility SIC Codes

Facility SIC Codes :

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Scope of Application

Emissions Unit ID	Description of Emissions Unit
001	2.75 MW West Diesel #1
002	2.75 MW East Diesel #2
003	31.6 MW Combined Cycle Gas Turbine Unit # 9
004	16.5 MW Boiler Unit #6
007	33.0 MW Boiler Unit #7
008	56.1 MW Boiler Unit #8
No Id	(1) Cooling Tower

Purpose of Application and Category

Category I : All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.

This Application for Air Permit is submitted to obtain :

Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.

Initial air operation permit under Chapter 62-213, F.A.C., for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number :

Air operation permit renewal under Chapter 62-213, F.A.C., for a Title V source.

Operation permit to be renewed :

Air operation permit revision for a Title V source to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number :

Operation permit to be revised :

Air operation permit revision or administrative correction for a Title V source to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application.

Operation permit to be revised/corrected :

Air operation permit revision for a Title V source for reasons other than construction or modification of an emissions unit.

Operation permit to be revised :

Reason for revision :

Category II : All Air Operation Permit Applications Subject to Processing Under Rule 62-210.300(2)(b), F.A.C.

This Application for Air Permit is submitted to obtain :

- Initial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s) :

- Renewal air operation permit under Rule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.

Operation permit to be renewed :

- Air operation permit revision for a synthetic non-Title V source.

Operation permit to be revised :

Reason for revision :

Category III : All Air Construction Permit Applications for All Facilities and Emissions Units

This Application for Air Permit is submitted to obtain :

- Air construction permit to construct or modify one or more emissions units within a facility (including any facility classified as a Title V source).

Current operation permit number(s), if any :

-] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Current operation permit number(s) :

-] Air construction permit for one or more existing, but unpermitted, emissions units.

Application Processing Fee

Attached - Amount : _____ NA

Construction/Modification Information

1. Description of Proposed Project or Alterations :
2. Projected or Actual Date of Commencement of Construction :
3. Projected Date of Completion of Construction :


Application Processing Fee

Attached - Amount : _____ NA

Construction/Modification Information

1. Description of Proposed Project or Alterations :
2. Projected or Actual Date of Commencement of Construction :
3. Projected Date of Completion of Construction :

TO: Isidore Goldman, SED

FROM: Bruce Mitchell 

DATE: November 14, 1996

SUBJECT: Completeness Review of an Application Package for a Title V Operation Permit
Ft. Pierce Utilities, H.D. King Power Plant: 1110003-003-AV

The Title V operating permit application package for the referenced facility is being processed in Tallahassee. The application was previously forwarded to your office for your files and future reference. Please have someone review the package for completeness and respond in writing by December 12, 1996, if you have any comments. Otherwise, no response is required. If there are any questions, please call the project engineer, Edward Svec, at 904/488-1344 or SC:278-1344. It is very important to verify the compliance statement regarding the facility. Since we do not have a readily effective means of determining compliance at the time the application was submitted, please advise if you know of any emissions unit(s) that were not in compliance at that time and provide supporting information. Also, do not write on the documents.

If there are any questions regarding this request, please call me or Scott Sheplak at the above number(s).

RBM/bm

cc: Joe Kahn

Phase II Permit Application

For more information, see instructions and refer to 40 CFR 72.30 and 72.31 and Chapter 62-214, F.A.C.

This submission is: New Revised

STEP 1
Identify the source by plant name, State, and ORIS code from NADB

H. D. King Power Plant Plant Name	FL State	658 ORIS Code
--------------------------------------	-------------	------------------

STEP 2
Enter the boiler ID# from NADB for each affected unit, and indicate whether a repowering plan is being submitted for the unit by entering "yes" or "no" at column c. For new units, enter the requested information in columns d and e

Compliance Plan				
a	b	c	d	e
Boiler ID#	Unit Will Hold Allowances in Accordance with 40 CFR 72.9(c)(1)	Repowering Plan	New Units Commence Operation Date	New Units Monitor Certification Deadline
8	Yes	No		
7	Yes	No		
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			

STEP 3
Check the box if the response in column c of Step 2 is "Yes" for any unit

For each unit that will be repowered, the Repowering Extension Plan form is included and the Repowering Technology Petition form has been submitted or will be submitted by June 1, 1997.

Plant Name (from Step 1)

STEP 4

Read the standard requirements and certification, enter the name of the designated representative, and sign and date

Standard RequirementsPermit Requirements.

- (1) The designated representative of each Acid Rain source and each Acid Rain unit at the source shall:
 - (i) Submit a complete Acid Rain part application (including a compliance plan) under 40 CFR part 72, Rules 62-214.320 and 330, F.A.C. in accordance with the deadlines specified in Rule 62-214.320, F.A.C.; and
 - (ii) Submit in a timely manner any supplemental information that the permitting authority determines is necessary in order to review an Acid Rain part application and issue or deny an Acid Rain permit;
- (2) The owners and operators of each Acid Rain source and each Acid Rain unit at the source shall:
 - (i) Operate the unit in compliance with a complete Acid Rain part application or a superseding Acid Rain part issued by the permitting authority; and
 - (ii) Have an Acid Rain Part.

Monitoring Requirements.

- (1) The owners and operators and, to the extent applicable, designated representative of each Acid Rain source and each Acid Rain unit at the source shall comply with the monitoring requirements as provided in 40 CFR part 75, and Rule 62-214.420, F.A.C.
- (2) The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the unit with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program.
- (3) The requirements of 40 CFR part 75 shall not affect the responsibility of the owners and operators to monitor emissions of other pollutants or other emissions characteristics at the unit under other applicable requirements of the Act and other provisions of the operating permit for the source.

Sulfur Dioxide Requirements.

- (1) The owners and operators of each source and each Acid Rain unit at the source shall:
 - (i) Hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under 40 CFR 73.34(c)) not less than the total annual emissions of sulfur dioxide for the previous calendar year from the unit; and
 - (ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide.
- (2) Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act.
- (3) An Acid Rain unit shall be subject to the requirements under paragraph (1) of the sulfur dioxide requirements as follows:
 - (i) Starting January 1, 2000, an Acid Rain unit under 40 CFR 72.5(a)(2); or
 - (ii) Starting on the later of January 1, 2000 or the deadline for monitor certification under 40 CFR part 75, an Acid Rain unit under 40 CFR 72.6(a)(3).
- (4) Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program.
- (5) An allowance shall not be deducted in order to comply with the requirements under paragraph (1)(i) of the sulfur dioxide requirements prior to the calendar year for which the allowance was allocated.
- (6) An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or the written exemption under 40 CFR 72.7 and 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization.
- (7) An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right.

Nitrogen Oxides Requirements. The owners and operators of the source and each Acid Rain unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides.

Excess Emissions Requirements.

- (1) The designated representative of an Acid Rain unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77.
- (2) The owners and operators of an Acid Rain unit that has excess emissions in any calendar year shall:
 - (i) Pay without demand the penalty required, and pay upon demand the interest on that penalty, as required by 40 CFR part 77; and
 - (ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77.

Recordkeeping and Reporting Requirements.

- (1) Unless otherwise provided, the owners and operators of the source and each Acid Rain unit at the source shall keep on site at the source each of the following documents for a period of 5 years from the date the document is created. This period may be extended for cause, at any time prior to the end of 5 years, in writing by the Administrator or permitting authority:
 - (i) The certificate of representation for the designated representative for the source and each Acid Rain unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with Rule 62-214.350, F.A.C.; provided that the certificate and documents shall be retained on site at the source beyond such 5-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative;
 - (ii) All emissions monitoring information, in accordance with 40 CFR part 75;
 - (iii) Copies of all reports, compliance certifications, and other submissions and all records made or required under the Acid Rain Program; and,

Plant Name (from Step 1)

Recordkeeping and Reporting Requirements (cont.)

(iv) Copies of all documents used to complete an Acid Rain part application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program.

(2) The designated representative of an Acid Rain source and each Acid Rain unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR part 72 subpart I and 40 CFR part 75.

Liability.

(1) Any person who knowingly violates any requirement or prohibition of the Acid Rain Program, a complete Acid Rain part application, an Acid Rain part, or a written exemption under 40 CFR 72.7 or 72.8, including any requirement for the payment of any penalty owed to the United States, shall be subject to enforcement pursuant to section 113(c) of the Act.

(2) Any person who knowingly makes a false, material statement in any record, submission, or report under the Acid Rain Program shall be subject to criminal enforcement pursuant to section 113(c) of the Act and 18 U.S.C. 1001.

(3) No permit revision shall excuse any violation of the requirements of the Acid Rain Program that occurs prior to the date that the revision takes effect.

(4) Each Acid Rain source and each Acid Rain unit shall meet the requirements of the Acid Rain Program.

(5) Any provision of the Acid Rain Program that applies to an Acid Rain source (including a provision applicable to the designated representative of an Acid Rain source) shall also apply to the owners and operators of such source and of the Acid Rain units at the source.

(6) Any provision of the Acid Rain Program that applies to an Acid Rain unit (including a provision applicable to the designated representative of an Acid Rain unit) shall also apply to the owners and operators of such unit. Except as provided under 40 CFR 72.44 (Phase II repowering extension plans), and except with regard to the requirements applicable to units with a common stack under 40 CFR part 75 (including 40 CFR 75.16, 75.17, and 75.18), the owners and operators and the designated representative of one Acid Rain unit shall not be liable for any violation by any other Acid Rain unit of which they are not owners or operators or the designated representative and that is located at a source of which they are not owners or operators or the designated representative.

(7) Each violation of a provision of 40 CFR parts 72, 73, 75, 77, and 78 by an Acid Rain source or Acid Rain unit, or by an owner or operator or designated representative of such source or unit, shall be a separate violation of the Act.

Effect on Other Authorities. No provision of the Acid Rain Program, an Acid Rain part application, an Acid Rain part, or a written exemption under 40 CFR 72.7 or 72.8 shall be construed as:

(1) Except as expressly provided in title IV of the Act, exempting or excluding the owners and operators and, to the extent applicable, the designated representative of an Acid Rain source or Acid Rain unit from compliance with any other provision of the Act, including the provisions of title I of the Act relating to applicable National Ambient Air Quality Standards or State Implementation Plans;

(2) Limiting the number of allowances a unit can hold; *provided*, that the number of allowances held by the unit shall not affect the source's obligation to comply with any other provisions of the Act;

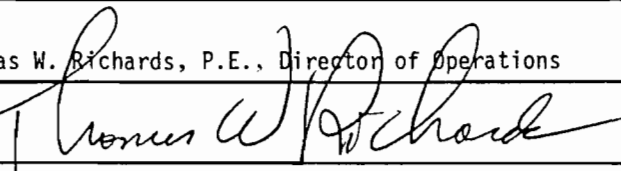
(3) Requiring a change of any kind in any State law regulating electric utility rates and charges, affecting any State law regarding such State regulation, or limiting such State regulation, including any prudence review requirements under such State law;

(4) Modifying the Federal Power Act or affecting the authority of the Federal Energy Regulatory Commission under the Federal Power Act; or,

(5) Interfering with or impairing any program for competitive bidding for power supply in a State in which such program is established.

Certification

I am authorized to make this submission on behalf of the owners and operators of the Acid Rain source or Acid Rain units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name Thomas W. Richards, P.E., Director of Operations	
Signature 	Date 12/14/95

STEP 5 (optional)
Enter the source AIRS
and FINDS identification
numbers, if known

AIRS	
FINDS	50WPB560003

Allowance Tracking System Report

Date: 08/25/94

Page: 1

AUTHORIZED ACCOUNT REPRESENTATIVE INFORMATION

AAR Number 000357
AAR Name Thomas W. Richards
Firm Name
Address 1 P.O. Box 3191
Address 2
City/State/Zip Fort Pierce, FL 34948-3191
Phone 407/466-1600 Extension: 3400
Fax 407/466-0396

Account Num	Plant/Account Name	AAR/Alternate	AAR Start Date
000658000007	Henry D King	AAR	07/19/94
000658000008	Henry D King	AAR	07/19/94

Please review the information shown above and report any errors, along with supporting documentation, to the address listed below, or call the Acid Rain Hotline.



Acid Rain Hotline: (202) 233-9620

U.S. Environmental Protection Agency
Acid Rain Division
401 M Street, SW
Mail Code 6204J
Washington, DC 20460

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official :

Name : Thomas W. Richards
Title : Director of Operations

2. Owner or Authorized Representative or Responsible Official Mailing Address :

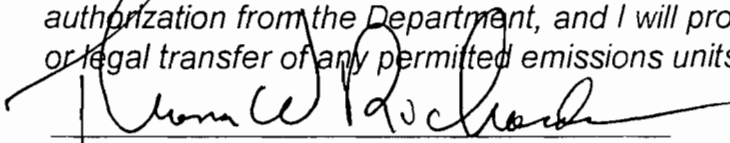
Organization/Firm : Fort Pierce Utilities Authority
Street Address : P.O. Box 3191
City : Fort Pierce
State : FL Zip Code : 34948-____

3. Owner/Authorized Representative or Responsible Official Telephone Numbers :

Telephone : (407)466-1600 Fax : (407)465-6984

4. Owner/Authorized Representative or Responsible Official Statement :

I, the undersigned, am the owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions units.*


Signature

6/13/96
Date

* Attach letter of authorization if not currently on file.

4. Professional Engineer Statement :

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

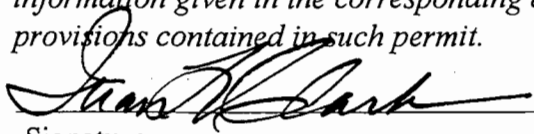
(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollutant control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions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

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

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

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

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


Signature

May 31, 1996
Date

* Attach any exception to certification statement.

I. Part 6 - 1

DEP Form No. 62-210.900(1) - Form
Effective : 3-21-96

ATTACHMENTS AND FIGURES

SITE PLAN OF H.D. KING PLANT

SITE ARRANGEMENT

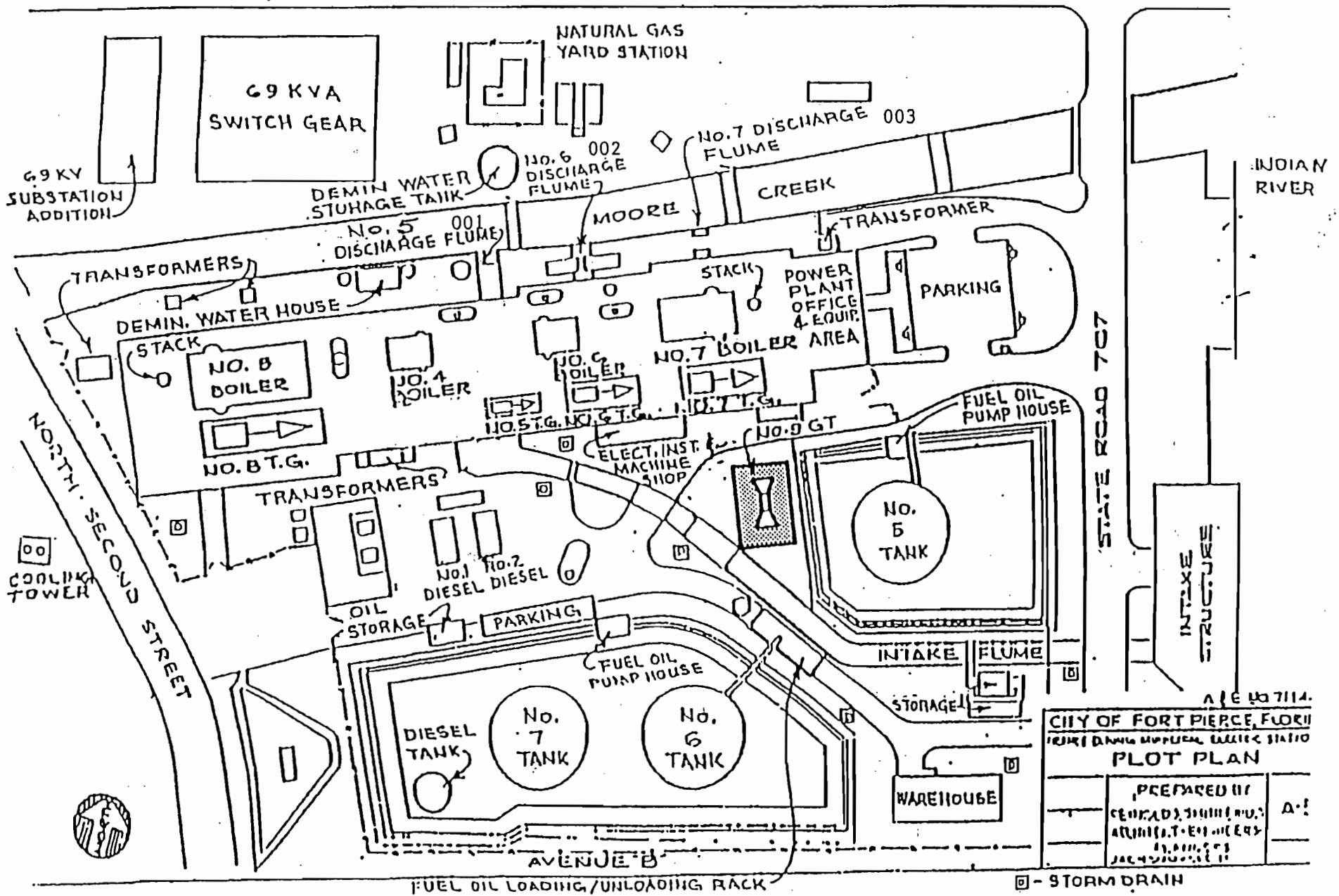


Figure 2

A/E 40714.
 CITY OF FORT PIERCE, FLORIDA
 PLANT ENGINEERING DEPARTMENT
PLOT PLAN
 PREPARED BY
 GEORGE J. HARRIS, P.E.
 APRIL 15, 1964
 SCALE: AS SHOWN

PROCESS FLOW DIAGRAM
H. D. KING DIESEL UNIT #1

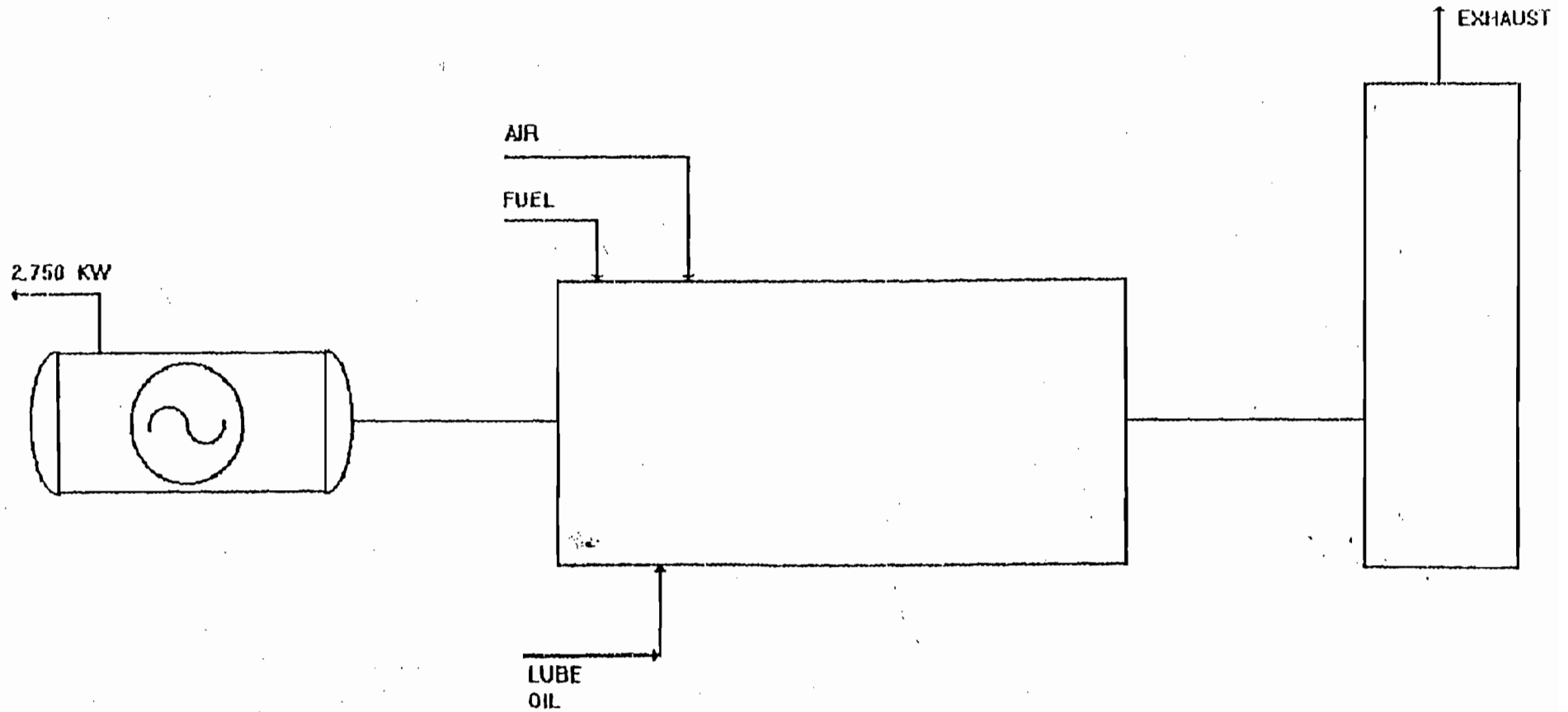


Figure 3

FORT PIERCE UTILITIES AUTHORITY
FORT PIERCE, FLORIDA
DATE: 6-6-95

PROCESS FLOW DIAGRAM
H. D. KING DIESEL UNIT #2

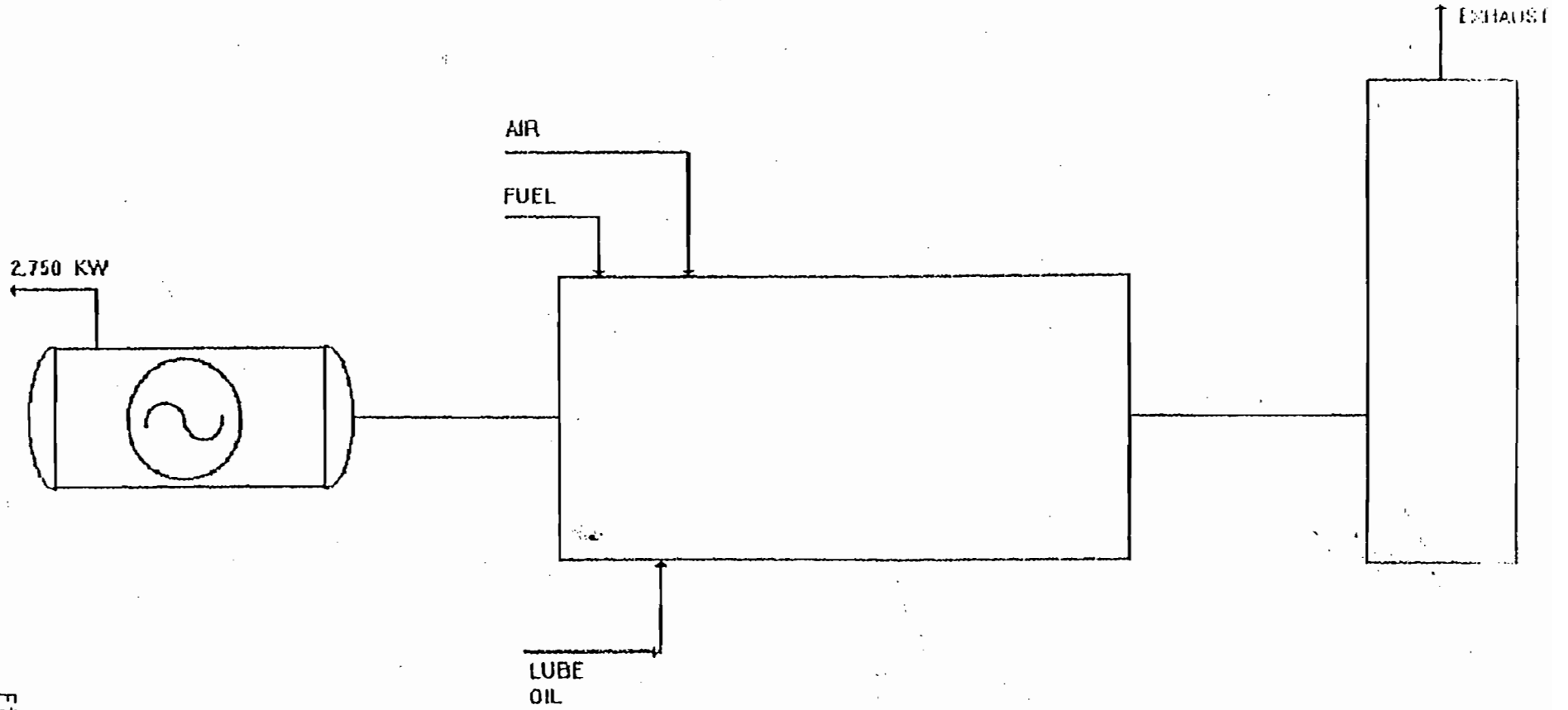


Figure 4

FORT PIERCE UTILITIES AUTHORITY
FORT PIERCE, FLORIDA
DATE: 6-6-95

Process Flow Diagram

Units # 9 & 5

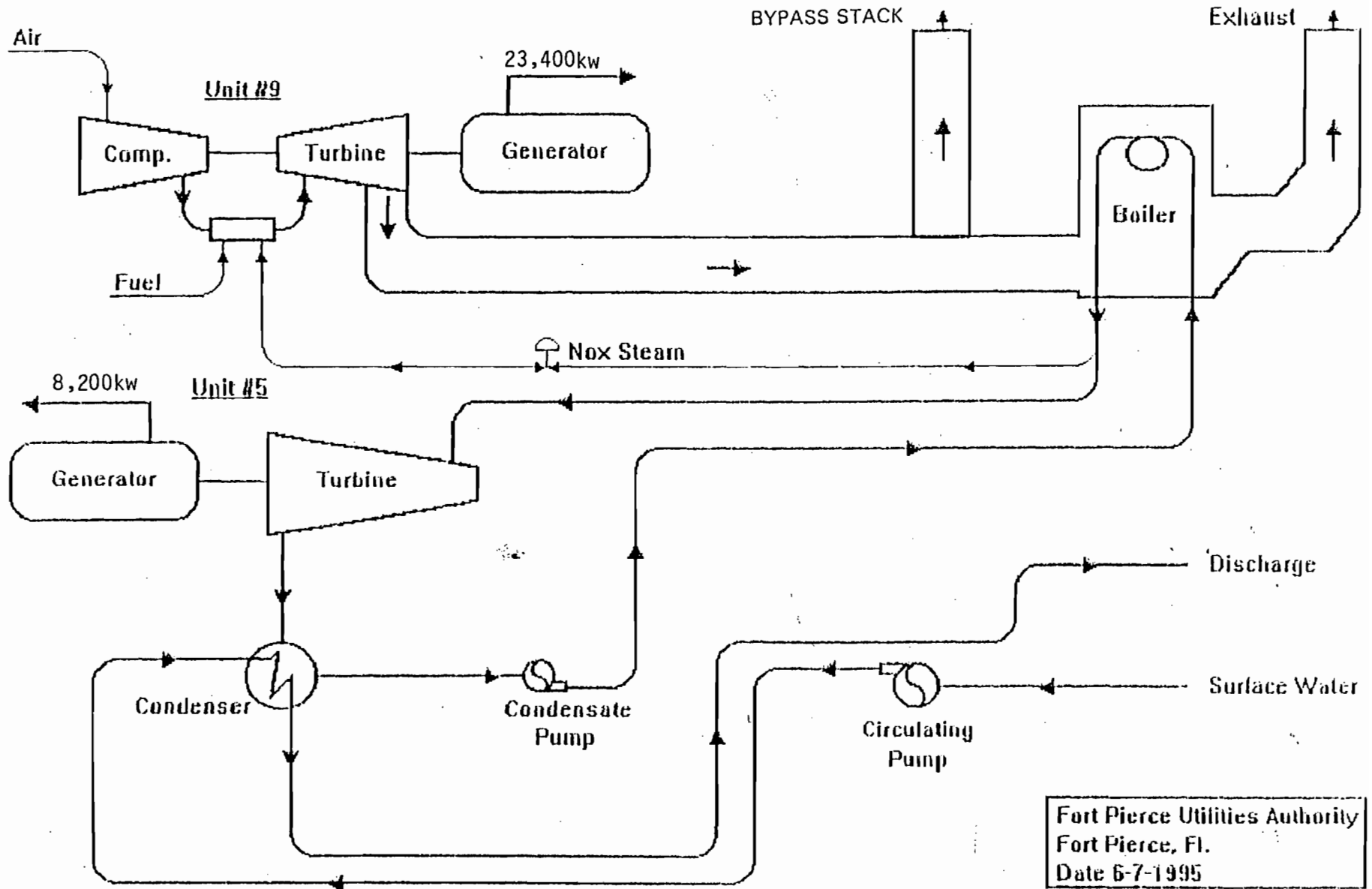


Figure 5

Fort Pierce Utilities Authority
Fort Pierce, FL.
Date 6-7-1995

Process Flow Diagram

Unit # 6

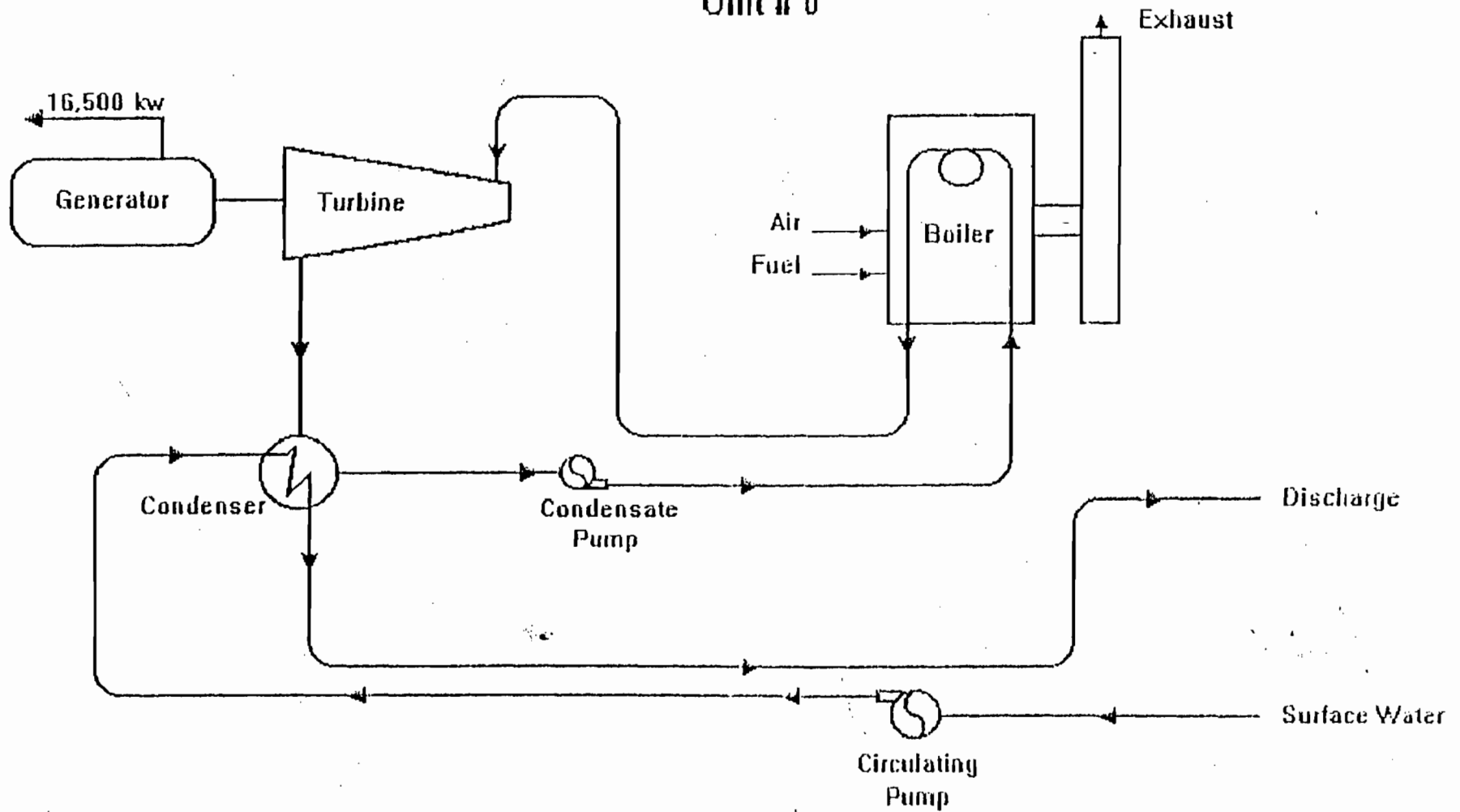


Figure 6

Fort Pierce Utilities Authority
Fort Pierce, Fl.
Date 6-7-1995

Process Flow Diagram

Unit # 7

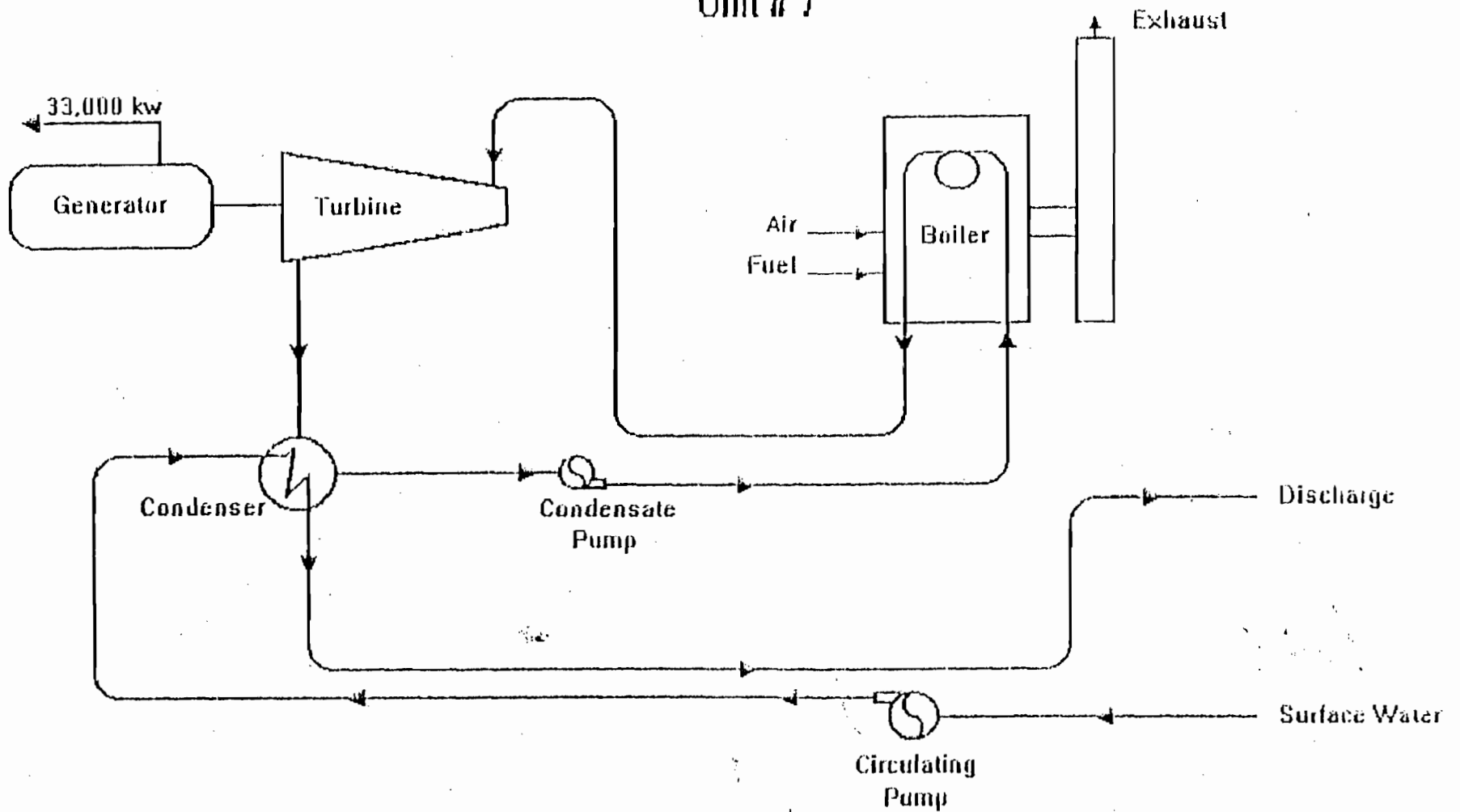


Figure 7

Fort Pierce Utilities Authority
Fort Pierce, FL
Date 6-7-1995

Process Flow Diagram

Unit #8

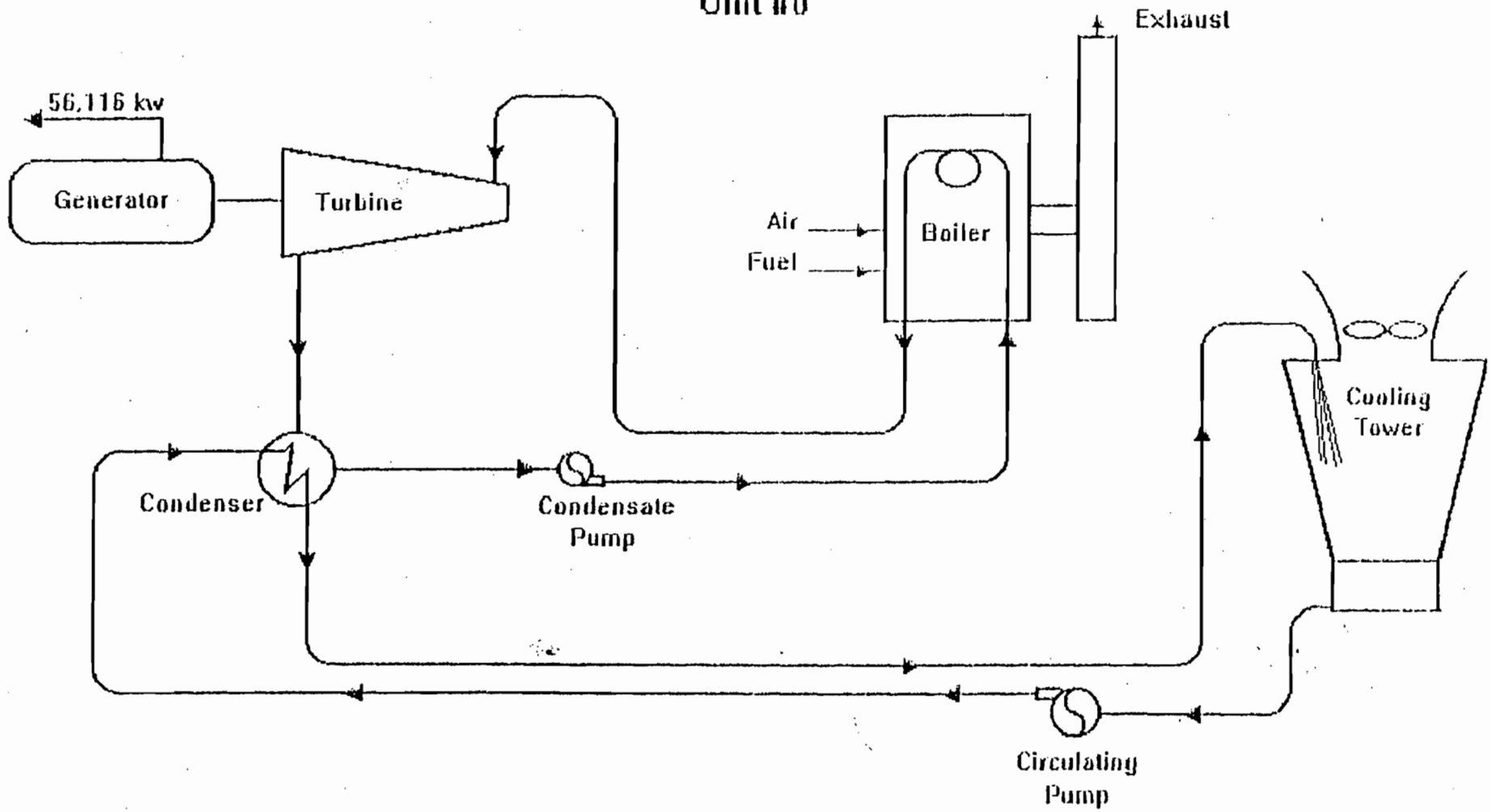


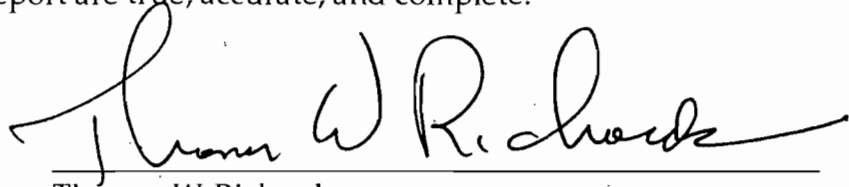
Figure 8

Fort Pierce Utilities Authority
Fort Pierce, FL.
Date 6-7-1995

Attachment A

COMPLIANCE STATEMENT

"I, the undersigned, am the responsible official as defined in Chapter 62-213, F.A.C., of the Title V source for which this report is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this report are true, accurate, and complete."

A handwritten signature in black ink, reading "Thomas W. Richards". The signature is written in a cursive style with a long horizontal flourish at the end.

Thomas W. Richards
Director of Operations

Attachment B

FUEL ANALYSES

FLORIDA GAS TRANSMISSION COMPANY

Spot Analysis of Natural Gas for Delivery in Florida

DATE: April 25, 1995

TIME: 11:48

<u>Component Name</u>	<u>Mole %</u>
Hexane	0.054
Propane	0.390
Isobutane	0.101
n-Butane	0.080
Isopentane	0.031
n-Pentane	0.018
Nitrogen	0.349
Methane	96.060
CO ₂	0.746
Ethane	2.171
Totals	100.000

Dry Btu/cf @ 14.730 psia and 60°F = 1033.7

Real Relative Density = 0.5829

Total Sulfur	0.16 Gr/Ccf
Total Sulfur D/S	0.35 Gr/Ccf
H ₂ S	0.04 Gr/Ccf
H ₂ O	3.4 lb/MMcf

3/95



CERTIFICATE OF ANALYSIS

JOB NO.	TPA-0956542
LAB NO.	L950214-057

VESSEL.	FORT PIERCE UTILITIES AUTHORITY	DATE	3-07-95
CARGO	# 2 FUEL OIL		
TERMINAL/PORT	FORT PIERCE UTILITIES, 311 NORTH INDIAN RIVER DRIVE FORT PIERCE, FL		
SAMPLE FROM	SUBMITTED		
SAMPLE SUBMITTED BY	FORT PIERCE UTILITIES AUTHORITY		
ANALYSIS PERFORMED BY	INSPECTORATE AMERICA, TAMPA		
CLIENT(S) REF.	P.O. # 43810		

TEST	RESULTS
D-287	API GRAVITY @ 60 DEG F 32.4
D-93	FLASH POINT, FMCC, DEG F 182
D-97	POUR POINT, DEG C -23
D-4294	SULFUR, WT % 0.41
D-95	WATER BY DISTILLATION <0.025
D-189	CARBON RESIDUE, WT.%, 10% BOTTOMS 0.07
D-482	ASH, WT % <0.01
AAS	VANADIUM, PPM <0.3
AAS	SODIUM, PPM <0.2
AAS	POTASSIUM, PPM <0.3
AAS	CALCIUM, PPM <0.3
AAS	LEAD, PPM <0.3
D-3228	NITROGEN, PPM 145
D-240	HEAT OF COMBUSTION, GROSS BTU/LB 19,524
D-976	CETANE INDEX 45.7
D-2274	PARTICULATES, MG/LITER 21
D-86	DISTILLATION, % RECOVERED, DEG F
	IBP/5 408/444
	10/20 464/486
	30/40 502/518
	50/60 536/550
	70/80 566/586
	90/EP 610/660
	REC/RES/LOSS 98.0/1.9/0.1
PE-240-C	BACTERIAL CONTAMINATION SLIGHT
	HYDROGEN WT. % 13.38 %

FOR INSPECTORATE: *[Signature]*

HEAT of Combustion BTU/gal = 140358.03 BTU/gal

3/14/95 P. 005



CERTIFICATE OF ANALYSIS

JOB NO.	TPA-0956542
LAB NO.	L950126-042, 43, 5

VESSEL	FORT PIERCE UTILITIES AUTHORITY	DATE	3-07-95
CARGO	# 6 FUEL OIL		
TERMINAL/PORT	FORT PIERCE UTILITIES, 311 NORTH INDIAN RIVER DRIVE FORT PIERCE, FL		
SAMPLE FROM	SUBMITTED		
SAMPLE SUBMITTED BY	FORT PIERCE UTILITIES AUTHORITY		
ANALYSIS PERFORMED BY	INSPECTORATE AMERICA, TAMPA		
CLIENT(S) REF.	P.O. # 29536		

TEST		RESULTS
L950125-043	SUBMITTED SAMPLE 7 pm to 12 pm COMPOSITE — 1/25/95	
D-287	DENSITY @ 15 DEG C	0.9267 = 7.722
D-4294	SULFUR, WT %	0.78
D-240	HEAT OF COMBUSTION # 146941.93 BTU/gal.	19,029 — <u>19,049</u> ^{LB/gal}
L950126-042	SUBMITTED SAMPLE, 12 pm to 8 am COMPOSITE — 1/24/95	
D-287	DENSITY @ A5 DEG C	0.9267 (7.72)
D-4294	SULFUR, WT %	0.77
D-240	HEAT OF COMBUSTION # 147644.64 BTU/gal.	19,120
L950209-058		
D-287	DENSITY @ A5 DEG C — 2/9/95	0.9261 (7.717)
D-4294	SULFUR, WT %	0.78
D-240	HEAT OF COMBUSTION # 146615.28 BTU/gal.	18,999

* AS PER DAN Buck of INSPECTORATE 3/14/95 [Signature]

FOR INSPECTORATE: [Signature]

Attachment C

DESCRIPTION OF CONTROL EQUIPMENT

ON UNITS NO. 6, 7 AND 9

DETAILED DESCRIPTION OF CONTROL EQUIPMENT

Unit ID 003 - Combined Cycle Gas Turbine

The air pollution control associated with the gas turbine consists of steam injection for NO_x emissions reduction. Design details and manufacturer guarantees for control efficiency for the steam injection system are unavailable. The control efficiency of the steam injection system is believed to be sufficient for the gas turbine to meet current applicable NO_x emissions limits.

Unit ID 004 - 16.5 MW Boiler Unit #6

The air pollution control associated with the boiler consists of a multiple cyclone for particulate emissions reduction. Manufacturer design details are attached. The control efficiency of the multiple cyclone is believed to be sufficient for the boiler to meet current applicable particulate emissions limitations.

Unit ID 007 - 33.0 MW Boiler Unit #7

The air pollution control associated with the boiler consists of a multiple cyclone for particulate emissions reduction. Manufacturer design details are attached. The control efficiency of the multiple cyclone is believed to be sufficient for the boiler to meet current applicable particulate emissions limitations.

Model #

Serial #

DATE INSTALLED

STEAM INJECTION

GENERAL

The steam injection control system provides the necessary flow of steam to the gas turbine combustion system in order to meet Federal and State regulations regarding the emission of nitrogen oxides (NO_x). The regulations not only require meeting the emission levels, but also require the continuous monitoring of fuel flow, steam injection flow, and other machine parameters to verify that the regulations are being met.

STEAM INJECTION HARDWARE

The steam injection control system hardware is located off-base, mounted in the steam piping. Figure SIR4000-1 shows a schematic of these control devices.

Devices

1. A metering tube and orifice are the primary devices for measurement of steam flow.
2. Two differential transmitters (96SJ-1, -2) measure pressure drop across the orifice. The two transmitters operate in a split-range mode, where one transmitter is calibrated to monitor the lower range of flow and the other, the higher range. Thus, the total flow range measurement accuracy is improved compared to a single transmitter arrangement.
3. A pressure transmitter (96PJ-1) measures steam pressure for calculation of steam flow and indication of steam condition.

4. Three thermocouples (ST-SJ-1, -2, -3) measure steam temperature for calculation of steam flow and indication of steam condition.
5. A pneumatically operated stop valve (controlled by trip solenoid 20SJ-1) opens to permit steam injection flow and closes to shut off flow when the system is not operating or when the system is tripped. A limit switch (33SJ-1) indicates valve-closed position.
6. Two pneumatically operated valves (controlled by solenoid valves 20BS-1, -2) provide steam-line condensate drain and warm-up prior to injection. Limit switches indicate valve position.
7. A steam control valve regulates the flow of steam to the gas turbine. This valve is driven by an electromechanical motor actuator which receives direction (open or close) and run signals from the gas turbine control system. The control valve has a limit switch which indicates valve fully closed position.

CONTROL PANEL/OPERATOR INTER-FACES

The turbine control panel provides the necessary information to the operator to indicate the operational status of the steam injection system. The steam injection system is manually enabled by selecting the "Manual Control Display" on the turbine control panel CRT, finding the "Steam Injection Control" page and pressing the "Steam Inj On" softswitch. The steam injection system is disabled by pressing the "Steam Inj Off" softswitch. When the steam

- o Assuming the turbine shutdown sequence continues, when the generator breaker opens, the steam stop valve will close and the #1 drain valve will open.
- o The operator should now close the steam-line isolation valve.

STEAM FLOW CONTROL

The steam flow program determines a steam injection flow setpoint based on fuel flow rate, ambient temperature and sometimes specific humidity. Figure SIR4000-2 shows a typical schedule. Note that there is a CONTROL schedule and a COMPLIANCE schedule. The COMPLIANCE schedule represents the amount of steam required to just meet the NO_x emissions requirement. If steam flow should ever fall to or below this schedule, an alarm will occur. The CONTROL schedule is the one used to control steam flow to the turbine. It is set higher than the COMPLIANCE schedule to account for the control system dead-band and normal operational transients. The separation between the curves is set by constant WQKR3.

As shown in Figure SIR4000-2, steam flow is initiated when fuel flow to the turbine reaches the value specified by constant WQK() E. At this point, the steam injection flow setpoint is released from 0. The setpoint assumes a value in accordance with the measured fuel flow, ambient temperature, and specific humidity. The control valve is allowed to ramp open until steam flow equals the setpoint. The ramp consists of a series of small steps. The control valve motor is turned on (in the open direction) for a fixed length of time and then turned off for another fixed length of time. The on time is set by timer L2WQOF1 and the off time by timer L2WQON. The ramp should be adjusted so the control valve opens as quickly as possible without upsetting the steam supply conditions.

Steam flow feedback is calculated from measured pressure drop across a flow orifice, compensated for steam temperature and pressure variations. Where there is a wide flow range, two differential transmitters are supplied to monitor flow in a split-range configuration; one transmitter calibrated for a low flow region, the other calibrated for a high flow region. Automatic switching between the two transmitters is programmed in the control logic of the computer. Based on the selected measurement of differential pressure, steam temperature and steam pressure, steam flow is calculated, forming the feedback for the flow control system.

PROTECTIVE FEATURES

Steam injection system alarm and shutoff conditions are detected by the protection task program within the microcomputer. Certain component or system conditions are alarmed only - to alert the operator of abnormal but not yet critical states. Other conditions result in shutoff of the steam injection system via the control valve or the stop valve.

Steam Supply Condition Trouble

The steam injection protection system monitors steam supply conditions to alarm or shutoff steam flow when abnormal conditions are detected. See Figure SIR4000-3 which illustrates the steam temperature and steam pressure supply conditions that will result in protective actions. Alarm actions are initiated by high or low pressure levels and by high or low temperatures. The low-temperature alarm setpoint is modified with pressure to track the saturation curve. The purpose of this alarm (and subsequent trip) is to insure that the supply steam is superheated. Steam injection shutdown actions are initiated on high steam pressure and high temperature for equipment protection. The steam injection shutdown signal is latched until operator actions are taken. To re-initiate

SIR4000-5

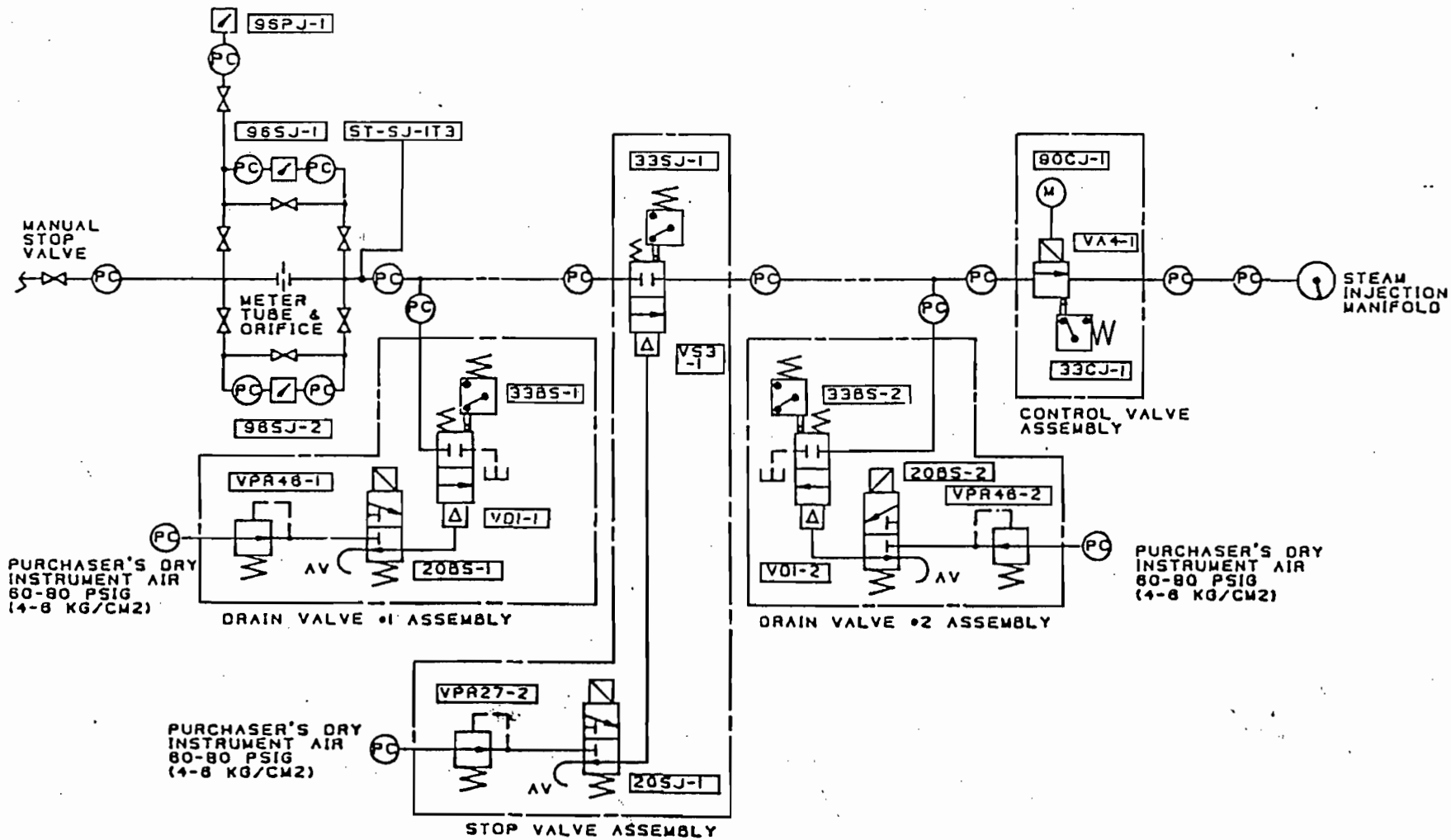
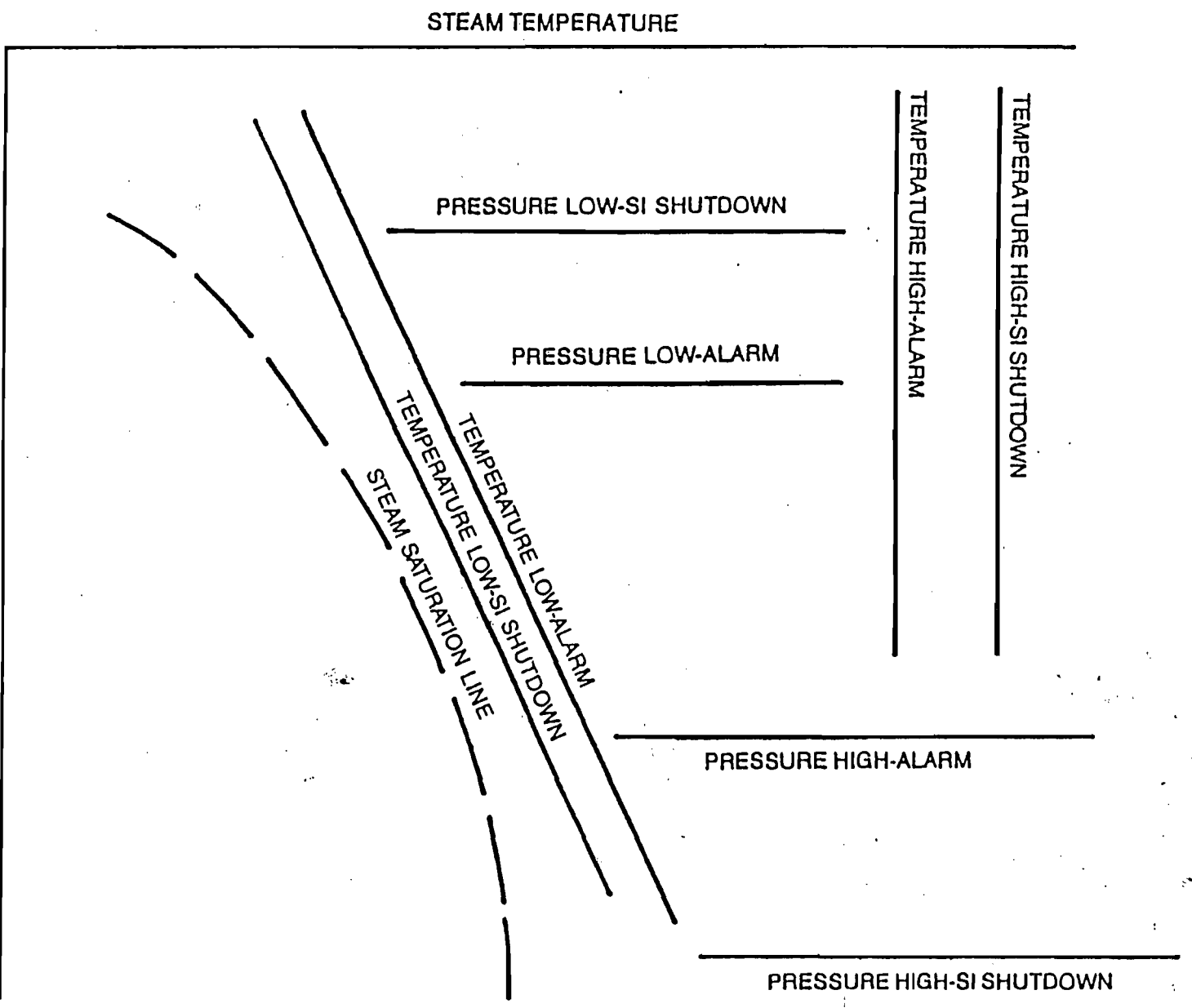


FIGURE SIR4000-1
(788)

STEAM SUPPLY CONDITION
ALARM & SHUTDOWN



STEAM PRESSURE

FIGURE SIR4000-3
(788)

SIR4000-7

STEAM INJECTION SYSTEM

GENERAL

The steam injection system provides the necessary flow of steam to the gas turbine combustion system to meet Federal and State exhaust emission requirements by limiting the emission of nitrogen oxides (NO_x) in the turbine exhaust. The strict regulations not only require meeting the emission levels, but also require the continuous monitoring of fuel flow, steam injection flow, and other machine parameters to verify that the regulations are being met.

The steam injection system, shown in the system schematic diagram (see Reference Drawings), consists of steam flow control and regulating valves and control and monitoring devices located off base in the purchaser's steam piping. The steam from this off-base source is supplied in a controlled flow to the turbine's steam injection manifold. The associated automatic electronic control system, part of the turbine control circuits, controlling this steam injection system utilizes the Mark IV computer as the basic control element and is described in the Control and Protection Section.

The main components of the steam injection system include the following:

1. A meter tube and orifice.
2. Differential pressure transmitters, 96SJ-1 and -2.
3. Steam supply pressure transmitter, 96PJ-1.
4. Thermocouple, ST-SJ-1T3.
5. Stop valve, VS3-1, pneumatically operated with limit switch, 33SJ-1.
6. Stop valve-trip solenoid, 20SJ-1.

7. Control air regulator valve, VPR27-2.
8. Steam line drain valves, VD1-1, -2 air actuated with limit switches 33BS-1, -2, -3.
9. Steam line drain valve-solenoid valve, 20BS-1, -2.
10. Drain valve air regulator valve, VPR46-1, -2.
11. Steam injection control valve, VA4-1, with electromechanical actuator and limit switch, 33CJ-1.
12. On-base steam injection manifold and piping to combustion chambers.

FUNCTIONAL DESCRIPTION

For a functional description of the steam injection system, refer to the steam injection system text in the Control and Protection section of this manual.

SYSTEM REQUIREMENTS

STEAM SUPPLY

The purchaser is to supply steam for the steam injection system to meet the system design requirements of flow, temperature and pressure (see Control Specification). The steam supplied must be superheated steam within the design temperature range of the system and must be at the specified minimum pressure to prevent backflow of combustion gases into the steam line. To keep within the system design operating range, the steam should not exceed the maximum specified temperature and pressure, otherwise, damage to seals and valve stem packing could result.

INSTRUMENT AIR

The purchaser is to supply dry instrument air at the pressure range specified on the steam injection piping schematic diagram for operation of the pneumatically operated stop valve and drain valves.

OPERATION

Before operating the steam injection system for the first time following an overhaul or periods of extended shutdown, it is important that the following checks be made:

1. Steam supply is within design parameters.
2. Instrument air supply is at required pressure.
3. Steam line orifice size is correct.
4. Pressure sensing lines are free of liquids.

PRE-OPERATION CHECKS

Prior to operation, check for the following conditions:

1. Panel controls are in Non select positions (Steam Injection OFF).
2. Manual stop valve is open.
3. All hand valves in line of flow are open.
4. All valves to temperature or pressure gauges are open.
5. Steam supply pressure and temperature are in operating range.

START UP

The automatic control system, in conjunction with logic circuits of the microcomputer of the SPEEDTRONIC control system, operates the steam injection system control valving and assures that the proper amount of steam injection is provided to the turbine combustion system during operation.

To initiate steam injection the operator must first select the "Manual Control Display" mode at the turbine control panel interface module. This mode will be displayed on the video display scope (CRT). By pressing the NEXT PAGE pushbutton (membrane switch), the display page will change until the "Steam Injection Control" page is reached. Then touching the function switch at the right of the CRT opposite the "Steam Inj ON" display initiates the steam injection control. At this point the automatic steam control circuits take over, initiate the drain and stop valve sequences and control the system. When steam conditions are correct, the steam control valve releases steam into the combustion system at the proper steam-to-fuel flow ratio.

The startup and operating sequence of the steam injection system is described and explained in the Steam Injection control system text of the Control and Protection section of this manual. (See CONTROL AND PROTECTION Tab).

MAINTENANCE

PERIODIC MAINTENANCE

During the first week of operation, the units steam injection on base piping and the control valves in the steam supply line should be checked periodically for leaks or other defects. After initial system checks monthly checks should be made.

All hand-operated valves should be cycled once a month to check freedom of movement. They should be returned to their normal operating position after this.

TROUBLE SHOOTING

The purpose of the system is to provide steam to the turbine combustion system at the desired pressure, temperature and flow. If this does not happen, the following problems may be the cause:

- a. Steam supply exhausted.
- b. Insufficient supply pressure.
- c. Control valve closed.
- d. Stop valve closed.

The following should be checked:

- a. Adequate steam supply.
- b. Check steam supply system.
- c. Check control valve actuator and drain valve operation.

- d. Check that instrument air supply is of sufficient pressure and/or solenoid control valve operation.

Alarm and shutdown conditions of the steam injection system are detected by a protection program built into the micro-computer. Alarm and trip indications are displayed on the turbine panel CRT scope. An alarm condition is initiated by high or low pressure levels and by high or low temperatures. See Control Specification for alarm and trip point values.

The computer program is designed to trip the steam STOP valve and prevent steam flow if steam temperature becomes excessive. It can trip the system on temperature or pressure. Steam at too high a pressure can cause damage to valve stem packing and system seals. A steam injection trip only shuts down the steam injection system, it does not trip the turbine.

Certain trouble status indications can be displayed as messages on the CRT screen. Refer to the elementary diagram for alarm numbers and messages.

STEAM INJECTION SYSTEM

INFORMATION FOR THE COMPONENTS LISTED BELOW IS CONTAINED
IN THE ASSOCIATED PUBLICATION.

<u>COMPONENT</u>	<u>SYMBOL</u>	<u>MANUFACTURER</u>	<u>PUBLICATION</u>
STEAM FLOW DIFFERENTIAL PRESSURE TRANSMITTER	96SJ-1 96AJ-1	ROSEMOUNT INC. MODEL 1151DP	4256/4257
STEAM INJECTION PRESSURE TRANSMITTER	96PJ-1 96PJ-2	ROSEMOUNT INC. MODEL 1151GP	4260/4261
<u>STEAM CONTROL VALVE ASSEMBLY</u>			
STEAM CONTROL VALVE WITH ACTUATOR AND ACCESSORIES	VA4-1 VA4-2	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33CJ-1 33CJ-2	MASONEILAN DIV. SERIES 496	ES-7000
	90CJ-1	MASONEILAN DIV. SERIES 4600	ES-2000
<u>STEAM STOP VALVE ASSEMBLY</u>			
STEAM STOP VALVE WITH ACTUATOR AND ACCESSORIES	VS3-1 VS3-2	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33SJ-2	MASONEILAN DIV. SERIES 496	ES-7000
	20SJ-1 20AJ-1,2	AUTOMATIC SWITCH CO.	V5688, V5380, V5551
	VPR27-2 VPR27-3	MASONEILAN DIV. MODEL 77-4	EY7700
<u>DRAIN VALVE ASSEMBLY</u>			
DRAIN VALVE, ACTUATOR AND ACCESSORIES	VD1-1, 2,4,5	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33BS-1, 2,4,5	MASONEILAN DIV. MODEL 496	ES-7000
	20BS-1, 2,4,5	AUTOMATIC SWITCH CO. CAT HT8320A185	V-5688 & V-5380
	VPR46-1, 2,4,5	MASONEILAN DIV. MODEL 77-4	EY7700

NOX

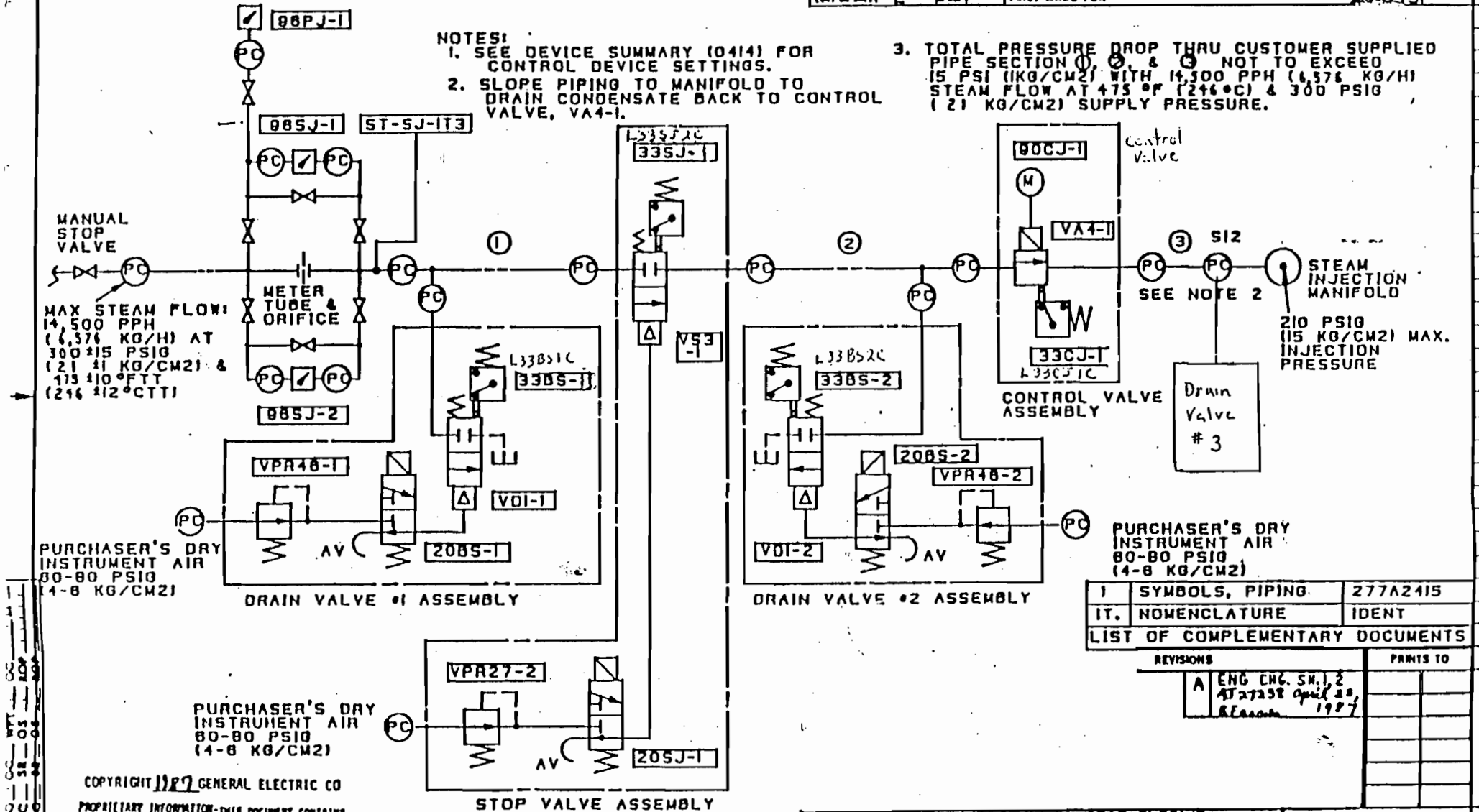
247B5083

247B5083	TITLE	DIAGRAM, SCHEM PP-ST INJECTION
CONT ON SHEET 2	FIRST MADE FOR	ML-7L5AIPP388-1

NOTES:

1. SEE DEVICE SUMMARY (0414) FOR CONTROL DEVICE SETTINGS.
2. SLOPE PIPING TO MANIFOLD TO DRAIN CONDENSATE BACK TO CONTROL VALVE, VA4-1.

3. TOTAL PRESSURE DROP THRU CUSTOMER SUPPLIED PIPE SECTION ①, ②, & ③ NOT TO EXCEED 15 PSI (1KG/CM²) WITH 14,500 PPH (6,576 KG/H) STEAM FLOW AT 475 °F (246 °C) & 300 PSIG (21 KG/CM²) SUPPLY PRESSURE.



MAX STEAM FLOW:
14,500 PPH
(6,576 KG/H) AT
300 ±15 PSIG
(21 ±1 KG/CM²) &
173 ±10 °FTT
(216 ±12 °CTT)

PURCHASER'S DRY
INSTRUMENT AIR
80-80 PSIG
(4-8 KG/CM²)

PURCHASER'S DRY
INSTRUMENT AIR
80-80 PSIG
(4-8 KG/CM²)

210 PSIG
(15 KG/CM²) MAX.
INJECTION
PRESSURE

1	SYMBOLS, PIPING	277A2415
IT.	NOMENCLATURE	IDENT

REVISIONS		PRINTS TO
A	ENG CHG. SH. 1, 2 AJ27258 April 28, 1987	

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MADE BY M. L. ... 2/27/87	APPROVALS 7/28/87	GAS TURBINE	REV. NO. 2	247B5083
		SCHENECTADY	LOCATION	CONT ON SHEET 2
				REV. A 4/28/87

STEAM INJECTION

GENERAL

The steam injection control system provides the necessary flow of steam to the gas turbine combustion system in order to meet Federal and State regulations regarding the emission of nitrogen oxides (NO_x). The regulations not only require meeting the emission levels, but also require the continuous monitoring of fuel flow, steam injection flow, and other machine parameters to verify that the regulations are being met.

STEAM INJECTION HARDWARE

The steam injection control system hardware is located off-base, mounted in the steam piping. Figure SIR4000-1 shows a schematic of these control devices.

Devices

1. A metering tube and orifice are the primary devices for measurement of steam flow.
2. Two differential transmitters (96SJ-1, -2) measure pressure drop across the orifice. The two transmitters operate in a split-range mode, where one transmitter is calibrated to monitor the lower range of flow and the other, the higher range. Thus, the total flow range measurement accuracy is improved compared to a single transmitter arrangement.
3. A pressure transmitter (96PJ-1) measures steam pressure for calculation of steam flow and indication of steam condition.
4. Three thermocouples (ST-SJ-1, -2, -3) measure steam temperature for calculation of steam flow and indication of steam condition.
5. A pneumatically operated stop valve (controlled by trip solenoid 20SJ-1) opens to permit steam injection flow and closes to shut off flow when the system is not operating or when the system is tripped. A limit switch (33SJ-1) indicates valve-closed position.
6. Two pneumatically operated valves (controlled by solenoid valves 20BS-1, -2) provide steam-line condensate drain and warm-up prior to injection. Limit switches indicate valve position.
7. A steam control valve regulates the flow of steam to the gas turbine. This valve is driven by an electromechanical motor actuator which receives direction (open or close) and run signals from the gas turbine control system. The control valve has a limit switch which indicates valve fully closed position.

CONTROL PANEL/OPERATOR INTER-FACES

The turbine control panel provides the necessary information to the operator to indicate the operational status of the steam injection system. The steam injection system is manually enabled by selecting the "Manual Control Display" on the turbine control panel CRT, finding the "Steam Injection Control" page and pressing the "Steam Inj On" softswitch. The steam injection system is disabled by pressing the "Steam Inj Off" softswitch. When the steam

- o Assuming the turbine shutdown sequence continues, when the generator breaker opens, the steam stop valve will close and the #1 drain valve will open.
- o The operator should now close the steam-line isolation valve.

STEAM FLOW CONTROL

The steam flow program determines a steam injection flow setpoint based on fuel flow rate, ambient temperature and sometimes specific humidity. Figure SIR4000-2 shows a typical schedule. Note that there is a CONTROL schedule and a COMPLIANCE schedule. The COMPLIANCE schedule represents the amount of steam required to just meet the NO_x emissions requirement. If steam flow should ever fall to or below this schedule, an alarm will occur. The CONTROL schedule is the one used to control steam flow to the turbine. It is set higher than the COMPLIANCE schedule to account for the control system dead-band and normal operational transients. The separation between the curves is set by constant WQKR3.

As shown in Figure SIR4000-2, steam flow is initiated when fuel flow to the turbine reaches the value specified by constant WQK() E. At this point, the steam injection flow setpoint is released from 0. The setpoint assumes a value in accordance with the measured fuel flow, ambient temperature, and specific humidity. The control valve is allowed to ramp open until steam flow equals the setpoint. The ramp consists of a series of small steps. The control valve motor is turned on (in the open direction) for a fixed length of time and then turned off for another fixed length of time. The on time is set by timer L2WQOF1 and the off time by timer L2WQON. The ramp should be adjusted so the control valve opens as quickly as possible without upsetting the steam supply conditions.

Steam flow feedback is calculated from measured pressure drop across a flow orifice, compensated for steam temperature and pressure variations. Where there is a wide flow range, two differential transmitters are supplied to monitor flow in a split-range configuration; one transmitter calibrated for a low flow region, the other calibrated for a high flow region. Automatic switching between the two transmitters is programmed in the control logic of the computer. Based on the selected measurement of differential pressure, steam temperature and steam pressure, steam flow is calculated, forming the feedback for the flow control system.

PROTECTIVE FEATURES

Steam injection system alarm and shutoff conditions are detected by the protection task program within the microcomputer. Certain component or system conditions are alarmed only - to alert the operator of abnormal but not yet critical states. Other conditions result in shutoff of the steam injection system via the control valve or the stop valve.

Steam Supply Condition Trouble

The steam injection protection system monitors steam supply conditions to alarm or shutoff steam flow when abnormal conditions are detected. See Figure SIR4000-3 which illustrates the steam temperature and steam pressure supply conditions that will result in protective actions. Alarm actions are initiated by high or low pressure levels and by high or low temperatures. The low-temperature alarm setpoint is modified with pressure to track the saturation curve. The purpose of this alarm (and subsequent trip) is to insure that the supply steam is superheated. Steam injection shutdown actions are initiated on high steam pressure and high temperature for equipment protection. The steam injection shutdown signal is latched until operator actions are taken. To re-initiate

SIR4000-5

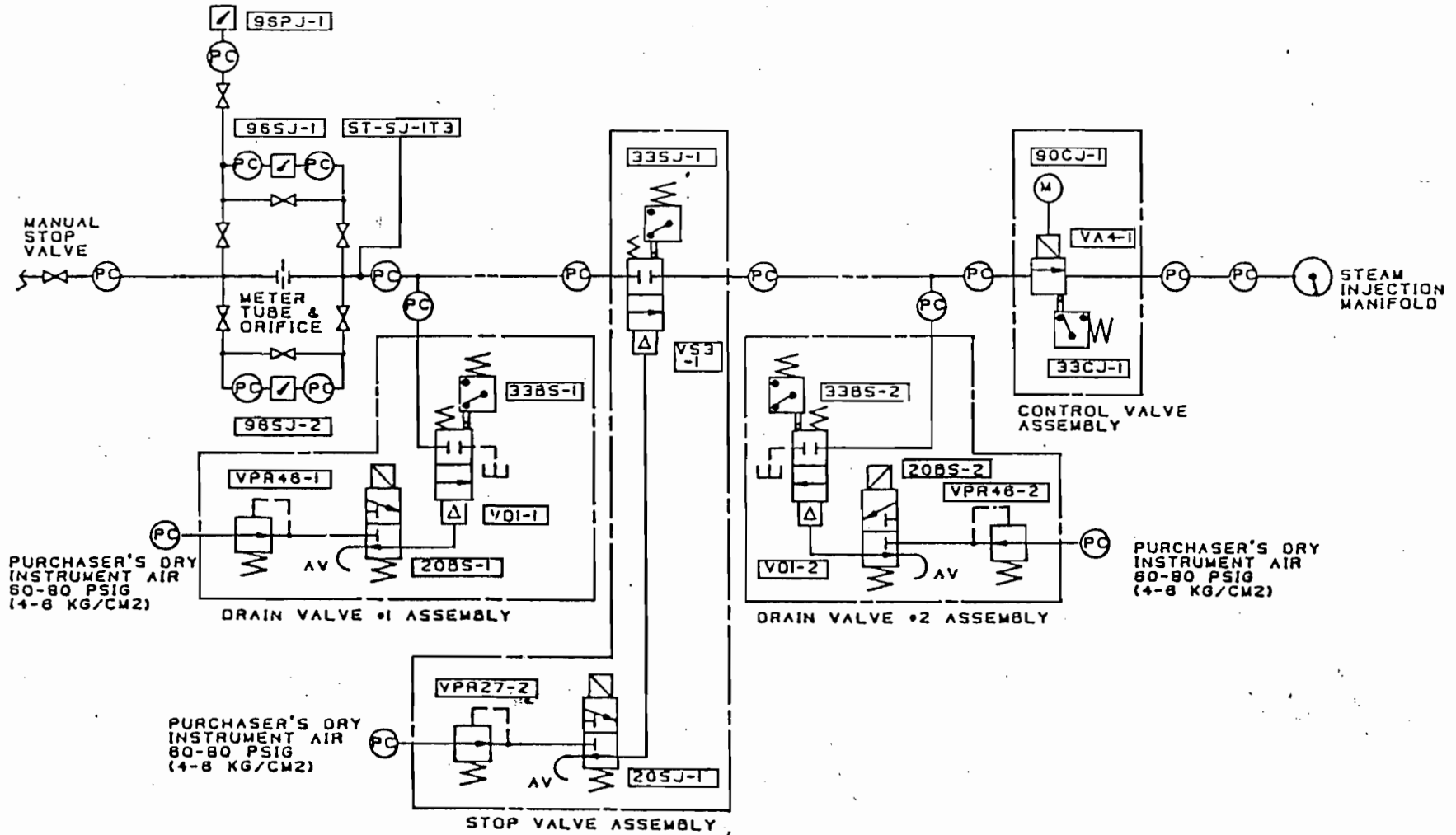


FIGURE SIR4000-1
(788)

STEAM SUPPLY CONDITION
ALARM & SHUTDOWN

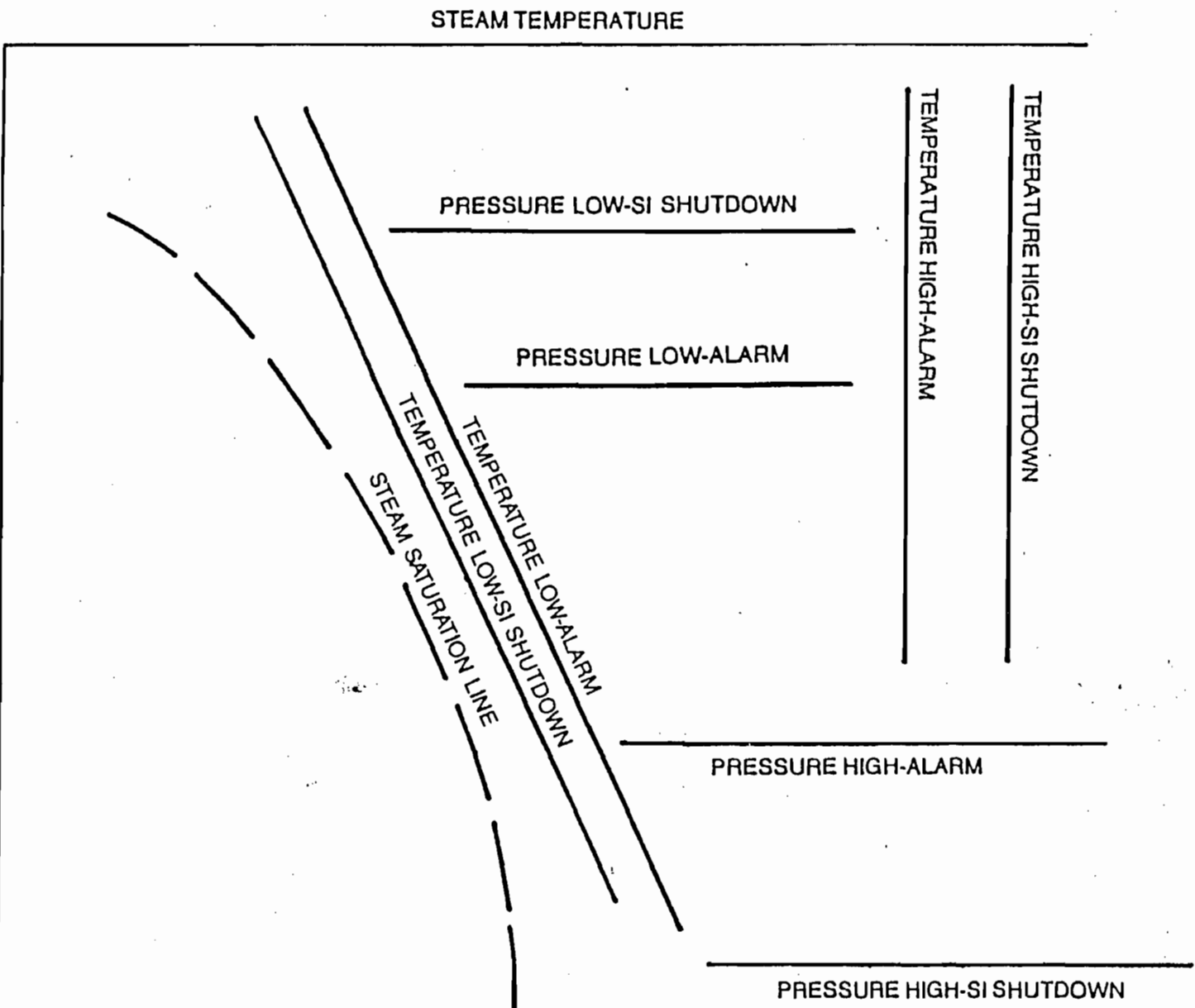


FIGURE SIR4000-3
(788)

SIR4000-7

STEAM INJECTION SYSTEM

GENERAL

The steam injection system provides the necessary flow of steam to the gas turbine combustion system to meet Federal and State exhaust emission requirements by limiting the emission of nitrogen oxides (NO_x) in the turbine exhaust. The strict regulations not only require meeting the emission levels, but also require the continuous monitoring of fuel flow, steam injection flow, and other machine parameters to verify that the regulations are being met.

The steam injection system, shown in the system schematic diagram (see Reference Drawings), consists of steam flow control and regulating valves and control and monitoring devices located off base in the purchaser's steam piping. The steam from this off-base source is supplied in a controlled flow to the turbine's steam injection manifold. The associated automatic electronic control system, part of the turbine control circuits, controlling this steam injection system utilizes the Mark IV computer as the basic control element and is described in the Control and Protection Section.

The main components of the steam injection system include the following:

1. A meter tube and orifice.
2. Differential pressure transmitters, 96SJ-1 and -2.
3. Steam supply pressure transmitter, 96PJ-1.
4. Thermocouple, ST-SJ-1T3.
5. Stop valve, VS3-1, pneumatically operated with limit switch, 33SJ-1.
6. Stop valve-trip solenoid, 20SJ-1.

7. Control air regulator valve, VPR27-2.
8. Steam line drain valves, VD1-1, -2 air actuated with limit switches 33BS-1, -2, -3.
9. Steam line drain valve-solenoid valve, 20BS-1, -2.
10. Drain valve air regulator valve, VPR46-1, -2.
11. Steam injection control valve, VA4-1, with electromechanical actuator and limit switch, 33CJ-1.
12. On-base steam injection manifold and piping to combustion chambers.

FUNCTIONAL DESCRIPTION

For a functional description of the steam injection system, refer to the steam injection system text in the Control and Protection section of this manual.

SYSTEM REQUIREMENTS

STEAM SUPPLY

The purchaser is to supply steam for the steam injection system to meet the system design requirements of flow, temperature and pressure (see Control Specification). The steam supplied must be superheated steam within the design temperature range of the system and must be at the specified minimum pressure to prevent backflow of combustion gases into the steam line. To keep within the system design operating range, the steam should not exceed the maximum specified temperature and pressure, otherwise, damage to seals and valve stem packing could result.

All hand-operated valves should be cycled once a month to check freedom of movement. They should be returned to their normal operating position after this.

TROUBLE SHOOTING

The purpose of the system is to provide steam to the turbine combustion system at the desired pressure, temperature and flow. If this does not happen, the following problems may be the cause:

- a. Steam supply exhausted.
- b. Insufficient supply pressure.
- c. Control valve closed.
- d. Stop valve closed.

The following should be checked:

- a. Adequate steam supply.
- b. Check steam supply system.
- c. Check control valve actuator and drain valve operation.

- d. Check that instrument air supply is of sufficient pressure and/or solenoid control valve operation.

Alarm and shutdown conditions of the steam injection system are detected by a protection program built into the micro-computer. Alarm and trip indications are displayed on the turbine panel CRT scope. An alarm condition is initiated by high or low pressure levels and by high or low temperatures. See Control Specification for alarm and trip point values.

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Certain trouble status indications can be displayed as messages on the CRT screen. Refer to the elementary diagram for alarm numbers and messages.

STEAM INJECTION SYSTEM

INFORMATION FOR THE COMPONENTS LISTED BELOW IS CONTAINED
IN THE ASSOCIATED PUBLICATION

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	33CJ-1 33CJ-2	MASONEILAN DIV. SERIES 496	ES-7000
	90CJ-1	MASONEILAN DIV. SERIES 4600	ES-2000
<u>STEAM STOP VALVE ASSEMBLY</u>			
STEAM STOP VALVE WITH ACTUATOR AND ACCESSORIES	VS3-1 VS3-2	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33SJ-2	MASONEILAN DIV. SERIES 496	ES-7000
	20SJ-1 20AJ-1,2	AUTOMATIC SWITCH CO.	V5688, V5380, V5551
	VPR27-2 VPR27-3	MASONEILAN DIV. MODEL 77-4	EY7700
<u>DRAIN VALVE ASSEMBLY</u>			
DRAIN VALVE, ACTUATOR AND ACCESSORIES	VD1-1, 2,4,5	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33BS-1, 2,4,5	MASONEILAN DIV. MODEL 496	ES-7000
	20BS-1, 2,4,5	AUTOMATIC SWITCH CO. CAT HT8320A185	V-5688 & V-5380
	VPR46-1, 2,4,5	MASONEILAN DIV. MODEL 77-4	EY7700

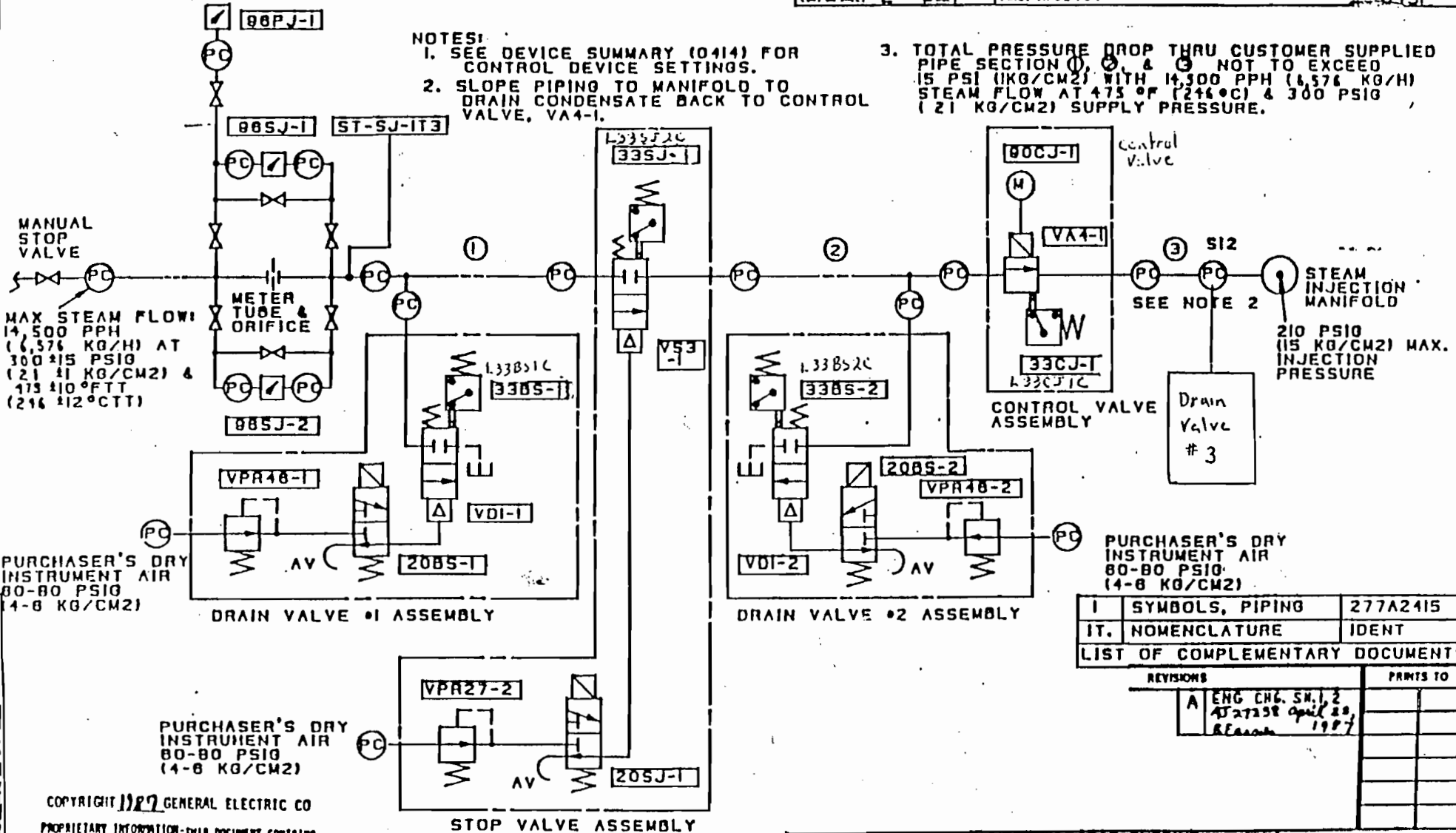
NOX

24785083

GENERAL ELECTRIC 000 24785083

24785083	TITLE	DIAGRAM, SCHEM PP-ST INJECTION
2	FIRST MADE FOR	ML-7L5AIPP388-1

- NOTES:
- SEE DEVICE SUMMARY (0414) FOR CONTROL DEVICE SETTINGS.
 - SLOPE PIPING TO MANIFOLD TO DRAIN CONDENSATE BACK TO CONTROL VALVE, VA4-1.
 - TOTAL PRESSURE DROP THRU CUSTOMER SUPPLIED PIPE SECTION ①, ②, & ③ NOT TO EXCEED 15 PSI (1KG/CM²) WITH 14,500 PPH (6,576 KG/H) STEAM FLOW AT 475 °F (246 °C) & 300 PSIG (21 KG/CM²) SUPPLY PRESSURE.



MAX STEAM FLOW:
14,500 PPH
(6,576 KG/H) AT
300 ± 15 PSIG
(21 ± 1 KG/CM²) &
175 ± 10 °FTT
(216 ± 12 °CTT)

PURCHASER'S DRY
INSTRUMENT AIR
80-80 PSIG
(4-8 KG/CM²)

PURCHASER'S DRY
INSTRUMENT AIR
80-80 PSIG
(4-8 KG/CM²)

STEAM
INJECTION
MANIFOLD
210 PSIG
(15 KG/CM²) MAX.
INJECTION
PRESSURE

PURCHASER'S DRY
INSTRUMENT AIR
80-80 PSIG
(4-8 KG/CM²)

1	SYMBOLS, PIPING	277A2415
IT.	NOMENCLATURE	IDENT

REVISIONS		PRINTS TO
A	ENG CHG. SN. 1, 2 AS 27258 April 28, Release 1987	

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MADE BY <i>Alison 2/27/87</i>	APPROVALS <i>RE</i>	GAS TURBINE	DWG NO. 24785083
ISSUED <i>March 31, 1987</i>		SCHENECTADY	LOCATION CONT ON SHEET 2 OF 1
			REV. A 4/28/87

UNIT #6 BOILER
CYCLONES

P R A T - D A N I E L C O R P O R A T I O N

POWER PLANT EQUIPMENT

Executive Offices and Plant
South Norwalk, Conn.

Fans, Stacks
Dust Collectors
Air Heaters
Thermobloc
Industrial Heaters

Project & Sales Engineers
THE THERMIX CORPORATION
Greenwich, Connecticut

JOB SUMMARY

The Babcock & Wilcox Company
P. O. #777-232523 Gr. 89
City of Fort Pierce, Fla.
Prat-Daniel File 357-55

- (1) Design 6UPHT #18-386 Prat-Daniel Tubular Dust Collector, 3/16" Corten steel hoppers, inlet damper, water washing system

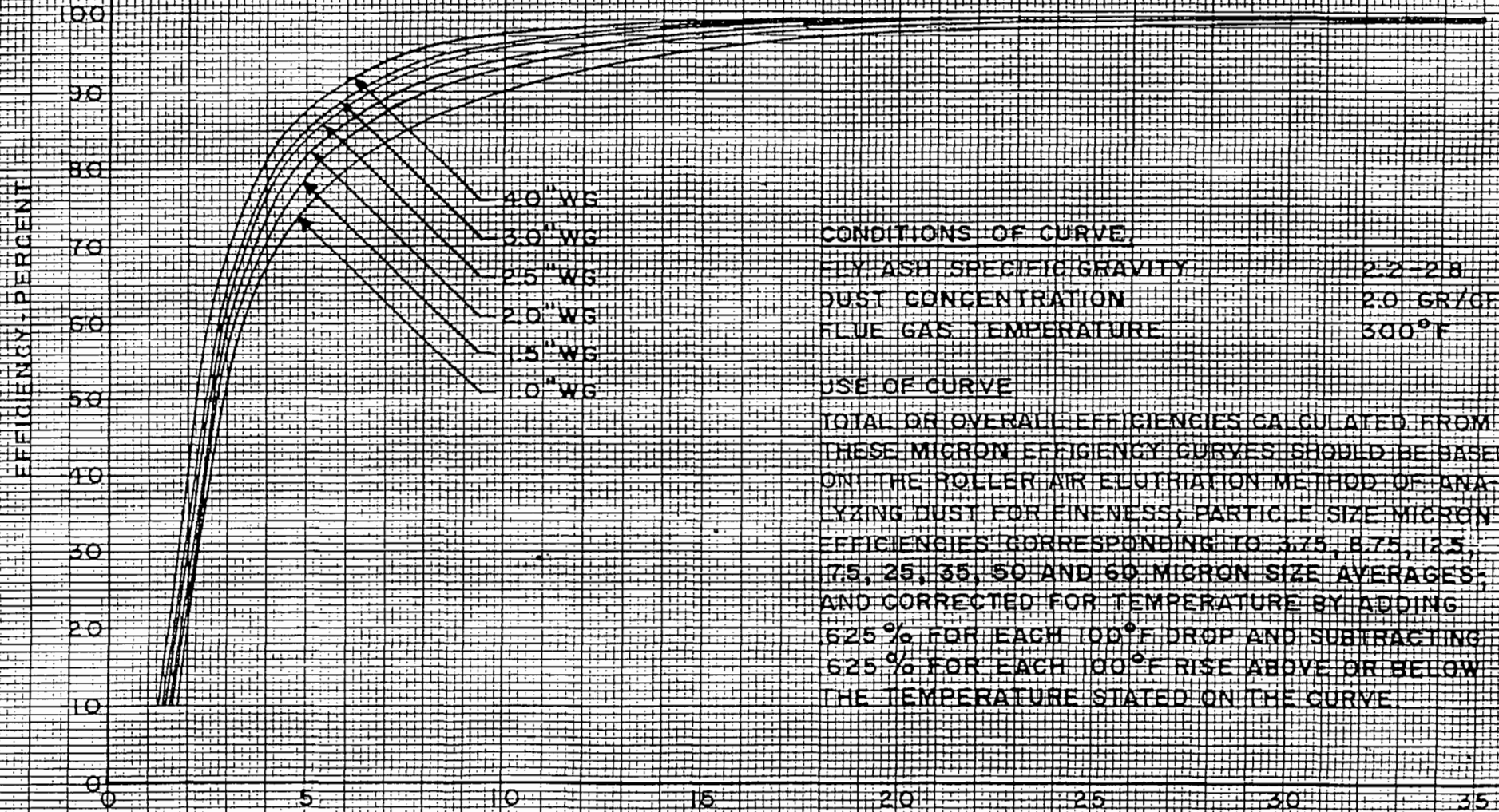
PERFORMANCE: Elev. Sea Level Bar.: 30" Hg.

Lbs. gas per hour	242,000
Temperature deg. F.	350
Collector resistance, "w.g.	2.5
Collection efficiency based on Curve GO-31-E.	

THERMIX	NAME	DATE
DRAWN BY	ara	5/19/55
COMPUTED BY		

APPROVED BY	NAME	DATE
THERMIX	WMO	5/19/55
PRAT-DANIEL		

PRAT-DANIEL DESIGN 6 UP DUST COLLECTOR MICRON EFFICIENCY CURVES



CONDITIONS OF CURVE

FLY ASH SPECIFIC GRAVITY	2.2-2.8
DUST CONCENTRATION	2.0 GR/GF
FLUE GAS TEMPERATURE	300°F

USE OF CURVE

TOTAL OR OVERALL EFFICIENCIES CALCULATED FROM THESE MICRON EFFICIENCY CURVES SHOULD BE BASED ON THE ROLLER AIR ELUTRIATION METHOD OF ANALYZING DUST FOR FINENESS; PARTICLE SIZE MICRON EFFICIENCIES CORRESPONDING TO 3.75, 8.75, 12.5, 17.5, 25, 35, 50 AND 60 MICRON SIZE AVERAGES; AND CORRECTED FOR TEMPERATURE BY ADDING 6.25% FOR EACH 100°F DROP AND SUBTRACTING 6.25% FOR EACH 100°F RISE ABOVE OR BELOW THE TEMPERATURE STATED ON THE CURVE.

MANUFACTURED BY
PRAT-DANIEL CORP.
SOUTH NORWALK, CONN.

DUST PARTICLE SIZE MICRONS

CURVE 60-31-E

PROJECT ENGINEERS
THE THERMIX CORP.
GREENWICH, CONN.

UNIT #6 CYCLOONES

REVISED JUNE 6, 1965

UNIT # 7
CYCLONES

JOB SUMMARY

Foster Wheeler Corporation
P. O. No. N-1581-2-78-234
City of Fort Pierce, Florida
Aerotec Industries, Inc. File No. 60-488

(2) Design 6UPHT #16-367 Aerotec Coll's, water washing system in inlet and outlet areas.

PERFORMANCE: Elev.: Sea Level

Bar.: 30" Hg.

Lbs. Gas per Hour	248,000	269,000
Temperature Deg. F.	311	311
CFM at Pressure	77,100	83,900
Collector Resistance		
"W.G.	2.50	2.96
Collection Efficiency, %	91	

The above noted collection efficiency is guaranteed in accordance with curve GO-31-E-R1 and the following Flys Ash Analysis.

DUST ANALYSIS
ELUTRIATION

<u>Particle Size</u>	<u>Average Partical Size</u>	<u>% In Gas Stream</u>
60 Microns	60 Microns	16
-60/40 Microns	50 Microns	3
-40/30 Microns	35 Microns	4
-30/20 Microns	25 Microns	14
-20/15 Microns	17.5 Microns	11
-15/10 Microns	12.5 Microns	17
-10/ 7 1/2 Microns	8.75 Microns	10
- 7-1/2 Microns	3.75 Microns	25

Attachment D

DESCRIPTION OF STACK SAMPLING FACILITIES

FOR UNITS 7, 8 AND 9

4.2 Sampling Locations

Locations of the sample ports and stack dimensions are shown in Figure 1. Sampling was performed through seven ports located on one side of the rectangular stack. Forty two sample points were selected for the preliminary oxygen traverse in accordance with EPA Method 20 and EPA Method 1 - Sample and Velocity Traverses for Stationary Sources, 40 CFR 60, Appendix A. Of these forty two points, twelve points exhibiting the lowest oxygen concentrations were utilized for the sulfur dioxide sampling.

Carbon monoxide, nitrogen oxides, and oxygen sampling were performed from the same sampling ports as the sulfur dioxide sampling.

4.3 Sampling Trains

The sulfur dioxide sampling train consisted of a Nutech Corporation 10 foot probe utilizing a stainless steel nozzle, a heated glass liner, a heated glass fiber filter and four impingers arranged as shown in Figure 2. The first impinger was charged with 100 milliliters of 80% isopropanol, the second and third impingers were each charged with 100 milliliters of 3% hydrogen peroxide and the fourth impinger was charged with indicating silica gel desiccant. The impingers were cooled in an ice and water bath during sampling. A Nutech Corporation control console was used to monitor the gas flow rates and stack conditions during sampling.

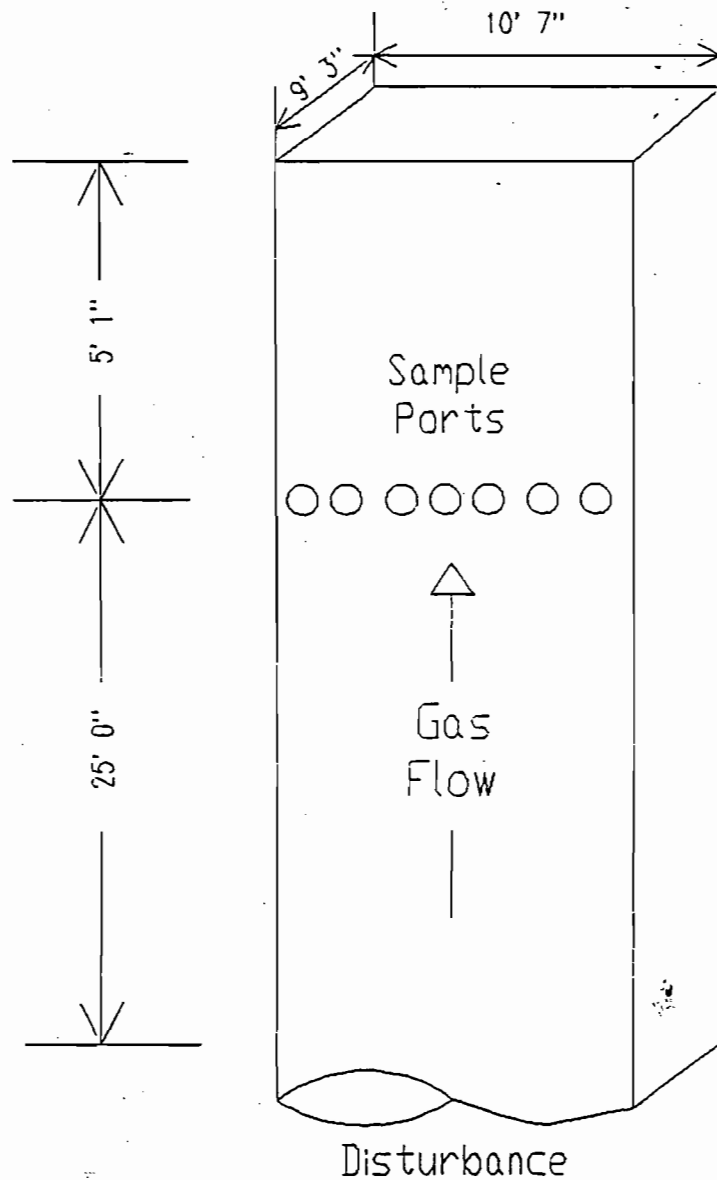


Figure 1. Stack Dimensions and sample port locations, Fort Pierce Utilities Authority, H.D. King Electric Generating Plant, Unit No.9. Fort Pierce, Florida.

9 1/32"

6 SPCS # APPROX. 1' 6 3/16" = 9' 15/16"

9 1/32"

3" X 3" X 1/4" TI

9 1/16"

5' 6"

6' 8 1/2"

1' 11 9/16"

W8 X 13#

SAME POTS

W8 X 13#

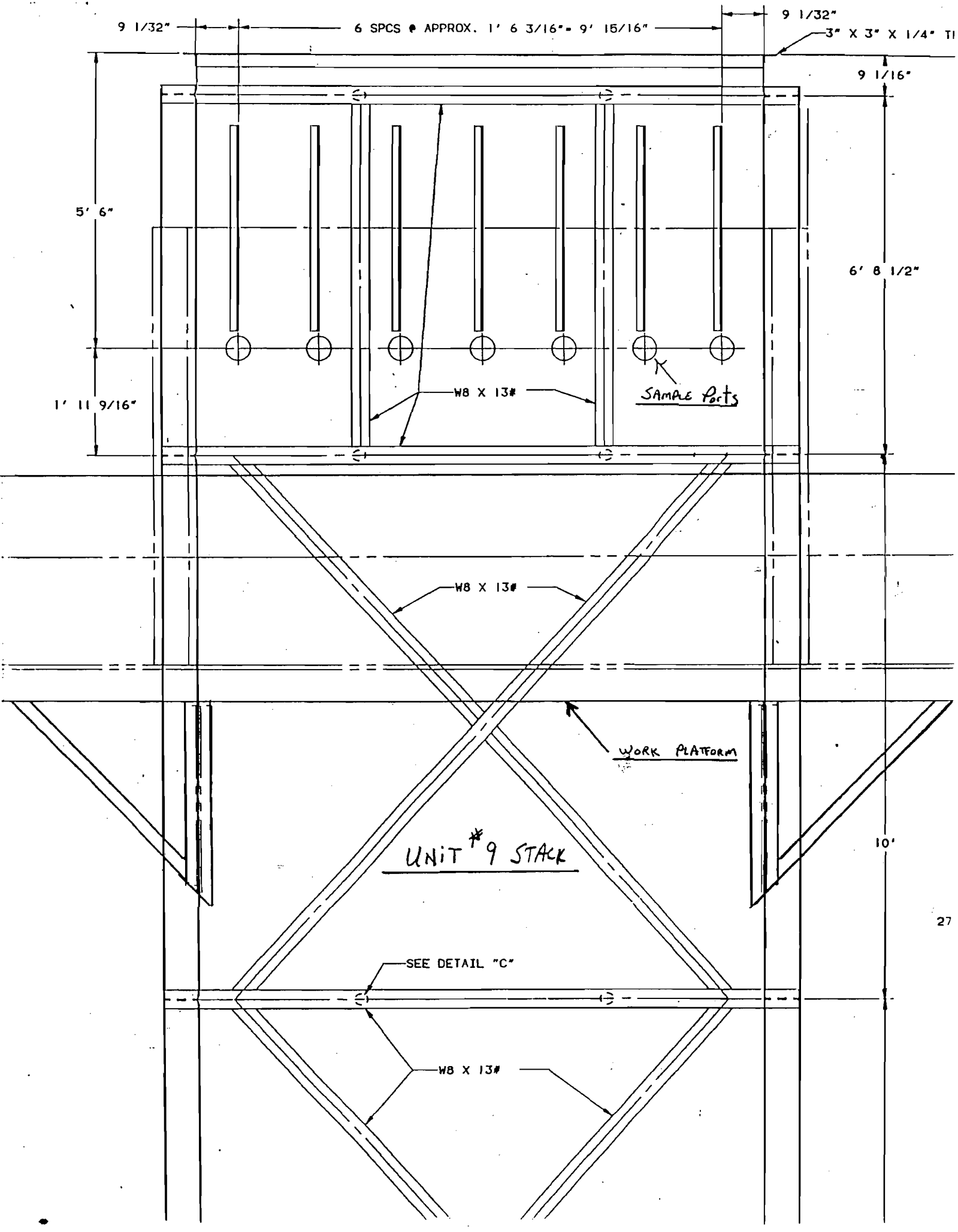
WORK PLATFORM

UNIT # 9 STACK

10'

SEE DETAIL "C"

W8 X 13#



Appendix A. Nitrogen oxides emissions sampling was conducted in accordance with EPA Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure), 40 CFR 60, Appendix A. Sulfur dioxide emissions sampling was conducted in accordance with EPA Method 6 - Determination of Sulfur Dioxide Emissions from Stationary Sources, 40 CFR 60, Appendix A. Volatile organic compounds emissions sampling was conducted in accordance with EPA Method 25A - Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer, 40 CFR 60, Appendix A. Visible emissions were determined in accordance with EPA Method 9 - Visual Determination of the Opacity of Emissions from Stationary Sources, 40 CFR 60, Appendix A.

UNIT 7

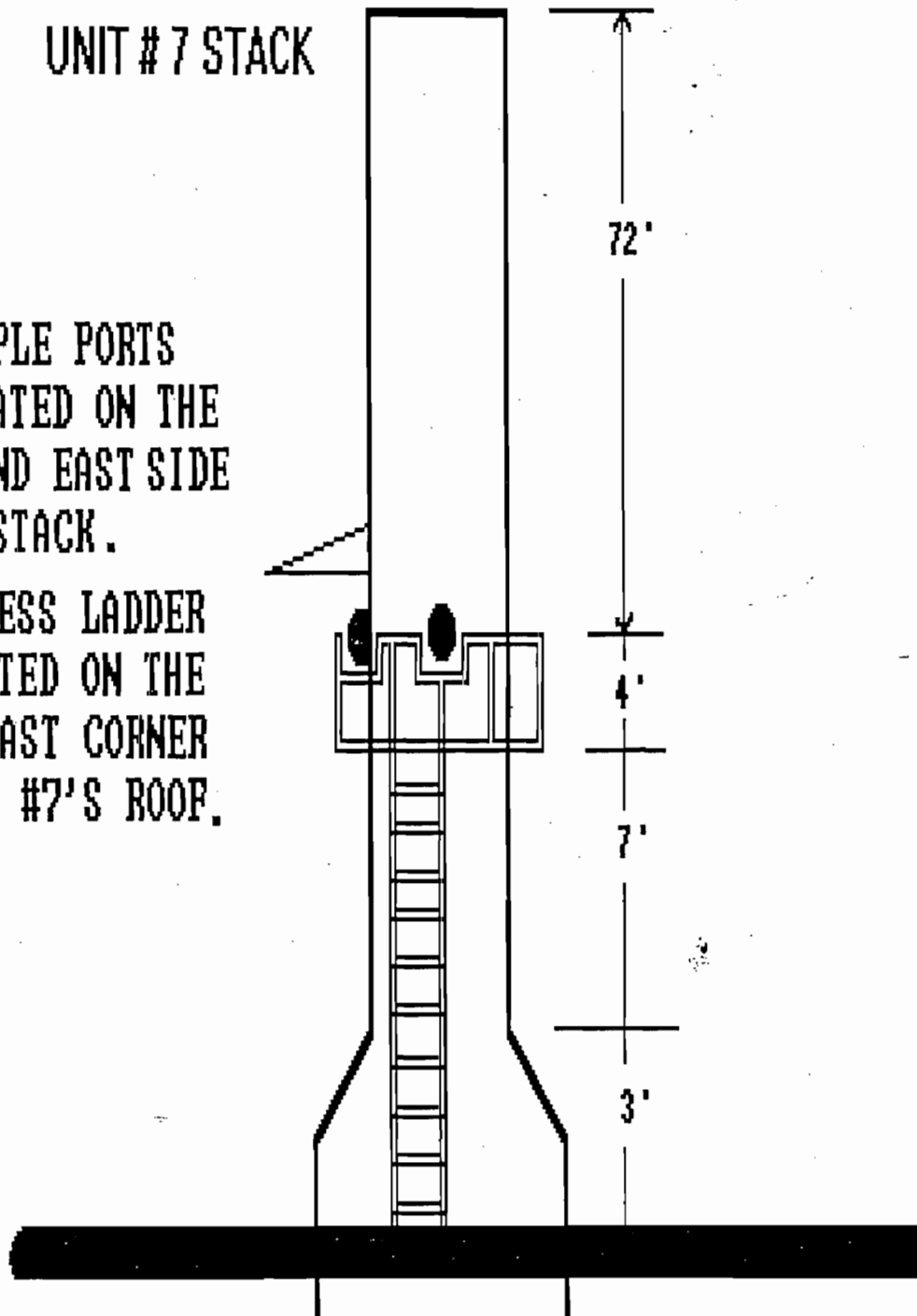
4.2 Sampling Locations

Locations of the sample ports and stack dimensions are shown in Figure 1. Particulate and sulfur dioxide sampling was performed by conducting horizontal traverses through each of two ports located on the stack at a ninety degree angle from one another. Twenty four sample points were chosen in accordance with EPA Method 1 - Sample and Velocity Traverses for Stationary Sources, 40 CFR 60, Appendix A. Carbon monoxide, nitrogen oxides, volatile organic compounds, and oxygen sampling were performed from the same sampling ports as the particulate sampling.

UNIT # 7 STACK

THE SAMPLE PORTS
ARE LOCATED ON THE
SOUTH AND EAST SIDE
OF THE STACK.

THE ACCESS LADDER
IS LOCATED ON THE
SOUTH EAST CORNER
OF UNIT #7'S ROOF.



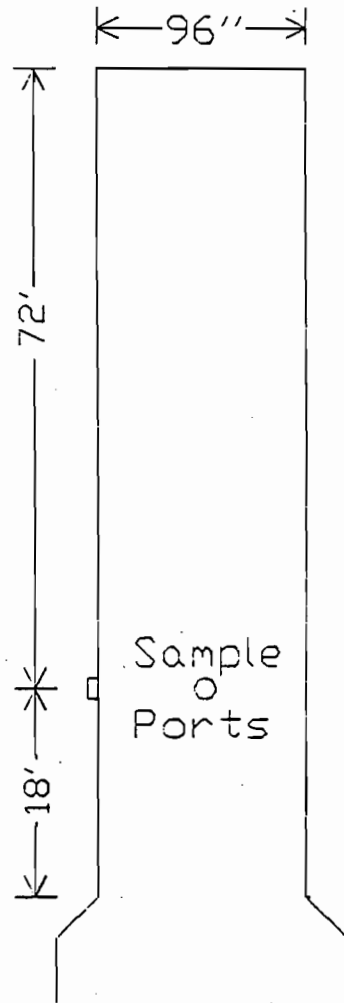


Figure 1. Stack Dimensions and sample port locations, Fort Pierce Utilities Authority, H.D. King Electric Generating Plant, Unit 7. Fort Pierce, Florida.

Appendix A. Nitrogen oxides emissions sampling was conducted in accordance with EPA Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure), 40 CFR 60, Appendix A. Sulfur dioxide emissions sampling was conducted in accordance with EPA Method 6 - Determination of Sulfur Dioxide Emissions from Stationary Sources, 40 CFR 60, Appendix A. Volatile organic compounds emissions sampling was conducted in accordance with EPA Method 25A - Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer, 40 CFR 60, Appendix A. Visible emissions were determined in accordance with EPA Method 9 - Visual Determination of the Opacity of Emissions from Stationary Sources, 40 CFR 60, Appendix A.

Unit 8

4.2 Sampling Locations

Locations of the sample ports and stack dimensions are shown in Figure 1. Particulate and sulfur dioxide sampling was performed by conducting horizontal traverses through each of two ports located on the stack at a ninety degree angle from one another. Twenty four sample points were chosen in accordance with EPA Method 1 - Sample and Velocity Traverses for Stationary Sources, 40 CFR 60, Appendix A. Carbon monoxide, nitrogen oxides, volatile organic compounds, and oxygen sampling were performed from the same sampling ports as the particulate sampling.

UNIT #8

CAGED LADDER

ASSY. B (F-3)

A (e-8)

8'-0" I.D.

TOP OF STACK
EL. 155'-11 1/2"

11'-2 1/2"

A

L4x3x1/4

(TYP ALL AROUND)

3" (TYP)

I.D. OF NIPPLE
TO BE SAME
ELEV. AS TOP
OF HANDRAIL

TYP 3/16 3-12

4" NIPPLE
HANDRAIL

DET-4 (a-6)
TYP (4) PLCS.

H-H 371 C-6

(4) 4" DIA. NIPPLES x 4' Lg
CAPPED SPC @ 90°
(S.S. TYPE 304)
EL. 110'-8"

SAMPLING PLATFORM EL. 107'-0"
(TOP OF GRATINGS)

5 SPCS @ 14'-6" = 72'-6"

Do

500A

Do

(B) 1/4"

Do

10 3/4" DIA.

L4x3x1/4
(TYP ALL AROUND)
SEE RD-371

Do

TYP (E)

Roof Line

GUIDES
EL. 72'-3 3/8"

Ladder
North East

C (h-7)

149'-0"

C

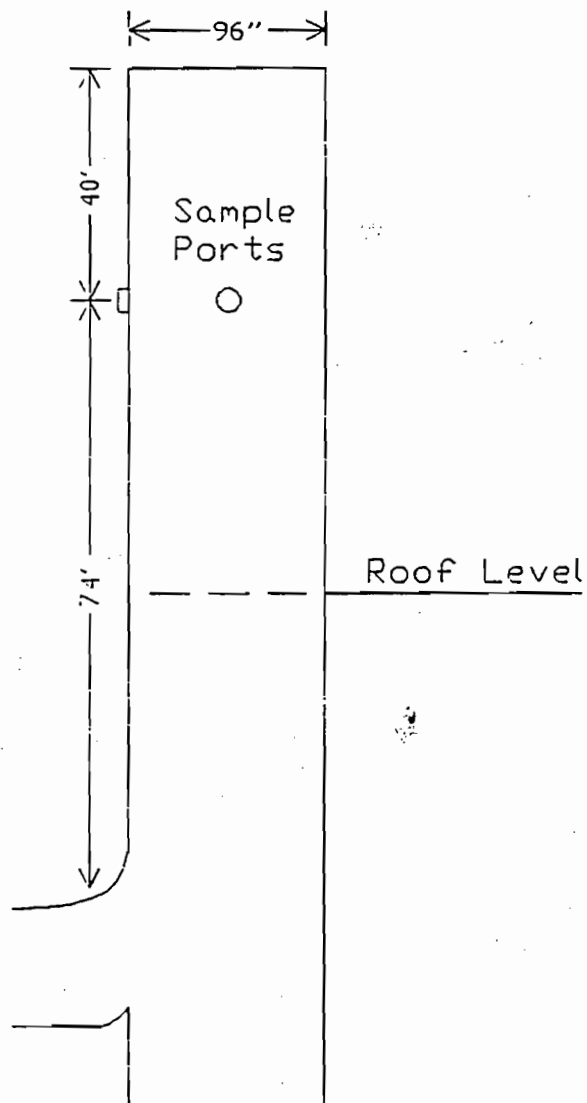


Figure 1. Stack Dimensions and sample port locations, Fort Pierce Utilities Authority, H.D. King Electric Generating Plant, Unit 8. Fort Pierce, Florida.

Attachment E

**PROCEDURES FOR
STARTUP AND SHUTDOWN**

DIESEL STARTUP PROCEDURE

- 1 Place mode selector switch in 'peak inc.'
- 2 Turn 'on' synchroscope
- 3 Place meter selection in '2'
- 4 Place bus vm-fm-gen in '2-3'
- 5 Turn mode selector switch to 'idle'
- 6 Turn diesel start switch to 'start' (spring loaded no need to hold)
- 7 Unit will start, watch smoke coming from stack. What colour is it?
- 8 Turn mode selector switch to 'run'
- 9 Turn mode selector switch to 'excite'
- 10 Lower governor control till 60 hz, unit is ready for synchronizing.
- 11 When synchroscope is at 12:00/noon, 'close' generator breaker
- 12 Raise governor control this puts load on unit
- 13 Turn mode selector switch to 'auto'
- 14 Turn 'off' : bus-vm-gen, meter selection and synchroscope

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#9 AND #5 START-UP PROCEDURE

PURPOSE

This procedure has been written to provide a guide in starting up unit(s) #9 and #5 in a manner that will protect both operating personnel and equipment.

SCOPE

This procedure provides details on how to start-up the unit(s) and the order in which the start-ups should be performed.

This is a standard operating procedure aimed at providing uniformity during normal start-up. However, it does not take into account unforeseen problems which can alter the order in which these procedures are performed.

This list is not all inclusive and should not be relied on as a substitute for good operating practice based on individual training and experience.

POLICY

It is the policy of the Power Plant and FPUA to ensure the safety of personnel and equipment as effectively as possible, in this case, by providing operational guidelines for start-up of equipment.

GENERAL

This procedure will be used each time the unit(s) are put into service and will be signed off by the Watch Engineer and the Operators assisting in the equipment checkout procedures. It will then be turned into the Operations Supervisor.

RESPONSIBILITY

Watch Engineer

The Watch Engineer will oversee and supervise all aspects of unit(s) start-up, ensuring that Control/Boiler and Auxiliary Operators have checked and put equipment in operation safely and properly, and will assist when necessary.

The Watch Engineer will also make sure all motors 50 HP and above have been meggered, all permits are closed, tags removed, and breakers are racked in and ready for operation.

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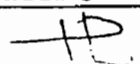
RESPONSIBILITY (continued)

Control/Boiler and Auxiliary Operators

Operators will inspect and ensure that all equipment is in proper working order and ready for operation. Operators will notify the Watch Engineer of any abnormal conditions.

Operators will also inspect for tagged out items and breakers not racked in and ready for use and will notify the Watch Engineer if any of these conditions are found.

THE WATCH ENGINEER HAS THE AUTHORITY AND IS RESPONSIBLE FOR REMOVING TAGS AND CLOSING WORK PERMITS. UNDER NO CIRCUMSTANCES WILL AN OPERATOR REMOVE ANY TAG OR RACK IN ANY BREAKERS WITHOUT THE CONSENT AND/OR PRESENCE OF THE WATCH ENGINEER.

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#9 AND #5 START-UP LIST

Date _____

PROCEDURES

- | | Checked By
(Initials) |
|---|--------------------------|
| 1. MAKE SURE THAT ALL BREAKERS ON #9 ARE RACKED IN AND WORK PERMITS ARE CLOSED. | <input type="text"/> |
| 2. CHECK FIELD AND GENERATOR BREAKERS IN G.A.C. | <input type="text"/> |
| 3. MAKE SURE GENERATOR HEATERS ARE ON. | <input type="text"/> |
| 4. MAKE SURE G.T. IS ON RATCHET - CALL GAS COMPANY. | <input type="text"/> |
| 5. IF STACK DAMPER TO BOILER IS NOT CLOSED - CLOSE IT. | <input type="text"/> |
| 6. VISUALLY CHECK G.T. FOR ANY UNUSUAL CONDITIONS THAT WOULD PREVENT SAFE OPERATION OF UNIT (OIL LEAKS, ETC.) | <input type="text"/> |
| 7. MAKE SURE YARD GAS VALVES AND MAIN GAS VALVE AT G.T. ARE OPEN. | <input type="text"/> |
| 8. TURN ON COALESCING UNIT FOR LUBE OIL SYSTEM. | <input type="text"/> |
| 9. CHECK ALARM PAGE ON G.T. FOR OUTSTANDING ALARMS. | <input type="text"/> |
| 10. MAKE SURE FUEL SELECTION IS ON GAS. | <input type="text"/> |
| 11. MAKE SURE YOU HAVE A START PERMISSIVE (PAGE 3A ON NET 90.) | <input type="text"/> |
| 12. TO START G.T. - PRESS AUTO, EXECUTE - THEN START, EXECUTE. | <input type="text"/> |
| 13. WHEN G.T. STARTS - OPEN DOORS AROUND UNIT AND CHECK FOR GAS LEAKS, HYDRAULIC LEAKS AND ABNORMAL CONDITIONS. | <input type="text"/> |
| 14. WHEN UNIT IS AT FULL SPEED - NO LOAD - SYNCHRONIZE UNIT (MANUAL OR AUTOMATIC) LOAD AS NEEDED. **NOTE** UNIT WILL NOT SYNCHRONIZE IF HYDRAULIC PUMP IS IN "HAND" POSITION. | <input type="text"/> |
| 15. CHECK FOR THINGS OVERLOOKED. | <input type="text"/> |

NOTE: IF YOU ARE ONLY RUNNING #9 G.T. - STOP HERE.
CONTINUE ONLY IF YOU ARE GOING TO START-UP #5 UNIT.

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#9 AND #5 START-UP LIST

Date _____

- 1. IF UNIT HAS BEEN OFF 72 HOURS OR LONGER, MEGGER ALL 2400V MOTORS.
 - 2. MAKE SURE AUX. OIL PUMP AND HEATER ON #5 IS ON.
 - 3. CHECK TO SEE IF ALL BREAKERS ON #5 ARE RACKED IN.
 - 4. MAKE SURE GENERATOR HEATERS ARE ON.
 - 5. OPEN ALL DRAINS AND VENTS ON #9 BOILER.
 - 6. MAKE SURE ECONOMIZER VENT IS OPEN (1 TURN IN OPERATION.)
 - 7. OPEN MAIN STEAM STOP VALVE.
 - 8. OPEN VALVES FOR PEGGING STEAM TO WARM UP DEAERATER.
 - 9. MAKE SURE FEED WATER STOP VALVE IS OPEN.
 - 10. YOU SHOULD HAVE 2 TO 3 BUBBLES IN #9 BOILER.
 - 11. TURN ON COOLING WATER TO FLASH TANK.
 - 12. SET #9 LOAD AT APPROX. 1 TO 3 MW.
 - 13. OPEN STACK DAMPER (5 TO 20%) DEPENDING ON G.T. LOAD.
- NOTE: DO NOT OPEN DAMPER MORE THAN 25% UNTIL YOU ARE READY TO COME ON-LINE WITH UNIT. BEFORE OPENING DAMPER COMPLETELY, #9 MUST BE BELOW 1 MW OR DAMAGE TO DAMPER CABLES MAY OCCUR.
- 14. OPEN MAIN STEAM - BELLY - BEFORE AND AFTER DRAINS ON #5.
 - 15. CHECK DA AND HOT WELL WATER LEVELS.
 - 16. LINE UP OLD SIDE MAKE-UP PUMP TO HOT WELL (OR DA.)
 - 17. CLOSE CONDENSATE INLET VALVE TO STAGE HEATER.
 - 18. OPEN BYPASS AROUND FLOAT ON CONDENSATE RECIRC LINE TO HOT WELL.
 - 19. MAKE SURE BOILER FEED PUMPS ARE READY FOR SERVICE.
 - 20. CHECK SEAL WATER TO CIRC PUMPS - PULL VACUUM ON CIRC PUMPS AND START.

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#9 AND #5 START-UP LIST

Date _____

- 21. AT 250 PSI OF STEAM PRESSURE - START CONDENSATE PUMP -
TURN OFF LUBE OIL HEATER.

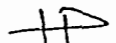
- NOTE: STEAM TEMPERATURE SHOULD BE 500 DEG. F -
(100 DEG. SUPERHEAT).

- 22. PUT APPROX. 1/2 LB. AIR PRESSURE ON GOVERNOR HOUSING SEAL.
- 23. CLOSE VACUUM BREAKER ON CONDENSER.
- 24. TURN ON GLAND WATER SUPPLY TO SEALS.
- 25. PUT 250 PSI STEAM STATION, AIR EJECTOR AND HOG IN SERVICE.
- 26. MAKE SURE STEAM DRIVEN OIL PUMP IS IN WORKING ORDER.
- 27. CUT MAIN STEAM DRAIN BACK TO APPROX. 1 TURN.
- 28. WHEN VACUUM IS UP TO APPROX. 18 INCHES Hg - RESET OIL TRIP -
LATCH UP GOVERNOR.
- 29. ROLL AT 500 RPM - LISTEN FOR RUBS - FEEL FOR VIBRATION.
- 30. CLOSE BELLY AND AFTER SEAT DRAINS.
- 31. IF #5 IS SMOOTH - ROLL FOR A MINIMUM OF 10 MIN. -
THEN GO TO 1000 RPM.
- 32. ROLL AT 1000 RPM FOR 20 MIN. - THEN GO TO 2200 RPM.
- 33. ROLL AT 2200 RPM FOR 20 MIN. - THEN GO TO 3000 RPM.
- 34. AT 3000 RPM - GOVERNOR TAKES OVER - WHEN GOVERNOR HAS CONTROL,
OPEN THROTTLE VALVE COMPLETELY - ROLL FOR 5 MIN.

- NOTE: ALL ROLL TIMES ARE APPROX. AND SUBJECT TO
CHANGE AS VIBRATION LEVELS AND CONDITIONS WARRANT.

- 35. GO TO SPEED SET POINT ON TRI-SEN BY PRESSING "05".
RAISE SPEED ON TURBINE WITH TRI-SEN IN CONTROL ROOM USING
"UP" ARROW. WHEN SPEED REACHES 3500 RPM, THE TRI-SEN WILL
TAKE UNIT SPEED TO 3600 RPM AUTOMATICALLY. USE "UP" ARROW
AGAIN TO BRING SPEED TO 3604 RPM.

- 36. WHEN TURBINE SPEED IS AT 3604 RPM - CLOSE FIELD BREAKER.

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#9 AND #5 START-UP LIST

Date _____

- 37. TURN ON SYNC SCOPE.
- 38. RAISE GEN. VOLTAGE (RUNNING) TO MATCH INCOMING VOLTAGE.
- 39. BOILER PRESSURE NEEDS TO BE 370 PSI MINIMUM - (STAYING THE SAME, OR INCREASING SLIGHTLY.) IF THIS CAN BE DONE WITH #9 UNIT AT 1 MW OR LESS, AND WITH THE DAMPER LESS THAN 25% OPEN, THEN SYNCHRONIZE AND CLOSE GENERATOR BREAKER, PUSH "F1" TO LOCK IN PRESSURE (CASCADE MODE), THEN OPEN DAMPER TO FULL OPEN POSITION. RAISE LOAD ON #9 UNIT SLOWLY TO LOAD UP BOTH UNITS.

IF PRESSURE CANNOT BE MAINTAINED, THEN LOWER #9 UNIT TO SLIGHTLY LESS THAN 1 MW AND OPEN CONTROL DAMPER TO FULL OPEN POSITION. RE-STABILIZE PRESSURE, INCREASING SLIGHTLY, THEN SYNCHRONIZE AND CLOSE GENERATOR BREAKER. (#9 UNIT MAY NEED TO BE RAISED TO STABILIZE PRESSURE.) WHEN UNIT IS ON LINE, PUSH "F1" TO LOCK IN PRESSURE (CASCADE MODE). RAISE LOAD ON #9 UNIT SLOWLY TO LOAD UP BOTH UNITS.

NOTE: DO NOT OPEN DAMPER MORE THAN 25% UNTIL YOU ARE READY TO COME ON-LINE WITH UNIT. BEFORE OPENING DAMPER COMPLETELY, #9 MUST BE BELOW 1 MW OR DAMAGE TO DAMPER CABLES MAY OCCUR.

- 40. WHEN LOAD IS APPROXIMATELY 3 MWS, OPEN EXTRACTION TO DA.
- 41. OPEN VALVE BEFORE STAGE HEATER SLOWLY.
- 42. CHECK LUBE OIL TEMP (BETWEEN 100 AND 110 DEG. F) - CLOSE TURBINE DRAINS.
- 43. WHEN YOU HAVE 4 TO 5 MWS ON #5, TAKE HOG OUT OF SERVICE. MAKE SURE VACUUM REMAINS STABLE.
- 44. CHECK AUX. LUBE OIL PUMP, (NOT RUNNING AND IN "AUTO".)
- 45. CLOSE OFF COOLING WATER TO FLASH TANK.
- 46. CLOSE OFF VALVES FOR PEGGING STEAM TO DEAERATER.
- 47. WHEN UNIT HAS STABILIZED, FINISH RAISING PRESSURE ON #9 BOILER BY GOING TO "06" ON THE TRI-SEN. PUSH "ENTER", THEN ENTER A PRESSURE SETTING THAT IS 5 LBS. HIGHER THAN WHAT IS LOCKED IN. PUSH "ENTER" AGAIN. THIS WILL RAISE #9 BOILER PRESSURE BY 5 LBS. CONTINUE THIS PROCEDURE UNTIL "THROTTLE" PRESSURE GAUGE ON #5 TURBINE BOARD READS 400 LBS.

NOTE: MAKE SURE ALL PRESSURE ADJUSTMENTS ARE ENTERED CORRECTLY BEFORE PUSHING "ENTER" ON TRI-SEN.

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NO. 7 BOILER PRELIGHT CHECKLIST

PURPOSE

This procedure has been prepared to serve as a guide to ensure that all systems and related equipment pertaining to the prelight of a steam generator is properly inspected and determined that it is fully functional prior to putting equipment into service.

SCOPE

As a safety precaution, responsibilities are listed in checklist form to ensure proper inspection of boilers by the Operators and acknowledged by the Watch Engineer. This does not necessarily dictate the order in which equipment is checked out, nor is it all inclusive and should not be relied on as a substitute for good operating practice based on individual experience and training.

POLICY

The checklist will be preformed and checked off before attempting to place equipment/prelight of steam generators into service.

GENERAL

The Boiler Prelight Checklist for the prospective unit will be properly filled out by both Operator and the Watch Engineer and then turned in to the Plant Operations Supervisor.

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<i>Stephen Tudor, Jr.</i>	<i>HE</i>	POWER PLANT	2-12-92	0

NO. 7 BOILER PRELIGHT CHECKLIST

- OPER 1. DRUM LEVEL IS UP TO FIRING LEVEL (1 BUBBLE IN SIGHTGLASS.)
- OPER 2. CHECK ALARM PANELS IN BOILER ROOM AND TURBINE PANEL, TEST ALARMS, REPLACE BULBS AS NECESSARY. PLACE MOLYTEKS IN AUTO MODE (BOILER ROOM AND TURBINE BOARD.)
- OPER 3. CHECK FOR TAGS ON EQUIPMENT IN BOILER ROOM, AT TURBINE PANEL AND IN 2400 SWITCHGEAR ROOM. NOTIFY WATCH ENGINEER OF ANY TAGS ON ANY EQUIPMENT.
- OPER 4. REMOVE NITROGEN BLANKET OFF BOILER, CLOSE VALVE AT BOILER VENT AND SHUT FLOW OFF AT SCAVENGER.
- OPER 5. OPEN BOILER VENTS (3)- SUPERHEATER, SPRAY HEADER, AND NORTH DRUM VENTS.
- OPER 6. OPEN BOILER DRAINS (3)- MAIN, BEFORE AND AFTER SPRAY-HEADER DRAINS; UPSTREAM AND DOWNSTREAM VALVES.
- OPER 7. VALVES BEFORE AND AFTER ATTEMPERATOR CONTROL REG. ARE OPEN (BYPASS CLOSED) AND UPSTREAM VALVE OPEN.
- OPER 8. VALVES BEFORE AND AFTER FEEDWATER REGULATOR ARE OPEN, AND FEEDWATER REGULATOR IS IN AUTO POSITION AT REGULATOR.
- OPER 9. CHECK POSITION OF FEEDWATER STOP VALVE AT DRUM.
- OPER 10. INSPECT ALL BOILER ENTRANCE DOORS TO MAKE SURE THEY ARE SECURE, AND NO WATER APPEARS FROM BOILER DRUM HATCHES.
- OPER 11. NORTH AND SOUTH BOILER BLOWDOWN VALVES SHOULD BE CLOSED. BLOWDOWNS SHOULD BE LINED UP TO FLASH TANK.
- OPER 12. NORTH AND SOUTH SIDE WATERWALL HEADER DRAINS SHOULD BE CLOSED.

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<i>Stephen Tudor, Jr.</i>	<i>HR</i>	POWER PLANT	2-12-92	0

NO. 7 BOILER PRELIGHT CHECKLIST (CON'T.)

- OPER 13. CHECK OUT FEEDWATER PUMPS: (A) COOLING WATER TO PUMP;
 (B) WATER ON TO GLANDS (C) SUCTION VALVES OPEN;
 (D) DISCHARGE VALVES CLOSED UNTIL PUMP IS STARTED ;
 (E) VENTS OPEN ; (F) CHECK OIL LEVELS AT MOTORS AND
 RESERVOIRS ;(G) RECIRC. VALVES AT DA OPEN AND MANUAL
 RECIRC. SWITCH IN BOILER ROOM IS IN MANUAL POSITION ;(H) ALL
 RELATED PIPING AND VALVES.
- OPER 14. CHECK OUT FORCED DRAFT FANS, OIL LEVELS, REGATRONS,
 AND BREAKERS; AND MAKE SURE BRUSHES ARE INSTALLED.
- OPER 15. OPEN WINDBOX, BOILER EXIT, AND CROSSARM DAMPERS ON
 FORCED DRAFT FAN TO BE PLACED IN SERVICE. MAKE SURE
 STACK DAMPERS ARE OPEN ON NORTH AND SOUTH SIDES. ALSO
 CHECK THE LOW VOLTAGE LOCKOUT RELAY IN 2400 V ROOM TO
 MAKE SURE IT IS NOT TRIPPED OUT.
- OPER 16. CHECK OIL LEVELS OF AIRHEATER TRUNION BEARINGS AND AIR
 HEATER MOTOR DRIVE.
- OPER 17. CHECK COOLING WATER TO AIRHEATER BEARINGS.
- OPER 18. TURN ON O2 ANALYZER AND CHECK CALIBRATION.
- OPER 19. CHECK LOCAL CONTROL PANELS AT EACH BURNER FOR AIR
 REGISTER OPERATION, IGNITORS IN AUTO POSITION,
 GUILLOTINES ARE CLOSED AND CHECK COOLING AIR VALVES.
 MAKE SURE BURNERS ARE IN THE GAS POSITION (IN) AND CHECK
 FIRE EYES FOR DIRT AND/OR WATER.
- OPER 20. CHECK FORNEY BURNER CABINETS FOR TAGS AND INFORM
 WATCH ENGINEER
- OPER 21. INSPECT ALL COOLING AIR LINES AND VALVES AT PORTHOLES.
- OPER 22. HOUSE AIR COMPRESSOR IS ON AND THE OTHER IS ON STANDBY.
- OPER 23. MAKEUP PUMP IS LINED TO D.A. AND CHECK D.A. LEVEL.

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<i>Stephen Tucker, Jr.</i>	<i>HE</i>	POWER PLANT	2-12-92	0

NO. 7 BOILER PRELIGHT CHECKLIST (CON'T.)

- OPER 24. MAKE SURE WE HAVE FULL INSTRUMENT AIR PRESSURE. CHECK ALL VALVES AT FILTERS (30 PSI.)
- OPER 25. CHECK DAY TANK LEVELS, AND BE SURE TO AND FROM SYSTEM VALVE IS OPEN AT DAY TANK.
- OPER 26. CHECK YARD GAS VALVES, OPEN S-4 VALVE AT GAS HEADER ON PLATFORM. MAKE SURE MINIMUM FLOW VALVE IS FULLY OPEN, AND THE MAIN GAS VALVE BEFORE MAIN REDUCER IS CLOSED (UNTIL WE ARE ON THE LINE.)
- OPER 27. CHECK IGNITOR GAS SUPPLY (CITY OR FLORIDA GAS.)
- OPER 28. MAIN STEAM STOP VALVE OPEN (UNLESS OTHERWISE INSTRUCTED BY THE WATCH ENGINEER.)
- OPER 29. INFORM CONTROL ROOM BEFORE STARTING FD FAN.
- OPER 30. START FAN AND INITIATE PURGE, CHECK FAN FOR VIBRATION AND BRUSHES FOR ARCING. ALSO, CHECK OIL SLINGERS.
- OPER 31. BE PREPARED TO PUT FIRE IN BOILER AND BRING BOILER UP AS USUAL.
- ENGR. 32. NOTIFY FLORIDA GAS THAT UNIT WILL BE COMING ON THE LINE.
- ENGR. 33. MAKE SURE ALL PERMITS ARE REVIEWED AND CLOSED IF NECESSARY PRIOR TO PLACING UNIT IN SERVICE.
- OPER 34. CHECK BALOMETER

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<i>Stephen T. ...</i>	HD	POWER PLANT	2-12-92	0

GENERATOR START-UP PROCEDURES

PURPOSE

This procedure has been prepared to serve as a guide to ensure that the generators are placed on the line in a safe and proper manner.

SCOPE

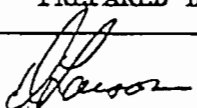
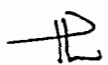
Details are listed for the responsibility of the Operator/Watch Engineer prior to putting a generator on the line. This list is not all inclusive and should not be relied on as a substitute for good operating practice based on individual experience and training.

POLICY

These checks will be performed and checked off before attempting to place a generator into service.

GENERAL

This sheet will be properly filled out by both the Operator and the Watch Engineer and then turned in to the Plant Operations Supervisor.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
		POWER PLANT	2-12-92	0

START-UP CHECK LIST

CONTROL ROOM

- 1. MAKE SURE THAT ALL TAGS ARE REMOVED IN THE CONTROL ROOM.
- 2. CHECK BULBS ON THE CONTROL PANEL.
- 3. CHECK THE TARGETS ON RELAYS AND THE LOCKOUTS BEFORE COMING ON THE LINE.
- 4. MAKE SURE THAT THE PROPER CHART RECORDERS ARE ON.
- 5. NOTIFY DISPATCH THAT WE ARE COMING ON THE LINE.
- 6. CHECK STATION SERVICE AND REROUTE IF NECESSARY.
- 7. PREPARE TO SYNCHRONIZE THE GENERATOR.
- 8. CHECK THE PANEL BULBS AND THE TARGETS AFTER YOU ARE ON THE LINE.

WATCH ENGINEERS

- 1. REVIEW PERMITS AND REMOVE ALL TAGS AND MAKE SURE THAT ALL BREAKERS ARE RACKED BACK IN.
- 2. MAKE SURE THAT ALL THE AUXILIARY EQUIPMENT IS RACKED IN AND MEG ALL MOTORS ABOVE 50 HP, REGARDLESS OF VOLTAGE. ALSO, CHECK THE MOTOR HEATERS.
- 3. MAKE SURE THAT THE OIL RESERVOIR IS AT THE CORRECT LEVEL.
- 4. MAKE SURE THAT YOU ARE ON TURNING GEAR. (MIN. 12 HRS.)
- 5. CHECK EXCITER RHEOSTAT. MAKE SURE IT IS IN THE PROPER POSITION.

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<i>Hanson</i>	<i>HD</i>	POWER PLANT	2-12-92	0

START-UP CHECK LIST

- 6. CHECK THE FIELD BREAKER. MAKE SURE THAT IT IS CHARGED.
- 7. CHECK THE GENERATOR OCB AND THE CONTROL POWER.
- 8. CHECK THE DISCONNECTS ON THE TRANSFORMERS AND OCB'S.
- 9. MAKE SURE THAT THE TRANSFORMERS HAVE PROPER OIL LEVELS, THAT THE FANS ARE ON AND THAT THE OIL AND WINDING TEMPS ARE O.K.
- 10. MAKE SURE THAT THE GENERATOR HAS 15 PSI OF HYDROGEN (UNITS NO. 7 AND NO. 8.)
- 11. MAKE SURE THAT THE BOILER ROOM HAS COMPLETED ITS CHECK OFF SHEET.
- 12. MAKE SURE THAT THE NECESSARY LUBE OIL PUMPS ARE ON.
- 13. BRINGING UNIT UP TO SPEED AND SYNC IS ANOTHER PROCEDURE.

OPERATOR ON WATCH _____

WATCH ENGINEER _____

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Wilson</i>	<i>HK</i>	POWER PLANT	2-12-92	0

NO. 8 BOILER PRELIGHT CHECK LIST

PURPOSE

This procedure has been prepared to serve as a guide to ensure that all systems and related equipment pertaining to the prelight of a steam generator is properly inspected and determined that it is fully functional prior to putting equipment into service.

SCOPE

As a safety precaution, responsibilities are listed in checklist form to ensure proper inspection of boilers by the Operators and acknowledged by the Watch Engineer. This does not necessarily dictate the order in which equipment is checked out, nor is it all inclusive and should not be relied on as a substitute for good operating practice based on individual experience and training.

POLICY

The check list will be preformed and checked off before attempting to place equipment/prelight of steam generators into service.

GENERAL

The No. 8 Boiler Prelight Check List for the prospective unit will be properly filled out by both the Operator and the Watch Engineer and then turned in to the Plant Operations Supervisor.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen Tudor, Jr.</i>	<i>HR</i>	POWER PLANT	2-12-92	0

NO. 8 BOILER PRELIGHT CHECK LIST

- OPER 1. DRUM LEVEL IS UP TO FIRING LEVEL (1 BUBBLE IN SIGHTGLASS.)
- OPER 2. CHECK ALARM PANELS IN BOILER ROOM AND TURBINE PANEL, TEST ALARMS, REPLACE BULBS AS NECESSARY. PLACE MOLYTEKS IN AUTO MODE (BOILER ROOM AND TURBINE BOARD.)
- W.ENG 3. CHECK FOR TAGS ON EQUIPMENT IN BOILER ROOM, TURBINE PANEL, 2400 V BUS AND 480 V BUS.
- OPER 4. TAKE NITROGEN BLANKET OFF BOILER, CLOSE VALVE AT BOILER AND SHUT FLOW OFF AT SCAVENGER.
- OPER 5. CHECK ALL BOILER ENTRANCE DOORS TO MAKE SURE THEY ARE SECURE, MAKE SURE THERE IS NO WATER LEAKAGE FROM BOILER DRUM HATCHES AND THAT THEY ARE SECURE.
- OPER 6. OPEN BOILER VENTS (3) SUPERHEATER OUTLET, AFTER SPRAY HEADER, AND NORTH DRUM VENT.
- OPER 7. OPEN BOILER DRAINS (2) MAIN, SPRAY HEADER DRAIN (UPSTREAM AND DOWNSTREAM VALVES.)
- OPER 8. VALVES BEFORE AND AFTER ATTEMPERATOR ARE OPEN (BY-PASS CLOSED,) AND DOWNSTREAM VALVE AT TOP OF BOILER OPEN.
- OPER 9. VALVES OPEN BEFORE AND AFTER FEEDWATER REGULATOR (BYPASS VALVE CLOSED.)
- OPER 10. CHECK POSITION OF FEEDWATER STOP VALVE.
- OPER 11. NORTH AND SOUTH BOILER BLOWDOWN VALVES SHOULD BE CLOSED. BLOWDOWNS SHOULD BE LINED UP TO FLASH TANK.
- OPER 12. NORTH AND SOUTH SIDE WATERWALL HEADER DRAINS SHOULD BE CLOSED.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen Tredor, Jr.</i>	<i>HR</i>	POWER PLANT	2-12-92	0

NO. 8 BOILER PRELIGHT CHECK LIST (CON'T.)

- OPER 13. CHECK OUT BOILER FEEDWATER PUMPS. (A) SUCTION AND DISCHARGE VALVES OPEN. (B) VENTS OPEN. (C) BALANCE LINE VALVES OPEN AT PUMP AND AT DA. (D) CHECK OIL LEVEL IN RESERVOIR. (E) CHECK IN BOWL FOR SHAFT PUMP SUCTION. (F) RECIRC VALVE AT DA AND VALVES AT PUMP OPEN. (G) ALL COOLING WATER VALVES OPEN. (H) AUX LUBE OIL PUMP IN AUTO. (I) RECIRC VALVES IN MANUAL OPEN POSITION IN BOILER ROOM.

- OPER 14. CHECK OIL LEVELS AT FORCED DRAFT FANS AND MOTORS.

- OPER 15. OPEN MANUAL FAN AND STACK DAMPERS ON FAN TO BE PLACED IN SERVICE.

- OPER 16. CHECK OIL LEVELS OF AIRHEATER TRUNION BEARINGS (HOT AND COLD ENDS); ALSO, COOLING WATER TO AIRHEATER BEARINGS

- OPER 17. COOLING WATER TO AIRHEATER SHAFTS ON.

- OPER 18. CHECK OIL LEVELS OF AIR HEATER MOTORS AND AIR DRIVES.

- OPER 19. TURN ON O2 ANALYZER AND CHECK CALIBRATION.

- OPER 20. TURN ON NOX RECORDER AS USUAL.

- OPER 21. CHECK OUT EACH BURNER AT FRONT. (A) PILOT IN AUTO POSITION. (B) AIR REGISTER OPERATION. (C) LIMIT SWITCHES IN PROPER POSITION. (D) COOLING AIR VALVES OPEN, SEALING VALVES CLOSED. (E) BURNER GUN OPERATION. (F) ALL OTHER RELATED EQUIPMENT.

- OPER 22. CHECK FORNEY BURNER CABINETS AND NOTIFY WATCH ENGINEER OF ANY TAGS.

- OPER 23. COOLING AIR VALVES TO PORTHOLES ARE OPEN.

- OPER 24. HOUSE AIR COMPRESSOR IS ON (PRESS. A MIN. OF 85 PSI.)

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen Huda, Jr.</i>	<i>TR</i>	POWER PLANT	2-12-92	0

NO. 8 BOILER PRELIGHT CHECK LIST (CON'T.)

- OPER 25. MAKE-UP PUMP IS LINED TO DA.
- OPER 26. MAKE SURE WE HAVE FULL INSTRUMENT AIR PRESSURE. VALVES AT FILTERS SHOULD BE OPEN.
- OPER 27. CHECK FIBERGLASS TANK LEVEL.
- OPER 28. BALOMETER HAS BEEN CLEANED.
- OPER 29. THERMO PROBE IS RETRACTED (UNLESS OTHERWISE INSTRUCTED BY WATCH ENGINEER.)
- W ENG 30. DRUM LEVEL TRIP IS LIFTED.
- OPER 31. COOLING AIR BLOWER IS ON, RESERVE IS ON STANDBY.
- OPER 32. MAIN STEAM STOP VALVE IS OPEN (UNLESS OTHERWISE INSTRUCTED BY WATCH ENGINEER.)
- OPER 33. CHECK IGNITOR GAS SUPPLY (12 - PSI CITY OF FLORIDA GAS.)
- OPER 34. CHECK YARD GAS VALVES, OPEN S-4 VALVE AT GAS HEADER ON PLATFORM. MAKE SURE MINIMUM FLOW VALVE IS FULLY OPEN, AND THE MAIN GAS VALVE BEFORE MAIN REDUCER IS CLOSED (UNTIL WE ARE ON THE LINE.)
- OPER 35. INFORM CONTROL ROOM YOU ARE GOING TO BE STARTING A FORCED DRAFT FAN.
- OPER 36. START FAN AND INITIATE PURGE. CHECK FAN FOR VIBRATION AND OIL SLINGERS FOR PROPER OPERATION.
- OPER 37. BE PREPARED TO PUT FIRE IN BOILER AND BRING BOILER UP AS USUAL.
- OPER 38. SIGN NOX CHART (TIME FIRE WAS PUT IN BOILER.)
- W ENG 39. NOTIFY FLORIDA GAS IF UNIT IS COMING ON LINE.

PREPARED BY:	APPROVED BY:	H. D. KING POWER PLANT	DATE ISSUED:	REVISION NO.:
<i>Stephen Tudor, Jr.</i>	<i>HD</i>		2-12-92	0

GENERATOR START-UP PROCEDURES

PURPOSE

This procedure has been prepared to serve as a guide to ensure that the generators are placed on the line in a safe and proper manner.

SCOPE

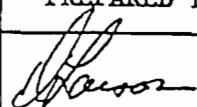
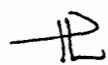
Details are listed for the responsibility of the Operator/Watch Engineer prior to putting a generator on the line. This list is not all inclusive and should not be relied on as a substitute for good operating practice based on individual experience and training.

POLICY

These checks will be performed and checked off before attempting to place a generator into service.

GENERAL

This sheet will be properly filled out by both the Operator and the Watch Engineer and then turned in to the Plant Operations Supervisor.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
		POWER PLANT	2-12-92	0

START-UP CHECK LIST

CONTROL ROOM

- 1. MAKE SURE THAT ALL TAGS ARE REMOVED IN THE CONTROL ROOM.
- 2. CHECK BULBS ON THE CONTROL PANEL.
- 3. CHECK THE TARGETS ON RELAYS AND THE LOCKOUTS BEFORE COMING ON THE LINE.
- 4. MAKE SURE THAT THE PROPER CHART RECORDERS ARE ON.
- 5. NOTIFY DISPATCH THAT WE ARE COMING ON THE LINE.
- 6. CHECK STATION SERVICE AND REROUTE IF NECESSARY.
- 7. PREPARE TO SYNCHRONIZE THE GENERATOR.
- 8. CHECK THE PANEL BULBS AND THE TARGETS AFTER YOU ARE ON THE LINE.

WATCH ENGINEERS

- 1. REVIEW PERMITS AND REMOVE ALL TAGS AND MAKE SURE THAT ALL BREAKERS ARE RACKED BACK IN.
- 2. MAKE SURE THAT ALL THE AUXILIARY EQUIPMENT IS RACKED IN AND MEG ALL MOTORS ABOVE 50 HP, REGARDLESS OF VOLTAGE. ALSO, CHECK THE MOTOR HEATERS.
- 3. MAKE SURE THAT THE OIL RESERVOIR IS AT THE CORRECT LEVEL.
- 4. MAKE SURE THAT YOU ARE ON TURNING GEAR. (MIN. 12 HRS.)
- 5. CHECK EXCITER RHEOSTAT. MAKE SURE IT IS IN THE PROPER POSITION.

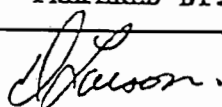
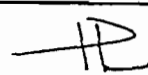
PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Hanson</i>	<i>HD</i>	POWER PLANT	2-12-92	0

START-UP CHECK LIST

- 6. CHECK THE FIELD BREAKER. MAKE SURE THAT IT IS CHARGED.
- 7. CHECK THE GENERATOR OCB AND THE CONTROL POWER.
- 8. CHECK THE DISCONNECTS ON THE TRANSFORMERS AND OCB'S.
- 9. MAKE SURE THAT THE TRANSFORMERS HAVE PROPER OIL LEVELS, THAT THE FANS ARE ON AND THAT THE OIL AND WINDING TEMPS ARE O.K.
- 10. MAKE SURE THAT THE GENERATOR HAS 15 PSI OF HYDROGEN (UNITS NO. 7 AND NO. 8.)
- 11. MAKE SURE THAT THE BOILER ROOM HAS COMPLETED ITS CHECK OFF SHEET.
- 12. MAKE SURE THAT THE NECESSARY LUBE OIL PUMPS ARE ON.
- 13. BRINGING UNIT UP TO SPEED AND SYNC IS ANOTHER PROCEDURE.

OPERATOR ON WATCH _____

WATCH ENGINEER _____

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
		POWER PLANT	2-12-92	0

DIESEL SHUTDOWN PROCEDURES

- 1 Control room operator turns start/stop switch to 'stop' position. Unit will automatically unload and come off the line with a cool down period for the engine.
- 2 A operator will go to local control panel and put mode selector switch to the off position and fault indicator light should come on.

#9 and #5 SHUTDOWN PROCEDURE

- 1 Take gas turbine off line by pressing gas turbine stop button at local controls.
- 2 Control room operator close the HRSG damper.
- 3 As #5 steam turbine rolls down, the control room operator must maintain proper generator voltage.
- 4 When the generator watt-hour meter stops, the control room operator must open the generator breaker and lower the generator voltage all the way down and open the field breaker.
- 5 When the generator is off line control room operator informs the shift supervisor and he/she will close the throttle valve stopping the turbine.
- 6 The auxiliary operator should maintain proper condenser/hotwell level during unit shutdown
- 7 Control room operator should maintain proper DA level and HRSG drum water levels.

#7 UNIT SHUTDOWN PROCEDURE

- 1 Boiler room lowers boiler pressure 50 to 100 psi. (from 900 to 800 psi)
- 2 Control room lowers generator to about 3 megawatts and switches station service from T-17 to T-18.
- 3 Boiler room takes gas fire out of boiler and starts a boiler purge and tells control room to take unit off line.
- 4 Control room operator lowers the generator voltage down from 13.8KV to 13.5KV
- 5 Control room lowers generator down to zero MW. When the generator watt-hour meter stops turning the operator opens the generator breaker and the field breaker.
- 6 When generator is off line control room operator informs the shift supervisor and he/she will close the throttle valve stopping the turbine.
- 7 Auxiliary operator controls condenser/hotwell and deaerating heater (DA) levels until the DA temperature is below 212 degrees and then pertaining auxiliary equipment is shutdown.
- 8 Shift supervisor places turbine-generator on turning gear once the turbine rolls down to zero speed.
- 9 Once the boiler has completed its 5 min. purge the FD fan is shut down and all gas valves are closed pertaining to the unit.

#8 UNIT SHUTDOWN PROCEDURE

- 1 Boiler room lowers boiler pressure 50 to 100 psi. (from 1250 to 1150 psi)
- 2 Control room lowers generator to about 3 megawatts.
- 3 Boiler room takes gas fire out of boiler and starts a boiler purge and tells control room to take unit off line.
- 4 Control room operator lowers the generator voltage down from 13.8KV to 13.5KV
- 5 Control room operator lowers generator down to zero MW. When the generator watt-hour meter stops turning the control room operator opens the generator breaker and the field breaker.
- 6 When generator is off line the control room operator informs the shift supervisor and he/she will close the throttle valve stopping the turbine.
- 7 Auxiliary operator controls condenser/hotwell and deaerating heater (DA) levels until the DA temperature is below 212 degrees and then pertaining auxiliary equipment is shutdown.
- 8 Shift supervisor places turbine-generator on turning gear once the turbine rolls down to zero speed.
- 9 Once the boiler has completed its 5 min. purge the FD fan is shut down and all gas valves are closed pertaining to the unit.

Attachment F

ADDITIONAL APPLICABLE REQUIREMENTS

Additional applicable requirements for the two diesel units (001 and 002) and the three boilers (004, 007, and 008) and the associated compliance methods, recordkeeping, and monitoring requirements are as set forth in the current operating permit #A056-190275 attached.

Additional applicable requirements for the combined cycle gas turbine (003) and the associated compliance methods, recordkeeping, and monitoring requirements are as set forth in the current operating permit #056-175955, attached.



Florida Department of Environmental Regulation

Southeast District • P.O. Box 15425 • West Palm Beach, Florida 33416

Lawton Chiles, Governor

1900 S. Congress Ave., Suite A

Virginia B. Wetherell, Secretary

Telephone: 407/433-2650

Fax: 407/433-2666

MAY 7 - 1993

PERMITTEE:

Mr. H. P. Lamb
Superintendent/Power Resources
Fort Pierce Utilities Authority
311 North Indian River Drive
Fort Pierce, Florida 34950

I.D. NUMBER: 50/WPB/56/0003
PERMIT/CERTIFICATION NUMBER: AO 56-190275*
DATE OF ISSUE: MAY 7 - 1993
EXPIRATION DATE: February 28, 1996
COUNTY: St. Lucie
LATITUDE/LONGITUDE: 27°27'00"N/80°19'26"W
UTM: Zone 17; 566.4 Km. E; 3036.3 Km. N
PROJECT: Ft. Pierce Utilities Authority
Units 6 - 8, Diesels 1 and 2

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule 17-296, and in conformance with all existing regulations of the Florida Department of Environmental Regulation. 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:

OPERATE: An air pollution source consisting of:

- a) Two (2) General Motors Corporation, Model MP-45, diesel electric generators burning No. 2 fuel oil at 28.9 million BTU/hr. maximum, discharging pollutants through a 3-ft. diameter stack 23 feet above ground level (peaking units);
- b) Babcock & Wilcox Boiler, Unit No. 6, 218.9 million BTU/hr. discharging pollutants through a 5-ft. diameter stack 148 feet above ground level;
- c) A Foster Wheeler Boiler, Unit No. 7, 470 million BTU/hr. maximum; discharging pollutants through a multicyclone collector and a 7.1 ft. diameter stack 147 feet above ground level, and
- d) A Foster Wheeler Boiler, Unit No. 8, 611 million BTU/hr. maximum; discharging pollutants through an 8 foot diameter stack 150 feet above ground level, equipped with continuous in-stack NO_x and O₂ monitors.

IN ACCORDANCE WITH: Settlement Agreement for OGC Case No. 91-1610 signed July 8, 1992; Application for Renewal received December 14, 1990, additional information received January 28, January 31 and February 27, 1991, AC 56-141460 issued March 14, 1988 and modified May 1, 1990; Application to Operate/Construct Air Pollution Sources received December 12, 1985 (Diesels 1 and 2); AC 56-12778 issued September 4, 1979 (Unit 8); and Application to Operate received July 21, 1980 (Units 6 and 7) (none are attached).

LOCATED AT: 311 North Indian River Drive, Fort Pierce, St. Lucie County, Florida.

TO SERVE: An electric generating utility (SIC # 4911).

SUBJECT TO: General Conditions 1-14 and Specific Conditions 1-10.

*This permit is a renewal of permit no. AO 56-113533 issued February 28, 1986; AO 56-113534 issued February 28, 1986; AO 56-112679 issued February 14, 1986; and AO 56-112678 issued February 14, 1986; and modifies and supersedes permit no. AO 56-190275 issued May 23, 1991.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
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), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither 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 is not 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, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; 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.
6. The permittee shall 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 and at reasonable times, access to the premises where the permitted activity is located or conducted to:
 - (a) Have access to and copy any records that must be kept under the conditions of the permit;
 - (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
 - (c) Sample or monitor 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 the permit, the permittee shall immediately notify and provide the Department with the following information:
 - (a) A description of and cause of noncompliance; 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. 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 for 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 involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

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 Rule 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following :

- (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically, unless otherwise stipulated by the Department.
- (b) The permittee shall hold 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) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained 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.

14. 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 the 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.

PERMITTEE:
Mr. H. P. Lamb
Fort Pierce Utilities Authority
Fort Pierce, Florida 34950

PERMIT/CERTIFICATION NUMBER: AO 56-190275
DATE OF ISSUE: MAY 7 - 1993
EXPIRATION DATE: February 28, 1996

SPECIFIC CONDITIONS:

1. Compliance testing shall be conducted for the sources covered by this permit by September 1991 and annually thereafter in accordance with the methods specified below.
2. Emission limiting standards are as follow:

a) Units 6, 7, and 8

- (1) Visible emissions shall not exceed 5% opacity while firing natural gas.

For Units 6 and 7, visible emissions shall not exceed 20% opacity when the unit is burning fuel oil, except for one two-minute period per hour during which opacity shall not exceed 40%.

For Unit 8 visible emissions shall not exceed 20% opacity when the unit is burning fuel oil, except for one six minute period per hour during which opacity shall not exceed 27%.

(2)

- A) The emission limits for Units 6,7 and 8 shall not exceed the following rates:

<u>Parameter</u>	<u>Unit 6</u> lb/hr.	<u>Unit 7</u> lb/hr.	<u>Unit 8</u> lb/hr.
PM	0.4	0.568	0.945
SOx	12.38	0.1199	0.1917
NOx	1.31	104.35	173.20
VOC	0.0236	0.266	0.441
CO	0.15	7.589	12.59

- B) The total emissions from combined Units 6, 7, and 8 shall not exceed:

<u>Parameter</u>	<u>Tons/Yr.</u>
PM	16.0
SOx	101.6
NOx	622.0
VOC	2.3
CO	45.3

Total combined heat input for the Units 6, 7, and 8 shall not exceed 4,534,930 MBtu per year.

SPECIFIC CONDITIONS:

(3) Natural gas is the only permitted fuel for normal operation for Units 6, 7, and 8. Units 6, 7, and 8 are allowed to burn natural gas with a No. 6 fuel oil (0.8 lbs SOx/MBtu) as a standby fuel for up to a combined total of 400 hours per year, when necessary in order to avoid curtailing electric power service to its customers. FPUA must notify the DER within 24 hours after commencement of oil firing and furnish the following information:

- a. Duration or projected duration of the event.
- b. Quantity of fuel oil burned or projected to be burned.
- c. A description of significant circumstances precipitating the event, which shall include:
 - i. Availability of power for purchase
 - ii. Availability of electric transmission capacity relating to power purchases.
 - iii. Availability of natural gas
 - iv. Availability of FPUA generation sources.

(4) When burning fuel oil in Units 6, 7, and 8, the emission rates set forth in Specific Condition 2(a)2.A above shall not apply and the following rates shall apply to Units 6, 7, and 8:

<u>Parameter</u>	<u>Unit 6</u> lb/MBTU	<u>Unit 7</u> lb/MBTU	<u>Unit 8</u> lb/MBTU
SOx	0.80	0.80	0.80
PM	n/a	0.1	0.1
VOC	n/a	n/a	n/a

(5) Unit 8

1. Continuous emission monitors are required for nitrogen oxides and oxygen.
2. Quarterly excess emissions reports pursuant to 40CFR60 shall be submitted to the Southeast District Office postmarked no later than the 30th day following the end of each calendar quarter.

(6) Diesels 1 and 2

Visible emissions shall not exceed 20 percent opacity while using No. 2 fuel oil.

PERMITTEE:

Mr. H. P. Lamb
Fort Pierce Utilities Authority
Fort Pierce, Florida 34950

PERMIT/CERTIFICATION NUMBER: AO 56-190275
DATE OF ISSUE: MAY 7 - 1993
EXPIRATION DATE: February 28, 1996

SPECIFIC CONDITIONS:

3. The compliance test report shall include results of tests by the following method:

<u>Source/Emission Point</u>	<u>Pollutant</u>	<u>Test Method</u>
Diesels 1 & 2 Boilers 6,7, & 8	Visible Emissions	EPA Method 9
Boilers 6,7, & 8	Particulate	EPA Method 5
	SOx	EPA Method 6
	NOx	EPA Method 7,7E
	VOC	EPA Method 25A
	CO	EPA Method 10

The compliance test report shall be submitted to the Department in accordance with Florida Administrative Code (F.A.C.) Rule 17-297.330.

4. Testing of emissions should be conducted using the fuel and/or process input which are expected to result in the highest emissions and within ten percent (10%) of the rated capacity of the source, otherwise the Department may require the test to be repeated or require modification of the permit to reflect tested rates and/or fuels. However, testing on fuel oil in Units 6, 7, and 8 shall be required only if fuel oil usage for the units exceed 400 hours in any calendar year.

5. The Department shall be notified of expected test dates at least fifteen (15) days prior to compliance testing.

6. On or before March 1 of each calendar year, a completed DER Form 17-210.900(4), Annual Operations Report Form for Air Emissions Sources shall be submitted to the Department.

7. Ambient monitoring for particulate and sulfur dioxide is required if fuel oil usage exceeds 400 hours per calendar year.

8. Copies of all reports, tests, notifications or other submittals required by this permit shall be submitted to the Department of Environmental Regulation, Southeast District Office.

9. The permittee shall be aware of and operate under the attached "General Permit Conditions #1 through 14". General Permit Conditions are binding upon the permittee and enforceable pursuant to Chapter 403 of the Florida Statutes.

PERMITTEE:
Mr. H. P. Lamb
Fort Pierce Utilities Authority
Fort Pierce, Florida 34950

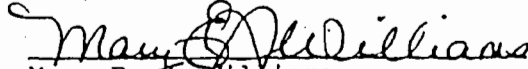
PERMIT/CERTIFICATION NUMBER: AO 56-190275
DATE OF ISSUE: MAY 7 - 1993
EXPIRATION DATE: February 28, 1996

SPECIFIC CONDITIONS:

10. The facility shall maintain unit logs reflecting the following information:
- a. Number of hours per day each unit burns gas.
 - b. Number of hours per day each unit burns fuel oil.
 - c. Amount of natural gas used per unit (MBTU/million cubic feet burned).
 - d. Amount of fuel oil used per unit including sulfur and ash content and heat input rate (MBTU/1000 gallons).

Executed in West Palm Beach, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


Mary E. S. Williams
Director of District Management
F.D.E.R., Southeast District
P.O. Box 15425
West Palm Beach, FL 33416
407/433-2650

MESW:ms:gml

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed by certified mail before the close of business on MAY 7 - 1993 to the listed persons.

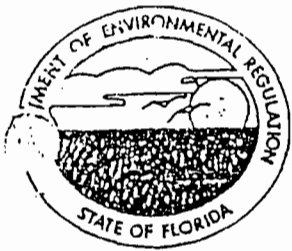
Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to S.120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.


Clerk

MAY 7 - 1993

Date



Florida Department of Environmental Regulation

Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406 • 407-964-9668

Bob Martinez, Governor

Dale Twachmann, Secretary

John Shearer, Assistant Secretary
Scott Benyon, Deputy Assistant Secretary

PERMITTEE:

Mr. Harry Schindehette
Director of Utilities
Fort Pierce Utilities Authority
P. O. Box 3191
Fort Pierce, Florida 33448

I.D. NUMBER: 50/WPB/56/0309
PERMIT/CERTIFICATION NUMBER: AO 56-175955
DATE OF ISSUE: MAY 1, 1990
EXPIRATION DATE: March 30, 1995
COUNTY: St. Lucie
LATITUDE/LONGITUDE: 27°27'00"N/80°19'26"W
UTM: Zone 17; 566.8 Km. E; 3306.3 Km. N
PROJECT: Fort Pierce Utilities Unit #9
31.6 MW Combined Cycle Gas Turbine

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule 17-2, and in conformance with all existing regulations of the Florida Department of Environmental Regulation. 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:

OPERATE: An air pollution source consisting of a Unit #9, 31.6 MW combined cycle gas turbine, (a 23.4 MW combustion turbine generator, a steam generator and an 8.2 MW condensing turbine generator). The unit uses steam injection from the waste heat recovery steam generator to control NO_x emissions from the gas turbine.

IN ACCORDANCE WITH: Certificate of Completion of Construction received February 7, 1990, AC 56-141460 issued March 24, 1988 and modified October 31, 1988 and Application to Construct Air Pollution Sources dated November 2, 1987 and additional information dated December 17, 1987 (none are attached).

LOCATED AT: Henry D. King Municipal Electric Station, Fort Pierce Utilities Authority, 2nd Street and B Avenue, Fort Pierce, St. Lucie County, Florida.

TO SERVE: An electrical generating facility (SIC # 4311).

SUBJECT TO: General Conditions 1-14 and Specific Conditions 1-13.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither 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 is not 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, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; 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.

6. The permittee shall 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 and at reasonable times, access to the premises where the permitted activity is located or conducted to:

- (a) Have access to and copy any records that must be kept under the conditions of the permit;
- (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
- (c) Sample or monitor 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 the permit, the permittee shall immediately notify and provide the Department with the following information:

- (a) A description of and cause of noncompliance; 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. 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 for 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 involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

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 Rule 17-4.120 and 17-30.300, F.A.C., 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 or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following :

- (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically, unless otherwise stipulated by the Department.
- (b) The permittee shall hold 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) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained 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.

14. 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 the 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. Compliance testing shall be conducted for the sources covered by this permit by September 30, 1990 and annually thereafter in accordance with the methods specified below.
2. Emission limiting standards are as follows:
In accordance with AC 56-141460; 40CFR60. Subpart GG, and 17-2.660 -
 - a) NO_x emissions shall not exceed 84ppm NO_x or $0.0075 \left(\frac{14.4}{Y} \right) + F$.
 - b) SO₂ emissions shall not exceed 0.015% by volume at 15% oxygen on a dry basis
 - c) Visible emissions shall not exceed 15% opacity.
 - d) The sulfur content of the No. 2 fuel oil shall not exceed 0.5% by weight.
 - e) CO emissions shall not exceed 32.85 lb./hr. and 110.4 ton/yr. when burning natural gas.
3. The compliance test report shall include results of tests by the following methods:

<u>Source/Emission Point</u>	<u>Pollutant</u>	<u>Test Method</u>
Unit #9	SO ₂	EPA Method 20 or ASTM 1552
	CO	EPA Method 10
	NO _x	EPA Method 20
	VE	EPA Method 9

During performance tests to determine compliance with the proposed standard, measured NO_x emission at 15 percent oxygen will be adjusted to ISP ambient atmospheric conditions by the following correction factor:

$$NO_x = (NO_x \text{ obs}) \left(\frac{P_{\text{ref}}}{P_{\text{obs}}} \right)^{0.5} e^{19 (H_{\text{obs}} - 0.00633)} \left(\frac{T_{\text{AMB}}}{288} \right)^{1.53}$$

where:

NO_x = Emissions of NO at 15% oxygen and ISO standard ambient conditions.

NO obs = Measured NO_x emission at 15% oxygen, ppmv.

P_{ref} = Reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure.

P_{bs} = Measured combustor inlet absolute pressure at test ambient pressure.

H_{obs} = Specific humidity of ambient air at test.

e = Transcendental constant (2.718)

T_{AMB} = Temperature of ambient air at test.

The compliance test report shall be submitted to the Department in accordance with Florida Administrative Code (F.A.C.) Rule 17-2.700(7).

PERMITTEE:
Mr. Harry Schindehette
Fort Pierce Utilities Authority
Fort Pierce, Florida

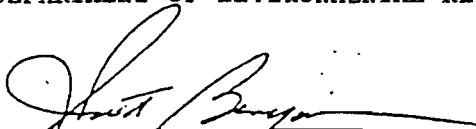
I.D. NUMBER: 50/WPB/56/0309
PERMIT/CERTIFICATION NUMBER: AO 56-175955
DATE OF ISSUE: MAY 1, 1990
EXPIRATION DATE: March 30, 1995

SPECIFIC CONDITIONS:

4. The compliance test report shall provide the following information on the air pollution control devices:
 - a. General condition of equipment (e.g., date of last thorough inspection and result of that inspection). Also note any deficiencies/problems, with the equipment which occur during testing,
 - b. Normal generating parameters of the equipment and the actual operation parameters for each test run (indicate how each parameter was determined).
5. Testing of emissions should be conducted using the fuel and/or process input which are expected to result in the highest emissions and within ten percent (10%) of the rated capacity of the source. Otherwise the Department may require the test to be repeated or modify the permit to reflect tested rates and/or fuels.
6. The Department shall be notified of expected test dates at least fifteen (15) days prior to compliance testing.
7. On or before March 1 of each calendar year, a completed DER Form 17-1.202(6), Annual Operations Report Form for Air Emissions Sources shall be submitted to the Department.
8. The operation of the sources covered by this permit shall be limited 8,736 hours/year.
9. Fuels used shall be limited to natural gas, except that No. 2 fuel oil with a maximum sulfur content of 0.5 percent by weight shall be allowed to be burned only as an emergency back-up fuel.
10. Sulfur and nitrogen content of the fuel being fired in the gas turbine shall be determined and recorded as specified in the NSPS for Gas Turbines 40 CFR 60, Subpart GG, Section 60.334. The records of fuel oil usage will be kept by the company, available for regulatory agency's inspection, for a two-year period.
11. The applicant shall comply with all requirements of 40 CFR 60, Subpart GG, Standards of Performance for stationary gas turbines.
12. A continuous monitoring system shall be installed to monitor and record the fuel consumption and the ratio of water to fuel being fired in the turbine.
13. The permittee shall be aware of and operate under the attached "General Permit Conditions #1 thru 14.". General Permit Conditions are binding upon the permittee and enforceable pursuant to Chapter 403 of the Florida Statutes.

Issued this 1st day of May, 1990

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION



J. Scott Benyon
Deputy Assistant Secretary



Best Available Copy
Department of
Environmental Protection

RECEIVED

APR 11 1996

POWER PLANT

Virginia B. Wetherell
Secretary

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Notice of Permit Amendment

In the matter of an
Application for Permit by:

DEP File No. AC 56-141460A
31.6 MW Combined Cycle
Gas Turbine

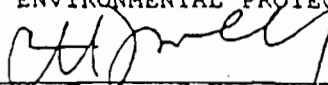
Mr. Thomas Richards, P.E.
Director of Operations
H. D. King Power Plant
311 North Indian River Drive
Ft. Pierce, Florida 34950

Enclosed is amended Permit Number AC 56-141460A for a 31.6 MW Combined Cycle Gas Turbine. This amendment corrects the sulfur dioxide emission limits for Units 6, 7, and 8 when natural gas fuel is burned at this facility and allows alternate means to determine compliance with the sulfur dioxide and particulate matter emission limits. This permit amendment is issued pursuant to Section 403, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by 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 14 days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

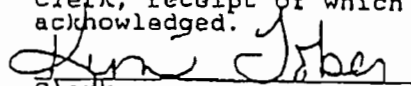

C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT AMENDMENT and all copies were mailed by certified mail before the close of business on 4-8-96 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.


Clerk 4-8-96
Date

Copies furnished to:
Isidore Goldman, SED

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

FINAL DETERMINATION
Permit No. AC 56-141460A

The Intent to Issue an amended air construction permit to the Ft. Pierce Utility Authority for the H. D. King Power Plant at 311 North Indian River Drive, Ft. Pierce, St. Lucie County, Florida 34950 to correct the sulfur dioxide emission limits when natural gas fuel is burned in Units 6, 7, 8, and 9 and to allow alternate means to determine compliance with the sulfur dioxide and particulate matter emission limits was distributed on March 7, 1996. The Notice of Intent to Issue Permit Amendment was published in the Tribune on March 18, 1996. Copies of the evaluation were available for public inspection at the Department's offices in West Palm Beach and Tallahassee.

Comments were submitted on the Department's Intent by our Southeast District office. The District asked that the amendment clarify that the facility has separate emission limits for natural gas and fuel oil. They also asked that the EPA test methods be listed in the permit. In response to this request, the Department has clarified that the unit has separate emission limits for natural gas and fuel oil and has listed the methods that can be used to determine compliance with the sulfur dioxide and particulate matter emission limits.

The final action of the Department will be to issue amended permit No. AC 56-141460A as proposed.



Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

PERMITTEE:

Ft. Pierce Utilities Authority
H. D. King Power Plant
311 North Indian River Drive
Ft. Pierce, Florida 34950

Permit Number: AC 56-141460A
Expiration Date: July 1, 1996
County: St. Lucie
Project: 31.6 MW Combined Cycle
Gas Turbine

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code, (F.A.C.), Chapters 62-4, 62-210 through 297. 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 re-issuance of permit No. AC 56-141460, subject to all previous conditions, amendments, and modifications, except for the changes by the Specific Conditions of this permit for Units Nos. 6, 7, 8, and 9. Permit No. AC 56-141460 expired June 1, 1990.

The H. D. King Power Plant is located at 311 North Indian River Drive, Ft. Pierce, St. Lucie County, Florida 34950. The UTM coordinates of the plant are Zone 17, 566.8 km E and 3,036.3 km N.

The project shall be constructed/operated in accordance with the attached request, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Original construction permit AC 56-141460 issued March 28, 1988.
2. Amendment dated October 31, 1988.
3. Amendment dated August 31, 1989.
4. Amendment dated April 18, 1990.
5. Amendment dated November 9, 1990.
6. Amendment dated June 28, 1991.
7. Amendment/Settlement Agreement, DOAH Case No. 91-6989
8. Request for amendment dated February 21, 1996.
9. Interoffice Memorandum dated March 29, 1996.

Page 1 of 3

RECEIVED

APR 11 1996

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Printed on recycled paper.

POWER PLANT

PERMITTEE:
Ft. Pierce Utility Authority

Permit No. AC 56-141460A
Expiration Date: July 1, 1996

SPECIFIC CONDITIONS:

1. This permit supersedes permit No. AC 56-141460 issued March 28, 1988.
2. The provisions of permit No. AC 56-141460 are incorporated into this air construction permit except for the following changes:
3. The sulfur dioxide emission standards in Specific Condition No. 2A of permit No. AC 56-141460 for Units 6, 7, and 8 when natural gas fuel is being burned are changed:

FROM

Parameter	Unit 6 lbs/hr	Unit 7 lbs/hr	Unit 8 lbs/hr
SO ₂	12.38	0.1199	0.1917

TO

Parameter	Unit 6 lbs/hr	Unit 7 lbs/hr	Unit 8 lbs/hr
SO ₂	2.5	2.5	2.5

The emission standards for other regulated air pollutants for natural gas fuel and all air pollutants for fuel oil are not changed by this amendment.

4. Compliance testing requirements for the sulfur dioxide emission limits for unit 9 of permit No. AC 56-141460 are changed:

FROM:

Compliance with the sulfur dioxide emission limits will be determined by Reference Method 20 or by calculations based on fuel analysis (ASTM D1552) for sulfur content.

TO:

Compliance with the sulfur dioxide emission limits will be determined by Reference Method 20 or by calculation based on fuel analysis (ASTM 1552, D1072, D3031, D4084, or D3246) for sulfur content of the oil and natural gas. Certified analysis by the appropriate test method from the fuel supplier is acceptable to the Department.

PERMITTEE:
Ft. Pierce Utility Authority

Permit No. AC 141460A
Expiration Date: July 1, 1996

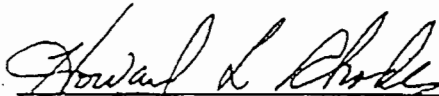
New Specific Condition for Permit No. AC 56-141460A;

11. Compliance testing requirements for the sulfur dioxide and particulate matter emission limits for units 6, 7, and 8 are:

Compliance with the sulfur dioxide emission limits will be determined by Reference Method 6 or 6C or by calculation based on fuel analysis (ASTM 1552, D1072, D3031, D4084, or D3246) for sulfur content of the oil and natural gas. Certified analysis by the appropriate test method from the fuel supplier is acceptable to the Department.

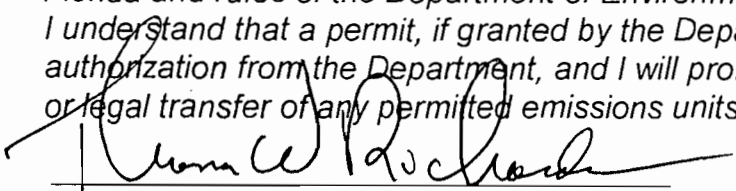
Particulate matter tests on these units are waived when burning natural gas provided that the visible emissions do not exceed 5 percent opacity.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



Howard E. Rhodes, Director
Division of Air Resources
Management

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official :	
Name :	Thomas W. Richards
Title :	Director of Operations
2. Owner or Authorized Representative or Responsible Official Mailing Address :	
Organization/Firm :	Fort Pierce Utilities Authority
Street Address :	P.O. Box 3191
City :	Fort Pierce
State :	FL
Zip Code :	34948-____
3. Owner/Authorized Representative or Responsible Official Telephone Numbers :	
Telephone :	(407)466-1600
Fax :	(407)465-6984
4. Owner/Authorized Representative or Responsible Official Statement :	
<p><i>I, the undersigned, am the owner or authorized representative* of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions units.</i></p>	
	<u>6/13/96</u>
Signature	Date

* Attach letter of authorization if not currently on file.

4. Professional Engineer Statement :

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

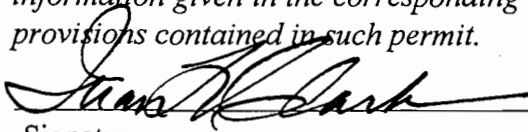
(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollutant control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions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

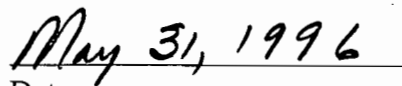
(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions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

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

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

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


Signature


Date

* Attach any exception to certification statement.

I. Part 6 - 1

DEP Form No. 62-210.900(1) - Form
Effective : 3-21-96

ATTACHMENTS AND FIGURES

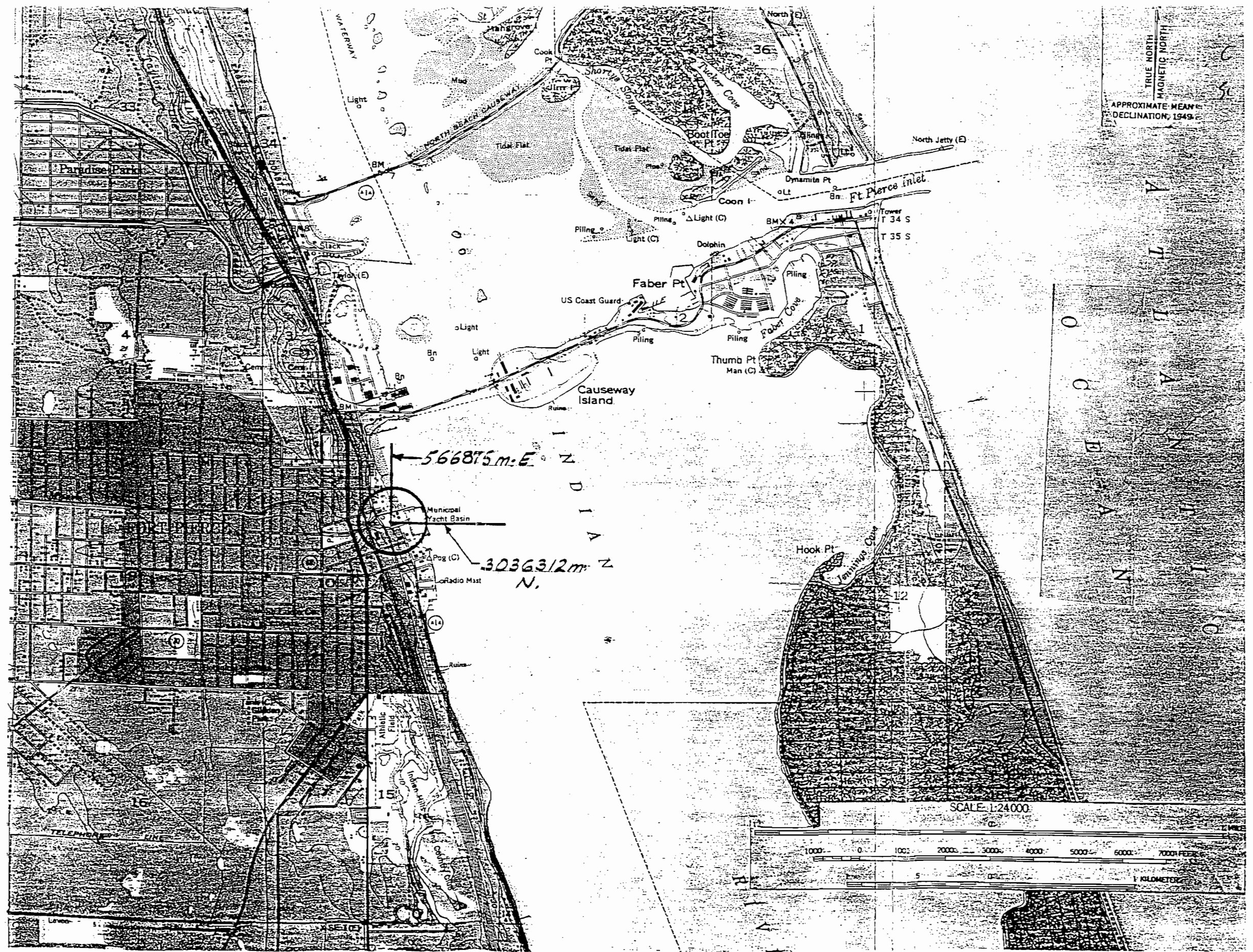


Figure 1

SITE PLAN OF H.D. KING PLANT

SITE ARRANGEMENT

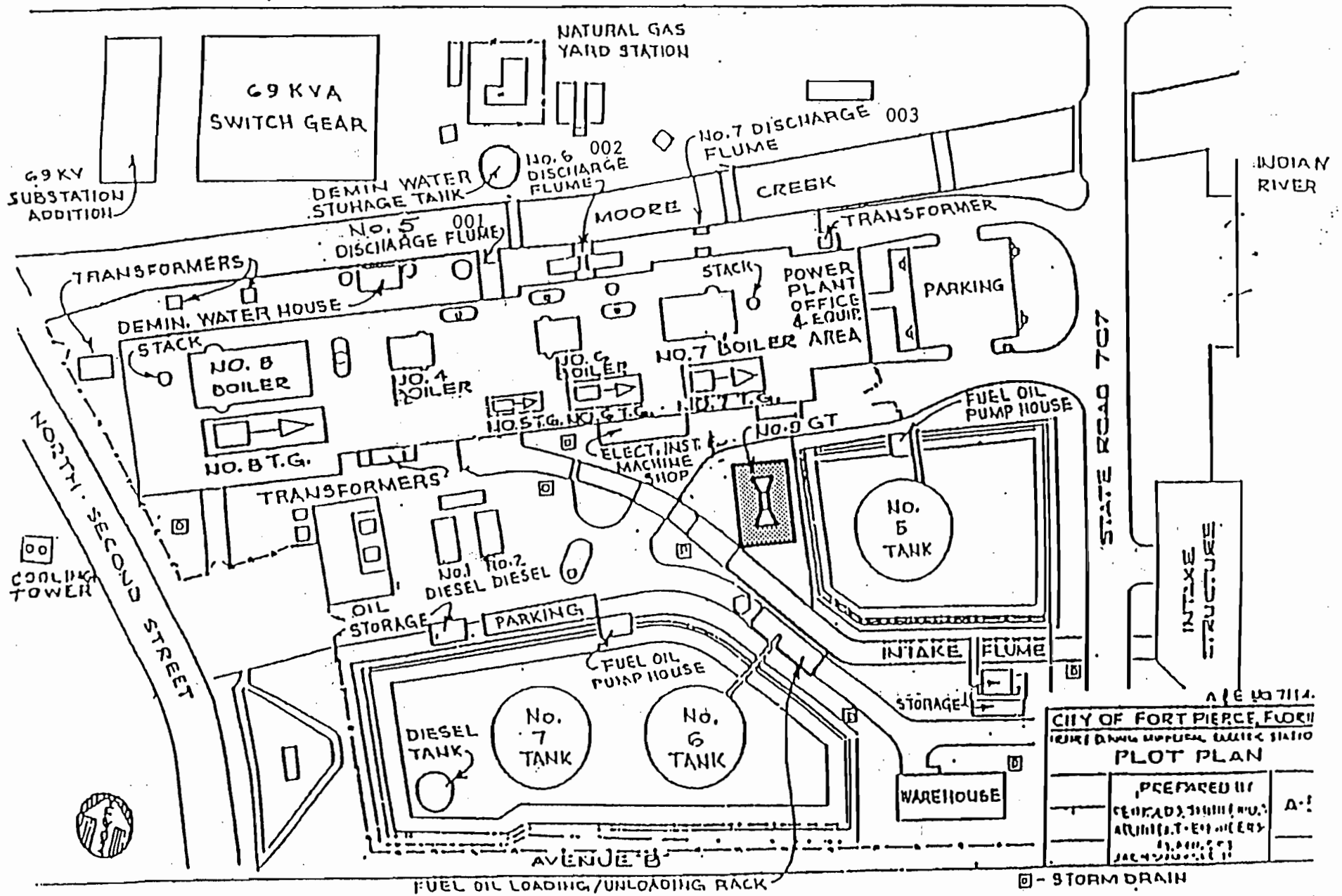


Figure 2

APR 10 1974

CITY OF FORT PIERCE, FLORIDA
 WATER DEPARTMENT
 WATER TREATMENT PLANT
PLOT PLAN

PREPARED BY	DATE
C. H. ADAMS, ENGINEER	4-10-74
APPROVED BY	
J. H. ADAMS, ENGINEER	

□ - STORM DRAIN

PROCESS FLOW DIAGRAM

H. D. KING DIESEL UNIT #1

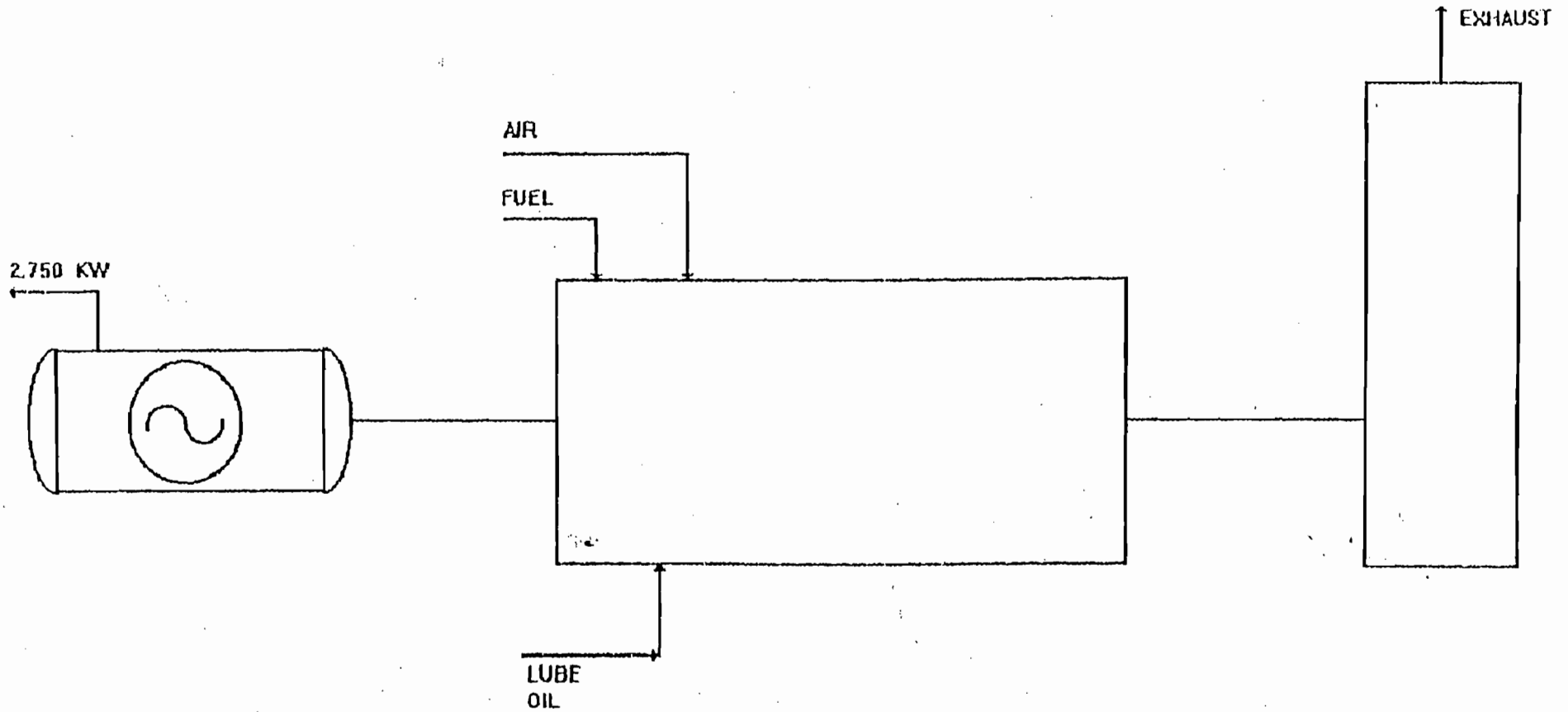


Figure 3

FORT PIERCE UTILITIES AUTHORITY
FORT PIERCE, FLORIDA
DATE: 6-6-95

PROCESS FLOW DIAGRAM
H. D. KING DIESEL UNIT #2

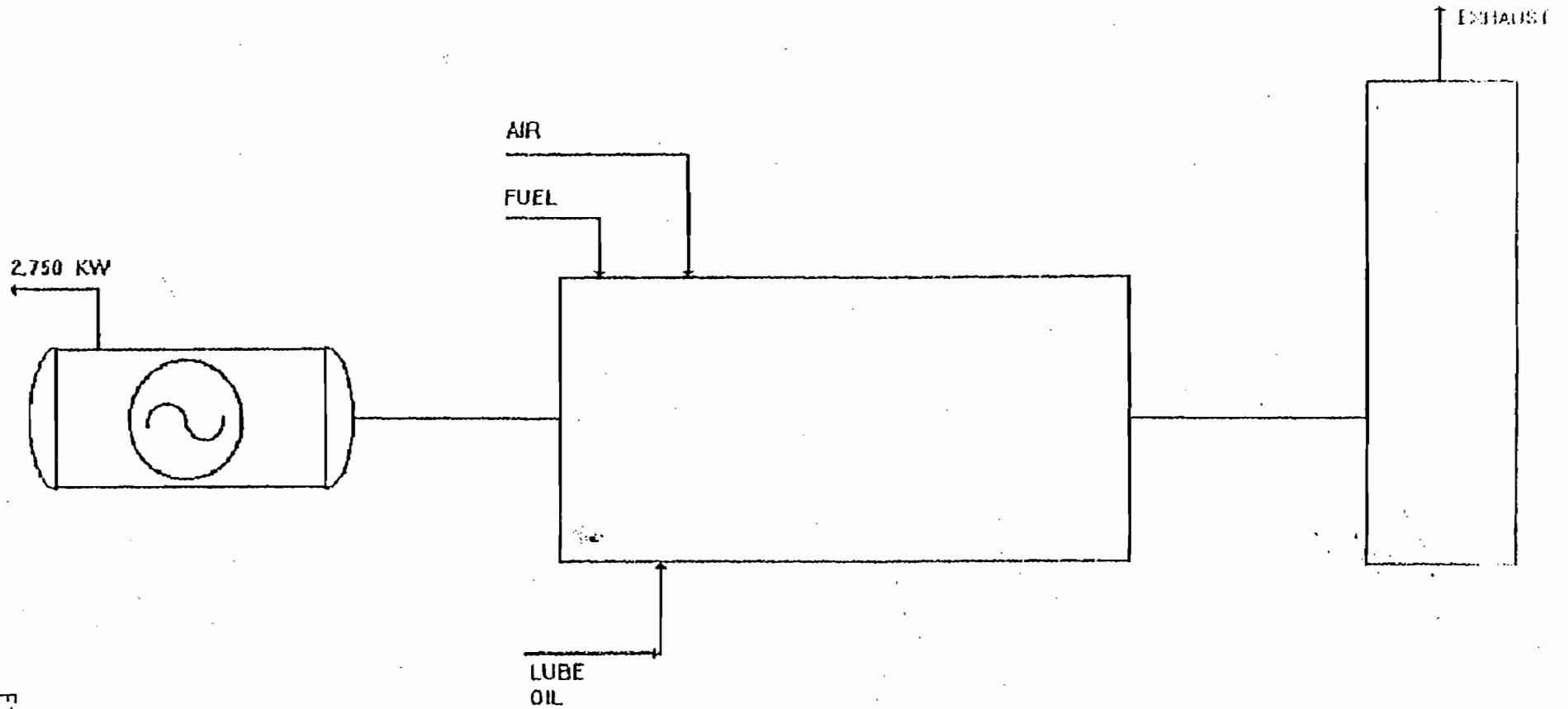


Figure 4

FORT PIERCE UTILITIES AUTHORITY
FORT PIERCE, FLORIDA
DATE: 8-8-95

Process Flow Diagram

Units # 9 & 5

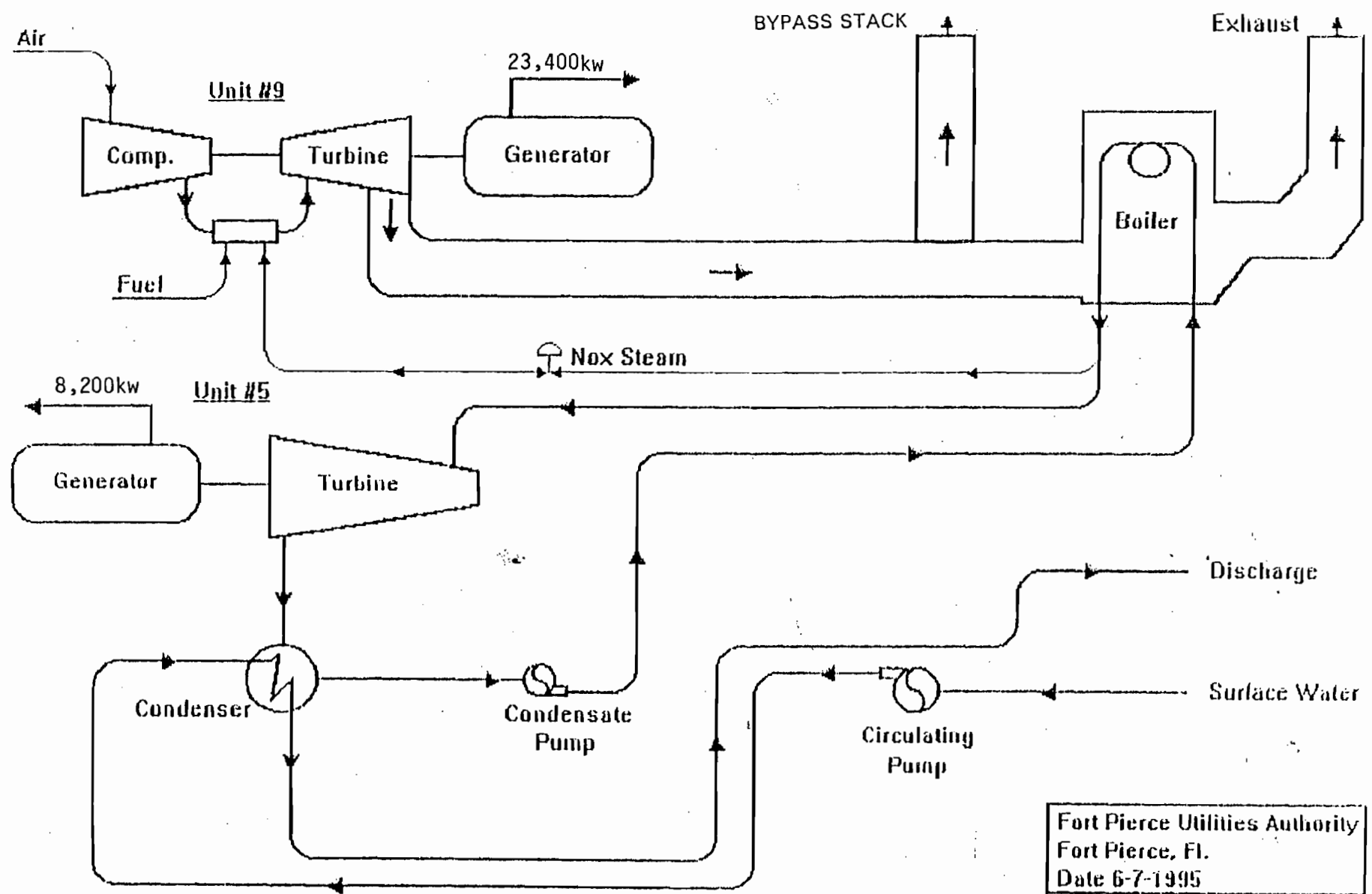


Figure 5

Fort Pierce Utilities Authority
Fort Pierce, Fl.
Date 6-7-1995

Process Flow Diagram

Unit # 6

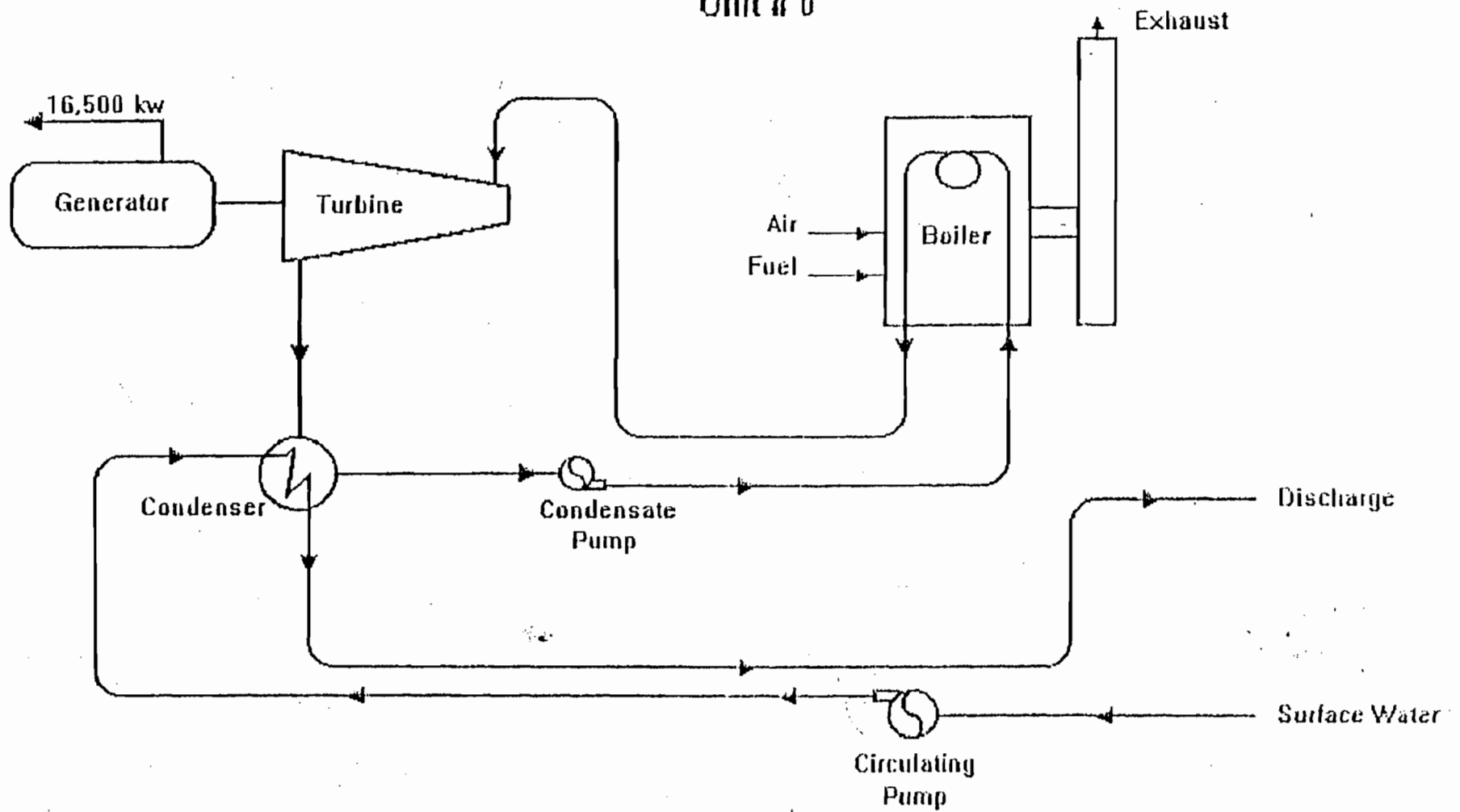


Figure 6

Fort Pierce Utilities Authority
Fort Pierce, Fl.
Date 6-7-1995

Process Flow Diagram

Unit # 7

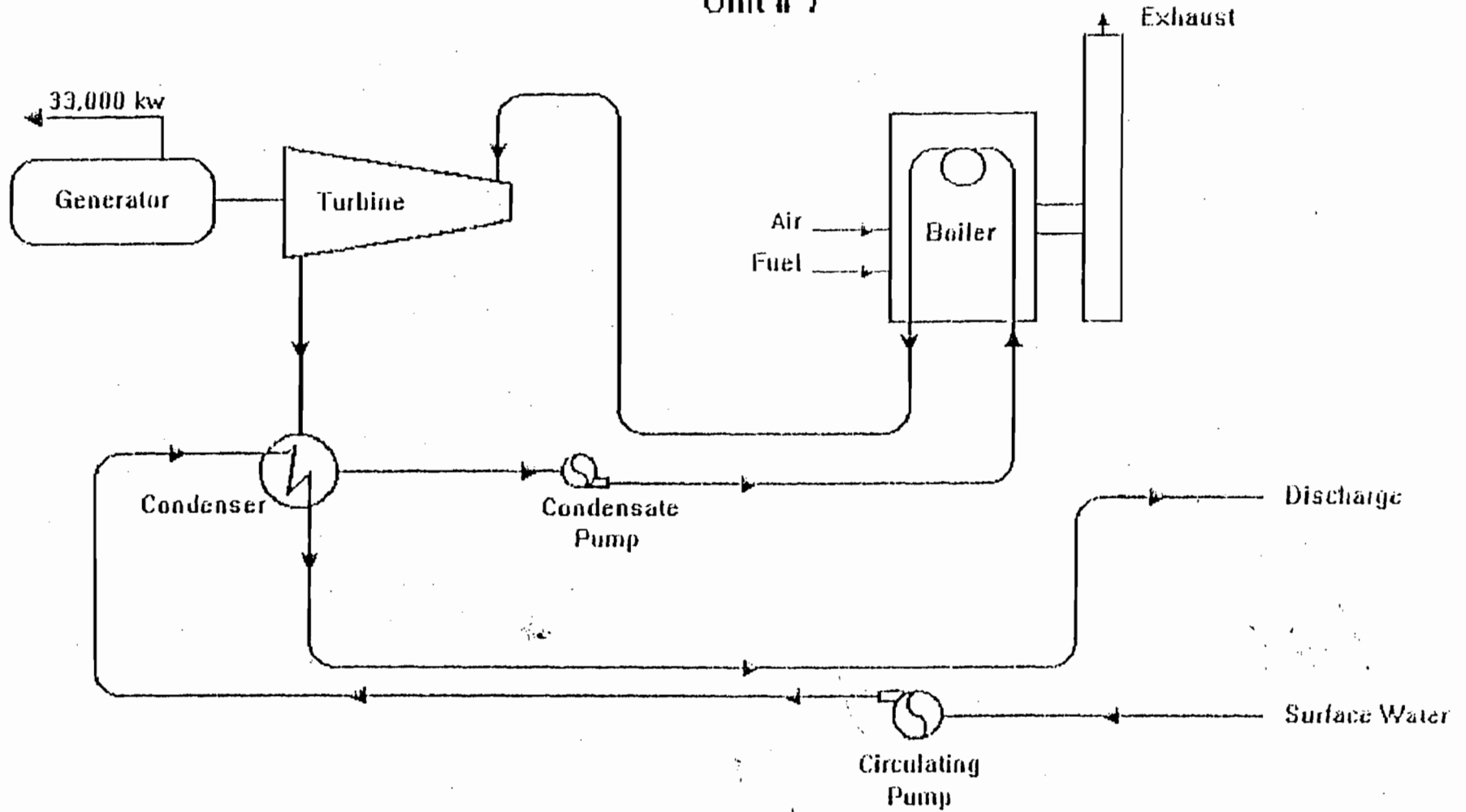


Figure 7

Fort Pierce Utilities Authority
Fort Pierce, FL
Date 6-7-1995

Process Flow Diagram

Unit #8

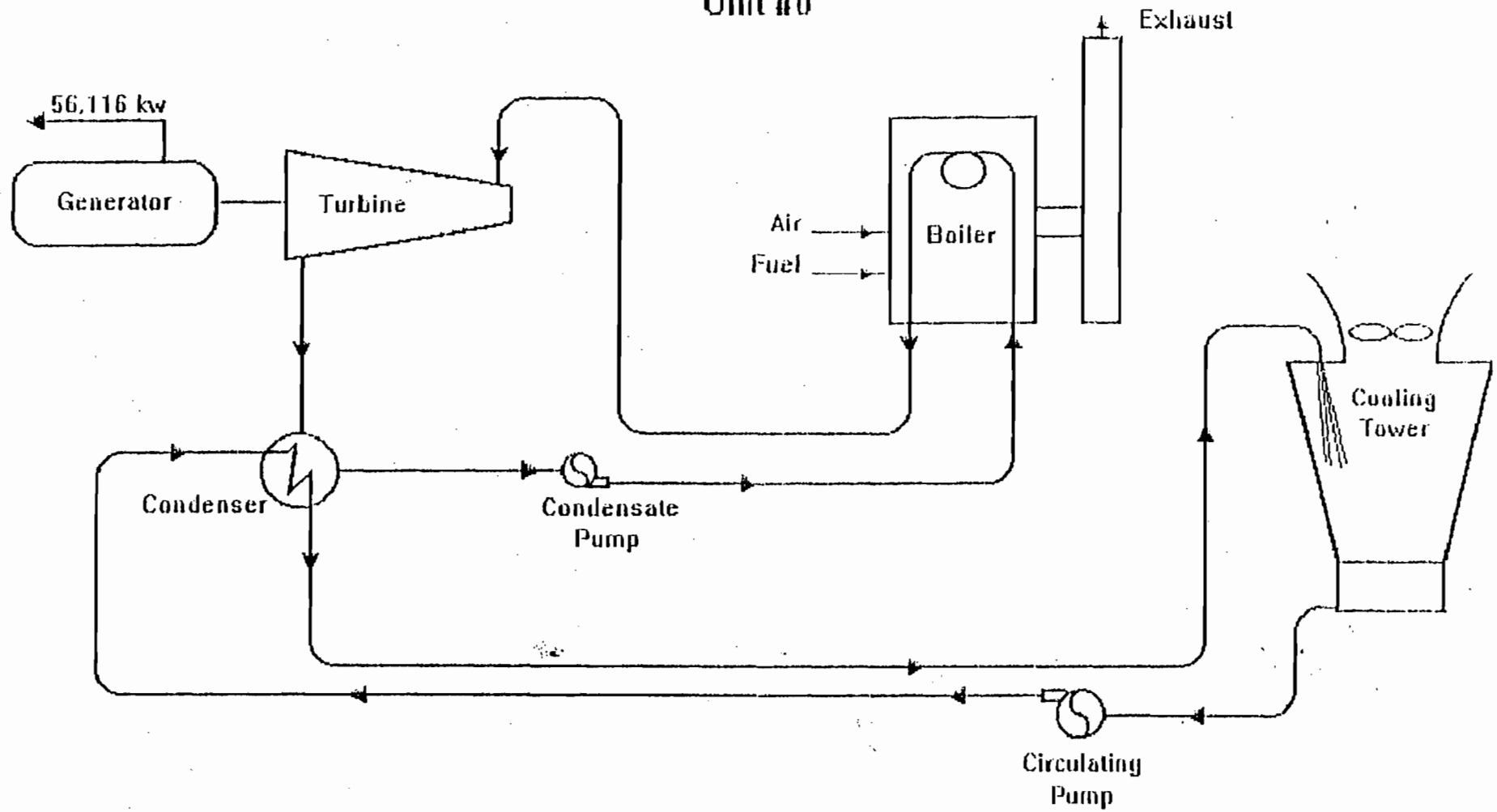


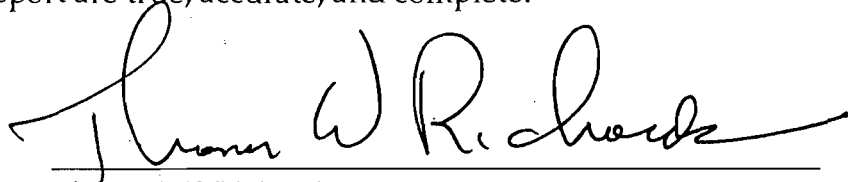
Figure 8

Fort Pierce Utilities Authority
Fort Pierce, FL.
Date 6-7-1995

Attachment A

COMPLIANCE STATEMENT

"I, the undersigned, am the responsible official as defined in Chapter 62-213, F.A.C., of the Title V source for which this report is being submitted. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made and data contained in this report are true, accurate, and complete."

A handwritten signature in black ink, appearing to read "Thomas W. Richards". The signature is written in a cursive style with a long horizontal flourish at the end.

Thomas W. Richards
Director of Operations

Attachment B

FUEL ANALYSES

FLORIDA GAS TRANSMISSION COMPANY

Spot Analysis of Natural Gas for Delivery in Florida

DATE: April 25, 1995

TIME: 11:48

<u>Component Name</u>	<u>Mole %</u>
Hexane	0.054
Propane	0.390
Isobutane	0.101
n-Butane	0.080
Isopentane	0.031
n-Pentane	0.018
Nitrogen	0.349
Methane	96.060
CO ₂	0.746
Ethane	2.171
Totals	100.000

Dry Btu/cf @ 14.730 psia and 60°F = 1033.7

Real Relative Density = 0.5829

Total Sulfur	0.16 Gr/Ccf
Total Sulfur D/S	0.35 Gr/Ccf
H ₂ S	0.04 Gr/Ccf
H ₂ O	3.4 lb/MMcf

3/95



CERTIFICATE OF ANALYSIS

JOB NO.	TPA-0956512
LAB NO.	L950214-057

VESSEL	FORT PIERCE UTILITIES AUTHORITY	DATE	3-07-95
CARGO	# 2 FUEL OIL		
TERMINAL/PORT	FORT PIERCE UTILITIES, 311 NORTH INDIAN RIVER DRIVE FORT PIERCE, FL		
SAMPLE FROM	SUBMITTED		
SAMPLE SUBMITTED BY	FORT PIERCE UTILITIES AUTHORITY		
ANALYSIS PERFORMED BY	INSPECTORATE AMERICA, TAMPA		
CLIENT(S) REF.	P.O. # 43810		

TEST	RESULTS
D-287	API GRAVITY @ 60 DEG F 32.4
D-93	FLASH POINT, FMCC, DEG F 182
D-97	POUR POINT, DEG C -23
D-4294	SULFUR, WT % 0.11
D-95	WATER BY DISTILLATION <0.025
D-189	CARBON RESIDUE, WT.%, 10% BOTTOMS 0.07
D-482	ASH, WT % <0.01
AAS	VANADIUM, PPM <0.3
AAS	SODIUM, PPM <0.2
AAS	POTASSIUM, PPM <0.3
AAS	CALCIUM, PPM <0.3
AAS	LEAD, PPM <0.3
D-3228	NITROGEN, PPM 145
D-240	HEAT OF COMBUSTION, GROSS BTU/LB 19,524
D-976	CETANE INDEX 45.7
D-2274	PARTICULATES, MG/LITER 21
D-86	DISTILLATION, % RECOVERED, DEG F
	IBP/5 408/444
	10/20 464/486
	30/40 502/518
	50/60 536/550
	70/80 566/586
	90/EP 610/660
	REC/RES/LOSS 98.0/1.9/0.1
	BACTERIAL CONTAMINATION SLIGHT
PE-240-C	HYDROGEN WT. % 13.38 %

FOR INSPECTORATE: *[Signature]*

HEAT of Combustion BTU/gal = 140358.03 BTU/gal

3/14 P. 005



CERTIFICATE OF ANALYSIS

JOB NO.	TPA-0956542
LAB NO.	L950126-042, 43, 5

VESSEL	FORT PIERCE UTILITIES AUTHORITY	DATE	3-07-95
CARGO	# 6 FUEL OIL		
TERMINAL/PORT	FORT PIERCE UTILITIES, 311 NORTH INDIAN RIVER DRIVE FORT PIERCE, FL		
SAMPLE FROM	SUBMITTED		
SAMPLE SUBMITTED BY	FORT PIERCE UTILITIES AUTHORITY		
ANALYSIS PERFORMED BY	INSPECTORATE AMERICA, TAMPA		
CLIENT(S) REF.	P.O. # 29536		

TEST		RESULTS	
L950125-043	SUBMITTED SAMPLE 7 pm to 12 pm COMPOSITE - 1/25/95		
D-287	DENSITY @ 15 DEG C	0.9267	= 7.722
D-4294	SULFUR, WT %	0.78	
D-240	HEAT OF COMBUSTION * 146941.93 BTU/gal.	19,029	← 433/gal
L950126-042	SUBMITTED SAMPLE, 12 pm to 8 am COMPOSITE - 1/24/95		
D-287	DENSITY @ A5 DEG C	0.9267	(7.72)
D-4294	SULFUR, WT %	0.77	
D-240	HEAT OF COMBUSTION * 147644.64 BTU/gal.	19,120	
L950209-058			
D-287	DENSITY @ A5 DEG C - 2/9/95	0.9261	(7.717)
D-4294	SULFUR, WT %	0.78	
D-240	HEAT OF COMBUSTION * 146615.28 BTU/gal.	18,999	
		19,049	
* AS PER DAN Buck of INSPECTORATE			3/14/95

FOR INSPECTORATE: *[Signature]*

Attachment C

DESCRIPTION OF CONTROL EQUIPMENT

ON UNITS NO. 6, 7 AND 9

DETAILED DESCRIPTION OF CONTROL EQUIPMENT

Unit ID 003 - Combined Cycle Gas Turbine

The air pollution control associated with the gas turbine consists of steam injection for NO_x emissions reduction. Design details and manufacturer guarantees for control efficiency for the steam injection system are unavailable. The control efficiency of the steam injection system is believed to be sufficient for the gas turbine to meet current applicable NO_x emissions limits.

Unit ID 004 - 16.5 MW Boiler Unit #6

The air pollution control associated with the boiler consists of a multiple cyclone for particulate emissions reduction. Manufacturer design details are attached. The control efficiency of the multiple cyclone is believed to be sufficient for the boiler to meet current applicable particulate emissions limitations.

Unit ID 007 - 33.0 MW Boiler Unit #7

The air pollution control associated with the boiler consists of a multiple cyclone for particulate emissions reduction. Manufacturer design details are attached. The control efficiency of the multiple cyclone is believed to be sufficient for the boiler to meet current applicable particulate emissions limitations.

Model #
Serial #

DATE INSTALLED

STEAM INJECTION

GENERAL

The steam injection control system provides the necessary flow of steam to the gas turbine combustion system in order to meet Federal and State regulations regarding the emission of nitrogen oxides (NO_x). The regulations not only require meeting the emission levels, but also require the continuous monitoring of fuel flow, steam injection flow, and other machine parameters to verify that the regulations are being met.

STEAM INJECTION HARDWARE

The steam injection control system hardware is located off-base, mounted in the steam piping. Figure SIR4000-1 shows a schematic of these control devices.

Devices

1. A metering tube and orifice are the primary devices for measurement of steam flow.
2. Two differential transmitters (96SJ-1, -2) measure pressure drop across the orifice. The two transmitters operate in a split-range mode, where one transmitter is calibrated to monitor the lower range of flow and the other, the higher range. Thus, the total flow range measurement accuracy is improved compared to a single transmitter arrangement.
3. A pressure transmitter (96PJ-1) measures steam pressure for calculation of steam flow and indication of steam condition.

4. Three thermocouples (ST-SJ-1, -2, -3) measure steam temperature for calculation of steam flow and indication of steam condition.
5. A pneumatically operated stop valve (controlled by trip solenoid 20SJ-1) opens to permit steam injection flow and closes to shut off flow when the system is not operating or when the system is tripped. A limit switch (33SJ-1) indicates valve-closed position.
6. Two pneumatically operated valves (controlled by solenoid valves 20BS-1, -2) provide steam-line condensate drain and warm-up prior to injection. Limit switches indicate valve position.
7. A steam control valve regulates the flow of steam to the gas turbine. This valve is driven by an electromechanical motor actuator which receives direction (open or close) and run signals from the gas turbine control system. The control valve has a limit switch which indicates valve fully closed position.

CONTROL PANEL/OPERATOR INTER-FACES

The turbine control panel provides the necessary information to the operator to indicate the operational status of the steam injection system. The steam injection system is manually enabled by selecting the "Manual Control Display" on the turbine control panel CRT, finding the "Steam Injection Control" page and pressing the "Steam Inj On" softswitch. The steam injection system is disabled by pressing the "Steam Inj Off" softswitch. When the steam

- o Assuming the turbine shutdown sequence continues, when the generator breaker opens, the steam stop valve will close and the #1 drain valve will open.
- o The operator should now close the steam-line isolation valve.

STEAM FLOW CONTROL

The steam flow program determines a steam injection flow setpoint based on fuel flow rate, ambient temperature and sometimes specific humidity. Figure SIR4000-2 shows a typical schedule. Note that there is a CONTROL schedule and a COMPLIANCE schedule. The COMPLIANCE schedule represents the amount of steam required to just meet the NO_x emissions requirement. If steam flow should ever fall to or below this schedule, an alarm will occur. The CONTROL schedule is the one used to control steam flow to the turbine. It is set higher than the COMPLIANCE schedule to account for the control system dead-band and normal operational transients. The separation between the curves is set by constant WQKR3.

As shown in Figure SIR4000-2, steam flow is initiated when fuel flow to the turbine reaches the value specified by constant WQK() E. At this point, the steam injection flow setpoint is released from 0. The setpoint assumes a value in accordance with the measured fuel flow, ambient temperature, and specific humidity. The control valve is allowed to ramp open until steam flow equals the setpoint. The ramp consists of a series of small steps. The control valve motor is turned on (in the open direction) for a fixed length of time and then turned off for another fixed length of time. The on time is set by timer L2WQOF1 and the off time by timer L2WQON. The ramp should be adjusted so the control valve opens as quickly as possible without upsetting the steam supply conditions.

Steam flow feedback is calculated from measured pressure drop across a flow orifice, compensated for steam temperature and pressure variations. Where there is a wide flow range, two differential transmitters are supplied to monitor flow in a split-range configuration; one transmitter calibrated for a low flow region, the other calibrated for a high flow region. Automatic switching between the two transmitters is programmed in the control logic of the computer. Based on the selected measurement of differential pressure, steam temperature and steam pressure, steam flow is calculated, forming the feedback for the flow control system.

PROTECTIVE FEATURES

Steam injection system alarm and shutoff conditions are detected by the protection task program within the microcomputer. Certain component or system conditions are alarmed only - to alert the operator of abnormal but not yet critical states. Other conditions result in shutoff of the steam injection system via the control valve or the stop valve.

Steam Supply Condition Trouble

The steam injection protection system monitors steam supply conditions to alarm or shutoff steam flow when abnormal conditions are detected. See Figure SIR4000-3 which illustrates the steam temperature and steam pressure supply conditions that will result in protective actions. Alarm actions are initiated by high or low pressure levels and by high or low temperatures. The low-temperature alarm setpoint is modified with pressure to track the saturation curve. The purpose of this alarm (and subsequent trip) is to insure that the supply steam is superheated. Steam injection shutdown actions are initiated on high steam pressure and high temperature for equipment protection. The steam injection shutdown signal is latched until operator actions are taken. To re-initiate

SIR4000-5

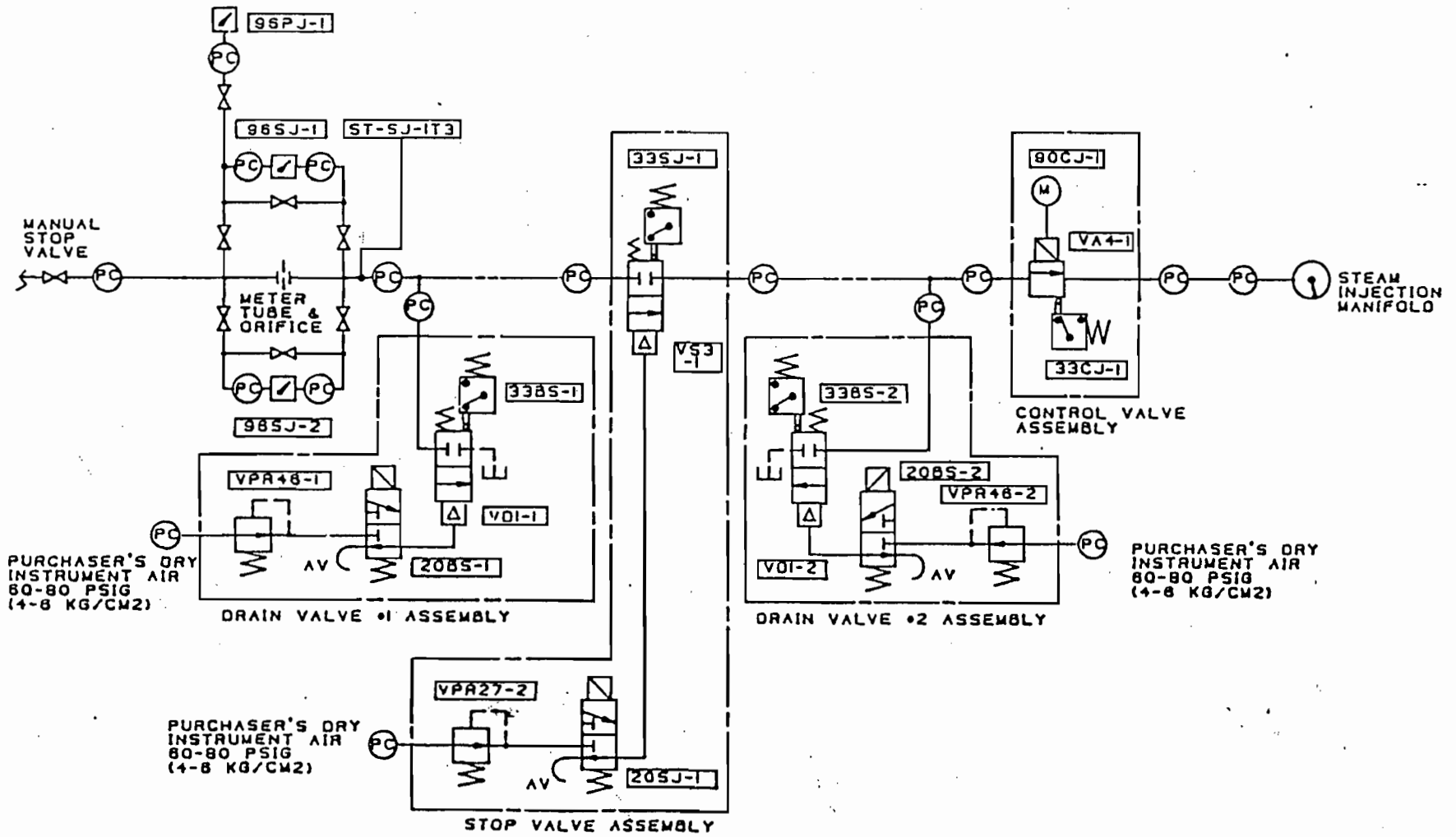


FIGURE SIR4000-1
(788)

STEAM SUPPLY CONDITION
ALARM & SHUTDOWN

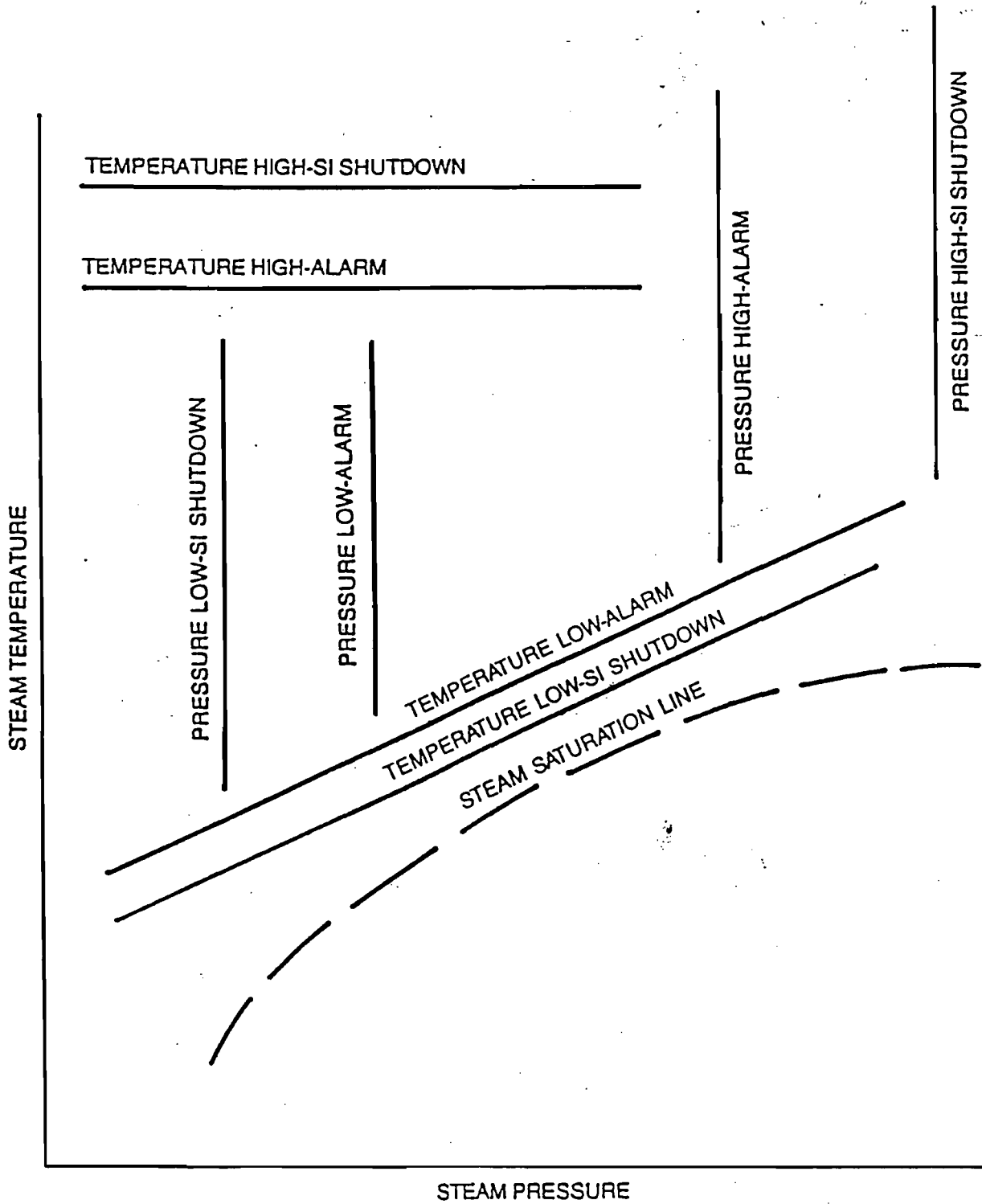


FIGURE SIR4000-3
(788)

SIR4000-7

STEAM INJECTION SYSTEM

GENERAL

The steam injection system provides the necessary flow of steam to the gas turbine combustion system to meet Federal and State exhaust emission requirements by limiting the emission of nitrogen oxides (NO_x) in the turbine exhaust. The strict regulations not only require meeting the emission levels, but also require the continuous monitoring of fuel flow, steam injection flow, and other machine parameters to verify that the regulations are being met.

The steam injection system, shown in the system schematic diagram (see Reference Drawings), consists of steam flow control and regulating valves and control and monitoring devices located off base in the purchaser's steam piping. The steam from this off-base source is supplied in a controlled flow to the turbine's steam injection manifold. The associated automatic electronic control system, part of the turbine control circuits, controlling this steam injection system utilizes the Mark IV computer as the basic control element and is described in the Control and Protection Section.

The main components of the steam injection system include the following:

1. A meter tube and orifice.
2. Differential pressure transmitters, 96SJ-1 and -2.
3. Steam supply pressure transmitter, 96PJ-1.
4. Thermocouple, ST-SJ-1T3.
5. Stop valve, VS3-1, pneumatically operated with limit switch, 33SJ-1.
6. Stop valve-trip solenoid, 20SJ-1.

7. Control air regulator valve, VPR27-2.
8. Steam line drain valves, VD1-1, -2 air actuated with limit switches 33BS-1, -2, -3.
9. Steam line drain valve-solenoid valve, 20BS-1, -2.
10. Drain valve air regulator valve, VPR46-1, -2.
11. Steam injection control valve, VA4-1, with electromechanical actuator and limit switch, 33CJ-1.
12. On-base steam injection manifold and piping to combustion chambers.

FUNCTIONAL DESCRIPTION

For a functional description of the steam injection system, refer to the steam injection system text in the Control and Protection section of this manual.

SYSTEM REQUIREMENTS

STEAM SUPPLY

The purchaser is to supply steam for the steam injection system to meet the system design requirements of flow, temperature and pressure (see Control Specification). The steam supplied must be superheated steam within the design temperature range of the system and must be at the specified minimum pressure to prevent backflow of combustion gases into the steam line. To keep within the system design operating range, the steam should not exceed the maximum specified temperature and pressure, otherwise, damage to seals and valve stem packing could result.

INSTRUMENT AIR

The purchaser is to supply dry instrument air at the pressure range specified on the steam injection piping schematic diagram for operation of the pneumatically operated stop valve and drain valves.

OPERATION

Before operating the steam injection system for the first time following an overhaul or periods of extended shutdown, it is important that the following checks be made:

1. Steam supply is within design parameters.
2. Instrument air supply is at required pressure.
3. Steam line orifice size is correct.
4. Pressure sensing lines are free of liquids.

PRE-OPERATION CHECKS

Prior to operation, check for the following conditions:

1. Panel controls are in Non select positions (Steam Injection OFF).
2. Manual stop valve is open.
3. All hand valves in line of flow are open.
4. All valves to temperature or pressure gauges are open.
5. Steam supply pressure and temperature are in operating range.

START UP

The automatic control system, in conjunction with logic circuits of the microcomputer of the SPEEDTRONIC control system, operates the steam injection system control valving and assures that the proper amount of steam injection is provided to the turbine combustion system during operation.

To initiate steam injection the operator must first select the "Manual Control Display" mode at the turbine control panel interface module. This mode will be displayed on the video display scope (CRT). By pressing the NEXT PAGE pushbutton (membrane switch), the display page will change until the "Steam Injection Control" page is reached. Then touching the function switch at the right of the CRT opposite the "Steam Inj ON" display initiates the steam injection control. At this point the automatic steam control circuits take over, initiate the drain and stop valve sequences and control the system. When steam conditions are correct, the steam control valve releases steam into the combustion system at the proper steam-to-fuel flow ratio.

The startup and operating sequence of the steam injection system is described and explained in the Steam Injection control system text of the Control and Protection section of this manual. (See CONTROL AND PROTECTION Tab).

MAINTENANCE

PERIODIC MAINTENANCE

During the first week of operation, the units steam injection on base piping and the control valves in the steam supply line should be checked periodically for leaks or other defects. After initial system checks monthly checks should be made.

All hand-operated valves should be cycled once a month to check freedom of movement. They should be returned to their normal operating position after this.

TROUBLE SHOOTING

The purpose of the system is to provide steam to the turbine combustion system at the desired pressure, temperature and flow. If this does not happen, the following problems may be the cause:

- a. Steam supply exhausted.
- b. Insufficient supply pressure.
- c. Control valve closed.
- d. Stop valve closed.

The following should be checked:

- a. Adequate steam supply.
- b. Check steam supply system.
- c. Check control valve actuator and drain valve operation.

- d. Check that instrument air supply is of sufficient pressure and/or solenoid control valve operation.

Alarm and shutdown conditions of the steam injection system are detected by a protection program built into the micro-computer. Alarm and trip indications are displayed on the turbine panel CRT scope. An alarm condition is initiated by high or low pressure levels and by high or low temperatures. See Control Specification for alarm and trip point values.

The computer program is designed to trip the steam STOP valve and prevent steam flow if steam temperature becomes excessive. It can trip the system on temperature or pressure. Steam at too high a pressure can cause damage to valve stem packing and system seals. A steam injection trip only shuts down the steam injection system, it does not trip the turbine.

Certain trouble status indications can be displayed as messages on the CRT screen. Refer to the elementary diagram for alarm numbers and messages.

STEAM INJECTION SYSTEM

INFORMATION FOR THE COMPONENTS LISTED BELOW IS CONTAINED
IN THE ASSOCIATED PUBLICATION.

<u>COMPONENT</u>	<u>SYMBOL</u>	<u>MANUFACTURER</u>	<u>PUBLICATION</u>
STEAM FLOW DIFFERENTIAL PRESSURE TRANSMITTER	96SJ-1 96AJ-1	ROSEMOUNT INC. MODEL 1151DP	4256/4257
STEAM INJECTION PRESSURE TRANSMITTER	96PJ-1 96PJ-2	ROSEMOUNT INC. MODEL 1151GP	4260/4261
<u>STEAM CONTROL VALVE ASSEMBLY</u>			
STEAM CONTROL VALVE WITH ACTUATOR AND ACCESSORIES	VA4-1 VA4-2	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33CJ-1 33CJ-2	MASONEILAN DIV. SERIES 496	ES-7000
	90CJ-1	MASONEILAN DIV. SERIES 4600	ES-2000
<u>STEAM STOP VALVE ASSEMBLY</u>			
STEAM STOP VALVE WITH ACTUATOR AND ACCESSORIES	VS3-1 VS3-2	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33SJ-2	MASONEILAN DIV. SERIES 496	ES-7000
	20SJ-1 20AJ-1,2	AUTOMATIC SWITCH CO.	V5688, V5380, V5551
	VPR27-2 VPR27-3	MASONEILAN DIV. MODEL 77-4	EY7700
<u>DRAIN VALVE ASSEMBLY</u>			
DRAIN VALVE, ACTUATOR AND ACCESSORIES	VD1-1, 2,4,5	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33BS-1, 2,4,5	MASONEILAN DIV. MODEL 496	ES-7000
	20BS-1, 2,4,5	AUTOMATIC SWITCH CO. CAT HT8320A185	V-5688 & V-5380
	VPR46-1, 2,4,5	MASONEILAN DIV. MODEL 77-4	EY7700

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GENERAL ELECTRIC 000

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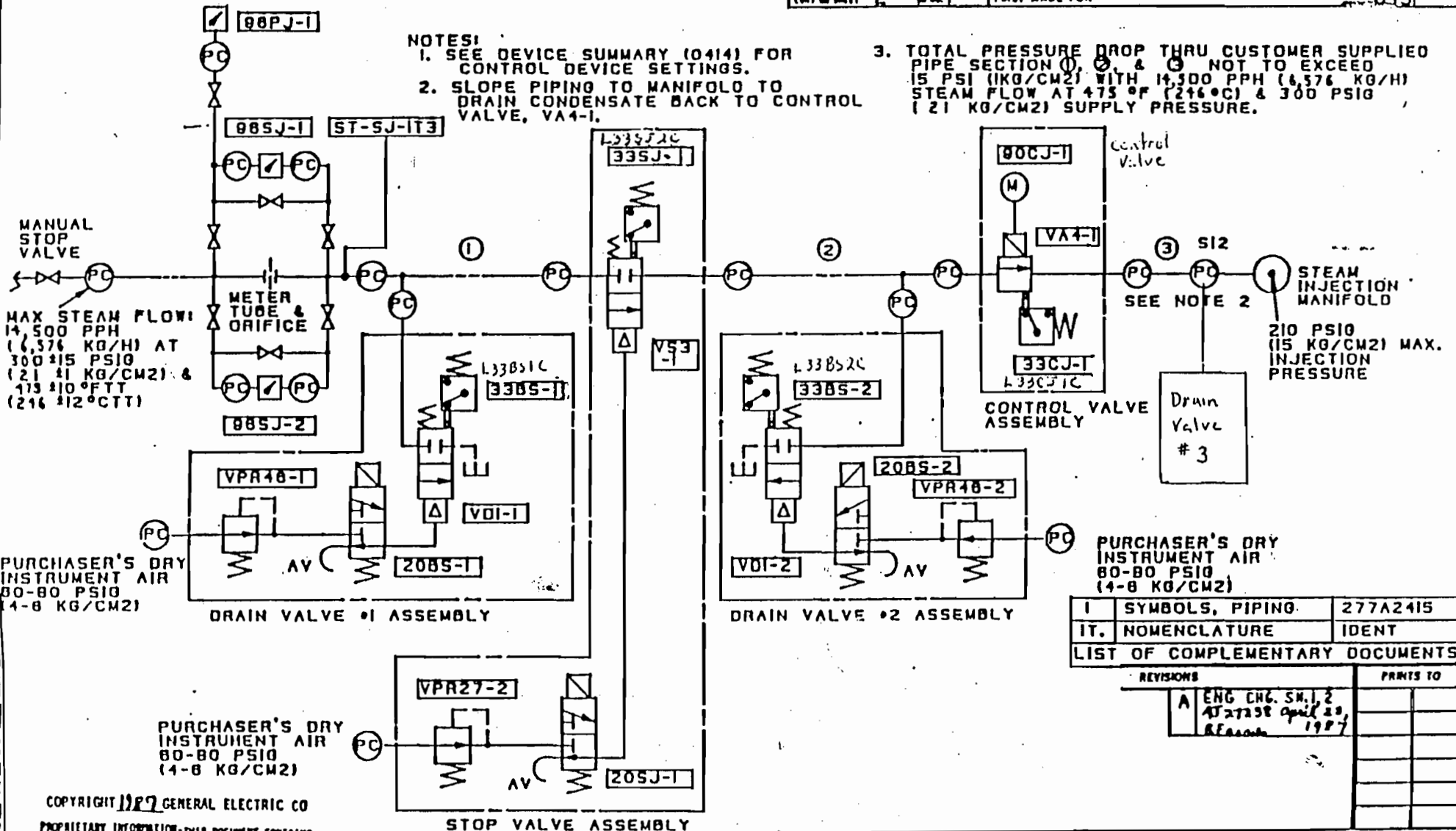
247B5083

DIAGRAM, SCHEM PP-ST INJECTION

FIRST MADE FOR ML-7L5AIPP388-1 0431

- NOTES:
1. SEE DEVICE SUMMARY (0414) FOR CONTROL DEVICE SETTINGS.
 2. SLOPE PIPING TO MANIFOLD TO DRAIN CONDENSATE BACK TO CONTROL VALVE, VA4-1.

3. TOTAL PRESSURE DROP THRU CUSTOMER SUPPLIED PIPE SECTION ①, ②, & ③ NOT TO EXCEED 15 PSI (1KG/CM²) WITH 14,500 PPH (6,576 KG/H) STEAM FLOW AT 475 °F (246 °C) & 300 PSIG (21 KG/CM²) SUPPLY PRESSURE.



MAX STEAM FLOW:
14,500 PPH
(6,576 KG/H) AT
300 ±15 PSIG
(21 ±1 KG/CM²) &
475 ±10 °FTT
(246 ±12 °CTT)

PURCHASER'S DRY
INSTRUMENT AIR
80-80 PSIG
(4-8 KG/CM²)

PURCHASER'S DRY
INSTRUMENT AIR
80-80 PSIG
(4-8 KG/CM²)

PURCHASER'S DRY
INSTRUMENT AIR
80-80 PSIG
(4-8 KG/CM²)

210 PSIG
(15 KG/CM²) MAX.
INJECTION
PRESSURE

I	SYMBOLS, PIPING	277A2415
IT	NOMENCLATURE	IDENT
LIST OF COMPLEMENTARY DOCUMENTS		

REVISIONS	PRINTS TO
A	ENG CHG. SN. 1, 2 AT 27298 April 29, 1987

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 OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF
 GAS TURBINE DIVISION, GENERAL ELECTRIC COMPANY.

MADE BY <i>Blanca 2/27/87</i>	APPROVALS <i>rr</i>	GAS TURBINE	REV. OR DEPT.	247B5083
DATE <i>March 31, 1987</i>		SCHENECTADY	LOCATION	COPY NO SHEET 2 OF 1
				REV. A 4/29/87

STEAM INJECTION

GENERAL

The steam injection control system provides the necessary flow of steam to the gas turbine combustion system in order to meet Federal and State regulations regarding the emission of nitrogen oxides (NO_x). The regulations not only require meeting the emission levels, but also require the continuous monitoring of fuel flow, steam injection flow, and other machine parameters to verify that the regulations are being met.

STEAM INJECTION HARDWARE

The steam injection control system hardware is located off-base, mounted in the steam piping. Figure SIR4000-1 shows a schematic of these control devices.

Devices

1. A metering tube and orifice are the primary devices for measurement of steam flow.
2. Two differential transmitters (96SJ-1, -2) measure pressure drop across the orifice. The two transmitters operate in a split-range mode, where one transmitter is calibrated to monitor the lower range of flow and the other, the higher range. Thus, the total flow range measurement accuracy is improved compared to a single transmitter arrangement.
3. A pressure transmitter (96PJ-1) measures steam pressure for calculation of steam flow and indication of steam condition.
4. Three thermocouples (ST-SJ-1, -2, -3) measure steam temperature for calculation of steam flow and indication of steam condition.
5. A pneumatically operated stop valve (controlled by trip solenoid 20SJ-1) opens to permit steam injection flow and closes to shut off flow when the system is not operating or when the system is tripped. A limit switch (33SJ-1) indicates valve-closed position.
6. Two pneumatically operated valves (controlled by solenoid valves 20BS-1, -2) provide steam-line condensate drain and warm-up prior to injection. Limit switches indicate valve position.
7. A steam control valve regulates the flow of steam to the gas turbine. This valve is driven by an electromechanical motor actuator which receives direction (open or close) and run signals from the gas turbine control system. The control valve has a limit switch which indicates valve fully closed position.

CONTROL PANEL/OPERATOR INTER-FACES

The turbine control panel provides the necessary information to the operator to indicate the operational status of the steam injection system. The steam injection system is manually enabled by selecting the "Manual Control Display" on the turbine control panel CRT, finding the "Steam Injection Control" page and pressing the "Steam Inj On" softswitch. The steam injection system is disabled by pressing the "Steam Inj Off" softswitch. When the steam

- o Assuming the turbine shutdown sequence continues, when the generator breaker opens, the steam stop valve will close and the #1 drain valve will open.
- o The operator should now close the steam-line isolation valve.

STEAM FLOW CONTROL

The steam flow program determines a steam injection flow setpoint based on fuel flow rate, ambient temperature and sometimes specific humidity. Figure SIR4000-2 shows a typical schedule. Note that there is a CONTROL schedule and a COMPLIANCE schedule. The COMPLIANCE schedule represents the amount of steam required to just meet the NO_x emissions requirement. If steam flow should ever fall to or below this schedule, an alarm will occur. The CONTROL schedule is the one used to control steam flow to the turbine. It is set higher than the COMPLIANCE schedule to account for the control system dead-band and normal operational transients. The separation between the curves is set by constant WQKR3.

As shown in Figure SIR4000-2, steam flow is initiated when fuel flow to the turbine reaches the value specified by constant WQK() E. At this point, the steam injection flow setpoint is released from 0. The setpoint assumes a value in accordance with the measured fuel flow, ambient temperature, and specific humidity. The control valve is allowed to ramp open until steam flow equals the setpoint. The ramp consists of a series of small steps. The control valve motor is turned on (in the open direction) for a fixed length of time and then turned off for another fixed length of time. The on time is set by timer L2WQOF1 and the off time by timer L2WQON. The ramp should be adjusted so the control valve opens as quickly as possible without upsetting the steam supply conditions.

Steam flow feedback is calculated from measured pressure drop across a flow orifice, compensated for steam temperature and pressure variations. Where there is a wide flow range, two differential transmitters are supplied to monitor flow in a split-range configuration; one transmitter calibrated for a low flow region, the other calibrated for a high flow region. Automatic switching between the two transmitters is programmed in the control logic of the computer. Based on the selected measurement of differential pressure, steam temperature and steam pressure, steam flow is calculated, forming the feedback for the flow control system.

PROTECTIVE FEATURES

Steam injection system alarm and shutoff conditions are detected by the protection task program within the microcomputer. Certain component or system conditions are alarmed only - to alert the operator of abnormal but not yet critical states. Other conditions result in shutoff of the steam injection system via the control valve or the stop valve.

Steam Supply Condition Trouble

The steam injection protection system monitors steam supply conditions to alarm or shutoff steam flow when abnormal conditions are detected. See Figure SIR4000-3 which illustrates the steam temperature and steam pressure supply conditions that will result in protective actions. Alarm actions are initiated by high or low pressure levels and by high or low temperatures. The low-temperature alarm setpoint is modified with pressure to track the saturation curve. The purpose of this alarm (and subsequent trip) is to insure that the supply steam is superheated. Steam injection shutdown actions are initiated on high steam pressure and high temperature for equipment protection. The steam injection shutdown signal is latched until operator actions are taken. To re-initiate

SIR4000-5

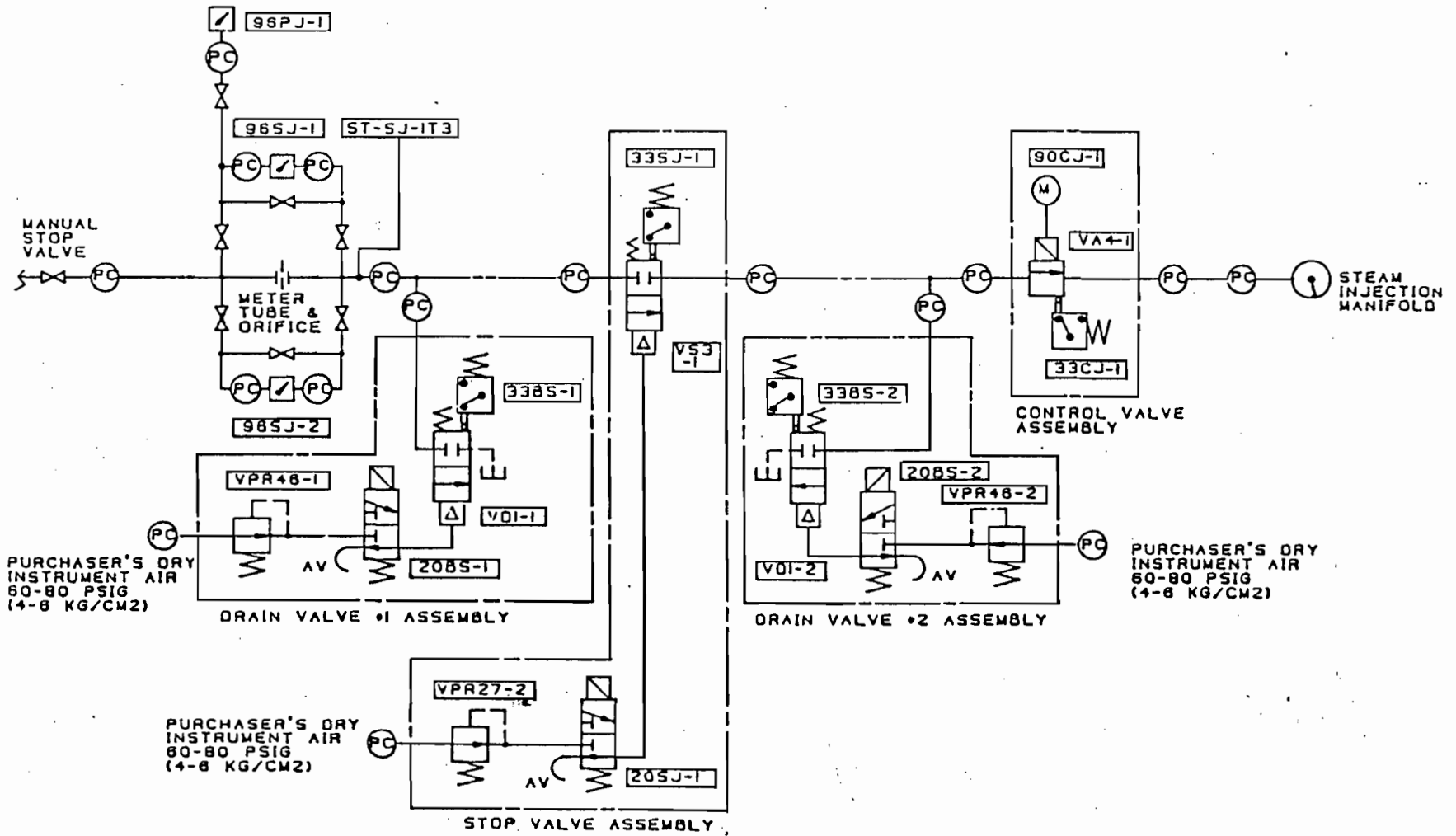


FIGURE SIR4000-1
(788)

STEAM SUPPLY CONDITION
ALARM & SHUTDOWN

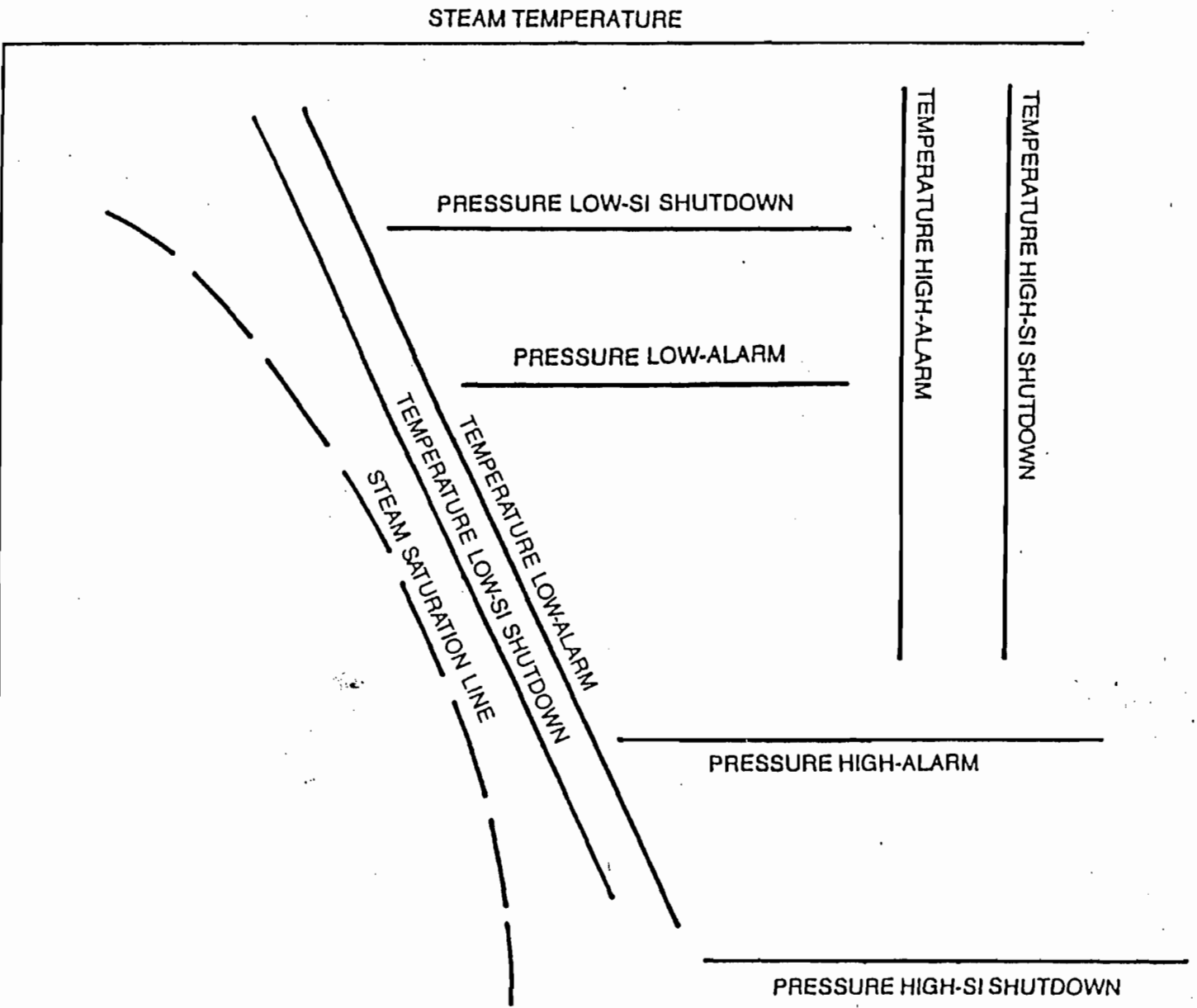


FIGURE SIR4000-3
(788)

SIR4000-7

STEAM INJECTION SYSTEM

GENERAL

The steam injection system provides the necessary flow of steam to the gas turbine combustion system to meet Federal and State exhaust emission requirements by limiting the emission of nitrogen oxides (NO_x) in the turbine exhaust. The strict regulations not only require meeting the emission levels, but also require the continuous monitoring of fuel flow, steam injection flow, and other machine parameters to verify that the regulations are being met.

The steam injection system, shown in the system schematic diagram (see Reference Drawings), consists of steam flow control and regulating valves and control and monitoring devices located off base in the purchaser's steam piping. The steam from this off-base source is supplied in a controlled flow to the turbine's steam injection manifold. The associated automatic electronic control system, part of the turbine control circuits, controlling this steam injection system utilizes the Mark IV computer as the basic control element and is described in the Control and Protection Section.

The main components of the steam injection system include the following:

1. A meter tube and orifice.
2. Differential pressure transmitters, 96SJ-1 and -2.
3. Steam supply pressure transmitter, 96PJ-1.
4. Thermocouple, ST-SJ-1T3.
5. Stop valve, VS3-1, pneumatically operated with limit switch, 33SJ-1.
6. Stop valve-trip solenoid, 20SJ-1.

7. Control air regulator valve, VPR27-2.
8. Steam line drain valves, VD1-1, -2 air actuated with limit switches 33BS-1, -2, -3.
9. Steam line drain valve-solenoid valve, 20BS-1, -2.
10. Drain valve air regulator valve, VPR46-1, -2.
11. Steam injection control valve, VA4-1, with electromechanical actuator and limit switch, 33CJ-1.
12. On-base steam injection manifold and piping to combustion chambers.

FUNCTIONAL DESCRIPTION

For a functional description of the steam injection system, refer to the steam injection system text in the Control and Protection section of this manual.

SYSTEM REQUIREMENTS

STEAM SUPPLY

The purchaser is to supply steam for the steam injection system to meet the system design requirements of flow, temperature and pressure (see Control Specification). The steam supplied must be superheated steam within the design temperature range of the system and must be at the specified minimum pressure to prevent backflow of combustion gases into the steam line. To keep within the system design operating range, the steam should not exceed the maximum specified temperature and pressure, otherwise, damage to seals and valve stem packing could result.

All hand-operated valves should be cycled once a month to check freedom of movement. They should be returned to their normal operating position after this.

TROUBLE SHOOTING

The purpose of the system is to provide steam to the turbine combustion system at the desired pressure, temperature and flow. If this does not happen, the following problems may be the cause:

- a. Steam supply exhausted.
- b. Insufficient supply pressure.
- c. Control valve closed.
- d. Stop valve closed.

The following should be checked:

- a. Adequate steam supply.
- b. Check steam supply system.
- c. Check control valve actuator and drain valve operation.

- d. Check that instrument air supply is of sufficient pressure and/or solenoid control valve operation.

Alarm and shutdown conditions of the steam injection system are detected by a protection program built into the micro-computer. Alarm and trip indications are displayed on the turbine panel CRT scope. An alarm condition is initiated by high or low pressure levels and by high or low temperatures. See Control Specification for alarm and trip point values.

The computer program is designed to trip the steam STOP valve and prevent steam flow if steam temperature becomes excessive. It can trip the system on temperature or pressure. Steam at too high a pressure can cause damage to valve stem packing and system seals. A steam injection trip only shuts down the steam injection system, it does not trip the turbine.

Certain trouble status indications can be displayed as messages on the CRT screen. Refer to the elementary diagram for alarm numbers and messages.

STEAM INJECTION SYSTEM

INFORMATION FOR THE COMPONENTS LISTED BELOW IS CONTAINED
IN THE ASSOCIATED PUBLICATION

<u>COMPONENT</u>	<u>SYMBOL</u>	<u>MANUFACTURER</u>	<u>PUBLICATION</u>
STEAM FLOW DIFFERENTIAL PRESSURE TRANSMITTER	96SJ-1 96AJ-1	ROSEMOUNT INC. MODEL 1151DP	4256/4257
STEAM INJECTION PRESSURE TRANSMITTER	96PJ-1 96PJ-2	ROSEMOUNT INC. MODEL 1151GP	4260/4261
<u>STEAM CONTROL VALVE ASSEMBLY</u>			
STEAM CONTROL VALVE WITH ACTUATOR AND ACCESSORIES	VA4-1 VA4-2	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33CJ-1 33CJ-2	MASONEILAN DIV. SERIES 496	ES-7000
	90CJ-1	MASONEILAN DIV. SERIES 4600	ES-2000
<u>STEAM STOP VALVE ASSEMBLY</u>			
STEAM STOP VALVE WITH ACTUATOR AND ACCESSORIES	VS3-1 VS3-2	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33SJ-2	MASONEILAN DIV. SERIES 496	ES-7000
	20SJ-1 20AJ-1,2	AUTOMATIC SWITCH CO.	V5688, V5380, V5551
	VPR27-2 VPR27-3	MASONEILAN DIV. MODEL 77-4	EY7700
<u>DRAIN VALVE ASSEMBLY</u>			
DRAIN VALVE, ACTUATOR AND ACCESSORIES	VD1-1, 2,4,5	MASONEILAN DIV. MODEL 35-35202	EF-5000
	33BS-1, 2,4,5	MASONEILAN DIV. MODEL 496	ES-7000
	20BS-1, 2,4,5	AUTOMATIC SWITCH CO. CAT HT8320A185	V-5688 & V-5380
	VPR46-1, 2,4,5	MASONEILAN DIV. MODEL 77-4	EY7700

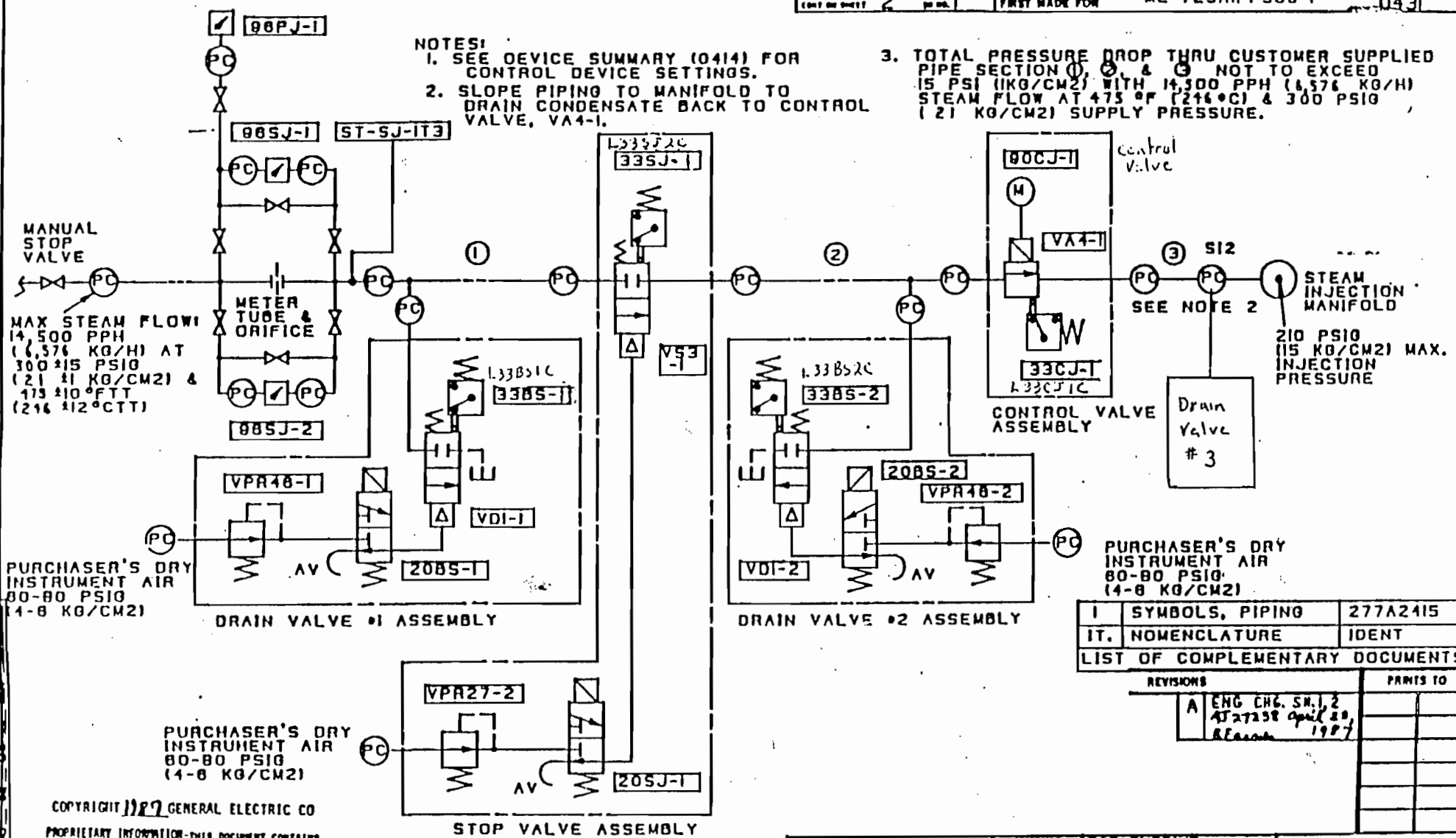
NOX

247B5083

GENERAL ELECTRIC 247B5083

247B5083
 TITLE: DIAGRAM, SCHEM PP-ST INJECTION
 FIRST MADE FOR: ML-7L5AIPP388-1

- NOTES:
- SEE DEVICE SUMMARY (0414) FOR CONTROL DEVICE SETTINGS.
 - SLOPE PIPING TO MANIFOLD TO DRAIN CONDENSATE BACK TO CONTROL VALVE, VA4-1.
 - TOTAL PRESSURE DROP THRU CUSTOMER SUPPLIED PIPE SECTION ①, ②, & ③ NOT TO EXCEED 15 PSI (1KG/CM²) WITH 14,500 PPH (6,576 KG/H) STEAM FLOW AT 475 °F (246 °C) & 300 PSIG (21 KG/CM²) SUPPLY PRESSURE.



1	SYMBOLS, PIPING	277A2415
IT.	NOMENCLATURE	IDENT

LIST OF COMPLEMENTARY DOCUMENTS		PRINTS TO
REVISIONS		
A	ENG CHG. SH. 2 4527258 April 28, REASON 1987	

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MADE BY: *Alanna 2/27/87*
 DATE: *March 31, 1987*
 APPROVAL: *RE*
 GAS TURBINE
 SCHENECTADY
 247B5083
 REV. A 4/21 1/81/87

UNIT # 6 BOILER
CYCLONES

P R A T - D A N I E L C O R P O R A T I O N

POWER PLANT EQUIPMENT

Executive Offices and Plant
South Norwalk, Conn.

Fans, Stacks
Dust Collectors
Air Heaters
Thermobloc
Industrial Heaters

Project & Sales Engineers
THE THERMIX CORPORATION
Greenwich, Connecticut

JOB SUMMARY

The Babcock & Wilcox Company
P. O. #777-232523 Gr. 89
City of Fort Pierce, Fla.
Prat-Daniel File 357-55

- (1) Design 6UPHT #18-386 Prat-Daniel Tubular Dust Collector, 3/16" Corten steel hoppers, inlet damper, water washing system

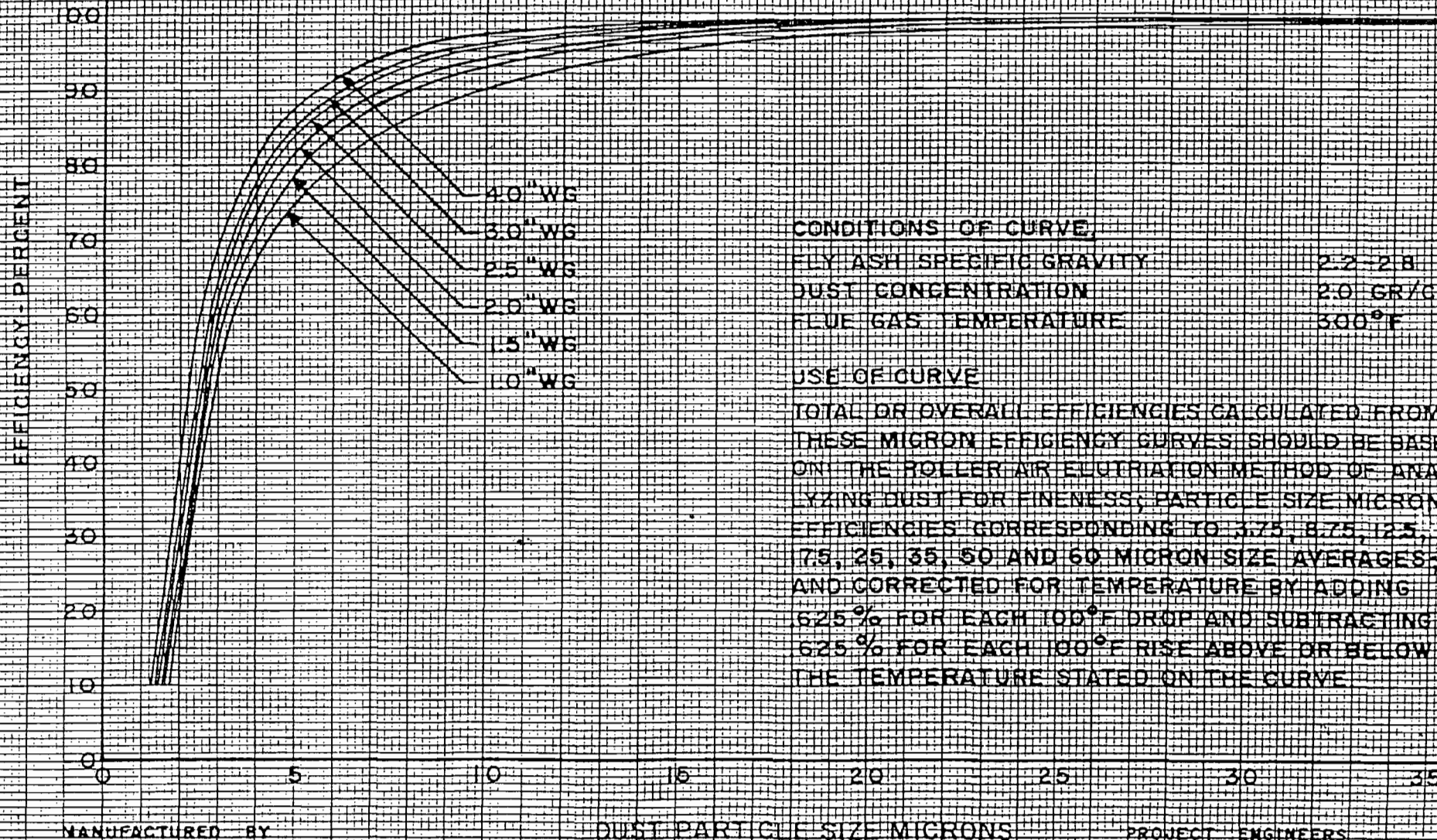
PERFORMANCE: Elev. Sea Level Bar.: 30" Hg.

Lbs. gas per hour	242,000
Temperature deg. F.	350
Collector resistance, "w.g.	2.5
Collection efficiency based on Curve GO-31-E.	

THERMIX	NAME	DATE
DRAWN BY	ara	5/19/55
COMPUTED BY		

APPROVED BY	NAME	DATE
THERMIX	1773	5/19/55
PRAT-DANIEL		

PRAT-DANIEL DESIGN 6 UP DUST COLLECTOR MICRON EFFICIENCY CURVES



CONDITIONS OF CURVE

FLY ASH SPECIFIC GRAVITY	2.2-2.8
DUST CONCENTRATION	2.0 GR/GF
FLUE GAS TEMPERATURE	300°F

USE OF CURVE

TOTAL OR OVERALL EFFICIENCIES CALCULATED FROM THESE MICRON EFFICIENCY CURVES SHOULD BE BASED ON THE ROLLER AIR ELUTRIATION METHOD OF ANALYZING DUST FOR FINENESS; PARTICLE SIZE MICRON EFFICIENCIES CORRESPONDING TO 3.75, 8.75, 12.5, 17.5, 25, 35, 50 AND 60 MICRON SIZE AVERAGES, AND CORRECTED FOR TEMPERATURE BY ADDING 6.25% FOR EACH 100°F DROP AND SUBTRACTING 6.25% FOR EACH 100°F RISE ABOVE OR BELOW THE TEMPERATURE STATED ON THE CURVE.

MANUFACTURED BY
PRAT-DANIEL CORP.
SOUTH NORWALK, CONN.

DUST PARTICLE SIZE MICRONS
CURVE GO-31-E

PROJECT ENGINEERS
THE THERMIX CORP.
GREENWICH, CONN.

UNIT # 6 CYCLOCONES
REVISED JUNE 6, 1985

UNIT # 7
CYCLONES

JOB SUMMARY

Foster Wheeler Corporation
 P. O. No. M-1581-2-78-234
 City of Fort Pierce, Florida
Aerotec Industries, Inc. File No. 60-488

(2) Design 6UPHT #16-367 Aerotec Coll's, water washing system in inlet and outlet areas.

<u>PERFORMANCE:</u>	Elev.: Sea Level	Bar.: 30" Hg.
Lbs. Gas per Hour	248,000	269,000
Temperature Deg. F.	311	311
CFM at Pressure	77,100	83,900
Collector Resistance		
"W.G.	2.50	2.96
Collection Efficiency, %	91	

The above noted collection efficiency is guaranteed in accordance with curve GO-31-E-R1 and the following Flys Ash Analysis.

DUST ANALYSIS
ELUTRIATION

<u>Particle Size</u>	<u>Average Partical Size</u>	<u>% In Gas Stream</u>
60 Microns	60 Microns	16
60 /40 Microns	50 Microns	3
40 /30 Microns	35 Microns	4
30 /20 Microns	25 Microns	14
20 /15 Microns	17.5 Microns	11
15 /10 Microns	12.5 Microns	17
10 /7 1/2 Microns	8.75 Microns	10
7 -1/2 Microns	3.75 Microns	25

Attachment D

DESCRIPTION OF STACK SAMPLING FACILITIES

FOR UNITS 7, 8 AND 9

Urn 9

4.2 Sampling Locations

Locations of the sample ports and stack dimensions are shown in Figure 1. Sampling was performed through seven ports located on one side of the rectangular stack. Forty two sample points were selected for the preliminary oxygen traverse in accordance with EPA Method 20 and EPA Method 1 - Sample and Velocity Traverses for Stationary Sources, 40 CFR 60, Appendix A. Of these forty two points, twelve points exhibiting the lowest oxygen concentrations were utilized for the sulfur dioxide sampling.

Carbon monoxide, nitrogen oxides, and oxygen sampling were performed from the same sampling ports as the sulfur dioxide sampling.

4.3 Sampling Trains

The sulfur dioxide sampling train consisted of a Nutech Corporation 10 foot probe utilizing a stainless steel nozzle, a heated glass liner, a heated glass fiber filter and four impingers arranged as shown in Figure 2. The first impinger was charged with 100 milliliters of 80% isopropanol, the second and third impingers were each charged with 100 milliliters of 3% hydrogen peroxide and the fourth impinger was charged with indicating silica gel desiccant. The impingers were cooled in an ice and water bath during sampling. A Nutech Corporation control console was used to monitor the gas flow rates and stack conditions during sampling.

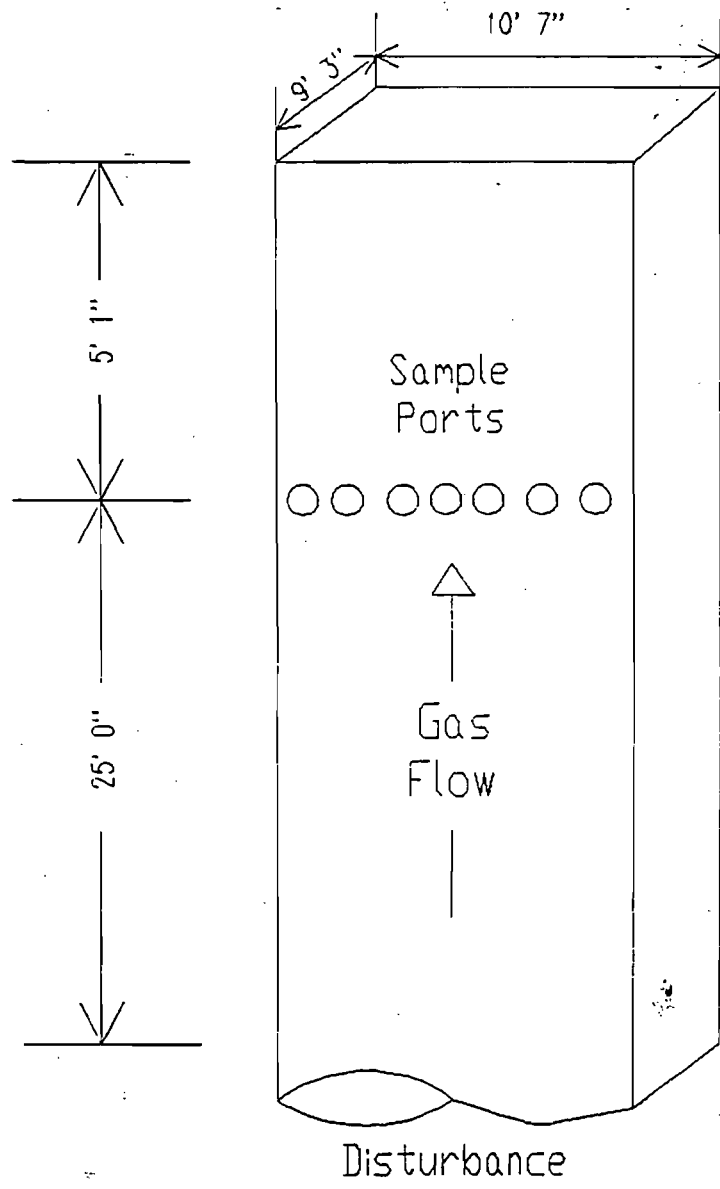
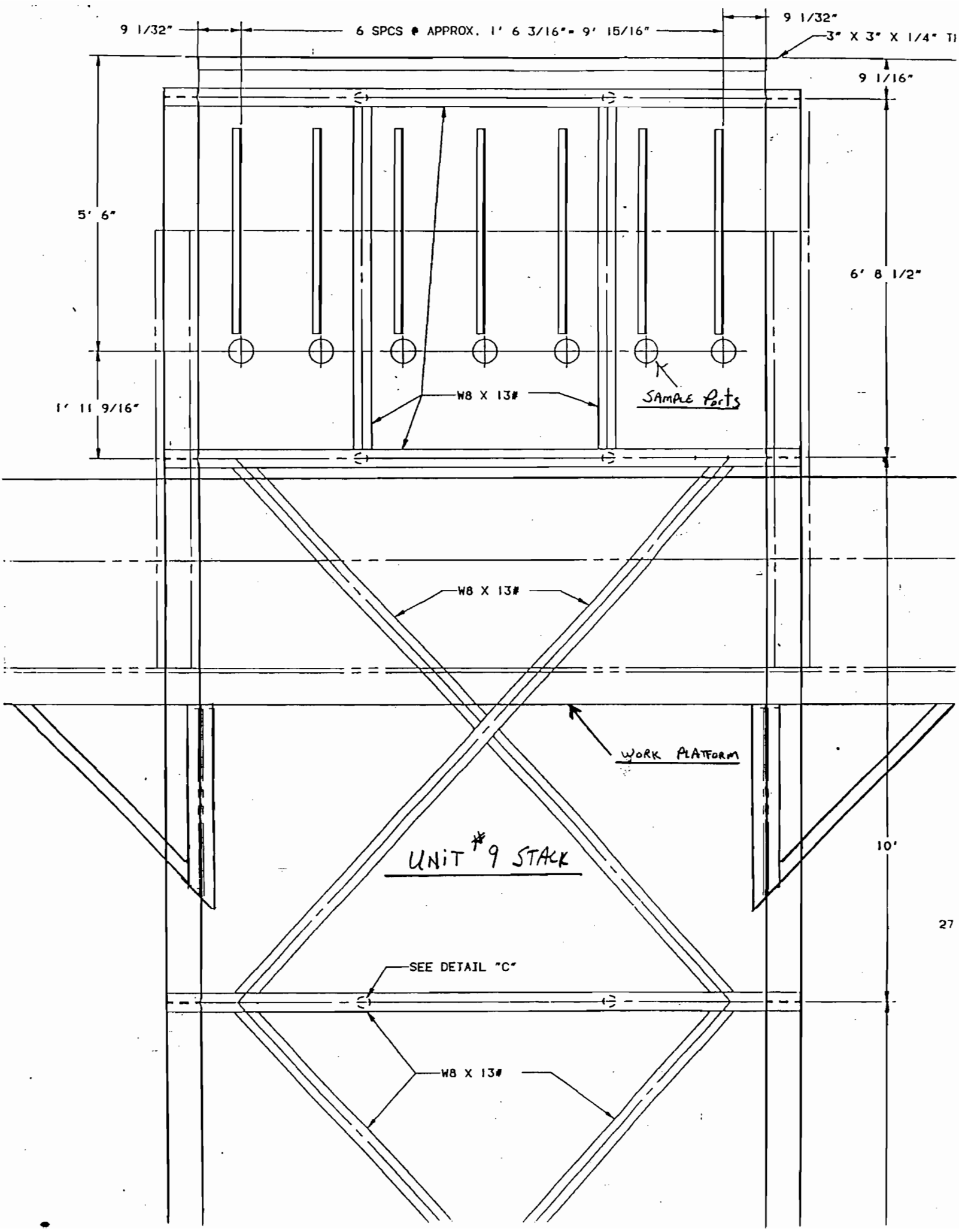


Figure 1. Stack Dimensions and sample port locations, Fort Pierce Utilities Authority, H.D. King Electric Generating Plant, Unit No.9. Fort Pierce, Florida.



Appendix A. Nitrogen oxides emissions sampling was conducted in accordance with EPA Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer -Procedure), 40 CFR 60, Appendix A. Sulfur dioxide emissions sampling was conducted in accordance with EPA Method 6 - Determination of Sulfur Dioxide Emissions from Stationary Sources, 40 CFR 60, Appendix A. Volatile organic compounds emissions sampling was conducted in accordance with EPA Method 25A - Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer, 40 CFR 60, Appendix A. Visible emissions were determined in accordance with EPA Method 9 - Visual Determination of the Opacity of Emissions from Stationary Sources, 40 CFR 60, Appendix A.

UNIT 7

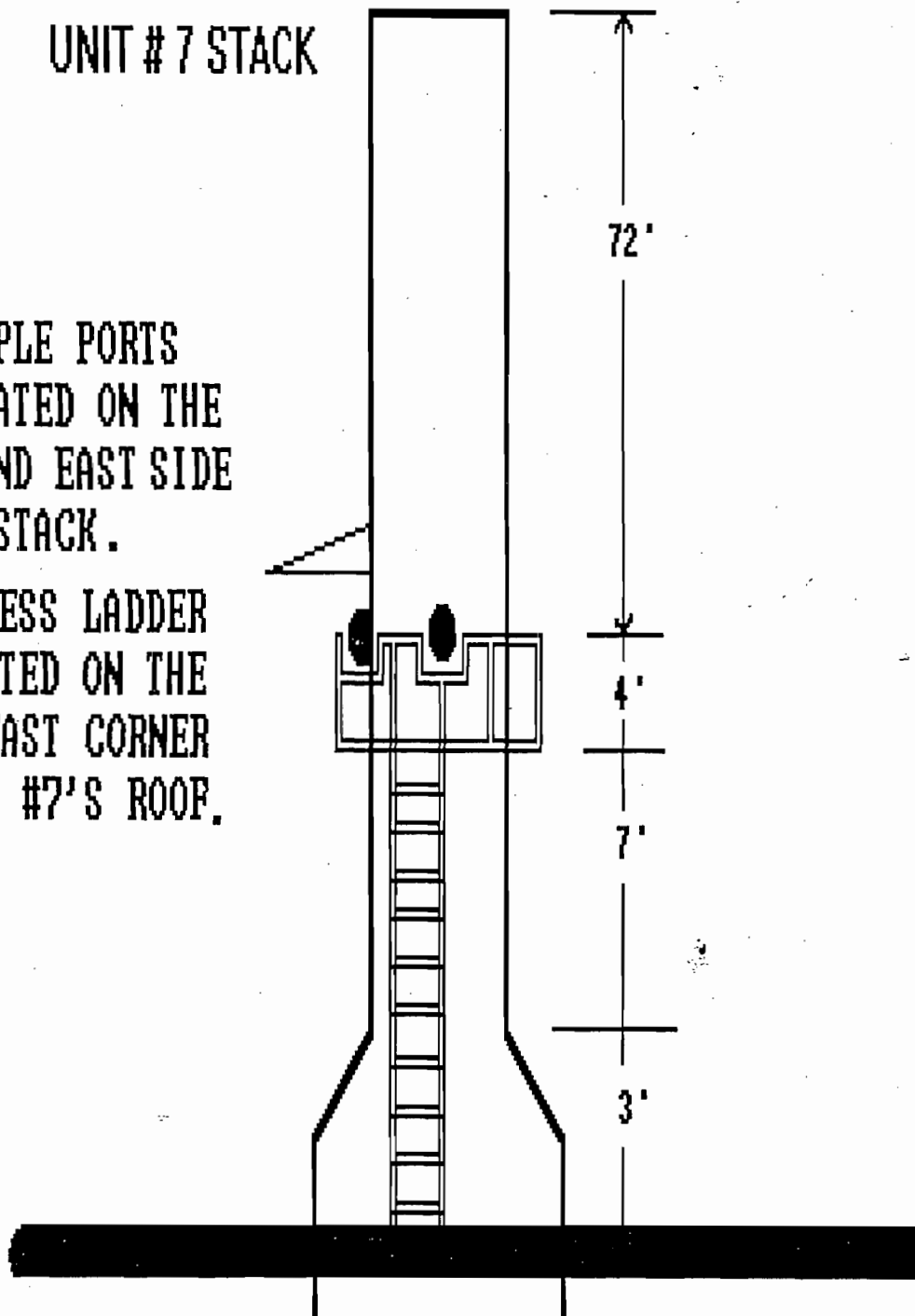
4.2 Sampling Locations

Locations of the sample ports and stack dimensions are shown in Figure 1. Particulate and sulfur dioxide sampling was performed by conducting horizontal traverses through each of two ports located on the stack at a ninety degree angle from one another. Twenty four sample points were chosen in accordance with EPA Method 1 - Sample and Velocity Traverses for Stationary Sources, 40 CFR 60, Appendix A. Carbon monoxide, nitrogen oxides, volatile organic compounds, and oxygen sampling were performed from the same sampling ports as the particulate sampling.

UNIT # 7 STACK

THE SAMPLE PORTS
ARE LOCATED ON THE
SOUTH AND EAST SIDE
OF THE STACK.

THE ACCESS LADDER
IS LOCATED ON THE
SOUTH EAST CORNER
OF UNIT #7'S ROOF.



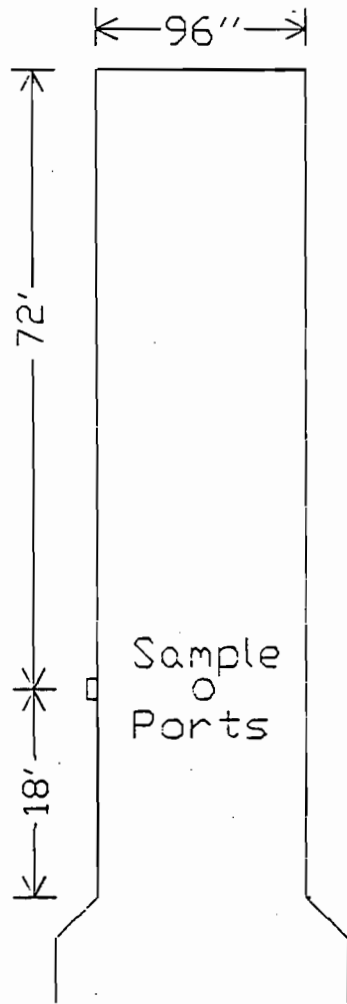


Figure 1. Stack Dimensions and sample port locations, Fort Pierce Utilities Authority, H.D. King Electric Generating Plant, Unit 7. Fort Pierce, Florida.

Appendix A. Nitrogen oxides emissions sampling was conducted in accordance with EPA Method 7E - Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure), 40 CFR 60, Appendix A. Sulfur dioxide emissions sampling was conducted in accordance with EPA Method 6 - Determination of Sulfur Dioxide Emissions from Stationary Sources, 40 CFR 60, Appendix A. Volatile organic compounds emissions sampling was conducted in accordance with EPA Method 25A - Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer, 40 CFR 60, Appendix A. Visible emissions were determined in accordance with EPA Method 9 - Visual Determination of the Opacity of Emissions from Stationary Sources, 40 CFR 60, Appendix A.

UNIT 8

4.2 Sampling Locations

Locations of the sample ports and stack dimensions are shown in Figure 1. Particulate and sulfur dioxide sampling was performed by conducting horizontal traverses through each of two ports located on the stack at a ninety degree angle from one another. Twenty four sample points were chosen in accordance with EPA Method 1 - Sample and Velocity Traverses for Stationary Sources, 40 CFR 60, Appendix A. Carbon monoxide, nitrogen oxides, volatile organic compounds, and oxygen sampling were performed from the same sampling ports as the particulate sampling.

UNIT #8

CAGED
& LADDER

4557

A
(e-8)

B (F-3)

8'-0 I.D.

TOP OF STACK
EL. 155'-11 1/2

11'-2 1/2

A

L4x3x1/4

(TYP ALL AROUND)

3"(TYP)

I.D. OF NIPPLE
TO BE SAME
ELEV. AS TOP
OF HANDRAIL

TYP 3/16
3-12

4" NIPPLE
HANDRAIL

DET-4 (a-b)
TYP (4) PLCS.

(A) 4" DIA. NIPPLES x 1/2"
CAPPED SPC @ 90°
(S.S. TYPE 304)
EL. 110'-8"
SEE DET-4 (a-7)

H-H 371 C-6

5 SPCS @ 14'-6" = 72'-6"

SAMPLING PLATFORM EL. 107'-0"
(TOP OF GRATINGS)

500A

DO

DO

DO

10 3/4" DIA

L4x3x1/4
(TYP ALL AROUND)
SEE RD-371

TYP (E)

Roof Line

GUIDES
EL. 72'-3 3/8"

Ladder
North EAST

C (h-7)

149'-0"

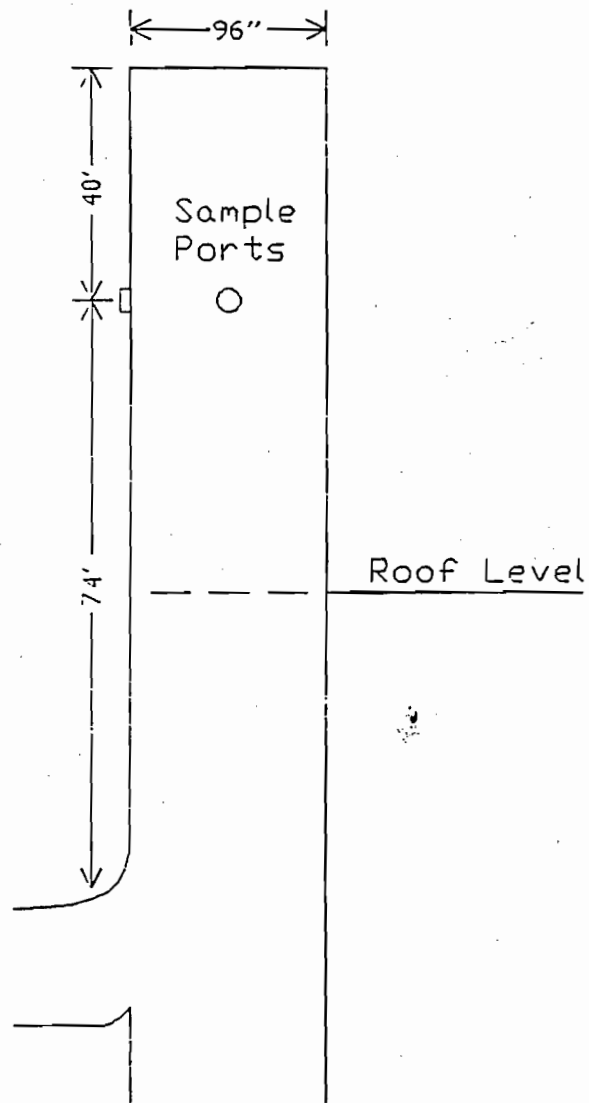


Figure 1. Stack Dimensions and sample port locations, Fort Pierce Utilities Authority, H.D. King Electric Generating Plant, Unit 8. Fort Pierce, Florida.

Attachment E

**PROCEDURES FOR
STARTUP AND SHUTDOWN**

DIESEL STARTUP PROCEDURE

- 1 Place mode selector switch in 'peak inc.'
- 2 Turn 'on' synchroscope
- 3 Place meter selection in '2'
- 4 Place bus vm-fm-gen in '2-3'
- 5 Turn mode selector switch to 'idle'
- 6 Turn diesel start switch to 'start' (spring loaded no need to hold)
- 7 Unit will start, watch smoke coming from stack. What colour is it?
- 8 Turn mode selector switch to 'run'
- 9 Turn mode selector switch to 'excite'
- 10 Lower governor control till 60 hz, unit is ready for synchronizing.
- 11 When synchroscope is at 12:00/noon, 'close' generator breaker
- 12 Raise governor control this puts load on unit
- 13 Turn mode selector switch to 'auto'
- 14 Turn 'off' : bus-vm-gen, meter selection and synchroscope

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#9 AND #5 START-UP PROCEDURE

PURPOSE

This procedure has been written to provide a guide in starting up unit(s) #9 and #5 in a manner that will protect both operating personnel and equipment.

SCOPE

This procedure provides details on how to start-up the unit(s) and the order in which the start-ups should be performed.

This is a standard operating procedure aimed at providing uniformity during normal start-up. However, it does not take into account unforeseen problems which can alter the order in which these procedures are performed.

This list is not all inclusive and should not be relied on as a substitute for good operating practice based on individual training and experience.

POLICY

It is the policy of the Power Plant and FPUA to ensure the safety of personnel and equipment as effectively as possible, in this case, by providing operational guidelines for start-up of equipment.

GENERAL

This procedure will be used each time the unit(s) are put into service and will be signed off by the Watch Engineer and the Operators assisting in the equipment checkout procedures. It will then be turned into the Operations Supervisor.

RESPONSIBILITY

Watch Engineer

The Watch Engineer will oversee and supervise all aspects of unit(s) start-up, ensuring that Control/Boiler and Auxiliary Operators have checked and put equipment in operation safely and properly, and will assist when necessary.

The Watch Engineer will also make sure all motors 50 HP and above have been meggered, all permits are closed, tags removed, and breakers are racked in and ready for operation.

PREPARED BY:	APPROVED BY:	II. D. KING	DATE ISSUED:	REVISION NO.
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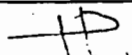
RESPONSIBILITY (continued)

Control/Boiler and Auxiliary Operators

Operators will inspect and ensure that all equipment is in proper working order and ready for operation. Operators will notify the Watch Engineer of any abnormal conditions.

Operators will also inspect for tagged out items and breakers not racked in and ready for use and will notify the Watch Engineer if any of these conditions are found.

THE WATCH ENGINEER HAS THE AUTHORITY AND IS RESPONSIBLE FOR REMOVING TAGS AND CLOSING WORK PERMITS. UNDER NO CIRCUMSTANCES WILL AN OPERATOR REMOVE ANY TAG OR RACK IN ANY BREAKERS WITHOUT THE CONSENT AND/OR PRESENCE OF THE WATCH ENGINEER.

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			10/92	0

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#9 AND #5 START-UP LIST

Date _____

PROCEDURES

- | | Checked By
(Initials) |
|---|--------------------------|
| 1. MAKE SURE THAT ALL BREAKERS ON #9 ARE RACKED IN AND WORK PERMITS ARE CLOSED. | <input type="text"/> |
| 2. CHECK FIELD AND GENERATOR BREAKERS IN G.A.C. | <input type="text"/> |
| 3. MAKE SURE GENERATOR HEATERS ARE ON. | <input type="text"/> |
| 4. MAKE SURE G.T. IS ON RATCHET - CALL GAS COMPANY. | <input type="text"/> |
| 5. IF STACK DAMPER TO BOILER IS NOT CLOSED - CLOSE IT. | <input type="text"/> |
| 6. VISUALLY CHECK G.T. FOR ANY UNUSUAL CONDITIONS THAT WOULD PREVENT SAFE OPERATION OF UNIT (OIL LEAKS, ETC.) | <input type="text"/> |
| 7. MAKE SURE YARD GAS VALVES AND MAIN GAS VALVE AT G.T. ARE OPEN. | <input type="text"/> |
| 8. TURN ON COALESCING UNIT FOR LUBE OIL SYSTEM. | <input type="text"/> |
| 9. CHECK ALARM PAGE ON G.T. FOR OUTSTANDING ALARMS. | <input type="text"/> |
| 10. MAKE SURE FUEL SELECTION IS ON GAS. | <input type="text"/> |
| 11. MAKE SURE YOU HAVE A START PERMISSIVE (PAGE 3A ON NET 90.) | <input type="text"/> |
| 12. TO START G.T. - PRESS AUTO, EXECUTE - THEN START, EXECUTE. | <input type="text"/> |
| 13. WHEN G.T. STARTS - OPEN DOORS AROUND UNIT AND CHECK FOR GAS LEAKS, HYDRAULIC LEAKS AND ABNORMAL CONDITIONS. | <input type="text"/> |
| 14. WHEN UNIT IS AT FULL SPEED - NO LOAD - SYNCHRONIZE UNIT (MANUAL OR AUTOMATIC) LOAD AS NEEDED. **NOTE** UNIT WILL NOT SYNCHRONIZE IF HYDRAULIC PUMP IS IN "HAND" POSITION. | <input type="text"/> |
| 15. CHECK FOR THINGS OVERLOOKED. | <input type="text"/> |

NOTE: IF YOU ARE ONLY RUNNING #9 G.T. - STOP HERE.
CONTINUE ONLY IF YOU ARE GOING TO START-UP #5 UNIT.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.
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#9 AND #5 START-UP LIST

Date _____

1. IF UNIT HAS BEEN OFF 72 HOURS OR LONGER, MEGGER ALL 2400V MOTORS.
2. MAKE SURE AUX. OIL PUMP AND HEATER ON #5 IS ON.
3. CHECK TO SEE IF ALL BREAKERS ON #5 ARE RACKED IN.
4. MAKE SURE GENERATOR HEATERS ARE ON.
5. OPEN ALL DRAINS AND VENTS ON #9 BOILER.
6. MAKE SURE ECONOMIZER VENT IS OPEN (1 TURN IN OPERATION.)
7. OPEN MAIN STEAM STOP VALVE.
8. OPEN VALVES FOR PEGGING STEAM TO WARM UP DEAERATER.
9. MAKE SURE FEED WATER STOP VALVE IS OPEN.
10. YOU SHOULD HAVE 2 TO 3 BUBBLES IN #9 BOILER.
11. TURN ON COOLING WATER TO FLASH TANK.
12. SET #9 LOAD AT APPROX. 1 TO 3 MW.
13. OPEN STACK DAMPER (5 TO 20%) DEPENDING ON G.T. LOAD.

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

NOTE: DO NOT OPEN DAMPER MORE THAN 25% UNTIL YOU ARE READY TO COME ON-LINE WITH UNIT. BEFORE OPENING DAMPER COMPLETELY, #9 MUST BE BELOW 1 MW OR DAMAGE TO DAMPER CABLES MAY OCCUR.

14. OPEN MAIN STEAM - BELLY - BEFORE AND AFTER DRAINS ON #5.
15. CHECK DA AND HOT WELL WATER LEVELS.
16. LINE UP OLD SIDE MAKE-UP PUMP TO HOT WELL (OR DA.)
17. CLOSE CONDENSATE INLET VALVE TO STAGE HEATER.
18. OPEN BYPASS AROUND FLOAT ON CONDENSATE RECIRC LINE TO HOT WELL.
19. MAKE SURE BOILER FEED PUMPS ARE READY FOR SERVICE.
20. CHECK SEAL WATER TO CIRC PUMPS - PULL VACUUM ON CIRC PUMPS AND START.

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

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#9 AND #5 START-UP LIST

Date _____

- 21. AT 250 PSI OF STEAM PRESSURE - START CONDENSATE PUMP -
TURN OFF LUBE OIL HEATER.

- NOTE: STEAM TEMPERATURE SHOULD BE 500 DEG. F -
(100 DEG. SUPERHEAT).

- 22. PUT APPROX. 1/2 LB. AIR PRESSURE ON GOVERNOR HOUSING SEAL.
- 23. CLOSE VACUUM BREAKER ON CONDENSER.
- 24. TURN ON GLAND WATER SUPPLY TO SEALS.
- 25. PUT 250 PSI STEAM STATION, AIR EJECTOR AND HOG IN SERVICE.
- 26. MAKE SURE STEAM DRIVEN OIL PUMP IS IN WORKING ORDER.
- 27. CUT MAIN STEAM DRAIN BACK TO APPROX. 1 TURN.
- 28. WHEN VACUUM IS UP TO APPROX. 18 INCHES Hg - RESET OIL TRIP -
LATCH UP GOVERNOR.
- 29. ROLL AT 500 RPM - LISTEN FOR RUBS - FEEL FOR VIBRATION.
- 30. CLOSE BELLY AND AFTER SEAT DRAINS.
- 31. IF #5 IS SMOOTH - ROLL FOR A MINIMUM OF 10 MIN. -
THEN GO TO 1000 RPM.
- 32. ROLL AT 1000 RPM FOR 20 MIN. - THEN GO TO 2200 RPM.
- 33. ROLL AT 2200 RPM FOR 20 MIN. - THEN GO TO 3000 RPM.
- 34. AT 3000 RPM - GOVERNOR TAKES OVER - WHEN GOVERNOR HAS CONTROL,
OPEN THROTTLE VALVE COMPLETELY - ROLL FOR 5 MIN.

- NOTE: ALL ROLL TIMES ARE APPROX. AND SUBJECT TO
CHANGE AS VIBRATION LEVELS AND CONDITIONS WARRANT.

- 35. GO TO SPEED SET POINT ON TRI-SEN BY PRESSING "05".
RAISE SPEED ON TURBINE WITH TRI-SEN IN CONTROL ROOM USING
"UP" ARROW. WHEN SPEED REACHES 3500 RPM, THE TRI-SEN WILL
TAKE UNIT SPEED TO 3600 RPM AUTOMATICALLY. USE "UP" ARROW
AGAIN TO BRING SPEED TO 3604 RPM.

- 36. WHEN TURBINE SPEED IS AT 3604 RPM - CLOSE FIELD BREAKER.

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#9 AND #5 START-UP LIST

Date _____

- 37. TURN ON SYNC SCOPE.
- 38. RAISE GEN. VOLTAGE (RUNNING) TO MATCH INCOMING VOLTAGE.
- 39. BOILER PRESSURE NEEDS TO BE 370 PSI MINIMUM - (STAYING THE SAME, OR INCREASING SLIGHTLY.) IF THIS CAN BE DONE WITH #9 UNIT AT 1 MW OR LESS, AND WITH THE DAMPER LESS THAN 25% OPEN, THEN SYNCHRONIZE AND CLOSE GENERATOR BREAKER, PUSH "F1" TO LOCK IN PRESSURE (CASCADE MODE), THEN OPEN DAMPER TO FULL OPEN POSITION. RAISE LOAD ON #9 UNIT SLOWLY TO LOAD UP BOTH UNITS.

IF PRESSURE CANNOT BE MAINTAINED, THEN LOWER #9 UNIT TO SLIGHTLY LESS THAN 1 MW AND OPEN CONTROL DAMPER TO FULL OPEN POSITION. RE-STABILIZE PRESSURE, INCREASING SLIGHTLY, THEN SYNCHRONIZE AND CLOSE GENERATOR BREAKER. (#9 UNIT MAY NEED TO BE RAISED TO STABILIZE PRESSURE.) WHEN UNIT IS ON LINE, PUSH "F1" TO LOCK IN PRESSURE (CASCADE MODE). RAISE LOAD ON #9 UNIT SLOWLY TO LOAD UP BOTH UNITS.

NOTE: DO NOT OPEN DAMPER MORE THAN 25% UNTIL YOU ARE READY TO COME ON-LINE WITH UNIT. BEFORE OPENING DAMPER COMPLETELY, #9 MUST BE BELOW 1 MW OR DAMAGE TO DAMPER CABLES MAY OCCUR.

- 40. WHEN LOAD IS APPROXIMATELY 3 MWS, OPEN EXTRACTION TO DA.
- 41. OPEN VALVE BEFORE STAGE HEATER SLOWLY.
- 42. CHECK LUBE OIL TEMP (BETWEEN 100 AND 110 DEG. F) - CLOSE TURBINE DRAINS.
- 43. WHEN YOU HAVE 4 TO 5 MWS ON #5, TAKE HOG OUT OF SERVICE. MAKE SURE VACUUM REMAINS STABLE.
- 44. CHECK AUX. LUBE OIL PUMP, (NOT RUNNING AND IN "AUTO".)
- 45. CLOSE OFF COOLING WATER TO FLASH TANK.
- 46. CLOSE OFF VALVES FOR PEGGING STEAM TO DEAERATER.
- 47. WHEN UNIT HAS STABILIZED, FINISH RAISING PRESSURE ON #9 BOILER BY GOING TO "06" ON THE TRI-SEN. PUSH "ENTER", THEN ENTER A PRESSURE SETTING THAT IS 5 LBS. HIGHER THAN WHAT IS LOCKED IN. PUSH "ENTER" AGAIN. THIS WILL RAISE #9 BOILER PRESSURE BY 5 LBS. CONTINUE THIS PROCEDURE UNTIL "THROTTLE" PRESSURE GAUGE ON #5 TURBINE BOARD READS 400 LBS.

NOTE: MAKE SURE ALL PRESSURE ADJUSTMENTS ARE ENTERED CORRECTLY BEFORE PUSHING "ENTER" ON TRI-SEN.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.
04 / 1 /		POWER PLANT	10/92	0

NO. 7 BOILER PRELIGHT CHECKLIST

PURPOSE

This procedure has been prepared to serve as a guide to ensure that all systems and related equipment pertaining to the prelight of a steam generator is properly inspected and determined that it is fully functional prior to putting equipment into service.

SCOPE

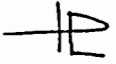
As a safety precaution, responsibilities are listed in checklist form to ensure proper inspection of boilers by the Operators and acknowledged by the Watch Engineer. This does not necessarily dictate the order in which equipment is checked out, nor is it all inclusive and should not be relied on as a substitute for good operating practice based on individual experience and training.

POLICY

The checklist will be preformed and checked off before attempting to place equipment/prelight of steam generators into service.

GENERAL

The Boiler Prelight Checklist for the prospective unit will be properly filled out by both Operator and the Watch Engineer and then turned in to the Plant Operations Supervisor.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen Treda, Jr.</i>		POWER PLANT	2-12-92	0

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NO. 7 BOILER PRELIGHT CHECKLIST
--

- | | | |
|------|---|--------------------------|
| OPER | 1. DRUM LEVEL IS UP TO FIRING LEVEL (1 BUBBLE IN SIGHTGLASS.) | <input type="checkbox"/> |
|------|---|--------------------------|
- | | | |
|------|---|--------------------------|
| OPER | 2. CHECK ALARM PANELS IN BOILER ROOM AND TURBINE PANEL, TEST ALARMS, REPLACE BULBS AS NECESSARY. PLACE MOLYTEKS IN AUTO MODE (BOILER ROOM AND TURBINE BOARD.) | <input type="checkbox"/> |
|------|---|--------------------------|
- | | | |
|------|--|--------------------------|
| OPER | 3. CHECK FOR TAGS ON EQUIPMENT IN BOILER ROOM, AT TURBINE PANEL AND IN 2400 SWITCHGEAR ROOM. NOTIFY WATCH ENGINEER OF ANY TAGS ON ANY EQUIPMENT. | <input type="checkbox"/> |
|------|--|--------------------------|
- | | | |
|------|---|--------------------------|
| OPER | 4. REMOVE NITROGEN BLANKET OFF BOILER, CLOSE VALVE AT BOILER VENT AND SHUT FLOW OFF AT SCAVENGER. | <input type="checkbox"/> |
|------|---|--------------------------|
- | | | |
|------|--|--------------------------|
| OPER | 5. OPEN BOILER VENTS (3)- SUPERHEATER, SPRAY HEADER, AND NORTH DRUM VENTS. | <input type="checkbox"/> |
|------|--|--------------------------|
- | | | |
|------|--|--------------------------|
| OPER | 6. OPEN BOILER DRAINS (3)- MAIN, BEFORE AND AFTER SPRAY-HEADER DRAINS; UPSTREAM AND DOWNSTREAM VALVES. | <input type="checkbox"/> |
|------|--|--------------------------|
- | | | |
|------|--|--------------------------|
| OPER | 7. VALVES BEFORE AND AFTER ATTEMPERATOR CONTROL REG. ARE OPEN (BYPASS CLOSED) AND UPSTREAM VALVE OPEN. | <input type="checkbox"/> |
|------|--|--------------------------|
- | | | |
|------|--|--------------------------|
| OPER | 8. VALVES BEFORE AND AFTER FEEDWATER REGULATOR ARE OPEN, AND FEEDWATER REGULATOR IS IN AUTO POSITION AT REGULATOR. | <input type="checkbox"/> |
|------|--|--------------------------|
- | | | |
|------|--|--------------------------|
| OPER | 9. CHECK POSITION OF FEEDWATER STOP VALVE AT DRUM. | <input type="checkbox"/> |
|------|--|--------------------------|
- | | | |
|------|--|--------------------------|
| OPER | 10. INSPECT ALL BOILER ENTRANCE DOORS TO MAKE SURE THEY ARE SECURE, AND NO WATER APPEARS FROM BOILER DRUM HATCHES. | <input type="checkbox"/> |
|------|--|--------------------------|
- | | | |
|------|--|--------------------------|
| OPER | 11. NORTH AND SOUTH BOILER BLOWDOWN VALVES SHOULD BE CLOSED. BLOWDOWNS SHOULD BE LINED UP TO FLASH TANK. | <input type="checkbox"/> |
|------|--|--------------------------|
- | | | |
|------|--|--------------------------|
| OPER | 12. NORTH AND SOUTH SIDE WATERWALL HEADER DRAINS SHOULD BE CLOSED. | <input type="checkbox"/> |
|------|--|--------------------------|

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen T. Judo, Jr.</i>	<i>HR</i>	POWER PLANT	2-12-92	0

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NO. 7 BOILER PRELIGHT CHECKLIST (CON'T.)
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- | | | |
|------|--|--------------------------|
| OPER | 13. CHECK OUT FEEDWATER PUMPS: (A) COOLING WATER TO PUMP;
(B) WATER ON TO GLANDS (C) SUCTION VALVES OPEN;
(D) DISCHARGE VALVES CLOSED UNTIL PUMP IS STARTED ;
(E) VENTS OPEN ; (F) CHECK OIL LEVELS AT MOTORS AND
RESERVOIRS ;(G) RECIRC. VALVES AT DA OPEN AND MANUAL
RECIRC. SWITCH IN BOILER ROOM IS IN MANUAL POSITION ;(H) ALL
RELATED PIPING AND VALVES. | <input type="checkbox"/> |
| OPER | 14. CHECK OUT FORCED DRAFT FANS, OIL LEVELS, REGATRONS,
AND BREAKERS; AND MAKE SURE BRUSHES ARE INSTALLED. | <input type="checkbox"/> |
| OPER | 15. OPEN WINDBOX, BOILER EXIT, AND CROSSARM DAMPERS ON
FORCED DRAFT FAN TO BE PLACED IN SERVICE. MAKE SURE
STACK DAMPERS ARE OPEN ON NORTH AND SOUTH SIDES. ALSO
CHECK THE LOW VOLTAGE LOCKOUT RELAY IN 2400 V ROOM TO
MAKE SURE IT IS NOT TRIPPED OUT. | <input type="checkbox"/> |
| OPER | 16. CHECK OIL LEVELS OF AIRHEATER TRUNION BEARINGS AND AIR
HEATER MOTOR DRIVE. | <input type="checkbox"/> |
| OPER | 17. CHECK COOLING WATER TO AIRHEATER BEARINGS. | <input type="checkbox"/> |
| OPER | 18. TURN ON 02 ANALYZER AND CHECK CALIBRATION. | <input type="checkbox"/> |
| OPER | 19. CHECK LOCAL CONTROL PANELS AT EACH BURNER FOR AIR
REGISTER OPERATION, IGNITORS IN AUTO POSITION,
GUILLOTINES ARE CLOSED AND CHECK COOLING AIR VALVES.
MAKE SURE BURNERS ARE IN THE GAS POSITION (IN) AND CHECK
FIRE EYES FOR DIRT AND/OR WATER. | <input type="checkbox"/> |
| OPER | 20. CHECK FORNEY BURNER CABINETS FOR TAGS AND INFORM
WATCH ENGINEER | <input type="checkbox"/> |
| OPER | 21. INSPECT ALL COOLING AIR LINES AND VALVES AT PORTHOLES. | <input type="checkbox"/> |
| OPER | 22. HOUSE AIR COMPRESSOR IS ON AND THE OTHER IS ON STANDBY. | <input type="checkbox"/> |
| OPER | 23. MAKEUP PUMP IS LINED TO D.A. AND CHECK D.A. LEVEL. | <input type="checkbox"/> |

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen T. ...</i>	<i>HE</i>	POWER PLANT	2-12-92	0

NO. 7 BOILER PRELIGHT CHECKLIST (CON'T.)

- OPER 24. MAKE SURE WE HAVE FULL INSTRUMENT AIR PRESSURE. CHECK ALL VALVES AT FILTERS (30 PSI.)

- OPER 25. CHECK DAY TANK LEVELS, AND BE SURE TO AND FROM SYSTEM VALVE IS OPEN AT DAY TANK.

- OPER 26. CHECK YARD GAS VALVES, OPEN S-4 VALVE AT GAS HEADER ON PLATFORM. MAKE SURE MINIMUM FLOW VALVE IS FULLY OPEN, AND THE MAIN GAS VALVE BEFORE MAIN REDUCER IS CLOSED (UNTIL WE ARE ON THE LINE.)

- OPER 27. CHECK IGNITOR GAS SUPPLY (CITY OR FLORIDA GAS.)

- OPER 28. MAIN STEAM STOP VALVE OPEN (UNLESS OTHERWISE INSTRUCTED BY THE WATCH ENGINEER.)

- OPER 29. INFORM CONTROL ROOM BEFORE STARTING FD FAN.

- OPER 30. START FAN AND INITIATE PURGE, CHECK FAN FOR VIBRATION AND BRUSHES FOR ARCING. ALSO, CHECK OIL SLINGERS.

- OPER 31. BE PREPARED TO PUT FIRE IN BOILER AND BRING BOILER UP AS USUAL.

- ENGR. 32. NOTIFY FLORIDA GAS THAT UNIT WILL BE COMING ON THE LINE.

- ENGR. 33. MAKE SURE ALL PERMITS ARE REVIEWED AND CLOSED IF NECESSARY PRIOR TO PLACING UNIT IN SERVICE.

- OPER 34. CHECK BALOMETER

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen Tucker, Jr.</i>	<i>HE</i>	POWER PLANT	2-12-92	0

GENERATOR START-UP PROCEDURES

PURPOSE

This procedure has been prepared to serve as a guide to ensure that the generators are placed on the line in a safe and proper manner.

SCOPE

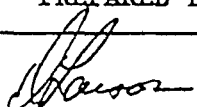
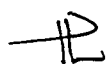
Details are listed for the responsibility of the Operator/Watch Engineer prior to putting a generator on the line. This list is not all inclusive and should not be relied on as a substitute for good operating practice based on individual experience and training.

POLICY

These checks will be performed and checked off before attempting to place a generator into service.

GENERAL

This sheet will be properly filled out by both the Operator and the Watch Engineer and then turned in to the Plant Operations Supervisor.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
		POWER PLANT	2-12-92	0

START-UP CHECK LIST

CONTROL ROOM

- 1. MAKE SURE THAT ALL TAGS ARE REMOVED IN THE CONTROL ROOM.
- 2. CHECK BULBS ON THE CONTROL PANEL.
- 3. CHECK THE TARGETS ON RELAYS AND THE LOCKOUTS BEFORE COMING ON THE LINE.
- 4. MAKE SURE THAT THE PROPER CHART RECORDERS ARE ON.
- 5. NOTIFY DISPATCH THAT WE ARE COMING ON THE LINE.
- 6. CHECK STATION SERVICE AND REROUTE IF NECESSARY.
- 7. PREPARE TO SYNCHRONIZE THE GENERATOR.
- 8. CHECK THE PANEL BULBS AND THE TARGETS AFTER YOU ARE ON THE LINE.

WATCH ENGINEERS

- 1. REVIEW PERMITS AND REMOVE ALL TAGS AND MAKE SURE THAT ALL BREAKERS ARE RACKED BACK IN.
- 2. MAKE SURE THAT ALL THE AUXILIARY EQUIPMENT IS RACKED IN AND MEG ALL MOTORS ABOVE 50 HP, REGARDLESS OF VOLTAGE. ALSO, CHECK THE MOTOR HEATERS.
- 3. MAKE SURE THAT THE OIL RESERVOIR IS AT THE CORRECT LEVEL.
- 4. MAKE SURE THAT YOU ARE ON TURNING GEAR. (MIN. 12 HRS.)
- 5. CHECK EXCITER RHEOSTAT. MAKE SURE IT IS IN THE PROPER POSITION.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Hanson</i>	<i>HD</i>	POWER PLANT	2-12-92	0

START-UP CHECK LIST

- 6. CHECK THE FIELD BREAKER. MAKE SURE THAT IT IS CHARGED.
- 7. CHECK THE GENERATOR OCB AND THE CONTROL POWER.
- 8. CHECK THE DISCONNECTS ON THE TRANSFORMERS AND OCB'S.
- 9. MAKE SURE THAT THE TRANSFORMERS HAVE PROPER OIL LEVELS, THAT THE FANS ARE ON AND THAT THE OIL AND WINDING TEMPS ARE O.K.
- 10. MAKE SURE THAT THE GENERATOR HAS 15 PSI OF HYDROGEN (UNITS NO. 7 AND NO. 8.)
- 11. MAKE SURE THAT THE BOILER ROOM HAS COMPLETED ITS CHECK OFF SHEET.
- 12. MAKE SURE THAT THE NECESSARY LUBE OIL PUMPS ARE ON.
- 13. BRINGING UNIT UP TO SPEED AND SYNC IS ANOTHER PROCEDURE.

OPERATOR ON WATCH _____

WATCH ENGINEER _____

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Hanson</i>	<i>HK</i>	POWER PLANT	2-12-92	0

NO. 8 BOILER PRELIGHT CHECK LIST

PURPOSE

This procedure has been prepared to serve as a guide to ensure that all systems and related equipment pertaining to the prelight of a steam generator is properly inspected and determined that it is fully functional prior to putting equipment into service.

SCOPE

As a safety precaution, responsibilities are listed in checklist form to ensure proper inspection of boilers by the Operators and acknowledged by the Watch Engineer. This does not necessarily dictate the order in which equipment is checked out, nor is it all inclusive and should not be relied on as a substitute for good operating practice based on individual experience and training.

POLICY

The check list will be performed and checked off before attempting to place equipment/prelight of steam generators into service.

GENERAL

The No. 8 Boiler Prelight Check List for the prospective unit will be properly filled out by both the Operator and the Watch Engineer and then turned in to the Plant Operations Supervisor.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen Tudor, Jr.</i>	<i>HR</i>	POWER PLANT	2-12-92	0

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NO. 8 BOILER PRELIGHT CHECK LIST

- | | | |
|-------|---|--------------------------|
| OPER | 1. DRUM LEVEL IS UP TO FIRING LEVEL (1 BUBBLE IN SIGHTGLASS.) | <input type="checkbox"/> |
| OPER | 2. CHECK ALARM PANELS IN BOILER ROOM AND TURBINE PANEL, TEST ALARMS, REPLACE BULBS AS NECESSARY. PLACE MOLYTEKS IN AUTO MODE (BOILER ROOM AND TURBINE BOARD.) | <input type="checkbox"/> |
| W.ENG | 3. CHECK FOR TAGS ON EQUIPMENT IN BOILER ROOM, TURBINE PANEL, 2400 V BUS AND 480 V BUS. | <input type="checkbox"/> |
| OPER | 4. TAKE NITROGEN BLANKET OFF BOILER, CLOSE VALVE AT BOILER AND SHUT FLOW OFF AT SCAVENGER. | <input type="checkbox"/> |
| OPER | 5. CHECK ALL BOILER ENTRANCE DOORS TO MAKE SURE THEY ARE SECURE, MAKE SURE THERE IS NO WATER LEAKAGE FROM BOILER DRUM HATCHES AND THAT THEY ARE SECURE. | <input type="checkbox"/> |
| OPER | 6. OPEN BOILER VENTS (3) SUPERHEATER OUTLET, AFTER SPRAY HEADER, AND NORTH DRUM VENT. | <input type="checkbox"/> |
| OPER | 7. OPEN BOILER DRAINS (2) MAIN, SPRAY HEADER DRAIN (UPSTREAM AND DOWNSTREAM VALVES.) | <input type="checkbox"/> |
| OPER | 8. VALVES BEFORE AND AFTER ATTEMPERATOR ARE OPEN (BYPASS CLOSED,) AND DOWNSTREAM VALVE AT TOP OF BOILER OPEN. | <input type="checkbox"/> |
| OPER | 9. VALVES OPEN BEFORE AND AFTER FEEDWATER REGULATOR (BYPASS VALVE CLOSED.) | <input type="checkbox"/> |
| OPER | 10. CHECK POSITION OF FEEDWATER STOP VALVE. | <input type="checkbox"/> |
| OPER | 11. NORTH AND SOUTH BOILER BLOWDOWN VALVES SHOULD BE CLOSED. BLOWDOWNS SHOULD BE LINED UP TO FLASH TANK. | <input type="checkbox"/> |
| OPER | 12. NORTH AND SOUTH SIDE WATERWALL HEADER DRAINS SHOULD BE CLOSED. | <input type="checkbox"/> |

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen Reddy, Jr.</i>	<i>HR</i>	POWER PLANT	2-12-92	0

NO. 8 BOILER PRELIGHT CHECK LIST (CON'T.)

- OPER 13. CHECK OUT BOILER FEEDWATER PUMPS. (A) SUCTION AND DISCHARGE VALVES OPEN. (B) VENTS OPEN. (C) BALANCE LINE VALVES OPEN AT PUMP AND AT DA. (D) CHECK OIL LEVEL IN RESERVOIR. (E) CHECK IN BOWL FOR SHAFT PUMP SUCTION. (F) RECIRC VALVE AT DA AND VALVES AT PUMP OPEN. (G) ALL COOLING WATER VALVES OPEN. (H) AUX LUBE OIL PUMP IN AUTO. (I) RECIRC VALVES IN MANUAL OPEN POSITION IN BOILER ROOM.

- OPER 14. CHECK OIL LEVELS AT FORCED DRAFT FANS AND MOTORS.

- OPER 15. OPEN MANUAL FAN AND STACK DAMPERS ON FAN TO BE PLACED IN SERVICE.

- OPER 16. CHECK OIL LEVELS OF AIRHEATER TRUNION BEARINGS (HOT AND COLD ENDS); ALSO, COOLING WATER TO AIRHEATER BEARINGS

- OPER 17. COOLING WATER TO AIRHEATER SHAFTS ON.

- OPER 18. CHECK OIL LEVELS OF AIR HEATER MOTORS AND AIR DRIVES.

- OPER 19. TURN ON O2 ANALYZER AND CHECK CALIBRATION.

- OPER 20. TURN ON NOX RECORDER AS USUAL.

- OPER 21. CHECK OUT EACH BURNER AT FRONT. (A) PILOT IN AUTO POSITION. (B) AIR REGISTER OPERATION. (C) LIMIT SWITCHES IN PROPER POSITION. (D) COOLING AIR VALVES OPEN, SEALING VALVES CLOSED. (E) BURNER GUN OPERATION. (F) ALL OTHER RELATED EQUIPMENT.

- OPER 22. CHECK FORNEY BURNER CABINETS AND NOTIFY WATCH ENGINEER OF ANY TAGS.

- OPER 23. COOLING AIR VALVES TO PORTHOLES ARE OPEN.

- OPER 24. HOUSE AIR COMPRESSOR IS ON (PRESS. A MIN. OF 85 PSI.)

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen Tucker, Jr.</i>	<i>TR</i>	POWER PLANT	2-12-92	0

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NO. 8 BOILER PRELIGHT CHECK LIST (CON'T.)

- OPER 25. MAKE-UP PUMP IS LINED TO DA.
- OPER 26. MAKE SURE WE HAVE FULL INSTRUMENT AIR PRESSURE. VALVES AT FILTERS SHOULD BE OPEN.
- OPER 27. CHECK FIBERGLASS TANK LEVEL.
- OPER 28. BALOMETER HAS BEEN CLEANED.
- OPER 29. THERMO PROBE IS RETRACTED (UNLESS OTHERWISE INSTRUCTED BY WATCH ENGINEER.)
- W ENG 30. DRUM LEVEL TRIP IS LIFTED.
- OPER 31. COOLING AIR BLOWER IS ON, RESERVE IS ON STANDBY.
- OPER 32. MAIN STEAM STOP VALVE IS OPEN (UNLESS OTHERWISE INSTRUCTED BY WATCH ENGINEER.)
- OPER 33. CHECK IGNITOR GAS SUPPLY (12 - PSI CITY OF FLORIDA GAS.)
- OPER 34. CHECK YARD GAS VALVES, OPEN S-4 VALVE AT GAS HEADER ON PLATFORM. MAKE SURE MINIMUM FLOW VALVE IS FULLY OPEN, AND THE MAIN GAS VALVE BEFORE MAIN REDUCER IS CLOSED (UNTIL WE ARE ON THE LINE.)
- OPER 35. INFORM CONTROL ROOM YOU ARE GOING TO BE STARTING A FORCED DRAFT FAN.
- OPER 36. START FAN AND INITIATE PURGE. CHECK FAN FOR VIBRATION AND OIL SLINGERS FOR PROPER OPERATION.
- OPER 37. BE PREPARED TO PUT FIRE IN BOILER AND BRING BOILER UP AS USUAL.
- OPER 38. SIGN NOX CHART (TIME FIRE WAS PUT IN BOILER.)
- W ENG 39. NOTIFY FLORIDA GAS IF UNIT IS COMING ON LINE.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Stephen Hudson, Jr.</i>	<i>HD</i>	POWER PLANT	2-12-92	0

GENERATOR START-UP PROCEDURES

PURPOSE

This procedure has been prepared to serve as a guide to ensure that the generators are placed on the line in a safe and proper manner.

SCOPE

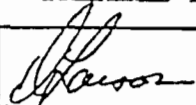
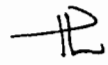
Details are listed for the responsibility of the Operator/Watch Engineer prior to putting a generator on the line. This list is not all inclusive and should not be relied on as a substitute for good operating practice based on individual experience and training.

POLICY

These checks will be performed and checked off before attempting to place a generator into service.

GENERAL

This sheet will be properly filled out by both the Operator and the Watch Engineer and then turned in to the Plant Operations Supervisor.

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
		POWER PLANT	2-12-92	0

START-UP CHECK LIST

CONTROL ROOM

- 1. MAKE SURE THAT ALL TAGS ARE REMOVED IN THE CONTROL ROOM.
- 2. CHECK BULBS ON THE CONTROL PANEL.
- 3. CHECK THE TARGETS ON RELAYS AND THE LOCKOUTS BEFORE COMING ON THE LINE.
- 4. MAKE SURE THAT THE PROPER CHART RECORDERS ARE ON.
- 5. NOTIFY DISPATCH THAT WE ARE COMING ON THE LINE.
- 6. CHECK STATION SERVICE AND REROUTE IF NECESSARY.
- 7. PREPARE TO SYNCHRONIZE THE GENERATOR.
- 8. CHECK THE PANEL BULBS AND THE TARGETS AFTER YOU ARE ON THE LINE.

WATCH ENGINEERS

- 1. REVIEW PERMITS AND REMOVE ALL TAGS AND MAKE SURE THAT ALL BREAKERS ARE RACKED BACK IN.
- 2. MAKE SURE THAT ALL THE AUXILIARY EQUIPMENT IS RACKED IN AND MEG ALL MOTORS ABOVE 50 HP, REGARDLESS OF VOLTAGE. ALSO, CHECK THE MOTOR HEATERS.
- 3. MAKE SURE THAT THE OIL RESERVOIR IS AT THE CORRECT LEVEL.
- 4. MAKE SURE THAT YOU ARE ON TURNING GEAR. (MIN. 12 HRS.)
- 5. CHECK EXCITER RHEOSTAT. MAKE SURE IT IS IN THE PROPER POSITION.


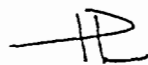
PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
<i>Hanson</i>	<i>HD</i>	POWER PLANT	2-12-92	0

START-UP CHECK LIST

- 6. CHECK THE FIELD BREAKER. MAKE SURE THAT IT IS CHARGED.
- 7. CHECK THE GENERATOR OCB AND THE CONTROL POWER.
- 8. CHECK THE DISCONNECTS ON THE TRANSFORMERS AND OCB'S.
- 9. MAKE SURE THAT THE TRANSFORMERS HAVE PROPER OIL LEVELS, THAT THE FANS ARE ON AND THAT THE OIL AND WINDING TEMPS ARE O.K.
- 10. MAKE SURE THAT THE GENERATOR HAS 15 PSI OF HYDROGEN (UNITS NO. 7 AND NO. 8.)
- 11. MAKE SURE THAT THE BOILER ROOM HAS COMPLETED ITS CHECK OFF SHEET.
- 12. MAKE SURE THAT THE NECESSARY LUBE OIL PUMPS ARE ON.
- 13. BRINGING UNIT UP TO SPEED AND SYNC IS ANOTHER PROCEDURE.

OPERATOR ON WATCH _____

WATCH ENGINEER _____

PREPARED BY:	APPROVED BY:	H. D. KING	DATE ISSUED:	REVISION NO.:
		POWER PLANT	2-12-92	0

DIESEL SHUTDOWN PROCEDURES

- 1** Control room operator turns start/stop switch to 'stop' position. Unit will automatically unload and come off the line with a cool down period for the engine.
- 2** A operator will go to local control panel and put mode selector switch to the off position and fault indicator light should come on.

#9 and #5 SHUTDOWN PROCEDURE

- 1 Take gas turbine off line by pressing gas turbine stop button at local controls.
- 2 Control room operator close the HRSG damper.
- 3 As #5 steam turbine rolls down, the control room operator must maintain proper generator voltage.
- 4 When the generator watt-hour meter stops, the control room operator must open the generator breaker and lower the generator voltage all the way down and open the field breaker.
- 5 When the generator is off line control room operator informs the shift supervisor and he/she will close the throttle valve stopping the turbine.
- 6 The auxiliary operator should maintain proper condenser/hotwell level during unit shutdown
- 7 Control room operator should maintain proper DA level and HRSG drum water levels.

#7 UNIT SHUTDOWN PROCEDURE

- 1 Boiler room lowers boiler pressure 50 to 100 psi. (from 900 to 800 psi)
- 2 Control room lowers generator to about 3 megawatts and switches station service from T-17 to T-18.
- 3 Boiler room takes gas fire out of boiler and starts a boiler purge and tells control room to take unit off line.
- 4 Control room operator lowers the generator voltage down from 13.8KV to 13.5KV
- 5 Control room lowers generator down to zero MW. When the generator watt-hour meter stops turning the operator opens the generator breaker and the field breaker.
- 6 When generator is off line control room operator informs the shift supervisor and he/she will close the throttle valve stopping the turbine.
- 7 Auxiliary operator controls condenser/hotwell and deaerating heater (DA) levels until the DA temperature is below 212 degrees and then pertaining auxiliary equipment is shutdown.
- 8 Shift supervisor places turbine-generator on turning gear once the turbine rolls down to zero speed.
- 9 Once the boiler has completed its 5 min. purge the FD fan is shut down and all gas valves are closed pertaining to the unit.

#8 UNIT SHUTDOWN PROCEDURE

- 1 Boiler room lowers boiler pressure 50 to 100 psi. (from 1250 to 1150 psi)
- 2 Control room lowers generator to about 3 megawatts.
- 3 Boiler room takes gas fire out of boiler and starts a boiler purge and tells control room to take unit off line.
- 4 Control room operator lowers the generator voltage down from 13.8KV to 13.5KV
- 5 Control room operator lowers generator down to zero MW. When the generator watt-hour meter stops turning the control room operator opens the generator breaker and the field breaker.
- 6 When generator is off line the control room operator informs the shift supervisor and he/she will close the throttle valve stopping the turbine.
- 7 Auxiliary operator controls condenser/hotwell and deaerating heater (DA) levels until the DA temperature is below 212 degrees and then pertaining auxiliary equipment is shutdown.
- 8 Shift supervisor places turbine-generator on turning gear once the turbine rolls down to zero speed.
- 9 Once the boiler has completed its 5 min. purge the FD fan is shut down and all gas valves are closed pertaining to the unit.

Attachment F

ADDITIONAL APPLICABLE REQUIREMENTS

Additional applicable requirements for the two diesel units (001 and 002) and the three boilers (004, 007, and 008) and the associated compliance methods, recordkeeping, and monitoring requirements are as set forth in the current operating permit #A056-190275 attached.

Additional applicable requirements for the combined cycle gas turbine (003) and the associated compliance methods, recordkeeping, and monitoring requirements are as set forth in the current operating permit #056-175955, attached.



MAY 7 - 1993

Florida Department of Environmental Regulation

Southeast District • P.O. Box 15425 • West Palm Beach, Florida 33416

Lawton Chiles, Governor

1900 S. Congress Ave., Suite A

Virginia B. Wetherell, Secretary

Telephone: 407/433-2650

Fax: 407/433-2666

PERMITTEE:

Mr. H. P. Lamb
Superintendent/Power Resources
Fort Pierce Utilities Authority
311 North Indian River Drive
Fort Pierce, Florida 34950

I.D. NUMBER: 50/WPB/56/0003
PERMIT/CERTIFICATION NUMBER: AO 56-190275*
DATE OF ISSUE: MAY 7 - 1993
EXPIRATION DATE: February 28, 1996
COUNTY: St. Lucie
LATITUDE/LONGITUDE: 27°27'00"N/80°19'26"W
UTM: Zone 17; 566.4 Km. E; 3036.3 Km. N
PROJECT: Ft. Pierce Utilities Authority
Units 6 - 8, Diesels 1 and 2

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule 17-296, and in conformance with all existing regulations of the Florida Department of Environmental Regulation. 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:

OPERATE: An air pollution source consisting of:

- a) Two (2) General Motors Corporation, Model MP-45, diesel electric generators burning No. 2 fuel oil at 28.9 million BTU/hr. maximum, discharging pollutants through a 3-ft. diameter stack 23 feet above ground level (peaking units);
- b) Babcock & Wilcox Boiler, Unit No. 6, 218.9 million BTU/hr. discharging pollutants through a 5-ft. diameter stack 148 feet above ground level;
- c) A Foster Wheeler Boiler, Unit No. 7, 470 million BTU/hr. maximum; discharging pollutants through a multicyclone collector and a 7.1 ft. diameter stack 147 feet above ground level, and
- d) A Foster Wheeler Boiler, Unit No. 8, 611 million BTU/hr. maximum; discharging pollutants through an 8 foot diameter stack 150 feet above ground level, equipped with continuous in-stack NO_x and O₂ monitors.

IN ACCORDANCE WITH: Settlement Agreement for OGC Case No. 91-1610 signed July 8, 1992; Application for Renewal received December 14, 1990, additional information received January 28, January 31 and February 27, 1991, AC 56-141460 issued March 14, 1988 and modified May 1, 1990; Application to Operate/Construct Air Pollution Sources received December 12, 1985 (Diesels 1 and 2); AC 56-12778 issued September 4, 1979 (Unit 8); and Application to Operate received July 21, 1980 (Units 6 and 7) (none are attached).

LOCATED AT: 311 North Indian River Drive, Fort Pierce, St. Lucie County, Florida.

TO SERVE: An electric generating utility (SIC # 4911).

SUBJECT TO: General Conditions 1-14 and Specific Conditions 1-10.

*This permit is a renewal of permit no. AO 56-113533 issued February 28, 1986; AO 56-113534 issued February 28, 1986; AO 56-112679 issued February 14, 1986; and AO 56-112678 issued February 14, 1986; and modifies and supersedes permit no. AO 56-190275 issued May 23, 1991.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
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), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither 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 is not 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, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; 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.
6. The permittee shall 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 and at reasonable times, access to the premises where the permitted activity is located or conducted to:
 - (a) Have access to and copy any records that must be kept under the conditions of the permit;
 - (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
 - (c) Sample or monitor 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 the permit, the permittee shall immediately notify and provide the Department with the following information:
 - (a) A description of and cause of noncompliance; 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. 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 for 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 involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

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 Rule 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following :

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically, unless otherwise stipulated by the Department.

(b) The permittee shall hold 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) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained 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.

14. 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 the 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.

PERMITTEE:
Mr. H. P. Lamb
Fort Pierce Utilities Authority
Fort Pierce, Florida 34950

PERMIT/CERTIFICATION NUMBER: AO 56-190275
DATE OF ISSUE: MAY 7 - 1993
EXPIRATION DATE: February 28, 1996

SPECIFIC CONDITIONS:

1. Compliance testing shall be conducted for the sources covered by this permit by September 1991 and annually thereafter in accordance with the methods specified below.
2. Emission limiting standards are as follow:

a) Units 6, 7, and 8

- (1) Visible emissions shall not exceed 5% opacity while firing natural gas.

For Units 6 and 7, visible emissions shall not exceed 20% opacity when the unit is burning fuel oil, except for one two-minute period per hour during which opacity shall not exceed 40%.

For Unit 8 visible emissions shall not exceed 20% opacity when the unit is burning fuel oil, except for one six minute period per hour during which opacity shall not exceed 27%.

(2)

- A) The emission limits for Units 6,7 and 8 shall not exceed the following rates:

<u>Parameter</u>	<u>Unit 6</u> lb/hr.	<u>Unit 7</u> lb/hr.	<u>Unit 8</u> lb/hr.
PM	0.4	0.568	0.945
SOx	12.38	0.1199	0.1917
NOx	1.31	104.35	173.20
VOC	0.0236	0.266	0.441
CO	0.15	7.589	12.59

- B) The total emissions from combined Units 6, 7, and 8 shall not exceed:

<u>Parameter</u>	<u>Tons/Yr.</u>
PM	16.0
SOx	101.6
NOx	622.0
VOC	2.3
CO	45.3

Total combined heat input for the Units 6, 7, and 8 shall not exceed 4,534,930 MBtu per year.

SPECIFIC CONDITIONS:

(3) Natural gas is the only permitted fuel for normal operation for Units 6, 7, and 8. Units 6, 7, and 8 are allowed to burn natural gas with a No. 6 fuel oil (0.8 lbs SOx/MBtu) as a standby fuel for up to a combined total of 400 hours per year, when necessary in order to avoid curtailing electric power service to its customers. FPUA must notify the DER within 24 hours after commencement of oil firing and furnish the following information:

- a. Duration or projected duration of the event.
- b. Quantity of fuel oil burned or projected to be burned.
- c. A description of significant circumstances precipitating the event, which shall include:
 - i. Availability of power for purchase
 - ii. Availability of electric transmission capacity relating to power purchases.
 - iii. Availability of natural gas
 - iv. Availability of FPUA generation sources.

(4) When burning fuel oil in Units 6, 7, and 8, the emission rates set forth in Specific Condition 2(a)2.A above shall not apply and the following rates shall apply to Units 6, 7, and 8:

<u>Parameter</u>	<u>Unit 6</u> lb/MBTU	<u>Unit 7</u> lb/MBTU	<u>Unit 8</u> lb/MBTU
SOx	0.80	0.80	0.80
PM	n/a	0.1	0.1
VOC	n/a	n/a	n/a

- (5) Unit 8
- 1. Continuous emission monitors are required for nitrogen oxides and oxygen.
 - 2. Quarterly excess emissions reports pursuant to 40CFR60 shall be submitted to the Southeast District Office postmarked no later than the 30th day following the end of each calendar quarter.

(6) Diesels 1 and 2

Visible emissions shall not exceed 20 percent opacity while using No. 2 fuel oil.

PERMITTEE:

Mr. H. P. Lamb
Fort Pierce Utilities Authority
Fort Pierce, Florida 34950

PERMIT/CERTIFICATION NUMBER: AO 56-190275
DATE OF ISSUE: MAY 7 - 1993
EXPIRATION DATE: February 28, 1996

SPECIFIC CONDITIONS:

3. The compliance test report shall include results of tests by the following method:

<u>Source/Emission Point</u>	<u>Pollutant</u>	<u>Test Method</u>
Diesels 1 & 2 Boilers 6,7, & 8	Visible Emissions	EPA Method 9
Boilers 6,7, & 8	Particulate	EPA Method 5
	SOx	EPA Method 6
	NOx	EPA Method 7,7E
	VOC	EPA Method 25A
	CO	EPA Method 10

The compliance test report shall be submitted to the Department in accordance with Florida Administrative Code (F.A.C.) Rule 17-297.330.

4. Testing of emissions should be conducted using the fuel and/or process input which are expected to result in the highest emissions and within ten percent (10%) of the rated capacity of the source, otherwise the Department may require the test to be repeated or require modification of the permit to reflect tested rates and/or fuels. However, testing on fuel oil in Units 6, 7, and 8 shall be required only if fuel oil usage for the units exceed 400 hours in any calendar year.

5. The Department shall be notified of expected test dates at least fifteen (15) days prior to compliance testing.

6. On or before March 1 of each calendar year, a completed DER Form 17-210.900(4), Annual Operations Report Form for Air Emissions Sources shall be submitted to the Department.

7. Ambient monitoring for particulate and sulfur dioxide is required if fuel oil usage exceeds 400 hours per calendar year.

8. Copies of all reports, tests, notifications or other submittals required by this permit shall be submitted to the Department of Environmental Regulation, Southeast District Office.

9. The permittee shall be aware of and operate under the attached "General Permit Conditions #1 through 14". General Permit Conditions are binding upon the permittee and enforceable pursuant to Chapter 403 of the Florida Statutes.

PERMITTEE:

Mr. H. P. Lamb
Fort Pierce Utilities Authority
Fort Pierce, Florida 34950

PERMIT/CERTIFICATION NUMBER: AO 56-190275
DATE OF ISSUE: MAY 7 - 1993
EXPIRATION DATE: February 28, 1996


SPECIFIC CONDITIONS:

10. The facility shall maintain unit logs reflecting the following information:

- a. Number of hours per day each unit burns gas.
- b. Number of hours per day each unit burns fuel oil.
- c. Amount of natural gas used per unit (MBTU/million cubic feet burned).
- d. Amount of fuel oil used per unit including sulfur and ash content and heat input rate (MBTU/1000 gallons).

Executed in West Palm Beach, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION


Mary E. S. Williams
Director of District Management
F.D.E.R., Southeast District
P.O. Box 15425
West Palm Beach, FL 33416
407/433-2650

MESW:ms:gml

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed by certified mail before the close of business on MAY 7 - 1993 to the listed persons.

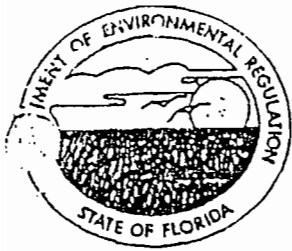
Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to S.120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.


Clerk

MAY 7 - 1993

Date



Florida Department of Environmental Regulation

Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406 • 407-964-9668

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary
Scott Benyon, Deputy Assistant Secretary

PERMITTEE:

Mr. Harry Schindehette
Director of Utilities
Fort Pierce Utilities Authority
P. O. Box 3191
Fort Pierce, Florida 33448

I.D. NUMBER: 50/WPB/56/0309
PERMIT/CERTIFICATION NUMBER: AO 56-175955
DATE OF ISSUE: MAY 1, 1990
EXPIRATION DATE: March 30, 1995
COUNTY: St. Lucie
LATITUDE/LONGITUDE: 27°27'00"N/80°19'26"W
UTM: Zone 17; 566.8 Km. E; 3306.3 Km. N
PROJECT: Fort Pierce Utilities Unit #9
31.6 MW Combined Cycle Gas Turbine

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule 17-2, and in conformance with all existing regulations of the Florida Department of Environmental Regulation. 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:

OPERATE: An air pollution source consisting of a Unit #9, 31.6 MW combined cycle gas turbine, (a 23.4 MW combustion turbine generator, a steam generator and an 8.2 MW condensing turbine generator). The unit uses steam injection from the waste heat recovery steam generator to control NO_x emissions from the gas turbine.

IN ACCORDANCE WITH: Certificate of Completion of Construction received February 7, 1990, AC 56-141460 issued March 24, 1988 and modified October 31, 1988 and Application to Construct Air Pollution Sources dated November 2, 1987 and additional information dated December 17, 1987 (none are attached).

LOCATED AT: Henry D. King Municipal Electric Station, Fort Pierce Utilities Authority, 2nd Street and B Avenue, Fort Pierce, St. Lucie County, Florida.

TO SERVE: An electrical generating facility (SIC # 4311).

SUBJECT TO: General Conditions 1-14 and Specific Conditions 1-13.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither 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 is not 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, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; 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.

6. The permittee shall 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 and at reasonable times, access to the premises where the permitted activity is located or conducted to:

- (a) Have access to and copy any records that must be kept under the conditions of the permit;
- (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
- (c) Sample or monitor 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 the permit, the permittee shall immediately notify and provide the Department with the following information:

- (a) A description of and cause of noncompliance; 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. 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 for 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 involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

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 Rule 17-4.120 and 17-30.300, F.A.C., 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 or a copy thereof shall be kept at the work site of the permitted activity.

13. The permittee shall comply with the following :

- (a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically, unless otherwise stipulated by the Department.
- (b) The permittee shall hold 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) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained 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.

14. 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 the 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. Compliance testing shall be conducted for the sources covered by this permit by September 30, 1990 and annually thereafter in accordance with the methods specified below.
2. Emission limiting standards are as follows:
In accordance with AC 56-141460; 40CFR60. Subpart GC, and 17-2.660 -
 - a) NO_x emissions shall not exceed 84ppm NO_x or $0.0075 \frac{(14.4)}{Y} + F$.
 - b) SO₂ emissions shall not exceed 0.015% by volume at 15% oxygen on a dry basis
 - c) Visible emissions shall not exceed 15% opacity.
 - d) The sulfur content of the No. 2 fuel oil shall not exceed 0.5% by weight.
 - e) CO emissions shall not exceed 32.85 lb./hr. and 110.4 ton/yr. when burning natural gas.
3. The compliance test report shall include results of tests by the following methods:

<u>Source/Emission Point</u>	<u>Pollutant</u>	<u>Test Method</u>
Unit #9	SO ₂	EPA Method 20 or ASTM 1552
	CO	EPA Method 10
	NO _x	EPA Method 20
	VE	EPA Method 9

During performance tests to determine compliance with the proposed standard, measured NO_x emission at 15 percent oxygen will be adjusted to ISP ambient atmospheric conditions by the following correction factor:

$$NO_x = (NO_x \text{ obs}) \left(\frac{P_{ref}}{P_{obs}} \right)^{0.5} e^{19 (H_{obs} - 0.00633)} \left(\frac{T_{AMB}}{288} \right)^{1.53}$$

where:

NO_x = Emissions of NO at 15% oxygen and ISO standard ambient conditions.

NO obs = Measured NO_x emission at 15% oxygen, ppmv.

P_{ref} = Reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure.

P_{bs} = Measured combustor inlet absolute pressure at test ambient pressure.

H_{obs} = Specific humidity of ambient air at test.

e = Transcendental constant (2.718)

T_{AMB} = Temperature of ambient air at test.

The compliance test report shall be submitted to the Department in accordance with Florida Administrative Code (F.A.C.) Rule 17-2.700(7).

PERMITTEE:
Mr. Harry Schindehette
Fort Pierce Utilities Authority
Fort Pierce, Florida

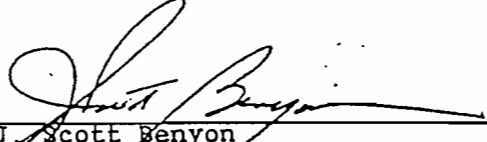
I.D. NUMBER: 50/WPB/56/0309
PERMIT/CERTIFICATION NUMBER: AO 56-175955
DATE OF ISSUE: MAY 1, 1990
EXPIRATION DATE: March 30, 1995

SPECIFIC CONDITIONS:

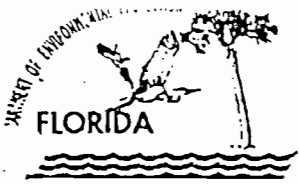
4. The compliance test report shall provide the following information on the air pollution control devices:
 - a. General condition of equipment (e.g., date of last thorough inspection and result of that inspection). Also note any deficiencies/problems, with the equipment which occur during testing,
 - b. Normal generating parameters of the equipment and the actual operation parameters for each test run (indicate how each parameter was determined).
5. Testing of emissions should be conducted using the fuel and/or process input which are expected to result in the highest emissions and within ten percent (10%) of the rated capacity of the source. Otherwise the Department may require the test to be repeated or modify the permit to reflect tested rates and/or fuels.
6. The Department shall be notified of expected test dates at least fifteen (15) days prior to compliance testing.
7. On or before March 1 of each calendar year, a completed DER Form 17-1.202(6), Annual Operations Report Form for Air Emissions Sources shall be submitted to the Department.
8. The operation of the sources covered by this permit shall be limited 8,736 hours/year.
9. Fuels used shall be limited to natural gas, except that No. 2 fuel oil with a maximum sulfur content of 0.5 percent by weight shall be allowed to be burned only as an emergency back-up fuel.
10. Sulfur and nitrogen content of the fuel being fired in the gas turbine shall be determined and recorded as specified in the NSPS for Gas Turbines 40 CFR 60, Subpart GG, Section 60.334. The records of fuel oil usage will be kept by the company, available for regulatory agency's inspection, for a two-year period.
11. The applicant shall comply with all requirements of 40 CFR 60, Subpart GG, Standards of Performance for stationary gas turbines.
12. A continuous monitoring system shall be installed to monitor and record the fuel consumption and the ratio of water to fuel being fired in the turbine.
13. The permittee shall be aware of and operate under the attached "General Permit Conditions #1 thru 14.". General Permit Conditions are binding upon the permittee and enforceable pursuant to Chapter 403 of the Florida Statutes.

Issued this 1st day of May, 1990

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION



J. Scott Benyon
Deputy Assistant Secretary



Best Available Copy
Department of
Environmental Protection

RECEIVED

APR 11 1996

POWER PLANT

Virginia B. Wetherell
Secretary

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Notice of Permit Amendment

In the matter of an
Application for Permit by:

DEP File No. AC 56-141460A
31.6 MW Combined Cycle
Gas Turbine

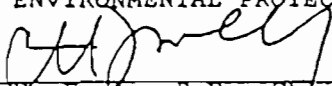
Mr. Thomas Richards, P.E.
Director of Operations
H. D. King Power Plant
311 North Indian River Drive
Ft. Pierce, Florida 34950

Enclosed is amended Permit Number AC 56-141460A for a 31.6 MW Combined Cycle Gas Turbine. This amendment corrects the sulfur dioxide emission limits for Units 6, 7, and 8 when natural gas fuel is burned at this facility and allows alternate means to determine compliance with the sulfur dioxide and particulate matter emission limits. This permit amendment is issued pursuant to Section 403, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by 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 14 days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

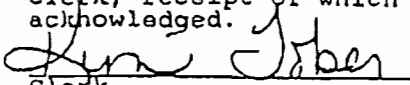

C. H. Farcy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT AMENDMENT and all copies were mailed by certified mail before the close of business on 4-8-96 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.


Clerk
Date 4-8-96

Copies furnished to:
Isidore Goldman, SED

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

FINAL DETERMINATION
Permit No. AC 56-141460A

The Intent to Issue an amended air construction permit to the Ft. Pierce Utility Authority for the H. D. King Power Plant at 311 North Indian River Drive, Ft. Pierce, St. Lucie County, Florida 34950 to correct the sulfur dioxide emission limits when natural gas fuel is burned in Units 6, 7, 8, and 9 and to allow alternate means to determine compliance with the sulfur dioxide and particulate matter emission limits was distributed on March 7, 1996. The Notice of Intent to Issue Permit Amendment was published in the Tribune on March 18, 1996. Copies of the evaluation were available for public inspection at the Department's offices in West Palm Beach and Tallahassee.

Comments were submitted on the Department's Intent by our Southeast District office. The District asked that the amendment clarify that the facility has separate emission limits for natural gas and fuel oil. They also asked that the EPA test methods be listed in the permit. In response to this request, the Department has clarified that the unit has separate emission limits for natural gas and fuel oil and has listed the methods that can be used to determine compliance with the sulfur dioxide and particulate matter emission limits.

The final action of the Department will be to issue amended permit No. AC 56-141460A as proposed.



Best Available Copy

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

PERMITTEE:

Ft. Pierce Utilities Authority
H. D. King Power Plant
311 North Indian River Drive
Ft. Pierce, Florida 34950

Permit Number: AC 56-141460A
Expiration Date: July 1, 1996
County: St. Lucie
Project: 31.6 MW Combined Cycle
Gas Turbine

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code, (F.A.C.), Chapters 62-4, 62-210 through 297. 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 re-issuance of permit No. AC 56-141460, subject to all previous conditions, amendments, and modifications, except for the changes by the Specific Conditions of this permit for Units Nos. 6, 7, 8, and 9. Permit No. AC 56-141460 expired June 1, 1990.

The H. D. King Power Plant is located at 311 North Indian River Drive, Ft. Pierce, St. Lucie County, Florida 34950. The UTM coordinates of the plant are Zone 17, 566.8 km E and 3,036.3 km N.

The project shall be constructed/operated in accordance with the attached request, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Original construction permit AC 56-141460 issued March 28, 1988.
2. Amendment dated October 31, 1988.
3. Amendment dated August 31, 1989.
4. Amendment dated April 18, 1990.
5. Amendment dated November 9, 1990.
6. Amendment dated June 28, 1991.
7. Amendment/Settlement Agreement, DOAH Case No. 91-6989
8. Request for amendment dated February 21, 1996.
9. Interoffice Memorandum dated March 29, 1996.

Page 1 of 3

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Printed on recycled paper.

POWER PLANT

PERMITTEE:
Ft. Pierce Utility Authority

Permit No. AC 56-141460A
Expiration Date: July 1, 1996

SPECIFIC CONDITIONS:

1. This permit supersedes permit No. AC 56-141460 issued March 28, 1988.
2. The provisions of permit No. AC 56-141460 are incorporated into this air construction permit except for the following changes:
3. The sulfur dioxide emission standards in Specific Condition No. 2A of permit No. AC 56-141460 for Units 6, 7, and 8 when natural gas fuel is being burned are changed:

FROM

Parameter	Unit 6 lbs/hr	Unit 7 lbs/hr	Unit 8 lbs/hr
SO ₂	12.38	0.1199	0.1917

TO

Parameter	Unit 6 lbs/hr	Unit 7 lbs/hr	Unit 8 lbs/hr
SO ₂	2.5	2.5	2.5

The emission standards for other regulated air pollutants for natural gas fuel and all air pollutants for fuel oil are not changed by this amendment.

4. Compliance testing requirements for the sulfur dioxide emission limits for unit 9 of permit No. AC 56-141460 are changed:

FROM:

Compliance with the sulfur dioxide emission limits will be determined by Reference Method 20 or by calculations based on fuel analysis (ASTM D1552) for sulfur content.

TO:

Compliance with the sulfur dioxide emission limits will be determined by Reference Method 20 or by calculation based on fuel analysis (ASTM 1552, D1072, D3031, D4084, or D3246) for sulfur content of the oil and natural gas. Certified analysis by the appropriate test method from the fuel supplier is acceptable to the Department.

PERMITTEE:
Ft. Pierce Utility Authority

Permit No. AC 141460A
Expiration Date: July 1, 1996

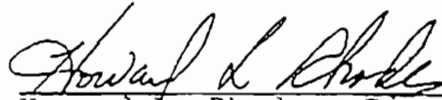
New Specific Condition for Permit No. AC 56-141460A;

11. Compliance testing requirements for the sulfur dioxide and particulate matter emission limits for units 6, 7, and 8 are:

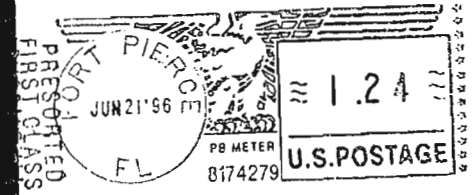
Compliance with the sulfur dioxide emission limits will be determined by Reference Method 6 or 6C or by calculation based on fuel analysis (ASTM 1552, D1072, D3031, D4084, or D3246) for sulfur content of the oil and natural gas. Certified analysis by the appropriate test method from the fuel supplier is acceptable to the Department.

Particulate matter tests on these units are waived when burning natural gas provided that the visible emissions do not exceed 5 percent opacity.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



Howard L. Rhodes, Director
Division of Air Resources
Management



**FORT PIERCE UTILITIES AUTHORITY
H.D. KING POWER PLANT
311 NORTH INDIAN RIVER DRIVE
FORT PIERCE, FLORIDA 34950**

**Mr. John Brown
Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation
2600 Blair Stone Road, Mail Station #5500
Tallahassee, FL 32399-2400**

Brown
This needs to be checked.
JA