October 9, 2002

MEMORANDUM TO: Christopher I. Grimes, Director
Policy and Rulemaking Program
Division of Regulatory Improvement Programs, NRR

FROM: Peter C. Wen, Project Manager ***/RA/***
Policy and Rulemaking Program
Division of Regulatory Improvement Programs, NRR

SUBJECT: SUMMARY OF A TELECONFERENCE BETWEEN NRC STAFF AND NEI ON OCTOBER 2, 2002, TO DISCUSS NEI'S RESPONSES TO NRC COMMENTS REGARDING THE ILRT TEST INTERVAL EXPERT ELICITATION PROCESS

On October 2, 2002, the NRC staff held a teleconference with the Nuclear Energy Institute (NEI) and its consultants to provide an opportunity for them to clarify their response provided in response to staff's comments/questions regarding the ILRT test interval extension expert elicitation process. NRC participants in the call were David Terao (EMEB), Jim Pulsipher (SPLB), Mike Snodderly and Andrzej Drozd (SPSB), Lee Abramson (RES) and Peter Wen (RPRP). The NEI participants were Rich Luckett, Biff Bradley, Ken Canavan, and John Gisclon.

Background:

In parallel with the one-time ILRT Type A test interval extensions (to 15 years) requested by several licensees, NEI initiated a project to propose a permanent ILRT test interval extension to, perhaps, as much as 20 years. The staff held two public meetings with NEI to discussed the related technical issues on July 12, 2001, and May 15, 2002. (Refer to ADAMS Accession Numbers ML01250051 and ML021560196 for meeting summaries).

NEI has completed a major milestone in its completion of an industry survey of test results of ILRTs performed from 1977 to 2001. NEI believes that the results of this survey along with the previous NUREG-1493 survey results (which covers ILRT test data from 1987 to 1993) would provide sufficient data samples to be used in the risk impact study associated with increasing ILRT test interval. NEI's next major milestone on this project is to construct a risk model; they plan to use an expert elicitation process to develop a refined frequency and size of a large containment leakage path.

NEI solicited the staff's comments on its documents regarding the expert elicitation process (ADAMS Accession Numbers ML021630328). The staff provided comments and questions to NEI on these documents by letter dated July 11, 2002 (ADAMS Accession Numbers ML021930012). NEI then sent its response to address the staff's comments and questions via e-mail on September 9, 2002 (Attachment 1). The teleconference was held for NEI to clarify some of their responses. A copy of the staff's talking points were transmitted to NEI prior to this teleconference (Attachment 2).

Summary:

All items of the staff's talking points were discussed during the teleconference. The participants did not believe it was necessary to resolve technical differences; rather, both sides used this as an opportunity to convey background information, future plans, and pending schedule. During this phone call, the staff expressed an interest to participate in NEI's expert elicitation panel as a member rather than just as an observer as previously indicated in the May 15, 2002 meeting. Other major points made during this phone call were:

- NEI will provide the staff with a copy of the ILRT, IWE, and IWL database to be used in the expert elicitation process.

- Ken Canavan (NEI consultant) will contact Lee Abramson (RES) to further discuss statistical issues.

- NEI's expert panel meeting is tentatively scheduled sometime between the end of October and Thanksgiving at the EPRI office in Charlotte, North Carolina. They plan to meet for at least two days, with a half day for elicitation training, a half day for issue discussion and decomposition and one day for the elicitation process.

Project No. 689
Attachments: As stated

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ATTACHMENT 1

Response to NRC Comments on NEI's Draft Documents Regarding ILRT Test Interval Extension Expert Elicitation Process

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

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.

Response:

Please refer to the table below. There were eight events where the leakage was either greater than 2La or was not determined. With the objective to determine the future risk associated with ILRT interval extension most of these events are considered not to be of concern for the reasons stated. The paragraph will be changed as follows:

"From an examination of the events in Attachment 1, eight events (Nos. 1, 2, 14, 19, 22, 25, 33, and 35) were discovered during performance of ILRTs, with stated leak rates, greater than 2 La (15.3La), or unknown. There were several additional events reported with leakage rates greater 2 La, (identified by local testing) with a maximum of ~21 La. However, with the one exception (No. 1), all these events were identified by local leak rate tests, or would probably be identified by alternate means including local tests in the future. Therefore, it does not appear that extension of the ILRT interval would significantly increase the time that a leak path was not detected, as the one exception (holes drilled in liner) occurred in 1977, and has not repeated. With no significant increase in the non-detection time, there would be no increase in risk attributable to ILRT extension in the future."

An objective of this paragraph is to call attention to those events where an extension of the ILRT surveillance interval would increase the time in which a leakage path > 2La would not be detected. Those events are detectable only by ILRT, and are >2La or the leakage was unknown or not quantifiable. Eight events were identified where leakage was identified during an ILRT and the leakage was > 2La or unknown (see the table below). Of these eight events, it would appear that No.1 would have increased the non-detection time if the ILRT interval were extended. (Note that this is a preliminary assessment, and is subject to change by the expert panel). Event 35 (Dresden 2, 1990) may have increased the future non-detection time, and it may have not if the cause and corrective action were effective. (A review of the performance of Dresden 2 since the event did not reveal any unsatisfactory performance during ILRTs. Dresden 2 conducted ILRTs during 1992 and 1996 with no reported further leak paths or failures.) Two events (25, 33) probably should have resulted in the Type A test not meeting the acceptance criteria if conducted under NEI 94-01, as the leakage apparently was not or could not be determined by local leakage rate testing in accordance with NEI 94-01, Section 9.1.1. If the acceptance criteria were not met, then, the ILRT interval would not be extended. The remaining events have been judged not to have affected the future non-detection time for the reasons stated.

Therefore, only event No. 1 may have been non-conservative as is indicated in the comment.

Events With Leak Paths >2La Identified During ILRTs

No.	Unit and Date	Leakage, fraction of La	**Cause**	**Description**	**Comments**	**Preliminary Assessment, will extended ILRT interval affect future non detection time?**
14	Susquehanna 2 Jun 86	2.6La		ILRT prior to LLRT	This leakage path would probably have been discovered during LLRT	No
35	Dresden 2 Dec 90	15.3La	Vacuum breaker leakage discovered during ILRT	Excessive local leakage identified by ILRT	This leakage path would probably been discovered during subsequent LLRTs	Maybe
1	NUMARC Note Mar 77	Unknown	Holes inadvertently drilled in liner			Yes, identifiable only by ILRT or observation
2	NUMARC 24 Apr 77	Unknown, >1La	SG manway gasket leak	Excessive leakage identified by ILRT	Manway gasket leakage is detectable during startup and operation	No
19	Quad Cities-1 Sep 87	Unknown		ILRT prior to LLRT	This leakage path would probably have been discovered during LLRT	No
22	Harris-1 Oct 89	Unknown		ILRT without prior LLRT, as found not quantified	This leakage path would probably have been discovered during LLRT	No
25	Beaver Valley-1 Dec 89	Unknown	Two penetration leaks discovered during ILRT	Excessive local leakage identified by ILRT	If leakage cannot be determined by local testing, Type A test does not meet NEI 94-01 performance criteria for ILRT interval extension	No, because ILRT interval would not be extended

No.	Unit and Date	Leakage, fraction of La	**Cause**	**Description**	**Comments**	**Preliminary Assessment, will extended ILRT interval affect future non detection time?**
33	Callaway Oct 90	Unknown, >La	Penetration Leakage	Excessive local leakage identified by ILRT	If leakage cannot be determined by local testing, Type A test does not meet NEI 94-01 performance criteria for ILRT interval extension	No, because ILRT interval would not be extended

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.

Response:

The statement will be revised to: "Manway leakage is identifiable during startup and normal plant operation." The comments regarding late, scrubbed releases were inserted to more adequately describe the potential leakage path consequences in light of the required RG 1.174 risk assessment for LERF, and were not intended to circumvent the 10CFR100 and GDC 19 requirements, nor to suggest that leakage exceeding technical specifications limits was allowable, if known. Steam generator manway leakage, indicated by steam leakage from the manways and condensate collection within containment would probably require a plant shutdown to correct the situation.

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"?

Response:

Note that NEI 94-01, Section 9.1.1 includes the following statement: "The performance

criteria for Type A test allowable leakage is less than 1.0La. This allowable leakage rate is calculated as the sum of the Type A UCL and As-left MNPLR leakage rate for all Type B and Type C pathways that were in service, isolated, or not lined up to their test position (i.e., drained and vented to containment atmosphere) prior to performing the Type A test. In addition, leakage pathways that were isolated during performance of the test because of excessive leakage must be factored into the performance demonstration. If the leakage can be determined by a local leakage rate test, the As-left MNPLR for that leakage path must also be added to the Type A UCL. If the leakage cannot be determined by local leakage rate testing, the performance criteria are not met.

Events 25 and 33: These events were ILRT failures, and the information available suggests that the leakage was or could not be determined by local testing. If these test were conducted today, under NEI 94-01, the plants would not meet the performance criteria for interval extension, and with the test interval at the baseline interval, there would be no extension of the non-detection time.

In events 34, 35, 36, 38, 42 and 61, the leak paths should have been identified by local leak rate tests. Since NEI 94-01 and the maintenance rule require cause determination and corrective action, it is considered likely that the local tests have been improved and will identify penetration leakage. These events have been reclassified as "Maybe" in the table regarding the preliminary assessment for whether they would increase the non-detection time for an extended ILRT interval. Events 34 and 38 are not identified by plant, so it is impossible to verify their subsequent performance, however, plants associated with the following events did respond to the 2001 NEI survey, and there was no evidence of additional failures:

> Event 35, 1990 Dresden 2, ILRTs conducted during 1992 and 1996 with no reports of further leak paths or failures.
>
> Event 36, 1991, Braidwood 1, ILRTs conducted during 1995 and 1998 with no reports of further leak paths or failures.
>
> Event 42, 1991, Braidwood 2, ILRTs conducted during 1994 and 1999 with no reports of further failures.

Comments were made during both meetings held with the NRC Staff regarding the questions that were asked during the 2001NEI survey, with concern about local leak paths identified in the course of the ILRT. Following is the 2001 survey, and it clearly asks whether there were failures of components subject to local leak rate testing identified during the course of the ILRTs. The following question was also asked to ascertain the performance of B&C components during this period: "At any time since 1995, has the sum of your as-found type B&C leakage rates (determined on an MNPLR basis) exceeded the limit (0.6La)? If so provide details including leak rate, root cause, date, and affected penetrations, and a statement as to whether the penetration was on an extended (Option B) testing frequency.[(1)]"

Results of this survey will also be made available to the expert panel.

Item	Response	Comments
Plant Name		
Unit No.		
Contact Name		
Contact Phone and Fax Numbers		
Contact email Address		
Contact Mailing Address		
Are you interested in being able to extend the integrated leakage rate test (ILRT) surveillance interval to 20 years? [yes or no]		
When did your conduct your <u>last 2</u> ILRT(s)? [year and month(s)]		
When do you plan to conduct your <u>next</u> ILRT? [year & month]		
Are you using Option B of 10CFR50, Appendix J for ILRT (10-year frequency)? [yes or no]		
Are you using Option B (extended interval) for any type B (local) leak rate testing?		
Are you using Option B (extended interval) for any type C (local) leak rate testing?		
Note: The following questions are applicable only for the period from January 1995 to present (July 2001). We are interested in ascertaining whether there have been any occurrences of excessive containment bypass paths (leak paths) detectable only at the ILRT frequency (Ten or the proposed twenty years).		
Have you had any ILRT failures?		
If yes, please provide additional details including how identified, leak rate, date, and root cause.(1)		
Have you seen any evidence of containment degradation affecting or potentially affecting containment leak-tight integrity?		
If yes, please provide additional details including how identified (e.g., IWE/IWL inspection), leak rate, date, and root cause.(1)		

Have you identified any leakage failures of components subject to local leak rate testing during an ILRT? [yes or no] If yes, please provide additional details, including date, leak rate, root cause and an assessment of the redundant component operability,

At any time since 1995, has the sum of your as-found type B&C leakage rates (determined on an MNPLR basis) exceeded the limit (0.6La)? If so provide details including leak rate, root cause, date, and affected penetrations, and a statement as to whether the penetration was on an extended (Option B) testing frequency.[(1)]

Note [(1)] – If it is more convenient to attach existing reports or data that contain these details, please feel free to do so.

Additional Comments:

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.

Response:

This information was extracted from NUREG-1493, Table 4-1, and would seem to imply that if a local test were performed the leakage would have been identified. Experience subsequent to these events indicates that any excessive leak paths are either eliminated or are being discovered by local tests.

Event 14, Susquehanna 2, 1986: This plant subsequently conducted ILRTs in 1989 and 1992 with no excessive leak paths reported.

Event 19, Quad Cities 1, 1987: This plant subsequently conducted ILRTs in 1992 and 1994 with no excessive leak paths reported.

Event 22, Harris 1, 1989: This plant subsequently conducted ILRTs in 1992 and 1996 with no excessive leak paths reported.

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?

Response:

This event was taken from NUREG-1493, Table 4-1. It does not specify what the leak path was or how it was detected, only that it was an ILRT failure with an as-found leak rate >0.476%/day (La), and an as-left leak rate of 0.427%/day. Since it was found and corrected, it is assumed that local testing identified the problem and that local testing could be relied on in the future for detection. The preliminary assessment has been changed to "Maybe".

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

Response:

This event was taken from NUREG-1493, Table 4-1. The statement in the table "Instrumentation Problems during ILRT" would seem to infer that the indeterminate as-found leakage was due to instrumentation difficulties, probably not a real leak. Therefore, "No" is appropriate.

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.

Response: Clarification with the utility revealed that the penetration minimum pathway leakage identified during the ILRT was insignificant, even though there was a problem with the test procedure which has since been corrected. Leakage through the inner valve was high (4000 sccm), but within the techspec limit for the penetration, 11000sccm. Leakage through the outer valve (and penetration minimum pathway) was insignificant.

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

8. 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.

Response:

The three, four, or five failures referred to were those where the failure was identified by an ILRT as opposed to alternate means. The reasons for why twenty-four (23 in the NUMARC survey and 1 in the NEI survey) failures are now considered not to increase the time which potential leak paths would not be identified if the ILRT interval were extended are indicated in the table. The reasons are summarized below:

- 14 were due to addition of B&C (local leak rate testing identified) leakage penalties, and would not increase the time a leak path would go undetected in an ILRT interval extension.

- 4 were due to steam generator in-leakage. The steam generator leak paths are identifiable during startup and normal operation and would not increase the time a leak path would go undetected in an ILRT interval extension.

- 2 were due to ILRT line up errors, and did not constitute valid leak paths.

- 1 was due to a discrepancy in a verification test and did not constitute a valid leak path.

- 3 were due to failures which should have been indicated by the local leak rate testing programs. It is expected that these discrepancies would have been corrected, and therefore would not increase the time a leak path would go undetected in an ILRT interval extension.

9. 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).

Response:

NEI 94-01 provides guidance for extending Type B&C test intervals. The guidance varies with component types (air lock tests are more restrictive than most isolation valve tests, for example). If an extension for a penetration is contemplated, performance must be demonstrated (satisfactory completion of two consecutive periodic tests), and consideration must be given to performance factors, including past performance, service, design, and safety impact. Considering the performance requirement, the effect of extending LLRT frequency on ILRT interval extension risk is not judged to be significant. EPRI TR-104285 provides a risk impact assessment for extension of type B and C leakage rate test intervals.

10. 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)?

Response:

This paragraph is attempting to illustrate the concept that the change in risk associated with ILRT interval extension is a function of the period in which a potential leakage path goes undetected. If the leakage can be detected by alternative means (other than an

ILRT), its undetected time will not be affected by a change in ILRT interval.

Note that NEI 94-01, Section 9.1 states that "The purpose of Type A testing is to verify the leakage integrity of the containment structure. The primary performance objective of the Type A test is to quantify an overall containment system leakage rate. ... Type B and Type C *(local*) testing assures that individual penetrations are essentially leak tight. In addition, aggregate Type B and Type C leakage rates support the leakage tightness of primary containment by minimizing leak paths.

11. 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.

Response:

Experience has shown that PWR containments must be periodically vented to maintain positive pressure within specified maximum limits. The increase in pressure can be caused by increase in the average air temperature during heatup and startup, changes in barometric pressure, and an increase in the containment air mass from compressed air equipment bleeds and leakage. Venting may be required as a result of the above. While maintaining a mass inventory and a continuous positive pressure will increase the accuracy and sensitivity of on-line monitoring, absence of pressure build-up and venting over a substantial period of time will provide a qualitative indication the existence of a containment atmosphere to outside atmosphere leak path.

12. 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?

Response: Please refer to the answer to comment No. 1.

13. 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?

Response:

Yes, it is true that tail behavior is generally very sensitive to the shape of the distribution. The effects of different distributions will be different resulting values. It was assumed, although not stated, that a lognormal would be used to represent the distribution in the absence of evidence that the failure mode was indeed not lognormal. The basis for allowing the expert panel to choose a distribution is to allow for the fact that certain failure modes may have different distributions. A better way of stating this flexibility, is that the experts will have the ability to choose an alternate distribution if a lognormal is not appropriate for the failure mode under consideration.

14. 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.

Response:

The analysis of the risk impact of the extension of Type A ILRT tests will be performed in accordance with RG 1.174. In addition, to the degree possible the methods and philosophy of previously performed submittals will be included in this assessment. The conditional containment failure probability could also be considered an additional figure of merit.

15. 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?

Response:

Consensus agreement is not required since each expert will be providing input. Estimates that are far from the average will serve to increase the uncertainty. In the unlikely event that a single or multiple experts have significant variance in their responses from the majority of the experts, a weighting system from the "almanac-type" questions could be employed to decrease the variance or the input could be discarded by the technical integrator with documented basis. Since the final distribution is the responsibility of the technical integrator decisions on the weighting the results or discarding input is his/her responsibility.

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

Response: Yes

17. 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)?

Response: This information is available and will be provided to the panel.

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

18. <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.

Response:

Degraded steel shell events discussion will be added to the Day 1, afternoon training session.

19. Page 4 of 16: 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.

Response:

As part of the presentation of the expert elicitation process given the morning of the Day 1, an exercise was planned. This exercise will include, based on the comment above, "almanac-type" questions to demonstrate that expert estimates can contain useful information about unknown quantities.

20. Page 6 of 16: 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.

Response:

The discussions of actual found degradations will be part of the presentations to the experts.

21. Page 9 of 16: 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 5^{th} and 95^{th} percentile of the uncertainty distribution of each failure mode frequency. The best estimate would then correspond to the median or 50^{th} percentile. If this is done, how will the elicited high and low values be incorporated into the uncertainties associated with the best estimate results?

Response:

Currently best estimates are solicited. We will consider asking the experts to provide low and high values as well. Given that low and high values are solicited, a distribution could be developed from two of the three points provided. The various distributions from the experts could be combined using a variety of mathematical techniques including Monte Carlo simulation.

22. Pages 14 of 16: 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.

Response:

The solicitation plan was to populate the small leakage pathway column with the available data. As expressed in the comment, experts would be asked to provide any additional information including additional failure modes or additional potential failures that have not occurred in the current data set. It is assumed that any additional failure modes that experts entered would be addressed relative to the existing failure modes. Also, as expressed in the comment, medium frequencies would be based on absolute numbers, however, the table is presented such that the entries for each pathway size are side by side. This presentation method allows for relative comparison for all size ranges. It is expected that experts will naturally compare the numbers for each category in a relative fashion as a "sanity" check. The text will be revised to ensure that the table is more completely explained including the relative nature of the failure modes within a leakage pathway and the various pathway sizes.

23. Pages 14 and 15 of 16, Table: 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.

Response:

As suggested the "prestressing force losses", "containment bellows degradation" and "ordinary wear and tear" will be added to the table failure modes.

24. The definitions of "small leakage pathway," "medium leakage pathway,' and "large leakage pathway" are inconsistent between the text and the table.

Response:

The report and the text will be made consistent. The original intent of the table was to illustrate the types of information that would be collected.

25. 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.

Response:

A La of less than 2 is considered a very small leakage pathway. The very small leakage pathways were not included to avoid biasing the results to the small leakage events. However, in the interests of completion, any event with leakage greater than 1 La will be included in the small leakage category and presented to the experts.

26. 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.

Response:

NEI 94-01 Section 9 performance criteria will be discussed during the expert panel preparations. This discussion will be conducted with the intent to clearly define "ILRT failure" in the context used in the ILRT interval optimization methodology, and not to confuse it with failure to meet Type A performance criteria.

ATTACHMENT 2

NRC Talking Points on NEI's ILRT Test Interval Extension Expert Elicitation Process

Comments 1 and 3:

Events 25 & 33 - The logic of the Preliminary Assessments is confusing. In general, it is said that leaks that can be detected by Type B&C tests do not result in Type A test failures, or, in other words, should not be an impediment to the generic extension of Type A test intervals. However, in these two events, the fact that the leaks could not be detected by Type B&C tests is also determined to be no impediment to the generic extension of Type A test intervals. It seems illogical to have it both ways.

Event 2 - How will SG manway leakages be accounted for in the performance monitoring program (RG 1.174)?

Event 35 - Perhaps the "Maybe" could be counted as one-half of a failure.

Comment 8:

– We would like to know of the 24 failures identified (23 by NUMARC survey and 1 by the NEI survey) which ones were the failures that make up the numerator when calculating the failure rate.

– We believe there are two types of failures of the containment: (i) flaws that can only be detected by Type A testing and (ii) flaws that should have been detected by Type B and C testing. We believe that the expert panel should consider both of these types of failures when coming up with the failure rate. There is some likelihood that Type B and C tests fail to detect leaks and that if a Type A test were conducted, the flaw could be detected. Therefore, by extending the Type A interval you increase the time that you are operating with the flaw.

Comment 9:

- The probability of a Type B and Type C test to detect a flaw, as discussed above in Comment 8, should consider the fact that the tests are now performed every 10 years and 5 years, respectively.

Comment 10:

The staff's view is that "containment leakage or degradation detectable by alternative means" does impact the risk associated with revising the ILRT interval for the following reasons:

As part of the one time extension reviews the staff have found it necessary to credit IWE and IWL visual examination programs to demonstrate that the increase in LERF is acceptable. In accordance with RG 1.174, an implementation and monitoring program should be developed to ensure that the engineering evaluation continues to reflect the actual reliability and availability of the SSCs that have been evaluated.

The Expert Panel should consider the ability of the visual examination programs to find large flaws, the findings of the visual examination programs thus far (North Anna, Brunswick, DC Cook), the implications of these findings on the uninspectable portions of the containment and how these findings will be feed back into the Type A test program.

Comment 11:
Unless the venting is properly monitored and if a positive differential of > .5 psi is maintained, the venting cannot be credited for detecting even large leakage through the containment pressure retaining components.

Comment 13:
Because the leakage probability for large La is determined by the tail behavior of whatever distribution is chosen and because we are interested in values of La for which no data is available, there is no basis for choosing one distribution over another. (Even if a lognormal, say, fits the observed data quite well over its range, the actual distribution could have a different tail.) Accordingly, the experts should not be asked to choose a specific distributional form but rather should be asked about the exceedance probabilities for large values of La.

Comment 18:
Degradation of containment liner should be included in the discussion of Day 1, afternoon session.

Comment 19:
It is not enough to have an exercise using "almanac-type" questions. It is also necessary to make the experts aware of potential bias mechanisms, such as availability and anchoring.

Comment 21:
Why not use all three points to develop a distribution, not just two of them?

Comment 22:
While it is certainly plausible that the experts will compute ratios of failure mode frequencies based on their absolute values, the results will not necessarily be the same as
if the ratios were elicited directly. Because people are generally more comfortable making comparisons than estimating absolute numbers, especially about phenomena which they have very little data, elicited ratios should have more credibility than elicited absolute numbers.

Comment 25:
Agree with the response. Recommend using leaks between 1 La and 2 La as a baseline for comparison with larger leaks.