

Blue Ridge Environmental Defense League

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Re: Watts Bar Nuclear Station, Unit 2, Docket No. 50-391, NRC-2008-0369

On behalf of the Blue Ridge Environmental Defense League and our members in Tennessee, I submit the following comments on the supplemental environmental impact statement for Watts Bar 2. These remarks will supplement my written remarks and oral testimony of October 6th.

Tritium Emissions

The NRC must include in its SEIS the impacts of tritium emissions from both Watts Bar Unit 1 and Unit 2 upon the environment and public health. As you know, Tennessee Valley Authority is irradiating Tritium-Producing Burnable Absorber Rods (TPBARs) for the U.S. Department of Energy (DOE). The production of radioactive tritium for defense purposes is authorized by License Amendment No. 48 issued October 8, 2003. However, the tests conducted during the sixth cycle of irradiation revealed disturbingly high levels of tritium to the reactor coolant system outside of acceptable limits; in fact, the emissions were 9.6 times higher than predicted by TVA's analytical model. TVA informed the NRC that:

[E]xperience gained during Cycle 6 indicates that this functional requirement has not been met and that additional measures are needed to meet this requirement. Because the 240 TPBARs to be irradiated in Cycle 7 are of similar design to those of Cycle 6, the tritium released from the Cycle 7 TPBARs into the RCS is also predicted to exceed TVA's functional requirement.¹

The expected emissions of 1 curie per TPBAR per years were actually about 9.6 curies per TPBAR per year. Therefore, instead of irradiating 2,304 TPBARs per cycle as permitted, TVA is irradiating 240 to stay within its permitted maximum. The questions which NRC must address are: (1) How were predictions by TVA and DOE nearly an order of magnitude too low? (2) What was the impact upon the local environment caused by the unexpected excess before it was discovered? (3) What are the implications for Watts Bar Unit 2? (4) What evidence do we have that TVA's predictive analysis is now reliable?

Tritium releases are the largest routine radioactive emissions from nuclear power plants. The chemical compound H₂O with a radioactive H³ (Tritium) is virtually impossible to contain

¹ Letter to NRC from TVA's P. L. Pace, Manager, Site Licensing and Industry Affairs, In the Matter of Tennessee Valley Authority Docket No.50-390, March 22, 2005

because nuclear plants are thermoelectric units which rely upon the heating of water to drive steam turbine-powered electric generators.

Nuclear power plants contaminate the water bodies used for cooling water. Watts Bar Unit 2, like Unit 1, would be cooled by cooling towers drawing makeup water from Chickamauga Reservoir. The contamination of the area surrounding Watts Bar is as follows:²

	Drinking water	Surface Water
Picocuries per liter	606	588

These levels of tritium contamination of drinking water and the river are found 24 and 9.9 miles from the Watts Bar reactor, respectively. They are excessive and harmful to human health.

The sources of the contamination include leaks from pipes and vales and other water-bearing components and airborne discharges from cooling towers. These radioactive discharges are difficult to quantify and may be underestimated:

The main problems of routine discharges of radioactivity to the water occur as a result of periodic discharges of the reactor's primary cooling water to water bodies and of tritiated water vapor to the atmosphere, creating radioactive rainfall when the release and rainfall occur at the same time. The high variability in tritium discharges from PWRs, the many leaks, the failure of some nuclear plant operators to disclose the leaks to the public in a timely manner, in at least some cases, and the fact that tritiated water crosses the placenta and behaves just like ordinary water in the living world but for its radioactivity leads us to call for an overhaul of the system for monitoring and reporting of both routine and non-routine tritium releases.³

That tritium emissions are released to the environment is well known and even acknowledged in NRC "lessons learned" documents. At minimum, the NRC must account for these releases in its EIS. Further, the agency should undertake a top to bottom review of its monitoring and control of tritium emissions.

National Environmental Policy Act

The National Environmental Policy Act requires that before undertaking a major federal action, an agency must take a "hard look" at the environmental consequences of the action.⁴ Where an agency has not yet taken the major federal action, it must consider "new and significant

² Annie Makhijani and Arjun Makhijani, Science for Democratic Action Vol. 16, No. 1, August 2009 (Sources by plant from Annual Radiological Environmental Operating Reports for 2006. Source link at <http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html>)

³ Ibid, page 8

⁴ *Baltimore Gas and Elec. Co. v. Natural Resources Defense Council, Inc.*, 462 U.S. 87, 97 (1983).

information” that bears on the environmental impacts of the proposed action.⁵ Also, federal regulations require supplementation where the proposed action has not been completed, if: “(1) there are substantial changes in the proposed action that are relevant to environmental concerns; or (2) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.”⁶ The environmental effects of the two side-by-side Watts Bar facilities raise the issues of segmentation and cumulative impacts.

The requirements of NEPA may not be avoided by segmentation of a project.⁷ Segmentation arises when the comprehensive environmental impact of a project is not given full consideration or that analysis of the impact is done after permitting agency decisions are made and the project is underway.⁸ The principal criteria for the determination segmentation are whether the parts of a project are interdependent, the original intent and whether the parts may be considered alone. Watts Bar Units 1 and 2 are co-located facilities. They share certain structures, systems and components.

Cumulative actions are those which have significantly greater impacts when viewed with other actions or which have increasing effect caused by successive additions. Council of Environmental Quality Regulations Implementing NEPA⁹ provide that reasonably foreseeable future actions are to be considered in a cumulative impact analysis. The consecutive licensing of Watts Bar Units 1 and 2 in close proximity are actions which are plainly foreseeable.

Therefore, NRC must account for the combined impact of Watts Bar Units 1 and 2 in its EIS.

Respectfully submitted,



Louis A. Zeller

⁵ *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 371-72 (1989)

⁶ 10 C.F.R. § 51.92(a)

⁷ *River v. Richmond Metropolitan Authority*, 481 F.2d 1280 (4th Cir. 1973)

⁸ Daniel R. Mandelker, *NEPA Law and Litigation*, 9-25 (2nd ed. 2004).

⁹ **Sec. 1508.7 Cumulative impact.**

"Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.