



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

February 16, 2001

**ORGANIZATION:** Nuclear Energy Institute

**SUBJECT:** SUMMARY OF MEETING WITH THE NUCLEAR ENERGY INSTITUTE (NEI) TO DISCUSS INDUSTRY COMMENTS ON THE MECHANICAL SECTIONS OF GALL THAT NEI HAS ESCALATED TO THE BRANCH CHIEF

On January 25, 2001, representatives of NEI met with the Nuclear Regulatory Commission (NRC) staff in Rockville, Maryland, to discuss industry comments on the mechanical sections of GALL that NEI has escalated to the Branch Chief (Attachment 2 is attendance list). This meeting was a followup meeting to the December 21, 2000 meeting where NEI identified a total of 64 issues that they would like to escalate to management. Prior to this meeting (January 25<sup>th</sup>), internal NRC staff meetings were held to discuss these issues with the responsible branch chiefs. Based on these internal meetings, the staff wrote their proposed resolution to the issues and sent to NEI (Adams Accession Number ML010220270). The purpose of the January 25<sup>th</sup> meeting was to discuss the mechanical issues in which NEI disagreed with the staffs preliminary resolution or that NEI needed clarification. A total of 13 issues from the 36 mechanical proposed resolutions were discussed at this meeting. NEI confirmed that they agreed with the proposed resolution of the other 23 items and they were not discussed.

The following table provides the issue number and issue title, the conclusion or action item from the meeting, and the staff's proposed action item resolution or conclusion from their action items. In some cases, communication with NEI was required. The purpose of the communication was to clarify the position and is provided as attachment 1.

Issue Number/title	Meeting conclusion or action item	Proposed action item resolution or conclusion from action item.
2/ Small bore piping – need for one-time inspection	AGREE TO DISAGREE.	No action item was identified for this issue

Issue Number/title	Meeting conclusion or action item	Proposed action item resolution or conclusion from action item.
5, 17 & 18/ Threshold for neutron fluence in reactor vessel and internals (10E17)	<b>NEI ACTION.</b> NEI will consider staff's proposal further on the threshold for neutron fluence. Staff agreed to remove the specific recommendation for enhanced VT-1 and replace with it as an example of an effective methodology.	Staff is considering to include the following:  One example of a supplemental examination could be enhancement of the visual VT-1 examination of Section XI IWA-2210. A description of such an enhanced visual VT-1 examination could include the ability to achieve a 0.0005-in. resolution, with the conditions (e.g., lighting and surface cleanliness) of the inservice examination bounded by those used to demonstrate the resolution of the inspection technique.
6/ Bolting – loss of pre-load and cyclic loading SCC	<b>NRC ACTION.</b> NRC will investigate lubricants use in the bolting programs. NRC will look up documentation provided by NEI (BL 82-02). NEI will make a recommendation of how bolting should be addressed in GALL.	NEI commented to delete the aging effects/mechanisms of loss of pre-load due to stress relaxation and crack initiation/growth due to cyclic loading and stress corrosion cracking for carbon steel closure bolting in high-pressure or high-temperature systems.  NRC staff conducted a conference call to clarify the issue on February 6, 2001, with NEI. The staff understands that the disulfide lubricants are no longer being used. The staff is concerned with the yield strength (YS) of the bolts. There are minimum technical specifications (107 ksi) but there are no maximum. Therefore, crack initiation and growth can still occur if the YS is high and there is moisture in the air. There is significant supporting evidence for crack initiation/growth due to cyclic loading and stress corrosion cracking. Field experience shows that SCC (NRC GL 91-17) caused 20% of the bolt failures. The bolts made of SA 193 Grade B7 can have YS as high as 175 ksi and failures have been reported with YS as low as 140 ksi. Crack initiation and growth can result in leakage.

Issue Number/title	Meeting conclusion or action item	Proposed action item resolution or conclusion from action item.
7/ Closure bolting – separate component	<b>RESOLVED.</b> Unless NEI provides additional comments on how bolting should be addressed in GALL, this issue is resolved for March.	Resolved.
11 & 12/ Vessel circumferential and axial welds	<b>NEI ACTION.</b> NRC staff is to request Robin Dyle to clarify NEI position.	<p>The new wording for GALL to address this issue is proposed as follows:</p> <p>The revised writeup for line A1.2-c, neutron embrittlement of reactor vessel TLAA is proposed as follows:</p> <p>Neutron irradiation embrittlement is a time dependent aging mechanism that needs to be evaluated for the period of extended operation for all ferritic materials that have a neutron fluence of greater than <math>10E17</math> n/cm<sup>2</sup> (<math>E&gt;1</math> MeV) at the end of the license renewal term. Aspects of this evaluation may involve a time-limited aging analysis (TLAA) . In accordance with approved BWRVIP-74, the TLAA should evaluate the impact of neutron embrittlement on:</p> <ul style="list-style-type: none"><li>(a) the adjusted reference temperature, the plant's pressure temperature limits, (b) the need for inservice inspection of circumferential welds, (c) the Charpy upper shelf energy or the equivalent margins analyses performed in accordance with 10 CFR 50, Appendix G.</li></ul> <p>Additionally, the applicant should monitor axial beltline weld embrittlement. One acceptable method is to determine that the mean RT<sub>ndt</sub> of the axial beltline welds at the end of the extended period of operation are less than the value specified by the staff in its May 7, 2000 letter. See the Standard Review Plan, Section 4.2 "Reactor Vessel Neutron Embrittlement" for details acceptable methods for meeting the requirements of 10CFR54.21(c).</p>

Issue Number/title	Meeting conclusion or action item	Proposed action item resolution or conclusion from action item.
13 Bottom head and pressurizer penetrations	NRC ACTION. GALL will be modified to make plant specific with the mrp to address the issue (similar to words that are in Void swelling)	<p>Staff is considering to revise the GALL report as follows:</p> <p>A need for augmented program (plant specific program) could be eliminated for the vessel closure head penetrations such as vessel head vent pipe (Item A2.7.2) and other top head penetration (new Item A2.7.3 added) because they are covered by GL 97-01. Therefore, the AMP for Item A2.2.1 (Control Rod Drive Head Penetration) is sufficient for Items A2.7.2 and A2.7.3.</p> <p>For bottom head instrumentation tubes (Item A2.7.1), pressurizer instrument penetrations (Item C2.5.6) and pressurizer heater sheaths and sleeves (Item C2.5.10), they are subjected to Inservice Inspection for Class 1 components and Water Chemistry. However in addition, the applicant should provide a plant-specific AMP or participate in industry programs to manage PWSCC of Inconel 182 welds.</p>
19 and 20 SCC in containment spray and standby liquid control	NRC ACTION. Staff will investigate the introduction of contaminants as an event because there is no experience of SCC at low temperatures. Staff will review NUREG/CR-6001 to see if SCC is appropriate.	<p>Stress corrosion cracking (SCC) of stainless steel (SS) components exposed to borated water is possible at temperatures below 200°F if contaminants are present in the water. This is supported by operating experience at PWR plants (IN 79-19, IE Bulletin 79-17) As suggested by NEI at a public meeting on 01/25/01, the staff reviewed the information in NUREG/CR-6001 and concurred that operating experience indicates that degradation does not occur if water chemistry is maintained.</p> <p>Staff proposes that the GALL report be changed as a result of this comment to rely on water chemistry as the aging management program for the affected line items.</p>

Issue Number/title	Meeting conclusion or action item	Proposed action item resolution or conclusion from action item.
22 Delta ferrite limit for cast stainless steel – 25% vs. 40%	<b>RESOLVED.</b> NEI agreed that staff should move forward with the 25% delta ferrite limit for cast stainless steel. They asked that staff review additional data later. Staff replied that when NEI provides the data then they should compare their data to the NRC data since there is several references from which the NRC has based their decision.	NEI indicated that they may send additional data after March.
25 Buildup of deposit/flow blockage – impact on heat transfer	<b>NRC ACTION.</b> Staff to investigate flow blockage as an issue	<p>NRC considers that biofouling affects both system flow performance and pressure boundary integrity. Flow performance is considered an active function covered under the current licensing basis and should not be included within the scope of license renewal. However, biofouling causes loss of material, which affects the pressure boundary and this passive function requires aging management.</p> <p>This position does not contradict License Renewal Issue No. 98-105 which states that the heat transfer function for heat exchangers is within the scope of license renewal. Therefore, biofouling of heat exchanger tubes require aging management.</p> <p>NRC proposes the following changes to the GALL report:</p> <p>1. The staff is considering revising the GALL report to delete all heat exchanger components except the tubes from the material column for buildup of deposits due to biofouling.</p>

Issue Number/title	Meeting conclusion or action item	Proposed action item resolution or conclusion from action item.
		<p>2. For all piping and components other than heat exchangers, the GALL report could be revised to delete all line items for buildup of deposits due to biofouling.</p> <p>3. For all piping and components including heat exchangers, loss of material due to biofouling could be included as an aging effect for pressure boundary parts.</p> <p>4. The aging management program XI.M20 "Open-Cycle Cooling Water System" could be revised to remove reference to flow blockage.</p>
26 Biofouling – preventing intended function	<p><b>NRC ACTION.</b> Actions are the same as item 25. Staff to investigate flow blockage as an issue.</p>	<p>For NEI comment G-VII-G-9, staff considers the buildup of deposit due to biofouling in fire protection applicable. Portions of the fire protection system are not routinely subjected to flow. The piping and fittings and miscellaneous components (filter, fire hydrant, multisifier, pump casing, sprinkler, strainer, and valve bodies, containment isolation valves) in water-based fire protection systems are exposed to raw water and are therefore susceptible to biofouling. Biofouling can occur anywhere although the effect may be more prominently noted on the sprinklers. Biofouling can cause loss of material due to corrosion as described in #25 above. In addition, biofouling can plug up a backup water supply line (flow blockage).</p>
49 WCAP on internals	<p><b>NEI ACTION.</b> NRC is to investigate wear of the guide tubes. NEI is to formulate position.</p>	<p>In item 49c, NEI commented to delete wear as an aging effect for the RCCA guide tubes, core barrel flange and guide tube cards because measurements have shown this effect to be not significant, or insignificant relative motion to result in wear. Staff agrees that wear of the RCCA guide tubes is not significant and this was confirmed in WCAP 14577. The line item for wear of the guide tubes in Gall will be removed based on this comment. Staff's conclusion for 49a, 49b, and 49d has not changed and NEI is considering their position.</p>

The staff also emphasized that NEI should provide their action items on an expedited basis to support the aggressive schedule of issuing the GALL report and SRP-LR in March, 2001.

A handwritten signature in black ink, appearing to read "Jerry Dozier". The signature is fluid and cursive, with the first name "Jerry" and last name "Dozier" clearly distinguishable.

Ira Jerry Dozier, General Engineer  
Engineering Section  
License Renewal and Standardization Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Project No. 690

Attachments: As stated

cc w/atts: See next page

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Ira Jerry Dozier, General Engineer  
Engineering Section  
License Renewal and Standardization Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Project No. 690

Attachments: As stated

cc w/atts: See next page

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## NUCLEAR ENERGY INSTITUTE

Project No. 690

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**From:** Kimberley Rico  
**To:** internet: DJW@NEI.ORG  
**Date:** Thu, Feb 8, 2001 11:31 AM  
**Subject:** Issue26

Doug-

Issue 62 (NEI comment G-XI-M10.2) concerning the full flow test in addition to NFPA is the same as Issue 26 (NEI comment G-VII-G-9) concerning buildup of deposit. My notes from the meeting indicate that Issue 62 was grouped with Issue 25 and 26 for further discussion on the applicability of flow in license renewal. The attached email is a copy of what was sent to you yesterday. Refer to this for our latest position. Please let me know if this does not clear things up.

-Kimberley  
301-415-1091

**CC:** James Strnisha, Jerry Dozier, Peter Kang, Samso...

## February 6, 2001 NRC Telephone Conference with NEI – For Comments on License Renewal Guidance Documents

On February 6, 2001, NRC staff held a conference call with NEI to discuss Issue 6 on bolting with loss of pre-load and cyclic loading due to SCC (see attendance list below). NRC staff clarified the purpose of the bolting integrity program. At the January 25, 2001 meeting, NEI had raised the issue of the discontinued use of moly disulfide lubricants (NRC BL 82-02). Therefore if the lubricant is no longer used, then the aging effect will not occur. During the teleconference NRC staff clarified that the disulfide lubricant was not the issue. The staff's concern is with the yield strength (YS) of the bolts. In Section II of the ASME Code, the specification for SA193 Grade B7 for bolting only give a minimum YS of 105, but no maximum is given. Staff stated that YS below 150 were acceptable. Staff referred NEI to NRC GL 91-17, which imposed no requirements but did referenced EPRI documents that address the issue of YS in bolting. Upon the close out of GSI-29 in NUREG-1339, the inspection of the bolts did not pass the back-fit rule. However, there are no such restrictions during the renewal period. The AMP remains the bolting integrity program, but the applicant always has the option of proposing an alternative plant specific program.

### Participants

Bill Bateman  
Jim Davis  
Kimberley Rico  
Jim Strnisha  
Ed Kleeh  
Doug Walters

### Organization

NRR/DE/EMCB  
NRR/DE/EMCB  
NRR/DRIP/RLSB  
NRR/DRIP/RLSB  
NRR/DRIP/RLSB  
NEI

**From:** Omid Tabatabai  
**To:** Dozier, Jerry, Lee, Samson  
**Date:** Mon, Feb 5, 2001 7:29 AM  
**Subject:** Re: Issue #12-- Axial Welds for BWRs

Jerry:

If you have not prepared a last week's meeting summary yet, please include the following into your meeting summary.

Thanks,

Omid Tabatabai, Project Manager  
License Renewal and Standardization Branch  
Office of Nuclear Reactor Regulation  
Phone: 301-415-3738

>>> Samson Lee 02/02 8:22 AM >>>  
Omid:

This communication with NEI should be documented. One option is to have this included in Jerry's meeting summary.

Thanks,  
Sam

>>> Omid Tabatabai 02/01 2:40 PM >>>  
Staff's response regarding subject issue-- NEI's comment on deleting Sections 4.2.2.1.5 and 4.2.3.1.5 from SRP-LR Chapter 4-- has been revised to:

*According to 10CFR part 54, the analyses must be performed for a 60-year period and not for 40-year period. SRP sections 4.2.2.1.5 and 4.2.3.1.5 will be revised to identify that embrittlement of axial beltline welds need to be monitored and that plant-specific information or a program for monitoring embrittlement is necessary.*

NEI had requested additional clarification regarding this issue during 1/29/01 meeting and this revision is based on Barry Elliot's conversation with Robin Dyle of ASME.

Omid Tabatabai, Project Manager  
License Renewal and Standardization Branch  
Office of Nuclear Reactor Regulation  
Phone: 301-415-3738

**From:** Jerry Dozier  
**To:** internet: rldyle@southernco.com  
**Date:** Fri, Feb 2, 2001 8:52 AM  
**Subject:** NEI Open items 11 and 12

Robin,

The updated writeup in response to NEI comment G-IV-A1-3 (Issue #11) was revised as follows:

Neutron irradiation embrittlement is a time-limited aging analysis (TLAA) to be evaluated for the period of extended operation for all ferritic materials that have a neutron fluence of greater than  $10^{17}$  n/cm<sup>2</sup> ( $E > 1$  MeV) at the end of the license renewal term. In accordance with approved BWRVIP-74, the TLAA should evaluate the impact of neutron embrittlement on: (a) the adjusted reference temperature, the plant's pressure temperature limits, and the need for inservice inspection of circumferential welds, (b) the Charpy upper shelf energy, (c) the equivalent margins analyses performed in accordance with 10 CFR 50, Appendix G. **Additionally, the applicant should monitor axial beltline weld embrittlement. One acceptable method is to determine that the mean RT<sub>ndt</sub> of the axial beltline welds at the end of the extended period of operation are less than the values specified by the staff in its May 7, 2000 letter.** See the Standard Review Plan, Section 4.2 "Reactor Vessel Neutron Embrittlement" for details.

(note that (d) probability of failure of axial welds was deleted)

**For open issue 12 (with SRP)**

Staff's response regarding subject issue-- NEI's comment on deleting Sections 4.2.2.1.5 and 4.2.3.1.5 from SRP-LR Chapter 4-- has been revised to:

*According to 10CFR part 54, the analyses must be performed for a 60-year period and not for 40-year period. SRP sections 4.2.2.1.5 and 4.2.3.1.5 will be revised to identify that embrittlement of axial beltline welds need to be monitored and that plant-specific information or a program for monitoring embrittlement is necessary.*

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**CC:** Allen Hiser, Barry Elliot, C. E. (Gene) Carpent...

**From:** "Dyle, Robin L." <RLDYLE@southernco.com>  
**To:** "Jerry Dozier" <JXD@nrc.gov>  
**Date:** Mon, Feb 5, 2001 11:08 PM  
**Subject:** Item 11 & 12 resolution:

Gentlemen:

Attached is a word document using "track changes mode" that contains edited responses of your proposed resolution of items 11 and 12. My efforts in the process is to define the information that the staff has indicated that it needed, but do so in a way that eliminates controversy. I cannot stress strongly enough that by definition, the axial beltline failure probability is not a TLAA. There is nothing in CLB requiring such a calculation. Thus, it cannot be a TLAA. However, we do need to monitor beltline embrittlement and the words offered are describing that.

<<Item 11 & 12 response comment.doc>>

Robin Dyle  
Southern Nuclear Operating Company  
40 Inverness Center Parkway  
Birmingham, AL 35242  
rldyle@southernco.com  
(205) 992-5885  
(205) 992-5793 fax

**CC:** "Carpenter, Gene" <cec@nrc.gov>

**Item 11:**

Neutron irradiation embrittlement is a time dependent aging mechanism that needs to be evaluated for the period of extended operation for all ferritic materials that have experienced a neutron fluence exceeding  $10^{17}$  n/cm<sup>2</sup> ( $E > 1$  MeV) at the end of the license renewal term. Aspects of this evaluation may involve a TLAA. In accordance with approved BWRVIP-74, the TLAA should evaluate the impact of neutron embrittlement on: (a) the adjusted reference temperature, the plant's pressure temperature limits, (b) the need for inservice inspection of circumferential welds, (c) the Charpy upper shelf energy, or the equivalent margins analyses performed in accordance with 10 CFR 50, Appendix G. Additionally, the applicant should monitor axial beltline weld embrittlement. One acceptable method to demonstrate adequate management of axial beltline embrittlement is that the licensee determine that the mean  $RT_{NDT}$  of the axial beltline welds at the end of the extended period of operation are less than the values specified by the staff in its May 7, 2000 letter. See the Standard Review Plan, Section 4.2 "Reactor Vessel Neutron Embrittlement" for details.

**Item 12:**

Staff's response regarding subject issue-- NEI's comment on deleting Sections 4.2.2.1.5 and 4.2.3.1.5 from SRP-LR Chapter 4 has been revised to:

SRP sections 4.2.2.1.5 and 4.2.3.1.5 will be revised to identify that embrittlement of axial beltline welds need to be monitored and that plant-specific information or a program for monitoring embrittlement is necessary.

**Suggested words:**

The licensee must have plant-specific information regarding the management of radiation embrittlement of beltline welds. This information includes a) an assessment of the need for inservice inspection of the RPV circumferential in accordance with BWRVIP-74 or other NRC approved methodology, (b) adjusted reference temperature and updated pressure-temperature limits for the extended period of operation, (c) an assessment of the Charpy upper shelf energy or equivalent margins analysis. Additionally, the applicant should monitor axial beltline weld embrittlement. One acceptable method to demonstrate adequate management of axial beltline embrittlement is that the licensee determine that the mean  $RT_{NDT}$  of the axial beltline welds at the end of the extended period of operation are less than the values specified by the staff in its May 7, 2000 letter.



**From:** Samson Lee  
**To:** internet: DJW@NEI.ORG  
**Date:** Wed, Feb 7, 2001 3:46 PM  
**Subject:** Follow-up items on 1/25/01 meeting

Doug:

We have completed follow-up items from our 1/25/01 meeting on certain GALL/SRP items (see attached).  
We plan on attaching this to the 1/25/01 meeting summary.

Thanks,  
Sam

**CC:** Cig, jxd, PTK

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2/ Small bore piping – need for one-time inspection	NEI/NRC agrees to disagree	No action item was identified for this issue
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<p>19 and 20 SCC in containment spray and standby liquid control</p>	<p>Staff will investigate the introduction of contaminants as an event because there is no experience of SCC at low temperatures. Staff will review NUREG/CR-6001 to see if SCC is appropriate.</p>	<p>Stress corrosion cracking (SCC) of stainless steel (SS) components exposed to borated water is possible at temperatures below 200°F if contaminants are present in the water. This is supported by operating experience at PWR plants (IN 79-19, IE Bulletin 79-17) As suggested by NEI at a public meeting on 01/25/01, the staff reviewed the information in NUREG/CR-6001 and concurred that operating experience indicates that degradation does not occur if water chemistry is maintained.</p> <p>Staff proposes that the GALL report be changed as a result of this comment to rely on water chemistry as the aging management program for the affected line items.</p>

<p>22 Delta ferrite limit for cast stainless steel – 25% vs. 40%</p>	<p>NEI agreed that staff should move forward with the 25% delta ferrite limit for cast stainless steel. They asked that staff review additional data later. Staff replied that when NEI provides the data then they should compare their data to the NRC data since there is several references from which the NRC has based their decision.</p>	<p>NEI may send additional data after March.</p>
<p>25 Buildup of deposit/flow blockage – impact on heat transfer</p>	<p>Staff to investigate flow blockage as an issue</p>	<p>NRC considers that biofouling affects both system flow performance and pressure boundary integrity. Flow performance is considered an active function covered under the current licensing basis and should not be included within the scope of license renewal. However, biofouling causes loss of material, which affects the pressure boundary and this passive function requires aging management.</p> <p>This position does not contradict License Renewal Issue No. 98-105 which states that the heat transfer function for heat exchangers is within the scope of license renewal. Therefore, biofouling of heat exchanger tubes require aging management.</p> <p>NRC proposes the following changes to the GALL report:</p> <ol style="list-style-type: none"> <li>1. The staff is considering revising the GALL report to delete all heat exchanger components except the tubes from the material column for buildup of deposits due to biofouling.</li> <li>2. For all piping and components other than heat exchangers, the GALL report could be revised to delete all line items for buildup of deposits due to biofouling.</li> </ol>

		<p>3. For all piping and components including heat exchangers, loss of material due to biofouling could be included as an aging effect for pressure boundary parts.</p> <p>4. The aging management program XI.M20 "Open-Cycle Cooling Water System" could be revised to remove reference to flow blockage.</p>
26 Biofouling – preventing intended function	Actions are the same as item 25, NRC will discuss at Chris' meeting on January 31, 2001. Staff to investigate flow blockage as an issue.	For NEI comment G-VII-G-9, staff considers the buildup of deposit due to biofouling in fire protection applicable. Portions of the fire protection system are not routinely subjected to flow. The piping and fittings and miscellaneous components (filter, fire hydrant, mulsifier, pump casing, sprinkler, strainer, and valve bodies, containment isolation valves) in water-based fire protection systems are exposed to raw water and are therefore susceptible to biofouling. Biofouling can occur anywhere although the effect may be more prominently noted on the sprinklers. Biofouling can cause loss of material due to corrosion as described in #25 above. In addition, biofouling can plug up a backup water supply line (flow blockage).
49 WCAP on internals	NRC is to investigate wear of the guide tubes. NEI is to formulate position.	In item 49c, NEI commented to delete wear as an aging effect for the RCCA guide tubes, core barrel flange and guide tube cards because measurements have shown this effect to be not significant, or insignificant relative motion to result in wear. Staff agrees that wear of the RCCA guide tubes is not significant and this was confirmed in WCAP 14577. The line item for wear of the guide tubes in Gall will be removed based on this comment. Staff's conclusion for 49a, 49b, and 49d has not changed and NEI is considering their position.

NRC MEETING WITH THE NUCLEAR ENERGY INSTITUTE ON LICENSE RENEWAL  
ATTENDANCE LIST  
JANUARY 25, 2001

<u>NAME</u>	<u>ORGANIZATION</u>
Jerry Dozier	
Jim Strnisha	NRC/NRR/DRIP/RLSB
Kieth Wichman	NRC/NRR/DE/EMCB
Bill Bateman	NRC/NRR/DE/EMCB
Barry Elliot	NRC/NRR/DE/EMCB
Tony Grenci	CNS
Michael Semmler	Duke Energy
Antonio G. Menocal	Florida Power & Light
Doug Walters	NEI
Michael McNel	NRC/RES/DET
Fred Polaski	Exelon Nuclear
Robert Gill	Duke Energy
Kris Parczewski	NRC/NRR/DE/EMCB
Omesh Chopra	ANL
P. T. Kuo	NRC/NRR/DRIP/RLSB
Sam Lee	NRC/NRR/DRIP/RLSB
W. C. Liu	NRC/NRR/DRIP/RLSB
Kathryn Sutton	Winston & Strawn
Deann Raleigh	LIS, Scientech
David Solorio	NRC/NRR/DRIP/RLSB
Kimberley Rico	NRC/NRR/DRIP/RLSB
E. A. Kleeh	NRC/NRR/DRIP/RLSB
Omid Tabatabai	NRC/NRR/DRIP/RLSB
Goutam Bagchi	NRC/NRR/DE
Robert Whorton	South Carolina Electric & Gas
William Evans	Southern Nuclear
Yung Y. Liu	Argonne National Lab
Charles Meyer	Westinghouse Owners Group
Robert Wyatt	Carolina Power & Light Company
James Claborde	South Carolina Electric & Gas Com
Francis Grubelich	NRC/NRR/DE/EMEB
Allen Hiser	NRC/NRR/DE/EMCB
Chris Grimes	NRC/NRR/DRIP/RLSB