



Byron Generating Station

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U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

Byron Station, Units 1 and 2  
Facility Operating License Nos. NPF-37 and NPF-66  
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Reply to a Notice of Violation; 05000454/2015007-03; 05000455/2015007-03

Reference: Letter from Christine A. Lipa (U.S. NRC) to Bryan C. Hanson (Exelon Generation Company, LLC), "Byron Station, Units 1 and 2, NRC Component Design Basis Inspection Report 05000454/2015007; 05000455/2015007 and Notice of Violation," dated September 18, 2015.

In the referenced letter, based on the results of an inspection completed on August 7, 2015, the NRC concluded that Byron Station was in violation of 10 CFR 50, Appendix B, Criterion III "Design Control," which requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis for structures, systems and components, are correctly translated into specifications, drawings, procedures, and instructions and that design control measures shall provide for verifying or checking the adequacy of the design.

The NRC requested Exelon Generation Company, LLC (EGC) to respond to the Notice of Violation within 30 days of the date of the referenced letter. EGC does not contest the violation.

Attachment 1 to this letter contains EGC's response to the Notice of Violation.

If you have any questions regarding this reply, please contact Mr. Douglas Spitzer, Regulatory Assurance Manager, at (815) 406-2800.

Respectfully,

A handwritten signature in black ink, appearing to read "F. A. Kearney", written over a horizontal line.

F. A. Kearney  
Site Vice President  
Byron Generating Station

FAK/AC/sg

Attachment

cc: Regional Administrator – NRC Region III  
NRC Senior Resident Inspector – Byron Station

## Attachment 1

In a letter from Eric Duncan (U.S. NRC) to Bryan C. Hanson (Exelon Generation Company, LLC), dated September 18, 2015, the NRC issued a Notice of Violation. The violation of NRC requirements was identified during an NRC inspection completed on August 7, 2015. The violation is repeated below:

Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis for structures, systems, and components, are correctly translated into specifications, drawings, procedures, and instructions, and that design control measures shall provide for verifying or checking the adequacy of the design.

Contrary to the above, from initial plant construction until August 11, 2015, the licensee failed to verify the adequacy of the design of the Byron Unit 1 and Unit 2 recycle holdup tanks, which are safety-related components subject to the requirements of Title 10 CFR Part 50, Appendix B, Criterion III. Specifically, the licensee failed to evaluate the effect of dynamic loads on inlet piping from the Unit 1 and Unit 2 residual heat removal systems' suction relief valves that discharge to the recycle holdup tanks; and, as a result, failed to verify the adequacy of the recycle holdup tank design to withstand design loads that would result from a discharge of residual heat removal system relief valves into the recycle holdup tanks.

This violation is associated with a Green Significance Determination Process finding.

Although determined to be of very low safety significance (Green), in accordance with Section 2.3.2 of the NRC Enforcement Policy, this violation is being cited because you have failed to restore compliance within a reasonable time after the violation was identified in NRC Inspection Report 05000454/2008009; 05000455/2008009 and again in NRC Inspection Report 05000454/2011008; 05000255/2008011.

This finding had a cross-cutting aspect in the Resources component of the Human Performance cross-cutting area because leaders at the station did not ensure that personnel, equipment, procedures, and other necessary resources were available and adequate to correct the condition adverse to quality over the past three years. Specifically, leaders did not ensure that personnel, equipment, procedures, and other necessary resources were available and adequate to correct the condition adverse to quality over the past three years (H.1).

### **Response:**

#### 1) Reason for the violation

Byron Station received NRC non-cited violations (NCVs) associated with the issue described as documented in inspection report 05000454/455/2008009 dated November 12, 2008 and in NCV 05000454/455/2008009-02. The issue was entered into the Corrective Action Program (CAP) process under Issue Reports (IRs) 680626 and 622574. Subsequently, NRC Problem Identification and Resolution Issue Report (PI&R) 2011-008 identified a NCV for failure to implement timely corrective actions to address

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these NCVs which was entered into the station CAP under IR 1285566. During the 2015 P&IR, the NRC identified the subject notice of violation (NOV) which has been entered into the station CAP under IR 2559727.

The reason for the finding for failure to restore compliance in a reasonable time after the violation was identified by the NRC is inadequate oversight and prioritization of site projects, including resolution to unrelated NRC violations, to drive the issue to resolution. The delays were caused by linear prioritization of available resources based on perceived risk significance. Contributing to this was the required level of engineering analysis and evaluation required to support resolution, refinement of the transient analysis as input to the resolution, and resolution of legacy piping design analysis concerns.

### 2) Corrective steps that have been taken and the results achieved

- For the immediate protection of the Recycle Hold-up Tank (RHUT) from the effects of potential steam relief, admin controls were put in place in October 2007 and station procedure BOP RH-6 was permanently revised in February 2008 to ensure the relief piping to the RHUT remained covered by water whenever the RHUT was aligned to the relief header.
- A detailed evaluation of the RHUT under the conditions of potential steam relief from the Residual Heat Removal (RH) System relief valve was completed in February 2010. The evaluation was documented in calculation CN-CRA-09-29 to verify that the RHUT would be protected with appropriate submergence of the relief header discharge piping.
- A revision of the Exclusion Area Boundary (EAB), Low Population Zone (LPZ) and Main Control Room (MCR) dose calculation for a postulated RHUT failure was completed in September 2011 and documented in calculation BYR10-007.
- The UFSAR has been updated related to the calculations referenced in the preceding 2 bullets and to correctly document the input sources to the RHUT via UFSAR change package 15-040.
- Modifications were installed in April 2015 per Engineering Change packages 396338 (Unit 1) and 396339 (Unit 2) revisions 0 through 1 installing drains for 6 piping low points which can accumulate water to address postulated water hammer effects of RH System relief valve lift.
- Hydraulic transient analysis BYR11-006 was revised in April 2015 to determine the final loads to be used in piping analyses for resolving the hydraulic transient from the Unit 1 and Unit 2 residual heat removal systems' suction relief valves that discharge to the recycle holdup tanks. This analysis used inputs from analysis FAI/14-0738 which was approved in March 2015 after undergoing refinements to provide realistic relief valve transient time history flow.

## Attachment 1

- With the completion of the hydraulic analysis refinement, numerous piping and structural analyses have been revised in 2015 to incorporate dynamic loads on inlet piping from the Unit 1 and Unit 2 residual heat removal systems' suction relief valves that discharge to the recycle holdup tanks under Engineering Change packages 396338 (Unit 1) and 396339 (Unit 2) revisions 2 through 5.
- Modifications were installed in August and September 2015 per Engineering Change packages 396338 (Unit 1) and 396339 (Unit 2) revisions 2 through 4, including modifying or installing 21 piping support/structure changes addressing load changes resulting from revised piping analyses which incorporated the hydraulic transient from the Unit 1 and Unit 2 residual heat removal systems' suction relief valves that discharge to the recycle holdup tanks.

Beginning the 3<sup>rd</sup> quarter of 2014, this design issue has been receiving elevated Senior Management oversight and support both within Exelon and the Engineer of Choice (EOC). This elevated oversight has included monthly updates to the Plant Health Committee on status and weekly project engineering meetings on progress and projected resolution since December 2014. Significant effort and resources have been applied to fully resolve this issue and significant progress was made, as noted above, since elevated management oversight and support was initiated.

### 3) Corrective steps that will be taken

No further corrective action steps are being taken as the issues have been resolved to restore compliance.

### 4) Date when full compliance will be achieved

Full compliance was achieved on October 14, 2015 with the approval of Engineering Change packages issuing final analyses and closure of the remaining Corrective Action tracking final resolution of the issue, including installation of necessary modifications, evaluating the effect of dynamic loads on piping from the Unit 1 and Unit 2 residual heat removal systems' suction relief valves that discharge to the recycle holdup tanks.