

Blue Ridge Environmental Defense League

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

March 19, 2012

Dr. Steven Chu, Secretary
U.S. Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

**RE: Loan guarantees for Vogtle Electric Generating Plant Units 3 and 4
EIS No. 20120031, Final EIS, DOE, GA, 77 Federal Register 9652, February 17, 2012**

Dear Secretary Chu:

On behalf of the Blue Ridge Environmental Defense League and our chapter the Concerned Citizens of Shell Bluff, I write to request that the Department of Energy not approve loan guarantees for Plant Vogtle.

The DOE must consider the impact that loan guarantees for two additional nuclear reactors will have on the people living around Plant Vogtle, a community already noted to suffer from higher-than-average cancer rates. Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires each federal agency to address disproportionate human health or environmental effects of its policies. This includes requirements to assess those impacts and to seek greater public participation in environmental planning and policy making. The following remarks are offered in keeping with the Executive Order.

Background

Pursuant to Section 1703 of Title XVII of the Energy Policy Act of 2005, the DOE is considering loan guarantees for Plant Vogtle in the amount of \$8.33 billion. Although there is presently a conditional commitment for the loan guarantees, final approval and a Record of Decision await fulfillment of specific conditions. An Eligible Project is one which *inter alia* employs a new or significantly improved technology that is not a commercial technology and that avoids, reduces or sequesters air pollutants or anthropogenic emissions. 42 U.S.C. 16513(a). In accordance with the Energy Policy Act, a commercial technology means a technology in general use in the commercial marketplace in the U.S. A technology is in general use if it has been installed in and is being used in three or more commercial projects in the U.S. in the same general application as in the proposed project, and has been in operation in each such commercial project for a period of at least five years.

Discussion

Plant Vogtle is a commercial technology under the law. Further, it fails to avoid, reduce or sequester air pollutants and anthropogenic emissions of greenhouse gases and presents an unwarranted financial hazard to the taxpayer.

Commercial Technology

The proposed Plant Vogtle nuclear Units 3 and 4 are pressurized water reactors. Fully two-thirds of the operational nuclear plants in the nation today are PWRs. They all share the following characteristics:

The fundamental characteristic of the PWR is that the primary coolant raises steam in a heat exchanger called a steam generator. Depending on the design, a reactor can have two to four steam generators; each steam generator consisting of a primary coolant loop comprised of thousands of steam generator tubes directly circulating water from the reactor under high pressure (approx. 2250 psi) and high temperature (600 F). The high pressure does not allow the water to boil in the primary coolant loop thus enabling more efficient heat transfer. In order to be effective heat exchangers the tubes are 3/4 inch in diameter with the tube wall being as thick as a dime. The heat is exchanged in the steam generator where water is allowed to turn to steam through a secondary loop that exits the reactor containment building to power the turbogenerator.¹

The pressurized water reactor (and its cousin the boiling water reactor) is also a light water reactor. The nuclear industry touts the Vogtle expansion as established light water reactor technology:

The Vogtle project uses proven light water reactor technology, which incorporates innovative features to provide even higher levels of safety than America's 104 operating nuclear plants.² [emphasis added]

In fact, the Westinghouse AP1000 reactor shares fundamental similarities with 73 other pressurized water reactors in the United States. They all produce heat by nuclear fission, use control rods to limit the reaction, use steam to drive turbines, etc.

Moreover, the cost-cutting measures such as modular construction and gravity-fed water supply introduce new and unresolved safety hazards which have been brought to light by the Nuclear Regulatory Commission's own engineers. Two cost-cutting measures employed by Westinghouse are modular construction of the reactor containment structure and an emergency cooling water tank holding eight hundred thousand gallons of water weighing 3,334 tons. For comparison, the total weight of the nuclear reactor vessel itself is 417 tons.³ The water tank would sit atop the modular structure of the AP-1000 building. Nuclear reactor shield buildings are supposed to guard against shocks from the outside and provide a barrier to radiation from the inside. Federal regulations require nuclear power plants to withstand earth tremors, severe weather and impacts from missiles and aircraft. But NRC engineer Dr. John Ma, said that the brittle structure could

¹ "Safety Problems with Pressurized Water Reactors in the United States," Paul Gunter, 1996, Nuclear Information and Resource Service, downloaded 3/17/12, <http://www.nirs.org/factsheets/pwrfact.htm>

² Nuclear Energy Institute, "Issues in Focus: Loan Guarantees for Clean Energy Development," from <http://www.nei.org/resourcesandstats/documentlibrary/newplants/whitepaper/issues-in-focus-loan-guarantees-for-clean-energy-development/>, downloaded 3/17/12

³ AP1000 Design Control Document Reactor Coolant System and Connected Systems 5.3.4.1

fail, and filed an opposition statement.⁴ But rather than doing real world testing, Westinghouse did computer simulations using off-the-shelf standard codes. If the AP1000 was truly an innovative design, something more than standard tests would have been called for. In the end, NRC staff sided with Westinghouse, while acknowledging that the shield building design did not meet American Concrete Institute criteria.

In short, unless one is referring to commercial products such as soap suds or shampoo which promote ersatz revolutionary advances to make the products easier to sell, cost cutting measures—altering the plumbing and reducing the number of pumps—do not alter the fundamental nature of pressurized water reactors, and certainly do not meet the criteria of “innovative” or “significantly improved,” particularly in light of the added risks outlined above.

Air Pollution

Air pollution sources are subject to Part 70 operating permit rule requirements under the federal Clean Air Act.⁵ Radionuclide emissions to the atmosphere are regulated as hazardous air pollutants (HAP) under the Act. National Emission Standards for Hazardous Air Pollutants (NESHAP) are subject to maximum achievable control technology standards (MACT). Enforcement of the Clean Air Act regulations related to nuclear power plants are delegated to the NRC. NRC-licensed facilities must meet the requirements of the Clean Air Act which limit radionuclide emissions to the atmosphere.

The goal of the radionuclide emission standard is to limit the lifetime risk of induced fatal cancer to a maximally exposed individual to approximately one in 10,000. The implementing regulations translate this into a maximum individual exposure of 10 millirem/year for airborne emissions that result in exposure through any environmental pathway. 10 CFR § 50 Appx. I This translates into a risk of 5.6 excess fatal cancers/10,000 people.⁶

Although the US EPA develops maximum achievable control technology standards, no MACT has been issued for radionuclides. Further, although emission rates from the plant are measured, the millirem standard for maximum allowable dosage to the public is an ambient standard, not an emission limit. Without ambient measurements, one cannot assure that emissions of radionuclides are below 10 millirem per year to any member of the public as required by law.

The Vogtle Electric Generating Plant will not meet Clean Air Act standards. Without maximum achievable control technology, routine emissions from the plant would be excessive especially when considered in addition to the existing site-wide radioactive emission levels. Second, Southern Nuclear does not properly account for the higher levels of morbidity and mortality in females and infants caused by low levels of radiation.

⁴ John Ma, Non-concurrence, NRC Form 757, published December 3, 2010, ADAMS Accession No. ML103370648

⁵ Clean Air Act §502(a) and 40 CFR 70.3

⁶ BEIR V, Table 4-2, pp. 172-173

Global Warming

The mining of uranium is powered by fossil fuels. Fossil-fueled transportation is necessary for the uranium fuel manufacturing process: i.e., mining, milling, conversion, enrichment, re-conversion, and fuel fabrication. The processes themselves also require fossil fuel power. And after removal from the reactor, used nuclear fuel may again be transported, adding to the carbon footprint of nuclear power. An analysis published by Phillip Smith and Willem Storm van Leeuwen⁷ indicates that:

If the uranium consumed by the nuclear energy system has been extracted from rich ores the ratio CO₂ (nuclear/CO₂(gas)) is much less than unity, giving the impression that the application of nuclear energy would solve the global warming problem. However as rich ores become exhausted this ratio increases until it finally becomes larger than one, making the use of nuclear energy unfavourable compared to simply burning the (remaining) fossil fuels directly. In the long term the use of nuclear energy provides us with no solution to the problem.

Just because nuclear power plants have no visible smokestack emissions of carbon dioxide and other greenhouse gases does not mean they can reduce global warming. In fact, the opposite appears to be true.

Financial Risk

The principal obligation of the Department of Energy's Loan Program Office is to guarantee loans to eligible clean energy projects, agreeing to repay the borrower's debt obligation in the event of a default, or by providing direct loans.

In its publication of the final rule 10 CFR Part 609, the Department of Energy's Chief Financial Officer points to the Department's inability to obtain a financial security interest to secure the debt obligation:

Approximately one-third of all currently operating nuclear power reactors, and approximately one-third of all planned nuclear power reactors for which applications are pending at the Nuclear Regulatory Commission are jointly owned through tenancies in common. As such, each owner holds an undivided interest in the physical project assets, and each owner typically finances its investment in the project separately. In this scenario, DOE would not be guaranteeing a direct loan to a project company, and may be guaranteeing the loan obligations of only some but not all of the project owners. As a result, it may not be commercially feasible to obtain a lien on all project assets.⁸

The conditional commitment here appears to rest upon the shifting sands of tenants in common. Ownership of Units 3 and 4 at Plant Vogtle is Georgia Power (45.7%),

⁷ *Nuclear Power–Energy Balance*, 2008, posted at: <http://www.stormsmith.nl/>.

⁸ Federal Register, Vol. 74, No. 232, December 4, 2009, page 63545

Oglethorpe Power Corporation (30%), Municipal Electric Authority of Georgia (22.7%) and Dalton Utilities (1.6%).⁹

The mission of the DOE's Loan Programs Office is to "Protect US taxpayers by ensuring the loans and loan guarantees we provide have a reasonable prospect of repayment." If this were so, Southern Nuclear Operating Company might could have found private investors instead of US taxpayers to finance the return to nuclear plant construction. But the fact that private capital has not rushed to invest in new nuclear power plants provide a warning:

The U.S. has far more nuclear power than any other country. The idea that Congress and state legislatures must override the 30-year market verdict against additional power reactors by providing vast infusions of taxpayer and customer money for dozens of new reactors is beyond sober analysis.¹⁰

Even the Nuclear Energy Institute acknowledges the risky financial history of nuclear power plants:

The capital markets remember the experience during construction of today's operating plants – longer-than-expected construction times and cost overruns caused partly by the licensing process and litigation.¹¹

There are troubling aspects to DOE's independence to secure the loan program. In its briefing papers about the investment incentives created by Title XVII of the Energy Policy Act of 2005, The Nuclear Energy Institute reveals that companies like Southern Nuclear are paying the so-called outside advisors to the DOE Loan Program.

At the Department of Energy, for example, expert outside financial, technical and legal advisors (whose fees and expenses are paid by the companies developing the projects) assist in due diligence, underwriting, negotiation, documentation, and monitoring of nuclear power projects.¹²

The Department's integrity in this matter is compromised by the presence of advisors paid by the selfsame industry which is seeking the financial backing of the taxpayer and the approval of the Loan Program.

⁹ <http://www.southerncompany.com/nuclearenergy/construction.aspx>

¹⁰ Peter A. Bradford, "Massive nuclear subsidies won't solve climate change," November 3, 2009, Bradford is a Professor at Vermont Law School and a former member of the U.S. Nuclear Regulatory Commission

¹¹ Nuclear Energy Institute, "Issues in Focus: Loan Guarantees for Clean Energy Development," from <http://www.nei.org/resourcesandstats/documentlibrary/newplants/whitepaper/issues-in-focus-loan-guarantees-for-clean-energy-development/>, downloaded 3/17/12

¹² Nuclear Energy Institute, "Issues in Focus: Loan Guarantees for Clean Energy Development," from <http://www.nei.org/resourcesandstats/documentlibrary/newplants/whitepaper/issues-in-focus-loan-guarantees-for-clean-energy-development/>, downloaded 3/17/12

Finally, I draw your attention to an economic analysis of nuclear power's prospects by Dr. Mark Cooper. I have attached to this letter a copy of his 2009 report which concludes:

The highly touted nuclear renaissance is based on fiction, not fact. It garnered a significant part of its traction in the early 2000s with a series of cost projections that vastly understated the direct costs of nuclear reactors. As those early cost estimates fell by the wayside and the extremely high direct costs of nuclear reactors became apparent, advocates for nuclear power turned to climate change as the rationale to offset the high cost. But introducing environmental externalities does not resuscitate the nuclear option for two reasons. First, consideration of externalities improves the prospects of non-fossil, non-nuclear options to respond to climate change. Second, introducing externalities so prominently into the analysis highlights nuclear power's own environmental and external problems. Even with climate change policy looming, nuclear power cannot compete in the marketplace, so its advocates are forced to seek to prop it up by shifting costs and risks to ratepayers and taxpayers.¹³

Without reasonable prospect of repayment, the Loan Programs Office is bound to protect the U.S. taxpayer by not approving defective loan guarantee proposals; specifically, rejecting the \$8.33 billion loan guarantee for the Vogtle Electric Generating Plant.

Respectfully,

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, Executive Director
Blue Ridge Environmental Defense League

CC: Patrick Gorman, patrick.gorman@hq.doe.gov
Sharon Thomas, sharon.r.thomas@hq.doe.gov

Attachment¹³

¹³ *The Economics of Nuclear Reactors: Renaissance or Relapse?*, Mark Cooper, Senior Fellow for Economic Analysis, Institute for Energy and Environment, Vermont Law School, June 2009