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Comment On: NRC-2008-0149-0006

Virginia Electric and Power Company D/B/A/ Dominion Virginia Power and Old Dominion Electric Cooperative, North Anna Power Station Combined License Application; Notice of Intent to Prepare a Supplemental Environmental Impact Statement and Conduct Scoping Process

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Comment on FR Doc # 2011-02599

Submitter Information

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(1)

Name: Louis Zeller

Address:

PO Box 88

PO Box 88

Glendale Springs, NC, 28629

Organization: Blue Ridge Environmental Defense League

General Comment

March 9, 2011

Cindy Bladey, Chief
Rulemaking, Announcements, and Directives Branch
Division of Administrative Services
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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RULES / DIRECTIVES

RE: Docket No. 52-017; NRC-2008-0149
Federal Register / Vol. 76, No. 25 / Monday, February 7, 2011
North Anna Power Station Supplemental Environmental Impact Statement

Dear Ms. Bladey:

On behalf of the Blue Ridge Environmental Defense League, the People's Alliance for Clean Energy and our other chapters and members in Virginia, I write to submit comments on the North Anna Power Station Supplemental Environmental Impact Statement.

Louis A. Zeller

*SUNSE Review Complete
Template = ADM-013*

*E-RIDS = ADM-03
Call = T. Dozier (TSD2)*

Attachments

NRC-2008-0149-DRAFT-0002.1: Comment on FR Doc # 2011-02599

Blue Ridge Environmental Defense League

www.BREDL.org PO Box 88 Glendale Springs, North Carolina 28629 BREDL@skybest.com (336) 982-2691

March 9, 2011

Cindy Bladey, Chief
Rulemaking, Announcements, and Directives Branch
Division of Administrative Services
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
NorthAnnaCOLEIS@nrc.gov
<http://www.regulations.gov>

RE: Docket No. 52-017; NRC-2008-0149
Federal Register / Vol. 76, No. 25 / Monday, February 7, 2011
North Anna Power Station Supplemental Environmental Impact Statement

Dear Ms. Bladey:

On behalf of the Blue Ridge Environmental Defense League, the People's Alliance for Clean Energy and our other chapters and members in Virginia, I write to submit comments on the North Anna Power Station Supplemental Environmental Impact Statement. These comments draw upon the work of many contributors with whom we have worked on North Anna environmental and safety issues since 2003. Without specific citation in these remarks, we reference the case of *Blue Ridge Environmental Defense League, et al v. Commonwealth of Virginia, ex rel., Supreme Court of Virginia, Record No. 101476*, and Blue Ridge Environmental Defense League's interventions in the Early Site Permit and the Combined License proceedings, NRC Docket No. 52-017.

Recommendations

- NRC should evaluate North Anna Unit 3 with an air condenser cooling system rather than proposed water tube condenser design. An air cooled reactor would have no thermal impact upon the Lake and its aquatic environment.
- The ESP plant parameter envelope no longer appears to encompass the COL design proposed by Dominion-Virginia Power. The NRC should require a new evaluation under 10 CFR 52.39.

Overview

Presently, Dominion operates two pressurized water reactors, each rated at thermal power of 2893 MW, with electrical outputs of 980.5 MWe and 972.9 MWe in Units 1 and 2, respectively. Unit 1 began operation in 1978 and Unit two in 1980.

Recognizing the health and environmental threats thermal pollution poses, both the federal Clean Water Act and the Virginia State Water Control Law forbid the discharge

Lex nemini operitur iniquum, nemini facit injuriam

of heat into “state waters” and “waters of the United States” without a permit.¹ Hoping to take advantage of a narrow regulatory exemption for “waste treatment systems,” Dominion has labeled the “hot side” as its “waste heat treatment facility.” As a result, billions of gallons of thermal pollution have been flowing freely from the NAPS into the “hot side” each day.

However, in 2009 the Virginia Circuit Court disagreed with the state and said that the discharge permit violated state and federal law. According to the court, the Board erred in applying the “waste treatment systems” exception to the “hot side,” which, under the controlling federal definition of “waters of the United States,” was a “cooling lake” subject to regulation. Fittingly, the circuit court set aside the permit and remanded it to the Board. The case is now before the Virginia Supreme Court.

Despite both the power company and the state referring to it as the “Waste Heat Treatment Facility,”² the so-called hot side, is in reality a 3,400-acre body of water that area with extensive public recreational uses. The widespread public use of the “hot side” should compel the NRC to make every attempt to reduce the increasing temperatures in both the “hot side” and “cool side” of Lake Anna. The record shows that 2,650 individuals petitioned the Virginia Department of Environmental Quality complaining about water temperatures as high as 106°F in the “hot side.” In fact, DEQ’s monitoring data in the record shows scores of readings showing water temperatures above upper limit of 32°C, or 89.6°F.³

Heat is a pollutant that can and does cause serious harm to receiving waters.⁴ Elevated temperatures at Lake Anna have greatly increased the public-health risk of an outbreak of *naegleria fowleri*, an amoeba which can enter the brain through the nose. *N. fowleri* thrives in warm water. The risks of infection increase dramatically as water temperatures exceed 86°F and are almost always fatal. We hereby bring to the attention of the NRC that *N. fowleri* was found in both the “hot side” and the “cool side” of Lake Anna during the summer of 2007.

Specific Comments

Water Impacts

According to Dominion’s amended license application, two pollutants in the effluent from Unit 3 would exceed water quality criteria: copper and tributyltin (TBT). TBT is an anti-fungal agent used in, among other things, industrial water systems such as cooling towers. TBT causes immunosuppression. As stated below, the choice of power plant cooling systems will have an impact on the concentrations of these pollutants.

¹ 33 U.S.C. § 1342(a) (2006); Va. Code Ann. § 62.1-44.5(A)(1) (2010)

² <http://www.dom.com/about/stations/nuclear/north-anna/waste-heat-treatment-facility.jsp> (“Waste Heat Treatment Facility”) (last visited July 21, 2010)

³ 9 Va. Admin. Code § 25-260-50

⁴ P.K. Goel, *Water Pollution: Causes, Effects and Control* 177-80, 2nd ed. 2006

North Anna Unit 3 Combined License Application (COLA) Environmental Report, as filed with the U.S. Nuclear Regulatory Commission (NRC), has significant deficiencies in its analysis resulting in serious unresolved issues with consumptive water use that will negatively impact the health and vitality of Lake Anna. North Anna Unit 3 was originally proposed as a Boiling Water Reactor (BWR) with an electrical output of slightly more than 1500 MWe. Dominion Power has now filed a Combined License Application to build North Anna Unit 3, a 1,700 MWe Mitsubishi Pressurized Water Reactor. Because the new PWR design has a lower thermodynamic efficiency, the North Anna Unit 3 will require an inordinately large draw of water from Lake Anna in order to cool the reactor. According to Dominion, more than Ten Billion British Thermal Units per hour (10E10BTU/hr) of heat would need to be dissipated. Two other nuclear power plants are already using Lake Anna as a heat sink and cooling facility, and thus have already significantly warmed Lake Anna. Unit 3 will withdraw up to 22,000 gallons of water per minute from Lake Anna to replace water lost from the operation of the cooling tower. This means that North Anna 3 would withdraw over 11 billion gallons of water from Lake Anna annually.⁵

Additionally, according to Dominion's Table 3.0-2, during each minute of operation the proposed Unit 3 power plant would release 5,500 gallons of cooling tower blowdown water into Lake Anna. Thus, 3 billion gallons of water annually would be returned to Lake Anna as heated and with additional chemical contaminants.

The difference between what would be withdrawn from Lake Anna and what is returned to the lake each year by Unit 3, its consumptive use, amounts to approximately 8 billion gallons per year. So, in addition to the environmental burden of 3 billion gallons of heated and chemically contaminated water that will be dumped into Lake Anna each year, the lake will face an enormous yearly consumption of water that will be withdrawn and never returned. Water returned to the lake as blowdown would have approximately four times higher concentrations of pollutants and minerals than the water which was withdrawn including biocides and algaecides used within the cooling towers to prevent them from becoming clogged with mold and mildew. As stated above, the anti-fungal agent TBT effluent levels from unit 3 would be exceeded.

Both of these constituents are already present in the lake water at concentrations equal to or greater than the current VPDES water quality criteria. The presence of both of these constituents is unrelated to the operation of the existing Units 1 and 2, and Unit 3 would not contribute to the amounts already existing in the lake. Additionally the increase in concentrations of these constituents in the discharge to the WHTF attributable to the operation of Unit 3 would be essentially immeasurable using current VDEQ-approved analytical methods.⁶

Further, blowdown water would be approximately 20 degrees hotter than the lake to which it is being returned. The proposed North Anna 3 nuclear power plant would use as its heat sink the process of evaporation with water withdrawn from Lake Anna. There are

⁵ North Anna Unit 3 Environmental Report Table 3.0-2

⁶ COLA Revision 3, June 3 2010, page 5-2.

three types of cooling tower designs currently in use by the power generation industry: natural draft, mechanical or forced draft and dry cooling. Dominion plans a mechanical draft system. In an air-cooled condenser, the steam that leaves the turbine passes directly to a dry cooling tower. There is no consumptive use of lake water and, without blowdown being sent back into the lake, contamination is reduced and water quality increased.

It may be less expensive for North Anna Unit 3 to continue to add waste heat into Lake Anna than to completely eliminate any waste-heat to the Lake through the use of air-cooled condensers. Air-cooled condensers are already in use in the electric industry but could not be retrofitted for use at North Anna 3 after the plant has begun construction. However, the problems detailed here would be completely eliminated by the installation of air-cooled condensers by Dominion Power at its proposed North Anna Unit 3 nuclear power plant.

Environmental impacts would be greatly reduced by dry-cooling systems at the North Anna plant. The change from a boiling water reactor to a pressurized water reactor design for the proposed North Anna Unit 3 nuclear power plant has created the opportunity to reduce the additional heat load on Lake Anna to zero. Dominion Power is conducting a complete redesign effort on its proposed North Anna Unit 3, changing from a BWR to a PWR. At this stage in the design process, these air-cooled condensers offer significant environmental benefits with inconsequential costs associated with such a modification. A further environmental review is necessary to meet the requirements of NEPA and to protect public health and environmental quality.

Plant Parameter Envelope

The plant parameter envelope for the North Anna early site permit considered reactors no larger than 4500 megawatts thermal power (MWt). North Anna Unit 3 was originally proposed as a boiling water reactor with a thermal power of 4500 MWt and an electrical output of 1520 MWe. The ESP application states:

The unit sizes of these conventional plants also vary, with some individual units having reactor ratings of as much as 4500 MWt. The conventional style plants that are based on dual-reactor construction have individual power ratings significantly less than that stated above, and the 4500 MWt rating bounds these dual-reactor designs.... An operating unit or group of modules typically has a maximum total thermal power rating of not greater than 4500 MWt, with a maximum electrical capacity of about 1520 MWe.⁷

On June 28, 2010, Dominion-Virginia Power altered its Combined License Application for North Anna Unit 3 to substitute a 1,700 MWe pressurized water reactor manufactured by Mitsubishi.

⁷ North Anna Early Site Permit Application Part 3 - Environmental Report, Revision 9, September 2006, page 3.3.3

Unit 3 would use closed-cycle, combination dry and wet cooling towers that would be placed on the ESP site in the area shown for cooling towers on Figure 3.1-3. Unit 3 dry and wet cooling towers would be less than 180 feet high. Make-up water for Unit 3 wet cooling towers would be provided from Lake Anna. To extract make-up water from the Lake, a new intake structure would be constructed near the existing Unit 1 and 2 intake structure. Unit 4 would use dry cooling towers, with finned-fan air coolers that would be placed on the ESP site in the area shown for cooling towers on Figure 3.1-3. The dry towers would be approximately 150 feet high, and would consist of a series of modules, each containing air-circulating fans. The Unit 3 and 4 cooling towers would be located with the approximately 55-acre cooling tower area.⁸

The ESP plant parameter envelope no longer appears to encompass the COL design proposed by Dominion-Virginia Power. The NRC should require a new evaluation under 10 CFR 52.39.

Conclusion

Before licensing the proposed North Anna Unit 3 nuclear power plant, the Nuclear Regulatory Commission must make a determination that the facility would operate in conformity with the Commission's rules and regulations and the national Environmental Policy Act and the Clean Water Act. The previous environmental impact statements, NUREG-1811 and NUREG-1917, fall far short of these requirements.

Respectfully submitted,

A handwritten signature in black ink that reads "Louis A. Zeller". The signature is written in a cursive style and is positioned above a horizontal line.

Louis A. Zeller

⁸ North Anna Early Site Permit Application Part 3 - Environmental Report, Revision 9, September 2006, page 3.3.4