

**INITIAL TITLE V AIR PERMIT APPLICATION REVIEW**

Revised 7/12/99

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<b>APPLICANT:</b> Virginia Electric & Power Company	<b>SITE LOCATION:</b> Kitty Hawk	<b>COUNTY:</b> Dare	
<b>TECHNICAL CONTACT:</b> Mr. Philip Knause	<b>PHONE:</b> (804)273-2946	<b>RESPONSIBLE OFFICIAL:</b> Mr. O. Preston Sloane	<b>TITLE:</b> Resp. Station Director
<b>REVIEW ENGINEER:</b> Susan McCarthy, P.E./Jenny Sheppard	<b>SIGNATURE:</b>	<b>DATE:</b> XX	
<b>REGIONAL CONTACT:</b> Edward Childs	<b>REGIONAL OFFICE:</b> Washington Regional Office	<b>SIC CODE:</b> 4911	
<b>APPLICATION NUMBER:</b> 280020A5.A	<b>EXISTING PERMIT NUMBER:</b> 02593R05	<b>NEW PERMIT NUMBER:</b> 02593T06	

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**I Introduction**

The U.S. Environmental Protection Agency (EPA) has given final approval to North Carolina's Title V operating permits program effective on October 1, 2001. This EPA approval triggered the requirements for Title V facilities to submit permit applications to the Division of Air Quality. Title V facilities are required to obtain an operating permit which addresses all applicable regulations under the State Implementation Plan, Federal Implementation Plan, and other provisions of the Clean Air Act (CAA). The Title V Operating Permit will define all of the facility's obligations under the CAA.

This Initial Title V Air Permit application Review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the DRAFT Title V operating permit. The primary source of information used to construct the DRAFT permit is the above referenced air permit application.

**II Background Information**

The DRAFT Title V operating permit replaces an existing Air Quality Construction and Operation Permit No. 02593R05 issued on December 1, 1999 and is currently scheduled to expire on November 30, 2004.

Pursuant to 15A NCAC 2Q .0506 Virginia Electric & Power Company, Inc., Kitty Hawk Combustion Turbine Station submitted its initial Title V application to the Division of Air Quality on June 13, 1996. The application was considered complete for processing on August 12, 1996. The DRAFT permit is required to go to public notice pursuant to 15A NCAC 2Q .0521.

**III Facility Description**

Virginia Electric & Power Company, located in Kitty Hawk, NC, owns two No. 2 fuel oil fired combustion turbines that are used primarily for transmission contingencies and system peak load generation. According to the Title V application, the facility is major for PM10 (648 tpy), sulfur dioxide (7,433 tpy), nitrogen oxides (2,432 tpy), carbon monoxide (194 tpy) due to potential emissions. The most recent emissions inventory in central files was for the year 1998 which showed zero emissions due to the facility not starting up. The latest inspection report indicated that the No. 2 unit burned 225,000 gallons of No. 2 fuel oil in 1999 during approximately 100 hours of operation.

This facility commenced operation March 17, 1971 and operates two simple combustion turbines fired on No. 2 fuel oil and rated at 368 million Btu per hour each and capable of generating 22 megawatts of electricity each. Following are the regulations that the facility is **NOT** subject to and the reasons why:

1. The facility is not subject to the Acid Rain rules because the turbines are 22 megawatts (i.e. less than the 25 megawatt cutoff) and are simple cycle combustion turbines.
2. The sections of the New Source Performance Standards that would apply to combustion turbines is 40 CFR Part 60 Subpart GG. However, Subpart GG only applies to turbines constructed or modified after October 3, 1977. As noted in the application, both turbines were installed in 1971.
3. NCAC 2D .0503 Particulates from Fuel Burning Indirect Heat Exchangers does not apply to these turbines as the turbines are not indirect heat exchangers but are internal combustion engines. This means that no particulate standard other than the ambient standard applies to these units.
4. NCAC 2D .0519 Control of Nitrogen Dioxide and Nitrogen Oxides Emissions does not apply since these are simple combustion turbines and not the combined cycle systems.
5. The newly approved rule NCAC 2D .1417 Emissions Allocations for Large Combustion Sources does not apply (as well as any of the .1400 regulations), because under the exemptions, the 25 megawatt exemption is the applicability cutoff of electricity generating units (EGU's). The 250 mmBtu/hr cutoff referred to in the 2D .1417 regulation applies to industrial turbines (not EGU's). Since these turbines are rated at 22 megawatts, they meet the exemption.

**IV. Statement of Compliance**

The latest inspection report of September 28, 2000 by Edward Childs of the Washington Regional Office indicated that the facility is unmanned and not often observed in operation as was with this inspection. The facility is currently in compliance with all applicable requirements. The applicant has certified that the facility will be in compliance with all applicable requirements. The applicant has also certified that the facility will be in compliance with any applicable requirements taking effect during the term of the permit and will meet such requirements on a timely basis.

**V. Summary of Emission Sources and Control Devices**

The following table identifies all emission sources and associated control devices for which the Initial Title V Operating Permit is being issued.

<b>Emission Source ID No.</b>	<b>Emission Source Description</b>	<b>Control Device ID No.</b>	<b>Control Device Description</b>
ES-001 and ES-003 (turbines) and ES-002 and ES-004 (starters)	two No. 2 fuel oil fired turbines (368.34 million Btu per hour maximum heat input each) each with a No. 2 fuel oil-fired starter (4.06 million Btu per hour per unit)	n/a	n/a

**VI. Emission Source-by-Source Evaluation**

**A. Two No. 2 fuel oil-fired turbines (ID Nos. ES-001 and ES-003, 368.34 million Btu per hour maximum heat input each) each with a No. 2 fuel oil-fired starter (ID Nos. ES-002 and ES-003, respectively, 4.06 million Btu per hour per unit)**

1. Description

As stated above, the two No. 2 fuel oil fired combustion turbines that are used primarily for transmission contingencies and system peak load generation at an unmanned site and are not often operated due to their age and the cost of operating an old system.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
sulfur dioxide	2.3 pounds per million Btu	15A NCAC 2D .0516
visible emissions	<p><u>State-only requirement:</u> 40 percent opacity (except during startup, shutdowns, and malfunctions) when averaged over a six-minute period except that six-minute periods averaging more than 90 percent opacity may occur not more than once in every hour nor more than four times in any 24-hour period</p> <p><u>Federal-only requirement:</u> 40 percent opacity (except during startup, shutdowns, and malfunctions) when averaged over a six-minute period except that six-minute periods averaging more than 90 percent opacity may occur not more than once in every hour nor more than four times in any 24-hour period</p>	<p>15A NCAC 2D .0521</p> <p>40 CFR 52 Subpart II</p>
excess emissions	Facility shall have malfunction abatement plan.	15A NCAC 2D .0535

a. **2D .0516 “Sulfur Dioxide Emissions from Combustion Sources”**

i. Regulatory Analysis

These turbines are sources of combustion which discharge through a stacks and therefore is subject to .0516(a). Allowable emissions of sulfur dioxide from this source while firing No. 2 fuel oil shall not exceed 2.3 pounds per million Btu.

According to the applicant, the distillate fuel burned by the turbines is 0.2 weight percent sulfur. According to the AP-42 emission factor (Table 3.4-1) for large stationary diesel fired engines (for stationary internal combustion sources), the emission factor for diesel fuel is  $1.01 S_1$  (lb/million Btu) where  $S_1$  = % sulfur in No. 2 fuel oil.

$$E = (1.01 \times 0.2\% \text{ sulfur})\text{lb/million Btu} = 0.202 \text{ lb/million Btu}$$

Thus, these turbines should be well within the allowable sulfur dioxide emission rate of 2.3 lb/million Btu while burning No. 2 fuel oil.

ii. Monitoring/ Recordkeeping/ Reporting Requirements

No monitoring/ recordkeeping/ reporting will be required for sulfur dioxide emissions from the combustion of No. 2 fuel oil for this source.

**STATE-ONLY REQUIREMENT**

b. **2D .0521 “Control of Visible Emissions”**

i. Regulatory Analysis

These turbines commenced operation on March 17, 1971. Since they were established before July 1, 1971, they are subject to 2D .0521(c). Per this regulation, visible emissions shall not be more than 40 percent opacity (except during startups, shutdowns, and malfunctions) when averaged over a six-minute period except that six-minute averaging not more than 90 percent opacity may occur not more than once any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances. In addition, there has not been a documented violation of 2D .0521 at this facility.

ii. Monitoring Requirements

To assure compliance, the Permittee shall perform a Method 9 test for one hour using a preapproved protocol to be submitted in accordance with 15A NCAC 2D .0501© and General Condition JJ when the cumulative hours of firing on No. 2 fuel oil only by this source exceeds 950 hours but is less than 1,050 hours. This monitoring protocol shall be repeated after each 1,000 hours of operation. The Permittee shall be deemed in noncompliance if the prescribed monitoring is not implemented or performed.

iii. Recordkeeping

The results of the monitoring shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request. The logbook shall record the following:

- a. the date and time of each recorded action;
- b. the results of each observation and/or test noting those sources with emissions that were observed to be in noncompliance along with any corrective actions taken to reduce visible emissions; and
- c. the results of any corrective actions performed.

The Permittee is deemed in non-compliance if the prescribed records are not maintained.

iv. Reporting

The permittee shall submit the results of the Method 9 test within 30 days of completion of the test. All instances of deviations from the requirements of this permit must be clearly identified.

**FEDERAL-ONLY REQUIREMENT**

c. **40 CFR 52 Subpart II: NORTH CAROLINA IMPLEMENTATION PLAN**

i. Regulatory Analysis

Visible emissions from these combustion turbines and starters shall not be more than 40 percent opacity (except during startups) when averaged over a six-minute period except that six-minute averaging not more than 90 percent opacity may occur not more than once any hour nor more than four times in any 24-hour period. Compliance is indicated with this regulation, because the latest inspection report did not cite any opacity exceedances. In addition, there has not been a documented violation of 2D .0521 at this facility.

ii. Monitoring/ Recordkeeping/ Reporting Requirements

As per 40 CFR 52 Subpart II, "North Carolina Implementation Plan," no other monitoring/recordkeeping/reporting are required for visible emissions from the combustion of No. 2 fuel oil.

**STATE-ONLY REQUIREMENT**

d. **2D .0535 "Excess Emissions Reporting and Malfunctions"**

i. Regulatory Analysis

All electric utility boiler units shall have a malfunction abatement plan approved by the Director as specified in 15A NCAC 2D .0535(d). [15A NCAC 2D .0535]

ii. Monitoring/ Recordkeeping [15A NCAC 2Q .0508(f)]

The Permittee shall maintain logs to show the operation and maintenance parts of the malfunction abatement plan are implemented. These logs (written or electronic form) shall be subject to inspection by DAQ personnel upon request during business hours.

**VII. Multiple Emission Source Limits**

The facility is not subject to any multiple emission source limits.

**VIII. MACT Applicability and Requirements**

Based on a review of the facility's current operations and emission sources, the facility will be subject to any MACT standards.

**IX. Permit Shield (including non-applicable requirements)**

In accordance with 2Q .0512 the permit will contain a provision stating that compliance with the terms, conditions, and limitations of the Title V permit shall be deemed in compliance with applicable requirements specifically identified in the permit, as of the date of permit issuance. If the permit does not expressly state that a permit shield exists then it shall be presumed not to provide such a shield.

**X. Other Applicable Requirements**

None.

**XI. General Conditions**

The “General Conditions” section of the Title V Operating Permits lists additional applicable rule requirements that the permittee must adhere to, as with any other permit condition. These requirements in general are common to all Title V facilities. The general conditions include provisions such as annual fee payment, permit renewal and expiration, transfer of ownership or operation, property rights, submission of documents, inspections and entry procedures, reopen for cause, and severability.

**XII. Insignificant Activities**

The insignificant activities listed in the application have been reviewed and verified. Because an emission source or activity is insignificant does not mean that the emission source or activity is exempted from any applicable requirement or that the owner or operator of the source is exempted from demonstrating compliance with any applicable requirement. Following are the insignificant activities for this facility:

Emission Source Description	Basis for Exemption
One 168 hp emergency diesel generator	NCAC 2D .0503(8)
Two Combustion Turbine No. 1 lube oil tanks	NCAC 2D .0503(8)
Two Combustion Turbine No. 2 lube oil tanks	NCAC 2D .0503(8)
Combustion Turbine No. 1 lube oil reservoir	NCAC 2D .0503(8)
Combustion Turbine No. 2 lube oil reservoir	NCAC 2D .0503(8)
Batteries (60 cells), District Substation (switch room)	NCAC 2D .0503(8)
Batteries (60 cells), Turbine 1 Battery Room	NCAC 2D .0503(8)
Batteries (60 cells), Turbine 2 Battery Room	NCAC 2D .0503(8)
Sealed antifreeze drums	NCAC 2D .0503(8)

**XIII. Public Notice**

Pursuant to 15A NCAC 2Q .0521, a notice of the draft Title V Operating Permit shall be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30 day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA.

**XIV. Recommendations**

The initial Title V application for Virginia Electric & Power Company, Kitty Hawk Combustion Turbine Station, has been reviewed by the DAQ to determine compliance with all procedures and requirements under 15A NCAC 2Q .0500 and 40 CFR Part 70. The DAQ has made a preliminary determination that the facility is complying or will achieve compliance as specified in the draft permit with all applicable requirements. Therefore, the DAQ is proposing to issue the Title V Operating Permit upon completion of the public comment period and the EPA review.

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