

October 26, 2004

Dr. Mario V. Bonaca, Chairman  
Advisory Committee on Reactor Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

**SUBJECT:    RESPONSE TO ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
              LETTER REGARDING THE SAFETY ASPECTS OF THE LICENSE RENEWAL  
              APPLICATION FOR THE DRESDEN UNITS 2 AND 3 AND QUAD CITIES  
              UNITS 1 AND 2 NUCLEAR POWER STATIONS**

Dear Dr. Bonaca:

In your letter to Chairman Diaz dated September 16, 2004, you summarized the results of the review by the Advisory Committee on Reactor Safeguards (ACRS) of Exelon Generation Company's (Exelon's) license renewal application for the Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2, and the U.S. Nuclear Regulatory Commission (NRC) staff's final safety evaluation report (SER) on the application. On the basis of its review, the Committee concluded that all open and confirmatory items had been resolved and that there was reasonable assurance that Dresden 2 and 3 and Quad Cities 1 and 2 could be operated safely in accordance with their current licensing basis for the period of extended operation without undue risk to the health and safety of the public. The Committee recommended approval of the license renewal application with the inclusion of two conditions. The staff's response to your recommendations is discussed below. The Committee's timely review helped the staff meet the review schedule and is appreciated.

With regard to operating experience at extended power uprate (EPU) levels, you noted that Dresden and Quad Cities have limited operating time at EPU levels and the staff should, prior to entering the period of extended operation, require that the applicant conduct an evaluation of operating experience at all four units and at other Boiling Water Reactor (BWR) plants operating at EPU levels. The letter also noted that all license renewal applicants that plan to operate during the license renewal period at EPU levels that are substantially higher than that experienced in the bases supporting their license renewal applications should conduct similar evaluations of operating experience at EPU levels.

The staff agrees with the recommendations that the staff and licensees should evaluate EPU operating experience, including aging management programs (AMPs), before plants enter the period of extended operation. Consistent with these ACRS recommendations, Exelon recently performed an evaluation of the components at Dresden and Quad Cities that have experienced performance problems under EPU conditions. Exelon is taking corrective action to prevent such problems in the future. Exelon is also performing a detailed evaluation of the vulnerability of other components at Dresden and Quad Cities to potential performance problems during future EPU operation. The NRC staff plans to review Exelon's evaluations prior to approving Quad Cities' return to EPU power levels. The staff has recommended that Exelon provide the lessons learned from these activities to the Boiling Water Reactor Owners Group (BWROG) so that industry-wide guidance can be developed for licensees currently operating, or proposing to

operate, their nuclear power plants at EPU conditions. In addition, shortly after the steam dryer cracking issues at Quad Cities, the staff recognized the need to address flow-induced vibration effects on steam dryers and other plant components in more detail during reviews of EPU applications. As a result, the staff added guidance in the Final Review Standard for EPUs for such reviews and included specific references in the Review Standard to this operating experience. The staff will provide further clarification, if necessary, to ensure that EPU applications are reviewed for aging effects for their current license operating period. The staff will continue to monitor industry's analyses in this area.

As was previously discussed with the ACRS during the Committee's review of the standard, the staff plans to incorporate lessons learned from the experience at Quad Cities and other EPUs into the review standard the next time the staff updates the standard. All license renewal applicants with an approved EPU will be required to perform an operating experience review and its impact on aging management programs for structures, and components before entering the period of extended operation. By letter dated October 8, 2004, Exelon has committed to perform an evaluation of operating experience at EPU levels prior to the period of extended operation to ensure that operating experience at EPU levels is properly addressed by the AMPs. The evaluation will include Dresden and Quad Cities units and other plants operating at EPU levels. Exelon will submit the results of this evaluation to the NRC which will be subject to inspection per approved NRC Inspection Procedure.

Your letter also stated that staff should provide improved guidance in this area. We agree. The Office of Nuclear Reactor Regulation (NRR) staff has initiated discussions with the Office of Research (RES) to address synergistic effects of plant operations/modifications, including aging management, at EPU levels on plant structures, and components. The NRR and RES staff will schedule a meeting with the ACRS full committee in the near future to provide the status of staff activities and gain a mutual understanding of the issues.

With regard to whether the steam dryers are within the scope of license renewal for Dresden and Quad Cities, you noted that the applicant had not provided appropriate justification for their exclusion. You also noted that the steam dryers are not safety-related, but structural failure can cause pieces to pass through safety-related components and cause the components to fail to operate properly. The staff agrees with these observations and the applicant has now put the steam dryers within the scope of license renewal for the Dresden 2 and 3 and Quad Cities 1 and 2. This is also consistent with the requirement in 10 CFR 54.4(a)(2) for structures, systems, and components within the scope of license renewal. The staff is currently working with the industry to develop generic guidance in this area. The aging management program would be the NRC-approved Boiling Water Reactor Vessel Internals Program (BWRVIP) Steam Dryer Inspection and Evaluation Guidelines. Exelon has committed to follow this NRC/industry effort. If the BWRVIP Steam Dryer Inspection and Evaluation Guidelines are not approved by the staff, then Exelon has committed to submit a plant-specific aging management program to the NRC for review and approval by December 22, 2007, which is 2 years before the first Dresden unit enters the period of extended operation.

In summary: (1) for license renewal applicants with approved EPU, the staff will require a licensee commitment requiring operating experience and aging management programs review prior to entering the period of extended operation, (2) for EPU applicants who have not requested license renewal, the EPU review process will ensure that impacts of operation at EPU levels are considered for the current license period of operation, and (3) for EPU

Dr. Bonaca

-3-

applicants with a renewed license, the EPU review process will consider applicable effects of aging to ensure that aging mechanisms which were considered as part of the license renewal process continue to remain valid over the period of extended operation. For all newly identified systems, structures and components that would have been subject to an aging management review or evaluation of time-limited aging analysis, 10 CFR 54.37(b) requires that the FSAR update must describe how the effects of aging will be managed during the period of extended operation. We agree that it is appropriate to reflect these ongoing power uprate actions in the license renewal program.

The staff appreciates the ACRS's efforts in support of the license renewal program.

Sincerely,

***/RA Martin J. Virgilio Acting For/***

Luis A. Reyes  
Executive Director  
for Operations

cc: Chairman Diaz  
Commissioner McGaffigan  
Commissioner Merrifield  
SECY

Dr. Bonaca

-3-

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Letter to Dr. Bonaca from Luis Reyes dated: October 26, 2004

Subject: Response to Advisory Committee on Reactor Safeguards Letter Regarding the Safety Aspects of the License Renewal Application for the Dresden Units 2 and 3 and Quad Cities Units 1 and 2 Nuclear Power Stations

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