UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of	)	
	)	
EXELON GENERATION COMPANY, LLC	)	Docket No. 52-007-ESP
	)	
(Early Site Permit for Clinton ESP Site)	)	

NRC STAFF'S RESPONSE TO COMMISSION'S JANUARY 22, 2007, ORDER

INTRODUCTION

Pursuant to the Commission Order dated January 22, 2007, in this proceeding,[1] the Nuclear Regulatory Commission staff ("Staff") hereby responds to two specific issues raised in the Atomic Safety and Licensing Board's December 28, 2006 Initial Decision, LBP-06-28. Specifically, the Staff states its position on: (1) the Board's modification of Permit Condition 3, and (2) the Board's indication that, had it not been constrained by the Commission's direction that the Board must defer to the NRC Staff in fact-finding matters, it would not have approved a review where the NRC Staff did not independently verify certain factual assertions made by the Applicant. In response to the Commission's invitation to present additional views, the Staff addresses the Board's statements regarding the applicability of 10 C.F.R. § 52.39 to issues resolved in this proceeding. As set forth in detail below, the Board need not have modified Permit Condition 3, and the NRC Staff appropriately verified factual assertions in reviewing the application of Exelon Generation Company, LLC ("Exelon," "Applicant," or "EGC") for an Early Site Permit ("ESP") at the Clinton site.

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[1] *Exelon Generation Co., LLC* (Early Site Permit for Clinton ESP Site), CLI-07-04, 65 NRC _(Jan. 22, 2007).

DISCUSSION

A. Order Issue (1): Modification of Permit Condition 3

In its December 14, 2006 Response to a Licensing Board Order, the Staff addressed its rejection of the Applicant's proposed modification of Permit Condition 3 and provided a brief description of its understanding of the scope of the hydrology-related permit conditions.

In short, the Staff proposed three permit conditions (Permit Conditions 3, 4, and 5) to govern the release of radioactive liquids. As described in more detail below, Permit Condition 3 requires that certain hydraulic gradients be directed inward toward facility structures, Permit Condition 5 requires monitoring of those gradients, and Permit Condition 4 requires design features to preclude radioactive effluent release.

Permit Condition 3 makes explicit and binding the commitment made by the Applicant that the hydraulic gradient will always point inward to preclude any release to the accessible environment. This Permit Condition imposes an obligation

> to ensure that the hydraulic gradient will always point inwards into the radwaste holding and storage facility from ambient groundwater during construction and operation of the ESP facility, including the time during which recovery of groundwater occurs to near its pre-dewatering elevation.

Safety Evaluation Report for an Early Site Permit at the Exelon Generation Company, LLC ESP Site ("SER"), NUREG-1844, A-3, (2006). This Permit Condition must be satisfied for the range of credible conditions associated with various ranges of groundwater conditions that could occur throughout the plant's life. Permit Condition 5 requires that the Applicant have a monitoring program sufficient to ensure that the hydraulic gradient is in the appropriate direction, as required by Permit Condition 3. At the COL stage, the Staff will review the Applicant's

monitoring program to ensure that it would detect any anomalies in the piezometric head around the boundaries of engineered structures that might contain liquid radiological effluents.[2]

Permit Condition 4 requires that a radwaste facility design include "features to preclude any and all accidental releases of radionuclides into any potential liquid pathway." *Id.* at A-3. "Liquid pathways" include both surface water and groundwater pathways outside an engineered system. However, it should be noted that Permit Condition 4 does not require preclusion of releases that remain confined within engineered systems. For instance, the Staff does not consider leaks from a pipe that remain confined within a guard pipe and are detected and corrected before radioactive material escapes into the environment to be "releases" under this permit condition. This permit condition provides additional assurance of protection in areas where the hydraulic gradient may be transient or small. The phrase "any and all releases" is intentionally comprehensive. "Any" refers to any type of measurable liquid release mechanism and "all" refers to all components (*e.g.,* pipes, tanks, values, etc.) that might contain radiological effluents.

Further, in evaluating site acceptability, 10 C.F.R. § 100.20(c)(3) requires consideration of factors important to hydrological radiological transport, including soil, sediment, and rock characteristics; adsorption and retention coefficients; ground water velocity; and distances to the nearest surface water body. In the context of construction permits, applicants obtained data on such factors with reference to a particular design and specific locations of buildings. That is, applicants obtained data on these matters only at the location of systems from which radioactive effluents might be emitted and the release pathways from these locations.[3] In the absence of a

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[2] If the Commission determines that Permit Conditions 3 and 5 should remain in the Permit, the Staff will reformat these conditions as a single Permit Condition.

[3] Since Permit Condition 4 refers to accidental releases, the Board may have supposed that the effluents under consideration result from design basis accidents. *See,* LBP-06-28, slip op. at 40, n.122. "Accidental releases," as used in Permit Condition 4, however, means "inadvertent releases," *i.e.*, leaks (continued. . .)

particular design and specified building locations, an applicant would have to obtain detailed data over the entire area of the site to satisfy § 100.20(c)(3). Under Permit Condition 4, such an undertaking is not necessary and that condition thus becomes a basis in this proceeding for the finding that the applicant has satisfied Part 100.

The Board opined, however, that Permit Condition 4 "is unachievable as a practical matter" and "may be legally unenforceable." LBP-06-28, slip op. at 40. Engineered features, such as a robust structural design, lined barriers around holding tanks to contain the contents of a radwaste tank, and guard pipes to surround liquid radwaste containing pipes, are all measures to prevent and preclude accidental spillage or release of liquid radioactive material. Permit Condition 4 requires the applicant to select a reactor design having features that preclude spills or leaks occurring during normal operation from escaping offsite, or otherwise ensure that the requirement is satisfied. As such, the Commission can enforce Permit Condition 4 simply by denying any application that references the ESP but does not satisfy that condition. In any event, an applicant referencing the ESP could request an amendment or a variance pursuant to 10 C.F.R. § 52.39(b) should it select a design, determine building locations, obtain appropriate data with respect to hydrological radionuclide transport, and show that the analytical results based on these data are acceptable.

The Staff concluded that the protection provided by Permit Conditions 3 and 5 together with Permit Condition 4 would reduce the need for additional monitoring outside the engineered system to ensure that inadvertent releases do not threaten public health and safety.

Following a request made by the Board during the mandatory hearing held November 7 - 8, 2006, the Applicant and the Staff discussed changing Permit Condition 3. The Applicant recommended that the permit condition be changed to read as follows:

(. . .continued)
and spills and not releases resulting from design basis accidents.

> The COL Applicant must confirm that (1) the hydraulic gradient based on baseline groundwater conditions is inwards towards structures, systems, and components ("SSCs") designed to hold liquid radioactive waste; or (2) provide SSCs designed to hold liquid radioactive waste with features to preclude accidental releases of radio-nuclides into potential liquid pathways.

EGC Response to Commission Order CLI-07-04 (January 30, 2007).

The Applicant's proposal would, in effect, eliminate one level of protection that the Staff's Permit Conditions were designed to ensure. The Staff believes that the first half of the Applicant's proposed permit condition mirrors Permit Condition 3, while its second half mirrors Permit Condition 4. The Staff's safety analysis concluded that the Applicant should be required to meet both Permit Condition 4 and Permit Conditions 3 and 5. As explained above, the Staff believes that these conditions are enforceable and work together to ensure adequate protection of the groundwater and to satisfy 10 C.F.R. Part 100. In contrast, under the Applicant's proposed permit condition, the Applicant would meet only one or the other. Consequently, either approach taken by the Applicant would leave unaddressed one of the bases for the Staff's finding of adequate protection. The Staff believes that Permit Condition 4 together with Permit Conditions 3 and 5 provide adequate protection against the release of radionuclides into the ambient groundwater. Based on these considerations, the Staff concluded that the Applicant's proposed changes to the permit condition were unnecessary because all of the requirements of 10 C.F.R. § 100.20(c)(3) are addressed by Permit Condition 4 together with Permit Conditions 3 and 5, and by the engineering characteristics of any facility that would be built at the proposed site.

In its Initial Decision, the Board directed the Staff to expand Permit Condition 3 to include "piping leading into the radwaste building or other buildings [containing] liquid radwaste." LBP-06-28, slip op. at 40. The Staff believes that the protection provided by Permit Condition 4, together with Permit Conditions 3 and 5, make it unnecessary to expand Permit Condition 3.

B. Order Issue (2): NRC Staff Independent Verification of Factual Assertions Made By the Applicant

Historically, the Staff has conducted an audit review of license applications, relying on 10 CFR § 50.30(b), which requires that each application for a license be executed by an applicant under oath or affirmation. Certain site-specific information can only be obtained from an applicant through data acquisition activities that must be conducted at the site over lengthy periods of time. Similarly, design-specific information must be obtained from the plant designer through the applicant. The information provided by an applicant is usually collected or developed under a quality assurance program that is reviewed by the NRC.

For the safety review, the information provided by the Applicant in the Safety Analysis Report is submitted under oath and affirmation. The Staff evaluates the information in the application, independently verifies selected information, and verifies selected analysis results through independent code analysis. In doing so, the Staff focuses on areas that warrant closer scrutiny, such as areas involving first-of-a-kind analysis, use of new modeling techniques, application of new or revised review guidance, areas of higher significance based upon risk-informed reviews, or where the Staff's independent analysis or technical experience and judgment does not support the analysis results of the Applicant. *See, generally, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants,* NUREG-0800 (1996), and *Processing Applications for Early Site Permits,* RS-002, (2004).

In the case of the EGC ESP application, the information and analysis results provided by Exelon were collected or developed using the quality assurance program described in Chapter 17 of the SER. The Staff reviewed the quality assurance measures used by the Applicant and its primary contractor and concluded that they implemented acceptable audit controls that meet the guidance of Section 17.1.1 of RS-002, Attachment 2, and help provide reasonable assurance that any information derived from ESP activities that is used in the design

and/or construction of SSCs important to safety will support satisfactory performance of such SSCs once they are in service. The Staff evaluated quality assurance measures for those activities associated with the Applicant's generation of site-related information to be used in the design of SSCs to ensure that the use of these measures can provide reasonable assurance of the integrity and reliability of the information.

The new methodology used to determine the safe-shutdown earthquake (SSE) ground motion spectra for this site is an example of the extensive review and independent verification that the Staff employs when confronted with a new analysis. In the EGC ESP Application, the Applicant, rather than developing the SSE as recommended by Regulatory Guide (RG) 1.165, used a new method called the performance-based approach. SER at 2-259. As stated by Dr. Clifford Munson, an NRC Senior Geophysicist, "In order to thoroughly review this new approach the Staff formed an advisory task group of senior geophysicists and civil engineers from the NRC offices of NRR [Nuclear Reactor Regulation], [R]esearch [Nuclear Regulatory Research], and NMSS [Nuclear Materials Safety and Safeguards], and took an additional six months of review time. The task group evaluated the model and assumptions underlying the approach including a detailed derivation of the factors used to develop the SSE. The Staff also focused on the adequacy of the performance goal and performed an independent confirmation of the SSE." Tr. at 706. In contrast, for issues where Staff review guidance already existed (having been developed and refined through experience with prior reviews), the Staff considered it appropriate to perform a less extensive independent verification of background information.

For the environmental review, pursuant to 10 C.F.R. §§ 51.70(b) and 51.90, the NRC is required to independently evaluate and be responsible for the reliability of all information used in the Environmental Impact Statement (EIS). The Staff performs an independent review of information provided by the Applicant in its Environmental Report (ER), which is submitted by the Applicant under oath or affirmation, and of information provided during the Staff's audit of

the ER. This independent review includes, for example, obtaining and reviewing information from local, State, Tribal, and Federal authorities.

When using information from an applicant in code analysis, the Staff makes sure that it understands where the values came from and, using the Staff's professional judgment and experience, it determines whether they are reasonable. In addition, the Staff's audit programs are used to verify that an applicant's proposed values are reasonable. During its environmental review, the Staff determines the scope of the EIS and identifies significant issues. Further, the Staff identifies, and eliminates from detailed study, issues that are peripheral, not significant, or that have been evaluated in Generic Environmental Impact Statements (GEIS). Each EIS prepared by the Staff stands on its own as an analytical document that fully informs decision-makers and the public of the environmental effects of the proposed action and any reasonable alternatives. The Staff identifies the issues that are significant and verifies the significant information provided by the applicant as necessary.

C. Staff Comments Regarding Resolved Issues

The Staff would like to provide its comments regarding the Board's statement on page 30 of its Initial Decision, that indicates that "none of the aforesaid Permit Conditions, COL Action Items, or items listed as requiring further action or follow-up shall be treated as "resolved" for the purposes of 10 C.F.R. § 52.39(a)(2)." LBP-06-28, slip op. at 30. The Staff believes that this statement should be amended to remove the reference to Permit Conditions and COL Action Items. Under 10 C.F.R. § 52.39 (a)(2), Permit Conditions and COL Action Items are considered to be resolved. Although it is possible, in a subsequent COL proceeding, to attempt to litigate whether a Permit Condition has been satisfied or a COL Action Item addressed, the current ESP proceeding has resolved the adequacy of the Permit Conditions and COL Action Items, and their content cannot be re-litigated. Section 52.39 states that only *unresolved issues* can be litigated without first meeting the standards of the section. The Permit Conditions and COL

Action Items contained in the SER and EIS should therefore be considered resolved and should not be subject to further litigation at the COL application phase concerning their adequacy, unless a petitioner can meet the standards of 10 C.F.R. § 52.39.

In addition, the Staff is unsure as to the meaning of the Board's reference to "items listed as requiring further action or follow-up." With respect to the SER, there are no site suitability criteria requiring further action or follow-up, except as governed by permit condition. With respect to the FEIS, unresolved matters are identified in the FEIS. A matter resolved in the FEIS may be reconsidered at the COL application phase only if new and significant information is identified with respect to it.

CONCLUSION

The Commission requested that the Staff address three issues in this response. First, the Staff was asked to provide comments on the proposed modification of Permit Condition 3. The Staff believes that it is unnecessary to modify Permit Condition 3 because the three hydrologic permit conditions contained in the SER, which are all technically and legally enforceable, provide adequate protection of the ambient groundwater. The Staff believes that the Board's modification of Permit Condition 3 is unnecessary and therefore opposes the Board's proposed modification.

Second, the Commission asked the Staff to discuss the Board's comments regarding the fact-finding process used during the development of the SER and EIS. The Staff employed different approaches in different technical areas of the review, depending on its familiarity with the information provided by the Applicant. In areas where the Staff could rely on previously developed and reviewed guidance, the independent verification of background information in the SER and EIS was less extensive. However, where the Staff was presented with new information, a more extensive and detailed review was documented in the SER. As an example, to address the performance-based approach for the SSE calculation, the Staff took an

additional six months of review time and documented its review in a more detailed manner. In all cases, the Staff ensured that it presented adequate analysis to support and document its findings, whether in the form of a new analysis, as in the case of the seismic review, or by following a standard review plan or other established guidance. Throughout the review process, the Staff worked to ensure that all aspects of the review met the NRC's environmental and safety standards.

Finally, the Staff provided a brief statement regarding the finality of Permit Conditions, COL action items, and items listed as requiring further action or follow-up.

Respectfully submitted,

/RA/
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Dated at Rockville, Maryland
this 1st day of February, 2007

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CERTIFICATE OF SERVICE

I hereby certify that copies of the "NRC STAFF'S RESPONSE TO COMMISSION'S JANUARY 22, 2007, ORDER" in the captioned proceeding, have been served on the following through deposit in the NRC's internal mail system; through deposit in the NRC's internal mail system, with copies by electronic mail (as indicated by an asterisk), or by deposit in the U.S. Postal Service, with copies by electronic mail (as indicated by a double asterisk) this 1st day of February, 2007:

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