Exelon Generation®

Michael P. Gallagher
Exelon Nuclear
Vice President
License Renewal and Decommissioning

200 Exelon Way
Kennett Square, PA 19348

610 765 5958 Office
610 765 5658 Fax
www.exeloncorp.com

michaelp.gallagher@exeloncorp.com

10 CFR 50
10 CFR 51
10 CFR 54

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July 11, 2016

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555–0001

LaSalle County Station, Units 1 and 2
Facility Operating License Nos. NPF-11 and NPF-18
NRC Docket Nos. 50-373 and 50-374

Subject: Response to NRC Request for Additional Information on Severe Accident Mitigation Alternatives for LaSalle County Station Units 1 and 2 License Renewal Environmental Review dated July 6, 2016

References:

1) Letter from Michael P. Gallagher, Exelon Generation Company, LLC (Exelon), to NRC Document Control Desk, dated December 9, 2014, "Application for Renewed Operating Licenses"

2) Letter from David Drucker, US NRC, to Michael P. Gallagher, Exelon, dated April 30, 2015, "Request for Additional Information on Severe Accident Mitigation Alternatives Regarding the LaSalle County Station, Units 1 and 2, License Renewal Application Environmental Review (TAC Nos. MF5567 and MF5568)"

3) Letter from Michael P. Gallagher, Exelon, to NRC Document Control Desk, dated May 29, 2015, "Response to NRC Request for Additional Information on Severe Accident Mitigation Alternatives Review, dated April 30, 2015, Regarding the LaSalle County Station, Units 1 and 2 License Renewal Application Environmental Review" (ADAMS Accession No. ML15149A370)

4) Email from William Ford, US NRC to Michael P. Gallagher, Exelon, dated July 6, 2016, "Request for Additional Information for the Review of the LaSalle County Station License Renewal Application, Severe Accident Mitigation Alternative (SAMA) Sensitivity Analysis"

In the Reference 1 letter, Exelon Generation Company, LLC (Exelon) submitted the License Renewal Application (LRA) for the LaSalle County Station, Units 1 and 2 (LaSalle), which

contained technical information required by 10 CFR 54.21 and, in Appendix E to the Application, site-specific environmental information required by 10 CFR 54.23 (Environmental Report).

In the Reference 2 letter, the NRC requested additional information to support the Staff's review of the LaSalle Severe Accident Mitigation Alternatives (SAMA) analysis contained in the Environmental Report. In the Reference 3 letter, Exelon provided responses to the requests for additional information (RAIs) from Reference 2. In the Reference 4 email, the NRC asked an additional RAI regarding sensitivity of the LaSalle SAMA analysis.

The Enclosure to this letter responds to the request for additional information in the Reference 4 email.

There are no new or revised regulatory commitments contained in this letter.

If you have any questions, please contact Ms. Nancy Ranek, Environmental Lead, Exelon License Renewal, at 610-765-5369.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 7-11-2016

Respectfully,

Michael P. Gallagher
Vice President – License Renewal & Decommissioning
Exelon Generation Company, LLC

Enclosure: Response to Request for Additional Information on Severe Accident Mitigation Alternatives For LaSalle County Station Units 1 and 2 License Renewal Environmental Report

cc: Regional Administrator - NRC Region III
NRC Project Manager (Environmental Review), NRR-DLR
NRC Project Manager (Safety Review), NRR-DLR
NRC Project Manager, NRR-DORL- LaSalle County Station
NRC Senior Resident Inspector, LaSalle County Station
Illinois Emergency Management Agency - Division of Nuclear Safety

**Response to Request for Additional Information on
Severe Accident Mitigation Alternatives
For LaSalle County Station Units 1 and 2
License Renewal Environmental Report**

RAI On TIMDEC CDNFRM

On May 4, 2016, the Commission issued a decision (CLI-16-07) in the Indian Point license renewal proceeding, in which it directed the Staff to supplement the Indian Point Severe Accident Mitigation Alternatives (SAMA) analysis with sensitivity analyses. Specifically, the Commission held that documentation was lacking for two inputs (TIMDEC and CDNFRM) used in the MACCS computer analyses, and that uncertainties in those input values could potentially affect the SAMA analysis cost-benefit conclusions. The Commission therefore directed the Staff to perform additional sensitivity analyses.

The two inputs (TIMDEC and CDNFRM) are commonly used in the SAMA analyses performed for license renewal applications (LRAs). These two input values were generally based on the values provided in NUREG 1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants" and NUREG/CR-3673, "Economic Risks of Nuclear Power Reactor Accidents." The TIMDEC input value defines the time required for completing decontamination to a specified degree. The CDNFRM input parameter defines the cost (on a per person basis) of decontaminating non-farmland by a specified decontamination factor. The CDNFRM values used in NUREG-1150 ($3,000/person for decontamination factor of 3 and $8,000/person for decontamination factor of 15) stem from decontamination cost estimates provided in NUREG/CR-3673, the same 1984 economic risk study referenced in support of the decontamination time inputs. These decontamination cost inputs are commonly escalated to account for inflation.

The NRC Staff believes the Commission's decision in CLI-16-07 may be applicable to the SAMA analysis performed for LaSalle County Station Units 1 and 2, inasmuch as that analysis may have also relied upon the NUREG-1150 values for TIMDEC and CDNFRM. We therefore request that Exelon Generation Company, LLC either justify why CLI-16-07 does not apply to the SAMA analysis performed for LaSalle County Station, Units 1 and 2 or supplement the SAMA analysis with sensitivity analyses for the CDNFRM and TIMDEC values.

Exelon Generation Company, LLC is requested to review the input values specified in CLI-16-07 for the Indian Point LRA, and (1) to apply the maximum values specified by the Commission (one year (365 days) for TIMDEC and $100,000 for the CDNFRM values for the decontamination factor of 15) or, in the alternative, (2) to explain, with sufficient justification, its rationale for choosing any other value(s) for its sensitivity analyses. In any event, Exelon Generation Company, LLC should execute sensitivity analyses for the release categories modeled that exceed 10^{15} Becquerels of Cs-137 released. Exelon Generation Company, LLC is requested to evaluate how these sensitivity analyses may affect its identification of potentially cost-beneficial SAMAs. Finally, upon completing its sensitivity analysis, Exelon Generation Company, LLC is requested to submit the spreadsheet (or equivalent table if another method is used) that conveys the population dose and off-site economic cost for each release category and integrates the results into a Population Dose Risk and an Offsite Economic Cost Risk for LaSalle County Station, Units 1 and 2.

EXELON RESPONSE

The MACCS2 analysis performed in support of the SAMA analysis for the LaSalle County Station ("LaSalle") included a number of MACCS2 sensitivity evaluations, as documented in Section F.7.3 of Appendix F to the LaSalle Operating License Renewal Stage Applicant's Environmental Report ("Environmental Report"). One of the sensitivity cases examined the potential impact associated with uncertainty of generic economic inputs to the MACCS2 code results, including escalating TIMDEC and CDNFRM simultaneously, along with other economic inputs (Section F.7.3.7). While the TIMDEC value was escalated in the ER to one year (365 days) for a decontamination factor (DF) of 15, the CDNFRM value for a DF of 15 was escalated by a factor of two (i.e., from $17,040 to $34,080). The factor of two increase for CDNFRM used in the LaSalle SAMA MACCS2 generic economic sensitivity case is judged reasonable to address uncertainty for the largely rural region surrounding the LaSalle County Station. However, the resulting CDNFRM value of $34,080/person is less than $100,000/person, which is the value the Commission specified in CLI-16-07 for evaluating uncertainty associated with this parameter for the New York City region near the Indian Point plant and in Option 1 for responding to the RAI.

To address this RAI, Exelon Generation Company, LLC ("Exelon") has chosen to use Option 1, and a new MACCS2 TIMDEC CDNFRM sensitivity case was developed with the following changes (as compared to the LaSalle MACCS2 base case documented in the Environmental Report):

- TIMDEC was escalated to one year (365 days) for DF=15
- CDNFRM was escalated to $100,000/person for DF=15
- These changes were applied to all release categories (even those with total releases of Cs-137 below 10^{15} Becquerels).

Both the conditional and frequency weighted MACCS2 results of this sensitivity case for offsite dose and economic cost are presented in Table 1 for each release category, as the RAI requests. Note that the frequencies used to weight the results are those from the LaSalle SAMA RAI Responses (ML15149A370; see RAI 6d response), which differ slightly from the frequencies presented in Table F.3-20 of the Environmental Report. For the specified TIMDEC and CDNFRM input changes, the MACCS2 Offsite Economic Cost Risk (OECR) increased approximately 54% and the Population Dose Risk (PDR) increased approximately 2% as compared to the MACCS2 base case results of 7.64 person-rem/yr and $5.77E+4/yr as presented in response to RAI 6d. The magnitude of these changes is similar to several other MACCS2 sensitivity cases documented in Section F.7.3 of the Environmental Report. Additionally, the increases seen in the OECR and PDR (both less than 60%) for this TIMDEC CDNFRM sensitivity case are bounded by the 95th percentile uncertainty factor of 2.14, which was included as part of the SAMA candidate cost-benefit evaluation documented in Section F.7 of the Environmental Report. Therefore, no new SAMA candidates are identified as potentially cost-beneficial based on this new TIMDEC CDNFRM sensitivity case. There are no changes to the conclusions of the SAMA analysis based on the TIMDEC CDNFRM sensitivity case.

Table 1

MACCS2 TIMDEC CDNFRM Sensitivity Results

Release Category	Frequency (per yr)	Population Dose (p-rem)	Population Dose Risk (p-rem/yr)	PDR % of Total	Offsite Economic Cost ($)	Offsite Economic Cost Risk ($/yr)	OECR % of Total
H/E-BOC	8.32E-08	1.66E+07	1.38E+00	17.7%	1.38E+11	1.15E+04	12.9%
H/E	5.98E-08	5.57E+06	3.33E-01	4.3%	8.31E+10	4.97E+03	5.6%
H/I	1.94E-08	6.08E+06	1.18E-01	1.5%	9.37E+10	1.82E+03	2.0%
M/E	2.36E-07	7.43E+06	1.75E+00	22.5%	7.53E+10	1.78E+04	20.0%
M/I	1.02E-06	3.94E+06	4.02E+00	51.5%	5.14E+10	5.24E+04	59.0%
L/E	3.94E-07	2.22E+05	8.75E-02	1.1%	3.57E+08	1.41E+02	0.2%
L/I	1.48E-07	7.11E+05	1.05E-01	1.3%	1.49E+09	2.21E+02	0.2%
INTACT	6.20E-07	2.17E+03	1.35E-03	0.02%	8.57E+05	5.31E-01	0.001%
Total	2.58E-06	--	7.80E+00	100%	--	8.88E+04	100%