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Emergency Preparedness Requirements for Small Modular Reactors

Comment On: NRC-2015-0225-0002
Emergency Preparedness for Small Modular Reactors and Other New Technologies: Draft Regulatory Basis for Comment

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General Comment

On behalf of the Blue Ridge Environmental Defense League and pursuant to the notice in the Federal Register published 13 April 2017 (82 FRN 17768), I write to provide comments on the proposed rulemaking "Emergency Preparedness for Small Modular Reactors and Other New Technologies,"

See attached file(s)

Attachments

170627_BREDL comments re SMR-ONT EP NRC-2015-0225

Blue Ridge Environmental Defense League

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June 27, 2017

Secretary, U.S. Nuclear Regulatory Commission
Washington, DC 20555-001
ATTN: Rulemakings and Adjudications Staff

RE: Docket ID NRC-2015-0225

On behalf of the Blue Ridge Environmental Defense League and pursuant to the notice in the Federal Register published 13 April 2017 (82 FRN 17768), I write to provide comments on the proposed rulemaking “Emergency Preparedness for Small Modular Reactors and Other New Technologies,”

Background

According to the Federal Register notice, the Nuclear Regulatory Commission’s purpose for this rulemaking is to establish new Emergency Planning requirements for Small Modular Reactors (SMRs) and Other Nuclear Technology (ONT). The focus is in three areas: 1) Distances for protective actions, 2) characteristics of potential radiation releases and exposure to nearby populations, and 3) characteristics of radioactive materials that would be released during an accident. 82 FRN 17768. The notice states,

However, SMRs and ONTs may have comparatively smaller reactor core size and also include passive design safety features, which result in potential accident releases and offsite radiation dose consequences that are smaller and may be delayed when compared to large [light water reactors].

In order to accomplish the rulemaking goal, the Commission states, “NRC plans to develop a consequence-oriented, performance-based, and technology inclusive approach to EP for these SMR and ONT designs.” (emphasis added)

According to the Nuclear Energy Institute, which represents 23 nuclear utilities and other industry professionals: “In March 2012, the administration announced a \$452 million cost-shared program between the U.S. Department of Energy and the industry to support first-of-a-kind activities for design certification and licensing activities for two small reactor designs over six years. DOE selected two small light water reactor designs: Babcock & Wilcox Co.’s mPower reactor design and the NuScale Power Module.”¹

Comments

Objectives of the draft regulatory basis

In its opaque style, the Nuclear Regulatory Commission’s notice, when unpacked, sets

¹ NEI website, accessed 6/26/17, <https://www.nei.org/Issues-Policy/New-Nuclear-Energy-Facilities/Small-Reactor-Designs>

forth a potentially catastrophic step towards the virtual elimination of the emergency planning zones, or EPZ, which presently surround every nuclear power plant in the nation. The Commission outlines its deregulatory analysis:

With the proposed adoption of an approach for these designs where the plume exposure pathway EPZ size is scalable in proportion with potential accident consequences, the potential exists for this EPZ to be contained within the site boundary. (82 FRN 17768)

In other words, the preparations for accidents would be limited to within the plant site itself. There are several fatal flaws in the Commission's analysis, but the principal one is the wholesale adoption of the industry-crafted sales pitch about the supposed advantages of the SMR, aka the small modular reactor. In fact, the SMR is a first-of-a-kind, factory manufactured power plant about one-third the power output of conventional nuclear power plants, still a substantial 300 megawatts-electric per unit, with the possibility of multiple units co-located.

"First-of-a-kind" means that such a nuclear power device has never been built before; it is an experimental design, untested. This alone should close the deregulatory discussion of having emergency planning zones which do not extend outside the plant fence line. The City of Oak Ridge, the site of the Tennessee Valley Authority's proposed Clinch River SMR, is home to over 29,000 people. The Clinch River site lies entirely within the city limits. If no planning zone were to extend outside the federal site, the city's population would be left to its own devices in the event of an emergency. And Knoxville is just 25 miles away.

The NRC defines the current purpose of emergency planning zones as:

To facilitate a preplanned strategy for protective actions during an emergency, there are two emergency planning zones (EPZs) around each nuclear power plant. The exact size and shape of each EPZ is a result of detailed planning which includes consideration of the specific conditions at each site, unique geographical features of the area, and demographic information.

The plume exposure pathway EPZ has a radius of about 10 miles from the reactor site. Predetermined protective action plans are in place for this EPZ and are designed to avoid or reduce dose from potential exposure of radioactive materials. These actions include sheltering, evacuation, and the use of potassium iodide where appropriate.

The ingestion exposure pathway EPZ has a radius of about 50 miles from the reactor site. Predetermined protective action plans are in place for this EPZ and are designed to avoid or reduce dose from potential ingestion of radioactive materials. These actions include a ban of contaminated food and water.²

² NRC website "Emergency Planning Zones," accessed 6/26/17, <https://www.nrc.gov/about-nrc/emerg-preparedness/about-emerg-preparedness/planning-zones.html>

These means of protecting the people of east Tennessee would be unavailable if the NRC proceeds with the current deregulation initiative, reducing the EPZ to 1000 feet. In fact, the Commission would be abandoning its obligation under the Atomic Energy Act; i.e., to set and enforce “standards the Commission may deem necessary or desirable in order to protect health and safety and minimize danger to life or property.”

The Blue Ridge Environmental Defense League is on record calling for greater emergency planning around nuclear power plants, not less. For example, we have established our own program for the provision of potassium iodide tablets to residents living near Plant Vogtle in Georgia because neither the NRC, Georgia Power nor the state provide this inexpensive and practical means of protecting residents in the event of a nuclear emergency.

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. Accidents happen.

Combined risk-informed and performance-based criteria

The NRC’s “consequence-oriented, performance-based, and technology inclusive approach” is a muddled abstract concept wholly misapplied in the extant case. First, consequence-oriented means: “Of all the things a person might do at any given moment, the morally right action is the one with the best overall consequences.”³ Second, performance-based regulations are: “implemented in many natural monopoly industries as an alternative to cost-of-service regulation. Its mechanisms are designed to control costs by overcoming the information asymmetries between regulators and firms. To accomplish this goal, [performance-based regulation] mechanisms establish an exogenously benchmarked price- or revenue-cap. If utilities are able to identify cost savings, then they may earn a higher return. On the other hand, if utilities exceed their revenue-cap, then they will incur losses. This combination of an upside and downside replicates the market discipline of a firm that faces competition.”⁴

The NRC is not a state public service commission with responsibilities such as price benchmarks. The morally right action in this case, the one with the best overall consequences, is the improvement of public protection, not deregulation.

Conclusion

The Nuclear Regulatory Commission should abandon the proposed rulemaking and substitute one which improves emergency planning at all nuclear power plant sites by:

³ Internet Encyclopedia of Philosophy, James Fieser, Ph.D., Bradley Dowden, Ph.D., accessed 6/26/17 at <http://www.iep.utm.edu/>

⁴ Performance Based Regulation: Theory and Applications to California, Dan Aas UC Berkeley Goldman School of Public Policy and Energy & Resources Group 5/5/2016

1) Expanding the radius of the Plume Exposure Pathway Emergency Planning Zone (EPZ) from a 10-mile radius to a 25-mile radius; 2) Establishing a new 50-mile radius Emergency Response Zone, with more limited requirements than the EPZ; 3) Expanding the radius of the Ingestion Pathway EPZ from the current 50 mile radius to a 100 mile radius; and 4) Ensuring that emergency plans are tested to encompass initiating and/or concurrent natural disasters that may affect both accident progression and evacuation conduct.

Respectfully submitted,

A handwritten signature in black ink, reading "Louis A. Zeller", followed by a horizontal line extending to the right.

Louis A. Zeller
Executive Director