

Eugene S. Grecheck
Vice President
Nuclear Development

Dominion Energy, Inc. • Dominion Generation
Innsbrook Technical Center
5000 Dominion Boulevard, Glen Allen, VA 23060
Phone: 804-273-2442, Fax: 804-273-3903
E-mail: Eugene.Grecheck@dom.com



January 3, 2012

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Serial No. NA3-11-033RB
Docket No. 52-017
COL/JBL

DOMINION VIRGINIA POWER
NORTH ANNA UNIT 3 COMBINED LICENSE APPLICATION
ESRP 2.7: RESPONSE TO ER RAI LETTER DATED MAY 23, 2011

On May 23, 2011, the NRC requested additional information to support the review of certain portions of the North Anna Unit 3 Combined License Application (COLA) Environmental Report. Complete responses to eight of the nine Request for Additional Information (RAI) questions were provided previously by Dominion letters NA3-11-033R dated August 10, 2011 and NA3-11-033RA dated December 2011. The response to the one remaining question is provided in the Enclosure:

- RAI MET-03 Meteorology / Air Quality US-APWR Criteria Pollutant Emissions

Please contact Tony Banks at (804) 273-2170 (tony.banks@dom.com) if you have questions.

Very truly yours,

Eugene S. Grecheck

Enclosure:

1. Response to ER RAI Letter Dated May 23, 2011, RAI MET-03 US-APWR Criteria Pollutant Emissions

Commitments made by this letter:

1. None

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NR0

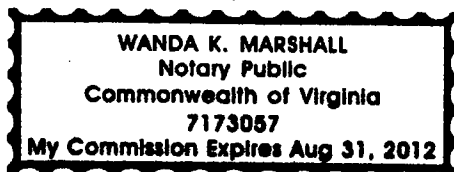
COMMONWEALTH OF VIRGINIA

COUNTY OF HENRICO

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Eugene S. Grecheck, who is Vice President-Nuclear Development of Virginia Electric and Power Company (Dominion Virginia Power). He has affirmed before me that he is duly authorized to execute and file the foregoing document on behalf of the Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 3rd day of January, 2012
My registration number is 7173057 and my
Commission expires: August 31, 2012

Wanda K. Marshall
Notary Public



cc: U. S. Nuclear Regulatory Commission, Region II
C. P. Patel, NRC
T. S. Dozier, NRC
G. J. Kolcum, NRC

ENCLOSURE

Response to NRC RAI Letter Dated May 23, 2011

RAI MET-03

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

North Anna Unit 3

Dominion

Docket No. 52-017

RAI No.: MET-03 (RAI Letter dated May 23, 2011)

ESRP SECTION: 2.7 METEOROLOGY AND AIR QUALITY

DATE OF RAI ISSUE: 05/23/2011

QUESTION NO.: MET-03

The NRC staff addresses the impacts of plant operation on air quality in its EISs. Rev 3 to the COL ER does not include estimates of criteria pollutant emissions associated with US-APWR reactor operations. Therefore the staff requests the following information:

Provide estimates of the annual emissions of criteria pollutants associated with operation of an US-APWR at the NAPS site.

Supporting Information

As part of the EIS discussion on air quality, the staff includes a table of estimated emissions of criteria pollutants associated with plant operations. Typically these emissions are from boilers and diesel generators. Dominion provided this information for various reactor types in its ER for an ESP at the NAPS site. Rev 3 to the COL ER does not include estimates of criteria pollutant emissions associated with US-APWR reactor operations.

Dominion Response

As stated in the North Anna Early Site Permit Application (ESPA) Environmental Report (ER), non-radioactive gaseous effluents created during plant operation from back-up power plant supply sources, such as gas turbine generators, would be permitted by state and federal regulatory authorities.

Sources of criteria pollutants associated with US-APWR operations at the Unit 3 site are as follows:

- four (4) Class 1E Gas Turbine Generators (GTG)
- two (2) Alternate Alternating Current (AAC) GTGs
- one (1) Auxiliary Boiler
- one (1) Diesel Fire Pump
- two (2) Station Security Diesel Generators
- associated Fuel Storage Tanks (total of 17 storage tanks)

The estimated criteria pollutants from the above listed sources are based on preliminary engineering design information associated with standard vendor equipment.

The attached Tables 1 through 5 provide estimates of criteria pollutant emissions associated with US-APWR Unit 3. The emissions estimates conservatively do not assume equipment which could be added for reduction of emissions. Expected emissions would not change the NRC's ESP EIS conclusion that resulting impacts on local ambient air quality levels (in Class 1 areas) are estimated to be negligible. Therefore, the estimates do not constitute new and significant information required to be included in the North Anna Combined License Application ER.

Proposed COLA Revision

None

Table 1 - Emission Rates for Class 1E and AAC GTGs

Fuel: Diesel fuel No. 2 – lower heating value of 0.018358 MMBtu/lb, Specific Gravity 0.83

Normal Operation - Emission Rate ^{a, b}		
Pollutant	Quantity For Six (6) GTG (lbs per year)	Notes
CO	150	
CO ₂	2,910,000	
SO ₂	20	c
NO _x	22,000	
Filterable Particulate Matter	ND	d
Condensable Particulate Matter	ND	d
Total Particulate Matter	200	
Total Hydrocarbons	90	

Table 1 – Notes:

- a. Values based on six (6) GTGs with a fuel consumption of 551.5 gallons per hour per GTG.
- b. Values based on GTG operation of 2 hours per month and one additional 24-hour period every 18 months for an annual operation of 40 hours per GTG.
- c. All sulfur in the fuel is assumed to be converted to SO₂. Emission values for GTGs are based upon 0.001% sulfur in fuel
- d. ND = no data

Table 2 - Emission Rates for Auxiliary Boiler

Fuel: No. 2 diesel

Normal Operation - Emission Rate ^{a, b}		
Pollutant	Quantity (lbs per year)	Notes
CO	6,100	
CO ₂	463,000	
SO ₂	41,200	c
NOx	9,500	c
Particulates	4,000	d
Hydrocarbons	400	

Table 2 – Notes:

- a. Values based on one (1) auxiliary boiler running at 180,000 lbs of steam per hour (data based on consuming 10,473 lbs per hour of fuel).
- b. Assumes boiler runs for a total of 384 hours (16 days) per year based upon:
 - 1) One refueling outage startup at 7 days per 18 month cycle,
 - 2) One non-refueling outage startup at 7 days per 2 years, and
 - 3) Auxiliary heating support at 7 days per year
- c. Based upon 0.5% sulfur content and 0.02% nitrogen content of fuel oil. Data assumes standard boiler burner.
- d. Particulates based upon particles equal to or less than 10 µm in size.

Table 3 - Emission Rates for Security Diesel

Fuel: No. 2 diesel

Normal Operation - Emission Rate ^{a, b}		
Pollutant	Quantity For Two (2) Diesels (lbs per year)	Notes
CO	210	
SO ₂	40	c
NO _x	1,300	
Particulates	40	d
Hydrocarbons	30	

Table 3 – Notes:

- a. Values based on two (2) security diesel generators (data based on running at full load).
- b. Based upon a projected yearly operation of 48 hours per security diesel generator due to testing.
- c. Based upon 0.035% sulfur content of fuel oil.
- d. Particulates based upon particles equal to or less than 10 µm in size.

Table 4 - Emission Rates for Diesel Driven Fire Pump

Fuel: No. 2 diesel

Normal Operation - Emission Rate ^{a, b}		
Pollutant	Quantity (lbs per year)	Notes
CO	20	
SO ₂	ND	c
NO _x + Non-Methane Hydrocarbons	110	
Particulates	10	d

Table 4 – Notes:

- a. Values based on one (1) diesel driven fire pump.
- b. Based upon a projected yearly operation of 30 hours for testing per NFPA 20 and 25.
- c. ND = no data available from vendor; sulfur content in No. 2 diesel is 0.05%
- d. Particulates based upon particles equal to or less than 10 µm in size.

Table 5 - Emission Rates for Fuel Oil Storage Tanks

Fuel: No. 2 diesel

Normal Operation - Emission Rate			
Description	Pollutant	Quantity (lbs per year)	Notes
Six (6) GTG Fuel Oil Storage Tanks (131,000 gal. each)	Hydrocarbons	150	a, b
Six (6) GTG Day Fuel Oil Storage Tanks (870 gal. each)	Hydrocarbons	10	c, d
One (1) Auxiliary Boiler Fuel Oil Storage Tank (300,000 gal.)	Hydrocarbons	40	e
One (1) Auxiliary Boiler Fuel Oil Day Tank (10,000 gal.)	Hydrocarbons	10	f, g
Two (2) Security Diesel Fuel Oil Storage Tanks (2,000 gal. each)	Hydrocarbons	1	h, i
One (1) Diesel Driven Fire Pump Fuel Oil Storage Tank (500 gal.)	Hydrocarbons	1	j

Table 5 – Notes:

- a. Values based upon annual run time of 40 hours per GTG; the fuel throughput is 22,060 gallons per year per tank.
- b. US-APWR Unit 3 site has a total of 6 GTG fuel tanks that support the GTG's (four (4) – Class 1E and two (2) – AAC). Each GTG tank has a usable volume of 131,000 gallons. This is a conservative value for the two AAC fuel oil storage tanks.
- c. GTG day tanks are required to house enough fuel to supply the GTGs for 1.5 hours. Value based upon the fuel consumption rate of the GTGs, each day tank has a throughput of 22,060 gallons per year based upon 40 hours of run time in a year.
- d. There are a total of six (6) GTG day fuel tanks, (four (4) – Class 1E and two (2) – AAC day tanks). Each GTG day tank has a usable volume of 870 gallons. This is a conservative value for the two AAC fuel oil storage tanks.
- e. Values based upon an auxiliary boiler annual run time of 384 hours with the fuel rate approximated to 1,453.4 gallons per hour (based on a boiler consumption data of 10,473 lbs per hour of fuel), with a fuel supply tank size of 300,000 gallons with an annual throughput of 558,095 gallons.
- f. Values based upon an auxiliary boiler annual run time of 384 hours per year with the fuel consumption rate of the auxiliary boiler 1,453.4 gallons per hour, with an annual throughput of 558,095 gallons.
- g. The auxiliary boiler day tank is considered with a usable volume of 10,000 gallons.
- h. There is one (1) security diesel fuel tank per security generator, for a total of two (2) for the site.
- i. Each security diesel fuel tank size is based on a usable volume of 2,000 gallons (assuming a run time of 24 hours for the diesel). The emission value is based on an annual throughput of 3,465.6 gallons per tank (considering an annual 48 hours of run time for the diesel and based on a fuel consumption of 72.2 gallons per hour).
- j. The diesel driven fire pump fuel tank is based on a usable volume of 500 gallons with an annual throughput of 534 gallons (considering an annual run time of 30 hours with a fuel consumption rate of 17.8 gallons per hour).