

October 18, 2006

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

SUBJECT: NOTICE OF ENFORCEMENT DISCRETION FOR EXELON GENERATION  
COMPANY LLC REGARDING QUAD CITIES NUCLEAR POWER STATION,  
UNIT 1 (NOED 06-3-01)

Dear Mr. Crane:

By letter dated October 16, 2006, you requested that the U.S. Nuclear Regulatory Commission (NRC) exercise discretion to not enforce compliance with the actions required in Technical Specification (TS) 3.1.7, "Standby Liquid Control (SLC) System." Your letter documented information previously discussed with the NRC in a telephone conference on October 13, 2006, at 8:00 a.m. (All times discussed in this letter refer to Central Daylight Time). You stated that on October 13, 2006, at 6:36 p.m., Quad Cities Unit 1 would not be in compliance with TS 3.1.7 Required Action C.1 which would require Exelon to place Unit 1 in Mode 3 (Hot Shutdown). You requested that a Notice of Enforcement Discretion (NOED) be granted pursuant to the NRC's policy regarding exercise of discretion for an operating facility, set out in Section VII.C, of the NRC Enforcement Policy, and be effective for the period from 6:36 p.m. on October 13, 2006, to 6:36 p.m. on October 16, 2006. This letter documents our telephone conversation on October 13, 2006, when we orally issued this NOED at 11:30 a.m. We understand that the condition causing the need for this NOED was corrected and you exited from TS 3.1.7 Required Action C.1 and from this NOED on October 15, 2006, at 11:22 a.m.

The principal NRC staff members who participated in that telephone conference included: Mark Satorius, Director, Division of Reactor Projects (DRP), RIII; Catherine Haney, Director, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation (NRR); Mark Ring, Branch Chief, Reactor Projects Branch 1, DRP, RIII; Daniel Collins, Chief, Plant Licensing Branch III-2, NRR; John Honcharik, Project Manager, Plant Licensing Branch III-2; Allan Barker, Project Engineer, Reactor Projects Branch 1, DRP, RIII; Karla Stoedter, Senior Resident Inspector, Quad Cities; Mike Kurth, Resident Inspector, Quad Cities; Julio Lara, Branch Chief, Engineering Branch 3, Division of Reactor Safety (DRS), RIII; Ken O'Brien, Enforcement/Investigations Officer, RIII; Sonia Burgess, Senior Reactor Analyst, DRS, RIII; John Jandovitz, Reactor Inspector, DRS, RIII; Harold Chernoff, Chief, Plant Licensing Branch I-2, NRR (NOED process expert); John Kramer, Senior Reactor Analyst, PRA Operational Support and Maintenance Branch, NRR; Allen Hiser, Chief, SG Tube Integrity and Chemical Engineering Branch, NRR; John Tsao, Acting Chief, Flaw Evaluation and Welding

Branch, NRR; Benjamin Parks, General Engineer, BWR Systems Branch, NRR; See-Meng Wong, Senior Reactor Analyst, PRA Operational Support and Maintenance Branch, NRR; and Zeynab Abdullahi, Reactor System Engineer, BWR Systems Branch, NRR.

Your staff requested enforcement discretion to preclude a required entry into Mode 3 (Hot Shutdown) by 6:36 p.m. on October 13, 2006. To accomplish this, you requested that the 12-hour Completion Time for TS 3.1.7 Required Action C.1 be extended by 72 hours to 6:36 p.m. on October 16, 2006, to accomplish restoration of the SLC system to an operable status. With this extended Completion Time, the unit would have been required by TS 3.1.7 Required Action C.1 to enter Mode 3 (Hot Shutdown) by 6:36 p.m. on October 16, 2006, if both SLC subsystems remained inoperable.

Technical Specification Limiting Condition for Operation 3.1.7, "Standby Liquid Control (SLC) System," states that "Two SLC subsystems shall be OPERABLE." This specification is applicable in MODES 1 and 2. Technical Specification 3.1.7 Condition B provides required actions for two SLC subsystems inoperable. If two SLC subsystems are inoperable under Condition B, action is required to restore one SLC subsystem to operable status within 8 hours. Technical Specification 3.1.7 Condition C requires the unit to be placed in Mode 3 (Hot Shutdown) within the next 12 hours if Condition B is not met.

At 10:36 p.m. on October 12, 2006, your staff determined that a pinhole leak in the Unit 1 SLC tank rendered both SLC subsystems inoperable. This placed Unit 1 in TS 3.1.7 Condition B, "Two SLC Subsystems Inoperable." The 8-hour Completion Time of TS 3.1.7 Required Action B.1 expired at 6:36 a.m. on October 13, 2006. At the expiration of this Completion Time, action was required to place Unit 1 in Mode 3 (Hot Shutdown) within the following 12 hours (i.e., 6:36 p.m. on October 13, 2006).

Your staff provided the following information:

Your staff initially identified, approximately 2 years ago, that a small amount of boric acid crystals had accumulated (about ½ inch) at the bottom of the Unit 1 SLC tank at the juncture of a weld on a support bracket for the tank. This condition was documented in a condition report on May 27, 2004. You did not conclusively determine whether the crystals were from the tank, operation of the system, sampling methods, spillage, or some other source. Reviews of the tank level since that period of time have not indicated any abnormal trends. Technical Specification surveillances consistently confirmed that requirements for volume (daily) and concentration (monthly) continued to be met. Walkdowns of other similar welds on the Unit 1 and Unit 2 SLC tanks have not detected any other boric acid crystals. A non-destructive ultrasonic examination (i.e., NDE UT) of the suspect area performed in May 2004 indicated no wall thinning. A visual exam, also performed in this time period, indicated that no flaws or discontinuities existed. Based on the aforementioned, you determined that the condition did not result in a structural concern.

You stated that recent industry issues involving operational leakage in American Society of Mechanical Engineers (ASME) Code components resulted in a heightened awareness that these crystals could be symptomatic of a tank integrity concern (the SLC

tank is a stainless steel, ASME Section XI Class 2 structure that is vented to atmosphere). Consequently, your staff determined that the Code Class 2 pressure boundary was not intact and the SLC operability requirement per TS 3.1.7 was therefore not met. You determined that the most probable cause for the apparent leakage can be assigned to a weld defect induced during fabrication; however, the root cause of the leak will be confirmed through NDE analyses, or possibly by material removal for offsite analysis. As a result, a repair plan was developed that will satisfy the ASME Code requirements for external or internal repair method for Class 2 structures. The required time to implement the repairs was estimated to be 72 hours. No extent of condition issues have been identified (the Unit 2 SLC tank was inspected for similar indications, and no issues were identified).

Two repair options were evaluated. One option involved an external repair, while the other involved an internal repair. The decision on which option to pursue would be based on detailed NDE examinations. The examination was performed following removal of a support bracket (adjacent to the defect), on October 13, 2006. You determined that the defect was not a minor flaw (not crack-like), and an external repair would not be sufficient to meet ASME Code requirements (Option 1). A more extensive repair was required and the SLC tank had to be drained to support the work activities (Option 2). The NOED request was based on Option 2, the longer of the two repair options. The significant work activities included: NDE examinations; engineering structural evaluations; 10 CFR 50.59 and modification preparation; independent, third party review; SLC tank draining and flush; weld repair and examination; SLC tank refill and heatup/chemical sampling; and operability testing.

Your staff requested this NOED after consideration of the safety significance and potential consequences of such an action. A bounding risk assessment of operating Unit 1 with the SLC tank unavailable was performed. The results of the risk assessment for operating for a short duration (i.e., a bounding 120 hours) with the SLC tank unavailable showed that there would be no net increase in radiological risk to the public.

Your staff stated that the baseline risk for Quad Cities Unit 1 using the zero maintenance probabilistic risk assessment (PRA) model yields a core damage frequency (CDF) value of  $5.05E-6$  and a large early release frequency (LERF) value of  $4.65E-7$ . The estimated increase in risk for the incremental conditional core damage probability (ICCDP) associated with a postulated 120-hour extension is  $3.3E-8$ . The ICCDP values for Unit 1 are less than the threshold of  $5E-7$  specified in regulatory issue summary (RIS) 2005-01. In addition, the estimated increase in risk for incremental conditional large early release probability (ICLERP) is  $2.1E-8$ . The ICLERP values for Unit 1 are also less than the threshold of  $5E-8$  specified in RIS 2005-01. These calculated risk increases are consistent with the site's normal work control levels; and therefore, there is no net increase in radiological risk to the public. A Region III Senior Risk Analyst reviewed this risk analysis and determined the values to be appropriate.

As for compensatory measures, during the time the SLC system was inoperable, your staff committed to the following: (1) both anticipated transient without a scram (ATWS) recirculation pump trip systems would be protected; (2) the reactor protection system (RPS) would be protected; and (3) all production risk activities would be prohibited. In addition to the

compensatory actions to minimize risk previously described, your staff committed to the following additional actions during the period of the enforcement discretion: (1) provided the repair leaves the SLC tank available, the frequency for Surveillance Requirement (SR) 3.1.7.1, which requires verification of available SLC tank volume, would be increased from once per 24 hours to once per 8 hours; (2) systems that impact production risk would not be removed from service for preventive maintenance; and (3) Nuclear Oversight personnel would independently verify that all compensatory actions are being implemented.

The NRC reviewed your written request for enforcement discretion dated October 16, 2006, and verified consistency between your oral and written requests. The NRC's basis for this discretion considered: (1) the compensatory measures to reduce the probability of a plant transient while ensuring the availability of other safety related equipment; and (2) the qualitative and quantitative risk evaluation of the condition determined that the calculated risk increases were consistent with normal work control levels and, therefore, there was no net increase in radiological risk to the public.

Based on the above considerations, the NRC staff concluded that Criterion B.2.1.1.a and the applicable criteria in Section D.4 to NRC Manual Chapter 9900, "Technical Guidance, Operations - Notice of Enforcement Discretion," were met. Criterion B.2.1.1.a states that for an operating plant, the NOED is intended to avoid unnecessary transients as a result of compliance with the license condition and, thus, minimize potential safety consequences and operational risks.

On the basis of the staff's evaluation of your request, we have concluded that granting this NOED was consistent with the Enforcement Policy and staff guidance, and had no adverse impact on public health and safety or the environment. Therefore, we exercised discretion to not enforce compliance with TS 3.1.7 Required Action C.1 for entry into Mode 3 (Hot Shutdown) by 6:36 p.m. on October 13, 2006, until October 16, 2006, at 6:36 p.m. A follow-up license amendment request is not required.

As stated in the Enforcement Policy, action will be taken, to the extent that violations were involved, for the root cause that led to the noncompliance for which this NOED was necessary.

Sincerely,

***/RA by S. West Acting for/***

Mark A. Satorius, Director  
Division of Reactor Projects

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Plant Manager - Quad Cities Nuclear Power Station  
Regulatory Assurance Manager - Quad Cities Nuclear Power Station  
Chief Operating Officer  
Senior Vice President - Nuclear Services  
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