November 9, 2000

MEMORANDUM TO: Mark A. Cunningham, Chief
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THRU: Mary T. Drouin, Section Leader **/RA/**
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FROM: Alan S. Kuritzky **/RA/**
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SUBJECT: NOTICE OF MEETING WITH NUCLEAR ENERGY INSTITUTE (NEI) AND OTHER INTERESTED STAKEHOLDERS REGARDING RISK-INFORMED CHANGES TO LOCA-RELATED REGULATORY REQUIREMENTS

DATE AND TIME: November 16, 2000
8:30 a.m. - 5:00 pm

LOCATION: U.S. Nuclear Regulatory Commission
Two White Flint North
11545 Rockville Pike
Rockville, Maryland 20852
Conference Room T-10A1

PURPOSE: To hold a one-day public working-level meeting for NRC staff, NEI, reactor owner's groups, and other interested stakeholders to exchange more detailed information regarding potential changes to loss of coolant accident (LOCA)-related regulatory requirements, as part of the staff's efforts to risk inform the regulatory requirements of 10 CFR Part 50 (Option 3).

PARTICIPANTS*:

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N. Lauben	W. Harrison, STPNOC
K. Wichman	L. Ward, Southern Nuclear Operating Co.
M. Mitchell	T. Rieck, Exelon
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M. Shuaibi	
J. Lazevnick, et al.	

Attachments:

1. Agenda
2. Topics for Discussion

Project No. 689
cc: See next page

*Meetings between the NRC technical staff and applicants or licensees are open for interested members of the public, petitioners, interveners, or other parties to attend as observers pursuant to "Commission Policy Statement on Staff Meeting Open to the Public," 59 Federal Register 48344, 9/20/94. Members of the public who wish to attend should contact Alan Kuritzky at (301) 415-6255 or ask1@nrc.gov.

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Attachment 1

AGENDA FOR PUBLIC MEETING ON POTENTIAL CHANGES TO LOCA-RELATED REGULATORY REQUIREMENTS

November 16, 2000

T-10A1

8:30am-8:40am	NRC Overview 1. Initial thoughts/scope – Schedule
8:40am-1:35pm	Technical Issues Associated With LBLOCA Redefinition[1] – WOG-developed draft LOCA frequencies (~2 hrs) – Break (15 min) – LOCA-related risk data and insights (30 min) – Risk-impact of LBLOCA redefinition (45 min) – Lunch (45 min) – Potential benefits of LBLOCA redefinition (20 min) – Impact of LBLOCA redefinition on implementing documents and safety issues (20 min)
1:35pm-2:30pm	Other ECCS-Performance Options
2:30pm-2:45pm	Break
2:45pm-3:30pm	Other ECCS-Performance Options (Continued)
3:30pm-5:00pm	Approach and Implementation

[1] The technical issues associated with LBLOCA redefinition are listed in order of priority. If insufficient time is available, then not all of these issues will be discussed.

Attachment 2

DISCUSSION TOPICS FOR PUBLIC MEETING ON POTENTIAL CHANGES TO LOCA-RELATED REGULATORY REQUIREMENTS (NOVEMBER 16, 2000)

1 NRC Overview

1.1 Initial thoughts/scope

1.2 Schedule

2 Technical Issues Associated With LBLOCA Redefinition

2.1 <u>WOG-developed draft LOCA frequencies</u>

2.1.1 Discussion of WOG-developed draft LOCA frequencies based on fracture mechanics.

2.1.2 How will the WOG synthesize all available supporting information in their overall evaluation to demonstrate specific, or threshold, values for the frequency of large bore piping rupture (including the assessment of uncertainty in the values)?

<u>Background:</u> The draft framework (Attachment 1 to SECY-00-0198) for risk-informing regulatory requirements under Option 3 classifies a set of initiating events as rare if their frequency is demonstrably less than 1E-6 per year. The necessity of considering uncertainties in making such a determination is discussed in Section 4.4.2 of the draft framework document. NRC presentations at prior public meetings have identified several methods that could potentially be used to characterize the current state of knowledge regarding RCS pipe rupture frequencies. These include methods based on:

- the observed frequency of throughwall cracks coupled with models of the probability of pipe rupture given a throughwall crack
- the number of pipe segments and welds (EPRI)
- fracture-mechanics analyses (NUREG-1061, Volume 3)

2.2 <u>LOCA-related risk data and insights</u>

2.2.1 Are there industry comments on the LOCA-related risk data (pipe break frequencies, LOCA-related CDF, conditional containment failure probability [CCFP], and LERF, etc.) and insights presented at the public workshop on October 2, 2000?

2.2.2 What is the basis/reference for the probabilities of pipe break LOCA with simultaneous loss of offsite power presented by the staff at the October 2, 2000, public workshop?

2.2.3 Are there updated industry data on LOCA-related event frequencies and probabilities that industry would like to provide to the NRC? What are the nature and bases of this data?

2.2.4 Industry has stated that IPE results have been updated for most plants, and that more recent PRA data should be evaluated. In what form, and by what mechanism, should this updated data be provided to the staff?

2.3 Risk-impact of LBLOCA redefinition

Before a set of rare initiating events can be removed from the current set of design basis initiating events, the risk impact of the plant changes that may result needs to meet the criteria set in the framework document. It has been argued by some that new design-basis accidents (DBAs) may be required because the large break LOCA (LBLOCA) has traditionally been used to bound the impact of other potential accidents. Others argue that formal risk assessment methods should be applied to demonstrate acceptable impacts on risk measures such as core damage frequency (CDF) and large early release frequency (LERF).

2.3.1 How are LOCAs resulting from failures other than pipe breaks considered, and what are these other failures?

2.3.2 The NRC has stated that analysis of LBLOCAs has eliminated the need to analyze other events, which are bounded by LBLOCA. What are the events the NRC considers to be in this category?

2.3.3 Given that smaller LOCAs will still be part of the design basis and these along with other current DBAs can set the system requirements, is there a need to identify alternative design-basis accident(s) for ECCS (e.g. a draindown event), for containment, or for equipment qualification? Why or why not?

2.3.4 If alternative DBAs are needed, should there be a different set of DBAs for ECCS, containment and EQ, or could there be a set applicable to all three? Why or why not?

2.3.5 How would plant changes implemented as a result of LBLOCA redefinition impact external (e.g., seismic) risks, including consideration of indirect LOCAs?

2.3.6 How would plant changes implemented as a result of LBLOCA redefinition impact low power and shutdown risks?

2.4 Potential benefits of LBLOCA redefinition

2.4.1 What are the broadly applicable safety benefits of LBLOCA redefinition?

Background: Safety benefits associated with LBLOCA redefinition that would potentially be realized by all plants include:

- Reallocation of licensee and NRC resources from meeting LBLOCA requirements to better addressing risk-dominant accident types,
- Consistency with respect to the design-basis for dynamic effects, ECCS, containment, and equipment qualification,
- More realism in accident progression analyses. Conservative Appendix K calculations of design-basis LBLOCAs could be eliminated. Treatment of remaining design-basis LOCAs could be based on realistic models. Residual

attention to LBLOCAs would be in the context of risk assessments, and could also be based on realistic models but without the need for costly uncertainty quantification.

2.4.2 What are the safety benefits of LBLOCA redefinition that may be realized by all or some specific plants? (Please explain/illustrate each benefit, indicating where the benefit would apply to specific NSSS or containment types.)

Background: Potential safety benefits associated with LBLOCA redefinition that might be realized by some but not all plants include:

- Lengthening the required emergency diesel start time would reduce wear associated with start testing and assist in preserving the reliability of the emergency diesel generators
- Lower ECCS set points might result in reliability improvements for other equipment
- Higher fuel peaking limits would permit fuel configurations that yield less radial neutron leakage thereby reducing the threat of pressurized thermal shock
- It may be possible to better optimize ECCS to deal with risk-dominant accident types (care should be taken to assure that the risk of draindown accidents is not increased).
- The increased time-window for switching to hot-leg injection or recirculation for design-basis accidents might lower failure probabilities associated with these switching actions for risk dominant accidents.

2.4.3 How many plants would be expected to realize each of the potential safety benefits identified in response to the preceding question? (Where relevant, please provide a breakdown by NSSS and/or containment type.)

2.4.4 What criteria are used by licensees to decide on barrel baffle bolt replacement?

2.4.5 What impact would LBLOCA redefinition have on plant life extension?

2.4.6 How many Westinghouse plants would be expected to realize each of the potential unnecessary burden reduction benefits listed in the May 18, 2000, WOG presentation?

2.4.7 What are the potential unnecessary burden reduction benefits of LBLOCA redefinition for B&W and CE plants?

2.5 Impact of LBLOCA redefinition on implementing documents and safety issues

At the public meeting on March 17, 2000, the WOG listed SRP/FSAR Sections, Regulatory Guides, Unresolved Safety Issues, and Generic Safety Issues that could potentially be affected by LBLOCA redefinition.

2.5.1 How does the WOG envision the listed SRP/FSAR Sections, Regulatory Guides, Unresolved Safety Issues, and Generic Safety Issues would be affected by LBLOCA redefinition?

2.5.2 Does the WOG believe that changes to the implementation guidance regarding leak detection (Regulatory Guide 1.145) will be required for LBLOCA redefinition?

2.5.3 What are the staff's plans for developing changes to the implementing regulatory requirements, i.e., Standard Review Plans, Regulatory Guides, etc., necessary to implement the rule change?

3 Other ECCS-Performance Options

3.1 What are the advantages and disadvantages of each of the following other ECCS-performance options:

3.1.1 Relax (risk-inform) simultaneous LOOP assumption
3.1.2 Relax Appendix K conservatisms
3.1.3 Make realistic modeling option less burdensome
3.1.4 Permit uncertainty in break size to be propagated with other uncertainties in the 10 CFR 50.46 best estimate option
3.1.5 Modify (risk-inform) single failure criterion
3.1.6 Relax or eliminate 10 CFR 50.46 reporting requirement
3.1.7 Demonstrate low risk associated with ECCS failure or inadequacy
3.1.8 Develop process for selecting DBLOCA initiators and coincident failures

3.2 What is the feedback from industry, if any, on the need to address known non-conservatisms in 50.46 evaluation models?

3.3 What is the feedback from industry, if any, on the NRC-suggested model selections and values for implementation of the 1979 ANS decay heat standard in Appendix K?

3.4 What is the feedback from industry, if any, on priorities for potential changes to the technical requirements of 10 CFR 50.46, GDC-35 and Appendix K?

3.5 Are there any potential safety or economic benefits to BWRs from a revised risk-informed 10 CFR 50.46, GDC-35 and Appendix K, and what would be the nature of these revisions?

4 Approach and Implementation

4.1 <u>Westinghouse Owner's Group program for LBLOCA redefinition</u>

4.1.1 What are the mechanisms (plant-specific submittals, bounding topical reports, etc.) by which the WOG anticipates obtaining NRC staff approval of leak-before-break (LBB)

analyses to cover any piping systems which have not been previously approved for LBB?

4.1.2 What is the WOG schedule for submitting analyses for NRC review? Will the analyses contain proprietary information? If so, what information will be claimed as proprietary?

4.2 <u>NRC program to risk-inform the technical requirements of 10 CFR Part 50 (Option 3)</u>

4.2.1 From previous discussions industry understands that the NRC staff will recommend to the Commission pursuing changes to 10 CFR 50.46. It is assumed that such an activity, and its associated rulemaking, would encompass conforming changes to other regulations, such as Appendix K and Appendix A to Part 50, and not be limited to just ECCS. Are these assumptions correct?

A suggestion has been made that the staff may want to take a step by step approach to 10 CFR 50.46, with redefinition of the LOCA break size being the first step. What are the subsequent steps? Is a plan for 10 CFR 50.46 being included with the recommendations that are being made to the Commission in the June 2001 time-frame? What would trigger the staff to go to each of the next steps, and what would be the overall schedule for getting through to the final rules?

4.2.2 What does the staff plan to recommend to the Commissioners in the June 2001 time-frame with respect to risk-informing 10 CFR Part 50 (RIP50), Option 3?

4.2.3 Is one of the RIP50, Option 3, recommendations to the Commissioners going to include the pursuit of changes to 50.46, such as changing the 1971 decay heat model?

4.2.4 What is the basis for the quantitative guidelines for the Option 3 framework, how are they similar to or different from RG 1.174, and which would take precedence given a plant change related to LBLOCA (e.g., rare initiator frequency < 1E-05/year)?

4.2.5 The Option 3 framework document contains many generalizations. How would this document be specifically applied in attempting to address LBLOCA redefinition?