



Bellefonte Efficiency & Sustainability Team

B.E.S.T.

A local chapter of Blue Ridge Environmental Defense League • www.bredl.org



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Nuclear Regulatory Commission

NRC Commissioners

Chairman Allison M. MacFarlane

Kristine L. Svinicki

George Apostolakis

William D. Magwood, IV

William C. Ostendorff

NRCExecSec@nrc.gov

Washington, D.C. 20555-0001

Dear NRC Commissioners,

Citizens in the Tennessee Valley are concerned about the dangers posed by poorly designed and operated as well as aging nuclear power plants. And we are especially concerned that the Nuclear Regulatory Commission, whose job it is to keep us safe from nuclear radiation, instead seems willing to bend over backwards in order to save money for the nuclear power industry – while risking our homes and the lives of our families.

Designed in the 1960s and built in the 1970s, all three Browns Ferry reactors had a very poor operational record during the first 10-15 years of TVA operation. There continue to be a high number of Reportable Events, including what was considered at the time to be a very high number of SCRAMS (automatic shutdowns) of all three reactors. The negative impact of SCRAMS is that they cool the reactor far more quickly than normal shutdowns, thermally shocking the reactor containment structure. These thermally induced stresses reportedly weaken and cause premature aging and metal fatigue of the Reactor Pressure Vessels, which are already near their 40 year design life. Thus, all three reactor containment structures at Browns Ferry may have been prematurely aged during their early use and may now be in a weakened state.

A paper published by the Nuclear Information and Resource Service (NIRS) entitled “[Hazards of GE Boiling Water Reactors in the United States](#)” reveals very disturbing weaknesses in the three Browns Ferry GE Mark I Boiling Water Reactors (BWR) that raise serious concerns regarding the lasting integrity of the Reactor Pressure Vessels and questions the adequacy of the system design. Some of the issues included the following:

In 1972, before Browns Ferry became operational, Dr. Hanauer, the Atomic Energy Commission safety official responsible for reviewing the Mark I system, recommended that the pressure suppression system be discontinued and that no more systems of this type be given construction permits. The report says his boss, Joseph Hendrie, agreed with the recommendation, but rejected it on the grounds that “it could mean the end of the nuclear power industry in the U.S.” In 1976, three General Electric (GE) nuclear engineers working on the system publicly resigned their prestigious positions citing dangerous shortcomings in the GE Mark I design. In 1986, Harold Denton, the top NRC safety official, stated that the WASH 1400 Safety Study revealed a 90% probability of the Mark I containment failing in the case of a significant malfunction. These are all very serious concerns about the safety, integrity, and reliability of these systems.

A 1993 NRC report (not related to above studies) confirmed that “age-related degradation in Boiling Water Reactors will damage or destroy vital safety related components inside the reactor

vessel BEFORE the forty year license expires“ [emphasis added]. It was determined that the reactor vessel cracks were the result of the deterioration of Type 304 Stainless Steel due to exposure to chronic radiation, heat, corrosive chemistry, and fatigue. Recently, the forty year license for each reactor has been extended another twenty years beyond design specifications, to give it a total life of sixty years, greatly increasing the likelihood of critical component failure.

Three of the Mark I reactors at Fukushima exploded when hydrogen escaping from the reactor pressure vessels built up in the secondary containment structures and blew the reactor buildings apart. The secondary containment – sheet metal structure above the cooling pools – is seriously insufficient in both size and strength. The highly controversial “hardened vent” modification (added to all 23 Mark I U.S. and the Fukushima reactor pressure suppression systems) reportedly failed to relieve pressure on all three Fukushima reactors, resulting in the buildup of hydrogen gas in the reactor pressure vessel. The massive pressure from the hydrogen gas buildup escaped through the weakest part of the reactor vessel (the removable head where fuel is reloaded) into the secondary containment and exploded.

The NIRS report explains how the core shroud provides the sealed containment that enables re-flooding of the fuel rods in case of a loss-of-coolant-accident. “Extensive cracking of circumferential welds on the core shroud have been discovered in a growing number of U.S. and foreign BWRs [boiling water reactors]. A lateral shift along circumferential cracks at the welds by as little as 1/8 inch can result in the misalignment of the fuel and the inability to insert the control rods coupled with loss of fuel core cooling capability. This scenario can result in a core melt accident.” This raises serious concerns about the lasting containment integrity of all three Browns Ferry reactors.

There is seriously insufficient overhead containment of the cooling pools in the Mark I reactors. TVA is storing over three million pounds of highly radioactive spent fuel in raised pools at Browns Ferry with only sheet metal, warehouse-style protection overhead. The Tennessee River Valley is a tornado corridor, and the 1968 Mark I design tests for tornado safety make poorly supported assumptions and reach questionable conclusions in their report, APED-5696. Therefore, there is sufficient reason to consider the lack of overhead containment of cooling pools a hazardous design defect for this region.

All of these stated defects and on-going problems, in combination, raise considerable cause for concern among valley residents – and for action on the part of the TVA. We call on the TVA to establish, publish and implement a schedule for removal of spent fuel from the Browns Ferry Nuclear Plant cooling pools into more secure dry cask storage facilities. And we call on the NRC to fulfill their mandate to protect the public (not the finances of the nuclear industry) by shutting down these extremely dangerous GE Mark I reactors.

Thank you for your service and consideration of our concerns.

Respectfully,
Stewart Horn and Garry Morgan
for BEST/MATRR
best@matrr.org

Bellefonte Efficiency & Sustainability Team
Mothers Against Tennessee River Radiation

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