

BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE

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March 1, 2005

Chief, Rules and Directives Branch
Division of Administrative Services
Office of Administration
Mailstop T6-D59
US Nuclear Regulatory Commission
Washington, DC 20555-0001
NorthAnna_ESP@nrc.gov

**Re: Draft Environmental Impact Statement for North Anna Early Site Permit,
Docket 52-008, NUREG-1811**

Dear Sir:

On behalf of the Blue Ridge Environmental Defense League and our members in Virginia, I write to provide additional comments. These comments are in addition to the oral remarks of February 17th delivered at the public hearing in Mineral, Virginia and my previous written comments.

Overview

The Draft Environmental Impact Statement for Dominion Virginia Power's North Anna Early Site Permit fails to properly address a number of critical issues regarding proposed nuclear power plants:

- 1) The DEIS omits critical information about seismology in the Central Virginia Area. The proposed construction of two or more reactors in close proximity to two existing nuclear reactors in an active earthquake zone beggars understanding.
- 2) The DEIS fails to address negative impacts on human health caused by historic radiation releases from existing North Anna nuclear reactors. In the ten counties nearest the plants, the breast cancer mortality rate increased 73% in the decade after the reactors began operation; the increase in the counties nearest the plant was triple the statewide increase.
- 3) The federal occupational radiation worker dose limit of 5 rem per year is arbitrary and capricious and would not protect worker health or safety. The NRC's 5 rem limit is based too heavily on economic factors, not medical knowledge. The NRC standard is more than double the maximum set by the International Commission on Radiation Protection. The NRC standard is illegal and unacceptable.
- 4) The DEIS fails to consider alternative sources to nuclear energy for the generation of electric power by Dominion at North Anna. Renewable sources of energy such as wind, solar, and small hydro are available in Virginia and could provide electric power generation with far smaller environmental and human health impacts.

Background on the Dominion Virginia Power Early Site Permit

On September 23, 2003 Dominion Virginia Power submitted an application to the Nuclear Regulatory Commission for an Early Site Permit at the North Anna Power Station. Approval of the applicant's request by the Commission would permit Dominion to reserve a site at the 1803 acre North Anna Power Station for the construction of two or more addition nuclear reactor units, to be designated North Anna Units 3 and 4. According to the Dominion's Site Safety Analysis Report, "Each unit would consist of a plant of one or more modules that would not exceed 4300 MWth [megawatts-thermal] of nuclear generating capacity." [ESP Application Part 2-Site Safety Analysis Report, Section 1.2.2, page 2-1-3, Sept. 2003] At present, Dominion operates two pressurized water reactor units each rated at 2893 MWth, each with a design power of 907 MWe (megawatts-electricity). In its request, Dominion seeks a permit to add 8600 MWth of new power generating capacity. This ESP application was the first to be received by the Nuclear Regulatory Commission under its new early site approval regulatory regime.

Earthquakes in the Central Virginia Seismic Zone

Dominion failed to adequately address the seismic history of the proposed ESP site. The Draft EIS contains only one page on the geology of the ESP site at North Anna. Section 2.4 alludes to two previous environmental reports prepared for North Anna Units 1 & 2 (done by Dames and Moore for VEPCo in 1969) and the never constructed North Anna Units 3 & 4 (Dames and Moore, 1971). It has come to our attention through recent conversations with the June Allen, M. Ed., former President of the North Anna Environmental Coalition, that there were "multiple problems beginning 33 years ago" with regard to the seismic faults underlying the North Anna station. According to information and belief, false statements were filed in that matter which were uncovered too late to affect the permitting decision. The ESP DEIS states that seismological data will be addressed in the safety evaluation report. Nevertheless, we hereby request that the DEIS record include and consider all documents in the case filed by North Anna Environmental Coalition during the extensive litigation brought during the 1970's.

The US Geological Survey describes central Virginia's seismology as follows:

Since at least 1774, people in central Virginia have felt small earthquakes and suffered damage from infrequent larger ones. The largest damaging earthquake (magnitude 4.8) in the seismic zone occurred in 1875. Smaller earthquakes that cause little or no damage are felt each year or two.

On December 9, 2003 there was a 4.5 Richter Scale earthquake in central Virginia, just one day after the NRC's first hearing on the ESP in Mineral. Again, according to the US Geological Survey:

This was a complex event consisting of two sub-events occurring 12 seconds apart. Slight damage (VI) at Brems Bluff and Kents Store. Felt (V) at Columbia, Fork Union, Goochland, Oilville, Rockville and Sandy Hook; (IV) at

Appomattox, Amelia Court House, Amherst, Blackstone, Bumpass, Charlottesville, Chester, Chesterfield, Colonial Heights, Cumberland, Dillwyn, Farmville, Glen Allen, Lawrenceville, Louisa, Manakin Sabot, Mechanicsville, Midlothian, Mineral, Palmyra, Petersburg, Powhatan, Richmond, Scottsville and Spotsylvania; (III) at Alexandria, Fairfax, Falls Church, Fredericksburg, Lexington, Lynchburg, McLean, Roanoke, Staunton and Vienna. Also felt (III) at Bethesda, Rockville and Silver Spring, Maryland and at Rocky Mount and Winston Salem, North Carolina. Felt (II) at Chapel Hill, Greensboro and Raleigh, North Carolina and at Washington, DC. Felt in much of Maryland and Virginia. Also felt in north-central North Carolina and a few areas of Delaware, New Jersey, New York, Pennsylvania, and West Virginia.

This information is easily available at <http://neic.usgs.gov/neis/poster/2003/20031209.html>. The horizontal acceleration which occurs during earthquakes presents unacceptable risks for a technology as sensitive as nuclear power. The proposed construction of two or more reactors in close proximity to two existing nuclear reactors in an active earthquake zone beggars understanding.

Negative Impacts on Human Health and the Environment

Dominion and the DEIS failed to investigate impacts caused by the addition of two or more reactors at its North Anna nuclear station including but not limited to the risks of cancer from ionizing radiation, birth defects (congenital anomalies), infant mortality, infant cancer incidence, heart disease, and neurological effects. We first brought this to the Commission's attention during the scoping hearing.

Federal regulations governing NRC site permit applications submitted after January 10, 1997 require that radiation dose be "acceptably low" at proposed nuclear power stations. 10 CFR 100.1 states:

(c) Siting factors and criteria are important in assuring that radiological doses from normal operation and postulated accidents will be acceptably low, that natural phenomena and potential man-made hazards will be appropriately accounted for in the design of the plant, that site characteristics are such that adequate security measures to protect the plant can be developed, and that physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans are identified.

Further, federal site permit regulations state that nuclear reactor design, construction and operation are the principal factors in the determination of public health and safety. 10 CFR 100.1 states:

(b) There exists a substantial base of knowledge regarding power reactor, design, construction, and operation. This base reflects that the primary factors that

determine public health and safety are the reactor design, construction and operation.

However, Dominion utilizes and the NRC accepts a *plant parameters envelope*, or PPE, in lieu of an actual reactor design to estimate safety impacts of the ESP. The company's application states:

Dominion has not selected a particular reactor design to be constructed at the ESP site. Thus, in order to provide sufficient design information to enable the NRC to determine that the site is suitable for new units, a surrogate design has been provided. [ESP Application Part 2-Site Safety Analysis Report, Section 2.1.1, page 2-1-1, Sept. 2003]

Dominion's ESP application posits a PPE which is filled with qualifiers and escape clauses. PPE date is not site-specific, not from the ESP site, and bounds only 85% of existing sites. The application states: "Site specific information is not listed on these tables. The data in this table is not to be taken as final design specific information. In some cases, where designs are not mature, the data supplied is based on *engineering judgment*, prior experience, or *a calculation based on non-site specific assumptions*." (emphasis added) [ESP Application Part 2-Site Safety Analysis Report, Section 1.3.3, page 2-1-13, Sept. 2003] Dominion's assertion that these data "can be used until site-specific design data is available" is unsupported. The NRC cannot permit the company's educated guesses to substitute for the data requirements of federal law.

The consequence of these deficiencies is that one cannot verify the impacts of the new reactors. This is a failure of omission which prevents the NRC and the general public from properly assessing the impact of new reactors at North Anna and ascertaining the accuracy of Dominion's analyses. Similarly unable to assess his wares, a Virginia farmer might label them "a pig in a poke."

The ESP process itself encourages judgment which is inherently flawed. The Supreme Court addressed a similar two-step regulatory process in 1961 regarding the AEC permit for the Fermi reactor. Though the court approved, Justices William O. Douglas and Hugo Black in their dissent wrote "When millions have been invested, the momentum is on the side of the applicant, not on the side of the public." Douglas and Black further criticized the Commission's approval of the reactor permit before resolution of safety issues as "a lighthearted approach to the most awesome, the most deadly, the most dangerous process ever created." [Power Reactor Development Company v. International Union of Electrical, Radio and Machine Workers, AFL-CIO et al, 367 US 396 (1961)] The Supreme Court Justices' dissent was prescient: Five years later an accident at the Fermi reactor caused an emergency shut-down, and by 1972 the reactor was shut down for good. The term "China Syndrome" was coined to describe what engineers feared following the partial melt-down at Fermi.

Nevertheless, with the submission of the ESP application by Dominion, the NRC must evaluate the ESP application for atmospheric dispersion characteristics to prove that radioactive air

emissions from routine operations and accidents will not pose a health threat to the surrounding community. 10 CFR §100.21 states:

(c) Site atmospheric dispersion characteristics must be evaluated and dispersion parameters established such that:

- (1) Radiological effluent release limits associated with normal operation from the type of facility proposed to be located at the site can be met for any individual located offsite; and
- (2) Radiological dose consequences of postulated accidents shall meet the criteria set forth in §50.34(a)(1) of this chapter for the type of facility proposed to be located at the site;

Here the site permit regulation which Dominion must adhere to is predicated on the type of nuclear power unit. But since “Dominion has not selected a particular reactor design,” the power unit is as yet undetermined. In order to evaluate the radiological dose consequences as stipulated in 10 CFR §100.21 (c)(2), the NRC must have the *preliminary safety analysis report* (PSAR) which would be submitted with Dominion’s application for a construction permit. As stipulated in 10 CFR §50.34(a)(1), the PSAR applicable to North Anna would include:

- (ii) A description and safety assessment of the site and a safety assessment of the facility. It is expected that reactors will reflect through their design, construction and operation an extremely low probability for accidents that could result in the release of significant quantities of radioactive fission products.

Dominion’s ESP application for North Anna contains no safety assessment of the facility and, therefore, cannot demonstrate a low probability of accidental releases of fission products.

The public record contains evidence that North Anna has not and will not meet the requirements under 10 CFR §100.21 (c)(1). In the ten counties nearest North Anna, the breast cancer mortality rate increased 73% in the decade after the reactors began operation, an increase made more significant by the fact that the combined rate for all counties within 100 miles of the plant is only 4% higher. Moreover, the increase in the counties nearest the plant was triple the statewide increase in breast cancer mortality during that period. [“The Enemy Within,” Jay Gould et al, 1996, Appendix B, p. 244] In human terms, 172 more women died from breast cancer during the decade after North Anna 1 and 2 opened than in previous decades in Goochland, Fluvanna, Albemarle, Louisa, Orange, Greene, Cumberland, Buckingham, Powhatan, and Nelson counties. Airborne emissions of radioactive gases at North Anna during the decade after Unit 1 reached criticality in 1978 was on average 8,900 Curies per year. Emissions to water during this same period was on average 2.16 Curies per year. [“The Enemy Within,” Jay Gould et al, 1996, Appendix C, p. 310]

Worker Exposure Would Not Be As Low As Reasonably Achievable

The 5 REM per annum standard is inadequate to protect the health of nuclear plant workers.

10 CFR §20.1201 “Occupational dose limits for adults”

“The licensee shall control the occupational dose to individual adults...to the following dose limits. (1) An annual limit, which is the more limiting of -- (i) The total effective dose equivalent being equal to 5 rems (0.05 Sv)....”

The federal occupational radiation worker dose limit of 5 rem per year is arbitrary and capricious and would not protect worker health or safety.

10 CFR §50, Appendix I, “Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion ‘As Low As is Reasonably Achievable’ for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents.”

During construction of new units and during operation, construction workers and plant personnel would be exposed to radiation sources within the restricted area boundary of existing nuclear power plants. Exposure would occur via direct radiation, gaseous effluents and liquid effluents. The federal annual radiation worker limit is 5 rem which will result in excessive genetic defects, morbidity and mortality. The Nuclear Regulatory Commission’s standard is more than double the standard set by the International Commission on Radiation Protection. The ICRP estimates that 5 rems of exposure would result in a 1 in 500 cancer death rate. The Commission’s standard is not conform to ALARA standards (As Low As Reasonably Achievable); rather, it is an illegal and unacceptable compromise which is based primarily on cost, not on the protection of worker health.

A license issued by the NRC must conform to standards which above all protect worker health and safety. These standards are embodied in 10 CFR §20 which states:

10 CFR §20.1001 “Purpose.”

(a) The regulations in this part establish standards for protection against ionizing radiation resulting from activities conducted under licenses issued by the Nuclear Regulatory Commission. These regulations are issued under the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended.

(b) It is the purpose of the regulations in this part to control the receipt, possession, use, transfer, and disposal of licensed material by any licensee in such a manner that the total dose to an individual (including doses resulting from licensed and unlicensed radioactive material and from radiation sources other than background radiation) does not exceed the standards for protection against radiation prescribed in the regulations in this part. *However, nothing in this part shall be construed as limiting actions that may be necessary to protect health and safety.* (emphasis added)

Dr. Stuart Bushong, Professor of Radiology, Baylor College of Medicine says, “The 5-rem standard is an administrative standard.” In other words, it is the result of a compromise forced by economic factors, not medical knowledge. The US Environmental Protection Agency estimates

that tightening the worker radiation exposure standard by 70% would require the nuclear industry to hire 30,000 additional personnel and would cost hundreds of millions of dollars.

Dominion's Environmental Report states that the "maximum annual collective dose to the construction work force (5000 workers) is estimated to be 93 person-rem." [ESP Application Part 3-Environmental Report, Section 4.5.4.4, page 3-4-38, Sept. 2003]

Moreover, the Commission's annual radiation worker limit of 5 rem does not conform to the ALARA concept (As Low As Reasonably Achievable), adopted by the Commission in 1991. The 5 rem standard will result in excessive genetic defects, morbidity and mortality. The NRC standard is 150% higher than the standard set by the International Commission on Radiation Protection. The ICRP estimates that 5 rems of exposure would result in a 1 in 500 cancer death rate (20E+04). This is not ALARA; this is not legal; this is not acceptable.

Alternative Sources of Energy: Wind, Solar & Small Hydro

The proposed action is a major Federal action significantly affecting the quality of the human environment; therefore, the NRC must consider alternative sources to nuclear energy for the generation of electric power by Dominion at North Anna before granting an ESP. Renewable sources of energy such as wind, solar, and small hydro are available in Virginia and, if implemented, would allow increased electric power generation with smaller environmental and human health impacts. Federal regulations pertaining to the environmental quality which apply:

10 CFR §51.10 "Purpose and scope of subpart; application of regulations of Council on Environmental Quality."

"The regulations in this subpart implement section 102(2) of NEPA in a manner which is consistent with the NRC's domestic licensing and related regulatory authority under the Atomic Energy Act of 1954, as amended, ...and which reflects the Commission's announced policy to take account of the regulations of the Council on Environmental Quality...."

10 CFR §51.20 "Criteria for and identification of licensing and regulatory actions requiring environmental impact statements."

10 CFR §51.41 Requirement to submit environmental information.

"The Commission may require an applicant for a permit, license, or other form of permission, or amendment to or renewal of a permit, license or other form of permission, or a petitioner for rulemaking to submit such information to the Commission as may be useful in aiding the Commission in complying with section 102(2) of NEPA. The Commission will independently evaluate and be responsible for the reliability of any information which it uses."

The proposed ESP is a major Federal action significantly affecting the quality of the human environment and it is the first such permit to be applied for. Dominion's Environmental Report does not contain a sufficient discussion of the purpose and need for the proposed action, the

environmental impacts, or the relative costs and benefits of alternatives. In its application for an ESP, Dominion failed to properly assess alternatives to its proposed action including the utilization of renewable energy to generate electricity. There are three favorable alternatives which could make additional nuclear reactors at North Anna unnecessary: wind energy, solar energy, and small-scale hydropower.

Regulations under the National Environmental Policy Act which apply to licensing by the Commission are found in the Code of Federal Regulations Title X Section 51 which state:

10 CFR §51.10

(a) The National Environmental Policy Act of 1969, as amended (NEPA) directs that, to the fullest extent possible: (1) The policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in NEPA, and (2) all agencies of the Federal Government shall comply with the procedures in section 102(2) of NEPA except where compliance would be inconsistent with other statutory requirements. The regulations in this subpart implement section 102(2) of NEPA in a manner which is consistent with the NRC's domestic licensing and related regulatory authority under the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and the Uranium Mill Tailings Radiation Control Act of 1978, and which reflects the Commission's announced policy to take account of the regulations of the Council on Environmental Quality published November 29, 1978 (43 FR 55978 - 56007) voluntarily, subject to certain conditions.

(b) The Commission recognizes a continuing obligation to conduct its domestic licensing and related regulatory functions in a manner which is both receptive to environmental concerns and consistent with the Commission's responsibility as an independent regulatory agency for protecting the radiological health and safety of the public.

The Commission can and, we contend, should require Dominion to submit information in accord with NEPA to allow an independent and fully informed evaluation as required by NEPA, including the no-build option.

10 CFR §51.41 "Requirement to submit environmental information."

The Commission may require an applicant for a permit, license, or other form of permission, or amendment to or renewal of a permit, license or other form of permission, or a petitioner for rulemaking to submit such information to the Commission as may be useful in aiding the Commission in complying with section 102(2) of NEPA. The Commission will independently evaluate and be responsible for the reliability of any information which it uses.

Before granting a permit, the NRC has the duty to comply with the National Environmental Policy Act (NEPA) to the fullest extent possible. In *Calvert Cliffs' Coordinated Committee v. Atomic Energy Commission*, 449 F.2d 1109 (D.C. Cir. 1971), *cert. denied*, 404 U.S. 942 (1972),

the court said a federal agency is “not only permitted, but compelled, to take environmental values into account. Perhaps the greatest importance of NEPA is to require [all] agencies to *consider* environmental issues just as they consider other matters within their mandates.” In *Natural Resources Defense Council v. Morton*, 458 F.2d 827 (D.C. Cir. 1972) the court held that reasonable alternatives must be considered, even if the alternatives are not within the scope of the agency.

For the record, I would like to add that the NRC’s moderator at the February 17th public hearing in Mineral did an excellent job. Throughout the meeting, Mr. Cameron was courteous, respectful and professional.

Finally, I wish to be informed of any decisions made by the Commission on this matter.

Respectfully submitted,

Louis Zeller

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**Re: Draft Environmental Impact Statement for North Anna Early Site Permit,
Docket 52-008, NUREG-1811**

Dear Sir:

Attached is an addendum to the comments I submitted earlier today. For the hearing record, I hereby request that the health study by Dr. Ernest Sternglass, the data compiled by the Illinois Department of Public Health, and the Mangano article published in *Archives of Environmental Health* cited by Representative Markey and the congressman's letter to the Nuclear Regulatory Commission be included in our comments. Dr. Sternglass' research further supports our statements on the negative impacts of nuclear power on human health and the environment. Moreover, we support Rep. Markey's directive to the Nuclear Regulatory Commission "to study not summarily dismiss the connection between serious health risks and radiation released from nuclear reactors."

Respectfully,

Louis Zeller

Attachment

Attachment

NEWS FROM ED MARKEY

United States Congress Massachusetts Seventh District

FOR IMMEDIATE RELEASE February 18, 2005

CONTACT: Mark Bayer, Michael Freedhoff (202) 225-2836

NEW STUDY SUGGESTS SPIKE IN INFANT MORTALITY ASSOCIATED WITH RADIATION FROM NUKE PLANTS

Markey Questions NRC on Health Risks of Living Near Nuclear Reactors

Washington, DC: Rep. Edward Markey (D-MA), a senior member of the House Energy and Commerce Committee, the panel which oversees nuclear power regulation, today released a letter he sent to the Nuclear Regulatory Commission (NRC) regarding health risks for communities who live close to nuclear reactors. A new study released today by Dr. Ernest Sternglass of the University of Pittsburgh suggests that infant mortality increased significantly in 2002, after operating capacity at 104 nuclear power stations reached its highest levels.

“The nuclear industry and the NRC have automatically dismissed all studies that link increased cancer risk to exposure to low levels of radiation,” said Rep. Markey. “The reality is that the data suggest that we should be taking this potential linkage much more seriously.”

Rep. Markey’s letter to the NRC was motivated by the ordeals of the Sauer family, former residents of Minooka, IL, which is located close to the Dresden nuclear power plant. The family has recently relocated because of concerns about the health impacts associated with living near the Dresden plant, which were heightened because of their daughter’s brain cancer. In June 2003, the NRC was presented with data obtained from the Illinois Department of Public Health (IDPH) that indicate that in Grundy County, IL between 1995-99, the infant mortality rate has doubled, there has been a nearly 400% increase in pediatric cancer and a 38% increase in cancer among those aged 28-44 years old (while the same statistic for all of IL decreased by 8%). Moreover, other statistics show that the incidence of leukemia was 50% higher in men and 100% higher in women in Grundy County than it was in the rest of the State. In its responses to the Sauers, NRC personnel have ignored these statistics and have instead cited a 1990 National Cancer Institute (NCI) study entitled “Cancer in Populations Living Near Nuclear Facilities”, which has numerous flaws in design, since, as the authors themselves stated, the limitations in the design were accepted so that “it could be completed in a timeframe that was relatively short for a survey of such magnitude.”

In addition to the Sauer case, Rep. Markey's office has been made aware of additional studies and data:

- Today, Dr. Ernest Sternglass of the University of Pittsburgh is releasing data at the American Association for the Advancement of Science meeting in Washington DC indicating a spike in infant mortality that occurred in 2002, coming after operating capacity at 104 nuclear power stations reached its highest levels and increased at the highest rate in the U.S. between 1997 and 2001. His work also refers to a scientific paper indicating that low levels of radiation exposure during pregnancy is directly related to low birth weight which, in addition to infant mortality, has also been implicated in numerous chronic diseases, including autism, asthma, cognitive dysfunction, rheumatoid arthritis, anemia, obesity, heart disease and cancer.
- A 2003 article by Joseph Mangano et al in Archives of Environmental Health found elevated levels of childhood cancers in populations living within 30 miles of nuclear power plants between 1988-1997. For example, in Plymouth County, MA (near the Pilgrim Power plant), there was found to be a 14.6% increase in the numbers of childhood cancers as compared to the rest of the country. And in Essex County, MA and Rockingham County, NH (near the Seabrook Power plant), there was found to be a 24.8% increase in the numbers of childhood cancer mortalities.

“The NRC needs to study – not summarily dismiss - the connection between serious health risks and radiation released from nuclear reactors. I am urging the agency to investigate these risks, and I will continue to closely monitor the NRC's progress in this important area,” Rep. Markey concluded.

For a copy of the letter sent to the NRC, please see www.house.gov/markey
