January 19, 2005

MEMORANDUM TO: Jared Wermiel, Chief
Reactor Systems Branch
Division of Systems Safety and Analysis
Office of Nuclear Reactor Regulation

FROM: Jennifer Uhle, Section Chief ***/RA by J. Wermiel For/***
PWR Systems Section
Reactor Systems Branch

SUBJECT: MEETING BETWEEN THE NUCLEAR REGULATORY COMMISSION STAFF AND STAKEHOLDERS CONCERNING CHANGES TO THE METHODOLOGIES OF CHAPTER 15 OF NUREG-0800 AND THE REPORTING REQUIREMENTS OF 10 CFR 50.46

On November 30, 2004, the Nuclear Regulatory Commission (NRC) staff met with the Nuclear Energy Institute (NEI), utility groups, and other stakeholders at NRC headquarters concerning a proposed Regulatory Issue Summary (RIS) regarding changes to Chapter 15 methodologies and Emergency Core Cooling Systems (ECCS) reporting requirements. Attachment 1 lists the meeting attendees.

A public meeting notice was issued on November 9, 2004, and was posted on the NRC's external (public) web page (ADAMS Accession No. ML043140223). The meeting notice included the meeting agenda, which was also available as a handout at the meeting, the topic of discussions included clarification of the analysis and reporting requirements of Title 10 of the Code of Federal Regulation (10CFR) Part 50 Section 50.46 (10 CFR 50.46), clarification of the requirements when making changes to Loss-of-Coolant-Accident (LOCA) and non-LOCA analyses, and recent cases of licensees' misinterpretation of associated regulatory requirements.

In opening remarks, Jennifer Uhle of the NRC staff stated that there seems to be an increasing trend in the number of misinterpretations of the reporting requirements of 10 CFR 50.46 by licensees and that further clarification is needed. In addition, she requested that the industry provide the staff examples of situations encountered by licensees that are difficult to disposition under 10 CFR 50.46. The meeting started with a presentation by Dr. Uhle covering the general RIS process, the 10 CFR 60.46 requirements for an analysis of record and a staff approved evaluation model, the reporting requirements of 10 CFR 50.46, examples of changes to evaluation models and analyses of record permitted under 10 CFR 50.46, the provisions of 10 CFR 50.59, and examples of changes to non-LOCA methodologies.

Attachments: 1. Meeting Attendees

CONTACT: J. Quichocho, NRR/DSSA/SRXB
415-1296

A discussion session followed after the presentation. Nuclear Energy Institute (NEI) stated that comments pertaining to the meeting will be submitted by NEI. NEI will also solicit from licensees the requested examples of 10 CFR 50.46 issues described in the meeting to the NRC staff by January 2005. In addition, NEI requested a public comment period for the 10 CFR 50.46 RIS. The NRC staff stated that there will be a public comment period available for the 10 CFR 50.46 RIS and that the NRC staff will be looking forward to reviewing the letter from NEI. A representative from General Electric requested that two RISs should be prepared, one to address changes to LOCA methodologies abd 10 CFR 50.46 reporting requirements and one dealing with changes to non-LOCA methodologies and 50.59. The NRC staff stated that they will take the comment into consideration when developing the 10 CFR 50.46 RIS. There was a discussion on the application of the 50.59 process to vendors and licensees. The NRC staff stated that the licensees are responsible for meeting the regulations of 50.59 and that the 50.59 process applies only to licensees, not vendors.

There was a discussion of vendors' interpretation of 10 CFR 50.46, definition of input models within the context of an evaluation model, and the definition of a re-analysis under 10 CFR 50.46. The NRC staff stated that the statement of considerations for the 1988 amendment to 10 CFR 50.46 (53 FR 35996) will be reviewed to ensure the NRC position is consistent.

There was a discussion of whether the NRC staff was reinterpreting 10 CFR 50.46, the requirements stated in the meeting is in addition to 10 CFR 50.46, and OGC's interpretation process of 10 CFR 50.46. The NRC staff stated that the RIS process is a clarification process developed to inform industry of current issues and the position of the NRC staff on these issues. The NRC staff also stated that the Office of the General Counsel (OGC) was not present at the meeting because of emergent work and that the NRC staff could not comment on OGC's behalf. However, OGC was consulted in preparing the staff's position and in recent interactions with licensees which served as the basis of the RIS. The NRC staff will convey the information presented to the OGC staff, and that both OGC and the Committee to Review Generic Requirements (CRGR) will concur on the RIS to ensure that no new requirements are being imposed.

The NRC staff will take all comments from the meeting into consideration when developing the 10 CFR 50.46 RIS. In addition, the NRC staff will be looking forward to the review of the examples from licensees to be submitted to the NRC staff by NEI in January for consideration. After the discussion session, the meeting was adjourned.

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NAME	JQUICHOCHO	JUHLE	
DATE	12/17/2004	01/18/2005	

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LIST OF ATTENDEES

MEETING REGARDING CHANGES TO THE METHODOLOGIES OF CHAPTER 15 OF NUREG-0800 AND THE REPORTING REQUIREMENTS OF 10 CFR 50.46

TUESDAY, JULY 1, 2003

NAME	TITLE	ORGANIZATION
Carol W. Fleming	Attorney	Winston and Shlawn LLP
Jennifer Furl	Nuclear Engineer	PSEG Nuclear
Kurt F. Flaig	Engineer III	Dominion
Robert Florian	Licensing Engineer	Southern Nuclear
Fran Bolger	Principal Engineer	General Electric (GE)
Jerry	Manager product Licensing	Frematome ANP
Jim Gresham	Manager Plant Licensing	Westinghouse
Charles Brinkman	Director Washington Operations	Westinghouse
Robert Taylor	Reactor Engineer	DSSA
John Olvera	Nuclear Engineer	NMC
Philip Benavides	Nuclear Engineer	Constellation Energy
Edmund Tylor	Engineer	Constellation Energy
Matt Cerrone	Engineer	Westinghouse
Louis Quintana	Manager GE Licensing	GE Energy
Mike Schoppman	NEI LATF	Nuclear Energy Institute
Eileen McKeena	Section Chief	DRIP
Nancy Chapman	SERCH Manager	Bechtel
Deann Raleigh	Client Manager	LIS, Scientech
George Thomas	Reactor Engineer	DSSA
Veronica Klein	Reactor Systems Engineer	DSSA
Staci Sakai	Reactor Systems Engineer	DSSA
Jared Wermiel	Branch Chief	DSSA
Jennifer Uhle	Section Chief	DSSA
Frank Akstulewicz	Section Chief	DSSA
Jessie Quichocho	Nuclear Engineer	DSSA

DSSA = Division of Systems Safety and Analysis
NMC = Nuclear Management Company
NEI = Nuclear Energy Institute
LATF = License Action Task Force
DRIP = Division of Reactor Inspection Programs

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United States Nuclear Regulatory Commission

Proposed Regulatory Issue Summary Regarding Changes to Chapter 15 Methodologies and ECCS Reporting Requirements

by
Jennifer L. Uhle, Chief
PWR Systems Section
Reactor Systems Branch
Office of Nuclear Reactor Regulation

Public Meeting
November 30, 2004

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Contents

- Introduction
- Purpose of the Proposed RIS and the Meeting
- 10 CFR 50.46 Reporting Requirements
- 10 CFR 50.46 Change Process
- 10 CFR 50.59 Change Process for Non-LOCA Analyses
- Public Comments
- Summary

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Introduction

- Reactor Systems Branch
  - Jared Wermiel, Chief
  - Frank Akstulewicz, BWR Systems and Nuclear Performance Section Chief
  - Jennifer Uhle, PWR Systems Section Chief
  - Jessie Quichocho, Reactor Systems Engineer
- Robert Weisman, Office of General Counsel
- Meeting Contacts
  - Jessie Quichocho, jfq@nrc.gov
  - Jennifer Uhle, jxu1@nrc.gov
- Category II Public Meeting
  - Schedule
  - Designated period for public participation
  - Public meeting feedback forms

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Purpose of RIS and Meeting

- The purpose of the Regulatory Issue Summary (RIS)
  - Clarify the analysis and reporting requirements of 10 CFR 50.46
  - Clarify the requirements when making changes to LOCA and non-LOCA analyses
  - Motivation stems from recent cases of licensees' misinterpretation of associated regulatory requirements.
- The purpose of the meeting
  - Exchange viewpoints with stakeholders
  - Obtain examples of situations that licensees encounter for use in the RIS

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RIS Process

- Use of Regulatory Issue Summaries
  - Document NRC endorsement of the resolution of issues addressed by industry-sponsored initiatives
  - Solicit voluntary licensee participation in staff-sponsored pilot programs
  - Inform licensee of opportunities for regulatory relief,
  - Announce staff technical or policy positions not previously communicated to industry or **not broadly understood**

- Process
  - Draft Technical Position
    - Public comment via meeting
  - CRGR review
  - Public comment via Federal Register (optional)
  - OGC review
  - Issuance Spring 2005

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10 CFR 50.46 Analysis of Record

- Each plant must have a (**plant specific**) licensing basis ECCS analysis (analysis of record (AOR)) using an evaluation model (EM)

- EM must be reviewed and approved by NRC
  - Computer code that simulates phenomena attendant to a LOCA at that specific plant
    - LBLOCA EM and SBLOCA EM are distinct;
    - 2 AORs per unit
  - Input model for the plant
    - Equipment functionality/performance
    - Initial conditions
    - Modeling selections, including nodalization approach

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10 CFR 50.46 Reporting Requirements

- Annual Reporting Requirements
  - To ensure that the plant-specific AOR represents the plant
    - Absolute value of the changes are summed
      - Change = code error or input model change
      - Accumulation of changes since last time AOR was approved
    - When the changes equal or exceed 50 °F, a reanalysis* must be scheduled
      - A change exceeding 50 °F is a “significant change”
      - Change is estimated, not necessarily calculated with an EM
    - NRC is contacted within 30 days
      - Separate from annual report
    - Schedule for reanalysis set within 60 days after NRC is contacted
      - Safety significance of the change
      - Accuracy of the estimate

*Reanalysis must be approved by NRC, since all EMs must be approved by NRC and a change is either an input change or code change.

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10 CFR 50.46 Reporting Requirements (cont.)

- Annual Reporting Requirements (cont.)
  - Out of compliance with the acceptance criterion
    - Algebraic sum of the errors exceeds 2200 °F
    - Local oxidation > 17%
      - Total oxidation = pre-existing oxidation and oxidation developed during LOCA
    - Core wide oxidation > 1%
      - Combustible gas control so only hydrogen generation during LOCA is counted
    - Long-term cooling or coolable geometry cannot be maintained
  - Actions when acceptance criteria are not met
    - The licensee must take immediate action to comply with 10 CFR 50.46.
    - Contact NRC immediately
    - Report the event as per 10 CFR 50.55(e), 50.72, and 50.73.
  - Apply to each methodology => 2 AORs per unit
    - LBLOCA
    - SBLOCA

IN 97-15

IN 97-15, Supplement 1

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10 CFR 50.59 and ECCS Analysis

- 10 CFR 50.59 specifies that:
  - The provisions of this section do not apply to changes to the facility or procedures when the applicable regulations establish more specific criteria for accomplishing such changes.
- 10 CFR 50.59 change process cannot be used to modify 10 CFR 50.46 Evaluation Models
  - Code change or input model change
  - 50 °F change criterion in 10 CFR 50.46

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10 CFR 50.46 Analysis Methodologies

- Topical Reports (TR) are used by methodology owners to submit a generic methodology to NRC for approval.
- A methodology will be specific to a given type of plant and NRC SER will contain restrictions on its application.
- Such referencing relieves the regulatory community of the burden of redundant reviews of the generic aspects for the individual plant implementations.
- The licensee assures that all conditions and limitations under which the method received NRC approval are addressed.
- Generic Letter 83-11, and Supplement 1, “Licensee Qualification for Performing Safety Analyses”

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10 CFR 50.46 and TSTF-363

- Technical Specification Task Force Traveler (TSTF)-363 permits use of the most recent NRC-approved version of a topical report (TR) without having to submit an amendment to the facility operating license every time the TR is revised.
  - **A license amendment is required to change to a revised LOCA methodology**.
- These methods are used to establish operating limits in the COLR (GL 88-16, "Removal of Cycle-Specific Parameter Limits From Technical Specifications."
- The COLR contains specific information identifying the particular revision number and date used.
  - The TS list of methods should include the revision number and date of **LOCA** methods.
  - The Annual Report specifies changes made to the methodology.

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10 CFR 50.46 Change Example

- A licensee proposes to increase tube plugging and concurrently reduce the linear heat generation rate in an attempt to maintain its PCT below 2200 °F.
- The estimated deviation in PCT would be calculated by summing absolute values of the PCT changes stemming from increasing the number of plugged SG tubes (65 °F) and a reduction in peak LHGR (30 °F).
- The change = 95 °F, which is significant, as per 10 CFR 50.46 (a)(3)(i) => contact NRC.
  - Reanalysis is a function of safety significance and estimate quality.
- Compliance with **all** criteria of 10 CFR 50.46(b)
  - For PCT, the algebraic sum of 35 °F is added to the PCT of the analysis of record to demonstrate compliance with 2200 °F.
  - No event report

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Changes to Non-LOCA Methodologies (cont.)

- A license amendment is required if a change results in a departure from a method of evaluation described in the FSAR (as update) used in establishing the design bases or in the safety analyses.
- 10 CFR 50.59 contains the change process.
- 10 CFR 50.59 change process cannot be used to adopt a safety analysis methodology if that methodology is used to derive cycle-specific core operating limits listed in the COLR.
- Departure from a method of evaluation
  - Changing any of the elements of a method unless conservative or essentially the same;
    - Specific methodologies in the TSs
  - Changing from a method unless that method has been approved by NRC.
    - License amendment would be required
    - Topical report
    - Licensee-specific method

GL 88-16, "Removal of Cycle-Specific Parameter Limits From Technical Specifications"

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Example Change to a Non-LOCA Methodology

- A licensee wants to modify the loss coefficients of the steam line in a Main Steam Line Break
  - No TS is required.
  - Acceptable provided the loss coefficient is specified according to the approved methodology.
  - And no violation of licensing basis acceptance criteria.

- A licensee wants to adopt a new version of the approved MSLB methodology.
  - TSTF-363
  - Must meet licensing basis criteria
  - Use only for MSLB as was approved in the methodology.

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Example Change to a Non-LOCA Methodology (cont.)

- A licensee wants to modify a correlation for choked flow in the approved MSLB methodology.
  - Provided the results essentially the same or conservative (closer to the acceptance criteria).

- A licensee wants to adopt a methodology that another licensee uses for MSLB
  - No TS change required.
  - Provided the approval applies to the licensee's facility.
  - And no violation of licensing basis acceptance criteria

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Summary

- Purpose of the Proposed RIS and the Meeting
- 10 CFR 50.46 Reporting Requirements
  - 10 CFR 50.59 specifies that the more specific change criterion of 50 °F is used for changes to LOCA evaluation models.
  - Change is either a code change or an input change.
  - Annual report is a separate requirement from contacting NRC when the change is significant.
- 10 CFR 50.46 Change Process
  - A license amendment is required to change EMs.
- 10 CFR 50.59 Change Process for Non-LOCA Analyses
- Public Comments

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