



RECEIVED

DEC 06 1999

BUREAU OF AIR REGULATION

December 2, 1999

Mr. Clair Fancy
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 7922 8804 3923

Re: Tampa Electric Company
Big Bend Station Combustion Turbine 2 & 3
Installation of Compressor Inlet Air Humidification Equipment
Construction Permit Application

0570039-006-AC

Dear Mr. Fancy:

Please find enclosed three (3) signed and sealed copies of Tampa Electric Company's (TEC) permit application for the installation of compressor inlet air humidification equipment on two of the existing simple-cycle combustion turbines at the Big Bend Power Station. A check for \$5,000.00 to the Florida Department of Environmental Protection is enclosed to cover the processing fee per Chapter 62-4.050(4)(a)2a F.A.C.

TEC appreciates your timely review and processing of this construction permit application. If you should have any questions, please feel free to call me at (813) 641-5210.

Sincerely,

Patrick L. Shell
Engineer
Environmental Planning

EP\gm\PLS134

Enclosure

c: Mr. Jerry Kissel, FDEP - SW (enc)
Mr. Richard Kirby, EPCHC (enc)

Tampa Electric Company

FLORIDA DEPARTMENT OF ENVIRONMENTAL

0905059

Invoice Date	Invoice Number	G/L Account	Description	Invoice Amount
12/1/99	BBCT 2&3 PERMIT	M07503	RECEIVED DEC 07 1999 BUREAU OF AIR REGULATION	5,000.00
Check Total				5,000.00

FOR SECURITY PURPOSES, THE BORDER OF THIS DOCUMENT CONTAINS MICROPRINTING



Tampa Electric Company
Post Office Box 3285
702 North Franklin Street
Tampa, Florida 33601

NationsBank
NationsBank of Georgia NA

Check Number

0905059

64-1278-8
611

Check Date

12/2/99

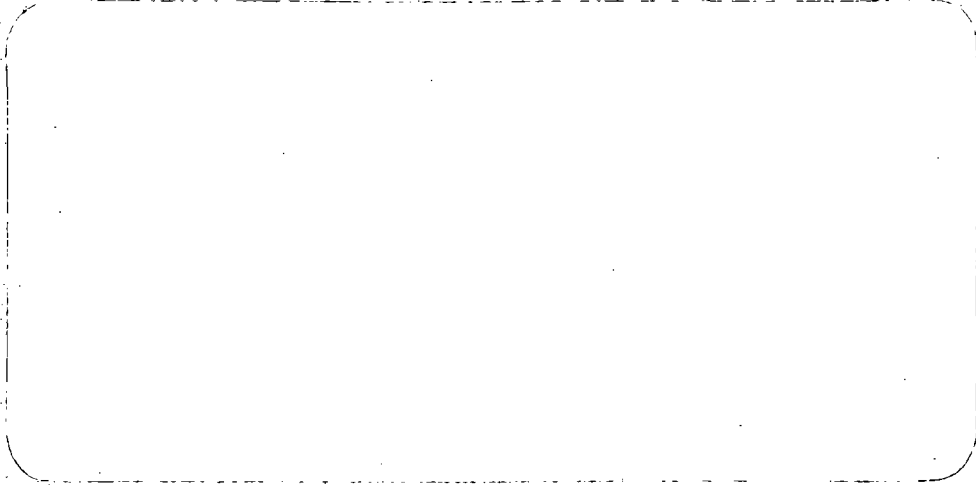
Check Amount

*****\$5,000.00

PAY Five Thousand Dollars and 00/100 Cents

TO THE ORDER OF FLORIDA DEPARTMENT OF ENVIRONMENTAL
PROTECTION
TAMPA, FL 33601

THE REVERSE SIDE OF THIS DOCUMENT INCLUDES AN ARTIFICIAL WATERMARK - HOLD AT AN ANGLE TO VIEW



ECT

Environmental Consulting & Technology, Inc.

RECEIVED

DEC 06 1999

BUREAU OF AIR REGULATION

**BIG BEND STATION
SIMPLE-CYCLE COMBUSTION
TURBINES NOs. 2 AND 3
AIR CONSTRUCTION
PERMIT APPLICATION**

Prepared for:


TAMPA ELECTRIC
Tampa, Florida

Prepared by:


Environmental Consulting & Technology, Inc.
3701 Northwest 98th Street
Gainesville, Florida 32606

ECT No. 990988-0100

December 1999

INTRODUCTION

Tampa Electric Company (TEC) is planning to install and operate inlet air humidification and evaporative cooling systems (direct water spray foggers) on two existing combustion turbines (CTs) at its Big Bend Station. The TEC Big Bend Station is located on Big Bend Road in North Ruskin, Hillsborough County, Florida.

TEC proposes to install the direct water spray foggers on existing CT Nos. 2 and 3. These CTs are identical Westinghouse Model W501B2 ECONOPAC units each having a nominal generation capacity of 77 megawatts (MW) at 59 degrees Fahrenheit (°F). CT Nos. 2 and 3 were initially installed and placed in service at the Big Bend Station in 1974.

On hot days, the generation capacity of a CT is reduced due to a decrease in inlet air density. The decrease in inlet air density on hot days decreases the mass flow through the CT resulting in a decrease in power output. Direct water spray foggers "recover" this decrease in power output on hot days by cooling the CT inlet air via evaporative cooling. The increase in compressor inlet air density due to the lower temperature allows for a higher heat input (i.e., additional fuel combustion) resulting in a greater mass flow through the CT. This greater mass flow will, in turn, increase the power output of each CT (Nos. 2 and 3) on hot days by approximately 2 to 8 MW. Use of CT inlet air humidification and evaporative cooling essentially shifts the CT power curve on hot days to power production levels that would occur naturally during colder weather conditions.

CT Nos. 2 and 3 presently serve as peaking units to provide power during high demand periods. The use of CT Nos. 2 and 3 as peaking units will not change due to the addition of inlet air humidification and evaporative cooling. The CT inlet air fogging systems will simply provide additional power (i.e., from 2 to 8 MW per CT) when CT Nos. 2 and 3 are already in use because of high power demand and when favorable meteorological conditions are also present (i.e., warm ambient temperatures and relatively low humidities).

Because CT compressor inlet air evaporative cooling is only effective when ambient temperatures are warm and humidities relatively low, the water fogging system will only

be used during these ambient conditions. Maximum short-term (i.e., hourly average) CT heat input and emission rates will remain unchanged. These maximum rates will continue to occur under natural, cold temperature ambient air conditions when the fogging system is not in use because CT inlet air humidification has little, if any, benefit under cold temperature, high humidity ambient air conditions. Because the use of CT inlet air humidification and evaporative cooling will not cause an increase in maximum hourly emission rates, the fogger system does not constitute a modification under the new source performance standards (NSPS) regulations, and, therefore, NSPS Subpart GG is not applicable to CT Nos. 2 and 3.

Because CT inlet air humidification and evaporative cooling will increase CT heat input rates compared to a CT not using inlet air fogging under the same ambient air conditions, long-term (i.e., annual average) emission rates will potentially increase. Potential emission rate increases for all PSD pollutants due to the use of the inlet air foggers will be well below the Prevention of Significant Deterioration (PSD) Significant Emission Rate values shown in Chapter 62-212, Table 212.400-2, Florida Administrative Code (F.A.C.). Accordingly, the installation and use of CT inlet air humidification and evaporative cooling for CT Nos. 2 and 3 constitutes a minor modification to an existing major source and therefore is not subject to PSD New Source Review (NSR).

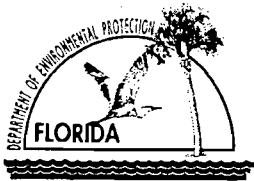
The planned construction start date for the CT fogger project is February 2000 with completion scheduled for March 2000.

CT No. 2 currently has a permit restriction that limits operating hours to no more than 10 hours per day and 365 days per year. This is equivalent to 3,650 hours per year operation. TEC requests that the annual operating hours limit of 3,650 hours per year be retained, but that the daily limit of 10 hours per day be deleted to allow for operational flexibility.

Attachments A through C provide the Florida Department of Environmental Protection (FDEP) Application for Air Permit—Title V Source, PSD Applicability Analysis, and NSPS Subpart GG Applicability Analysis, respectively.

ATTACHMENTS A

**FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
APPLICATION FOR AIR PERMIT
TITLE V SOURCE**



Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: Tampa Electric Company	
2. Site Name: Big Bend Station	
3. Facility Identification Number: 0570039 [] Unknown	
4. Facility Location: Street Address or Other Locator: Big Bend Road City: North Ruskin County: Hillsborough Zip Code: 33572	
5. Relocatable Facility? [] Yes [<input checked="" type="checkbox"/>] No	6. Existing Permitted Facility? [<input checked="" type="checkbox"/>] Yes [] No

Application Contact

1. Name and Title of Application Contact: Jamie Hunter Administrator – Air Programs Environmental Planning	
2. Application Contact Mailing Address: Organization/Firm: Tampa Electric Company Street Address: 6499 U.S. Highway 41 North City: Apollo Beach State: FL Zip Code: 33572-9200	
3. Application Contact Telephone Numbers: Telephone: (813)641 – 5033 Fax: (813) 641-5081	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	December 7, 1999
2. Permit Number:	0570039-006-AC
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[] Initial Title V air operation permit for an existing facility which is classified as a Title V source.

[] Initial Title V air operation permit 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: _____

[] Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: _____

Operation permit number to be revised: _____

[] Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.)

Operation permit number to be revised/corrected: _____

[] Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit number to be revised: _____

Reason for revision: _____

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[✓] Air construction permit to construct or modify one or more emissions units.

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

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

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official: Gregory M. Nelson, P.E., Manager – Environmental Planning
2. Application Contact Mailing Address: Organization/Firm: Tampa Electric Company Street Address: 6499 U.S. Highway 41 North City: Apollo Beach State: FL Zip Code: 33572-9200
3. Owner/Authorized Representative or Responsible Official Telephone Numbers: Telephone: (813) 641-5016 Fax: (813) 641-5081
4. Owner/Authorized Representative or Responsible Official Statement: <i>I, the undersigned, am the owner or authorized representative*(check here [<input checked="" type="checkbox"/>], if so) or the responsible official (check here [<input type="checkbox"/>], if so) 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

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: Thomas W. Davis Registration Number: 36777
2. Professional Engineer Mailing Address: Organization/Firm: Environmental Consulting & Technology, Inc. Street Address: 3701 Northwest 98th Street City: Gainesville State: FL Zip Code: 32606
3. Professional Engineer Telephone Numbers: Telephone: (352) 332-0444 Fax: (352) 332-6722

4. Professional Engineer Statement:

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

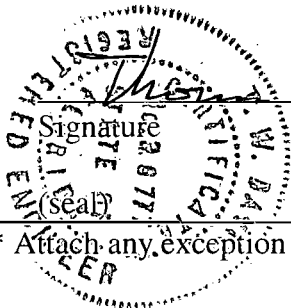
(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions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

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

If the purpose of this application is to obtain a Title V source air operation permit (check here [], 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.



W. D. A. [Signature]

Date

12/1/99

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
005	Combustion Turbine No. 2	AC1B	\$5,000
006	Combustion Turbine No. 3	AC1B	N/A

Application Processing Fee

Check one: [] Attached - Amount: \$ 5,000 [] Not Applicable

Note: Similar Emissions Unit Fee provided per Rule 62-4.050(a)4., F.A.C.

Construction/Modification Information

1. Description of Proposed Project or Alterations:

Project consists of the installation of compressor inlet air humidification equipment on existing simple-cycle Combustion Turbine (CT) Nos. 2 and 3. CT Nos. 2 and 3, initially installed in 1974, are identical Westinghouse Model W501B2 units each having a nominal generation capacity of 77 MW at 59° F. CT generation capacity is an inverse function of ambient air temperature; higher ambient air temperatures result in lower CT power output and vice versa. The maximum power output of CT No. 2 is reduced on days with high ambient temperatures due to the decrease in CT compressor inlet air density. The decrease in inlet air density on hot days decreases the mass flow through the CT resulting in a decrease in power output.

The addition of water to the CT compressor inlet air will reduce the temperature of the inlet air by means of evaporative cooling. The increase in compressor inlet air density due to the lower temperature will allow for a greater mass flow through the combustion. This greater mass flow will, in turn, increase the CT power output on hot days by approximately 2 to 8 MW.

The humidification equipment will be primarily utilized on hot and/or dry days to increase CT power output during these periods.

CT No. 2 currently has a permit restriction that limits operating hours to no more than 10 hours per day and 365 days per year. This is equivalent to 3,650 hours per year operation. TEC requests that the annual operating hours limit of 3,650 hours per year be retained but that the daily limit of 10 hours per day be deleted to allow for operational flexibility.

2. Projected or Actual Date of Commencement of Construction: **March 2000**

3. Projected Date of Completion of Construction: **April 2000**

Application Comment

[Empty box for Application Comment]

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: 17 East (km): 361.9 North (km): 3,075.0			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS):		Longitude (DD/MM/SS):	
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 (limit to 500 characters):			

Facility Contact

1. Name and Title of Facility Contact: Greg Benton, Environmental Coordinator			
2. Facility Contact Mailing Address: Organization/Firm: Tampa Electric Company Street Address: Big Bend Road City: North Ruskin State: FL Zip Code: 33572			
3. Facility Contact Telephone Numbers: Telephone: (813) 228-4111 Fax: (813) 228-1864			

Facility Regulatory Classifications

Check all that apply:

1. <input type="checkbox"/> Small Business Stationary Source?	<input type="checkbox"/> Unknown
2. <input checked="" type="checkbox"/> Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. <input type="checkbox"/> Synthetic Minor Source of Pollutants Other than HAPs?	
4. <input checked="" type="checkbox"/> Major Source of Hazardous Air Pollutants (HAPs)?	
5. <input type="checkbox"/> Synthetic Minor Source of HAPs?	
6. <input checked="" type="checkbox"/> One or More Emissions Units Subject to NSPS?	
7. <input type="checkbox"/> One or More Emission Units Subject to NESHAP?	
8. <input type="checkbox"/> Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters):	

List of Applicable Regulations

Facility applicable regulations previously submitted with the Title V permit application;	
reference Big Bend Station Title V Operating Permit Application, Volume II,	
Attachment A.	

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap		4. Basis for Emissions Cap	5. Pollutant Comment
		lb/hour	tons/year		
NO _x	A	N/A	N/A	N/A	
SO ₂	A	63,000	N/A	62-296.405 (1)(c)2.b., F.A.C.	Units 1-3, 3-hr average
SO ₂	A	37,500	N/A	62-204.240 (1), F.A.C.	Units 1-3, 24-hr average
SO ₂	A	33,000	N/A		Units 1 and 2, 3-hr average
CO	A	N/A	N/A	N/A	
PM ₁₀	A	N/A	N/A	N/A	
PM	A	N/A	N/A	N/A	
SAM	A	N/A	N/A	N/A	
VOC	A	N/A	N/A	N/A	
PB	B	N/A	N/A	N/A	
H106	A	N/A	N/A	N/A	Hydrochloric Acid
H107	A	N/A	N/A	N/A	Hydrofluoric Acid
H133	A	N/A	N/A	N/A	Nickel Cmpds.
HAPS	A	N/A	N/A	N/A	Total HAPs

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Area Map Showing Facility Location: <input type="checkbox"/> Attached, Document ID: <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested Previously submitted; reference Document II.D.1 of Title V permit application.
2. Facility Plot Plan: <input type="checkbox"/> Attached, Document ID: <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested Previously submitted; reference Document II.D.2 of Title V permit application.
3. Process Flow Diagram(s): <input type="checkbox"/> Attached, Document ID: <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested Previously submitted; reference Document II.D.3 of Title V permit application.
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: <input type="checkbox"/> Attached, Document ID: <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested Previously submitted; reference Document II.D.4 of Title V permit application.
5. Fugitive Emissions Identification: <input type="checkbox"/> Attached, Document ID: <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Waiver Requested Previously submitted; reference Document II.D.5 of Title V permit application.
6. Supplemental Information for Construction Permit Application: <input checked="" type="checkbox"/> Attached, Document ID: <input type="checkbox"/> Not Applicable Reference Air Construction Permit Application Report
7. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

Not Applicable

8. List of Proposed Insignificant Activities: <input type="checkbox"/> Attached, Document ID:_____ <input type="checkbox"/> Not Applicable
9. List of Equipment/Activities Regulated under Title VI: <input type="checkbox"/> Attached, Document ID:_____ <input type="checkbox"/> Equipment/Activities On site but Not Required to be Individually Listed <input type="checkbox"/> Not Applicable
10. Alternative Methods of Operation: <input type="checkbox"/> Attached, Document ID:_____ <input type="checkbox"/> Not Applicable
11. Alternative Modes of Operation (Emissions Trading): <input type="checkbox"/> Attached, Document ID:_____ <input type="checkbox"/> Not Applicable
12. Identification of Additional Applicable Requirements: <input type="checkbox"/> Attached, Document ID:_____ <input type="checkbox"/> Not Applicable
13. Risk Management Plan Verification: <input type="checkbox"/> Plan previously submitted to Chemical Emergency Preparedness and Prevention Office (CEPPO). Verification of submittal attached (Document ID:_____) or previously submitted to DEP (Date and DEP Office:_____) <input type="checkbox"/> Plan to be submitted to CEPPO (Date required:_____) <input type="checkbox"/> Not Applicable
14. Compliance Report and Plan: <input type="checkbox"/> Attached, Document ID:_____ <input type="checkbox"/> Not Applicable
15. Compliance Certification (Hard-copy Required): <input type="checkbox"/> Attached, Document ID:_____ <input type="checkbox"/> Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.</p>			
<p>2. Regulated or Unregulated Emissions Unit? (Check one)</p> <p><input type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.</p> <p><input checked="" type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.</p>			
<p>1. Description of Emissions Unit Addressed in This Section (limit to 60 characters): Emission unit consists of one, existing Westinghouse W501B2 simple-cycle combustion turbine (CT No. 2) having a nominal rating of 77 megawatts (MW). The CT is fired exclusively with distillate fuel oil.</p>			
<p>4. Emissions Unit Identification Number: <input type="checkbox"/> No ID</p> <p>ID: 005 (CT No. 2) <input type="checkbox"/> ID unknown</p>			
<p>5. Emissions Unit Status Code: A</p>	<p>6. Initial Startup Date:</p>	<p>7. Emissions Unit Major Group SIC Code: 49</p>	<p>8. Acid Rain Unit? <input type="checkbox"/></p>
<p>9. Emissions Unit Comment: (Limit to 500 Characters)</p> <p>Existing CT No. 2 is proposed to be modified by the addition of compressor inlet air humidification equipment.</p>			

Emissions Unit Information Section 1 of 2

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):

None

2. Control Device or Method Code(s):

Emissions Unit Details

1. Package Unit:

Manufacturer: **Westinghouse**

Model Number: **W501B2**

2. Generator Nameplate Rating: **77 MW (nominal at 59° F)**

3. Incinerator Information:

Dwell Temperature:

°F

Dwell Time:

seconds

Incinerator Afterburner Temperature:

°F

**B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)**

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	mmBtu/hr	
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate:		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:		
	hours/day	days/week
	weeks/year	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters):		

**C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)**

List of Applicable Regulations

**D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)**

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram?		2. Emission Point Type Code:	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):			
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:			
5. Discharge Type Code:	6. Stack Height: feet	7. Exit Diameter: feet	
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates: Zone: East (km): North (km):			
14. Emission Point Comment (limit to 200 characters):			

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Combustion turbine fired with distillate fuel oil.		
2. Source Classification Code (SCC): 20100101		3. SCC Units: Thousand Gallons Burned
3. Maximum Hourly Rate: 7.40	4. Maximum Annual Rate: 27,010	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: 0.5	8. Maximum % Ash: 0.1	9. Million Btu per SCC Unit: 138
10. Segment Comment (limit to 200 characters): Fuel heat content (Field 9) represents lower heating value (LHV).		

Segment Description and Rate: Segment of

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):		3. SCC Units:
3. Maximum Hourly Rate:	4. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
5. Maximum % Sulfur:	6. Maximum % Ash:	7. Million Btu per SCC Unit:
8. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
1 - NOX			NS
2 - CO			NS
3 - PM			NS
4 - PM10			NS
5 - SO2			NS
6 - VOC			NS
7 - H113			NS
8 - H133			NS
7 - H148			NS

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted:		2. Total Percent Efficiency of Control:	
3. Potential Emissions: lb/hour		4. Synthetically Limited? [] tons/year	
5. Range of Estimated Fugitive Emissions: [] 1 [] 2 [] 3 _____ to _____ tons/year			
6. Emission Factor: Reference:		7. Emissions Method Code:	
8. Calculation of Emissions (limit to 600 characters):			
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):			

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:		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):			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):			

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
6. Continuous Monitor Comment (limit to 200 characters):	

Continuous Monitoring System: Continuous Monitor ____ of ____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters):	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

Emissions Unit Information Section 1 of 2

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
12. Alternative Modes of Operation (Emissions Trading) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
13. Identification of Additional Applicable Requirements <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
14. Compliance Assurance Monitoring Plan <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
15. Acid Rain Part Application (Hard-copy Required) <input type="checkbox"/> Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: _____ <input type="checkbox"/> Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID: _____ <input type="checkbox"/> New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID: _____ <input type="checkbox"/> Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID: _____ <input type="checkbox"/> Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID: _____ <input type="checkbox"/> Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID: _____ <input type="checkbox"/> Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

**A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)**

Emissions Unit Description and Status

<p>1. Type of Emissions Unit Addressed in This Section: (Check one)</p> <p><input checked="" type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.</p> <p><input type="checkbox"/> This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.</p>			
<p>2. Regulated or Unregulated Emissions Unit? (Check one)</p> <p><input type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.</p> <p><input checked="" type="checkbox"/> The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.</p>			
<p>9. Description of Emissions Unit Addressed in This Section (limit to 60 characters): Emission unit consists of one, existing Westinghouse W501B2 simple-cycle combustion turbine (CT No. 3) having a nominal rating of 77 megawatts (MW). The CT is fired exclusively with distillate fuel oil.</p>			
<p>4. Emissions Unit Identification Number: <input type="checkbox"/> No ID</p> <p>ID: 006 (CT No. 3) <input type="checkbox"/> ID unknown</p>			
<p>5. Emissions Unit Status Code: A</p>	<p>6. Initial Startup Date:</p>	<p>7. Emissions Unit Major Group SIC Code: 49</p>	<p>8. Acid Rain Unit? <input type="checkbox"/></p>
<p>9. Emissions Unit Comment: (Limit to 500 Characters)</p> <p>Existing CT No. 3 is proposed to be modified by the addition of compressor inlet air humidification equipment.</p>			

Emissions Unit Control Equipment

8. Control Equipment/Method Description (Limit to 200 characters per device or method): None
2. Control Device or Method Code(s):

Emissions Unit Details

1. Package Unit: Manufacturer: Westinghouse Model Number: W501B2
2. Generator Nameplate Rating: 77 MW (nominal at 59° F)
3. Incinerator Information: Dwell Temperature: °F Dwell Time: seconds Incinerator Afterburner Temperature: °F

**B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)**

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:	mmBtu/hr	
2. Maximum Incineration Rate:	lb/hr	tons/day
3. Maximum Process or Throughput Rate:		
4. Maximum Production Rate:		
5. Requested Maximum Operating Schedule:	hours/day	days/week
	weeks/year	hours/year
7. Operating Capacity/Schedule Comment (limit to 200 characters):		

**C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)**

List of Applicable Regulations

**D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)**

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram?		9. Emission Point Type Code:	
10. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):			
11. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:			
12. Discharge Type Code:	6. Stack Height: feet	7. Exit Diameter: feet	
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet		
13. Emission Point UTM Coordinates: Zone: East (km): North (km):			
14. Emission Point Comment (limit to 200 characters):			

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): Combustion turbine fired with distillate fuel oil.		
10. Source Classification Code (SCC): 20100101		3. SCC Units: Thousand Gallons Burned
11. Maximum Hourly Rate: 7.40	12. Maximum Annual Rate: 64,792	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: 0.5	8. Maximum % Ash: 0.1	10. Million Btu per SCC Unit: 138
10. Segment Comment (limit to 200 characters): Fuel heat content (Field 9) represents lower heating value (LHV).		

Segment Description and Rate: Segment of

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
9. Source Classification Code (SCC):		3. SCC Units:
10. Maximum Hourly Rate:	11. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
13. Maximum % Sulfur:	14. Maximum % Ash:	15. Million Btu per SCC Unit:
16. Segment Comment (limit to 200 characters):		

**F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)**

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
1 - NOX			NS
2 - CO			NS
3 - PM			NS
4 - PM10			NS
5 - SO2			NS
6 - VOC			NS
7 - H113			NS
8 - H133			NS
7 - H148			NS

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
 (Regulated Emissions Units -
 Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted:			2. Total Percent Efficiency of Control:	
3. Potential Emissions: lb/hour tons/year			4. Synthetically Limited? <input type="checkbox"/>	
5. Range of Estimated Fugitive Emissions: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 _____ to _____ tons/year				
6. Emission Factor: Reference:			7. Emissions Method Code:	
8. Calculation of Emissions (limit to 600 characters):				
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):				

Allowable Emissions Allowable Emissions _____ of _____

1. Basis for Allowable Emissions Code:		2. Future Effective Date of Allowable Emissions:	
4. Requested Allowable Emissions and Units:		4. Equivalent Allowable Emissions: lb/hour tons/year	
5. Method of Compliance (limit to 60 characters):			
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):			

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

3. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [] Rule [] Other
3. Requested Allowable Opacity: Normal Conditions: _____ % Exceptional Conditions: _____ % Maximum Period of Excess Opacity Allowed: _____ min/hour	
12. Method of Compliance:	
13. Visible Emissions Comment (limit to 200 characters):	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

4. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [] Rule [] Other
3. Requested Allowable Opacity: Normal Conditions: _____ % Exceptional Conditions: _____ % Maximum Period of Excess Opacity Allowed: _____ min/hour	
14. Method of Compliance:	
15. Visible Emissions Comment (limit to 200 characters):	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
13. Continuous Monitor Comment (limit to 200 characters):	

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information: Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
14. Continuous Monitor Comment (limit to 200 characters):	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
 (Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
2. Fuel Analysis or Specification <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
3. Detailed Description of Control Equipment <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
4. Description of Stack Sampling Facilities <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
5. Compliance Test Report <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously submitted, Date: _____ <input type="checkbox"/> Not Applicable
6. Procedures for Startup and Shutdown <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
7. Operation and Maintenance Plan <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable <input type="checkbox"/> Waiver Requested
8. Supplemental Information for Construction Permit Application <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
9. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
12. Alternative Modes of Operation (Emissions Trading) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
13. Identification of Additional Applicable Requirements <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
14. Compliance Assurance Monitoring Plan <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
15. Acid Rain Part Application (Hard-copy Required) <input type="checkbox"/> Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID: _____ <input type="checkbox"/> Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID: _____ <input type="checkbox"/> New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID: _____ <input type="checkbox"/> Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID: _____ <input type="checkbox"/> Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID: _____ <input type="checkbox"/> Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID: _____ <input type="checkbox"/> Not Applicable

ATTACHMENTS B
PSD APPLICABILITY ANALYSIS

ATTACHMENT B PSD APPLICABILITY ANALYSIS

The addition of water to the combustion turbine (CT) compressor inlet air will reduce the temperature of the inlet air by means of evaporative cooling. The increase in compressor inlet air density due to the lower temperature will allow for a higher heat input (i.e., additional fuel combustion), resulting in a greater mass flow through the CT. This greater mass flow will, in turn, increase the CT power output on hot days by approximately 2 to 8 megawatts (MW).

Because CT compressor inlet air evaporative cooling is only effective when ambient temperatures are warm and humidities relatively low, the water fogging system will only be used during these ambient conditions. Maximum short-term (i.e., hourly average) CT heat input and emission rates will remain unchanged; these maximum rates will continue to occur under cold ambient air temperature conditions when the fogging system is not in use (i.e., CT inlet air humidification has little, if any, benefit under cold temperature, high humidity ambient air conditions).

Because CT inlet air humidification and evaporative cooling will increase CT heat input rates compared to a CT not using inlet air fogging under the same ambient air conditions, long-term (i.e., annual average) emission rates will potentially increase. Because year-to-year variations in operating hours and load are generally not considered operational changes and, therefore, do not constitute modifications under the Prevention of Significant Deterioration (PSD) regulatory program, the determination of potential emission rate increases was made using AP-42 emission factors for CTs (in units of pounds of pollutant per million British thermal units [lb of pollutant/MMBtu]), CT heat input rate as a function of inlet air temperature (in units of million British thermal units per hour per degree Fahrenheit [MMBtu/hr/°F]), average annual inlet air temperature decrease resulting from CT inlet air evaporative cooling (in units of degrees Fahrenheit [°F]), and the maximum hours per year per CT that inlet air humidification and evaporative cooling will be used. This approach is considered appropriate because it effectively excludes permissible

variations in operating hours and power production rates unrelated to the use of the CT inlet air fogger.

CT Nos. 2 and 3 presently serve as peaking units to provide power during high demand periods. The use of CT Nos. 2 and 3 as peaking units will not change due to the addition of inlet air humidification and evaporative cooling. The CT inlet air fogging systems will simply provide additional power (i.e., from 2 to 8 MW per CT) when CT Nos. 2 and 3 are already in use because of high power demand and when favorable meteorological conditions are also present (i.e., warm ambient temperatures and relatively low humidities). The addition of the fogging systems will not result in a change in the amount or the order in which these CT generating units are dispatched to meet the electrical demand of Tampa Electric Company's (TEC's) customers. Because CT Nos. 2 and 3 are the most expensive units to operate on the TEC system, they typically are used only during periods of peak load or in emergency situations. Therefore, the implementation of CT inlet air fogging will not cause an increase in utilization of CT Nos. 2 and 3.

The maximum number of hours per year that the CT inlet air foggers will be used is estimated to be 800 per CT. This annual fogger usage rate (i.e., 1,600 hours per year for both CT Nos. 2 and 3), was used to develop potential emission rate changes in terms of the tons per year (tpy) Significant Emission Rate values shown in Chapter 62-212, Table 212.400-2, Florida Administrative Code (F.A.C.).

Table B-1 provides a derivation of the Westinghouse Model W501B2 ECONOPAC CT heat input rate as a function of inlet air temperature (i.e., heat input in units of MMBtu/hr/°F). The heat input rate derivation was based on baseload CT data for two inlet air temperatures (i.e., 95 and 75°F). Based on the differences in heat inputs and inlet air temperatures, the Westinghouse CT heat input as a function of inlet air temperature was calculated to be 3.21 MMBtu/hr/°F.

Table B-2 provides the basis for the estimation of the annual average temperature decrease that will occur due to the use of CT inlet air humidification and evaporative

Table B-1. TEC Big Bend Station CT Nos. 2 and 3 Heat Input Versus Temperature

Parameter	Units	Air Temperature		Difference
		75°F	95°F	
Base Load Heat Input	MMBtu/hr	837.8	773.5	64.3
Air Temperature	°F	75.0	95.0	20.0
Heat Input Change	MMBtu/hr/°F		3.21	

Sources: TEC, 1999.
ECT, 1999.

Table B-2. TEC Big Bend Station Temperature Decrease Due to CT Inlet Air Evaporative Cooling

Month	Fogger Inlet Dry Bulb Temperature Daily Maximum* (°F)	Relative Humidity*			Wet Bulb Temperature† (°F)	Fogger Outlet Dry Bulb Temperature at 100% RH‡ (°F)	Dry Bulb Temperature Change (°F)
		Time of Day					
		1,300 (%)	1,900 (%)	Average (%)			
Apr	81.9	51.0	61.0	56.0	70.0	70.0	-11.9
May	87.1	53.0	62.0	57.5	75.0	75.0	-12.1
Jun	89.5	60.0	69.0	64.5	79.5	79.5	-10.0
Jul	90.0	63.0	73.0	68.0	80.5	80.5	-9.5
Aug	90.3	65.0	76.0	70.5	82.0	82.0	-8.3
Sep	88.5	62.0	75.0	68.5	79.5	79.5	-9.0
Average	87.9	59.0	69.3	64.2	77.8	77.8	-10.1

*Tampa International Airport data.

†Psychrometric chart data.

‡At 100-percent RH, wet bulb and dry bulb temperatures are equal.

Source: ECT, 1999.

cooling. The annual average temperature decrease estimation was based on evaluating the wet bulb temperatures associated with daily maximum dry bulb temperatures and relative humidities for the warm air temperature months of April through September. Climatological data collected at the Tampa International Airport over an approximate 30-year period was evaluated. The wet bulb temperature represents the coolest temperature that can be obtained by evaporating water into air. At 100-percent relative humidity, the wet bulb and dry bulb temperatures are equal because the air is already saturated with water vapor. Conservatively assuming that the fogging system will saturate the CT inlet air with water vapor (i.e., achieve 100-percent relative humidity), the difference between the inlet dry bulb temperature and the wet bulb temperature corresponding to the inlet dry bulb temperature and relative humidity represents the maximum temperature decrease that will occur due to CT inlet air humidification and evaporative cooling. At a constant relative humidity, the maximum temperature change (i.e., decrease in CT inlet air temperature) due to evaporative cooling will increase with higher air temperatures. At a constant air temperature, the maximum temperature decrease due to evaporative cooling will increase with lower relative humidities. Based on the Tampa International airport climatological data, the annual average temperature decrease due to CT inlet air humidification and evaporation is estimated to be 10.1°F. Maximum short-term (i.e., hourly) temperature decrease is estimated to be approximately 16°F assuming an inlet ambient air temperature of 95°F and relative humidity of 50 percent.

Potential emission rate increases resulting from use of the inlet air foggers are summarized in Table B-3. The tpy increases were calculated by multiplying the average annual temperature decrease (in units of °F) by the heat input change (in units of MMBtu/hr/°F), multiplying this result by the appropriate AP-42 emission factor (in units of lb of pollutant/MMBtu), multiplying this result by the maximum hours per year of fogging for both CTs, and then converting the result (in units of pounds per year) to units of tpy. An example calculation for NO_x is as follows:

$$\text{Emission Increase} = 10.1^{\circ}\text{F} \times 3.21 \text{ MMBtu/hr/}^{\circ}\text{F} \times 0.698 \text{ lb NO}_x\text{/MMBtu} \times 1,600 \text{ hr/yr} \times 1 \text{ ton/2,000 lb}$$

$$\text{Emission Increase} = 18.2 \text{ tpy}$$

Table B-3. TEC Big Bend Station CT Nos. 2 and 3 PSD Applicability Analysis

Parameter	CT2 + CT3	Net Increase (tpy)	PSD Threshold (tpy)	PSD Review (Y/N)
Average Cooling (°F)	10.1			
Heat Input Change (MMBtu/hr/°F)	3.21			
Max. Fogging Hours (hrs/yr)	1,600.0			
Fuel Oil Wt % S	0.50			
NO _x				
AP-42 (lb/MMBtu)	0.698			
Annual Increase (tons)		18.2	40.0	No
CO				
AP-42 (lb/MMBtu)	0.048			
Annual Increase (tons)		1.3	100.0	No
SO ₂				
AP-42 (lb/MMBtu)	0.51			
Annual Increase (tons)		13.2	40.0	No
H ₂ SO ₄ *				
AP-42 (lb/MMBtu)	0.015			
Annual Increase (tons)		0.4	7.0	No
PM ₁₀				
AP-42 (lb/MMBtu)	0.038			
Annual Increase (tons)		1.0	15.0	No
PM				
AP-42 (lb/MMBtu)	0.038			
Annual Increase (tons)		1.0	25.0	No
VOC				
AP-42 (lb/MMBtu)	0.017			
Annual Increase (tons)		0.4	40.0	No

*Assumes 3-percent conversion of SO₂ to H₂SO₄.

Sources: TEC, 1999.
ECT, 1999.

As shown in Table B-3, the potential emission rate increases for all PSD pollutants are demonstrated to be well below the PSD Significant Emission Rate values shown in Chapter 62-212, Table 212.400-2, F.A.C. Accordingly, the installation and use of CT inlet air humidification and evaporative cooling for CT Nos. 2 and 3 constitutes a minor modification to an existing major source and therefore is not subject to PSD New Source Review (NSR).

ATTACHMENTS C
NSPS SUBPART GG APPLICABILITY ANALYSIS

ATTACHMENT C
NSPS SUBPART GG APPLICABILITY ANALYSIS

A modification to an emission source which is addressed by a New Source Performance Standard (NSPS) becomes subject to that standard if the modification will cause an increase in the emission rate of a pollutant covered by the standard. The pertinent NSPS with respect to combustion turbines (CTs) is Chapter 40, Part 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, Code of Federal Regulations (CFR). As specified in 40 CFR 60.14(b), the determination of whether a modification will cause an emission rate increase is based on maximum short-term, hourly emission rates (i.e., on a kilogram per hour [kg/hr] basis).

Because CT compressor inlet air evaporative cooling is only effective when ambient temperatures are warm and humidities relatively low, the water fogging system will only be used during these ambient conditions. Maximum short-term (i.e., hourly average) CT heat input and emission rates will remain unchanged. These maximum rates will continue to occur under natural, cold temperature ambient air conditions when the fogging system is not in use because CT inlet air humidification has little, if any, benefit under cold temperature, high humidity ambient air conditions.

The maximum short-term (i.e., hourly) temperature decrease due to use of the CT inlet air fogger is estimated to be approximately 16 degrees Fahrenheit (°F) assuming an inlet ambient air temperature of 95°F and relative humidity of 50 percent. At a conditioned (i.e., fogger outlet) CT inlet air temperature of 79°F, the maximum CT heat input is calculated to be 824.9 million British thermal units per hour (MMBtu/hr). The lowest recorded temperature obtained from Tampa International Airport climatological data is 18°F. At this CT inlet air temperature, the maximum CT heat input is estimated to be 1,020.7 MMBtu/hr without use of the CT inlet fogger. Because CT emission rates are directly proportional to heat input rates, maximum CT emission rates will continue to occur under natural, cold weather conditions when the inlet air fogger is not in use.

Because the use of CT inlet air humidification and evaporative cooling will not cause an increase in maximum hourly emission rates, the fogger system does not constitute a modification under the NSPS regulations and therefore NSPS Subpart GG is not applicable to CT Nos. 2 and 3.