July 18, 2002

Mr. Barry Quigley
3512 Louisiana Rd.
Rockford, Illinois 61108

Dear Mr. Quigley:

Thank you for your May 17, 2002, letter in which you expressed concerns about the capability of the reactor coolant system (RCS) leakage detection systems at operating nuclear power plants to detect a 1 gallon-per-minute (gpm) RCS leak rate within 1 hour. You asked three questions and inquired about the status of generic activities related to RCS leakage detection systems. The enclosure to this letter provides our answers to your questions and the status of generic activities related to RCS leakage detection. Although your letter, and hence our response, focused on pressurized-water reactors (PWRs), the same issue may also apply to boiling water-reactors (BWRs).

We would like to point out that in light of leak-before-break studies performed since the issuance of Regulatory Guide (RG) 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," we have determined that the detector response time (1 hour) specified therein is conservative with respect to crack growth in piping. However, with respect to the recent control rod drive mechanism penetration cracking events, the sensitivity (1 gallon per minute) specified in RG 1.45 cannot detect the small leak rates associated with these type of events. Such small leakage rates must be detected via inservice inspection programs, boric acid walkdowns or other inspection techniques.

For most component and piping degradation mechanisms, the probability of crack growth resulting in a loss-of-coolant accident (LOCA) prior to detection by one of the reactor coolant system leakage detection systems is extremely low. This conclusion may be drawn due to: (1) the overall diversity and redundancy of the leakage detection systems, (2) relatively slow rates of stable crack growth for most cracking mechanisms, and (3) the low probability of an abnormal loading event (e.g., an earthquake) which could lead to catastrophic failure of the component or piping. Nuclear power plants are designed to provide adequate core cooling following any postulated LOCA up to and including a break equivalent in size to the double-ended rupture of the largest pipe in the RCS. This design feature, coupled with the extremely low likelihood of undetected crack growth resulting in a LOCA, leads us to conclude that the risk significance of this issue is low.

Thank you for expressing your concerns to the NRC. I trust the information provided in the enclosure to this letter is responsive to your concerns.

Sincerely,

/RA/

Brian W. Sheron, Associate Director
for Project Licensing and Technical Analysis
Office of Nuclear Reactor Regulation

Enclosure: As stated

Thank you for expressing your concerns to the NRC. I trust the information provided in the enclosure to this letter is responsive to your concerns.

Sincerely,

/RA/

Brian W. Sheron, Associate Director
for Project Licensing and Technical Analysis
Office of Nuclear Reactor Regulation

Enclosure: As stated

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