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10 CFR 50.90

June 28, 2016

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

R.E. Ginna Nuclear Power Plant
Renewed Facility Operating License No. DPR-18
NRC Docket No. 50-244

Subject: Supplement to Response to Request for Additional Information for the Review of TSTF-490, Deletion of E-Bar Definition and Revision to RCS Specific Activity Tech Spec

References:

1. Letter from James Barstow (Exelon) to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information for the Review of TSTF-490, Deletion of E-Bar Definition and Revision to RCS Specific Activity Tech Spec (ML16105A243)," dated April 14, 2016.

2. Letter from James Barstow (Exelon) to U.S. Nuclear Regulatory Commission, "Application to Revise Technical Specifications to Adopt TSTF-490, 'Deletion of E Bar Definition and Revision to RCS Specific Activity Tech Spec' (ML16035A015)," dated February 4, 2016.

By letter dated April 14, 2016 (Reference 1), Exelon Generation Company, LLC (Exelon) responded to a Request for Additional Information (RAI) for a License Amendment Request (LAR) submitted on February 4, 2016 (Reference 2) for R.E. Ginna Nuclear Power Plant (Ginna). The proposed LAR would revise Ginna's Technical Specifications (TS) Limiting Condition for Operation 3.4.16.

Supplemental information is being provided to the NRC, as discussed during a telephone call on April 26, 2016, to support the Exelon response to the RAI.

There are no regulatory commitments in this letter.

Exelon has reviewed the information supporting a finding of no significant hazards consideration, and the environmental consideration, that were previously provided to the NRC in Attachment 1 of the Reference 1 letter. The supplemental information provided in this response does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration under the standards set

forth in 10 CFR 50.92. In addition, Exelon has concluded that the information provided in this supplemental response does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

If you have any questions or require additional information, please contact Laura A. Lynch at 610-765-5729.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 28th day of June 2016.

Respectfully,

James Barstow
Director, Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachment: Supplemental Information for Response to Request for Additional Information for the Review of TSTF-490, Deletion of E-Bar Definition and Revision to RCS Specific Activity Tech Spec

cc:

Regional Administrator - NRC Region I	w/ attachment
NRC Senior Resident Inspector – Ginna	"
NRC Project Manager, NRR – Ginna	"
A.L. Peterson, NYSERDA	"

ATTACHMENT

R.E. Ginna Nuclear Power Plant
Renewed Facility Operating License Nos. DPR-18
NRC Docket No. 50-244

Supplemental Information for Response to
Request for Additional Information for the
Review of TSTF-490, Deletion of E-Bar Definition and
Revision to RCS Specific Activity Tech Spec

By letter dated April 14, 2016 (Reference 1), Exelon Generation Company, LLC (Exelon) responded to a Request for Additional Information (RAI) for a License Amendment Request (LAR) submitted on February 4, 2016 (Reference 2) for R.E. Ginna Nuclear Power Plant (Ginna). The proposed LAR would revise Ginna's Technical Specifications (TS) Limiting Condition for Operation 3.4.16.

Supplemental information is being provided to the NRC, as discussed during a telephone call on April 26, 2016, to support the Exelon response to the RAI. The RAI responded to in Reference 1 stated:

ARCB-RAI-1:

The proposed change deletes Condition C of TS 3.4.16 requiring gross specific activity of the coolant less than or equal to 100/$\bar{E}$ µCi/gm and proposes to replace it with Dose Equivalent Xenon-133 (DEX) not within limits. In the current TS 3.4.16, when the gross specific activity of the coolant is greater than 100/$\bar{E}$ µCi/gm, the required action is to take immediate action to begin shutdown of the reactor (be in mode 3 with T_{avg} less than 500 °F) within 8 hours [emphasis added]. Ginna proposes 48 hours [emphasis added] to restore DEX within limits. Technical Specification Task Force (TSTF)-490, Revision 0 provided the following justification for this change:

> The Completion Time for revised TS 3.4.16 Required Action B.1 will require restoration of Dose Equivalent Xe-133 to within limit in 48 hours. This is consistent with the Completion Time for current Required Action A.2 for Dose Equivalent I-131. The Completion Time of 48 hours for revised Required Action B.1 is acceptable since it is expected that, if there were a noble gas spike, the normal coolant noble gas concentration would be restored within this time period. Also, there is a low probability of an accident occurring during this time period.

For the following reasons the NRC staff needs additional justification for the proposed change:

While it is a correct statement that the proposed change makes the Completion Times of TS 3.4.16 Required Action A.2 and B.1 in NUREG-1431, "Standard Technical Specifications [STS] Westinghouse Plants," consistent, it is not clear to the NRC staff why the Completion Times should be consistent. The plant Conditions for these Required Actions are different. Ginna's TS 3.4.16 Required Action A.2 is required when the plant is in a condition analyzed in the design basis accident analyses (reactor coolant dose equivalent I-131 is between 1 and 60 µCi/gm). The new proposed TS 3.4.16 Required Action B.1 is required when the plant is in a condition not analyzed [emphasis added] in the design basis accident analyses (DEX is greater than 650 µCi/gm). Typically, the Required Action for a condition not analyzed requires the plant to take immediate actions to begin shutdown of the plant. The proposed change does not take immediate actions to begin shutdown of the plant, but allows 48 hours before the plant is required to begin shutting down.

Therefore, please provide additional justification for the proposed change to increase the Completion Time of TS 3.4.16 Required Action B.1 to 48 hours and why it is acceptable to be in an unanalyzed condition for 48 hours.

Supplemental Information for Response:

Exelon's response to the RAI (Reference 1) stated that,

> "…operation above the proposed DEX limit does not result in increased risk to individuals located in the control room and offsite. This is due to the fact that coolant noble gas activity contributes to a small fraction of the dose consequences resulting from design basis accidents. This is consistent with the approved NRC Safety Evaluation (Reference 3), which states, "The radiological consequences for the SGTR and the MSLB accidents demonstrate that the calculated thyroid doses are generally a greater percentage of the applicable acceptance criteria than the calculated whole body doses. It then follows that the Completion Time for noble gas activity being out of specification in the revised Required Action B.1 should be at least as great as the Completion Time for iodine specific activity being out of specification in current Required Action A.2. Therefore the Completion Time of 48 hours for revised Required Action B.1 is acceptable from a radiological dose perspective."
>
> Given the above considerations, it is acceptable to be in a condition when the DEX exceeds 650 µCi/gm for up to 48 hours."

Further information is being provided to justify the increase in the duration of operating with DEX not within limits from 8 hours to 48 for hours for Ginna, as requested by the NRC during a telephone call on April 26, 2016.

The Reactor Coolant System (RCS) activity is an initial condition for the plant radiological safety analyses and is governed by TS 3.4.16. More specifically, in accordance with the proposed amendment (Reference 2), the plant RCS activity is limited to 60 µCi/gm Dose Equivalent Iodine (DEI) and 650 µCi/gm DEX. These limits match the analyzed values in the Main Steam Line Break (MSLB), Steam Generator Tube Rupture (SGTR), Locked Rotor (LRA) and Rod Eject (REA) Accident analyses. The acceptable duration of plant operation in excess of these limits is evaluated based on dose consequences postulated for operating conditions in excess of the limits. Therefore, the consequences were technically evaluated to assess the safety significance and to justify the increase in the duration of operating with DEX not within limits from 8 hours to 48 hours. A review of the source term in the LRA and REA analyses reveals that the coolant activity contribution to the total dose equivalent source term is less than about 0.3%. As a result of this low sensitivity to the coolant source term, the increase from 8 hours to 48 hours will not substantially change the consequences for these events and they are not considered further. The noble gas contributes only about 1% to 10% of the total dose consequences and the SGTR is most limiting, as shown in Table 1. Therefore, an increase in DEX is not as consequential as an increase in DEI and is evaluated further for postulated conditions beyond the DEX Technical Specification limit.

The Ginna design basis reactor coolant inventory corresponds to equilibrium operation with 1% failed fuel. The design basis DEI is about 4 µCi/gm and is detailed in Table 2 below. For this evaluation the DEX is assumed to increase by the same proportion as the DEI. In other words, the DEX will be increased from the TS limit by a factor of 15 (i.e., 60 µCi/gm DEI TS divided by the design basis 1% failed fuel value of 4 µCi/gm).

Applying the factor of 15 increase in iodine to DEX results in a value of 9750 µCi/gm, as shown in Table 3. The noble gas dose portion was increased by the factor of 15 and the new total dose consequences determined. This was evaluated for the SGTR Pre-Incident Spike (PIS) since it is the limiting accident in terms of dose and involves the RCS TS. The results are shown in Table 3 and clearly demonstrate compliance with the 10 CFR 50.67 limits. There remains significant margin to the limits. To examine the margin, an additional case was added to determine the limiting DEX associated with the 10 CFR 50.67 limits. This case demonstrates a DEX value of 90,000 µCi/gm is necessary to project a Control Room dose of 5 rem TEDE. This corresponds to a DEX value 138 times larger than the 1% failed fuel value. Therefore, a DEX value would not exceed 10 CFR 50.67 while at the same time not exceed the DEI 60 µCi/gm shut down TS limit.

This technical evaluation bounds the consequences due to operation of DEX in excess of 650 µCi/gm are substantially below the regulatory limits of 10 CFR 50.67. This result is based on the assumed operation of DEX at 9750 µCi/gm (15 times the limit) and DEI at 60 µCi/gm. The DEX necessary to challenge the limit is substantially greater, and without spiking, would require more than 100% of the fuel rods to be failed. DEX is not expected to spike to a larger degree than DEI, as confirmed by examining plant data.

In conclusion, a DEX value would not exceed the 10 CFR 50.67 while at the same time not exceed the DEI 60 µCi/gm shut down Technical Specification limit. Therefore, based on this evaluation it is concluded that the safety significance of allowed plant operation for 48 hours with DEX in excess of 650 µCi/gm is very low. Ginna's Updated Final Safety Analysis Report is being updated to include the values provided in this response.

Table 1 – SUMMARY OF DOSE CONSEQUENCES DUE TO MSLB AND SGTR PRE-INCIDENT SPIKE

	Exclusion Area Boundary (EAB) (rem TEDE)		Low Population Zone (LPZ) (rem TEDE)		CR (rem TEDE)	
Source	**MSLB**	**SGTR**	**MSLB**	**SGTR**	**MSLB**	**SGTR**
Iodine	6.90E-02	4.27E-01	2.70E-02	5.58E-02	1.61E-01	9.55E-01
Noble Gas	1.27E-03	4.85E-02	4.59E-04	5.62E-03	1.22E-03	2.92E-02
Total	7.02E-02	4.75E-01	2.75E-02	6.14E-02	1.63E-01	9.84E-01

	EAB (fraction by source)		LPZ (fraction by source)		CR (fraction by source)	
Source	**MSLB**	**SGTR**	**MSLB**	**SGTR**	**MSLB**	**SGTR**
Iodine	98%	90%	98%	91%	99%	97%
Noble Gas	2%	10%	2%	9%	1%	3%
Total	100%	100%	100%	100%	100%	100%

Table 2 – DESIGN BASIS 1% FAILED FUEL RCS INVENTORY

1% Failed Fuel RCS Activity		
Nuclide	**Factor**	**uCi/gm**
Kr-85m	4.79	1.93E+00
Kr-85	0.0763	8.21E+00
Kr-87	26.4	1.24E+00
Kr-88	65.4	3.60E+00
Xe-131m	0.249	3.54E+00
Xe-133m	0.878	3.84E+00
Xe-133	1	2.71E+02
Xe-135m	13.1	5.58E-01
Xe-135	7.63	9.49E+00
Xe-138	37	6.92E-01
	DEX:	6.59E+02
I-131	1	3.05E+00
I-132	1.16E-02	2.97E+00
I-133	1.78E-01	4.72E+00
I-134	3.99E-03	6.49E-01
I-135	3.73E-02	2.59E+00
	DEI:	4.02E+00

Table 3 – DOSE CONSEQUENCES POSTULATED FOR DEX EXCEEDING TECH SPEC LIMIT

	Coolant (uCi/gm)		SGTR PIS (rem TEDE)	
Case	**DE I-131**	**DE Xe-131**	**EAB**	**CR**
AOR	60	650	4.75E-01	9.84E-01
1% Failed Fuel	4	650	7.69E-02	9.29E-02
15% Failed Fuel	60	9750	1.15E+00	1.39E+00
Limiting DEX	60	90000	7.14E+00	5.00E+00
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REFERENCES

1. Letter from James Barstow (Exelon) to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information for the Review of TSTF-490, Deletion of E-Bar Definition and Revision to RCS Specific Activity Tech Spec (ML16105A243)," dated April 14, 2016.

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3. Federal Register Notice of Availability published on March 19, 2007, 72 FR 12838, "Notice of Availability of Model Application Concerning Technical Specification Improvement Regarding Deletion of E Bar Definition and Revision to Reactor Coolant System Specific Activity Technical Specification Using the Consolidated Line Item Improvement Process."