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US NRC

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June 19, 1997

Chief, Rules Review and Directives Branch  
U.S. Nuclear Regulatory Commission  
Mail Stop T-6D-69  
Washington, D.C. 20555-0001

Re: Proposed Bulletin 96-01, Supplement 1  
Control Rod Insertion

On May 20, 1997, the U.S. NRC published a proposed generic communication related to control rod insertion problems for public comment. The public comment period expires June 19, 1997. I have reviewed the subject generic communication and am pleased to supply comments below.

COMMENTS

In the proposed bulletin supplement, the NRC has asserted that "This problem is limited to fuel designs that incorporate small-diameter (approximately 0.5 inch) thimble tubes". Various Westinghouse plants utilize 15x15 fuel designed with nominal outside diameter thimble tubes of approximately 0.5 inches. To my knowledge, there have been no problems or identified concerns with control rod insertability for 15x15 fuel assemblies. All of the events identified in the proposed bulletin supplement are related to 17x17 VANTAGE 5H fuel assembly designs. The proposed bulletin should distinguish between the different fuel assembly design arrays (15x15 versus 17x17 assemblies).

Other factors such as operating temperatures and active fuel height dimensions (12 foot versus 14 foot) are not adequately considered when specifying the burnup limits for testing. Detailed analyses and collection of empirical data by the fuel vendor, Westinghouse, identified RCS core exit temperature as being an important factor. Specifically, it was observed that accelerated growth of the fuel assemblies occurs above a core exit temperature of 615°F. This important factor should be accounted for in the NRC proposed bulletin supplement.

Both Westinghouse and the industry have provided a large volume of data consisting of hot rod drop tests, rod drag tests, hot cell examinations, rod recoil information and fuel design information to assist the industry and the NRC in determining the root cause of this event. The proposed bulletin supplement would require the industry to perform extensive and frequent testing of

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control rod insertion, without applying the knowledge gained from the data gathered in 1996.

The fundamental issue concerning incomplete rod insertion is whether the ability to safely shutdown the core for all anticipated or postulated events is adversely affected. Many plants have substantial shutdown margin such that several control rods could fail to insert fully without an adverse impact on core shutdown. Most plants are designed conservatively and would meet the required shutdown margin assuming several control rods get stuck at the dashpot of fuel assemblies. A control rod stuck in the dashpot region has essentially performed its required safety function. Additional mid-cycle testing should not be required since there is no safety significance.

The proposed tests approximately every 2500 MWD/MTU until the end of cycle will also cause undue risk of a reactor trip. The cycling of plant equipment every 3 to 4 months as a result of the required rod drop tests will have an adverse impact by increasing the number of thermal cycles and the associated potential for unanticipated transients. Subjecting a plant to increased thermal cycles may adversely affect equipment reliability and substantially increase maintenance costs. Since the test will need to be performed at hot zero power, plant operators will need to reduce power and realign major secondary systems. Following the test, the operators will need to increase power and realign feedwater and secondary systems to achieve full power. These operations decrease unit reliability and increase the probability of a reactor trip.

The decreased unit reliability associated with the increased thermal cycling and the increased probability of a reactor trip contribute to a decrease in the overall protection to the health and safety of the public. This decreased protection is not appropriately counterbalanced by the perceived increase in safety of the proposed additional testing.

The actions proposed by the NRC, which include several middle-of-cycle shutdowns, and an end-of-cycle rod drop test and drag test can have significant financial impacts on operating utilities. These financial impacts are likely to be in excess of a million dollars per year per unit affected.

Alternatively, changing the core design to ensure that no fuel assembly with burnup higher than 35,000 MWD/MTU is located under control rods will cause a significant increase in environmental impact in addition to costs. Additional fresh fuel assemblies would be required each reload such that control rods would be inserted in fuel assemblies with less than 35,000 MWD/MTU. The incremental cost of this option is also estimated to be in excess of one million dollars per cycle for each unit affected. Increasing the number of fresh fuel assemblies each cycle will

result in an increase in the required spent fuel storage capacity. This would require earlier development and implementation of storage alternatives, and substantial increase in interim and final disposal costs, with the associated increase in high level radwaste and the attendant increase in environmental impact.

All events, which involved 17x17 fuel assemblies, resulted in the control rod inserting for most of its length and only became stuck in the dashpot region. Therefore, the control rod essentially achieved its safety function. The NRC has recognized the importance of the rod drop time endpoint as the dashpot entry, as indicated by the Rod Drop Time Technical Specification. The portions that did not insert would have little impact on core reactivity. The additional testing that would be required by this proposed bulletin supplement represents a new staff position not described in the current Technical Specification surveillance requirements to determine control rod operability.

#### Backfit Analysis

The backfit analysis in the proposed bulletin supplement does not conform with the requirements of the backfit rule. The proposed bulletin supplement states that "to the extent that the actions requested herein by addressees are considered backfits, the backfits are justified under the compliance exception of the backfit rule, that is, 10 CFR 50.109(a)(4)(I)."

As a preliminary matter, the actions "requested" by the draft bulletin supplement are in fact backfits. Backfitting is defined by the regulation as the "modification of . . . the procedures required to . . . operate a facility . . . which may result from . . . the imposition of a regulatory staff position interpreting the Commission rules that is either new or different from a previously applicable staff position . . ." 10 CFR 50.109(a)(1).

The "requested action" in the draft bulletin supplement is that all licensees of Westinghouse plants are required to test control rod drops in fuel assemblies with certain burnups "upon first reaching the limits and approximately every 2,500 MWD/MTU until the end of cycle." For Westinghouse plants, this action would require a plant shutdown approximately every 3 months to perform this testing, and would require modification of existing plant procedures in order to carry out this testing. The requirement for new procedures represents a new staff position that requires control rod insertability testing not previously required by any staff position and beyond that found in the current Technical Specifications for control rod operability testing.

Before a new NRC Staff position can be imposed on a licensee, the NRC must conduct a "systematic and documented analysis" for backfits that it wishes to impose, unless the proposed backfit

falls under one of the exceptions to 10 CFR 50.109(a)(2). The "compliance" exception to the backfit rule, cited by NRC as justification not to conduct a backfit analysis, is applicable only where a modification is necessary to "bring a facility into compliance with a license or the rules or orders of the Commission, or into conformance with written commitments by the licensee."

As discussed above, there is no basis for concluding that Westinghouse plants with 15X15 fuel assemblies will be out of compliance with NRC requirements, and therefore the compliance exception does not apply to this case. Without an exception to the backfit rule to rely upon, in order to impose a backfit on a licensee, the Staff must demonstrate that "there is a substantial increase in the overall protection of the public health and safety or the common defense and security to be derived from the backfit and that the direct and indirect costs of implementation for that facility are justified in view of this increased protection."

As demonstrated in the above discussion, the incomplete rod insertion is not considered safety significant. Therefore, the proposed testing would result in a decrease in the overall protection of the public health and safety in that the probability of a reactor trip is increased. Moreover, the direct costs that each utility would incur as a result of the proposed Staff position are substantial. Accordingly, the new staff position would not survive the scrutiny of a proper backfit analysis.

In addition to performing a backfitting analysis under 10 CFR 50.109, the proposed bulletin supplement should be evaluated pursuant to the Small Business Regulatory Enforcement Fairness Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996). This statute requires federal agencies, including NRC, to submit all new regulatory initiatives for review to each house of Congress and the U.S. Comptroller General. For "major rules" (defined in the statute as likely to result in an annual effect on the economy of \$100,000,000 or more), the effective date of the rule will be either 60 days after Congress receives the rule from NRC or 60 days after the major rule is published in the Federal Register, whichever is later.

NRC has previously considered that "bulletins . . . that provide new interpretations of law or policy" are "rules" for the purposes of the Administrative Procedure Act. [NRC Memorandum from J.M. Taylor, Executive Director for Operations, to Office Directors, June 25, 1996, at Attachment 1]. Therefore, the draft bulletin supplement is a rule under the Act.

The costs to Westinghouse utilities for the additional control rod insertion testing would be substantial. While the exact

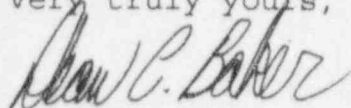


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industry-wide financial impact for implementing the actions requested by the proposed bulletin have not been calculated, with more than 50 nuclear plants conducting control rod insertion testing, the costs of such testing would probably exceed \$100 million, which would result in a major increase in costs for the nuclear industry and utility customers. Included in these costs would be the purchase of replacement power during the additional, unscheduled shutdowns for testing control rod insertion as proposed in the bulletin. Accordingly, the draft bulletin supplement would likely constitute a "major rule," and Congressional review under the Act should be required.

I appreciate the opportunity to comment upon this proposed bulletin supplement.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Dean C. Baker". The signature is written in a cursive, flowing style with some loops and flourishes.

Dean C. Baker