

UNITED STATES OF AMERICA
U.S. NUCLEAR REGULATORY COMMISSION
BEFORE THE SECRETARY

In the Matter of:
Tennessee Valley Authority
Clinch River Nuclear Site
Early Site Permit
Docket No. 52-047
NRC-2016-0119

June 12, 2017

**HEARING REQUEST AND PETITION TO INTERVENE BY
BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE**

Pursuant to 10 CFR § 2.309 and a notice published by the Nuclear Regulatory Commission (õNRCö or õCommissionö) at 82 Fed. Reg. 16436, Petitioner Blue Ridge Environmental Defense League (õBREDLö) petitions to intervene in the above-captioned proceeding. As demonstrated below, Petitioner has representational standing, through a member of the organization, to make this hearing request.

Description of this Proceeding

This proceeding concerns an application by Tennessee Valley Authority (õTVAö or õApplicantö) for an Early Site Permit (õESPö) for construction of one or more so-called small modular nuclear reactors (õSMRö) on the Clinch River Nuclear site (õCRNö) located in Oak Ridge, Tennessee, in Roane County. TVA filed its application with the Commission on May 12, 2016. The Commission published a notice of opportunity to request a hearing on April 4, 2016. On June 2, 2017, responding to a request from two

other petitioners, the Commission issued an Order stating that petitioners would have until June 12, 2017, to file hearing petitions on TVA's license application.

According to the Applicant, TVA has prepared this ER to analyze the environmental effects of construction, operation, and decommissioning of two or more SMRs at the CRN Site. CRN ESP Application ER Part 3, Chapter 1 at 1-1. TVA proposes to build two or more nuclear powered electric generating reactors with a maximum electrical output of 800 megawatt-electric (MWe) for the site on the Clinch River. The 935-acre CRN site is located in a bend of the Clinch River in Roane County, Tennessee, within the city limits of Oak Ridge, Tennessee, population 29,300.

The purpose for the ESP, according to TVA, is to demonstrate the capability of small modular reactor technology. The issues before the Commission pursuant to the National Environmental Policy Act (NEPA) center on whether the ESP can be issued in accordance with 10 CFR Part 51. The issues to be decided pursuant to the Atomic Energy Act (AEA) are 1) Whether the issuance of an ESP will be inimical to the common defense and security or the health and safety of the public and 2) whether a reactor or reactors can be constructed and operated without undue risk to the health and safety of the public.

Description of Petitioner

BREDL is a regional, community-based non-profit environmental education organization whose founding principles are earth stewardship, environmental democracy, social justice, and community empowerment. BREDL encourages government agencies and citizens to take responsibility for conserving and protecting our natural resources.

BREDL advocates grassroots involvement to empower whole communities in environmental issues. BREDL also functions as a watchdog of the environment, monitoring issues and holding government officials accountable for their actions.

Standing

As required by 10 C.F.R. § 2.309 (d), a hearing request must set forth with particularity the interest of the petitioner in the proceeding, how that interest may be affected by the results of the proceeding, including the reasons why the petitioner should be permitted to intervene with particular reference to the factors set forth in 10 CFR 2.309(d)(1), and the specific aspect or aspects of the subject matter of the proceeding as to which the petitioner wishes to intervene.

In addition, the hearing request must identify the petitioner and address 1) the nature of the petitioner's right under the Atomic Energy Act to be made a party to the proceeding, 2) the nature and extent of the petitioner's property, financial, or other interest in the proceeding, and 3) the possible effect of any order that may be entered in the proceeding on the petitioner's interest. *Id.*

Other standing requirements are found in NRC case law. As summarized by the Atomic Safety and Licensing Board (ASLB), these standing requirements are as follows:

In determining whether a petitioner has sufficient interest to intervene in a proceeding, the Commission has traditionally applied judicial concepts of standing. *See Metropolitan Edison Co.* (Three Mile Island Nuclear station, Unit 1), CLI-83-25, 18 NRC 327, 332 (1983) (citing *Portland General Electric Co.* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610 (1976)). Contemporaneous judicial standards for standing require a petitioner to demonstrate that (1) it has suffered or will suffer a distinct and palpable harm that constitutes injury-in-fact within the zone of interests arguably protected by the

governing statutes (e.g., the Atomic Energy Act of 1954 (AEA), the National Environmental Policy Act of 1969 (NEPA)); (2) the injury can be fairly traced to the challenged action; and (3) the injury is likely to be redressed by a favorable decision. *See Carolina Power & Light Co.* (Shearon Harris Nuclear Power Plants), LBP-99-25, 50 NRC 25, 29 (1999). An organization that wishes to intervene in a proceeding may do so either in its own right by demonstrating harm to its organizational interests, or in a representational capacity by demonstrating harm to its members. *See Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), LBP-98-9, 47 NRC 261, 271 (1998). To intervene in a representational capacity, an organization must show not only that at least one of its members would fulfill the standing requirements, but also that he or she has authorized the organization to represent his or her interests. *See Private Fuel Storage, L.L.C.* (Independent Fuel Storage Installation), LBP-98-7, 47 NRC 142, 168, *aff'd on other grounds*, CLI-98-13, 48 NRC 26 (1998). *Pacific Gas & Electric Co.* (Diablo Canyon Power Plant Independent Spent Fuel Storage Installation), LBP-02-23, 56 NRC 413, 426 (2002) (hereinafter "Diablo Canyon").

Petitioner's standing to participate in this proceeding is demonstrated by the declaration of the following member of Petitioner's organization, who has authorized the Petitioner to represent his interests in this proceeding:

Jake Almond, Kingston, TN (Declaration of Standing Filed)

As demonstrated by the attached declaration, Mr. Almond lives very near the proposed site; i.e., within 2 miles, his home overlooking the Clinch River and the Department of Energy's Clinch River site. Thus, he has presumptive standing by virtue of proximity to the nuclear plant that TVA would construct. *Diablo Canyon, supra*, 56 NRC at 426-427, citing *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-01-6, 53 NRC 138, 146, *aff'd*, CLI-01-17, 54 NRC 3 (2001) (hereinafter "Florida Power & Light"). In *Diablo Canyon*, the Licensing Board noted that petitioners who live within 50 miles of a proposed nuclear power plant are presumed to have standing in reactor construction permit and operating license cases, because there is an "obvious potential for offsite consequences" within that distance. *Id.* Here, the granting

of an Early Site Permit to TVA would facilitate the granting of a construction permit and operating license for one or more so-called small modular reactors on the Clinch River.

Thus, the same standing concepts apply.

The Petitioner's member seeks to protect his life and health by opposing the issuance of an Early Site Permit to TVA. The issuance of an ESP could have an adverse effect on their health and safety by paving the way for an unsafe, experimental nuclear operation. Petitioner seeks to ensure that no Early Site Permit is issued by the U.S. Nuclear Regulatory Commission unless TVA demonstrates full compliance with the Atomic Energy Act and NEPA.

A petitioner is obligated to provide the analyses and supporting evidence showing why its bases support its contention. *See Georgia Institute of Technology (Georgia Tech Research Reactor, Atlanta, Georgia), LBP-95-6, 41 NRC 281.* Although a licensing board may not make factual inferences on a petitioner's behalf, the board may nevertheless appropriately view a petitioner's supporting information in a light favorable to the petitioner. *See Southern Nuclear Operating Company (Early Site Permit for Vogtle ESP Site) LBP-07-03.*

General Issue

The concept of "plant parameter envelope" is a complicating factor, both in the contention proffered *infra*, and in general. Guidance developed by the US Department of Energy highlights the issue: "It is unclear if the existing NRC guidance for ESP applications sufficiently addresses expected level of details needed to adequately use the PPE approach for future ESP applications. This is especially relevant regarding cases

where exact size of reactor footprint is not accurately known. Based on North Anna and Grand Gulf COLA experiences, the need should be evaluated for future NRC guidance pertaining to the PPE approach to clarify these issues. For example, guidance may be helpful on using the PPE approach when the range of facilities considered consists of specific designs that are the subject of reference COLAs.¹

In the extant situation, of course, there is no reference COLA (combined operating license application), so no clarification is forthcoming. The problem is made manifest specific to this petition in TVA's Environmental Report.

CONTENTION: TVA'S ENVIRONMENTAL REPORT FAILS TO PROVIDE COMPLETE AND ACCURATE INFORMATION ON ALTERNATIVES, INCLUDING THE NO-BUILD OPTION

This contention centers of the requirements of the National Environmental Policy Act of 1969 *et seq.*

A. Statement of the issue of law

In accord with National Environmental Policy Act 42 USC 4332; 83 Stat. 853 §102, major federal actions, including nuclear power plant site permits, must include a detailed statement by the issuing agency on the environmental impact of the proposed action including adverse environmental effects which cannot be avoided and alternatives to the proposed action, including the no-build option or no-action alternative.

¹ US DOE Report on Lessons Learned from the NP 2010 Early Site Permit Program, Final Report, Section 4.1, PPE Approach, March 26, 2008

B. Brief explanation of the basis for the contention

The Applicant has not fulfilled its NEPA obligation to provide a detailed, accurate statement, with particularity to the no-build option.

C. Issue raised is within the scope of the proceeding

Federal regulations at 10 CFR § 51.50 state, "Each applicant for an early site permit shall submit with its application a separate document, entitled "Applicant's Environmental Report - Early Site Permit Stage," which shall contain the information specified in §§ 51.45, 51.51, and 51.52...."

10 CFR § 51.45(b)(3) requires "discussion of alternatives shall be sufficiently complete to aid the Commission in developing and exploring, pursuant to section 102(2)(E) of NEPA, "appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

10 CFR § 51.51 requires "every environmental report prepared for the construction permit stage or early site permit stage or combined license stage of a light-water-cooled nuclear power reactor, and submitted on or after September 4, 1979, shall take Table S-3, Table of Uranium Fuel Cycle Environmental Data, as the basis for evaluating the contribution of the environmental effects of uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and management of low-level wastes and high-level wastes related to uranium fuel cycle activities to the environmental costs of licensing the nuclear power reactor."

10 CFR § 51.52 requires "every environmental report prepared for the construction permit stage or early site permit stage or combined license stage of a light-water-cooled nuclear power reactor, and submitted after February 4, 1975, shall contain a statement concerning transportation of fuel and radioactive wastes to and from the reactor."

D. The issue raised is material to the findings the NRC must make

NUREG-1555, the environmental standard review plan (ESRP), directs the NRC staff to prepare an introduction to the environmental impact statement (EIS) that describes alternatives to the proposed action, including the no action alternative, consistent with the intent of 10 CFR 51.70(b), which requires that, to the fullest extent possible, statements be prepared "concurrently or integrated with" studies required by other Federal law. Acceptance of the no-action criteria is based on 10 CFR 51, Appendix A to subpart A, with respect to the analysis of alternatives, and Regulatory Guide 4.2, Rev. 2, *Preparation of Environmental Reports for Nuclear Power Stations*, with respect no-action alternatives.

E. Facts or expert opinions which support the requestor's/petitioner's position

NEPA requires federal agencies to "study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." National Environmental Policy Act, § 102, 42 U.S.C. 4332(E) (2006). TVA, a federal agency itself, is required to abide by this rule. However, it has not done so. The Applicant's ER gives short shrift to alternatives, with summary dismissal of the no-action alternative. The ER states the SMW would avoid reliance on "a regional grid system," the accepted, reliable system

now in place across the TVA service area and elsewhere. Clinch River Nuclear Site Early Site Permit Application, Part 3, Environmental Report, Section 9.1. Zero analysis to justify this dismissal is included in the ER. The discussion of Alternatives in ER Chapter 9 is likewise limited solely to various methods of providing thermoelectric cooling such as cooling towers with natural draft, dry, wet natural draft and wet-dry systems, cooling and spray ponds. The considered alternatives run the gamut from A to B. Yet, the ER seeks to stake out higher ground on the issue of global warming. TVA's ESP application states:

In 2009, Executive Order (EO) 13514 was issued on *Federal Leadership in Environmental, Energy, and Economic Performance*. EO 13514 directed all Federal Agencies to reduce their greenhouse gas (GHG) emissions by 28% by 2020 (Reference 1-1). This was followed by EO 13693 (March 2015), *Planning for Federal Sustainability in the Next Decade* (Reference 1-2), which called for further reduction of Federal facility GHG emissions to 40 percent by 2025, and identified SMRs as one of the "alternative energy" options for meeting clean energy goals.

Further:

In 2013, Executive Order (EO) 13636 was issued on *Improving Critical Infrastructure Cybersecurity and Presidential Policy Directive (PPD) 21 on Critical Infrastructure Security and Resilience* (Reference 1-3). EO 13636 and PPD-21 are designed to strengthen the security and resilience of critical infrastructure against evolving threats and hazards.²

However, neither of these goals is advanced by the siting of two or more modular reactors at the Clinch River Nuclear Site. We take them in turn.

Global Warming

Executive Order 13514, titled "Federal Leadership in Environmental, Energy, and Economic Performance," was issued on October 5, 2009. The public policy advanced by the President's Order was:

² Clinch River Nuclear Site Early Site Permit Application, Part 3, Environmental Report, page 1-2

[I]ncrease energy efficiency; measure, report, and reduce their greenhouse gas emissions from direct and indirect activities; conserve and protect water resources through efficiency, reuse, and stormwater management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services; design, construct, maintain, and operate high performance sustainable buildings in sustainable locations; strengthen the vitality and livability of the communities in which Federal facilities are located; and inform Federal employees about and involve them in the achievement of these goals.³

The United States is the world's largest energy consumer; the federal government is the nation's single largest energy user; the Department of Defense is the biggest energy user in the federal government; and the leading use of energy in the Defense Department is...jet fuel. In other words, energy use in the most energy-intensive federal agency is used principally to fly or drive heavy equipment over long distances. A modular nuke at Clinch River would not have any impact here.

Moreover, the general trend in energy use by the federal government has been downward for the last four decades, and is now in steep decline. According to the Federal Energy Management Program, "this accomplishment is directly attributed federal employees making the choice for efficiency and striving to reduce operating costs." The tools employed by federal agencies are: training, technical assistance and energy performance contracts. Not nuclear power, not SMRs.

A subsequent executive order, EO 13693 "Planning for Federal Sustainability in the Next Decade," was issued on March 19, 2015. This order revoked EO 13514 but reiterated the overall policy: "It therefore continues to be the policy of the United States that agencies shall increase efficiency and improve their environmental performance."

³ Federal Register Vol. 74, No. 194, Page 52117, October 8, 2009

EO 13693 also set specific targets for cleaner energy sources with interim goals, the end points to be achieved by 2025 for building-electric energy and thermal energy.

Two broad energy categories are defined in EO 13693: Renewable and alternative. They are not the same. According to the order, *alternative energy*⁴ includes small modular nuclear reactors. The order's definition of *renewable energy*⁵ does not include small modular reactors. The differences are significant when applied to the ten-year sustainability goals set by Section 3 of the order.⁶ Section 3(b) of the order is specific to *building electric energy and thermal energy* which shall be provided by renewable electric energy and alternative energy, "not less than 25 percent by fiscal year 2025." However, Section 3(c) states that the percentage of *building electric energy* to be provided by renewable electric energy is to be "not less than 30 percent by fiscal year 2025."

Clearly, the Executive Order contemplates *alternative energy* sources to be heat sources, such as nuclear and other thermoelectric power plants. The *renewable* sources, directed to be used solely for electrical generation, are largely solar, wind, wave, heat pumps and hydroelectric. The order provides TVA with no justification for so-called small modular reactors, particularly within the eight-year window remaining between now and 2025.

⁴ "alternative energy" means energy generated from technologies and approaches that advance renewable heat sources, including biomass, solar thermal, geothermal, waste heat, and renewable combined heat and power processes; combined heat and power; small modular nuclear reactor technologies; fuel cell energy systems; and energy generation, where active capture and storage of carbon dioxide emissions associated with that energy generation is verified." EO 13693, Section 19(c)

⁵ "renewable electric energy" means energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, geothermal heat pumps, microturbines, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project." EO 13693, Section 19(v)

⁶ Sec. 3. *Sustainability Goals for Agencies*, In implementing the policy set forth in section 1 of this order and to achieve the goals of section 2 of this order, the head of each agency shall, where life-cycle cost-effective, beginning in fiscal year 2016, unless otherwise specified:

Critical Infrastructure

Executive Order 13636, "Improving Critical Infrastructure Cybersecurity," was issued February 12, 2013.⁷ The order cites "cyber intrusions into critical infrastructure" which "demonstrate the need for improved cybersecurity." The order states:

Sec. 9. Identification of Critical Infrastructure at Greatest Risk. (a) Within 150 days of the date of this order, the Secretary shall use a risk-based approach to identify critical infrastructure where a cybersecurity incident could reasonably result in catastrophic regional or national effects on public health or safety, economic security, or national security.

TVA's application states that "SMR deployment will demonstrate that the technology is capable of incrementally supplying...power that is less vulnerable to disruption to facilities owned by federal agencies."⁸ Yet, according to Dr. Arjun Makhijani, "Safety improvements may be reduced because SMR proponents are already arguing for changes in regulations to reduce costs. For instance, the current mPower design would have just three personnel for operating for two reactors — an operator for each reactor and one supervisor overseeing them both (Stout 2013, at 41 min 25 secs). This raises serious safety questions — will three operating staff be able to adequately respond to and manage a serious accident?"⁹

SMR passive cooling systems do not have active backup systems. The weaker containment of SMRs has a greater chance of damage from hydrogen explosions. Underground siting increases risk during flooding. And multiple SMRs present higher risk from reduced support staff or safety equipment. The risks from these reactors are

⁷ Federal Register, Vol. 78, No. 33, February 19, 2013

⁸ Clinch River Nuclear Site Early Site Permit Application, Part 3, Environmental Report, page 1-1

⁹ "Light Water Designs of Small Modular Reactors: Facts and Analysis" Institute for Energy and Environmental Research, Arjun Makhijani, PhD, September 2013, page 10.

precisely the catastrophic regional or national effects on public health or safety and economic security which EO 13636 seeks to prevent.

F. A genuine dispute exists with the applicant

TVA states: "Title 10 of the Code of Federal Regulations 51.50(b)(2) does not require a need for power discussion be included in an early site permit application." ESP Environmental Report, Part 3 Chapter 8, NEED FOR POWER. Nevertheless, in Chapter 1 of the same ER, (ML16144A085), TVA opens the door to the question of need by attempting to justify its site permit on the basis of global warming and energy security. Based on our information and analysis, the no-action alternative is the preferred option.

Conclusion

Federal regulations at 10 CFR 51.50(b)(2) require, *inter alia*, that "The environmental report must address all environmental effects of construction and operation necessary to determine whether there is any obviously superior alternative to the site proposed." TVA's Environmental Report fails to adequately address alternatives including the no-action alternative. Based on the foregoing, I request on behalf of the Blue Ridge Environmental Defense League that the Contention be admitted.

Respectfully submitted,

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

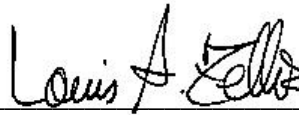
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CERTIFICATE OF SERVICE

I hereby certify that the
**HEARING REQUEST AND PETITION TO INTERVENE BY
BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE**
has been filed through the Electronic Information Exchange system
this 12th day of June, 2017.



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