



March 6, 2006

March 13, 2006 (3:10pm)

Secretary
U. S. Nuclear Regulatory Commission
Washington D. C. 20555-0001
Attention: Rulemakings and Adjudications Staff

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

Subject: Duke Energy Corporation Comments on Proposed Rule 10 CFR 50.46a
(RIN 3150-AH29, 70 FR 67598 Dated November 7, 2005)
Risk-Informed Changes to Loss-of-Coolant Accident (LOCA) Technical
Requirements

The purpose of this letter is to provide the Duke Energy Corporation (Duke) comments on the proposed 50.46a regulation published in the Federal Register on November 7, 2005. Duke has participated on the NEI Task Force and the Westinghouse Owners Group (WOG) efforts seeking to take advantage of research insights and current industry knowledge regarding LOCAs, and thereby improve the regulations. The proposed regulations will re-classify the larger LOCAs into the beyond-design-basis category, which is prudent given their low probability of occurrence. Duke endorses this concept and the need to continue to show a mitigation capability for the full range of break sizes.

However, the proposed regulations include elements that significantly detract from the value that Duke was expecting to obtain as the industry worked with the NRC staff on this initiative for many years. Duke recognizes that the proposed 50.46a is an optional regulation. Our concern is that the requirements in the proposed regulation will result in few if any licensees undertaking this option, and consequently there being little value to the industry. Duke's comments are intended to highlight some of the major areas of the proposed regulation where consideration of other regulatory approaches and implementation requirements will enable the regulation to be a viable option for licensees.

Duke endorses many of the industry comments included in the NEI and WOG comment letters. The comments provided in Attachment 1 are offered for consideration by the NRC staff. These comments are applicable to PWRs and no representation of their applicability to BWRs is intended.

Very truly yours,

James R. Morris

Attachment

Duke Energy Corporation
Additional Comments on Proposed Rule 10 CFR 50.46a (RIN 3150-AH29)
Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements
70 FR 67598 Dated November 7, 2005

1. Adequacy of Current Regulatory Framework to Assess Risk of Plant Changes

Description of Proposed Regulation: The risk-informed integrated safety performance (RISP) concept is proposed to evaluate the risk impact of all plant changes due to the relaxation of the regulations with implementation of 50.46a. (Reference 50.46a(d)(3, 4, 5))

Duke Comment: The current regulatory framework and licensing basis will be maintained for LOCAs up to and including the transition break size (TBS). Under this regulatory framework all plant changes will be evaluated via the 50.90 or the 50.59 processes. Plant changes that have the potential to significantly affect the LOCA analyses will require submittal of a License Amendment Request (LAR) under the 50.90 process, and the NRC will have the opportunity to review all aspects of the plant change, including the risk impact. This is true for PWR LOCAs below and above the TBS since the mitigating systems and equipment are the same, and technical specifications are in place to maintain the LOCA mitigation capability for the full spectrum of LOCAs.

It is noted that non-safety LOCA mitigation systems/components may be applicable in the context of BWR LOCA analysis. This is not the case for PWRs. If this element of the proposed regulation is intended to address a situation that is only applicable to BWRs, then it should not be required for PWRs.

All plant changes are also evaluated for contribution to risk by virtue of the industry practice of maintaining PRAs. Duke currently evaluates on the order of 500 plant changes per site per year for possible impact on the results of the PRA. The significant changes are evaluated in detail to ensure that risk impact is captured and the individual and cumulative change in CDF and LERF remain acceptable. The PRA is then periodically revised to include all significant plant changes since the last revision.

The current regulatory framework and existing licensee programs to maintain PRAs provide an effective approach to identify and capture the risk impact of plant changes with the potential to significantly affect the beyond-TBS LOCAs.

Duke proposes that the NRC's concerns in this area can be addressed by requiring an evaluation of the risk impact for beyond-TBS LOCAs during review of LARs with some relationship to LOCA mitigation systems and components, and LOCA analyses. PRAs

include the full LOCA break spectrum, and there will be no change in this approach with implementation of the proposed 50.46a. Therefore, the risk evaluation of plant changes will continue to capture the risk impact for LOCAs beyond the TBS. The risk evaluations for plant changes involving 50.90 submittals is currently addressing any impact on LOCA mitigation capability.

2. Selection of Transition Break Size for PWRs

Description of Proposed Regulation: The NRC staff has selected the inner diameter of the largest pipe connected to the main primary loop piping as the TBS. This is based on staff judgment that larger LOCAs would probably be an attached pipe. This TBS is a logical demarcation based on the actual design of connecting pipes in a given plant, and also provides some margin to account for uncertainties in the results of the expert elicitation process. For PWRs the TBS will be based on the pressurizer surge line. Furthermore this break size is to be assumed to be located anywhere on the main coolant loop. (Reference 50.46a(a)(4))

Duke Comment: Duke proposes an alternate approach for selection of the TBS in Westinghouse designed PWRs. This alternate approach would use the staff-recommended TBS for breaks on the hot leg piping, but for the cold leg piping the largest connected pipe on the cold leg would be used instead of the pressurizer surge line. This alternate approach is more logical since the cold leg TBS will be consistent with the actual design of the attached piping in the cold leg. For Duke's McGuire and Catawba units of the Westinghouse 4-loop design, the pressurizer surge line is a Schedule 160 14 inch pipe (11.188 inch ID). The safety injection line on the cold leg is a Schedule 140 10 inch pipe (8.75 inch ID).

For Duke's Oconee units of the B&W design, the pressurizer surge line is a Schedule 140 10 inch ID pipe. For the B&W class plants it is appropriate to use the pressurizer surge line as the TBS for the cold leg piping because there are no large connecting pipes on the cold leg. Since the proposed TBS for B&W plants has the same basis as the proposed TBS for Westinghouse plants, then a logical extension is that the TBS for B&W plants should be the same for Westinghouse plants. By setting the TBS for cold leg LOCAs for Westinghouse plants based on the largest pipe attached to the cold leg, the TBS will be the same for Westinghouse plant cold legs and B&W plants.

3. Conflict Between Relaxing the Single Failure Assumption and Plant Operational Requirements

Description of Proposed Regulation: States that the single failure assumption is not required for the beyond-TBS LOCA analyses, which is commensurate with the low probability of the larger LOCAs. The proposed regulation also requires LOCA analyses

for beyond-TBS breaks for all allowed operating configurations. (References 50.46a(d)(2) and (e)(2))

Duke Comment: The language of the proposed regulation states that a single failure assumption in the LOCA analyses for beyond-TBS break sizes is not required. However, requiring LOCA analyses for all plant operating configurations including those configurations allowed by current technical specifications such as one train of ECCS temporarily out-of-service. Since ECCS components must be temporarily removed from service for required surveillances, this requirement has the effect of maintaining the single failure assumption.

This conflict needs to be addressed in the proposed regulation. Either the plant operational requirements language should be revised to not preclude the intent to not require a single failure assumption for beyond-TBS LOCA analyses, or the relaxation of the single failure assumption should be removed so that the proposed regulation is not misleading.

4. NRC Approval of Beyond-TBS Analysis Method and Application Prior to Implementation

Description of Proposed Regulation: States that licensees will not be required to submit their beyond-TBS analysis method or application for NRC review and approval. NRC will maintain regulatory oversight by inspection. (Reference 50.46a(e), and (e)(5))

Duke Comment: This element has the appearance of a benefit to the licensees, but it actually introduces a risk of a regulatory crisis should an inspection identify a deficiency in the beyond-TBS analysis method following implementation. Such an identified deficiency could result in a consequence such as the regulator imposing restrictions on reactor operation. This risk is greater than for the current situation where LOCA evaluation models and applications are pre-approved by the NRC. It would be preferable that NRC review and approval of 50.46a applications be obtained prior to implementation to avoid such a regulatory crisis. This comment proposes that NRC agree to perform a pre-approval of a licensee's beyond-TBS analysis method and application if requested by a licensee.

5. Risk Assessment of Plant Changes Should Focus on Beyond-TBS LOCAs

Description of Proposed Regulation: The proposed RISP process is stated as being applicable to all plant changes. (Reference 50.46a(d)(3))

Duke Comment: Since the rule change is applicable only to LOCA, the first step in any RISP process should screen in only those plant changes that have a significant impact

on beyond-TBS LOCA sequences. The subsequent risk evaluation would not be required and no documentation of the evaluation would be required for plant changes that do not pass this initial qualitative screen. By performing this initial screen, the RISP and associated documentation stay focused on LOCA. This comment proposes that the regulation explicitly include NRC endorsement of an initial qualitative screen for LOCA significance, and documentation of only those plant changes that screen in. Major industry concerns regarding the burden of the RISP process would be addressed. Requiring that all plant changes be processed through the RISP assessment is an unnecessary burden without a commensurate safety benefit.

6. Cumulative Risk Tracking

Description of Proposed Regulation: The proposed RISP process requires cumulative tracking of risk for each individual plant change. (Reference 50.46a(d)(5))

Duke Comment: Cumulative risk tracking is most appropriately accomplished by monitoring the base PRA results to assure that the total CDF as well as the CDF from specific initiators or class of accidents is not increasing. Such monitoring would verify that increases in risk resulting from a series of LOCA-related plant changes are not being masked by reductions elsewhere. Also, since the plant PRA is periodically updated to a new version, previous Δ CDF values for individual plant changes are not additive and cannot be summed in a meaningful way.

7. Applicability to New Reactor Designs

Description of Proposed Regulation: The proposed regulation is not applicable to new reactor designs. (Reference 50.46a(b))

Duke Comment: Duke recommends that the proposed regulation be applicable for new pressurized water reactor designs because the existing (50.46) and proposed (50.46a) LOCA regulations remain applicable for these new designs. Therefore, the 50.46a option for complying with the LOCA regulations and the concept of dividing the LOCA spectrum using the TBS concept remain directly applicable.

8. Specific Reference to M5 Cladding

Description of Proposed Regulation: Specifically refers to Zircaloy and Zirlo cladding alloys, but not the NRC-approved M5 alloy. (Reference 50.46a(b))

Duke Comment: Duke requests that the M5 alloy be included throughout the proposed regulation similar to how Zirlo is included. Future unproductive use of industry and NRC resources to address M5 not being included will be eliminated.

9. Future Changes to TBS Not Subject to the Backfit Rule

Description of Proposed Regulation: The backfit rule will not be applicable should the NRC determine that the TBS must be revised in the future. (Reference 50.46a(m), 50.109))

Duke Comment: Duke disagrees with this portion of the rulemaking for the following reasons. As set forth in Section XV (Backfit Analysis) of the Statement of Considerations (SOC), three provisions of the proposed rule "effectively exclud[e] certain actions from the purview of the Backfit Rule." 70 Fed. Reg. 67,598, 67,624 (Nov. 7, 2005). Those provisions are proposed Sections 50.109(b)(2), 50.46a(d)(5), and 50.46a(m). As discussed below, these exclusions are not necessary to comply with the Commission's direction as set forth in the applicable SRM. Moreover, these provisions would defeat the important policies reflected in the Backfit Rule, namely to assure that proposed regulatory changes are necessary for regulatory compliance, are necessary to protect public health and safety or provide for common defense and security, or are otherwise justified by a backfitting analysis. The goal of the Backfit Rule – regulatory stability – should apply even in the context of the voluntary 50.46a LOCA approach.

In the SRM, the Commission directed the Staff that "[t]he proposed rule should be structured such that a *backfit analysis* is not necessary for plant changes resulting from LOCA frequency changes identified by a periodic re-evaluation of LOCA frequencies." See July 1, 2004 SRM at 2 (emphasis added). The Commission, however, qualified this statement by clarifying that "[b]ackfit analyses should not be required where restorations to the design basis and other actions are necessary *because the licensee is unable to maintain compliance* with the relevant large break LOCA criteria as a result of changes in plant design and operating characteristics (or new information such as revised frequency estimates)." *Id.* (emphasis added). Accordingly, the current "compliance" exception to the Backfit Rule would apply under the specific circumstances envisioned by the Commission, (see 10 C.F.R. § 50.109(a)(4)(i) and there is no need for a new, broader "exception" to the Backfit Rule in the form of proposed Section 50.109(b)(2) to satisfy the Commission's direction.

Nor is proposed Section 50.109(b)(2) necessary for public health and safety or common defense and security reasons. For example, with respect to changes that might result from future revisions to the TBS (e.g., due to periodic Staff re-evaluations of LOCA frequency information), the NRC has indicated that the proposed TBS values "will provide regulatory stability such that LOCA reevaluations are less likely to result in a

requirement that licensees undo plant modifications made as a result of implementing 10 C.F.R. 50.46a." 70 Fed. Reg. at 67,605. Stated differently, the margins in the TBS as defined in the proposed rule are intended to preclude plant changes as a result of minor changes in break frequency estimates. *See id.* at 67,617. Accordingly, the NRC has expressed its intent "to revise the TBS in § 50.46a *rarely and only if necessary based upon public health and safety and/or common defense and security*," and not to "adopt cost-unjustified changes to the TBS." *Id.* at 67,624 (emphasis added). If future NRC-imposed changes under Section 50.46a are in fact based only upon public health and safety and/or common defense and security, then there is no need to modify Section 50.109, as the traditional backfit analysis would ensure that such intent is met.

Despite the Commission's stated intent in the SOC on changes necessary to ensure licensee "compliance" and "adequate protection," Duke remains concerned about the prospect of future changes that are not held to the discipline of the Backfit Rule. That is, the Staff conceivably might seek to impose changes to facilities or procedures that provide for a substantial increase in the overall protection of the public health and safety (or common defense and security), but which may not be cost-justified. For such changes, the Staff currently is required to develop a backfit analysis of the type described in 10 CFR § 50.109(a)(3) and § 50.109(c). *See* NUREG-1409, "Backfitting Guidelines" (July 1990) at 4. However, proposed Section 50.109(b)(2), which broadly states that Section 50.109(a)(3) "shall not apply . . . to [a]ny changes made to the TBS specified in § 50.46 or as otherwise applied to a license," would eliminate this longstanding Staff requirement in this context. Licensees who might now voluntarily opt to comply with the alternative acceptance criteria of proposed Section 50.46a would be left without the traditional recourse of the backfit appeal process.

Duke is not persuaded by the justifications for excepting this area from the requirements of the Backfit Rule that are presented in Section XV of the proposed rule SOC. The Staff submits, in principal part, that its proposed revision to the Backfit Rule is justified because: (1) the Staff will consider the costs and benefits of *proposed alternatives* as part of its regulatory analysis; (2) application of the Backfit Rule in this context "effectively favors increases in risk;" and (3) the "substantial flexibility" built into the proposed rule "may tend to reduce the burden associated with changes in the TBS." Even if true, these assertions do not address how the objective of the Backfit Rule (*i.e.*, that a substantial safety benefit is realized and the costs are justified by the safety benefit) continues to be met. Nor do these assertions suggest that the objectives of the Backfit Rule should not apply. The fact that the proposed rule provides an optional or voluntary approach for LOCA analysis does not negate either the Backfit Rule itself or the important policy of regulatory stability.

For these reasons, Duke respectfully requests that the NRC remove proposed Section 50.109(b)(2), and the related backfitting references in Sections 50.46(a)(d)(5), and 50.46a(m), from the final rule. In its July 1, 2004, SRM, the Commission emphasized that "[s]tability and reliability of the process should be important considerations." The

inclusion of a new and overly broad "exception" to the Backfit Rule very conceivably could undercut these objectives. To the extent that future modifications prove necessary to ensure compliance or adequate protection, the current backfit provisions will suffice, and the Staff will bear no greater burden. Specifically, if revisions to the TBS are needed to protect public health and safety or achieve compliance, then the NRC will undertake rulemaking (or issue orders to specific licensees, as appropriate). For actions not meeting the *current* exception criteria, a backfit analyses and justification should be required.

From: Richard Dudley
To: Evangeline Ngbea
Date: Mon, Mar 13, 2006 1:38 PM
Subject: Fwd: Duke 50.46a comments

Attached are comments from Duke Power Co.

Dick Dudley
301-415-1116

CC: Geary Mizuno

From: "BUTLER, John" <jcb@nei.org>
To: "Richard Dudley" <RFD@nrc.gov>
Date: Mon, Mar 13, 2006 12:11 PM
Subject: Duke 50.46a comments

Dick,

I scanned in a copy of the Duke comments (attached). I have contacted Duke and forwarded your request for a WORD (or equivalent) version of the comment letter.

John Butler
NEI
Office: 202-739-8108
Mobile: 202-391-2970

-----Original Message-----

From: Richard Dudley [mailto:RFD@nrc.gov]
Sent: Monday, March 13, 2006 10:06 AM
To: BUTLER, John
Subject: RE: 50.46a comments

My error.....We have received the BWROG comments. It is the Duke Power submittal we have not seen. Sorry for the confusion.....

>>> "BUTLER, John" <jcb@nei.org> 03/13/06 9:16 AM >>>
Darn good question. I know that they were preparing comments. I'll call and find out and let you know.

John Butler
NEI
Office: 202-739-8108
Mobile: 202-391-2970

-----Original Message-----

From: Richard Dudley [mailto:RFD@nrc.gov]
Sent: Monday, March 13, 2006 9:15 AM
To: BUTLER, John
Subject: RE: 50.46a comments

Thanks very much! By the way, do you know if the BWROG has submitted comments yet?

Dick Dudley
301-415-1116

>>> "BUTLER, John" <jcb@nei.org> 03/13/06 8:59 AM >>>
Dick,

The NEI comments are attached as a WORD file.

John Butler
NEI
Office: 202-739-8108
Mobile: 202-391-2970

-----Original Message-----

From: Richard Dudley [mailto:RFD@nrc.gov]

Sent: Wednesday, March 08, 2006 9:42 AM

To: BUTLER, John

Cc: Timothy Collins

Subject: 50.46a comments

Could you please send me the word processor file (Word or WordPerfect) for the NEI comments? It will save time not having to retype them when analyzing the comments. Also, if you would forward this same request to the WOG and BWROG, I would appreciate it.

Thanks!!

Dick Dudley
301-415-1116

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CC: "Swindlehurst, Gregg (Duke Energy) (Swindlehurst, Gregg (Duke Energy))"
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From: Richard Dudley

Created By: RFD@nrc.gov

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