



# NRC NEWS

## U.S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs

Telephone: 301/415-8200

Washington, D.C. 20555-0001

E-mail: [opa.resource@nrc.gov](mailto:opa.resource@nrc.gov) Site: [www.nrc.gov](http://www.nrc.gov)

Blog: <http://public-blog.nrc-gateway.gov>

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### **NRC REQUESTS INFORMATION FROM 11 NUCLEAR PLANTS REGARDING FUEL PERFORMANCE DURING ACCIDENTS**

The Nuclear Regulatory Commission has issued a Request for Information (RFI) to 11 nuclear power plants, requesting analyses of the effects of irradiation on nuclear fuel's physical properties under certain postulated accident conditions.

The agency is requesting the licensees evaluate a phenomenon known as "thermal conductivity degradation" – the fact that older fuel has a reduced capacity to transfer heat, potentially changing its performance during various accident scenarios, including loss-of-coolant accidents. The NRC is concerned that this phenomenon may not have been accounted for in realistic performance models for nuclear fuel developed by Westinghouse Electric Co.

NRC regulations set a fuel thermal limit of 2,200 degrees Fahrenheit for "peak cladding temperature" under predicted loss-of-coolant accident conditions. Above that limit, the fuel rod is considered susceptible to damage. Thermal conductivity must be accounted for in realistic computer models used to evaluate a reactor's emergency core cooling system. An error in the models may underestimate the fuel's calculated peak cladding temperature. An error is considered significant if it would result in a difference of 50 degrees F or more in the predicted peak cladding temperature during the worst postulated loss-of-coolant accident scenario.

"The NRC alerted the industry to this problem in 2009, and Westinghouse needs to do more to account for thermal conductivity degradation in its fuel performance codes," said Eric Leeds, director of the NRC's Office of Nuclear Reactor Regulation. "We need information from a few nuclear power plant licensees to maintain assurance that they can continue to operate safely with sufficient margin."

In December, Westinghouse notified the NRC that an analysis it had conducted for a power plant indicated that thermal conductivity degradation could cause peak cladding temperature to increase by more than 100 degrees F during a worst-case loss-of-coolant accident at a Westinghouse pressurized water reactor. The NRC staff responded by issuing an Information Notice on Dec. 13 ([IN 2011-21](#)) alerting industry that the error could cause a number of plant-specific evaluations to exceed the 2,200 degree F temperature limit.

The 11 plants named in the RFI are those Westinghouse clients with currently reported peak cladding temperatures above 2,000 degrees F. Accounting for thermal conductivity degradation in their analyses could result in peak temperatures approaching or exceeding the 2,200 degree limit. These plants are Beaver Valley 1 and 2, Braidwood 2, Byron 2, Catawba 1 and 2, Donald C. Cook 1 and 2, Kewaunee, and McGuire 1 and 2. An additional 23 plants that use the Westinghouse performance models also received informational copies of the RFI, to ensure that they are aware of their obligations to address this error.

The plants have until March 19<sup>th</sup> to provide the requested information to the NRC staff. If the information received does not demonstrate that NRC regulations are met, the staff will recommend imposing restrictions on reactor operating limits until acceptable action has been taken.

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