

August 8, 2009

Mr. Charles G. Pardee  
Chief Nuclear Officer and Senior Vice President  
Exelon Generation Company, LLC  
200 Exelon Way  
Kennett Square, PA 19348

SUBJECT: LIMERICK GENERATING STATION, UNIT NOS. 1 AND 2 - REQUEST FOR  
ADDITIONAL INFORMATION REGARDING RELIEF REQUESTS ASSOCIATED  
WITH THE SECOND INSERVICE INSPECTION INTERVAL (TAC NOS. MD8071  
THROUGH MD8078)

Dear Mr. Pardee:

By letter dated January 28, 2008 (Agencywide Documents Access and Management System Accession No. ML080370257), Exelon Generation Company, LLC, submitted a set of relief requests associated with the second 10-year inservice inspection interval at Limerick Generating Station, Units 1 and 2.

The U.S. Nuclear Regulatory Commission has determined that a response to the enclosed Request for Additional Information (RAI) is necessary in order for the staff to complete its review. The questions in the enclosure were sent to Mr. Thomas Loomis of your staff via electronic transmission, in draft form, on July 17, 2008. The draft RAI was sent to ensure that the questions were understandable, the regulatory basis was clear and to determine if the information was previously docketed. These questions were discussed with your staff in a teleconference on July 22, 2008, and based on that discussion several changes were made. Based on further discussions with Mr. Loomis, it was agreed that you would provide responses within 30 days of the date of this letter.

Please contact me at 301-415-2833 if you have any questions.

Sincerely,

*/ra/ (John D. Hughey for)*

Peter J. Bamford, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-352 and 50-353

Enclosure: As stated

cc w/encl: See next page

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cc:

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August 8, 2008

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Chief Nuclear Officer and Senior Vice President  
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200 Exelon Way  
Kennett Square, PA 19348

SUBJECT: LIMERICK GENERATING STATION, UNIT NOS. 1 AND 2 - REQUEST FOR ADDITIONAL INFORMATION REGARDING RELIEF REQUESTS ASSOCIATED WITH THE SECOND INSERVICE INSPECTION INTERVAL (TAC NOS. MD8071 THROUGH MD8078)

Dear Mr. Pardee:

By letter dated January 28, 2008 (Agencywide Documents Access and Management System Accession No. ML080370257), Exelon Generation Company, LLC, submitted a set of relief requests associated with the second 10-year inservice inspection interval at Limerick Generating Station, Units 1 and 2.

The U.S. Nuclear Regulatory Commission has determined that a response to the enclosed Request for Additional Information (RAI) is necessary in order for the staff to complete its review. The questions in the enclosure were sent to Mr. Thomas Loomis of your staff via electronic transmission, in draft form, on July 17, 2008. The draft RAI was sent to ensure that the questions were understandable, the regulatory basis was clear and to determine if the information was previously docketed. These questions were discussed with your staff in a teleconference on July 22, 2008, and based on that discussion several changes were made. Based on further discussions with Mr. Loomis, it was agreed that you would provide responses within 30 days of the date of this letter.

Please contact me at 301-415-2833 if you have any questions.

Sincerely,  
**/ra/ (John D. Hughey for)**  
Peter J. Bamford, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-352 and 50-353  
Enclosure: As stated  
cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION  
REGARDING RELIEF REQUESTS ASSOCIATED WITH THE  
SECOND INSERVICE INSPECTION INTERVAL  
LIMERICK GENERATING STATION, UNIT NOS. 1 AND 2  
DOCKET NOS. 50-352 AND 50-353

By letter dated January 28, 2008 (Agencywide Documents Access and Management System Accession No. ML080370257), Exelon Generation Company, LLC (Exelon), submitted a set of relief requests (Relief Request (RR)-33, 34, 35, and 36) associated with the second inservice inspection (ISI) interval for Limerick Generating Station (LGS), Units 1 and 2.

The Nuclear Regulatory Commission (NRC) staff and its contractor, Pacific Northwest National Laboratory, have been reviewing the submittal and have determined that additional information is needed to complete the review.

**RR-33**

None

**RR-34**

Background for RR-34, Request for Additional Information (RAI), number 1:

The submittal summarizes limited examinations performed during the second 10-year interval, and provides estimated coverage for each component. However, in order to show the impracticality of examining 100% of the American Society of Mechanical Engineers (ASME) Code-required volumes or surface areas, only general statements are included, such as:

- a) *Due to nozzle-to-forging configuration, portions of the [ASME] code required examination volume could not be completely examined. The curvature of the radius of the nozzle forging is such that ultrasonic scanning of the weld is interrupted due to loss of contact of the ultrasonic search unit.*
- b) *In support of ALARA [As Low As Reasonably Achievable], many of the nozzle-to-vessel welds, nozzle inside radius, and reactor vessel welds are examined by a remote automated scanner. These techniques, however, limit the examination coverage mainly because of the scanner design.*
- c) *In addition to component configuration, certain weld examinations are further limited by reactor pressure vessel [RPV] design obstructions (such as RPV appurtenances) and mirror insulation.*

Specific limitations, or causes, for less than ASME Code-required coverage are briefly listed in Tables RR-34-01 through RR-34-04, but these are insufficient to demonstrate impracticality. For example, the recirculation nozzle-to-shell weld N2C in Table RR-34-01 lists “N8A nozzle and nozzle configuration,” as the cause of only 52% coverage on this weld. It is unclear how nozzle N8A and the configuration of nozzle N2C specifically limit the examination for this weld, since no description of the ultrasonic scanning apparatus or further details of the suggested interference and nozzle geometry are provided.

In addition, in RR-34, Diagrams 1 and 2 are provided which are intended to depict areas of the RPV where scan limitations are encountered. However, the NRC staff is unable to determine the exact cause of the limitations, and to which weld each limitation is associated. Other diagrams are included in RR-34 to show typical nozzle weld configurations, however, these also do not provide sufficient information to enable the NRC staff to evaluate the welds under a basis of impracticality.

Based on this background discussion, the NRC staff has the following RAI:

- 1) Provide further detailed information to support the basis for each limited examination in RR-34, and therefore, demonstrate impracticality. This information should include detailed descriptions (with sufficient explanation, and lay-out or cross-sectional drawings/sketches) to enable the staff to fully understand the causes of ultrasonic scan limitations and their impact on examination volume coverage.

Background for RR-34, RAI number 2:

The submittal states the following regarding the scheduling and completion of examinations for LGS, Unit 2, RPV shell welds and nozzle-to-vessel welds:

*The Unit 2 inspection interval was reduced to three outages to align the start of the Unit 2 interval with the Unit 1 interval. The remainder of the second interval inspections for Unit 2 will be completed during the first period of the third interval, per Relief Request I3R-01, Request for Relief for Alternative Requirements for the Synchronization of Ten-Year ISI Intervals Between Units 1 and 2 for [ASME Code] Class 1, 2, 3, MC [metal containment vessel], and CC [concrete containment] Components, which was approved in accordance with 10 CFR 50.55a(a)(3)(i).*

- 2) Considering this realignment of the LGS Unit 2 schedule, confirm that all ASME Code-required RPV shell and nozzle weld examinations will be completed within 10 code years of the time when the exams were previously performed.

For example, the Unit 2 inspections, which were performed in the first period of the second ISI interval, should be performed again no later than the second period of the third ISI interval. Likewise, inspections which they performed in the second period of the second ISI interval should be performed no later than the third period of the third ISI interval.

- 3) State whether the methods used for the RPV shell weld and nozzle-to-vessel weld inspections in RR-34 have been qualified in accordance with performance demonstration requirements per ASME Code, Section XI, Appendix VIII.

- 4) Provide descriptions of the ultrasonic techniques deployed for each weld examination volume (near surface, inner 15%, and full volume), and the amount of coverage obtained for each of these techniques. Also, please provide cross-sectional drawings showing scanning angle coverage. List the materials for the base metal and welds.
- 5) As applicable, describe nondestructive examination (NDE) equipment, show accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.

### **RR-35**

RR-35 actually contains two requests, based on impracticality. Part 1 of the submittal states:

*Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the new examination coverage requirements for austenitic piping welds with single side access as required in 10 CFR 50.55a(b)(2)(xv)(A)(2), on the basis that conformance with these Code requirements is impractical due to the fact that procedures were not available at the time of the examination of the welds to perform a single-sided Appendix VIII demonstration using flaws on the opposite side of the weld.*

Part 1 refers to the 10 CFR 50.55a requirement that, when applying ASME Section XI, Appendix VIII, Supplement 2, for ultrasonic procedures qualified by performance demonstration, full coverage credit on austenitic welds may only be claimed after a successful single-side demonstration has been performed with flaws located on the opposite side of the weld. However, 10 CFR 50.55a(g)(5)(iii) only pertains to when ASME Code inservice inspection requirements are found to be impractical, not 10 CFR 50.55a rules. Based on this discussion the NRC staff has the following RAI:

- 1) Please either withdraw part 1 of RR-35, or re-submit it so that it reflects an ASME code requirement for which relief is being sought.

Part 2 of the RR-35 submittal states:

*Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is also requested from the 100% volumetric examination requirements of Class 1 and 2 piping welds as defined by Table IWB-2500-1, Table IWC-2500-1, and the Limerick Risk Informed Inservice Inspection Program, on the basis that conformance with these [ASME] Code requirements is impractical due to component configuration and access restrictions.*

Part 2 summarizes limited examinations performed during the second 10-year interval, and provides estimated coverage for each component. Some specific limitations, or causes, for less than ASME Code-required (100%) coverage are briefly listed in Tables RR-35-01 and RR-35-02, but these are insufficient to demonstrate impracticality.

Other diagrams are included in RR-35 to show typical pipe-to-valve and valve-to-flued head weld configurations, however, these also do not provide sufficient information to enable the staff to evaluate the welds under a basis of impracticality.

For RR-35, Part 2, the NRC staff requests the following (RAIs 2-5):

- 2) Provide further detailed information to support the basis for each limited examination in RR-35, and therefore, demonstrate impracticality. This information should include detailed descriptions (with sufficient explanation, and lay-out or cross-sectional drawings/sketches) to enable the staff to fully understand the causes of ultrasonic scan limitations and their impact on examination volume coverage.
- 3) Provide descriptions of the ultrasonic techniques deployed for each weld examination volume, and the amount of coverage obtained for each of these techniques. Also, please provide cross-sectional drawings showing scanning angle coverage. List the materials for the base metal and welds.
- 4) As applicable, describe NDE equipment, show accessibility limitations, and discuss whether alternative methods or advanced technologies could be employed to maximize ASME Code coverage.
- 5) State whether the methods used for the various piping welds in RR-35 have been qualified in accordance with performance demonstration requirements per ASME Section XI, Appendix VIII.

**RR-36**

None (RR-36 has been requested to be withdrawn)