March 3, 2003

Mr. John L. Skolds, President
and Chief Nuclear Officer
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Exelon Generation Company, LLC
200 Exelon Way, KSA 3-E
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SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2 - AMERICAN SOCIETY OF MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE - RELIEF FOR RISK-INFORMED INSERVICE INSPECTION OF PIPING (TAC NOS. MB4633 AND MB4634)

Dear Mr. Skolds:

By letter dated March 15, 2002, as supplemented by letters dated October 16, 2002, and January 10, 2003, Exelon Generation Company, LLC (Exelon or the licensee), submitted proposed alternatives to the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a, concerning the second 10-year inservice inspection (ISI) programs for Limerick Generating Station, Units 1 and 2 (LGS-1 and 2).

Exelon submitted ISI Relief Request RR-32, Revision 0, and the risk-informed ISI (RI-ISI) program summary for LGS-1 and 2, in lieu of American Society of Mechanical Engineers, *Boiler and Pressure Vessel Code* (ASME Code), Section XI, requirements for the selection and examination of Class 1 and 2 piping welds. The proposed RI-ISI program was developed in accordance with the methodology contained in the Nuclear Regulatory Commission (NRC)-approved Electric Power Research Institute (EPRI) Topical Report, EPRI TR-112657, Revision B-A. Additionally, Exelon proposed modifications to the current Relief Request RR-12-9 to clarify applicability to RI-ISI Examination Category R-A piping elements.

As a result of its review of the licensee's submittal, the NRC staff identified certain areas where additional information was needed from the licensee. By letters dated October 16, 2002, and January 10, 2003, the licensee provided additional information concerning the use of the proposed alternative.

Based on the information provided by the licensee, the NRC staff concludes that for RR-32 and RR-12-9, the proposed alternatives will provide an acceptable level of quality and safety. Therefore, the use of the proposed alternatives is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the second 10-year ISI interval at each unit. The NRC staff's safety evaluation is enclosed.

If you need clarification of this approval, please contact the project manager, Mr. Scott P. Wall at (301) 415-2855.

Sincerely,

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-352 and 50-353

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RISK-INFORMED INSERVICE INSPECTION RELIEF REQUESTS

RR-32 AND RR-12-9

EXELON GENERATION COMPANY, LLC

LIMERICK GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-352 AND 50-353

1.0 INTRODUCTION

By letter dated March 15, 2002 (Reference 1), Exelon Generation Company (Exelon or the licensee), LLC, submitted proposed alternatives to the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a, concerning the second 10-year inservice inspection (ISI) programs for Limerick Generating Station, Units 1 and 2 (LGS-1 and 2).

Exelon submitted ISI Relief Request RR-32, Revision 0, and the risk-informed ISI (RI-ISI) program summary for LGS-1 and 2, in lieu of American Society of Mechanical Engineers, *Boiler and Pressure Vessel Code* (ASME Code), Section XI, requirements for the selection and examination of Class 1 and 2 piping welds. By letters dated October 16, 2002 (Reference 2), and January 10, 2003 (Reference 3), Exelon further provided its response to the Nuclear Regulatory Commission (NRC) staff's request for additional information concerning the proposed alternative associated with the RI-ISI program.

The proposed RI-ISI program was developed in accordance with the methodology contained in the NRC-approved Electric Power Research Institute (EPRI) Topical Report, EPRI TR-112657, Revision B-A (Reference 4), which has been previously reviewed and approved by the NRC staff (Reference 5). Additionally, Exelon proposed modifications to the current Relief Request RR-12-9 to clarify applicability to RI-ISI Examination Category R-A piping elements.

2.0 REGULATORY EVALUATION

Section 50.55a(g) requires that ISI of the ASME Code, Class 1, 2, and 3 components be performed in accordance with Section XI of the ASME Code and applicable addenda, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). According to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if an applicant demonstrates that the proposed alternatives would provide an acceptable level of quality and safety or if the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code, Class 1, 2, and 3 components (including supports) shall meet the requirements set forth in the ASME Code to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that ISI of components conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. For LGS-1 and 2, the applicable edition of Section XI of the ASME Code for the second 10-year ISI interval is the 1989 Edition. RR-32 states that the RI-ISI program will be implemented during the second 10-year ISI interval.

3.0 TECHNICAL EVALUATION

3.1 Summary of Proposed Approach

The licensee is required to perform ISI in accordance with the ASME Code, Section XI, which specifies that for each successive 10-year ISI interval, 100% of Category B-F welds and 25% of Examination Category B-J welds in Class 1 piping greater than 1 inch in nominal diameter be selected for volumetric and/or surface examination based on existing stress analyses and cumulative usage factors. For Examination Category C-F piping welds in Class 2 piping, 7.5% of non-exempt welds shall be selected for volumetric and/or surface examination.

The licensee has proposed to use an RI-ISI program for a subset of ASME Code, Class 1 and 2 piping (Examination Categories B-F, B-J, and C-F) welds, as an alternative to the ASME Code, Section XI requirements. The proposed RI-ISI program follows a previously approved RI-ISI methodology delineated in EPRI TR-112657 (Reference 4).

The licensee has indicated that for the existing augmented ISI program implemented in response to NRC Generic Letter (GL) 88-01, “Intergranular Stress Corrosion Cracking (IGSCC),” Category A welds are integrated into the RI-ISI program. Portions of the program related to Categories B through G welds are credited in the RI-ISI program development, but are not affected or changed by the RI-ISI program. In addition, the existing augmented ISI program implemented in response to GL 89-08, “Flow Accelerated Corrosion (FAC),” is credited in the RI-ISI program, but is not affected or changed by the RI-ISI program. All other existing augmented ISI programs are not affected by the proposed RI-ISI program.

3.2 NRC Staff's Evaluation

Pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff has reviewed and evaluated the licensee’s proposed RI-ISI program, based on guidance and acceptance criteria provided in the following documents: EPRI TR-112657, NRC’s Safety Evaluation to EPRI TR-112657, Regulatory Guides (RGs) 1.174 (Reference 6) and 1.178 (Reference 7), and Standard Review Plan (SRP), Chapter 3.9.8 (Reference 8).

3.2.1 Proposed Changes to the ISI Program

The scope of the licensee’s proposed RI-ISI program is limited to ASME Code Class 1 and 2 piping welds for the following Examination Categories: B-F for pressure retaining dissimilar metal welds in vessel nozzles, B-J for pressure retaining welds in piping, C-F-1 for pressure

retaining welds in austenitic stainless steel or high alloy piping, and C-F-2 for pressure retaining welds in carbon or low alloy steel piping. The RI-ISI program is proposed as an alternative to the existing ISI requirements of the ASME Code, Section XI. A general description of the proposed changes to the ISI program is provided in Sections 3 and 5 of the licensee's submittal (Reference 1).

The licensee stated that the proposed RI-ISI program is consistent with the guidelines contained in EPRI TR-112657, which state in part that industry and plant-specific piping failure information, if any, is to be utilized to identify piping degradation mechanisms and failure modes, and consequence evaluations are performed using probabilistic risk assessments to establish safety ranking of piping segments for selecting new inspection locations.

3.2.2 Engineering Analysis

In accordance with the guidance provided in RGs 1.174 and 1.178 (References 6 and 7), the licensee provided the results of an engineering analysis of the proposed changes, using a combination of traditional engineering analysis and supporting insights from the probabilistic risk assessment (PRA). The licensee stated that the results of the engineering analysis demonstrate that the proposed changes are consistent with the principles of defense-in-depth. The licensee performed an evaluation to determine susceptibility of components (i.e., a weld on a pipe) to a particular degradation mechanism that may be a precursor to leak or rupture, and then performed an independent assessment of the consequence of a failure at that location.

Augmented programs for IGSCC (GL 88-01) except Category A welds, service water integrity (GL 89-13), FAC, (GL 89-09), and high energy line break (USNRC Branch Technical Position MEB 3-1) are not subsumed into the RI-ISI program and remain unaffected. Elements that are covered by these augmented programs were included in the consequence assessment, degradation assessment, and risk categorization evaluations to determine whether the affected piping was subject to damage mechanisms other than those addressed by the augmented program. If another damage mechanism was identified, the element was retained within the scope of consideration for element selection as part of the RI-ISI program. When inspections are required under the RI-ISI and augmented programs, all inspection requirements for both RI-ISI and augmented programs are met. If no other damage mechanism was identified, the element was excluded from the RI-ISI element selection population (i.e., not included in the population of elements from which 25% or 10% must be selected for inspection) and retained in the appropriate augmented inspection program. The licensee's approach deviates from the approved methodology because the methodology in EPRI TR-112657 includes all elements in the RI-ISI element selection population but allows crediting up to 50% of the augmented inspections as RI-ISI element inspections. The deviation is acceptable because inspections required only in the augmented programs are not credited as RI-ISI inspections, elements in the augmented programs will continue to be inspected for the appropriate degradation mechanisms, and the RI-ISI program will address other damage mechanisms.

Piping systems within the scope of the RI-ISI program were divided into piping segments. Pipe segments are defined as lengths of pipe whose failure (anywhere within the pipe segment) would lead to the same consequence and which are exposed to the same degradation mechanisms. That is, some lengths of pipe whose failure would lead to the same consequence may be split into two or more segments when two or more regions are exposed to different degradation mechanisms. The licensee also stated that failure potential assessments,

presented in Table 2 of the licensee's submittal, were generated utilizing industry failure history, plant-specific failure history, and other relevant information using the guidance provided in EPRI TR-112657. The NRC staff concludes that the licensee has met the SRP 3.9.8 guidelines to confirm that a systematic process was used to identify the component's (i.e., pipe segments) susceptibility to common degradation mechanisms, and to categorize these degradation mechanisms into the appropriate degradation categories with respect to their potential to result in a postulated leak or rupture.

Additionally, the licensee stated that the consequences of pressure boundary failures were evaluated and ranked based on their impact on core damage and large early release, and that the impact due to both direct and indirect effects was considered using guidance provided in the EPRI TR-112657. The licensee reported no deviations from the consequence evaluation methodology approved by the staff in the EPRI report. Therefore, the NRC staff considers the consequence evaluation performed by the licensee for this application to be acceptable.

3.2.3 Probabilistic Risk Assessment

The licensee used an updated version of the Individual Plant Examination (IPE) model to evaluate the consequences of pipe rupture for the RI-ISI assessment. This version of the risk model, which represents the second upgrade to the IPE model, is a full level II PRA model. It addresses accidents initiated by internal events at full power, internal flooding, and containment response to these accidents. The original IPE was submitted to the NRC on July 30, 1992. The IPE estimated a core damage frequency (CDF) of 4.3E-6/year. The NRC staff's evaluation of the IPE, dated December 9, 1994, concluded that the IPE satisfied the intent of GL 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities." Additionally, the staff's evaluation did not report any significant weaknesses found in the review of the IPE. A Boiling Water Reactor Owners Group Peer Review/Certification Review was performed in 1998 on the updated PRA model and its supporting documentation and found that the PRA can be used to support regulatory applications when combined with deterministic insights.

The NRC staff did not review the PRA model to assess the accuracy of the quantitative estimates. The staff recognizes that the quantitative results of the PRA model are used as order-of-magnitude estimates to support the assignment of segments into three broad consequence categories. Inaccuracies in the models or in assumptions large enough to invalidate the broad categorizations developed to support the RI-ISI should have been identified during the NRC staff's review of the IPE and by the licensee's model update control program that included peer review of the PRA model by a certification team. Minor errors or inappropriate assumptions will affect only the consequence categorization of a few segments and will not invalidate the general results or conclusions.

As required by Section 3.7 of the EPRI-TR, the licensee evaluated the change in risk expected from replacing the current ISI program with the RI-ISI program. The calculations estimated the change in risk due to removing locations and adding locations to the inspection program. As discussed in Section 3.2.2 above, the licensee deviated from the EPRI methodology by excluding some elements from the population of elements from which RI-ISI locations for inspection were selected. In Reference 1, the licensee stated that the change in risk estimates included a quantitative evaluation of the change in risk due to changes in the ISI program for

each piping element in the scope of the RI-ISI evaluation. Therefore, excluding some elements from the population of elements for possible inspection does not affect the change in risk calculations.

The licensee used the failure frequencies developed in EPRI Topical Report TR-111880 (Reference 9) to support the estimate for the change in risk. The nonproprietary version of TR-111880 (Reference 10) illustrates the characteristics and format of the information used, but does not include the calculated parameters. The change in risk is calculated utilizing the Markov model described in EPRI Topical Report TR-110161 (Reference 11) to estimate the "inspection efficiency factor (IEF)." The IEF calculation incorporates the time between ISI inspections and the time between opportunities to detect a leak together with the probability of detection to estimate the reduction in pipe failure frequency arising from including the element in an ISI program. The method is identical to that used by the licensee, and approved by the NRC staff, for the Dresden Nuclear Power Station RI-ISI program (Reference 12). The NRC staff finds this same method appropriate for use in the proposed LGS-1 and 2 RI-ISI program.

In Reference 1, the licensee estimated the aggregate change in CDF and large early release frequency (LERF) for both units. These estimates are shown in the table below. A negative aggregate change in CDF and LERF indicates a reduction in risk as a result of transitioning from ASME Code, Section XI-based ISI to the RI-ISI program.

Estimated Change in Risk Associated with Replacing the Section XI ISI Program with a Risk-Informed ISI Program		
	DCDF	DLERF
Unit 1	-1.9E-9/yr	-1.8E-9/yr
Unit 2	-4.9E-9/yr	-4.2E-9/yr

The staff finds the licensee's process to evaluate and bound the potential change in risk reasonable because it accounts for the change in the number and location of elements inspected, recognizes the difference in degradation mechanism related to failure likelihood, and considers the synergistic effects of multiple degradation mechanisms within the same piping segment. System level and aggregate estimates of the changes in CDF and LERF are less than the corresponding guideline values in the EPRI-TR. The NRC staff finds that re-distributing the welds to be inspected with consideration of the safety significance of the segments provides assurance that segments whose failure have a significant impact on plant risk receive an acceptable and often improved level of inspection and, therefore, the licensee's process to evaluate the potential change in risk is acceptable.

3.2.4 Integrated Decision Making

As described in the licensee's submittal, an integrated approach is utilized in defining the proposed RI-ISI program by considering in concert the traditional engineering analysis, the risk evaluation, the implementation of the RI-ISI program, and performance monitoring of piping degradation. This is consistent with the guidelines given in RG 1.178.

The selection of pipe segments to be inspected is described in Section 3.5 of the submittal using the results of the risk category ranking and other operational considerations. Tables 3 and 4 of the submittal provide the number of elements (welds) and inspections by risk category for LGS-1 and 2 respectively, within the scope of the RI-ISI program. Tables 5 and 6 of the submittal provide a summary table for each unit comparing the number of inspections required under the existing ASME Code, Section XI, ISI program with the alternative RI-ISI program. Tables 7 and 8 of the submittal provide the risk impact analysis results for each system for LGS-1 and 2, respectively. The licensee stated that the failure estimates and the selection of examination elements with high- and medium-risk-ranked piping segments were determined using the guidance provided in EPRI TR-112657.

The licensee stated in their submittal that for any examination location where greater than 90% volumetric coverage can not be obtained, the process outlined in EPRI TR-112657 will be followed. As required by Section 6.4 of the EPRI TR, the licensee completed an evaluation of existing relief requests and determined that no existing relief request is required to be withdrawn or modified due to RI-ISI expansion of the examination volume. A new relief request will be generated for any RI-ISI examination location for which greater than 90% coverage is not achieved.

The licensee did propose modifications to the current RR-12-9 to clarify applicability to RI-ISI Examination Category R-A piping elements. Through RR-12-9, the licensee has requested to implement the provisions of ASME Code, Section XI, Code Case N-598, “Alternative Requirements to Required Percentages of Examinations,” during each inspection period for components examined within the scope of the ASME Code, Section XI, ISI program and the RI-ISI program as an alternative to the ASME Code requirement. The use of the Code Case allows the licensee to perform up to 50 and 75% of the examinations in the first and second period of the inspection interval instead of the 34 and 67% allowed by the ASME Code. The licensee’s basis for the alternative is based upon the fact that due to longer fuel cycles one of the inspection periods in the interval may have only one refueling outage which may not provide sufficient outage time to complete the Code-required percentage of examinations for the inspection period. However, Code Case N-598 allows taking credit for a greater percentage of examinations than that of the ASME Code and, thereby, provides more flexibility to complete the RI-ISI or the Code-required examinations in a given period. The NRC staff believes that by allowing the maximum percentages of examinations to be 50% and 75% in the first and the second inspection periods in accordance with Code Case N-598, any degradation or relevant condition can be detected early in the interval and appropriate corrective measures can be taken to preclude failures of components. Therefore, the implementation of Code Case N-598 would provide an acceptable level of quality and safety and the NRC staff authorizes this alternative pursuant to 10 CFR 50.55a(a)(3)(i) for the second 10-year interval. In the submittal, the licensee states that this relief request will remain applicable for the current inspection interval.

The methodology described in EPRI TR-112657 requires that existing augmented programs be maintained, with the exception of thermal fatigue and IGSCC Category A piping welds, which the RI-ISI program supersedes. The EPRI report also describes targeted examination volumes (typically associated with welds) and methods of examination based on the type(s) of degradation expected. The NRC staff has reviewed these guidelines and has determined that, if implemented as described, the RI-ISI examinations should result in improved detection of service-related degradations over that currently required by the ASME Code, Section XI.

The objective of the ISI required by ASME Code is to identify conditions (i.e., flaw indications) that are precursors to leaks and ruptures in the pressure boundary that may impact plant safety. The RI-ISI program is judged to meet this objective. Further, the risk-informed selection process is a technically sound "inspection for cause" program. This way the process not only identifies the risk-important areas of the piping systems, but also defines the appropriate examination methods, examination volumes, procedures, and evaluation standards necessary to address the degradation mechanism(s) of concern and the ones most likely to occur at each location to be inspected. Thus, the location selection process is acceptable since it is consistent with the process described in EPRI TR-112657, takes into account defense-in-depth, and includes coverage of systems subjected to degradation mechanisms in addition to those covered by augmented inspection programs.

Chapter 4 of EPRI TR-112657 provides guidelines for the areas and/or volumes to be inspected as well as examination methods, acceptable standards, and evaluation standards for each degradation mechanism. Based on the review of the cited portion of the EPRI report, the staff concludes that the examination methods for the proposed RI-ISI program are acceptable since they are selected based on specific degradation mechanisms, pipe sizes, and materials of concern.

3.2.5 Implementation and Monitoring

Performance-based implementation and performance monitoring strategies require careful consideration by the licensee and are addressed in Element 3 of RG 1.178 and the SRP 3.9.8. The objective of Element 3 is to assess performance of the affected piping systems under the proposed RI-ISI program by utilizing monitoring strategies that confirm the assumptions and analyses used in the development of the RI-ISI program. Pursuant to 10 CFR 50.55a(a)(3)(i), a proposed alternative, in this case the implementation of the RI-ISI program, including inspection scope, examination methods, and methods of evaluation of examination results, must provide an acceptable level of quality and safety.

The licensee stated that upon approval of the RI-ISI program, procedures that comply with the EPRI TR-112657 guidelines will be prepared to implement and monitor the RI-ISI program. The licensee confirmed that the EPRI report provides the relationship between the proposed risk-informed examination program and the remaining portions of the ASME Code, Section XI that are unaffected by the proposed RI-ISI program.

The licensee stated in Section 4 of the submittal that the RI-ISI program is a living program and its implementation will require feedback of new relevant information to ensure the appropriate identification of safety-significant piping locations. The licensee also stated that, as a minimum, risk ranking of piping segments will be reviewed and adjusted on an ASME period basis and that significant changes may require more frequent adjustment as directed by NRC bulletin or GL requirements, or by industry and plant-specific feedback.

The licensee's submittals (References 1 and 3) addressed additional examinations. Section 3.5 of the initial submittal stated that examinations performed that reveal flaws or relevant conditions exceeding the applicable acceptance standards shall be extended to include additional examinations. These additional examinations shall include piping structural elements with the same postulated failure mode. Additional examinations will be performed on these elements up to a number equivalent to the number of elements with the same postulated failure

mode originally scheduled for that fuel cycle. If the additional required examinations reveal flaws or relevant conditions exceeding the acceptance standards, the examinations shall be further extended. Reference 3 provided additional information to address the time frame for the second sample expansion. The licensee stated in Reference 3 that "Exelon will consider all R-A category welds as ASME Class 1, and will follow the provisions of the 1989 ASME Section XI Code, IWB-2430(b), with regard to the second sample expansion. The required additional examinations will be performed during the same outage that the relevant condition was detected." The NRC staff finds the licensee's approach acceptable since the additional examinations, if required, will be performed during the outage in which the indications or relevant conditions are identified.

The proposed periodic reporting requirements meet existing ASME Code requirements and applicable regulations, and therefore, are considered acceptable. The staff finds that the proposed process for the RI-ISI program updates meets the guidelines of RG 1.174 which provide that risk-informed applications should include performance monitoring and feedback provisions; therefore, the licensee's proposed process for program updates is acceptable.

The LGS-1 and 2 RI-ISI program will be implemented in the second 10-year inspection interval. The program requires examination of 96 welds in Unit 1 and 97 welds in Unit 2 over the current ISI interval. Hence, all examinations of the required RI-ISI locations will be completed during the three inspection periods within the current interval.

4.0 CONCLUSION

Pursuant to 10 CFR 50.55a(a)(3)(i), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that the proposed alternatives will provide an acceptable level of quality and safety. In this case, the licensee has proposed an alternative to use the risk-informed process described in NRC-approved EPRI TR-112657. As discussed in Section 3.0 above, the NRC staff concludes that the licensee's proposed RI-ISI program, which is consistent with the methodology described in EPRI TR-112657, will provide an acceptable level of quality and safety with regard to the number of inspections, location of inspections, and method of inspections.

In accordance with RGs 1.174 and 1.178 guidelines, the elements of traditional engineering analysis and PRA of an RI-ISI program are part of an integrated decision making process that assesses the acceptability of the program. The primary objective of this process is to confirm that the proposed program change will not compromise defense-in-depth, safety margins, and other key principles described in these RGs. The EPRI TR-11256 RI-ISI methodology is a process-driven approach, that is, the process identifies high risk-significant pipe segment locations to be inspected. The LGS RI-ISI program demonstrates that unacceptable risk impacts will not occur, and thus, implementation of the RI-ISI program satisfies the acceptance guideline of RG 1.174.

The LGS-1 and 2 methodology also considers implementation and performance monitoring strategies. Inspection strategies ensure that failure mechanisms of concern have been addressed and there is adequate assurance of detecting damage before structural integrity is affected. The risk significance of piping segments is taken into account in defining the inspection scope for the RI-ISI program.

System pressure tests and visual examination of piping structural elements will continue to be performed on all Class 1, 2, and 3 systems in accordance with ASME Code, Section XI. The RI-ISI program applies the same performance measurement strategies as the existing ASME Code requirements and, in addition, increases the inspection volumes at weld locations that are susceptible to thermal fatigue.

The LGS-1 and 2 methodology includes an engineering analysis of the proposed changes using a combination of engineering analysis with supporting insights from a PRA. Defense-in-depth quality is not degraded, in that, the methodology provides reasonable assurance that any reduction in inspections will not lead to degraded piping performance when compared to the existing performance levels. Inspections are focused on locations with active degradation mechanisms as well as selected locations that monitor the performance of system piping.

The NRC staff concludes that the licensee's proposed RI-ISI program is an acceptable alternative to the current ISI program for Class 1 and 2 piping welds at LGS-1 and 2, and therefore, the proposed alternatives of Relief Requests RR-32 and RR-12-9 are authorized for the second 10-year ISI interval pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the alternatives will provide an acceptable level of quality and safety.

5.0 REFERENCES

1. Letter from Michael P. Gallagher, Exelon, to U.S. Nuclear Regulatory Commission, "Second Ten-Year Interval Inservice Inspection (ISI) Program, Risk-Informed Inservice Inspection Program, Alternative to the ASME Boiler and Pressure Vessel Code, Section XI Requirements for Class 1 and 2 Piping Welds," dated March 15, 2002.

2. Letter from Michael P. Gallagher, Exelon, to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information Concerning a Proposed Alternative Associated with the Risk-Informed Inservice Inspection Program," dated October 16, 2002.

3. Letter from Michael P. Gallagher, Exelon, to U.S. Nuclear Regulatory Commission, "Proposed Alternative Associated with the Risk-Informed Inservice Inspection Program," dated January 10, 2003.

4. EPRI TR-112657, Revision B-A, *Revised Risk-Informed Inservice Inspection Evaluation Procedure*, Final Report, December 1999.

5. NRC Staff Safety Evaluation on EPRI TR-112657, Revision B-A, dated October 28, 1999.

6. NRC Regulatory Guide 1.174, *An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis*, July 1998.

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