July 29, 2005

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

SUBJECT: BRAIDWOOD UNITS 1 AND 2, AND BYRON UNITS 1 AND 2 - REQUEST FOR ADDITIONAL INFORMATION (TAC NOS. MC6221, MC6222, MC6223, AND MC6224)

Dear Mr. Crane:

By letter dated February 15, 2005, you submitted a license amendment request for an alternative radiological source term for Braidwood Units 1 and 2, and Byron Units 1 and 2. The U.S. Nuclear Regulatory Commission (NRC) has been reviewing your request and finds that we need additional information to complete our review. These questions are from one technical branch. Additional questions are expected from the other technical review branches.

The enclosed questions were forwarded to your staff by facsimile on June 17, 2005. Based on communication with your staff, we have determined that question A.2 does not need to be answered as your submittal provides sufficient information. Your staff has also agreed to respond to these questions 120 days from the date of this letter.

Contact me if you have any questions.

Sincerely,

/RA/

Jon B. Hopkins, Senior Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454, STN 50-455,
STN 50-456 and STN 50-457

Enclosure: As stated

cc w/encl: See next page

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Sincerely,
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Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454, STN 50-455,
STN 50-456 and STN 50-457

Enclosure: As stated

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

EXELON GENERATION COMPANY, LLC

ALTERNATIVE RADIOLOGICAL SOURCE TERM

BRAIDWOOD UNITS 1 AND 2, AND BYRON UNITS 1 AND 2

DOCKET NOS. STN 50-456, STN 50-457, STN 50-454, AND STN 50-455

A. Iodine Leakage

After a loss-of-coolant accident (LOCA), a significant portion of the inventory of core iodine is released to the containment and some of this iodine leaks to the outside. In the submittal, two release paths are identified: containment leakage and emergency core cooling systems (ECCS) leakage.

Containment Leakage Path

(1) The iodine from the damaged core is released to the containment as 95% CsI and 5 % as I_2 and HI. CsI and HI are soluble in sump water but I_2 is scarcely soluble. If the sump water is acidic some of the ionic iodine from CsI is converted to I_2 and because of its low solubility it is released into containment atmosphere and some of it will leak to the outside. To prevent this from happening the pH of the sump water has to be maintained at the pH value of $7. Describe your program for controlling sump pH to maintain it basic. The description should include: (a) chemicals used for sump pH control; (b) the procedure and the corresponding calculations for determining the amount of chemicals needed for neutralizing the effect of acidic chemicals in the containment such as boric, hydrochloric or nitric acids.

ECCS Recirculation Leakage Path

(2) Provide the basis for assuming the value of 276,000 cc/hr for the ECCS recirculation leakage rate used in the AST LOCA analysis. (NO ANSWER REQUIRED.)

(3) In the ECCS leakage path leading to the Borated Water Storage Tank (BWST), the sump water will mix with the remaining borated water in the tank. Since the BWST water contains between 2300 and 2500 ppm of boron in form of boric acid, the pH of the mixture of sump and BWST water will have lower pH (most probably well below 7). Lowering the pH of the sump water will cause the conversion of ionic iodine into the elemental form and its corresponding release to the reactor water storage tank (RWST) air space. This effect will increase the total release of radioactive iodine from engineering safety features and cause correspondingly higher radiation doses.

Was this effect included in the licensee's analysis? If it was included, provide its description and the analyses for determining its significance to the overall release of radioactivity in the ECCS recirculation leakage path.

ENCLOSURE

B. Iodine Removal

(4) Provide the reason why natural deposition of elemental iodine was not considered in your analysis.