

November 2, 2006

Mr. Christopher M. Crane, President
and Chief Nuclear Officer
Exelon Generation Company, LLC
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BRAIDWOOD STATION, UNIT NOS. 1 AND 2; BYRON STATION, UNIT NOS. 1 AND 2; CLINTON POWER STATION, UNIT 1; DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3; LASALLE COUNTY STATION, UNITS 1 AND 2; LIMERICK GENERATING STATION, UNITS 1 AND 2; OYSTER CREEK NUCLEAR GENERATING STATION; PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3; QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2; AND THREE MILE ISLAND NUCLEAR STATION, UNITS 1 AND 2 - REQUEST FOR ADDITIONAL INFORMATION RE: EMERGENCY ACTION LEVELS (TAC NOS. MD2846, MD2847, MD2848, MD2849, MD2850, MD2851, MD2852, MD2853, MD2854, MD2855, MD2856, MD2857, MD2858, MD2859, MD2860, MD2861, MD2862 AND LS2697)

Dear Mr. Crane:

By letter to the Nuclear Regulatory Commission (NRC) dated August 15, 2006, Exelon Generation Company, LLC submitted a request to revise the emergency action levels (EALs) based on Nuclear Energy Institute 99-01, "Methodology for Development of Emergency Action Levels," for the subject plants.

The NRC staff is reviewing your submittal and has determined that additional information is required to complete the review. The specific information requested is addressed in the enclosure to this letter. During a discussion with your staff on October 24, 2006, it was agreed that you would provide a response within 20 days from the date of this letter.

The NRC staff considers that timely responses to requests for additional information help ensure sufficient time is available for staff review and contribute toward the NRC's goal of

C. Crane

-2-

efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-1157.

Sincerely,

/RA/

John Honcharik, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-456 and STN 50-457; STN 50-454 and STN 50-455; 50-461; 50-237, and 50-249; 50-373 and 50-374; 50-352 and 50-353; 50-219; 50-277, and 50-278; 50-254 and 50-265; 50-289; and 50-320

Enclosure:
Request for Additional Information

cc w/encl: See next page

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-3-

efficient and effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-1157.

Sincerely,
/RA/

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Enclosure:
Request for Additional Information

cc w/enci: See next page

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REQUEST FOR ADDITIONAL INFORMATION

RELATED TO EMERGENCY ACTION LEVELS FOR

BRAIDWOOD STATION, UNIT NOS. 1 AND 2; BYRON STATION, UNIT NOS. 1 AND 2;
CLINTON POWER STATION, UNIT 1; DRESDEN NUCLEAR POWER STATION, UNITS 2
AND 3; LASALLE COUNTY STATION, UNITS 1 AND 2; LIMERICK GENERATING STATION,
UNITS 1 AND 2; OYSTER CREEK NUCLEAR GENERATING STATION; PEACH BOTTOM
ATOMIC POWER STATION, UNITS 2 AND 3; QUAD CITIES NUCLEAR POWER STATION,
UNITS 1 AND 2; THREE MILE ISLAND NUCLEAR STATION, UNITS 1 AND 2
DOCKET NOS. STN 50-456 AND STN 50-457; STN 50-454 AND STN 50-455; 50-461; 50-237,
AND 50-249; 50-373 AND 50-374; 50-352 AND 50-353; 50-219; 50-277, AND 50-278; 50-254
AND 50-265; AND 50-289 AND 50-320

Note: The code provided in the parenthesis after each question refers to the request for additional information (RAI) categorization codes listed at the end of the RAI.

In reviewing the Exelon Generation Company, LLC's (Exelon's) and AmerGen Energy Company, LLC (AmerGen's) submittal dated August 15, 2006, related to a request to revise the emergency action levels (EALs), for the subject plants, the Nuclear Regulatory Commission (NRC) staff has determined that the following information is needed in order to complete its review.

The attached table provides the RAIs as it applies to each plant concerning the EAL discussed in Nuclear Energy Institute (NEI) 99-01, Revision 4, "Methodology for Development of Emergency Action Levels." Exelon and AmerGen must address the RAIs on a site-specific basis. In addressing each of the RAIs applicable to Exelon's and AmerGen's sites, the responses should revise the EAL and/or provide more information in the EAL Basis, and revise the Difference/Deviation Matrix as applicable. A revised Difference/Deviation Matrix and Redline/Strikeout copy shall be provided in the response. In addition, a complete, clean, EAL Basis Document shall be provided as an attachment to the response.

Enclosure

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	Braidwood	Byron	Clinton	Dresden	LaSalle	Limerick	Oyster Creek	Peach Bottom	Quad Cities	Three Mile Island	RAI
1	Various		X	X	X	X	X	X	X	X	X	X	Several inconsistencies exist related to accurately reflecting the correct Operating Modes applicable to EALs. For example, for Oyster Creek EAL MG3 and MS3, the Operating Mode applicability is Mode 1 only. However, for all others, it is Modes 1 and 2. Perform a review for inconsistencies in the submittal and correct these discrepancies. (2.h)

Enclosure

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	RAI
2	Fission Product Barrier Sections		The containment barrier EAL "Other site-specific indications" stated in NEI 99-01 is not addressed. The bases for this EAL in NEI 99-01 states that the EAL is intended to cover other site-specific indications. Revise the proposed EALs and their bases to provide the other site-specific indications identified in NEI 99-01 bases or provide further justification for having none available. (2.b)
3	FB-BWR-RCS-L1		A threshold value "and drywell pressure rise due to RCS [Reactor Coolant System] leakage" was added to the EAL RCS2.c. Provide justification for adding this threshold to the EAL. (2.d)
4		CONT 3.C	Explain why "response" in regards to drywell pressure was changed to "rise". (2.d)

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	RAI
5	Clad #2	FC 1.a	The threshold value for a Loss (reactor pressure vessel (RPV) Level) was changed from “<-30” to “<-20.” Provide justification for this change. (2.a)
6	HA1/HU1	HA5/ HU5	Clarify whether the proposed wind speed setpoint is within the calibrated range of the instrument used for determining wind speed. (2.b)
7	HA1	HA5	Provide additional justification for the inclusion of this seismic alarm EAL threshold (i.e., why instrumentation alone is not sufficient to declare the seismic EAL). In addition, does this annunciate in the control room, and is it reliable for indicating the EAL? If it does not, use the guidance in NEI 99-01. In addition, explain why there are limits, e.g., 0.01, referenced in some EALs and not in others. (2.b)
			Three Mile Island
			Quad Cities
			Peach Bottom
		X	Oyster Creek
			Limerick
			LaSalle
			Dresden
			Clinton
			Byron
			Braidwood

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	RAI
8	HA1	HA5	The EAL does not address HA1.6 (including ultimate heat sink hi/lo level) in NEI 99-01. Provide the necessary information in the EAL to address NEI 99-01, EAL HA1.6, or provide justification for not including this information. (2.b)
9	HA1	HA5	What is meant by "seismic check per OPAO2J" in the EAL threshold? Referencing procedures in the EAL does not allow for timely decision making in declaring an EAL. Therefore, provide the EAL threshold in a clear, concise manner in the body of the EAL in order to ensure timely decision making in declaring an EAL. (2.d)
10	HA1	HA5.1	How is a seismic event determined in ABN-38? Referencing procedures in the EAL does not allow for timely decision making in declaring an EAL. Provide the EAL threshold in a clear, concise manner in the body of the EAL in order to ensure timely decision making in declaring an EAL. (2.d)
			Three Mile Island
			Quad Cities
			Peach Bottom
			Oyster Creek
			Limerick
			LaSalle
			Dresden
			Clinton
			Byron
			Braidwood
			X

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	Braidwood	Byron	Clinton	Dresden	LaSalle	Limerick	Oyster Creek	Peach Bottom	Quad Cities	Three Mile Island	RAI
11	HA3	HA7	X	X	X	X	X	X	X	X	X	X	<p>The word "may" has been removed from EAL 1. Provide justification for this change. (2.h)</p> <p>For consistency, review EAL Frequently Asked Questions (FAQ) 2006-024 Language specific to asphyxiates, and include this in the EAL. (2.d)</p>
12	HU1	HU5	X	X	X	X	X	X	X	X	X	X	<p>Provide additional justification for the inclusion of this seismic alarm EAL threshold (i.e., why instrumentation alone is not sufficient to declare the seismic EAL). In addition, does this annunciate in the control room, and is it reliable for indicating the EAL? If it does not, use the guidance in NEI 99-01. In addition, explain why there are limits, e.g., 0.01, referenced in some EALs and not in others. (2.b)</p>

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	RAI
13	HU1	HU5	The EAL does not address NEI 99-01 EAL HU1.7 (including ultimate heat sink hi/lo level). Provide the necessary information in the EAL to address NEI 99-01 EAL HU1.7, or provide justification for not including this information. (2.b)
14	HU1	HU5.3	Explain the difference between HU5 (EAL Threshold #3 concerning physical damage) and HA5 (EAL Threshold #3 concerning visible damage). Since these EALs are similar (only differing in one word), explain how errors in declaration will be avoided, or follow NEI 99-01 guidance. (2.d)
15	HU2	HU6.3	EAL Threshold values specify "physical damage", while the EAL Threshold basis specifies "visible damage." Explain why there is a change in terminology. (2.d)

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	RAI
16	SA2, SS2, SG2	MA3/ MS3/ MG3	The EAL includes initiating conditions and EAL Threshold values when manual scram has not been successful, but provides no guidance on what constitutes a successful manual scram. Therefore, provide additional guidance in the EAL, or EAL Basis Document, explaining what constitutes successful manual scram actions. (2.d)
17	CA4	MA5	What instrument is used to measure EAL #2 and does the scale of that instrument cover all conditions where the EAL might be declared? (2.b)
18	SG1	MG1	Could this EAL (3.b) be declared if RPV level is unknown? (2.a)
19	SG1	MG1	Explain why there are only two divisions of essential busses? Explain why the Initiating Condition is changed? (2.d)
20	SG1	MG1	For consistency, review EAL FAQ 2006-016 wording and implement this in the EAL. (2.d)
			Three Mile Island
			Quad Cities
			Peach Bottom
			Oyster Creek
			Limerick
			LaSalle
			Dresden
			Clinton
			Byron
			Braidwood

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	RAI
21	SS4	MS5	Three Mile Island
			Quad Cities
			Peach Bottom
			Oyster Creek
			Limerick
			LaSalle
			Dresden
			Clinton
			Byron
			Braidwood
22	CS1	MS8	X
23	CS2	MS9	X

Why not have only Exelon EAL Threshold #2, since this meets the guidance of NEI 99-01, without the use of Exelon EAL Threshold #1? Provide additional justification for including Exelon EAL Threshold #1. (2.d)

Proposed EAL MS8 2.b. eliminates one of the two conditions that indicate core uncovary per the NEI 99-01 scheme without proposing an alternative. Provide either the conditions as identified in NEI 99-01, or provide an alternative with justification, or justify why these conditions are not needed. (2.d)

Proposed EAL FAQ 2006-005 describes the 30-minute threshold as not applicable to this EAL. For consistency, review this EAL FAQ for implementation. (2.d)
NEI 99-01 1.b uses core uncovary, however, the Exelon submittal uses loss of RPV inventory. Clarify how loss of RPV inventory meets the intent of the NEI 99-01 EAL. (2.d)

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	Clinton	Dresden	LaSalle	Limerick	Oyster Creek	Peach Bottom	Quad Cities	Three Mile Island	RAI
24	CS2	MS9	X	X	X	X	X	X	X	X	For consistency, review EAL FAQ 2006-011 wording and implement this in the EAL. (2.d)
25	CU1	MU8	X	X	X	X	X	X	X	X	For consistency, review EAL FAQ 2006-014 wording and implement this in the EAL. (2.d)
26	CU1	MU8	X	X	X	X	X	X	X	X	Describe the basis for the EAL Threshold values in EAL #2. (2.d)
27	FB-BWR	N/A	X								RCS Barrier EAL 4. - EAL basis information appears to apply for a pressurized-water reactor only. Therefore, provide the EAL basis for a boiling water reactor, which is applicable to Clinton. (2.h)
28	RCS #4	None	X	X	X	X	X	X	X	X	Provide additional justification for the elimination of this EAL, or propose an alternative method. (2.d)
29	AA1	RA1.1	X	X	X	X	X	X	X	X	Are there any other effluent monitors? If there are other monitors, include them in the EAL, or follow the guidance in NEI 99-01. (2.b)

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	Braidwood	Byron	Clinton	Dresden	LaSalle	Limerick	Oyster Creek	Peach Bottom	Quad Cities	Three Mile Island	RAI
30	AA2	RA2.1										X	Explain why G6 and G7 are not applicable in all modes? (2.d)
31	AA3.2	RA3.2	X	X	X	X	X	X	X	X	X	X	For consistency, review EAL FAQ 2006-025 wording and implement this in the EAL. (2.d)
32	AU1	RU1.1	X	X	X	X	X	X	X	X	X	X	Are there any other effluent monitors? If there are other monitors, include them in the EAL, or follow the guidance in NEI 99-01. (2.b)
33	AU2	RU2			X	X	X		X		X		Exelon EAL did not include the fuel transfer canal as indicated in NEI 99-01. Include the fuel transfer canal in the EAL or provide justification for not including it in the EAL. (2.d)
34	AU1	RU2.1										X	Explain why G6 and G7 are not applicable in all modes? (2.d)

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	Braidwood	Byron	Clinton	Dresden	LaSalle	Limerick	Oyster Creek	Peach Bottom	Quad Cities	Three Mile Island	RAI
35	SU4	RU3				X		X		X	X		EAL #1: If a hi-hi or hi alarm setpoint is reached but not exceeded, will this EAL still be declared, and explain why or why not? Otherwise, make appropriate changes in the EAL using the guidance in NEI 99-01. (2.d)

Request for Additional Information Related to Emergency Action Levels for Exelon and AmerGen Plants

RAI #	NEI 99-01 EAL #	Exelon EAL #	Braidwood	Byron	Clinton	Dresden	LaSalle	Limerick	Oyster Creek	Peach Bottom	Quad Cities	Three Mile Island	RAI
N/A	N/A	N/A	X	X	X	X	X	X	X	X	X	X	<p>When responding to these RAIs, ensure to do the following:</p> <p><1> Provide revised difference/deviation matrix pages for the changes you have made.</p> <p><2> Provide revised EAL Basis Document redline-strikeout pages for the changes you have made.</p> <p><3> Provide a complete, clean, EAL Basis Documents for all of the EALs you submitted for prior approval, for all 10 sites. Provide this as an attachment to your RAI responses.</p>

RAI CATEGORIES

(Select only one, most dominant category for each RAI question)

1. More information is needed because of:
 - a. complexity of request
 - b. first-of-a-kind nature of request
 - c. NRC change in regulatory significance or focus
 - d. NRC questions on previously used methodology or guidance
 - e. licensee change to previously used methodology
 - f. licensee reduction in current safety margin

2. The review can not be completed without additional explanation or clarification of:
 - a. input variables or analytical assumptions
 - b. methodology used or results obtained
 - c. applicability or bounding nature of third party analyses or data correlations
 - d. differences from NRC guidance documents (SRP, RG, etc.)
 - e. no significant hazards consideration discussion
 - f. environmental considerations discussion
 - g. applicable regulatory requirements discussion
 - h. information that appears to be incorrect and needs to be corrected
 - i. response to previous RAI appears inadequate

3. Reviewer requesting information even though the question is, or the question asks for:
 - a. not directly related to the request
 - b. inconsistent with applicable codes, standards, RGs, or SRP sections
 - c. information accessible from readily available sources and was explicitly referenced
 - d. information does not appear needed given the precedent cases discussed in the request
 - e. information that is not safety significant or pertinent to the regulatory finding
 - f. information that is known to engineers who work in the general technical area

- g. going beyond the current licensing basis and doesn't need to be asked
- h. a formal commitment

4. Other (please specify)