



Order No. EA-12-049

RS-14-242

August 29, 2014

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

Byron Station, Unit 2  
Facility Operating License No. NPF-66  
NRC Docket No. STN 50-455

Subject: Request for Schedule Relief/Relaxation from NRC Order EA-12-049, "Order Modifying Licenses With Regard To Requirements For Mitigation Strategies For Beyond-Design-Basis External Events"

References:

1. NRC Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012
2. Exelon Generation Company, LLC letter to USNRC, "Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order EA-12-049)," dated February 28, 2013 (RS-13-018)
3. Westinghouse Nuclear Safety Advisory Letter NSAL 14-1, "Impact of Reactor Coolant Pump No. 1 Seal Leakoff Piping on Reactor Coolant Pump Seal Leakage During a Loss of All Seal Cooling," dated February 10, 2014

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-049 (Reference 1) to Exelon Generation Company, LLC (EGC). NRC Order EA-12-049 was immediately effective and directed EGC to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment cooling, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. This letter transmits a request for relaxation from the requirements of NRC Order EA-12-049 for Byron Station, Unit 2.

As described in the Overall Integrated Plan (Reference 2), the Byron Station mitigation strategies are based on generic Westinghouse Reactor Coolant Pump (RCP) Seal leakage rates. In response to Westinghouse Nuclear Safety Advisory Letter (NSAL) 14-1 (Reference 3), Westinghouse has conservatively re-calculated leakage rates applicable to Byron Station and determined that they are not enveloped by the generic leakage values. The Pressurized Water Reactor Owners Group (PWROG) is performing additional evaluations to refine RCP Seal leakage projections, which are part of the technical bases for demonstrating Byron Station compliance with the requirements of NRC Order EA-12-049. The current schedule requirement for Byron Station, Unit 2 implementation of NRC Order EA-12-049 is prior to restart from the

B2R18 refueling outage in October 2014. The requested relaxation would defer full implementation of NRC Order EA-12-049 by one refueling cycle to prior to restart from the B2R19 refueling outage in Spring 2016. The requested relaxation would enable EGC to develop and incorporate an analytical basis for RCP Seal leakage values which can be endorsed by the NRC. EGC is proceeding with completion of other design, equipment procurement, and programmatic changes to support the ability to implement the Byron Station, Unit 2 mitigation strategies.

Section IV of NRC Order EA-12-049 (Reference 1) states that licensees proposing to deviate from requirements contained in NRC Order EA-12-049 may request that the Director, Office of Nuclear Reactor Regulation, relax those requirements.

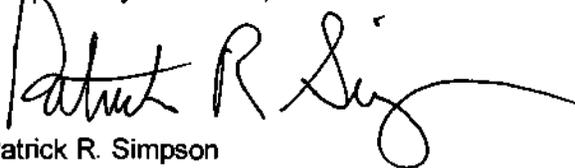
In accordance with Section IV of NRC Order EA-12-049, EGC is requesting that the Director, Office of Nuclear Reactor Regulation, relax the requirement for completion of full implementation as prescribed in Section IV.A.2 of NRC Order EA-12-049 as described in the attachment to this letter.

EGC considers that, upon approval by the NRC, the alternative full implementation date regarding NRC Order EA-12-049 proposed in the attachment will constitute a condition of the NRC Order EA-12-049 for Byron Station, Unit 2. Therefore, there are no new regulatory commitments contained in this letter.

If you have any questions regarding this request, please contact David P. Helker at 610-765-5525.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 29<sup>th</sup> day of August 2014.

Respectfully submitted,



Patrick R. Simpson  
Manager – Licensing  
Exelon Generation Company, LLC

Attachment: Request for Relaxation of NRC Order EA-12-049 Requirement IV.A.2 for Byron Station, Unit 2

cc: Director, Office of Nuclear Reactor Regulation  
NRC Regional Administrator – Region III  
NRC Senior Resident Inspector – Byron Station  
NRC Project Manager, NRR – Byron Station  
Mr. Jeremy Bowen, NRR/JLD/JOMB, NRC  
Mr. John Hughey, NRR/JLD/JOMB, NRC  
Illinois Emergency Management Agency – Division of Nuclear Safety

## ATTACHMENT

### REQUEST FOR RELAXATION OF NRC ORDER EA-12-049 REQUIREMENT IV.A.2 FOR BYRON STATION, UNIT 2

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#### **Relaxation Request:**

Pursuant to the procedure specified in Section IV of Nuclear Regulatory Commission (NRC) Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (Reference 1), Exelon Generation Company, LLC (EGC) hereby submits a request for relaxation (for Byron Station, Unit 2) from the Order requirements for completion of full implementation currently required to be no later than two (2) refueling cycles after submittal of the overall integrated plan, as required in Condition C.1.a of the Order, or December 31, 2016, whichever occurs first.

#### **Order Requirement from Which Relaxation is Requested:**

NRC Order EA-12-049, Section IV.A.2 requires completion of full implementation of the Order requirements to be no later than two (2) refueling cycles after submittal of the overall integrated plan, as required by Condition C.1.a or December 31, 2016, whichever comes first. In accordance with the requirements of the Order, EGC submitted the Byron Station, Units 1 and 2, Mitigation Strategies Overall Integrated Plan (Reference 2) on February 28, 2013. The Byron Station, Units 1 and 2, Mitigation Strategies Overall Integrated Plan milestone schedule identified the completion date for full implementation of NRC Order EA-12-049 as October 2014 for Unit 2, in order to satisfy the requirements of NRC Order EA-12-049.

As described in the Overall Integrated Plan (Reference 2), the Byron Station mitigation strategies are based on generic Westinghouse Reactor Coolant Pump (RCP) Seal leakage rates. Recent evaluations performed by Pressurized Water Reactor Owners Group (PWROG) PA-SEE-1196 (Reference 5), and associated reports PWROG-14008-P (Reference 6), PWROG-14015-P (Reference 7), and PWROG-14027-P (Reference 8) have further documented plant configurations, developed expected RCP Seal Leakoff flow rates, and revised the time expected to enter Reflux Cooling and Core Uncovery stages. Following meetings between the NRC and Westinghouse, the PWROG is undertaking additional evaluation through a revision to PWROG PA-SEE-1196 to refine leakage projections and validate results. EGC is applying conservative interim actions by adding additional margin for initiating RCS inventory make-up, until such a time as the NRC can endorse the revised RCP Seal parameters. Byron Station Unit 2 will be unable to demonstrate compliance to NRC Order EA-12-049 until such time that the NRC endorses the new generic or site-specific RCP Seal leakage analyses. The current schedule requirement for Byron Station, Unit 2 implementation of NRC Order EA-12-049 is prior to restart from the B2R18 refueling outage in October 2014. The requested relaxation would defer full implementation of NRC Order EA-12-049 by one refueling cycle to prior to restart from the B2R19 refueling outage in Spring 2016. The requested relaxation would enable EGC to develop and incorporate an analytical basis for RCP Seal leakage values that has been endorsed by the NRC. EGC is proceeding with completion of other design, equipment procurement, and programmatic changes to support the ability to implement the Byron Station, Unit 2 mitigation strategies.

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### REQUEST FOR RELAXATION OF NRC ORDER EA-12-049 REQUIREMENT IV.A.2 FOR BYRON STATION, UNIT 2

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#### **Justification for Relaxation Request:**

As described in the Byron Station Overall Integrated Plan (Reference 2) for compliance with NRC Order EA-12-049, the mitigation strategies depend on generic Westinghouse evaluations contained in WCAP-17601 (Reference 3) that apply to Westinghouse four loop pressurized water reactor designs. Evaluations performed by the PWROG PA-SEE-1196 (Reference 5) and associated reports PWROG-14008-P (Reference 6), PWROG-14015-P (Reference 7), and PWROG-14027-P (Reference 8) have further documented plant configurations, developed expected RCP Seal Leakoff flow rates, and revised the time expected to enter Reflux Cooling and Core Uncovery stages. Following meetings between the NRC and Westinghouse, the PWROG is undertaking additional evaluation through a revision to PWROG PA-SEE-1196 to refine leakage projections and validate results. EGC is applying conservative interim actions by adding additional margin for initiating RCS inventory make-up, until such time as the NRC can endorse revised RCP Seal parameters.

The revised RCP Seal leakage rates affect the ability of Byron Station, Unit 2 to fully implement the requirements of NRC Order EA-12-049 prior to restart from the B2R18 refueling outage in October 2014. Byron Station, Unit 2 will be unable to demonstrate compliance to NRC Order EA-12-049 until such time that the NRC endorses new generic or site-specific RCP Seal leakage analyses. The requested relaxation would allow for the completion of the engineering analysis, and procedure changes associated with the final NRC endorsed RCP Seal leakage analytical basis.

EGC is concurrently proceeding with the other design changes, equipment procurement, and programmatic changes to implement the Byron Station, Unit 2 mitigation strategies. Other FLEX equipment and modifications required to implement the mitigation strategies required by NRC Order EA-12-049 will be completed and available for use in accordance with the implementation schedule requirements specified in NRC Order EA-12-049. Full compliance with the requirements of NRC Order EA-12-049 requires NRC endorsement of the Byron Station, Unit 2 RCP Seal leakage analysis of record. EGC is planning to complete this analysis prior to the B2R19 refueling outage in Spring 2016. The proposed date for full implementation of NRC Order EA-12-049 remains within the December 31, 2016 date specified in Order Condition IV.A.2.

Accordingly, EGC requests that the NRC Order EA-12-049, Section IV.A.2, full implementation milestone for Byron Station, Unit 2 be relaxed to prior to restart from the B2R19 refueling outage in Spring 2016.

The mitigation strategy requirements imposed by NRC Order EA-12-049 provide additional defense-in-depth measures for mitigating consequences of a beyond-design-basis external event. A sequence of events such as the Fukushima Dai-ichi accident is unlikely to occur in the United States based on current regulatory requirements and existing plant capabilities. Therefore, allowing additional time for development and incorporation of an analytical basis for RCP Seal leakage values endorsed by the NRC is not a significant increase in plant risk. Other design changes, equipment procurement, and programmatic changes to implement the Byron Station, Unit 2 mitigation strategies will be completed and implemented in accordance with the current requirements of NRC Order EA-12-049. These strategies provide enhanced plant

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capability to mitigate beyond-design-basis external events. Therefore, the requested relaxation does not reduce nuclear safety or safe plant operations.

#### **Conclusion:**

As described above, compliance with the NRC Order EA-12-049 schedule required for full completion of implementation of mitigation strategies would result in hardship or unusual difficulty without a compensating increase in the level of safety. The PWROG is undertaking additional evaluation through a revision to PWROG PA-SEE-1196 to refine RCP Seal leakage projections and validate results in order to develop an analytical basis that can be endorsed by the NRC. Accordingly, significant hardship and unusual difficulty exists in meeting the full implementation milestone for Byron Station, Unit 2. Therefore, in accordance with the provisions of Section IV of NRC Order EA-12-049, EGC requests relaxation of the schedule requirement described in Section IV.A.2 of NRC Order EA-12-049 for Byron Station, Unit 2, to allow full implementation of NRC Order EA-12-049 to be completed prior to restart from the Byron Station, Unit 2 B2R19 refueling outage in Spring 2016.

#### **References:**

1. NRC Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012
2. Exelon Generation Company, LLC letter to USNRC, "Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order EA-12-049)," dated February 28, 2013 (RS-13-018)
3. Westinghouse Report WCAP-17601-P, Revision 0, "Reactor Coolant System Response to the Extended Loss of AC Power Event for Westinghouse, Combustion Engineering and Babcock & Wilcox NSSS Designs," dated August 2012
4. Westinghouse Nuclear Safety Advisory Letter NSAL 14-1, "Impact of Reactor Coolant Pump No. 1 Seal Leakoff Piping on Reactor Coolant Pump Seal Leakage During a Loss of All Seal Cooling," dated February 10, 2014
5. PWROG PA-SEE-1196, "No. 1 Seal Flow Rate for Westinghouse Reactor Coolant Pumps following a Loss of All AC Power," April 28, 2014
6. PWROG-14008-P, "No. 1 Seal Flow Rate for Westinghouse Reactor Coolant Following Loss of All AC Power, Task 1: Documentation of Plant Configurations," Revision 0, May 2014
7. PWROG-14015-P, "No. 1 Seal Flow Rate for Westinghouse Reactor Coolant Pumps Following Loss of All AC Power, Task 2: Determine Seal Flow Rates," Revision 0, June 2014

**ATTACHMENT**

**REQUEST FOR RELAXATION OF NRC ORDER EA-12-049 REQUIREMENT IV.A.2  
FOR BYRON STATION, UNIT 2**

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8. PWROG-14027-P, "No. 1 Seal Flow Rate for Westinghouse Reactor Coolant Pumps Following Loss of All AC Power, Task 3: Evaluations of Revised Seal Flow Rate on Time to Enter Reflux Cooling and Time at which the Core Uncovers," Revision 1, August 2014