Dominion Generation
5000 Dominion Boulevard, Glen Allen, VA 23060

Dominion

March 7, 2002

Mr. A. Dahlgren Vaughan
Environmental Engineer Senior
Virginia Department of Environmental Quality
Fredericksburg Satellite Office
806 Westwood Office Park
Fredericksburg, Virginia 22401

Re: Questions From the Initial Review of the State Operating Permit Application for Dominion's North Anna Power Station

Dear Mr. Vaughan:

This is in response to your March 1, 2002 request for additional information to supplement Dominion's application for a state operating permit that would cover potential sources of air pollution emissions at our North Anna Power Station (North Anna). Our answers to your requests are provided below.

Your first question concerns the use of AP-42 emissions factors to determine actual emissions. At this time, we believe that the use of AP-42 factors is conservative enough to provide assurance that North Anna is not a major source of air pollution emissions. We reviewed the annual emissions inventory data that we submitted to the Department of Environmental Quality (DEQ) over the most recent five years, which we believe to be a representative period. These data show that our annual emissions of oxides of nitrogen (NOx) from the entire facility (including the station blackout generator) to be only a fraction of the major source threshold of 100 tons per year. NOx is the pollutant of concern for the facility because we burn only distillate fuel oil. The maximum annual emissions of NOx during this five-year period were 12.24 tons in the year 2001. These emissions sources are not in continuous use, and, in fact, are only operated for test purposes to ensure that they are operable in the event of an emergency.

You also requested in your first item that we either 1) provide a guarantee from the manufacturer that the NOx and carbon monoxide (CO) emissions will be less than or equal to AP-42; 2) provide a copy of a stack test conducted on an identical emergency generator that demonstrates that the actual NOx and CO emissions will be less than or equal to AP-42; or 3) accept a permit requirement that would mandate a stack test for one of the units at North Anna to demonstrate that tested emissions are equal to or less than AP-42 values. In light of the low actual emissions calculated using AP-42 values, we believe that any of these steps are excessive and unwarranted. Even if AP-42 factors were off by 100% on the low side, our calculated annual actual emissions would only be about 20% of the Title V major source thresholds.

To support our assertion that AP-42 is appropriate, we obtained information from the vendor on expected emissions. A guarantee was not obtained from the manufacturer when the engines were built in the 1970's. Using the information provided by the vendor generates lower emissions of

C001

NOx and CO than those submitted in our permit application. Therefore, we believe that the use of AP-42 remains appropriate for this facility. The emission factors used for the engines all came from the October 1996 version of AP-42, which is the most recent revision of this section of AP-42. Our calculations and the vendor-supplied emissions factors are enclosed.

Your second request was to provide calculations showing the origin of the numbers used in our permit application as Attachment A. We have sent you an electronic copy of the spreadsheet used to perform these calculations and we are enclosing a printed copy with this letter. As discussed above, all of our emissions calculations (except for the station blackout generator) are based on AP-42 factors.

Finally, you also asked if we intended to be able to run each of the four Fairbanks Morse emergency generators simultaneously. We do wish to retain that capability, with the understanding that the sum of all emissions of criteria air pollutants from this facility will be restricted to less than Title V major source thresholds. We expect this restriction will come in the form of restricted hours of operation.

We believe that the information in this letter and its attachments will satisfy your requests for additional information in your March 1, 2002 letter. Please contact Mr. Andy Gates of Dominion's Electric Environmental Services department at (804) 273-2950 if you need any additional information.

Very truly yours,

Cathy C. Taylor
Director – Electric Environmental Services

Enclosures: Calculation of hourly emissions using AP-42 factors
Calculation of hourly emissions using Fairbanks Morse factors

cc:

U. S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30303
Docket Nos. 50-338/50-339
License Nos. NPF-4/NPF-7

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555
Docket Nos. 50-338/50-339
License Nos. NPF-4/NPF-7

Mr. M.J. Morgan
NRC Senior Resident Inspector
North Anna Power Station

North Anna Power Station
Auxiliary Boiler / Emergency Generator Emissions Calculations
Potential to Emit Data

Emission Unit	Fuel Type	Maximum % Sulfur	Maximum Fuel Throughput (per hour)		Heating Value		Maximum Heat Input (MBtu/hr)
ES-1 Aux Boiler 4A	No. 2 Fuel Oil	0.2	647.9	gal/hour	140,000	Btu/gal	90.7
ES-2 Aux Boiler 4B	No. 2 Fuel Oil	0.2	647.9	gal/hour	140,000	Btu/gal	90.7
ES-3 Blackout Generator	No. 2 Fuel Oil	0.5	261.4	gal/hour	140,000	Btu/gal	36.60
ES-4 Emergency Diesel Generator	No. 2 Fuel Oil	0.2	250.8	gal/hour	140,000	Btu/gal	35.11
ES-5 Emergency Diesel Generator	No. 2 Fuel Oil	0.2	250.8	gal/hour	140,000	Btu/gal	35.11
ES-6 Emergency Diesel Generator	No. 2 Fuel Oil	0.2	250.8	gal/hour	140,000	Btu/gal	35.11
ES-7 Emergency Diesel Generator	No. 2 Fuel Oil	0.2	250.8	gal/hour	140,000	Btu/gal	35.11

Emission Unit	Pollutant	Emission Factor	Emission Factor Units	Emission Factor Source	Uncontrolled lb/hour	
ES-1 Aux Boiler 4A	CO	5	lb/Kgal	AP-42, Table 1.3-1, 5th Edition	3.239	
ES-1 Aux Boiler 4A	Lead (Pb)	0.00151	lb/Kgal	AP-42, Table 1.3-11, 5th Edition	0.001	
ES-1 Aux Boiler 4A	NOx	20	lb/Kgal	AP-42, Table 1.3-1, 5th Edition	12.957	
ES-1 Aux Boiler 4A	TSP	2	lb/Kgal	AP-42, Table 1.3-7, 5th Edition	1.296	
ES-1 Aux Boiler 4A	PM_{10}	1.08	lb/Kgal	AP-42, Table 1.3-7, 5th Edition	0.700	
ES-1 Aux Boiler 4A	SO_2	142	(lb/Kgal)(%S)	AP-42, Table 1.3-1, 5th Edition	18.399	
ES-1 Aux Boiler 4A	VOC	0.34	lb/Kgal	AP-42, Table 1.3-3, 5th Edition	0.220	
ES-2 Aux Boiler 4B	CO	5	lb/Kgal	AP-42, Table 1.3-1, 5th Edition	3.239	
ES-2 Aux Boiler 4B	Lead (Pb)	0.00151	lb/Kgal	AP-42, Table 1.3-11, 5th Edition	0.001	
ES-2 Aux Boiler 4B	NOx	20	lb/Kgal	AP-42, Table 1.3-1, 5th Edition	12.957	
ES-2 Aux Boiler 4B	TSP	2	lb/Kgal	AP-42, Table 1.3-7, 5th Edition	1.296	
ES-2 Aux Boiler 4B	PM_{10}	1.08	lb/Kgal	AP-42, Table 1.3-7, 5th Edition	0.700	
ES-2 Aux Boiler 4B	SO_2	142	(lb/Kgal)(%S)	AP-42, Table 1.3-1, 5th Edition	18.399	
ES-2 Aux Boiler 4B	VOC	0.34	lb/Kgal	AP-42, Table 1.3-3, 5th Edition	0.220	
ES-3 Blackout Generator	CO	10.4	ton/yr	Permit (Reg. No. 40726)	29.900	Permit (Reg. No. 40726)
ES-3 Blackout Generator	NOx	39.3	ton/yr	Permit (Reg. No. 40726)	157.200	Permit (Reg. No. 40726)
ES-3 Blackout Generator	PM_{10}	1.0	ton/yr	Permit (Reg. No. 40726)	1.800	Permit (Reg. No. 40726)
ES-3 Blackout Generator	SO_2	4.6	ton/yr	Permit (Reg. No. 40726)	18.500	Permit (Reg. No. 40726)
ES-3 Blackout Generator	TSP	0.8	ton/yr	Permit (Reg. No. 40726)	2.300	Permit (Reg. No. 40726)
ES-3 Blackout Generator	VOC	1.7	ton/yr	Permit (Reg. No. 40726)	6.700	Permit (Reg. No. 40726)
ES-4 Emergency Diesel Generator	CO	0.85	lb/MMBtu	AP-42, Table 3.4-1	29.845	
ES-4 Emergency Diesel Generator	NOx	3.2	lb/MMBtu	AP-42, Table 3.4-1	112.358	
ES-4 Emergency Diesel Generator	TSP	0.0697	lb/MMBtu	AP-42, Table 3.4-2	2.447	
ES-4 Emergency Diesel Generator	PM_{10}	0.0573	lb/MMBtu	AP-42, Table 3.4-2	2.012	
ES-4 Emergency Diesel Generator	SO_2	1.01	(lb/MMBtu)*(%S)	AP-42, Table 3.4-1	7.093	
ES-4 Emergency Diesel Generator	VOC	0.0819	lb/MMBtu	AP-42, Table 3.4-1, TOC nonmethane	2.876	
ES-5 Emergency Diesel Generator	CO	0.85	lb/MMBtu	AP-42, Table 3.4-1	29.845	
ES-5 Emergency Diesel Generator	NOx	3.2	lb/MMBtu	AP-42, Table 3.4-1	112.358	
ES-5 Emergency Diesel Generator	TSP	0.0697	lb/MMBtu	AP-42, Table 3.4-2	2.447	
ES-5 Emergency Diesel Generator	PM_{10}	0.0573	lb/MMBtu	AP-42, Table 3.4-2	2.012	
ES-5 Emergency Diesel Generator	SO_2	1.01	(lb/MMBtu)*(%S)	AP-42, Table 3.4-1	7.093	
ES-5 Emergency Diesel Generator	VOC	0.0819	lb/MMBtu	AP-42, Table 3.4-1, TOC nonmethane	2.876	
ES-6 Emergency Diesel Generator	CO	0.85	lb/MMBtu	AP-42, Table 3.4-1	29.845	
ES-6 Emergency Diesel Generator	NOx	3.2	lb/MMBtu	AP-42, Table 3.4-1	112.358	
ES-6 Emergency Diesel Generator	TSP	0.0697	lb/MMBtu	AP-42, Table 3.4-2	2.447	
ES-6 Emergency Diesel Generator	PM_{10}	0.0573	lb/MMBtu	AP-42, Table 3.4-2	2.012	
ES-6 Emergency Diesel Generator	SO_2	1.01	(lb/MMBtu)*(%S)	AP-42, Table 3.4-1	7.093	
ES-6 Emergency Diesel Generator	VOC	0.0819	lb/MMBtu	AP-42, Table 3.4-1, TOC nonmethane	2.876	
ES-7 Emergency Diesel Generator	CO	0.85	lb/MMBtu	AP-42, Table 3.4-1	29.845	
ES-7 Emergency Diesel Generator	NOx	3.2	lb/MMBtu	AP-42, Table 3.4-1	112.358	
ES-7 Emergency Diesel Generator	TSP	0.0697	lb/MMBtu	AP-42, Table 3.4-2	2.447	
ES-7 Emergency Diesel Generator	PM_{10}	0.0573	lb/MMBtu	AP-42, Table 3.4-2	2.012	
ES-7 Emergency Diesel Generator	SO_2	1.01	(lb/MMBtu)*(%S)	AP-42, Table 3.4-1	7.093	
ES-7 Emergency Diesel Generator	VOC	0.0819	lb/MMBtu	AP-42, Table 3.4-1, TOC nonmethane	2.876	

North Anna Power Station

Fairbanks Morse Emission Factors

Each unit is rated at 3840 hp
There are 453.59 grams per pound

		Emissions		
Pollutant	F-M Emission Factor (grams/hp-hr)	F-M grams/hr	F-M pounds/hr	AP-42 pounds/hr
NOx	12.2	46,848	103.28	112.36
CO	2.2	8,448	18.62	29.85
SOx	1.4	5,376	11.85	7.09
THC	0.3	1,152	2.54	2.88
PM	0.3	1,152	2.54	2.45

NOx is the controlling pollutant. Therefore, since AP-42 predicts higher emissions than the vendor, we will continue to use AP-42 to demonstrate compliance.