Exelon.
Generation

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U. S. Nuclear Regulatory Commission
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Subject: Exelon Nuclear Texas Holdings, LLC
Victoria County Station, Units 1 and 2
Additional Information - Conceptual Temporary Dewatering Plan in Support of Combined License Application
NRC Project Number 761

Reference: Letter from Thomas S. O'Neill (Exelon Generation) to NRC, "Application for Combined Licenses for Victoria County Station, Units 1 and 2," dated September 2, 2008

In the referenced letter, Exelon Nuclear Texas Holdings, LLC (Exelon) submitted an application for a combined license (COL) for Victoria County Station (VCS), Units 1 and 2. That submittal consisted of eleven parts as described in the referenced letter, including a part containing Safeguards Information provided under separate cover.

In addition to the contents of the application, Exelon is also providing the enclosed supplemental information in support of the review of the VCS Units 1 and 2 COL application (COLA). The enclosed conceptual-level dewatering plan describes the temporary dewatering system methods planned to be employed during construction of safety-related structures.

If any additional information is needed, please contact David J. Distel at (610) 765-5517.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 24th day of October 2008.

Respectfully,

Kenneth A. Ainger

Kenneth A. Ainger
Director – New Plant Licensing

Enclosure: Conceptual Temporary Dewatering Plan

cc: USNRC, Project Manager, VCS, Division of New Reactor Licensing (w/enclosure)
USNRC Region IV, Regional Administrator (w/enclosure)

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Enclosure

Conceptual Temporary Dewatering Plan

Victoria County Station

Conceptual Temporary Dewatering Plan

This report provides the requirements for dewatering the excavation for the construction of the facilities in the power block area. This plan assumes that the cooling basin has been filled with water increasing the ground water level profile in the excavated area to elevation 85 ft (NAVD88). This is conservative since the current construction schedule does not have water in the basin to the operating level at this time. The reactor building will require an excavation to an elevation of 8 ft (NAVD 88). The intent is to provide a conceptual dewatering plan so that the water level in the deepest excavation is a minimum of 3 ft below the exposed surface. In addition, a slope stability calculation has been performed on the most critical slope to show the excavated slopes will remain stable during the time period the excavation is open.

It should be noted that this conceptual dewatering plan to is subject to revision at the detailed design phase. The purpose of this conceptual dewatering plan is to verify the feasibility of dewatering the site during construction. In addition, this dewatering system will not be a permanent plant system and is non-safety related.

<u>Dewatering Wells</u>
The conceptual plan consists of providing 18 wells separated by 20 degrees radially from the center of the reactor building. Each well varies in distance from the center of the reactor building so that they will not interfere with construction activities. The pump rate for each of the wells has been calculated to be approximately 60 gpm. The wells, as shown in Figure 1, will be able to draw the water down to an approximate elevation of 2.0 ft (approximately 6.0 ft below the excavation) at the center of the reactor building. The water level profile contours while pumping are shown in Figure 1. Sections A and B are cut N/S (plant North) and E/W respectively and are shown in Figure 2. These sections provide the water level profile along these two locations.

The assumptions considered in the dewatering model include:

(i) The cooling basin located at the south part of the site is filled;
(ii) The groundwater level in the power block is conservatively assumed to be at 85 ft (NAVD 88); and
(iii) The Units 1 and 2 excavations are identical, thus values obtained from one unit dewatering is doubled to determine the worst case pumping rates for both excavations.

Predictive dewatering simulations indicate that a combined construction dewatering rate of approximately 900 gpm is necessary to dewater an excavation for a single unit to elevation 3 ft NAVD 88 when the cooling basin is full. This flow rate assumes only one excavation is dewatered at a time and is based on the use of a constant head boundary in a 3-dimensional numerical groundwater flow model to simulate the combined pumping effects of an unspecified number of wells pumping at identical flow rates. A trial-and-error analytical approach was used to obtain a more conservative dewatering flow rate for a single unit excavation, as well as to determine the pumping rates, locations, and number of perimeter dewatering wells.

The following table provides estimated pumping rates with estimated drawdown for two scenarios:

Scenario	Q per well (gpm)	Dewatered Elevation (ft NAVD 88)
Scenario 1 – six months	60	2.3
Scenario 1 – five years	60	-13.5
Scenario 2 – six months	300	2.0
Scenario 2 – five years	300	-18.5

Scenario 1: Consists of a series of pumping wells situated at an evenly spaced interval along the perimeter of the power block excavation for a single unit. The pumping wells will be used to dewater the Upper and Lower Shallow aquifers to approximately 3 feet below the bottom of the excavation, or 3.0 ft NAVD 88, at the center of the excavation (reactor building). A targeted dewatering flow of approximately 900 gpm was obtained from the groundwater model. The pumping rates and number and locations of the perimeter wells were adjusted to achieve the targeted drawdown elevation at the center of the excavation while maintaining the hydraulic head above the pump intake in the pumping wells. It is assumed that the sand layers to be dewatered will be below the top of the screen intervals in the pumping wells.

Scenario 2: Consists of a series of pumping wells situated at an evenly spaced interval along the perimeter of the power block excavation for a single unit. The pumping wells will be used to dewater the Deep aquifer (see Figure 3) to approximately 3 feet below the bottom of the excavation, or elevation 3.0 ft NAVD 88, at the center of the excavation (reactor building). Pumping in the Deep aquifer is necessary to depressurize Sand 6 beneath the confining Clay 5 and reduce the amount of vertical inflow into the excavation once dewatering commences. This scenario considered pumping from eight wells in Sand 6 at 300 gpm to decrease the hydraulic head of the Deep aquifer to approximately the same elevation as the final water elevation in Scenario 1, or elevation 3.0 ft NAVD 88.

Dewatering Contract

A dewatering contract including a detailed engineering specification outlining all the requirements for the installation, operation, monitoring, and maintenance of the dewatering system will be put into place before any work is started on site. The specification will be a performance specification based on meeting the requirement for lowering the groundwater a minimum of 3 feet below the bottom of the excavation with the additional requirement to add additional wells, pumps, etc. as needed to meet this requirement.

The specification and contract will also require crews, comprised of personnel experienced in the operation and maintenance of dewatering systems, to maintain and operate the groundwater control system 24 hours per day for as long as necessary to complete the excavation and construction. The crews shall be provided all necessary equipment and materials, including a back-up power supply needed for effective maintenance, operation and repair of the system. A monitoring program will be established that will specify a monitoring frequency to ensure proper water levels are maintained while the area is excavated.

Slope Stability

The proposed layout of the power block excavation plan along with the associated boreholes and excavation dewatering are shown in Figure 1. The Unit 1 side was analyzed and will be typical for the Unit 2 side when constructed.

Significant earthwork is required to provide embedment of major power block structures. The deepest excavation point in the power block area will be at El. 8.0 ft (NAVD 88). There are no permanent safety-related excavation or fill slopes created by power block site grading. Temporary excavation slopes are graded to a slope not exceeding 2 horizontal to 1 vertical (2H:1V).

The critical slope for slope stability with the anticipated water level during dewatering is shown in Section C on Figure 2. It has been determined that there will not be any slope stability concerns associated with this most critical section.

The excavation plan and sections (see Figures 1 and 2) show temporary ground supports along the north and west edges of the reactor/fuel building and along the south edge of the radwaste building. At the north edge of the reactor/fuel building, there is an abrupt change in grade that cannot be accommodated by an open cut stable soil slope. Also, at the west edge of the reactor-fuel building and the south edge of the radwaste building, temporary ground support is also required to accommodate the reach of a heavy lift crane. Both of these cases will be analyzed and designed during the detailed design phase.

The subsurface profiles in the east-west, north-south, and northwest-southeast directions (for Unit 1) are provided in Figure 2. The general subsurface profile at the proposed power block area can be divided into 22 layers/sublayers, as described in detail in Subsection 2.5.4 of the FSAR. The 22 soil strata, in general, are alternating layers of sand and clay. It is not always possible to define the exact interface, and there are lenses of soils that classify as clay or silts in the defined sand stratum, and lenses of sands in the defined clay layers. The properties of these strata have been determined along with strata elevations and thicknesses for Units 1 and 2, inside the power block, which shows relatively consistent elevations and thicknesses in the overall power block area. Bedrock is considered too deep to influence the earthwork and foundation design and construction.

Temporary dewatering at the excavations for the major power block structures is required for groundwater control during construction. Power block groundwater condition and construction dewatering conceptual design have been described above. The deepest excavation level (El. 8.0 ft [NAVD 88]) extends approximately 40 ft below the existing groundwater level (El. 48 ft [NAVD 88]). However, in addition to the dewatering model assumptions, it was assumed that all geological formations are horizontal and have infinite horizontal extent. The resulting groundwater contours during construction dewatering are provided in Figure 1, and superimposed on three cross-sections shown in Figure 2. From Figures 1 and 2, the average groundwater level in the excavation area is at about El. 2.0 ft (NAVD 88) and reaches El. 4.0 ft (NAVD 88) at almost 300 ft beyond the crest of the slopes.

The results of the Slope/W computer program using Bishop's simplified and Janbu's simplified methods of slices have been determined for each analysis type.

Shortly after construction (SAC) slope stability analyses are performed for one generic section with a full cooling basin. The resulting factors of safety have been determined to be 2.1 for both the Bishop and Janbu methods, which exceed the required criteria.

Pseudo-static (PS) slope stability analyses have been performed for one generic section with the cooling basin full of water. The resulting factors of safety have been determined to be 1.6 (Bishop) and 1.5 (Janbu), which also exceed the required criteria.

<u>Excavation</u>
Excavation to the depths required can commence 6 months after dewatering activities have begun. Modifications to the excavation schedule can only be made by qualified personnel.

<u>System Removal</u>
Criteria for the dewatering system removal shall consider backfill requirements around the facilities. In addition, they shall also include grouting of all dewatering wells and final site cleanup. The observation wells shall remain as permanent installations.

<u>Water Disposal</u>
The water removed from the wells, in addition to the rain water collected in the excavation, will be pumped into the cooling basin.

<u>COLA Revision</u>
The COLA will be revised as necessary to incorporate the additional information as presented above.

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FIGURE 1
"DEWATERING PLAN"

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FIGURE 2
"DEWATERING SECTIONS"

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FIGURE 3
"DEWATERING PLAN,
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