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Draft Letter to the Nuclear Energy Institute Regarding the Clarification of Regulatory Paths for Lead Test Assemblies

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Draft Letter to Nuclear Energy Institute Regarding Clarification of Regulatory Paths for Lead Test Assemblies

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General Comment

The NRC should not issue this letter.

In accordance with 10 CFR 2.206, I am filing a request to institute a proceeding pursuant to 2.202 to suspend the operating
license of Hatch Unit 1.

The regulation 10 CFR 50.46(a)(1)(i) states:

"Each boiling or pressurized light-water nuclear power reactor fueled with uranium oxide pellets within cylindrical
zircaloy or ZIRLO cladding must be provided with an emergency core cooling system (ECCS) that must be designed so that its calculated cooling performance following postulated loss-of-coolant accidents conforms to the criteria set forth in paragraph (b) of this section."

Hatch Unit 1 has installed 8 Accident Tolerant Fuel (ATF) Lead Test Assemblies (LTAs) in the reactor core. There are 4 LTAs of IronClad and 4 LTAs of ARMOR.

The IronClad lead test rods in 4 standard GNF2 bundles consist of segmented rods with cladding produced with
ferritic steel alloys (two different Fe-Cr-Al alloys: APMT and C26M).

The ARMOR lead test rods in 4 standard GNF2 bundles consist of GNFs proprietary coating that is applied to standard GNF2 Zircaloy-2 cladding.

Cladding is the first barrier to fission product release to the environment.

The LTAs were installed in Hatch Unit 1 without and amendment and an exemption.

The LTAs installed in Hatch Unit 1 violate 10 CFR 50.46.

Appendix K to Part 50ECCS Evaluation Models I.A.5, "Metal-Water Reaction Rate," states:

"The rate of energy release, hydrogen generation, and cladding oxidation from the metal/water reaction shall be
calculated using the Baker-Just equation (Baker, L., Just, L.C., "Studies of Metal Water Reactions at High Temperatures, III. Experimental and Theoretical Studies of the Zirconium-Water Reaction," ANL-6548, page 7, May 1962). This publication has been approved for incorporation by reference by the Director of the Federal Register. A copy of the publication is available for inspection at the NRC Library,
11545 Rockville Pike, Two White Flint North, Rockville, Maryland 20852-2738. The reaction shall be assumed
not to be steam limited. For rods whose cladding is calculated to rupture during the LOCA, the inside of the cladding shall be assumed to react after the rupture. The calculation of the reaction rate on the inside of the cladding
shall also follow the Baker-Just equation, starting at the time when the cladding is calculated to rupture, and extending
around the cladding inner circumference and axially no less that 1.5 inches each way from the location of the rupture,
with the reaction assumed not to be steam limited."

Since the Hatch Unit 1 LTAs are not made of Zirconium, there is a potential the LTAs could burst, increasing the danger
of the fission product release to the environment. Hatch Unit 1 operating license should be suspended until the licensee
performs and evaluation of the LTAs with an NRC approved methodology and analysis and the NRC completes an
Amendment and an Exemption for the 8 installed LTAs.