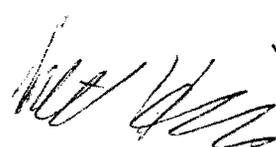




UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

March 4, 2011

MEMORANDUM TO: Antonio F. Dias, Acting Chief  
Aging Management of Reactor Systems  
and Guidance Update Branch  
Division of License Renewal  
Office of Nuclear Reactor Regulation

FROM: Matthew J. Homiack, Mechanical Engineer   
Aging Management of Reactor Systems  
and Guidance Update Branch  
Division of License Renewal  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE MEETING BETWEEN THE U.S. NUCLEAR  
REGULATORY COMMISSION STAFF AND THE NUCLEAR ENERGY  
INSTITUTE TO DISCUSS TIME-LIMITED AGING ANALYSES FOR  
REACTOR LICENSE RENEWAL

The U.S. Nuclear Regulatory Commission (NRC) staff and representatives of the Nuclear Energy Institute (NEI) and the industry met on February 3, 2011, to discuss time-limited aging analyses (TLAAs) for reactor license renewal. The purpose of this meeting was to discuss recent issues on TLAAs with current and future license renewal applicants. The goal of these discussions was to help applicants better understand the issues in order to reduce the number of requests for additional information (RAIs) and thereby improve the efficiency of the license renewal review process.

Enclosed is a list of the meeting participants. The handouts and slide presentations for the meeting are available in the NRC's Agencywide Documents Access and Management System under Accession Numbers ML110341658 and ML110610647. A summary of the meeting's discussions follows.

1. Environmentally-Assisted Fatigue

The NEI representatives presented a paper which outlined a proposed approach for determining the limiting set of components to be monitored for environmentally-assisted fatigue. The NEI representatives asked for the NRC staff's informal comments on the paper, but stated that they were not seeking NRC's endorsement of the approach. The NRC staff discussed and commented on several areas. The NEI representatives indicated that they would consider revising the paper to clarify certain areas and provide examples to better illustrate the approach.

2. Reactor Pressure Vessel (RPV) Integrity TLAAs

The NRC staff stated that it reviewed past RAIs related to RPV integrity TLAAs and found

that these RAIs primarily concerned the following areas: lack of consistency with previously submitted information; lack of sufficient documentation; and incomplete consideration of beltline materials. To reduce RAIs, the NRC staff stated that submittals should be consistent with the information and data provided in previous submittals, or that the appropriate information and technical bases for the changes should be provided. Also, submittals should contain sufficient levels of information and detail so that NRC staff reviewers can fully understand how the results presented in the submittal were achieved. As an example, NRC staff mentioned that applicants should assess the need for inclusion of other RPV components, most notably additional beltline nozzles, based on the increased beltline fluence for the vessel at 60 years of operation. The NEI representatives agreed that the necessary information should be provided.

### 3. Proposed Standard License Condition

The NRC staff presented a standard condition proposed to be included in future renewed licenses and asked the NEI representatives for feedback. This draft license condition is available in the NRC's Agencywide Documents Access and Management System under Accession Number ML110610647. The NEI representatives expressed concern that the proposal implies that plants with this license condition will be expected to implement new NRC staff positions (in effect be subject to a backfit). In response, the NRC staff explained that the intent of the proposal is to require licensees to periodically review the adequacy of their aging management programs (AMPs) and update them as necessary to ensure adequate aging management. The NEI representatives also commented that licensees already update their AMPs on an ongoing basis, so the proposed license condition would not necessarily be an additional burden. In addition, the NEI representatives indicated that licensees would rather commit to perform such reviews and updates, instead of having them as a condition of the renewed license. Lastly, the NEI representatives commented that the proposed 24-month evaluation frequency may be too short, as many AMPs specify periodic inspections on a longer frequency, for example, every 5 or 10 years.

### 4. TLAA Exemptions, Identification, and Disposition Issues

The NRC staff highlighted and provided examples to illustrate other areas related to TLAA's that, of recent, have resulted in RAIs.

The NRC staff discussed general issues associated with neutron irradiation embrittlement TLAA's, which are addressed in license renewal application (LRA) Section 4.2. Special attention should be given to the six criteria in 10 CFR 54.3 that define when an analysis in the current licensing basis (CLB) must be identified as a TLAA. Also discussed were situations when one of these criteria could be used to justify that an analysis does not meet the definition of a TLAA.

The NRC staff also discussed compliance with 10 CFR 54.21(c)(2). This regulation requires a license renewal applicant to identify exemptions in the CLB that have been granted, in accordance with the provisions of 10 CFR 50.12, and that are based on a TLAA. Some applicants have requested, under 10 CFR 50.60(b), exemption from either 10 CFR Part 50, Appendix G, upper-shelf energy (USE) or pressure-temperature (P-T) limit assessment requirements. These exemptions were granted in accordance with 10 CFR 50.12. The NRC staff explained the need for these exemptions to be identified in the LRA, in

accordance with 10 CFR 54.21(c)(2), because they were granted under 10 CFR 50.12 and are based on the USE or P-T limit TLAAAs, which are governed by the fracture toughness analysis requirements in 10 CFR Part 50, Appendix G.

Also, the NRC staff discussed the disposition of metal fatigue TLAAAs under 10 CFR 54.21(c)(1)(i), (ii), and (iii). The applicant's disposition may be accepted in accordance with 10 CFR 54.21(c)(1)(i), if it can be demonstrated that the analysis in the CLB will remain valid for the period of extended operation. Under 10 CFR 54.21(c)(1)(ii), the disposition may be accepted if it can be demonstrated that the analysis has been projected to the end of the period of extended operation. Under 10 CFR 54.21(c)(1)(iii), it is appropriate to accept the disposition of a metal fatigue TLAA if it can be demonstrated that the effects of aging associated with the analysis will be adequately managed during the period of extended operation. As to the bases for this last approach, the NRC staff discussed when it is appropriate to use the metal fatigue of reactor coolant pressure boundary program or the fatigue monitoring program.

Finally, the NRC staff informed the NEI representatives that some of the TLAA issues concern the application's inconsistency with other requirements, like those technical specification requirements for monitoring transients or the requirements of 10 CFR 50.59 and 10 CFR 50.71(e), which establish design basis change and recordkeeping requirements.

The NEI representatives requested that the NRC staff issue a document to better capture and explain the details of these issues. The NRC staff indicated that it would consider issuing such a document.

#### 5. Environmentally-Assisted Fatigue Calculations

The NRC staff stated that applicants should (a) consider locations in addition to the generic components in NUREG/CR-6260, "Application of NUREG/CR-5999 Interim Fatigue Curves to Selected Nuclear Power Plant Components," for the environmentally-assisted fatigue analyses; and (b) justify the dissolved oxygen level and strain rate assumptions used in the  $F_{en}$  adjustment factor derivations.

#### 6. Public Participation

No member of the public attended the meeting.

Enclosures:  
As stated

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## PARTICIPANT LIST

Meeting between the U.S. Nuclear Regulatory Commission (NRC) Staff and the Nuclear Energy Institute to Discuss Time-Limited Aging Analyses for Reactor License Renewal

February 3, 2011

Name	Affiliation
Matthew Homiack	NRC
James Medoff	NRC
Jerry Dozier	NRC
Jon Hornbuckle	SNC
Michael Guthrie	Exelon Nuclear
Albert Piha	Exelon Nuclear
Alan Cox	Entergy
Julie Keys	NEI
Eric Blocher	STARS
Dave Gerber	Structural Integrity Assoc.
Carolyn Fairbanks	NRC
Seung Min	NRC
Ching Ng	NRC
Antonio Dias	NRC
Brett Lynch	STARS
Steve Toney	Westinghouse
Michelle Albright	Southern California Edison
David Alley	NRC
Tom Quintenz	Exelon
Allen Hiser	NRC
Al Fulvio	Exelon
Alexander Tsirigotis	NRC
Rachel Vaucher	NRC
Roger Kalikian	NRC
Bennett Brady	NRC
Sharon Murciel*	AmerenUE
Abbas Mostala*	Columbia
Arthur Cunanan*	NRC
Angie Krainik*	Palo Verde
Gene Echols*	Prairie Island

\* Participated by teleconference

ENCLOSURE

# Draft License Condition

Upon entering the period of extended operation, programs and activities for managing the effects of aging and evaluations of time-limited aging analyses shall be evaluated at least every refueling cycle provided the interval between evaluations does not exceed 24 months. The evaluations shall take into account industry-wide and site-specific operating experience. Adjustments shall be made where necessary to ensure that programs are updated to appropriately manage aging, and to ensure the activities authorized by the renewed license will continue to be conducted in accordance with the current licensing basis.

accordance with 10 CFR 54.21(c)(2), because they were granted under 10 CFR 50.12 and are based on the USE or P-T limit TLAAs, which are governed by the fracture toughness analysis requirements in 10 CFR Part 50, Appendix G.

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**ADAMS Accession No.: ML110610639 (PKG) ML110530016 (LTR) ML110610647 (SLIDES)**

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<b>NAME</b>	IKing	MHomiack	ADias (RGramm for)	MHomiack
<b>DATE</b>	03/04/2011	03/04/2011	03/04/2011	03/04/2011

**OFFICIAL RECORD COPY**

Memorandum to Antonio F. Dias from Matthew J. Homiack dated March 04, 2011

SUBJECT: SUMMARY OF THE MEETING BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION STAFF AND THE NUCLEAR ENERGY INSTITUTE TO DISCUSS TIME-LIMITED AGING ANALYSES FOR REACTOR LICENSE RENEWAL

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