

June 25, 2002

EA-02-118

Mr. John L. Skolds, President  
Exelon Nuclear  
Exelon Generating Company, LLC  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: PRELIMINARY WHITE FINDING  
(NRC INSPECTION REPORT NO. 50-456/02-03; 50-457/02-03)  
(BRAIDWOOD STATION, UNITS 1 AND 2)

Dear Mr. Skolds:

On February 22, 2002, the NRC completed an inspection at your Braidwood Station Units 1 and 2. The results of this inspection were documented in NRC Inspection Report 50-456/02-03; 50-457/02-03. The inspection report discussed a finding pertaining to your corrective actions for Unit 1 pressurizer power operated relief valve (PORV) air accumulator check valve failures which was considered unresolved at the time because the NRC had not completed its determination of the safety significance of the issue. On June 4, 2002, the NRC preliminary results were discussed with Mr. Thomas Joyce, Plant Manager.

Based on information provided by your staff since this inspection and the Significance Determination Process (SDP) Phase 2 analysis results, the issue was preliminarily determined to be White, an issue with some increased importance to safety, which may require additional NRC inspection. The finding has low-to-moderate safety significance because it could have resulted in the pressurizer PORVs being unavailable for establishing a reactor coolant system bleed path under certain accident or transient conditions. Although it appears that the pressurizer PORVs may have been inoperable for several operating cycles, the NRC applied the SDP to the most recent complete operating cycle (March 2000 to September 2001) and assumed the pressurizer PORV bleed path would not have been available for any event which resulted in a dual-unit loss of offsite power or Unit 1 containment isolation for a one-year period.

For the SDP, the NRC used the unbenchmarked Braidwood-specific SDP Notebook, Revision 0, dated December 8, 2000. Although the notebook was not benchmarked, our risk analyst worked closely with your staff to ensure a mutual understanding of the applicable core damage sequences. While our dominant sequence differed slightly from your analysis due to the uncertainty associated with human recovery credit applied, both analysis determined that the core damage frequency for internal events and large early containment release was of low to moderate risk significance, White.

We determined that the most limiting single core damage sequence was a dual-unit loss of offsite power event with a concurrent loss of the auxiliary feedwater system. Since your staff indicated that the initiating event frequency for a single-unit and dual-unit loss of offsite power were not significantly different, we used the normal loss of offsite power worksheet. The NRC evaluated the rather complex recovery procedures for the service air compressors in that scenario, and determined that a 1E-1 human error probability was appropriate. This resulted in a White sequence.

Three additional Green-adjacent-to-White core damage sequences were also identified. Two of these sequences related to a steam generator tube rupture event with failure to isolate the affected steam generator or failure to depressurize the secondary. The human error probability for recovery was set at 1E-2 for those two sequences due to the easier task of diagnosing and resetting the containment isolation. The third Green-adjacent-to-White core damage sequence was identified for a transient with loss of the power conversion system event with a concurrent failure of the auxiliary feedwater system. For that sequence, a lower human error probability of 1E-3 was used because a containment isolation would be manually actuated by the control room operators. The operators would not need to diagnose the cause of this isolation prior to resetting the isolation signal. The three Green-adjacent-to-White sequences resulted in the equivalent of a second White sequence when the counting rule of the SDP was applied.

The NRC also examined the change in core damage frequency due to external events and the potential risk contribution due to the large early release frequency for this finding. While the external events did not significantly change the risk characterization, the risk contribution due to large early release frequency resulted in a White finding for the steam generator tube rupture sequences. Thus, the overall result of the SDP was that the issue was preliminarily determined to be low-to-moderate safety significance, White.

The finding also appears to involve an apparent violation of Criterion XVI, "Corrective Action," of 10 CFR Part 50, Appendix B, and is being considered for escalated enforcement action in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Action" (Enforcement Policy), NUREG-1600. The current Enforcement Policy is included on the NRC's website at [www.nrc.gov](http://www.nrc.gov).

The apparent violation involves the failure to prevent recurrence of a significant condition adverse to quality, specifically, Unit 1 pressurizer PORV air accumulator check valves leak-through, as evidenced by repeated failures to meet testing acceptance criteria between 1991 and 2001. This resulted in several extended periods where the unit was operated in a condition where the pressurizer PORVs may not have been able to perform their intended safety function of opening following events which resulted in isolation of instrument air to the containment or loss of the service air compressors.

We understand that you determined that the check valve failures appear to be related to the sequence in which various maintenance and testing activities on the PORV systems were accomplished during previous outages and that a careful review of the activities conducted in the most recent outages on each unit indicated that all of the check valves are currently operable. We also understand that this issue has been placed in your corrective action

program and that actions to either replace the check valves with models not susceptible to the same failure mechanism and/or sequencing activities to prevent the exposure of the valves to the failure mechanism will be accomplished in future outages.

We believe that sufficient information was considered to make a preliminary significance determination. However, before we make a final decision on this matter, we are providing you an opportunity to request a Regulatory Conference where you would be able to provide your perspectives on the significance of the finding, the basis for your position, and whether you agree with the apparent violation. You may also chose to submit your position on the finding in writing. If you choose to request a Regulatory Conference, it should be held withing 30 days of the receipt of this letter and we encourage you to submit your evaluation and any differences with the NRC evaluation at least one week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. The NRC will also issue a press release to announce the Regulatory Conference. If you decide to submit only a written response, such submittal should be sent to the NRC within 30 days of the receipt of this letter.

Please contact Ann Marie Stone at (630) 829-9729 within 7 business days of the receipt of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decision and you will be advised by separate correspondence of the results of our deliberations on this matter.

Since the NRC has not made a final determination in this matter, no Notice of Violation is being issued for this inspection finding at this time. Please be advised that the number of violations and characterization of the apparent violation described in Inspection Report 50-456/02-03; 50-457/02-03 may change as a result of further NRC review.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC's Web site at <http://www.nrc.gov/reading-rm.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Geoffery E. Grant, Director  
Division of Reactor Projects

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