

**Golder Associates Inc.**

6241 NW 23rd Street, Suite 500  
Gainesville, FL 32653-1500  
Telephone (352) 336-5600  
Fax (352) 336-6603



*File w/ J. E. app'n*

June 5, 1997

Mr. Clair H. Fancy, P.E., Chief  
Bureau of Air Regulation  
Florida Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

*Entered in ARMS 6/16/97  
KFK*

RE: Revision to Title V Application  
File No. 1050223-003-AC (PSD-FL-190)  
Tiger Bay Limited Partnership, Polk County

ATTN: Title V Section - Mr. Scott Sheplak, P.E.

Dear Scott:

On January 8, 1997, the compliance date for the combustion turbine to achieve the NO<sub>x</sub> emission limit of 97.2 lb/hr (equivalent to 15 ppmvd corrected to 15% O<sub>2</sub>) was revised with Final Permit Amendment No. 1050223-003-AC (PSD-FL-190) to no later than December 31, 1998. This submittal provides information for the Title V application relative to the revised permit which allows for either appropriate combustion technology or the use of selective catalytic reduction (SCR) to achieve compliance. Information in the application form was updated and is presented in both paper and computerized versions. The Responsible Official's and the Professional Engineer's statements have been included.

Please call if you have any questions.

Sincerely,

Kennard F. Kosky, P.E.  
Principal

KFK/lcb

cc: Jeffrey Keenan, DESTEC Energy  
Jeffrey Fassett, DESTEC Energy  
Ken Nash, Tiger Bay Limited Partnership  
File (2)

**RECEIVED**

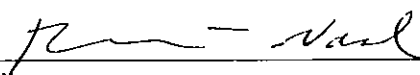
JUN 06 1997

BUREAU OF  
AIR REGULATION

RECEIVED  
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D E P

RECEIVED  
JUN 10 1997  
BY: [Name] / [Title]  
Department of Environmental Protection  
SOUTHWEST DISTRICT

**Owner/Authorized Representative or Responsible Official**

1. Name and Title of Owner/Authorized Representative or Responsible Official: <b>Ken Nash, President</b>
2. Owner/Authorized Representative or Responsible Official Mailing Address: Organization/Firm: <b>Tiger Bay Limited Partnership</b> Street Address: <b>2500 City West Blvd Suite 150</b> City: <b>Houston</b> State: <b>TX</b> Zip Code: <b>77042</b>
3. Owner/Authorized Representative or Responsible Official Telephone Numbers:  Telephone: <b>(713) 735-4124</b> Fax: <b>(713) 735-4169</b>
4. Owner/Authorized Representative or Responsible Official Statement:  <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 unit.</i>   Signature _____ Date <u>5/29/97</u>

\* Attach letter of authorization if not currently on file.

4. Professional Engineer's Statement:

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

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

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

*If the purpose of this application is to obtain a Title V source air operation permit (check here [  ] 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 unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.*



Signature  
(seal)

27 May 1997  
Date

\* Attach any exception to certification statement.

**ATTACHMENT TB-FE-2**

**FACILITY PLOT PLAN**

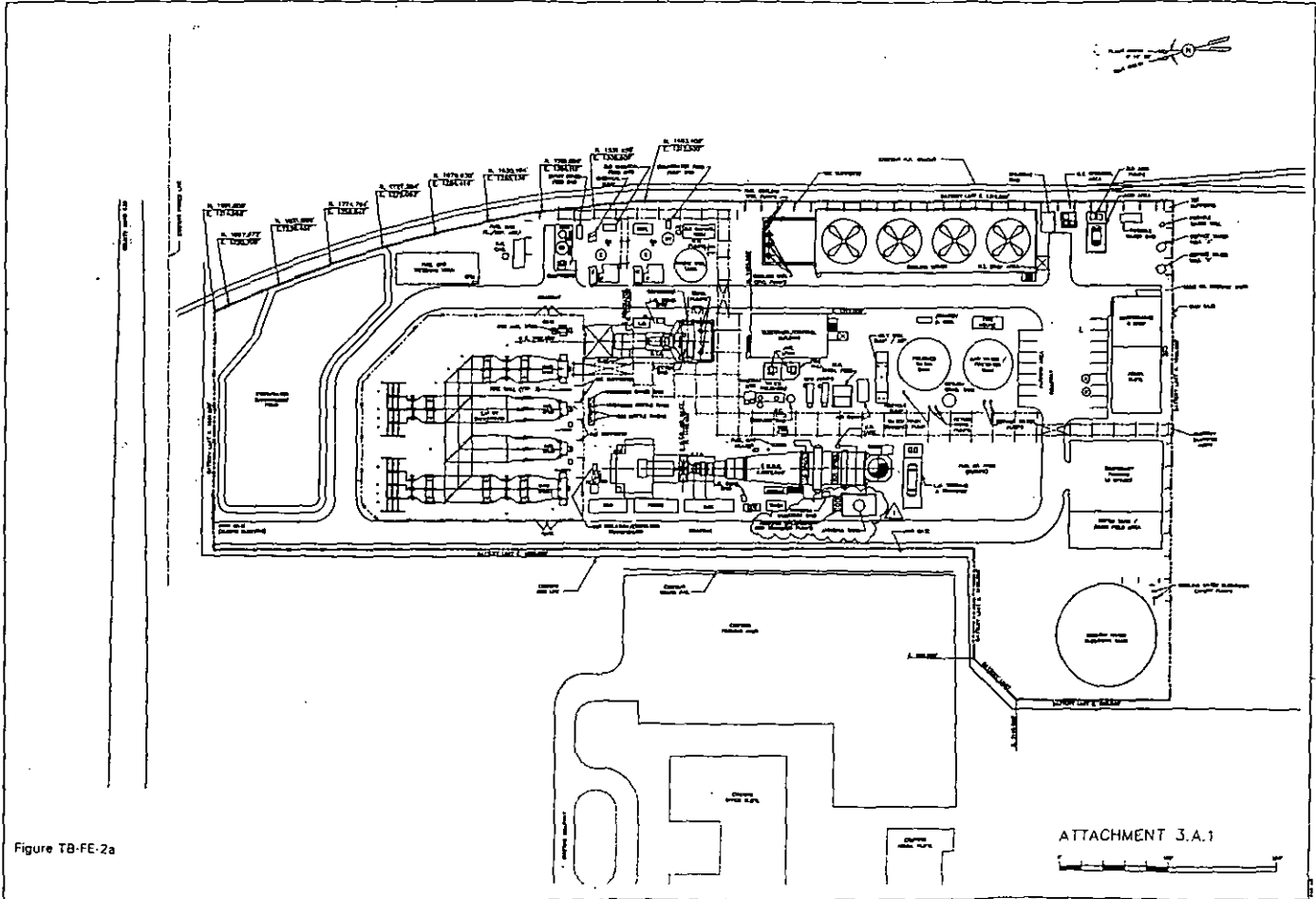


Figure TB-FE-2a

ATTACHMENT J.A.1

NO.	DATE	DESCRIPTION
1	12/20/00	PRELIMINARY
2	01/10/01	REVISED
3	02/15/01	REVISED
4	03/20/01	REVISED
5	04/25/01	REVISED
6	05/30/01	REVISED
7	06/30/01	REVISED
8	07/30/01	REVISED
9	08/30/01	REVISED
10	09/30/01	REVISED
11	10/30/01	REVISED
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96	11/30/08	REVISED
97	12/30/08	REVISED
98	01/30/09	REVISED
99	02/30/09	REVISED
100	03/30/09	REVISED

**DESIGN**

**DESIGNER** TIGER BAY COHEN  
**PROJECT** PLOT PLAN FOR SCR ADDITION  
**DATE** 12/30/02  
**SCALE** 1/8" = 1'-0"

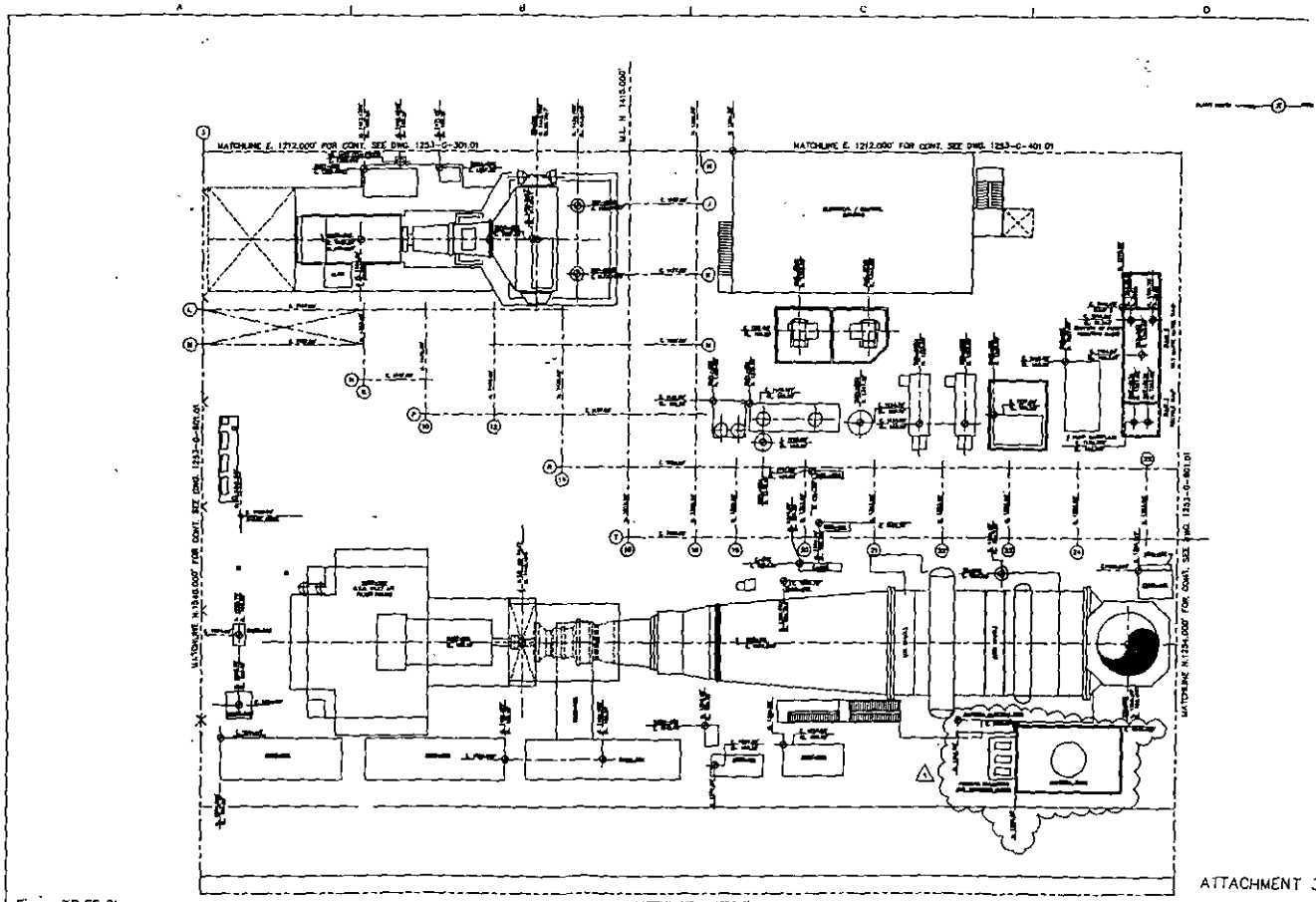


Figure TB-FE-2b

ATTACHMENT 3.A.2

REVISIONS	
NO.	DESCRIPTION
1	ISSUED FOR PERMIT
2	ISSUED FOR CONSTRUCTION
3	ISSUED FOR CONSTRUCTION
4	ISSUED FOR CONSTRUCTION
5	ISSUED FOR CONSTRUCTION
6	ISSUED FOR CONSTRUCTION
7	ISSUED FOR CONSTRUCTION
8	ISSUED FOR CONSTRUCTION
9	ISSUED FOR CONSTRUCTION
10	ISSUED FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	BY	CHKD.	APP'D.	SCALE	DATE

**DESTEC**  
 TIGER BAY OGDEN  
 EQUIPMENT LOCATION PLAN AREA 70

Scale: 1/4" = 1'-0"  
 Date: 12/13/2013  
 Project: TIGER BAY LP

**ATTACHMENT TB-FE-14**  
**COMPLIANCE REPORT AND PLAN**

**ATTACHMENT TB-FE-14**  
**COMPLIANCE PLAN**  
Tiger Bay Limited Partnership

This attachment presents information on the emission units in this application that provide certification that the emission units are in compliance with the applicable requirements as of the date of the application.

COMBUSTION TURBINE:

In accordance with Chapter 62 - 213, F.A.C., and Tiger Bay's FDEP Permit No. AC53-214903/PSD-FL-190 (as amended) compliance status and requirements are presented herein and listed in the table on the following page.

Initial Compliance Test

The initial compliance test was performed on October 19-23, 1994 to verify that the unit was in compliance. The results of the test is summarized in the submittal of the certificate of completion of construction and was submitted to FDEP in December 1994.

Initial compliance testing for oil-firing has not yet been performed. Such compliance tests will be performed in accordance with Specific Conditions 8, 9, and 10 of AC53-214903 and summarized in the attached table.

Annual Compliance Test

An annual compliance test must be performed to verify compliance with the NO<sub>x</sub> and CO requirements while the CT is fired on natural gas.

Compliance with NO<sub>x</sub> Emission Limits

The compliance date for the combustion turbine to achieve the NO<sub>x</sub> emission limit of 97.2 lb/hr (equivalent to 15 ppmvd corrected to 15% O<sub>2</sub>) was revised with Final Permit Amendment No. 1050223-003-AC (PSD-FL-190) to no later than December 31, 1998. Meeting this emission limit will be made with either appropriate combustion technology improvements or selective catalytic reduction (SCR). If SCR is used, the schedule for engineering, procurement, construction, and testing will be complete prior to December 31, 1998.



ZERO LIQUID DISCHARGE (ZLD) SYSTEM:

In accordance with Chapter 62-213 and Tiger Bay's FDEP Permit AC53-230744, the following is the compliance status of the ZLD system.

Initial Compliance Test

The initial compliance test for VE using EPA Method 9 was performed on 8/24/94. The results found zero visible emissions compared with the permitted limit of 5 percent opacity.

Annual Compliance Test

The ZLD is required to perform an annual VE test. In 1995 and during the period through June 15, 1996, the ZLD did not operate. In accordance with Rule 62-297.310(7)(a)3.a., an annual test was not required. A VE test will be performed within 30 days of continued operation of the ZLD.

## Combustion Turbine Compliance Values, Reporting, and Test Methods

Compliance Parameter	Compliance Values <sup>a</sup>	Compliance Reporting	Compliance Test Method (EPA)
Run Hours	8760	Annual Operating Report (AOR)	None
Heat Input	1,710 MMBtu/hr	Quarterly and AOR	Fuel Analysis
NO <sub>x</sub>	15 ppmvd @ 15% O <sub>2</sub> ; 97.2 lb/hr <sup>b</sup> ; 425.7 TPY (gas)	Annual Compliance Test <sup>c</sup> ; Quarterly and AOR	20
	25 ppmvd @ 15% O <sub>2</sub> ; 161.9 lb/hr; 709.1 TPY (gas)	Annual Compliance Test <sup>c</sup> ; Quarterly and AOR	20
	42 ppmvd @ 15% O <sub>2</sub> ; 326 lb/hr; 48.9 TPY (oil)	Initial Compliance Test <sup>c</sup> and AOR	20
CO	15 ppmvd; 48.8 lb/hr; 213.7 TPY (gas)	Annual Compliance Test <sup>c</sup> and AOR	10
	30 ppmvd; 98.4 lb/hr; 14.8 TPY (oil)	Initial Compliance Test <sup>c</sup>	10
VOC	2.8 lb/hr; 12.3 TPY (gas)	Annual Compliance Test <sup>c</sup> and AOR	18/25A
	7.5 lb/hr; 1.1 TPY (oil)	Initial Compliance Test <sup>c</sup>	18/25A
Visible Emissions (VE)	10% (gas)	Annual Compliance Test <sup>c</sup> and AOR	
	20% (oil)		
PM <sub>10</sub>	9 lb/hr; 39.4 TPY (gas)	Only Initial Compliance Test required/AOR	5 or 17
	17 lb/hr; 2.6 TPY (oil)	Initial Compliance Test <sup>c</sup> and AOR	201A or 202
SO <sub>2</sub>	4.86 lb/hr; 21.3 TPY (gas)	Annual Compliance Test <sup>c</sup>	Fuel Analysis
	99.7 lb/hr; 15 TPY (oil)	Initial Compliance Test <sup>c</sup>	Fuel Analysis
H <sub>2</sub> SO <sub>4</sub>	5.95x10 <sup>-1</sup> lb/hr; 26 TPY (gas)	Annual Compliance Test <sup>c</sup>	Fuel Analysis
	1.22 lb/hr; 0.183 TPY (oil)	Initial Compliance Test <sup>c</sup>	Fuel Analysis

Note: Initial testing for Hg, and Be when oil is fired is requested to be deleted from permit per FDEP May 19, 1995 guidance (DARM-PER/GEN-18)

<sup>a</sup> The above emission limits are based on baseload conditions @ 27°F.

<sup>b</sup> The NO<sub>x</sub> maximum limit will be lowered to 97.2 lb/hr (equivalent to 15 ppmv @ 15% O<sub>2</sub> ) on 12/31/98 using appropriate combustion improvements or SCR.

<sup>c</sup> Baseload conditions.

**G. EMISSIONS UNIT POLLUTANTS  
(Regulated and Unregulated Emissions Units)**

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX	024	065	EL
SO2			EL
CO			EL
PM10			EL
VOC			EL
SAM			NS

**H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION**  
**(Regulated Emissions Units Only - Emissions Limited Pollutants Only)**

**Pollutant Detail Information:**

1. Pollutant Emitted: <b>NOX</b>	
2. Total Percent Efficiency of Control:	<b>90 %</b>
3. Potential Emissions:	<b>161.9 lb/hour                      709.1 tons/year</b>
4. Synthetically Limited? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
5. Range of Estimated Fugitive/Other Emissions: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3    _____ to _____ tons/yr	
6. Emission Factor: <b>161.9 lb/hr</b>  Reference: <b>See Comment</b>	
7. Emissions Method Code:  <input checked="" type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5	
8. Calculation of Emissions (limit to 600 characters):  <b>Potential-to-emit authorized by FDEP permit AC53-214903/ 1050223-003-AC/PSD-FL-190, as amended (equivalent to 25 ppmvd @ 15% O2).</b>	
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):  <b>Emission Factor Ref.: AC53-214903/1050223-AC/PSD-FL-190 as amended. Potential Emissions based on oil (lb/hr) &amp; gas (annual) firing. Maximum lb/hr when firing fuel oil is 326 lb/hr &amp; 48.9 TPY.</b>	

Emissions Unit Information Section 1 of 3  
**Allowable Emissions (Pollutant identified on front page)**

A.

1. Basis for Allowable Emissions Code: <b>OTHER</b>		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units: <b>161.9 lb/hr*</b>		
4. Equivalent Allowable Emissions:	<b>161.9 lb/hour</b>	<b>709.1 tons/year</b>
5. Method of Compliance (limit to 60 characters): <b>Annual Compliance Test, EPA Method 20 Annual Fuel Usage- AFU</b>		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): <b>*709.1 TPY (equivalent to 25 ppmvd @ 15% O2). Natural gas firing (refer to FDEP Permit AC53-214903 and 1050223-003-AC)</b>		

B.

1. Basis for Allowable Emissions Code: <b>OTHER</b>		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units: <b>326 lb/hr*</b>		
4. Equivalent Allowable Emissions:	<b>326 lb/hour</b>	<b>48.9 tons/year</b>
5. Method of Compliance (limit to 60 characters): <b>Initial Compliance Test</b>		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): <b>*48.9 TPY (42 ppmvd @ 15% O2) Distillate Fuel-Oil firing which the EU is capable of accommodating. Annual tons/year based on 300 hours/year operation.</b>		

Emissions Unit Information Section 1 of 3  
**Allowable Emissions (Pollutant identified on front page)**

A.

1. Basis for Allowable Emissions Code: <b>OTHER</b>		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units: <b>97.2 lb/hr*</b>		
4. Equivalent Allowable Emissions:	<b>97.2 lb/hour</b>	<b>425.7 tons/year</b>
5. Method of Compliance (limit to 60 characters): <b>Annual Compliance Test, EPA Method 20; Annual Fuel Usage</b>		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):  <b>*425.7 TPY (equivalent to 15 ppmvd @ 15% O2) FDEP Permit AC53-214903/1050223-003-AC/PSD190. Compliance on or before 12/31/98.</b>		

B.

1. Basis for Allowable Emissions Code: <b>RULE</b>		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hour	tons/year
5. Method of Compliance (limit to 60 characters): <b>Quarterly Report</b>		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):  <b>Excess Emissions allowed by Rule 62-210.700(1) for startup, shutdown and malfunction up to 2 hrs/24 hrs.</b>		

**ATTACHMENT TB-EU1-L3**

**DETAILED DESCRIPTION OF CONTROL EQUIPMENT**

**ATTACHMENT TB-EU1-L3  
DETAILED DESCRIPTION OF CONTROL EQUIPMENT**

The General Electric (GE) PG 7221 FA uses dry low-NO<sub>x</sub> combustion to control NO<sub>x</sub> emissions resulting from the combustion of natural gas. The control of NO<sub>x</sub> is accomplished by reducing the flame temperatures through the use of staged combustion techniques. At lower loads, the combustors operate in a diffusion mode with lean mixtures of air and gas. At higher loads, the combustors operate in a premix mode where gas and air are mixed prior to combustion. When fuel oil is fired, NO<sub>x</sub> emissions are controlled by water injection. Although not yet operated with oil firing, the water to fuel ratio for this machine is 1.2 at 72°F, based on data provided in the original air construction application. The control systems for the machine when firing natural gas and oil are internal to GE's digital control systems (DCS).

To achieve the NO<sub>x</sub> emissions of 97.2 lb/hr (equivalent to 15% O<sub>2</sub>), selective catalytic reduction (SCR) may be used. SCR reduces NO<sub>x</sub> emissions by injection of ammonia into turbine exhaust flow upstream of a catalyst operating in temperatures ranging from 600 to 750°F. The ammonia reacts with NO<sub>x</sub> to form nitrogen and water. In a combined cycle plant this temperature range is achieved within the heat recovery steam generator (HRSG). During the construction of the HRSG and as required by Specific Condition 15a of the original FDEP construction permit, a module was added to the HRSG to install SCR if required to meet the lower NO<sub>x</sub> limit. At this time the SCR vendor has not been determined from a bidding process. A representative design used in budgetary estimates is included with this attachment.



MESSRS. SARGENT & LUDY  
TECHNICAL SPECIFICATION  
OF  
DRY SELECTIVE CATALYTIC NOx REMOVAL SYSTEM  
FOR  
TIGER BAY/POLK COUNTY

SPEC. NO. LAK1C80

Jan. 29, 1996



mitsubishi heavy industries, ltd.

501-13

§ 1. GENERAL DESCRIPTION

This specification covers the design specification and scope of supply for MITSUBISHI Dry Selective NOx Removal system(s).

1. NOx Removal Performance

Offered SCR system is designed to achieve the performance described in section 2 "TECHNICAL SPECIFICATION" and/or performance requirements of Buyer's data sheets as attached except where stated otherwise in this specification.

2. Scope of Supply

Any item which is not shown in this specification means Mitsubishi's Out of Scope.

## S 2 TECHNICAL SPECIFICATION

## 1. SCR SYSTEM SPECIFICATION

- Type of Catalyst : HOMOGENEOUS HONEYCOMB TYPE
- Nos. of SCR System : 1
- Flue Gas Source : CTG/GE 7F
- Main Fuel Considered for SCR Design : NG
- Supplementary Firing : N/A
- Fuel of Supplementary Firing :

## 2. REACTOR INLET FLUE GAS CONDITION

- Performance Case : 1
- Flue Gas Flow Rate (Lb/Hr) : 3264000
- Flue Gas Temperature Low (°F) : 630
- Flue Gas Temperature High (°F) : 630
- Flue Gas Main Component (VOL%)
- N<sub>2</sub> : 73.74
- O<sub>2</sub> : 12.52
- H<sub>2</sub>O : 2.14999
- CO<sub>2</sub> : 3.71
- Ar : .88

- Other Flue Gas Component
- Particulate (Lb/Hr) : 0
- SO<sub>2</sub> (ppmvd, @ 15%O<sub>2</sub>) : 0
- SO<sub>3</sub> (ppmvd, @ 15%O<sub>2</sub>) : 0
- NO<sub>x</sub> (ppmvd, @ 15%O<sub>2</sub>) : 25

## 3. SCR PERFORMANCE DATA

( items marked  show warranty values )

- Catalyst life (Years) :  3
- NO<sub>x</sub> Removal Performance
- NO<sub>x</sub> Removal Efficiency (%) :  40
- SCR Outlet NO<sub>x</sub> (ppmvd, @ 15%O<sub>2</sub>) :  15
- Slip NH<sub>3</sub> (ppmvd, @ 15%O<sub>2</sub>) :  10
- Gas Side Pressure Drop (Inches WC) :  2 ← 2" DP

## 4. PREDICTED OTHER DATA

- Ammonia Consumption (Lb/Hr) : 171.2
- ( 25 % AQUEOUS AMMONIA)

## 5. LIMITATION ON OPERATION

- Heat Resistance Temperature of Catalyst (°F) - 750
- Minimum Temperature to Inject Ammonia (°F) - 530

## 6. OVERALL HOUSING DIMENSION

- Interface Dimensions at Reactor Inlet and/or Outlet  
(Housing or Duct Internal Dimension)  
 $W \times H = 27'-4 \frac{1}{4}'' \times 65'-7 \frac{1}{4}''$
- Gas Pass Dimensions of Boiler Side at Upstream of Reactor (ASSUMED)  
 $W \times H = 27'-4 \frac{1}{4}'' \times 56'-9''$

## Reactor Internal Dimensions

$$W \times H \times L = 26'-5'' \times 55'-9'' \times \overline{6'-9\frac{7}{8}''}$$

NOTE 1. Items Marked "\*" show(s) MHI's assumption value(s).  
Please let us know these data immediately to design properly.

2. There shall be no warranty owing to any causes or circumstances beyond control of this system including improper plant operation over this specification, or fly of abnormal flammable, fragmental insulation or rust from upstream equipments.
3. Initial loading of catalyst modules shall be conducted after complete starting-up adjustment of plant.
4. Minimum temperature to inject ammonia is defined by SO<sub>3</sub> concentration which is shown above.

## 5. Materials

- Catalyst Module Frame	Carbon Steel
- SCR Housing	
Casing & Structure	Carbon Steel
Inner Liner	12GA Carbon Steel
Insulation/Mineral Wool	3" t
Insulation/Ceramic Fiber	0" t
- AIG	Carbon Steel
- Ammonia Injection System	Carbon Steel

## 6. Shipping Condition

Module size for SCR Housing should be decided the largest one under following Transportation Limit.  
Maximum Legal Load with permits not Regarding Escorts.  
12'-0" wide × 15'-0" overall height.

7. NO<sub>2</sub> in NO<sub>x</sub>  
NO<sub>2</sub>/NO<sub>x</sub> ratio at SCR inlet shall be less than 50%.

## 5.3. SCOPE OF SUPPLY

## SCOPE OF SUPPLY SHEET (1/3)

ITEM	BY MHI		BY OTHERS	OUT OF SCOPE
	BASE	OPTION		
<b>1. DESIGN</b>				
1.1 BASIC DESIGN	<input type="radio"/>			
1.2 DETAIL DESIGN FOR CATALYST MODULE	<input type="radio"/>			
1.3 DETAIL DESIGN FOR SCR HOUSING	<input type="radio"/>			
1.4 DETAIL DESIGN FOR NH3 INJECTION SYSTEM	<input type="radio"/>			
1.5 CONTROL LOGIC	<input type="radio"/>			
1.6 INSTRUCTION MANUAL (10 SETS)	<input type="radio"/>			
1.7 PE STAMP			<input type="radio"/>	
<b>2. CATALYST</b>				
2.1 CATALYST MODULES (TO BE INITIALLY INSTALLED)	<input type="radio"/>			
2.2 FUTURE CATALYST MODULES				<input type="radio"/>
<b>3. SCR HOUSING</b>				
3.1 SCR HOUSING w/INTERNAL INSULATIONS (INCLUDE SUPPORTS STRUCTURES FOR CATALYST MODULES & SCR HOUSING)	<input type="radio"/>			
3.2 INLET & OUTLET TRANSITIONS w/INTERNAL INSULATIONS	<input type="radio"/>			
3.3 AIG SUPPORT DUCT			<input type="radio"/>	
3.4 SPACE FOR FUTURE CATALYST MODULES				<input type="radio"/>
3.5 HOIST & MONORAIL w/SUPPORT STRUCTURES		<input type="radio"/>		
3.6 INTERNAL PLATFORM w/LADDERS				<input type="radio"/>
3.7 EXTERNAL PLATFORM FOR CATALYST LOADING HATCH			<input type="radio"/>	
3.8 ACCESS DOORS (2 SETS)	<input type="radio"/>			
3.9 INSTRUMENT OR SAMPLING TAPS (10 SETS)	<input type="radio"/>			
3.10 SLIDE PLATES FOR FOUNDATION			<input type="radio"/>	
3.11 FOUNDATION BOLTS			<input type="radio"/>	
3.12 THERMOCOUPLE (0 SETS)			<input type="radio"/>	
3.13 DIFFERENTIAL PRESSURE INDICATOR (0 SETS)				<input type="radio"/>
3.14 DRAINAGE (2 SETS)	<input type="radio"/>			
3.15 EXPANSION JOINT			<input type="radio"/>	
<b>4. AMMONIA INJECTION GRID (AIG)</b>				
4.1 AIG PIPES w/INJECTION NOZZLES	<input type="radio"/>			
<b>5. AMMONIA ADJUSTMENT HEADER (2 SETS)</b>				
5.1 HEADER w/CONNECTING PIPES	<input type="radio"/>			
5.2 FLOW CONTROL DAMPERS (MANUAL)	<input type="radio"/>			
5.3 FLOW ORIFICES	<input type="radio"/>			
5.4 MANOMETERS w/ISOLATION VALVES	<input type="radio"/>			
5.5 PRESSURE INDICATOR	<input type="radio"/>			
5.6 TEMPERATURE INDICATOR	<input type="radio"/>			
5.7 THERMOCOUPLE	<input type="radio"/>			
5.8 DRAIN VALVE	<input type="radio"/>			
5.9 INSULATION			<input type="radio"/>	
5.10 SUPPORT LEGS				<input type="radio"/>

## SCOPE OF SUPPLY SHEET (2/3)

ITEM	BY MBI		BY OTHERS	OUT OF SCOPE
	BASE	OPTION		
<b>6. AQUEOUS AMMONIA FLOW CONTROL SKID (ELECTRIC AIR HEATER TYPE)</b>				
6.1 DILUTION AIR FANS w/MOTORS, FILTERS & SILENCERS (100% CAPACITY x 2 SETS)	<input type="radio"/>			
6.2 DILUTION AIR PIPING DAMPERS	<input type="radio"/>			
6.3 DILUTION AIR FLOW ORIFICE & TRANSMITTER	<input type="radio"/>			
6.4 ELECTRIC AIR HEATER w/HEATER CONTROL PANEL	<input type="radio"/>			
6.5 AMMONIA VAPORIZER w/AIR ATOMIZING NOZZLE	<input type="radio"/>			
6.6 AQUEOUS AMMONIA PIPING & VALVES	<input type="radio"/>			
6.7 AQUEOUS AMMONIA FLOW ORIFICE & TRANSMITTER	<input type="radio"/>			
6.8 AQUEOUS AMMONIA FLOW CONTROL VALVE	<input type="radio"/>			
6.9 AQUEOUS AMMONIA FLOW SHUT-OFF VALVE	<input type="radio"/>			
6.10 AQUEOUS AMMONIA STRAINER	<input type="radio"/>			
6.11 ATOMIZING AIR PIPING & VALVES	<input type="radio"/>			
6.12 ATOMIZING AIR FLOW SHUT-OFF VALVE	<input type="radio"/>			
6.13 ATOMIZING AIR PRESSURE CONTROL VALVE	<input type="radio"/>			
6.14 ATOMIZING AIR PRESSURE LOW SWITCH	<input type="radio"/>			
6.15 ATOMIZING AIR FILTER	<input type="radio"/>			
6.16 INSTRUMENT AIR PIPING & VALVES	<input type="radio"/>			
6.17 JUNCTION BOX	<input type="radio"/>			
6.18 INSULATIONS	<input type="radio"/>			
<b>7. AQUEOUS AMMONIA STORAGE FACILITY</b>				
7.1 AQUEOUS AMMONIA STORAGE TANK (10,000 Gallon)		<input type="radio"/>		
7.2 AQUEOUS AMMONIA PUMP SKID		<input type="radio"/>		
<b>8. EXTERNAL PIPE</b>				
8.1 DILUTED NH3 PIPING w/EXPANSION JOINT (SKID - HEADER) 50ft		<input type="radio"/>		
8.2 SUPPORTS FOR DILUTED NH3 PIPING		<input type="radio"/>		
8.3 INSULATIONS FOR DILUTED NH3 PIPING			<input type="radio"/>	
8.4 AMMONIA DISTRIBUTION PIPING w/EXPANSION JOINTS (HEADER - AIG) 400ft		<input type="radio"/>		
8.5 SUPPORTS FOR AMMONIA DISTRIBUTION PIPING		<input type="radio"/>		
8.6 INSULATIONS FOR AMMONIA DISTRIBUTION PIPING			<input type="radio"/>	
8.7 AQUEOUS AMMONIA PIPING (PUMP - SKID)			<input type="radio"/>	
8.8 SUPPORTS FOR AQUEOUS AMMONIA PIPING			<input type="radio"/>	
<b>9. CONTROL &amp; ELECTRICAL SYSTEM</b>				
9.1 MOTOR CONTROL CENTER			<input type="radio"/>	
9.2 POWER SUPPLY OF ELECTRICAL EQUIPMENT			<input type="radio"/>	

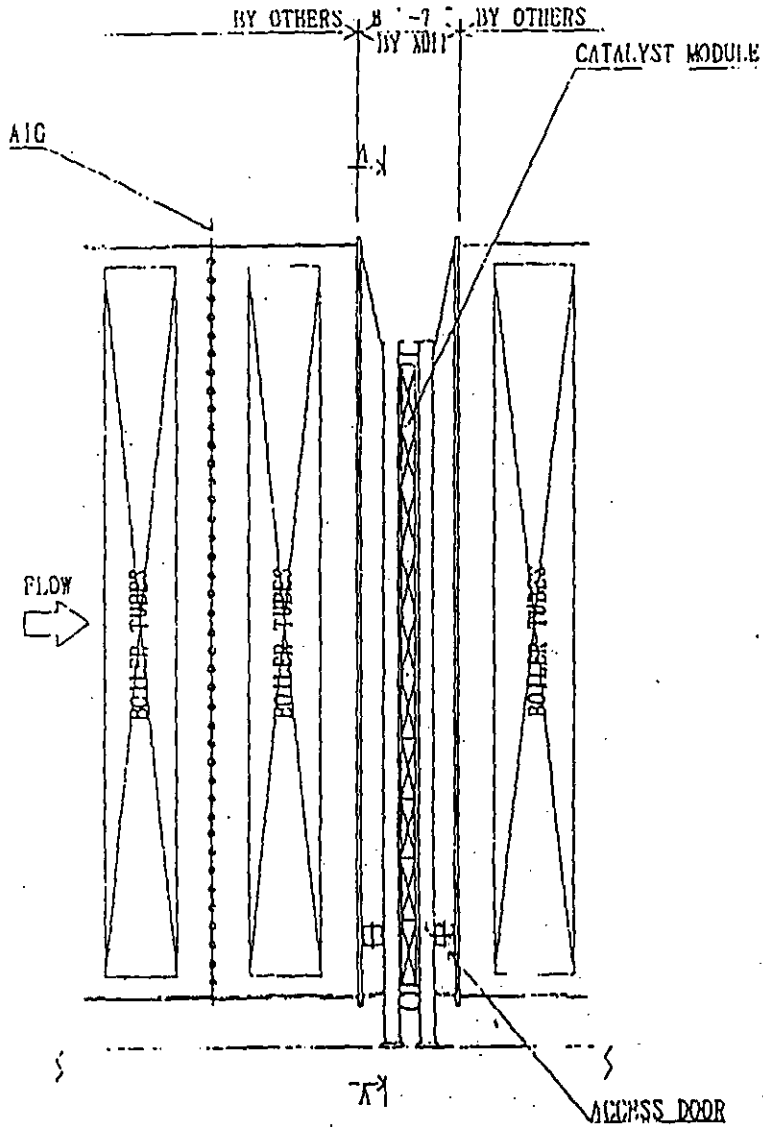
## SCOPE OF SUPPLY SHEET (3/3)

ITEM	BY MH1		BY OTHERS	OUT OF SCOPE
	BASE	OPTION		
<b>10. SCR INLET NOx/O2 ANALYZER</b>				
10.1 ANALYZER (NDIR TYPE)		<input type="radio"/>		
10.2 HEATED SAMPLING LINE (LENGTH: 80 FEET)		<input type="radio"/>		
10.3 CEM SYSTEM			<input type="radio"/>	
<b>11. SCR OUTLET NOx/NH3 ANALYZER</b>				
11.1 ANALYZER w/PROBE			<input type="radio"/>	
11.2 HEATED SAMPLING LINE (LENGTH: FEET)			<input type="radio"/>	
11.3 CEM SYSTEM			<input type="radio"/>	
<b>12. SURFACE PREPARATION (ACCORDING TO SSPC - SF6)</b>				
12.1 SCR HOUSING (OUTSIDE OF OUTER CASING ONLY)	<input type="radio"/>			
12.2 AIG PIPES	<input type="radio"/>			
12.3 AMMONIA ADJUSTMENT HEADER	<input type="radio"/>			
12.4 AMMONIA FLOW CONTROL SKID	<input type="radio"/>			
12.5 EXTERNAL PIPES			<input type="radio"/>	
<b>13. PRIMER</b>				
13.1 SCR HOUSING (OUTSIDE OF OUTER CASING ONLY)	<input type="radio"/>			<input type="radio"/>
13.2 AIG PIPES				
13.3 AMMONIA ADJUSTMENT HEADER	<input type="radio"/>			
13.4 AMMONIA FLOW CONTROL SKID	<input type="radio"/>			
13.5 EXTERNAL PIPES			<input type="radio"/>	
<b>14. FINISH PAINTING</b>				
14.1 SCR HOUSING (OUTSIDE OF OUTER CASING ONLY)			<input type="radio"/>	
14.2 AIG PIPES				<input type="radio"/>
14.3 AMMONIA ADJUSTMENT HEADER			<input type="radio"/>	
14.4 AMMONIA FLOW CONTROL SKID			<input type="radio"/>	
14.5 EXTERNAL PIPES			<input type="radio"/>	
<b>15. FIELD WORK</b>				
15.1 FOUNDATIONS			<input type="radio"/>	
15.2 ERECTION			<input type="radio"/>	
15.3 SETTING CATALYST MODULES			<input type="radio"/>	
15.4 START-UP SCR SYSTEM			<input type="radio"/>	
15.5 PERFORMANCE TEST			<input type="radio"/>	
15.6 FIELD PAINT & TOUCH-UP PAINTING			<input type="radio"/>	
<b>16. SUPERVISORY SERVICE</b>				
16.1 ERECTION		<input type="radio"/>		
16.2 SETTING CATALYST MODULES		<input type="radio"/>		
16.3 START-UP SCR SYSTEM		<input type="radio"/>		
16.4 PERFORMANCE TEST		<input type="radio"/>		

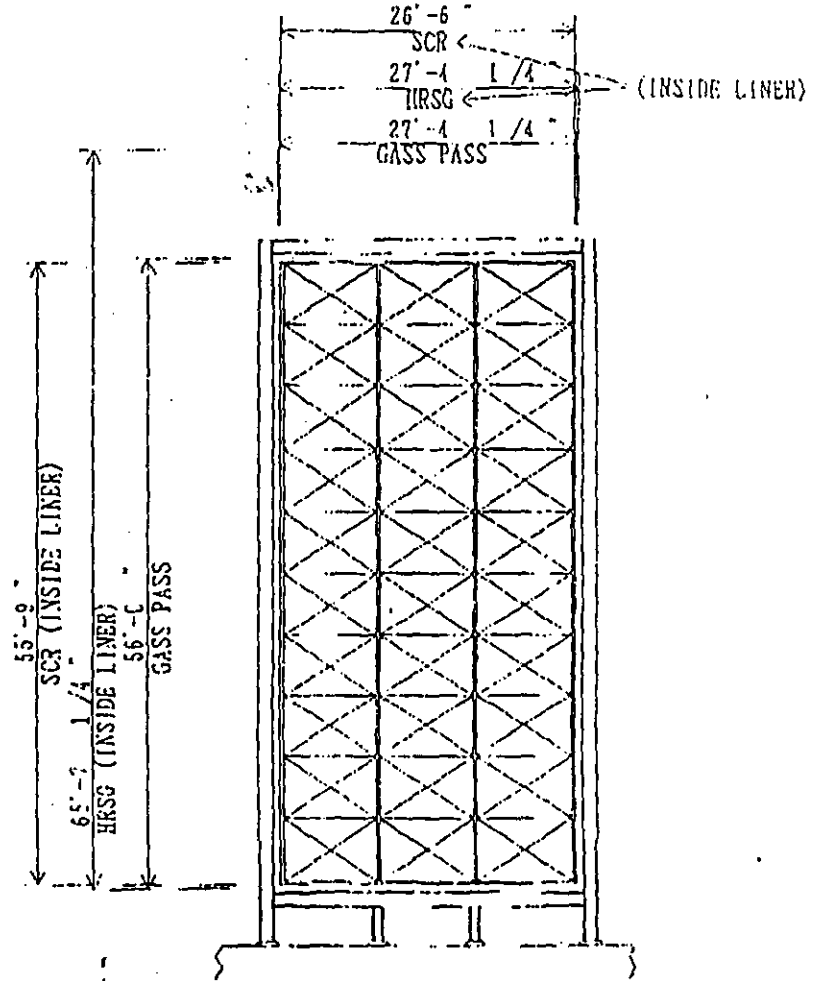
## § 3 ATTACHMENT

1. P & I DIAGRAM FOR SCR SYSTEM  
(STANDARD DRAWING)
2. SUPPLEMENTARY P & I DIAGRAM
3. GENERAL VIEW OF REACTOR
4. SPECIFIED PERFORMANCE SHEET(S)
5. DATA SHEET(S)
6. EXCEPTION & CLARIFICATION



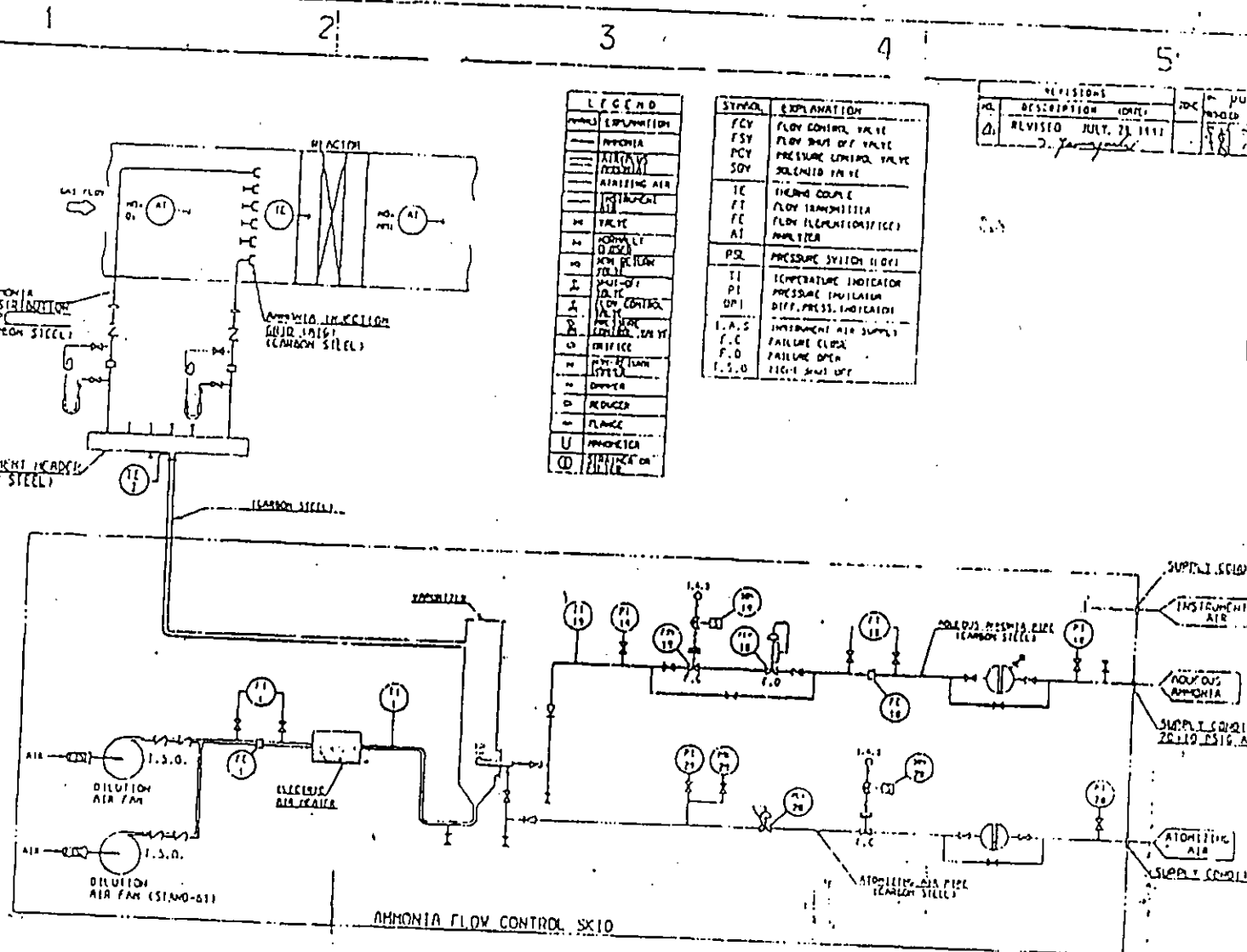


SIDE VIEW



SECTION A-A

GENERAL VIEW OF SCR HOUSING  
 1.A10800



LEGEND	
[Symbol]	EXPLANATION
[Symbol]	AMMONIA
[Symbol]	ATOMIZING AIR
[Symbol]	INSTRUMENT AIR
[Symbol]	TANK
[Symbol]	FLANGE
[Symbol]	REDUCER
[Symbol]	PLUG
[Symbol]	VALVE
[Symbol]	ORIFICE
[Symbol]	PIPE
[Symbol]	WELD
[Symbol]	FLANGE
[Symbol]	ORIFICE
[Symbol]	PIPE
[Symbol]	WELD

SYMBOL	EXPLANATION
FCV	FLOW CONTROL VALVE
FSV	FLOW STOP OFF VALVE
PCV	PRESSURE LIMITED VALVE
SOV	SOLENOID VALVE
TC	TEMP. COUPLER
FT	FLOW TRANSMITTER
FE	FLOW ELECTRIFICATION
AI	ANALYZER
PSI	PRESSURE SWITCH (NOV)
TI	TEMPERATURE INDICATOR
PI	PRESSURE INDICATOR
OPI	DIFF. PRESS. INDICATOR
I.A.S	INSTRUMENT AIR SUPPLY
F.C	FAILURE CLASP
F.D	FAILURE OPEN
F.S.O	100% SHUT OFF

REVISIONS		PLAN RECORD	
NO.	DESCRIPTION	DATE	BY
1	REVISED	JULY 23 1968	[Signature]
ISO THERM SEALTY DESIGN		7100 0000 00	

**NOTES**

1. PIPE SIZE: SCH 80  
 2" OR LGS  
 80

NOTE: IN ALL STANDARDS CONCERNING THIS SCOPE OF WORK PLEASE REFER TO SECTIONS OF SEPARATE SYSTEMS.

NO. TEST REF.	No. 2 LAND BOILER DESIGNING SECTION	STANDARD DRAWING	
AT SITE	DATE: 7/27/68	P & I DIAGRAM FOR SCR SYSTEM (AMMONIA ELECTRIC HEATER TYPE)	
EXPLORED	DRAWN BY: [Signature]	SCALE: 1/4" = 1'-0"	
OPEN	CHECKED BY: [Signature]	SCALE: (SEE)	
		N59-0004	