April 18, 2000

Mr. Oliver D. Kingsley, President
Nuclear Generation Group
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2 - PIPE SUPPORT CALCULATIONS

Dear Mr. Kingsley:

By letters dated March 10 and March 20, 2000, ComEd provided information in response to a request for additional information dated February 8, 2000. The NRC had requested specific information to address the design control issue for anchor bolt stiffness values used in pipe support calculations, and to resolve the fundamental issue related to the appropriateness of modeling the structural attachments of base plates as pinned connections.

On April 12, 2000, we held a conference call with members of your staff and requested a meeting with ComEd to discuss this issue. We indicated during the call that we would like ComEd to address the four concerns described below during the public meeting.

(1) In ComEd's March 10, 2000, letter (response to Question 1), you stated that the method described on page 12 of Calculation No. L-002424 was not a sub-structuring method, but was a simplified, conservative, bounding analysis. Please demonstrate that analyzing the supports at M09-LP28-2804X, Node 6, and M09-RH04-2883S, Node 1, using your two-step analysis approach will result in more conservative anchor bolt loads than those computed using the one-step analysis approach. The one-step analysis is an analysis in which the support member(s) and the baseplate (anchor) and the anchor bolts are represented in one integrated mathematical model.

(2) In ComEd's March 10, 2000, letter (response to Question 2), you stated that the computer code APLAN is a fully validated and controlled program and the validation consisted of running several baseplate problems with APLAN and comparing the results against analysis results of the same baseplates analyzed with ADINA. The staff is concerned that the results presented in your March 10 response are counter-intuitive in that the anchor bolt's stiffness increases with increasing load.

We would like you to demonstrate that the rotational stiffness corresponding to the two bending moments, 102.89 kip-in and 17.72 kip-in, in Calculation No. L-002379, using the APLAN code are similar to the values computed using ADINA or other codes in the public domain. This may be accomplished by demonstrating that computations of the rotational stiffness using ADINA or any other computer codes in the public domain are similar to the values computed using the APLAN computer code.

(3) In ComEd's March 10, 2000, letter (response to Question 3), you provided a response regarding in-structure floor response values for operating basis earthquake (OBE) and safe shutdown earthquake (SSE). The staff's understanding of your response to Question 3 is that the OBE acceleration values (g-values) are higher than the SSE g-values because the base mat input motions have different frequency content for SSE and OBE, and the damping is lower for OBE than for SSE.

The staff would like to understand more specifically, the frequencies being excited for SSE motions versus that for OBE and the corresponding damping values for SSE and OBE. The staff would also like to know whether the g-values of OBE exceed those for SSE only at resonant frequencies or at all frequencies. Please explain the reasons that the accelerations in the vertical direction (4.41g for OBE and 3.53g for SSE) are so much higher than the accelerations in the horizontal direction (1.89g for OBE and 1.35g for SSE) for support M09-VG01-0024X (Calculation L-002291, Revision 0). Generally, the floor acceleration resulting from OBE is higher than that resulting from SSE and the horizontal acceleration is greater than the vertical acceleration. The staff would like to better understand the technical factors for LaSalle that result in (1) the SSE accelerations being lower than those produced by the OBE, and (2) the vertical accelerations being higher than the horizontal acceleration.

(4) In your March 20, 2000, submittal, you stated that you had used a secant modulus at ultimate load (anchor failure) as your anchor bolt stiffness in calculating the bending moment generated at the anchorage. Your secant modulus value was the slope of the line connecting the origin to the anchor ultimate load of an anchor test data by using the load as the ordinate and bolt deformation as the abscissa.

The staff considers the use of a secant modulus based on the ultimate load to be non-conservative since the maximum allowable anchor bolt loads are typically 1/4 of the ultimate load. The staff considers that the actual secant modulus should be the slope of the line connecting the origin to a bolt load value corresponding to 1/4 of the ultimate load. The secant modulus, or bolt stiffness, corresponding to the actual load on the bolt is about a magnitude higher than the secant modulus that ComEd had used to calculate the bending moment generated at the anchorage. Please calculate the bending moment generated at the anchorages and the corresponding bolt loads for the supports identified in Item 1, above, using a more realistic bolt stiffness corresponding to bolt behavior similar to operational loads under consideration.

ComEd is not required to respond to these concerns in writing prior to the meeting. We have tentatively scheduled the meeting for the week of May 8, 2000, at NRC headquarters for ComEd to provide its responses. If you have any questions regarding this information, please call me at 310-415-1322.

Sincerely,

/RA/

Donna M. Skay, Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-373, 50-374

cc: See next page

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