

One Energy Place  
Pensacola, Florida 32520

Tel 850.444.6111



Certified Mail

January 18, 2005

Jonathan Holtom  
Florida Department of Environmental Protection  
Division of Air Resources Management  
2600 Blair Stone Road  
Mail Station #5510  
Tallahassee, Florida 32399-2400

RECEIVED

JAN 25 2005

BUREAU OF AIR REGULATION

Dear Mr. Holtom:

RE: CRIST ELECTRIC GENERATING PLANT  
CONSTRUCTION PERMIT APPLICATION  
SNCR, Cooling Tower Replacement, Biomass, Mercury Test Center  
Permit No: 0330045-009-AV

Please find enclosed Gulf Power's application for construction permit for several projects currently in planning at the Crist Electric Generating Plant located in Pensacola, Florida. Included in the application are the required certifications by the Responsible Official and Professional Engineer registered in Florida.

As you may be aware, Gulf Power's schedule to begin construction on these projects is critical pursuant to damages sustained by Hurricane Ivan and due to engineering & design delays due to the hurricane's impact on planning. Please advise Gulf Power as soon as possible any delay to the construction schedules due to permitting processes.

We appreciate your efforts to work with us regarding the startup of these emission control and research control systems. Please call me regarding any additional questions or concerns.

Sincerely,

G. Dwain Waters, Q.E.P.  
Air Quality Programs Supervisor

cc: w/att: Trina Vielhauer, FDEP – Tallahassee Office  
Jim Vick, Gulf Power Company  
Wright, Terry, Gulf Power Company  
John Dominey, Gulf Power Company  
Ms. Sandra Veazey, FDEP Northwest District Office, Pensacola, Florida  
Mr. Richard Fancher, FDEP Northwest District Office, Pensacola, Florida



# Department of Environmental Protection

## Division of Air Resource Management

### APPLICATION FOR AIR PERMIT - LONG FORM

#### I. APPLICATION INFORMATION

**Air Construction Permit** – Use this form to apply for an air construction permit for a proposed project:

- subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or
- where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or
- at an existing federally enforceable state air operation permit (FESOP) or Title V permitted facility.

**Air Operation Permit** – Use this form to apply for:

- an initial federally enforceable state air operation permit (FESOP); or
- an initial/revised/renewal Title V air operation permit.

**Air Construction Permit & Revised/Renewal Title V Air Operation Permit (Concurrent Processing Option)**  
– Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

#### Identification of Facility

1. Facility Owner/Company Name: Gulf Power Company	
2. Site Name: Crist Electric Generating Plant	
3. Facility Identification Number: 0330045	
4. Facility Location...: Street Address or Other Locator: Pate Road (Off of 10 Mile Road) City: Pensacola                      County: Escambia                      Zip Code: 32520-0340	
5. Relocatable Facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. Existing Title V Permitted Facility? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

#### Application Contact

1. Application Contact Name: G. Dwain Waters	
2. Application Contact Mailing Address... Organization/Firm: Gulf Power Company Street Address: One Energy Place City: Pensacola                      State: Florida                      Zip Code: 32520-0328	
3. Application Contact Telephone Numbers... Telephone: (850) 444-6527                      ext.                      Fax: (850) 444-6217	
4. Application Contact Email Address: gdwaters@southernco.com	

#### Application Processing Information (DEP Use)

1. Date of Receipt of Application:	1-25-05
2. Project Number(s):	0330045-011-AC, 0330045-012-AC
3. PSD Number (if applicable):	

**APPLICATION INFORMATION**

4. Siting Number (if applicable):	
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## APPLICATION INFORMATION

### Purpose of Application

**This application for air permit is submitted to obtain: (Check one)**

#### **Air Construction Permit**

Air construction permit.

#### **Air Operation Permit**

Initial Title V air operation permit.

Title V air operation permit revision.

Title V air operation permit renewal.

Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

#### **Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)**

Air construction permit and Title V permit revision, incorporating the proposed project.

Air construction permit and Title V permit renewal, incorporating the proposed project.

**Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:**

I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

### Application Comment

The purpose of this application is to request a construction permit for several projects at Plant Crist located in Pensacola, Florida. These projects include: 1) Construction of a Selective Non-Catalytic Reduction (SNCR) System on Crist Unit 6 to support the facility wide NOx emission limitation as outlined under the Gulf-FDEP Ozone Reduction Agreement. 2) Re-construction of the damaged Unit 6 cooling tower from Hurricane Ivan. 3) Continuation of the previously issued biomass use permit for Units 4 and 5 and incorporation of long term use of biomass fuel in the Title V permit. 4) Construction of a Mercury Test Center on Unit 5.



# APPLICATION INFORMATION

## Owner/Authorized Representative Statement

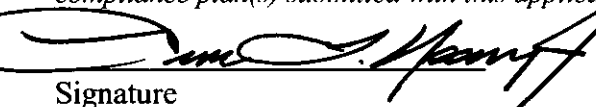
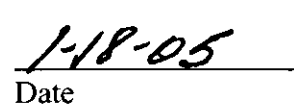
**Complete if applying for an air construction permit or an initial FESOP.**

1. Owner/Authorized Representative Name :
2. Owner/Authorized Representative Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Owner/Authorized Representative Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
4. Owner/Authorized Representative Email Address:
5. Owner/Authorized Representative Statement:  <i>I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. 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 and all other requirements identified in this application to which the facility is subject. 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 the facility or any permitted emissions unit.</i>  _____ Signature  _____ Date

# APPLICATION INFORMATION

## Application Responsible Official Certification

Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name: Gene L. Ussery, Jr.
2. Application Responsible Official Qualification (Check one or more of the following options, as applicable): <input checked="" type="checkbox"/> For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C. <input type="checkbox"/> For a partnership or sole proprietorship, a general partner or the proprietor, respectively. <input type="checkbox"/> For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official. <input type="checkbox"/> The designated representative at an Acid Rain source.
3. Application Responsible Official Mailing Address... Organization/Firm: Gulf Power Company Street Address: One Energy Place City: Pensacola State: FL Zip Code: 32520-0100
4. Application Responsible Official Telephone Numbers... Telephone: (850) 444-6383 ext. Fax: (850) 444-6744
5. Application Responsible Official Email Address: GLUSSERY@southernco.com
6. Application Responsible Official Certification: <i>I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. 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 and all other applicable requirements identified in this application to which the Title V source is subject. 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 the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.</i>  Signature  Date

# APPLICATION INFORMATION

## Professional Engineer Certification

1. Professional Engineer Name: Gregory N. Terry Registration Number: 52786
2. Professional Engineer Mailing Address... Organization/Firm: Gulf Power Company Street Address: One Energy Place City: Pensacola State: FL Zip Code: 32520-0340
3. Professional Engineer Telephone Numbers... Telephone: (850) 429-2381 ext. Fax: (850) 429-2246
4. Professional Engineer Email Address: GNTERRY@southernco.com
5. Professional Engineer Statement: <i>I, the undersigned, hereby certify, except as particularly noted herein*, that:</i> <i>(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</i> <i>(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.</i> <i>(3) If the purpose of this application is to obtain a Title V air operation permit (check here <input type="checkbox"/>, 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 plan and schedule is submitted with this application.</i> <i>(4) If the purpose of this application is to obtain an air construction permit (check here <input checked="" type="checkbox"/>, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here <input type="checkbox"/>, 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.</i> <i>(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here <input type="checkbox"/>, 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.</i>  Signature <u>Gregory N. Terry</u> Date <u>1-14-2005</u>  (seal)

\* Attach any exception to certification statement.



## II. FACILITY INFORMATION

### A. GENERAL FACILITY INFORMATION

#### Facility Location and Type

1. Facility UTM Coordinates... Zone 16      East (km)    478.27 North (km) 3381.36		2. Facility Latitude/Longitude... Latitude (DD/MM/SS)    30 33 58 Longitude (DD/MM/SS) 87 13 44	
3. Governmental Facility Code: 0	4. Facility Status Code: A	5. Facility Major Group SIC Code: 49	6. Facility SIC(s): 4911
7. Facility Comment :			

#### Facility Contact

1. Facility Contact Name: G. Dwain Waters
2. Facility Contact Mailing Address... Organization/Firm: Gulf Power Company Street Address: One Energy Place <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <span>City: Pensacola</span> <span>State: FL</span> <span>Zip Code: 32520-0329</span> </div>
3. Facility Contact Telephone Numbers: Telephone: (850) 444-6527      ext.      Fax: (850) 444-6217
4. Facility Contact Email Address: <a href="mailto:gdwaters@southernco.com">gdwaters@southernco.com</a>

#### Facility Primary Responsible Official

**Complete if an "application responsible official" is identified in Section I. that is not the facility "primary responsible official."**

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <span>City:</span> <span>State:</span> <span>Zip Code:</span> </div>
3. Facility Primary Responsible Official Telephone Numbers... Telephone: (    )      -      ext.      Fax: (    )      -
4. Facility Primary Responsible Official Email Address:

## FACILITY INFORMATION

### Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a “major source” and a “synthetic minor source.”

1.	<input type="checkbox"/> Small Business Stationary Source	<input type="checkbox"/> Unknown
2.	<input type="checkbox"/> Synthetic Non-Title V Source	
3.	<input checked="" type="checkbox"/> Title V Source	
4.	<input checked="" type="checkbox"/> Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5.	<input type="checkbox"/> Synthetic Minor Source of Air Pollutants, Other than HAPs	
6.	<input checked="" type="checkbox"/> Major Source of Hazardous Air Pollutants (HAPs)	
7.	<input type="checkbox"/> Synthetic Minor Source of HAPs	
8.	<input type="checkbox"/> One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9.	<input type="checkbox"/> One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10.	<input type="checkbox"/> One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11.	<input type="checkbox"/> Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12.	Facility Regulatory Classifications Comment:	

# FACILITY INFORMATION

## List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
No Change from previous Title V application		



**FACILITY INFORMATION**

**C. FACILITY ADDITIONAL INFORMATION**

**Additional Requirements for All Applications, Except as Otherwise Stated**

1. Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Previously Submitted, Date: <u>06/22/2004</u>
2. Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Previously Submitted, Date: <u>06/22/2004</u>
3. Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Previously Submitted, Date: <u>06/22/2004</u>

**Additional Requirements for Air Construction Permit Applications**

1. Area Map Showing Facility Location: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable (existing permitted facility)
2. Description of Proposed Construction or Modification: <input checked="" type="checkbox"/> Attached, Document ID: _____
3. Rule Applicability Analysis: <input type="checkbox"/> Attached, Document ID: _____
4. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable (no exempt units at facility)
5. Fugitive Emissions Identification (Rule 62-212.400(2), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
6. Preconstruction Air Quality Monitoring and Analysis (Rule 62-212.400(5)(f), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
7. Ambient Impact Analysis (Rule 62-212.400(5)(d), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
8. Air Quality Impact since 1977 (Rule 62-212.400(5)(h)5., F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
9. Additional Impact Analyses (Rules 62-212.400(5)(e)1. and 62-212.500(4)(e), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable



Crist Electric Generating Plant  
Unit 6 Cooling Tower Project

Due to damage sustained during Hurricane Ivan in September, 2004, Gulf Power has elected to re-build the Crist Unit 6 Cooling Tower. The structure will be re-constructed as a like kind replacement with the exception that the drift and evaluation percent of flow will be reduced from 2.4% to 2.1%. This change will slightly reduce volatile organic matter and particulate matter. Attached is a comparison of the new emission estimates for the Crist Unit 6 Cooling Tower and a replacement sheet for Plant Crist Emissions Unit #12 as previously submitted for Title V permitting.

## Cooling Tower Information

	Cr 1-5	Crist 6	Crist 7	Total
GPM Design		150960	165000	
Evaporation Loss Design		2.10%	3.10%	
Drift Loss Design		0.0005%	0.20%	
Max Cu Ft/sec Flow (EIA 767)	426	310	344	
GPM	191444.4	139314	154593.6	
Cu Ft/sec Consumption (Eia 767)	0	7.3	9.9	
GPM	0	3280.62	4449.06	
Note: Consumption is Makeup less Blowdown				
<b>Emission Calculations:</b>				
Based on Circulating Flow & Apparent Factor				
Flow (GPM)	191444.4	150960	165000	
Flow (Annual Gallons)	1.00623E+11	7.9345E+10	86724000000	
PM10 Tons (=0.019 lb/1000 gal/2000 lb/lb))	955.9	753.8	823.9	2,533.6
Based on Design Drift & Drift Factor				
Drift & Evaporation % of Flow	2.1%	2.1%	3.3%	
Drift & Evap (GPM)	4021.3	3170.9	5445.0	
Drift (Annual Gallons)	2113589825	1666632819	2861892000	
PM 10 Tons (=1.7 lb/1000 gal/(2000 lb/ton))	1796.6	1416.6	2432.6	5,645.8
Based on Estimated Drift & Drift Factor				
Drift & Evaporation % of Flow	2.0%	0.005%	2.0%	
Drift (GPM)	3828.9	7.5	3300.0	
Drift (Annual Gallons)	2012463533	3967228.8	1734480000	
PM 10 Tons (=1.7 lb/1000 gal/(2000 lb/ton))	1710.6	3.4	1474.3	3,188.3
Based on Consumption & Drift Factor				
Drift (GPM)	unknown	3280.62	4449.06	
Drift (Annual Gallons)		1724293872	2338425936	
PM 10 Tons (=1.7 lb/1000 gal/(2000 lb/ton))		1465.6	1987.7	3,453.3
<b>Maximum Annual PM10 Tons</b>				
	1796.6	1465.6	2432.6	5,694.8
Based on Design Drift & Drift Factor				
Drift (Annual Gallons)	2113589825	1666632819	2861892000	
VOC's Tons (=6.0 lb/10 <sup>6</sup> gallons/(2000 lb/ton))	6.34	5.00	8.59	19.93
Based on Estimated Drift & Drift Factor				
Drift (Annual Gallons)	2012463533	3967228.8	1734480000	
VOC's Tons (=6.0 lb/10 <sup>6</sup> gallons/(2000 lb/ton))	6.04	0.01	5.20	11.25
Based on Consumption & Drift Factor				
Drift (Annual Gallons)	0	1724293872	2338425936	
VOC's Tons (=6.0 lb/10 <sup>6</sup> gallons/(2000 lb/ton))	0.00	5.17	7.02	12.19
<b>Maximum Annual VOC Tons</b>				
	6.34	5.17	8.59	20.10



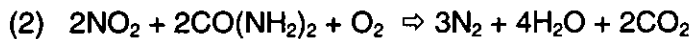
## Cooling Tower Information

	Old Crist 6	New Crist 6
GPM Design	150960	150960
Evaporation Loss Design	2.20%	2.10%
Drift Loss Design	0.20%	0.0005%
Max Cu Ft/sec Flow (EIA 767)	310	310
GPM	139314	139314
Cu Ft/sec Consumption (Eia 767)	7.3	7.3
GPM	3280.62	3280.62
Note: Consumption is Makeup less Blowdown		
<b>Emission Calculations:</b>		
Based on Circulating Flow & Apparent Factor		
Flow (GPM)	150960	150960
Flow (Annual Gallons)	7.9345E+10	79344576000
PM10 Tons (=0.019 lb/1000 gal/2000 lb/lb))	753.8	753.8
<b>Based on Design Drift &amp; Drift Factor</b>		
Drift & Evaporation % of Flow	2.4%	2.1005%
Drift & Evap (GPM)	3623.0	3170.9
Drift (Annual Gallons)	1904269824	1666632819
PM 10 Tons (=1.7 lb/1000 gal/(2000 lb/ton))	<b>1618.6</b>	<b>1416.6</b>
<b>Based on Estimated Drift &amp; Drift Factor</b>		
Drift & Evaporation % of Flow	2.0%	0.005%
Drift (GPM)	3019.2	7.5
Drift (Annual Gallons)	1586891520	3.967E+06
PM 10 Tons (=1.7 lb/1000 gal/(2000 lb/ton))	1348.9	3.4
<b>Based on Consumption &amp; Drift Factor</b>		
Drift (GPM)	3280.62	3280.62
Drift (Annual Gallons)	1724293872	1724293872
PM 10 Tons (=1.7 lb/1000 gal/(2000 lb/ton))	1465.6	1465.6
<b>Maximum Annual PM10 Tons</b>		
	<b>1618.6</b>	<b>1465.6</b>
<b>Based on Design Drift &amp; Drift Factor</b>		
Drift (Annual Gallons)	1904269824	1666632819
VOC's Tons (=6.0 lb/10 <sup>6</sup> gallons/(2000 lb/ton))	<b>5.71</b>	<b>5.00</b>
<b>Based on Estimated Drift &amp; Drift Factor</b>		
Drift (Annual Gallons)	1586891520	3967228.8
VOC's Tons (=6.0 lb/10 <sup>6</sup> gallons/(2000 lb/ton))	4.76	0.01
<b>Based on Consumption &amp; Drift Factor</b>		
Drift (Annual Gallons)	1724293872	1724293872
VOC's Tons (=6.0 lb/10 <sup>6</sup> gallons/(2000 lb/ton))	5.17	5.17
<b>Maximum Annual VOC Tons</b>		
	<b>5.71</b>	<b>5.17</b>

**Plant Crist, Unit 6  
Selective Non-Catalytic Reduction Retrofit  
System Description**

Gulf Power Company is making application to install selective non-catalytic reduction, or "SNCR," technology on the Plant Crist Unit 6 boiler. The SNCR systems will be designed to provide approximately 25% removal of nitrogen oxides (NO<sub>x</sub>) when operating.

SNCR is a post-combustion technology for reducing NO<sub>x</sub> emissions from flue gases by chemical conversion. This chemical reaction requires the injection of urea into the hot flue gas stream in the upper regions of the furnace to reduce the nitrogen oxides to nitrogen, water, and small quantities of carbon dioxide. The reduction is normally expressed by the following equations:



N<sub>2</sub>O is also a by-product of the SNCR process and is typically in the range of 10-20% of the NO<sub>x</sub> reduced. Small amounts of CO emissions can also be expected from the process. There are no other known organic emissions from the SNCR process beyond CO and CO<sub>2</sub>.

The SNCR process takes place in a temperature range between 1600°F to 2200°F, which normally occurs in the convective sections of the boiler. Urea is delivered and stored on-site at a concentration of ~40%. Prior to injection into the boiler, the urea is further diluted to a concentration somewhat less than 30%. Dilution is required to improve the mixing characteristics of the urea stream with the flue gas stream. The urea/water mixture is injected into the boiler via air atomizing wall lances.

The SNCR equipment to be installed at Crist Unit 6 is fabricated by Fuel Tech, Inc.

The SNCR system will be tuned to achieve the maximum level of NO<sub>x</sub> reduction while limiting average ammonia slip across the duct to 5 ppmvd corrected to 3% O<sub>2</sub> (24 hour basis). Ammonia slip can react with small quantities of sulfur trioxide (SO<sub>3</sub>) present in the flue gas to form ammonium bisulfate (NH<sub>4</sub>HSO<sub>4</sub>), which can foul and corrode downstream equipment (especially the air preheater).

The components of the SNCR system include a reagent unloading station, reagent storage tanks, reagent circulation module, reagent metering modules, reagent distribution modules, and air atomized injectors.

Below is a list of information previously requested by FDEP for the Crist Unit 6 SCR.

**1. SNCR System Design Information:**

	<b>Crist 6</b>
Heat Input, MBtu/hr	3704.8
Current NO <sub>x</sub> , lbs/MBtu	0.578
SNCR Inlet NO <sub>x</sub> , lbs/MBtu	0.35
SNCR Inlet NO <sub>x</sub> , lbs/hr	1296.68
NO <sub>x</sub> Emissions (SNCR Outlet), lbs/MBtu	0.28
NO <sub>x</sub> Emissions (SNCR Outlet), lbs/hr	1037.34
NH <sub>3</sub> slip, ppmvd @ 3% O <sub>2</sub>	5
SNCR Design NO <sub>x</sub> removal, %	25%
SNCR Guaranteed NO <sub>x</sub> removal, %	20%

## **2. Flow Diagram:**

See attachment flow diagram.

## **3. Narrative of the SNCR process:**

See introduction

## **4. Reagent Circulation and Distribution Loop:**

Urea is delivered and stored as a 40% aqueous solution that is maintained at a temperature of approximately 40° by circulating through the SNCR system piping loop and heating module. Using plant service water or other dilution water source, the metering module further dilutes the reagent to a predetermined concentration and precisely controls the flow of diluted reagent to distribution modules located near the boiler injection point. The distribution modules provide the final control of diluted reagent and atomizing/cooling (plant) air being delivered to each injector. The diluted reagent is injected into the boiler via wall-mounted air atomizing lances.

## **5. Plant Equipment Modifications:**

The only anticipated change to the Unit 6 boiler is an adaptation of the boiler tube panels to accommodate the installation of wall-mounted injection lances. The Unit 6 SNCR will be designed with 6 wall-mounted injectors.

## **6. Peak Urea Injection Rate:**

At peak load for Crist Unit 6, with 0.35 lbs./MBtu inlet NO<sub>x</sub> and 20% reduction, urea injection would be 741 lb/hr on a dry basis. This translates to an ammonia flow of 333.8 lb/hr.

## **7. Ammonia Tank Sizes:**

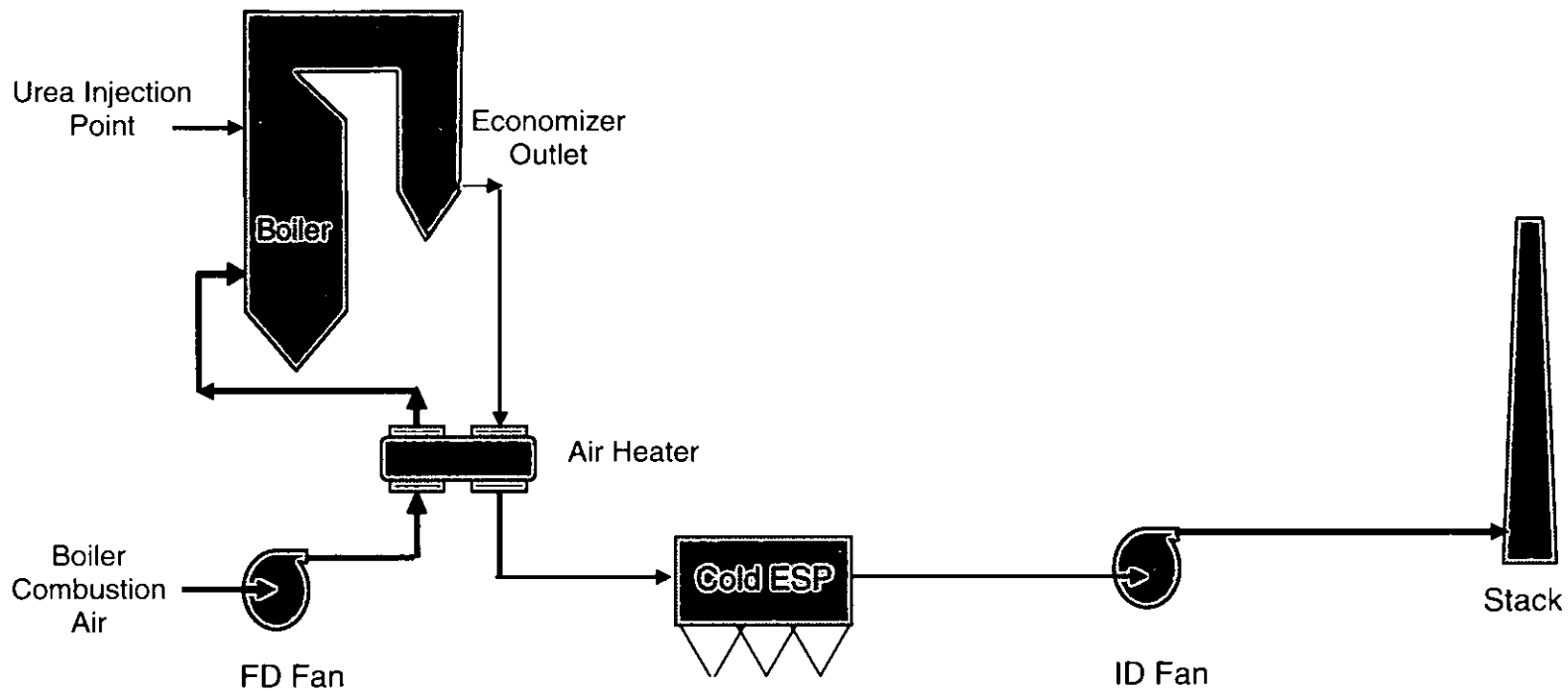
Liquid urea at a concentration of 40% will be stored in 1 tank with capacity to store 45,000 gallons of solution. This arrangement will provide a minimum of 7 days operating inventory.

## **8. Peak Ammonia Slip:**

The SNCR is designed and guaranteed to have an ammonia slip concentration of 5 ppm by volume (dry basis) corrected to 3% O<sub>2</sub> as averaged over a 24 hour period in the duct cross sectional area for all boiler operating loads.

## **9. Construction Schedule:**

- Mobilize Construction – June 27, 2005
- Equipment Deliveries – June 28, 2005 – July 1, 2005
- Pre-Outage Construction - June 28, 2005 – September 9, 2005
- Unit 6 Outage – September 10, 2005 – November 20, 2005
- Optimized System – May 1, 2006



Gulf Power Company  
Plant Crist, Unit 6  
SNCR Process Flow Diagram

Crist Electric Generating Plant  
Biomass Fuels for Units 4 & 5

Gulf Power is making application to include the following fuel for use in at Plant Crist Units 4 and 5 as previously outlined in the 2004 Title V Renewal Application. Use of this fuel was not incorporated in the recently finalized Crist Title V permit. Gulf Power successfully demonstrated Crist 4 and 5 as units being "capable of accommodating" biomass fuels under a construction permit issued in 2003. Below is the information previously submitted in the 2004 Title V renewal application.

SCC Code: 10100903

Units: Tons Wood Burned

Description 1: External Combustion Boiler

Description 2: Electric Generation

Description 3: Wood/Bark Waste

Description 4: Wood-fired Boiler - Wet Wood ( $\geq$  20% moisture)

Is this a valid segment? Yes

Segment Description: Biomass (wood, switchgrass, sawdust, and sander dust)

Segment comment: Permit allows up to 97.7 equivalent mmbtu/hr of biomass (wood, switchgrass, sawdust, and sander dust) with TPH limits for each biomass fuel.