



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

February 12, 2014

Mr. Michael P. Gallagher
Vice President License Renewal Projects
Exelon Generation Company, LLC
200 Exelon Way
Kennett Square, PA 19348

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
LIMERICK GENERATING STATION LICENSE RENEWAL APPLICATION

Dear Mr. Gallagher:

By letter dated June 22, 2011, Exelon Generation Company, LLC, submitted an application pursuant to Title 10 of the *Code of Federal Regulations* (CFR) Part 54, to renew the operating licenses NPF-39 and NPF-85 for Limerick Generating Station, Units 1 and 2, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff).

On October 31, 2013, the Commission issued order CLI-13-07 directing the staff to review any new severe accident mitigation alternatives-related information in its environmental review of Exelon's license renewal application, including information presented in the Natural Resources Defense Council's (NRDC) waiver petition, and to discuss its review in the final Supplement Environmental Impact Statement. The staff has identified, in the enclosure, areas where additional information is needed in order for the staff to complete the Commission's directive in CLI-13-07.

These requests for additional information were discussed with Mr. Christopher Wilson, and a mutually agreeable date for the response is within 45 days from the date of this letter. If you have any questions, please contact me at 301-415-2375 or by e-mail at Leslie.Perkins@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "Carmen Bell".

For Leslie Perkins, Environmental Project Manager
Reactor Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-352 and 50-353

Enclosure:
Requests for Additional Information

cc w/encl: Listserv

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200 Exelon Way
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Sincerely,

/RA by Carmen Fells for/

Leslie Perkins, Environmental Project Manager
Reactor Projects Branch 2
Division of License Renewal
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LIMERICK GENERATING STATION
LICENSE RENEWAL APPLICATION
REQUESTS FOR ADDITIONAL INFORMATION

Background:

In accordance with the Commission's regulations, the Environmental Report (ER) Exelon Generation Company, LLC (Exelon) submitted as part of its Limerick Generating Station (LGS) license renewal application did not include a site-specific severe accident mitigation alternatives (SAMA) analysis, because the Staff previously considered severe accident mitigation design alternatives (SAMDA) in the Final Environmental Statement (FES) supporting issuance of the LGS operating licenses. See 10 CFR 51.53(c)(3)(ii)(L) and CLI-13-07. Exelon's ER did include an analysis of new and significant information with respect to 10 CFR 51.53(c)(3)(ii)(L) and the SAMDA Analysis in the FES, as required by 10 CFR 51.53(c)(3)(iv).

The Natural Resources Defense Council (NRDC) submitted a hearing request, which proposed three SAMA contentions and one no-action alternative contention. In CLI-12-19, as relevant here, the Commission held that the SAMA contentions were impermissible challenges to 10 CFR 51.53(c)(3)(ii)(L). The Commission did allow NRDC to submit a subsequent waiver petition to litigate the SAMA contentions. As summarized in CLI-13-07, NRDC's waiver petition raised three challenges to the consideration of new and significant information with respect to SAMAs in Exelon's ER. NRDC claimed that Exelon (and, ultimately, the NRC in the supplemental Environmental Impact Statement (EIS)) must: (1) consider potential new SAMAs that have been considered for other Mark II boiling water reactors; (2) use economic cost information specific to LGS, rather than Three Mile Island; and (3) use "modern techniques for assessing whether the newly considered [SAMAs] are cost-beneficial."

In CLI-13-07, the Commission affirmed the Board's denial of NRDC's waiver petition but referred NRDC's waiver petition to the Staff as additional comments on the Staff's draft supplemental EIS for the Staff's consideration and response.¹ The Commission directed the Staff to review the significance of any new SAMA-related information in its environmental review of Exelon's LGS license renewal application, including the information presented in NRDC's waiver petition, and to discuss its review in the final supplemental EIS.

Details:

1. The following table provides a list of Potentially Cost Beneficial SAMAs that have been identified at other Mark II boiling water reactors (BWRs) that have completed license renewal. Additional information regarding these Potentially Cost Beneficial SAMAs is provided in the NRC's final supplemental EIS and the applicants' environmental reports. See References below.

¹ NRDC also submitted comments on the draft supplemental EIS on June 27, 2013. See Agencywide Documents Access & Management System (ADAMS) (Accession No. ML13189A129).

ENCLOSURE

Potential Cost Beneficial SAMAs at other Mark II BWRs

Nine Mile Point 2

- Provide redundant ventilation for residual heat removal (RHR) pump rooms.
- Provide redundant ventilation for high pressure core spray (HPCS) pump room.
- Provide redundant ventilation for reactor core isolation cooling (RCIC) pump room.
- Enhance loss of service water procedure.
- Enhance Station Blackout procedures.
- Use of a portable charger for the batteries.
- Hard pipe diesel fire pump to the reactor pressure vessel.
- Reduce unit cooler contribution to emergency diesel generator (EDG) unavailability by increasing testing frequency.
- Reduce unit cooler contribution to EDG unavailability by providing redundant means of cooling.
- Improve procedure for loss of instrument air.
- Improve control building flooding scenarios.

Susquehanna

- SAMA 2a - Install minimal hardware changes and modify procedures to provide cross-tie capability between the 4 kilovolt (kV) alternating current (AC) emergency buses.
- SAMA 2b - Improve cross-tie capability between 4 kV AC emergency buses, i.e. between A or D emergency buses and B or C emergency buses (a more flexible cross-tie option than SAMA 2a).
- SAMA 3 - Modify procedures to stagger RPV depressurization when fire protection system injection is the only available make-up source.
- SAMA 5 - Modify portable station diesel generator to automatically align to 125 V direct current (DC) battery chargers.
- SAMA 6 - Procure an additional portable 480 V AC station diesel generator to power battery chargers in scenarios where AC power is unavailable.

Columbia

- AC/DC-28—Reduce common cause failures (CCFs) between EDG-3 and EDG-1/2.
- CC-03b—Raise RCIC backpressure trip set points.
- FR-07a—Improve the fire resistance of critical cables for containment venting.
- FR-07b—Improve the fire resistance of critical cables for transformer E-TR-S.
- FR-08—Improve the fire resistance of cables to RHR and standby SW.
- HV-02—Provide a redundant train or means of ventilation.
- SR-05R—Improve seismic ruggedness of MCC-7F and MCC-8F.
- FL-05R—Clamp on flow instruments to certain drain lines in the control building of the radwaste building and alarm in the control room.
- FL-04R—Add one isolation valve in the SW, turbine SW, and fire protection lines in the control building area of the radwaste building.
- FL-06R—Additional nondestructive evaluation (NDE) and inspections (in the control building).

- CC-24R—Backfeed the HPCS system with SM-8 to provide a third power source for HPCS.
- CC-25R—Enhance alternate injection reliability by including RHR, SW and fire water cross-tie in the maintenance program.
- OT-07R—Increase operator training on systems and operator actions determined to be important from the Probabilistic Safety Assessment.
- FW-05R—Examine the potential for operators to control reactor feedwater (RFW) and avoid a reactor Trip.
- OT-09R—For the non-Loss of Coolant Accident initiating events, credit the Z (power conversion system recovery) function.
- FR-11R—Install early fire detection in the following analysis units: RC-02, RC-03, RC-04, RC-05, RC-07, RC-08, RC-11, RC-13, RC-14, and RC-1A

Exelon's ER does not specifically discuss whether these potentially cost beneficial SAMAs constitute new and significant information pertaining to the 1989 SAMDA analysis. Please provide a discussion of how, if at all, Exelon considered whether these potentially cost beneficial SAMAs impact the conclusions in the 1989 SAMDA regarding the risk and environmental impacts of severe accidents at LGS. Please indicate whether these SAMAs were discussed in Table A of Exelon's December 14, 2012, Counter Affidavit (ADAMS Accession No. ML12349A328). If so, what is the basis for Exelon's conclusions with respect to those SAMAs in Table A? If not, please provide the basis for why these SAMAs are not new and significant information with respect to the 1989 SAMDA.

2. On page 5-6 of the ER, Exelon provides a history of the reductions in core damage frequency (CDF). Exelon further states that "the reduction in CDF reflects improvements in reliability data, improvements in procedural guidance and plant capabilities, and a reduction in the number of reactor trips." Furthermore Exelon states, "Reductions in CDF reflect implementation of the IPE, IPEEE, and CPI program."

What is the status of these improvements and mitigation measures? Please indicate which have been implemented and when. Describe other mitigation activities that have been implemented at LGS to substantially reduce the CDF or Large Early Release Frequency since the 1989 SAMDA.

References:

U.S. Nuclear Regulatory Commission (NRC). May 2006. Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Nine Mile Point Nuclear Station, Units 1 and 2 - Final Report (NUREG-1437, Supplement 24), Washington, D.C. (ADAMS Accession No. ML061290310).

U.S. Nuclear Regulatory Commission (NRC). March 2009. Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Susquehanna Steam Electric Station, Units 1 and 2 (NUREG-1437, Supplement 35), Washington, D.C. (ADAMS Accession No. ML090700454).

U.S. Nuclear Regulatory Commission (NRC). April 2012. Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Regarding Columbia Generating Station — Final Report, Main Report, Volume 1 and Appendices, Volume 2 (NUREG-1437, Supplement 47), Washington, D.C. (ADAMS Accession Nos. ML12096A334 and ML12097A271).

Constellation Energy. May 2004. Nine Mile Point Nuclear Station, License Renewal Application, Environmental Information, Appendix F. Severe Accident Mitigation Alternatives (SAMAs) (ADAMS Accession No. ML041490222).

PPL Susquehanna, LLC (PPL). September 2006. Susquehanna Steam Electric Station Units 1 and 2 Application for License Renewal, Appendix E: Applicant's Environmental Report – Operating License Renewal Stage. Allentown, Pennsylvania (ADAMS Accession No. ML062630235).

Energy Northwest. January 2010. Appendix E, Applicant's Environmental Report, Operating License Renewal Stage, Columbia Generating Station, Energy Northwest, Docket No. 50-397 License No. NPF-21. (ADAMS Accession No. ML100250666).

Exelon Generation Company, LLC. December 2012. Exelon's Counter Affidavit Supporting Exelon's Response Opposing NRDC's Petition for Waiver of 10 CFR Section 51.53(c)3(ii)(L). (ADAMS Accession No. ML12349A238).