July 11, 2002

Mr. Richard Luckett, Project Manager
Performance Based Regulation
Nuclear Energy Institute
1776 I Street, NW
Suite 400
Washington, DC 20006-3708

SUBJECT: NRC COMMENTS ON NEI's DRAFT DOCUMENTS REGARDING ILRT TEST INTERVAL EXTENSION EXPERT ELICITATION PROCESS

Dear Mr. Luckett:

By E-mail dated June 12, 2002 (Refer to ADAMS Accession Number: ML021630328), the staff was asked to review and comment on three NEI draft documents: "ILRT Type A Test Interval Optimization Methodology - Problem Statement," "ILRT Type A Test Interval Optimization Methodology - Expert Elicitation Input and Results," and "ILRT Type A Test Interval Optimization Methodology - Expert Elicitation Process." Attached for your consideration are the staff's comments on these draft documents.

If you have any questions please contact me at 301-415-2832.

Sincerely,

/RA/

Peter C. Wen, Project Manager
Policy and Rulemaking Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Project No.: 689
Attachment: As stated

cc: See next page

cc: Mr. Anthony Pietrangelo, Director
Performance Based Regulation
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

Mr. Richard Luckett, Project Manager
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

July 11, 2002

Mr. Richard Luckett, Project Manager
Performance Based Regulation
Nuclear Energy Institute
1776 I Street, NW
Suite 400
Washington, DC 20006-3708

SUBJECT: NRC COMMENTS ON NEI's DRAFT DOCUMENTS REGARDING ILRT TEST INTERVAL EXTENSION EXPERT ELICITATION PROCESS

Dear Mr. Luckett:

By E-mail dated June 12, 2002 (Refer to ADAMS Accession Number: ML021630328), the staff was asked to review and comment on three NEI draft documents: "ILRT Type A Test Interval Optimization Methodology - Problem Statement," "ILRT Type A Test Interval Optimization Methodology - Expert Elicitation Input and Results," and "ILRT Type A Test Interval Optimization Methodology - Expert Elicitation Process." Attached for your consideration are the staff's comments on these draft documents.

If you have any questions please contact me at 301-415-2832.

Sincerely,

/RA/

Peter C. Wen, Project Manager
Policy and Rulemaking Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Project No.: 689
Attachment: As stated
cc: See next page

Distribution:

ADAMS-PUBLIC	RPRP R/F		
DMatthews/FGillespie	C. Grimes	S. West	
C. Casto/R. Barrett	G. Imbro	D. Terao	H. Ashar
G Holahan/ S. Black	M. Johnson	M. Rubin	M. Snodderly
J. Hannon	S. Weerakkody	J. Pulsipher	L. Abramson

ADAMS ACCESSION NO: **ML021930012**

*See Previous Concurrence

OFFICE	RPRP:DRIP	PRAB:RES	EMEB:DE	SPSB:DSSA	SPLB:DSSA
NAME	P Wen*	L Abramson*	H Ashar*	M Snodderly*	J Pulsipher*
DATE	07/10/02	07/10/02	07/10/02	07/10/02	07/10/02

OFFICE	SC:SPLB:DSSA	BC:SPLB:DSSA	RPRP:DRIP
NAME	SWeerakkody	J Hannon	S West
DATE	07/11/02	07/11/02	07/11/02

OFFICIAL OFFICE COPY

NRC COMMENTS ON DRAFT EPRI REPORT,
"ILRT TYPE A TEST INTERVAL OPTIMIZATION METHODOLOGY"

A. Pertaining to the Significant Containment Leakage or Degradation Event Database (Attachment 1 to the Problem Statement)

1. The draft report (2nd paragraph on page 8 of 30) states that only one event (i.e., Event 35) in Attachment 1 was discovered during performance of an ILRT, not identified by local leak rate tests, with a stated leak rate greater than 2 La. This statement may not be conservative, because there were events, such as Event 1, where the leakage rate was not quantified or was unquantifiable and were not included. It is possible that some if not all of these events may have had leakage rate greater than 2 La.

2. Several events in Attachment 1, such as manway gasket leakage, include a comment that states, "Manway gasket leakage is detectable during startup and operation, releases through SG would be late and scrubbed." The test interval extensions that have been approved to date are based on the premise that the containment is within its technical specification limits and the plant meets current requirements including 10 CFR Part 100 and GDC 19. Therefore, it is unacceptable to assume that preexisting leakage is allowed just because it would be late and scrubbed, unless it is included as part of the plant's radiological design basis. A detailed description of how such leakage would be detected should be provided. This comment also applies to Events 41 and 57.

3. Events 25, 33, 34, 35, 36, 38, 42, and 61: Please clarify the "Comments" block and the assessment of "No" in the last column of "Preliminary Assessment Effect Non Detection Time." If the Type A test found excessive leakage, which was not and would not have been identified by Type B and C testing or other means, doesn't that qualify as an "ILRT failure"?

4. Events 14, 16, 19, and 22: It is implied, and should be stated if true, that the subsequent Type B and C tests showed that the excessive leakage found by the Type A test was due to Type B and C-tested penetrations.

5. Event 30: The only information here is that the leakage rate was greater than 1 La, and yet the preliminary assessment is "No," with no explanation. Is this correct?

6. Event 31: "Unknown" leakage caused by "instrumentation problems." How is the preliminary assessment result of "No" derived from this information?

7. Event 66: The inadequate Type C test procedure did not detect excessive purge valve leakage, and would not have been corrected if the problem had not been found during a Type A test. It seems, then, that the non-detection time would have been affected if the Type A test interval had been extended.

B. Pertaining to the Expert Elicitation Process (NEI draft documents - Problem Statement and Expert Elicitation Process)

1. NUREG-1493 describes the 1994 NUMARC survey of utilities to study containment testing performance and cost data. Of the 144 ILRT test results reported in the survey, 23 exceeded 1.0 La. An NEI letter, dated November 13, 2001, concerning one time extensions of containment integrated leak rate test interval discusses 4 ILRT failures out of 144 tests and an expanded survey that indicated 5 failures out of 182 tests. This does not correlate with the 3 failures (based on the 1994 NUMARC survey) discussed on page 6 of the draft report (Problem Statement). A more detailed explanation of why the 23 failures identified in NUREG-1493 were reduced to 0 should be provided including the alternative method of detection.

2. The problem statement did not include the discussion of extending the LLRT intervals on ILRT intervals (in relation to LLRT intervals in Option A of Appendix J).

3. Page 2 of 30: In Section 3.0, “FRAMEWORK,” paragraph 2, the report states that “containment leakage or degradation detectable by alternative means does not impact the risk associated with revising the ILRT interval.” Isn’t the containment integrity (as required by GDC 16) verified by the combination of the available alternative means (i.e. ISIs, LLRTs and ILRTs)?

4. Page 8 of 30: Regarding the discussion of venting, unless a positive pressure is maintained and air inventory is taken as part of routine monitoring, venting cannot be relied upon for detecting small and large leakages.

5. Page 9 of 30: The following sentence on the top of the page, “In any event, it does not appear that extension of the ILRT interval would increase the time that a leak path was not detected, as the single exception should have been identified by local leak rate testing and has not repeated.” needs further clarification. What was the single exception?

6. Page 10 of 30: The probability of a significant containment leakage event for large La will be calculated by extrapolating the tail of an assumed distribution whose shape will be determined by the panel. The problem with this is that the tail behavior can be very sensitive to the shape of the distribution, especially if the extrapolation is well beyond the observed data to which the distribution is fitted. What are the effects of assuming different distributional shapes for La?

7. The report considers LERF and the increase in population dose as figures of merit in assessing the risk impact of the proposed change. RG 1.174 discusses defense-in-depth and encourages the use of risk analysis techniques to help ensure and show that key principles, such as the defense-in-depth philosophy, are met. The one time ILRT Type A test interval extensions that have been approved to date estimate the change in the conditional containment failure probability for the proposed change to demonstrate that the defense-in-depth philosophy is met. Such a demonstration that the defense-in-depth philosophy is met should be provided.

8. With the ILRT Type A Testing Optimization issue assigned a level of complexity of C, the technical integrator develops the community distribution. Is consensus agreement among the technical experts of the community distribution required? If not, how are differences of opinion documented and reconciled?

9. Will resumes of the technical experts be included as part of the report?

10. In addition to the significant containment leakage database, shouldn't the panel be provided with the containment degradation database? This database is available from EPRI or NRC (SEC-96-080)?

C. <u>Pertaining to the Expert Elicitation Input and Results</u>

1. <u>Page 3 of 16</u>: In Section 4.0, Day 1, Afternoon Session, we recommend that in addition to the "degraded liner"events, the "degraded steel shell" events be included in the presentation.

2. <u>Page 4 of 16</u>: In Section 4.1, there is no mention of training for the experts in estimating the leakage rates which they will be asked to provide. It is well-established that people are subject to various biases in making subjective estimates. Furthermore, many scientists and engineers are uncomfortable and distrustful with making subjective estimates of quantities which they usually determine from data. In designing an expert elicitation process, it is essential that the experts be made aware of the potential bias mechanisms so as to reduce the bias in their judgments. In addition, through the use of an exercise based on "almanac-type" questions, it is highly desirable to demonstrate to the expert panel that their group estimates can contain useful information about an unknown quantity even if the panel members are uncertain about their own individual estimates. Based on these considerations, the staff suggests that 2-3 hours be devoted to elicitation training in the first day of the expert elicitation meeting.

3. <u>Page 6 of 16</u>: Paragraph starting with "second presentation," should include discussion of actual database of found degradations, some commonly found during ISIs (e.g. corrosion of liner plates or steel shell near moisture barriers), and some that are found after a number of years of hybernation (concealed corrosion). ISIs cannot detect concealed corrosion, unless UTs are performed periodically. These types of degradation need to be integrated in risk-assessment.

4. <u>Page 9 of 16</u>: The experts will be asked to estimate the expected frequencies of various failure modes. Presumably, they will be instructed to provide their "best" estimates, without any indication of their uncertainty. If the only measure of uncertainty is based on the variability of the individual experts' estimates, there is a possibility that the uncertainties in the failure mode frequencies will be underestimated.

   In order to estimate the uncertainties in the failure mode frequencies, consider eliciting low and high values, as well as the best estimates. One way to do this is to ask for a subjective 5th and 95th percentile of the uncertainty distribution of each failure mode frequency. The best estimate would then correspond to the median or 50th percentile. If this is done, how will the elicited high and low values be incorporated into the uncertainties associated with the best estimate results?

5. <u>Pages 14 of 16:</u> The entries in the input table to be completed by the experts are all absolute numbers. However, for the small leakage pathways, there is considerable historic data available for some of the failure modes, e.g., corrosion. Why elicit frequencies for such failure mode frequencies? Furthermore, it is preferable to elicit relative rather than absolute values from the experts, because people are generally more comfortable making comparisons than estimating frequencies for phenomena with which they have little or no experience.

   For small leakage pathways, consider eliciting frequencies relative to failure mode frequencies for which data is available. For example, if little data is available for design deficiencies, ask the experts to estimate the ratio of the design deficiency frequency to the corrosion frequency. For medium leakage pathways, consider eliciting frequencies relative to the corresponding frequencies for small leaks. For large leaks, consider eliciting frequencies relative to medium leak frequencies.

6. <u>Pages 14 and 15 of 16, Table</u>: The staff suggests that “prestressing force losses” “containment bellows degradation” and “ordinary wear and tear” be added to the “Failure Mode or Degradation Description” column for discussion.

7. The definitions of “small leakage pathway,” “medium leakage pathway,’ and “large leakage pathway” are inconsistent between the text and the table.

8. The report defines a small leakage pathway as a leakage pathway that has resulted in an La of 2 or greater and less than 10 La. The one time ILRT Type A test interval extensions that have been approved to date are based on the premise that the containment is within its technical specification limits. Therefore, any event with a leakage greater than 1 La and less than 10 La should be considered a small leakage pathway.

9. The staff acknowledges that the document, “ILRR Type A Test Interval Optimization Methodology - Problem Statement” defines an ILRT failure as described in Footnote 1 as “those ILRT tests in which containment leakage was identified above the acceptance criteria that would not be detected by a local leak rate test, containment inspections, or other alternate means.” However, it is important for the panel to understand that an ILRT failure is when ILRT leakage exceeds the performance criteria of Section 9.1.1 of NEI 94-01.