



RS-17-006

Order No. EA-13-109  
Order No. EA-12-049

January 12, 2017

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

Quad Cities Nuclear Power Station, Units 1 and 2  
Renewed Facility Operating License Nos. DPR-29 and DPR-30  
NRC Docket Nos. 50-254 and 50-265

Subject: Request for Extension to Comply with NRC Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions" and 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 Number EA-13-109, "Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," dated June 6, 2013
2. NRC Order Number 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
3. Exelon Generation Company, LLC Letter to USNRC, Request for Relaxation from NRC Order EA-12-049, "Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated February 27, 2014
4. USNRC Letter to Exelon Generation Company, LLC, Quad Cities Nuclear Power Station, Units 1 and 2 – Relaxation of Certain Schedule Requirements for Order EA-12-049 "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events," dated April 15, 2014
5. Exelon Generation Company, LLC Letter to USNRC, Certification of Permanent Cessation of Power Operations at Quad Cities Nuclear Power Station, Units 1 and 2, dated June 20, 2016
6. Exelon Generation Company, LLC Letter to USNRC, Request for Extension to Comply with NRC Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions" and NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design Basis External Events," dated November 16, 2016
7. Exelon Generation Company, LLC Letter to USNRC, Withdrawal of Certification of Permanent Cessation of Power Operations for Quad Cities Nuclear Power Station, Units 1 and 2 and Previously Submitted Licensing Actions in Support of Decommissioning, dated December 14, 2016 (RS-16-253)

On June 6, 2013, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an Order (Reference 1) to Exelon Generation Company, LLC (EGC). Reference 1 was immediately effective and directs EGC to require their BWRs with Mark I and Mark II containments to take certain actions to ensure that these facilities have a hardened containment vent system (HCVS) to remove decay heat from the containment, and maintain control of containment pressure within acceptable limits following events that result in loss of active containment heat removal capability while maintaining the capability to operate under severe accident (SA) conditions resulting from an Extended Loss of AC Power (ELAP). Specific requirements are outlined in Attachment 2 of Reference 1. The Order includes two separate implementation phases. Phase 1 includes modifications to wetwell venting systems, while Phase 2 includes modifications to drywell venting systems or implementation of a reliable containment strategy that meets regulatory approval.

On March 12, 2012, the NRC issued an Order (Reference 2) to EGC. Reference 2 was immediately effective and directs EGC to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. In Reference 3, EGC requested schedule relaxation of the requirements of NRC Order EA-12-049 for Quad Cities Nuclear Power Station, Units 1 and 2 as a result of the revised NRC Order EA-13-109 containment venting capability schedule and implementation timeline requirements, since mitigation strategies implemented in accordance with NRC Order EA-12-049 are dependent upon implementation of the reliable hardened containment venting capability established in accordance with Phase 1 of NRC Order EA-13-109. In Reference 4, the NRC granted the requested schedule relaxation from the requirements of NRC Order EA-12-049 until completion of the Spring 2017 refueling outage for Quad Cities, Unit 1, and the completion of the Spring 2018 refueling outage for Quad Cities, Unit 2 to allow sufficient time to implement a severe accident capable hardened containment wetwell vent at each respective Unit. Thus, final full compliance with NRC Order EA-12-049 is tied to the final compliance date for Phase 1 of NRC Order EA-13-109 for Quad Cities Nuclear Power Station, Units 1 and 2. Quad Cities Nuclear Power Station, Units 1 and 2 have since completed implementation of the mitigation strategies capabilities in accordance with NRC Order EA-12-049 that are not impacted by the delay in the implementation of the containment vent capability.

On June 20, 2016, EGC notified the NRC that it had decided to permanently cease power operations at the Quad Cities Nuclear Power Station, Units 1 and 2 by June 1, 2018 (Reference 5). In Reference 6, EGC requested schedule relaxation of the requirements of NRC Orders EA-13-109 and EA-12-049 for Quad Cities Nuclear Power Station, Units 1 and 2 based on the planned cessation of operations.

In Reference 7, EGC notified the NRC that as a result of approved Illinois legislative action supporting the continued operation of Quad Cities Nuclear Power Station, Units 1 and 2, EGC has reversed the permanent cessation of operation decision and, therefore, both units will continue operation beyond June 1, 2018.

EGC has resumed work to complete full implementation of the NRC Orders EA-13-109 and EA-12-049 at Quad Cities Nuclear Power Station, Units 1 and 2. However, additional time is needed to complete implementation of the remaining engineering and design activities, plant modifications, and procedural and training activities required to fully implement the requirements of NRC Order EA-13-109 and NRC Order EA-12-049 for Quad Cities Nuclear Power Station, Units 1 and 2.

NRC Order EA-13-109, Section IV.B requires licensees to complete implementation of Phase 1 (severe accident capable wetwell venting system) no later than startup from the second refueling outage that begins after June 30, 2014, or June 30, 2018, whichever occurs first. NRC Order EA-13-109, Section IV.B also requires licensees to complete implementation of Phase 2 (severe accident capable drywell venting system) no later than startup from the first refueling outage that begins after June 30, 2017, or June 30, 2019, whichever occurs first.

Thus, NRC Order EA-13-109, Section IV requires that Quad Cities Nuclear Power Station, Unit 1 shall complete implementation of Phase 1 of the Order no later than startup from the Q1R24 refueling outage (Spring 2017), and completion of implementation of Phase 2 of the Order no later than startup from the Q1R25 refuel outage (Spring 2019). NRC Order EA-13-109, Section IV requires that Quad Cities Nuclear Power Station, Unit 2 shall complete implementation of Phases 1 and 2 of the Order no later than startup from the Q2R24 refueling outage (Spring 2018).

In accordance with Section IV of NRC Order EA-13-109, EGC is hereby requesting that the Director, Office of Nuclear Reactor Regulation, grant an extension to comply with the requirements in Section IV of NRC Order EA-13-109 concerning implementation of the Phase 1 (wetwell vent) at Quad Cities Nuclear Power Station, Units 1 and 2, and NRC Order EA-12-049 at Quad Cities Nuclear Power Station, Units 1 and 2, until June 30, 2018. Additionally, EGC is requesting an extension to comply with the requirements in Section IV of NRC Order EA-13-109 concerning implementation of the Phase 2 (drywell vent) at Quad Cities Nuclear Power Station, Unit 2 until June 30, 2018. No request for extension to comply with Phase 2 of Order EA-13-109 for Quad Cities Nuclear Power Station, Unit 1 is needed at this time. The enclosure to this letter provides the basis and justification supporting the request for extension to comply with the requirements of NRC Orders EA-13-109 Phase 1 and EA-12-049 for Quad Cities Nuclear Power Station, Unit 1; and for extension to comply with the requirements of NRC Orders EA-13-109 Phases 1 and 2, and EA-12-049 for Quad Cities Nuclear Power Station, Unit 2. The requested schedule extension to June 30, 2018 does not extend compliance beyond the latest compliance dates specified in NRC Order EA-13-109 for Phase 1 (June 30, 2018) or Phase 2 (June 30, 2019).

This request for extension to comply with NRC Order EA-12-049 for Quad Cities Nuclear Power Station, Units 1 and 2 is in addition to the previous schedule relaxation granted by the NRC in Reference 4, and provides an additional schedule relaxation to June 30, 2018 for Quad Cities Nuclear Power Station, Units 1 and 2.

This request for extension to comply supersedes the previous request for extension to comply provided in Reference 6. Therefore, EGC requests that the requested extension to comply provided in Reference 6 be withdrawn.

This letter contains no new regulatory commitments. If you have any questions regarding this submittal, please contact David J. Distel at 610-765-5517.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 12<sup>th</sup> day of January 2017.

Respectfully submitted,



Patrick R. Simpson  
Manager – Licensing

Enclosure: Request for Extension to Comply with NRC Order EA-13-109, Section IV Requirements Regarding Implementation of Phase 1 Severe Accident Capable Vents and NRC Order EA-12-049, Section IV Requirements Regarding Mitigation Strategies for Beyond-Design-Basis External Events for Quad Cities Nuclear Power Station, Units 1 and 2, and with NRC Order EA-13-109, Section IV Requirements Regarding Implementation of Phase 2 Severe Accident Capable Vents for Quad Cities Nuclear Power Station, Unit 2

cc: Director, Office of Nuclear Reactor Regulation  
Director, Japan Lessons-Learned Division, NRR  
NRC Regional Administrator - Region III  
NRC Senior Resident Inspector - Quad Cities Nuclear Power Station  
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## **Enclosure**

### **Quad Cities Nuclear Power Station, Units 1 and 2**

**Request for Extension to Comply with NRC Order EA-13-109, Section IV Requirements Regarding Implementation of Phase 1 Severe Accident Capable Vents and NRC Order EA-12-049, Section IV Requirements Regarding Mitigation Strategies for Beyond-Design-Basis External Events for Quad Cities Nuclear Power Station, Units 1 and 2, and with NRC Order EA-13-109, Section IV Requirements Regarding Implementation of Phase 2 Severe Accident Capable Vents for Quad Cities Nuclear Power Station, Unit 2**

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**Request for Extension to Comply with NRC Order EA-13-109, Section IV Requirements Regarding Implementation of Phase 1 Severe Accident Capable Vents and NRC Order EA-12-049, Section IV Requirements Regarding Mitigation Strategies for Beyond-Design-Basis External Events for Quad Cities Nuclear Power Station, Units 1 and 2, and with NRC Order EA-13-109, Section IV Requirements Regarding Implementation of Phase 2 Severe Accident Capable Vents for Quad Cities Nuclear Power Station, Unit 2**

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**I. Request for Extension**

Pursuant to Nuclear Regulatory Commission (NRC) Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions" (Reference 1), and NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (Reference 2), Exelon Generation Company, LLC (EGC) hereby submits a request for extension to comply with the requirements in Section IV of NRC Order EA-13-109 concerning implementation of the Phase 1 (wetwell vent) at Quad Cities Nuclear Power Station, Units 1 and 2, and NRC Order EA-12-049 at Quad Cities Nuclear Power Station, Units 1 and 2, until June 30, 2018. Additionally, EGC is requesting an extension to comply with the requirements in Section IV of NRC Order EA-13-109 concerning implementation of the Phase 2 (drywell vent) at Quad Cities Nuclear Power Station, Unit 2 until June 30, 2018.

**II. Order Requirement from Which Extension is Requested**

NRC Order EA-13-109, Section IV.B requires licensees to complete implementation of Phase 1 (severe accident capable wetwell venting system) no later than startup from the second refueling outage that begins after June 30, 2014, or June 30, 2018, whichever occurs first. NRC Order EA-13-109, Section IV.B also requires licensees to complete implementation of Phase 2 (severe accident capable drywell venting system) no later than startup from the first refueling outage that begins after June 30, 2017, or June 30, 2019, whichever occurs first.

Based on the timelines specified in NRC Order EA-13-109, EGC is required to complete implementation of Phase 1 of the Order no later than startup from the Q1R24 refueling outage (Spring 2017), and completion of implementation of Phase 2 of the Order no later than startup from the Q1R25 refuel outage (Spring 2019) for Quad Cities Nuclear Power Station, Unit 1; and complete implementation of Phases 1 and 2 of the Order no later than startup from the Q2R24 refueling outage (Spring 2018) for Quad Cities Nuclear Power Station, Unit 2.

On June 20, 2016, EGC notified the NRC that it had decided to permanently cease power operations at the Quad Cities Nuclear Power Station, Units 1 and 2 by June 1, 2018 (Reference 3). As a result of the planned permanent cessation of operation at Quad Cities Nuclear Power Station, Units 1 and 2, EGC submitted a request for an extension to comply with the Order based on the planned permanent shutdown date (Reference 4), and engineering design and plant modification activities supporting Order implementation were discontinued.

Based on the recent decision to continue operations at Quad Cities Nuclear Power Station, Units 1 and 2 resulting from the recently approved Illinois legislative action supporting the continued operation, EGC has reversed the permanent cessation of operation decision and, therefore, both units will continue to operate beyond June 1, 2018 (Reference 5).

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EGC has resumed work to complete full implementation of the NRC Orders EA-13-109 and EA-12-049 at Quad Cities Nuclear Power Station, Units 1 and 2. However, additional time is needed to complete implementation of the remaining engineering and design activities, plant modifications, and procedural and training activities required to fully implement the requirements of NRC Order EA-13-109 Phase 1 and NRC Order EA-12-049 for Quad Cities Nuclear Power Station, Units 1 and 2, and the requirements of NRC Order EA-13-109 Phase 2 for Quad Cities Nuclear Power Station, Unit 2.

In Reference 6, the NRC previously approved relaxation of the requirement for full implementation of NRC Order EA-12-049 until the completion of the Spring 2017 and Spring 2018 refueling outages for Quad Cities Nuclear Power Station, Units 1 and 2, respectively, to allow sufficient time to implement a severe accident capable hardened containment wetwell vent (Phase 1). Accordingly, the requested extension for compliance with Order EA-13-109 Phase 1 requirements to June 30, 2018 for Quad Cities Nuclear Power Station, Units 1 and 2 necessitates an extension to the final FLEX Order EA-12-049 compliance date for Quad Cities Nuclear Power Station, Units 1 and 2 to June 30, 2018. The requested extension for final FLEX Order EA-12-049 compliance is consistent with the above justification supporting the requested extension to Order EA-13-109 Phase 1 compliance and the FLEX Order EA-12-049 compliance extension previously granted by the NRC in Reference 6.

### **III. Justification for Extension Request**

In accordance with the requirements of Section IV of NRC Order EA-13-109, EGC is required to implement Phase 1 (severe accident capable wetwell venting system) at Quad Cities Nuclear Power Station, Unit 1 by startup from the Q1R24 Refueling Outage (Spring 2017), and completion of implementation of Phase 2 of the Order no later than startup from the Q1R25 refuel outage (Spring 2019). NRC Order EA-13-109, Section IV requires that Quad Cities Nuclear Power Station, Unit 2 shall complete implementation of Phases 1 and 2 of the Order no later than startup from the Q2R24 refueling outage (Spring 2018). These requirements are intended to provide a reliable Hardened Containment Vent System (HCVS) to prevent or limit core damage upon loss of heat removal capability during beyond-design-basis severe accident conditions until other means of heat removal are available, such as the Residual Heat Removal and Shutdown Cooling systems.

EGC has developed project plans to finalize the engineering and design activities supporting plant modifications required to achieve compliance with Phases 1 and 2 of the Order. Based on the current status of these project activities, the project completion schedules identified that completing all Phase 1 modifications prior to startup from the Q1R24 refueling outage (April 2017) for Quad Cities Nuclear Power Station, Unit 1, and completing all Phase 1 and 2 modifications prior to startup from the Q2R24 refueling outage (April 2018) for Quad Cities Nuclear Power Station, Unit 2, is not achievable.

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The requested relaxation to the Phase 1 compliance date for Quad Cities Nuclear Power Station, Unit 1, and to the Phases 1 and 2 compliance date for Quad Cities Nuclear Power Station, Unit 2, to no later than June 30, 2018 has been determined to be adequate to complete all required project activities needed to fully implement the requirements of the Order. The requested relaxation would enable EGC to complete the ongoing engineering and design activities, complete all plant modifications, complete operator training activities, and implement applicable plant procedures.

During the requested period of extension to comply with Phase 1 of the Order, the existing Quad Cities Nuclear Power Station, Units 1 and 2 containment vent systems used to address NRC Generic Letter (GL) 89-16, along with implementation of the existing FLEX strategies in accordance with NRC Order EA-12-049 at each unit, will continue to provide defense-in-depth measures and enhanced plant capability to mitigate the consequences of a beyond-design-basis external event and to prevent severe accident conditions in accordance with existing Emergency Operating Procedures.

Interim Vent Capability and Seismic Design

The existing HCVS at each unit is designed to meet NRC GL 89-16 requirements. Operation of the vent system at each unit without AC power is included in plant procedure QCOP 1600-13, Post-Accident Venting of the Primary Containment, Attachments C and D, as a result of B.5.b evaluations. Operation without AC power (ELAP conditions) is accomplished with two Equipment Operators using portable nitrogen bottles and a specially-designed rig to locally operate the required flow path AOVs. The flow path is from Suppression Pool through 18" line 1(2)1603 past seismically designed isolation valves 1(2)-1601-60, and 1(2)-1601-24, then through the non-seismic flow path consisting of a reducing line sized to 8", and then cycling flow through valve 1(2)-1699-6 to the Main Chimney. The seismic capability of the existing HCVS at each unit for piping and valves from the suppression pool is through seismically designed isolation valves 1(2)-1601-60, and 1(2)-1601-24, then via the non-seismic discharge piping and ductwork to the Main Chimney. The first two valves are located in the Reactor Building, and for the HCVS Order EA-13-109 beyond-design-basis external event (BDBEE) scenario, could be opened within the first hour post-event to avoid radiological exposure to the Equipment Operators. Valve 1(2)-1699-6 is remotely operated from the MCR, is located in the turbine building, and remains accessible for local operation with portable nitrogen bottles. Based on the above, the existing HCVS provides enhanced containment venting capability during a potential ELAP condition.

Combustible Gas Control

The Quad Cities Nuclear Power Station, Units 1 and 2, GL 89-16 hardened vent was designed to meet the intent of GL 89-16 criterion (h), which requires that "The hardened vent design shall ensure that no ignition sources are present in the pipeway". The GL 89-16 hardened vent design recognizes the uncertainty as to whether a combustible mixture could develop and the



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prevention potential of steam and nitrogen to suppress a hydrogen deflagration. The flow path bypasses the SGTS, routes directly to the Turbine Building wall, and is seismically qualified to the first anchor downstream of the combined isolation valve (EPN 1(2)-1601-6) in the Turbine Building. The routing of the line is not in the vicinity of any safety related (SR) equipment. Due to these factors, deflagration is unlikely and would not affect safety related equipment.

A walkdown was conducted by site personnel to address valve accessibility. Additionally, the existing hardened vent system (as designed to address GL 89-16) will continue to provide containment venting capability using existing emergency operating procedures to support the existing FLEX mitigating strategies during the duration of the requested schedule extension relief to June 30, 2018.

#### Containment Integrity

Currently, Quad Cities Nuclear Power Station, Units 1 and 2 containment integrity can be maintained using the normal installed design features of the containment such as the containment isolation valves and the torus and containment vent system, used to address GL 89-16, qualified vents by use of manual valve actuation where required.

The coping strategy is to vent containment early using the existing torus and containment vent system. As documented in the containment analysis, venting early ensures that containment pressures stay within acceptable limits. Containment remains vented throughout the event.

#### FLEX Strategies

In Reference 6, the NRC approved relaxation of the requirement for full implementation of NRC Order EA-12-049 until the completion of the Spring 2017 refueling outage and the Spring 2018 refueling outage for Quad Cities Nuclear Power Station, Units 1 and 2, respectively, to allow sufficient time to implement a severe accident capable hardened containment wetwell vent. In accordance with Reference 6, Quad Cities Nuclear Power Station, Units 1 and 2, have completed installation of the equipment and modifications required to implement the mitigating strategies required by Order EA-12-049, except for the primary containment venting strategy. FLEX equipment, robust storage facilities, and procedures have been implemented, and required training and validation tasks have been completed for the current mitigating strategies in order to support final compliance with NRC Order EA-12-049. The existing hardened vent system at each unit will continue to provide containment venting capability using emergency operating procedures to support the installed FLEX mitigating strategies during the duration of the requested schedule extension relief to June 30, 2018.

Based on the current implementation of the Quad Cities Nuclear Power Station, Units 1 and 2 installed FLEX strategies and equipment, along with the existing HCVS containment venting capability described above, a significant portion of the desired increase in capability to respond to a BDBEE is realized within the timeframe specified in NRC Order EA-12-049. The requested

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extension for final FLEX compliance (Order EA-12-049) is consistent with the above justification supporting the requested extension to Order EA-13-109 Phase 1 compliance, and the NRC Order EA-12-049 compliance extension previously granted by the NRC in Reference 6.

Hardened Containment Vent System

The Quad Cities Nuclear Power Station, Unit 1 current plans are to implement all outage-required Phase 1 HCVS mechanical and electrical tie-ins and testing during the Q1R24 refueling outage (March 2017 timeframe). The field work required to implement the remainder of the Phase 1 HCVS modifications will be performed online during operating cycle CY25, with a completion target no later than June 30, 2018.

The Quad Cities Nuclear Power Station, Unit 2 current plans are to implement all outage-required Phases 1 and 2 HCVS mechanical and electrical tie-ins and testing during the Q2R24 refueling outage (March 2018 timeframe). The field work required to implement the remainder of the Phases 1 and 2 HCVS modifications will be performed online during operating cycle CY25, with a completion target no later than June 30, 2018.

EGC has evaluated the risk, training and complex modifications required to meet the Phase 1 and Phase 2 venting capability requirements specified in NRC Order EA-13-109 for Quad Cities Nuclear Power Station, Units 1 and 2 and concluded that an extension to compliance with these Order requirements to June 30, 2018 is reasonable based on the resequencing of the installation, established training process and cycle, and allowing for risk recovery associated with the common tower installation. The revised schedule and associated resequencing will require Unit 1 Phase 1 installation work to be reversed (from original) with the outage tie-ins now being completed first (Q1R24), and the remaining work to be completed and tested while on-line during Unit 1 operating cycle CY25. The Unit 2 outage installation work will remain as originally scheduled, but with a needed schedule extension to allow for uncertainties in mobilizing specialized equipment, crane mobilization, and HCVS final testing and operational acceptance. The revised milestone task schedules will be reflected in the subsequent 6-month HCVS OIP updates.

EGC's evaluation of the revised HCVS completion schedule considered the impacts on the remaining work pertaining to design completion, installation, simulator upgrades, operator training, final testing, operational acceptance, and associated risks required to meet the compliance requirements of NRC Order EA-13-109 Phase 1 and NRC Order EA-12-049 for Quad Cities Nuclear Power Station, Units 1 and 2, and the compliance requirements of NRC Order EA-13-109 Phase 2 for Quad Cities Nuclear Power Station, Unit 2. The following considerations are limiting factors that establish the requested compliance date of June 30, 2018.

- Simulator upgrades and the current 2016/2017 licensed operator training cycle annual window were missed; since on December 7, 2016, the decision to reverse the early

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decommissioning plan had just been made, so these training activities were unable to be completed in the 2016 training cycle. The next opportunity to complete the simulator upgrades and operator training is the 2017/2018 licensed operator training cycle window for Units 1 and 2. These milestone task schedules and status will be reflected in the next 6-month OIP update.

- Due to the stoppage of HCVS work in June 2016 resulting from the planned permanent shutdown, the Unit 1 installation schedule requires re-sequencing (reversed) since now the outage tie-ins (upcoming in Q1R24 Spring 2017)) must be completed before the remaining work can be completed and tested while on-line during Unit 1 operating cycle CY25. The next Unit 1 refuel outage is Q1R25 (Spring 2019). The Unit 2 outage installation will remain as originally scheduled in Q2R24 (Spring 2018); however, with final operational acceptance completed by June 30, 2018. This represents a compliance extension of approximately two months. These milestone task schedules and status will be reflected in the next 6-month OIP update.
- In order to complete HCVS installation for Units 1 and 2, the common Unit hardened vent piping tower will be required to be installed on the side of the Reactor Building. Due to the stoppage of HCVS work in June 2016 resulting from the planned permanent shutdown, EGC cancelled the agreements for the specialized equipment and labor needed to install the vent tower. This specialized equipment and labor is now required to be re-secured. This tower installation presents scheduling uncertainties due to the crane re-mobilization needed for the tower assembly lift, the associated crane schedule availability, contracting issues, crane long lead-time, the requirement for favorable weather conditions during lift, logistical/installation uncertainties, and recovering from the interim loss of required equipment and available labor to complete the installation activities. EGC intends to utilize a two (2) month post Unit 2 refuel outage period in 2018 (period ending June 30, 2018), as the final window/contingency period for acceptable Phase 1 HCVS installation for both Units 1 and 2 (since the tower is common). This same two (2) month post Unit 2 outage period will be utilized in parallel for Unit 2 Phase 2 final testing/procedure validation and operations acceptance, and to align with Unit 1 Phase 1 completion activities. These milestone task schedules and status will be reflected in the next 6-month OIP update.

In conclusion, the need for an extension to compliance with the requirements of NRC Order EA-13-109 Phase 1 and NRC Order EA-12-049 for Quad Cities Nuclear Power Station, Units 1 and 2, and an extension to compliance with the requirements of NRC Order EA-13-109 Phase 2 for Quad Cities Nuclear Power Station, Unit 2, to June 30, 2018 is reasonable based on the required rescheduling impacts to recover from the decommissioning reversal decision in a timely manner.

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The current implementation of the Quad Cities Nuclear Power Station, Units 1 and 2 FLEX strategies and equipment, along with the existing HCVS containment venting capability at each unit, ensures that a portion of the desired increase in capability to respond to a BDBEE is realized within the timeframe specified in NRC Order EA-12-049. The requested extension for Quad Cities Nuclear Power Station, Units 1 and 2 final FLEX Order EA-12-049 compliance is consistent with the above justification supporting the requested extension to Order EA-13-109 Phase 1 compliance, and the prior FLEX Order EA-12-049 compliance extension granted in Reference 6 for Quad Cities Nuclear Power Station, Units 1 and 2.

The existing plant safety features at Quad Cities Nuclear Power Station, Units 1 and 2, along with implementation of FLEX strategies in accordance with NRC Order EA-12-049 with the exception of the Phase 1 vent capability, and the installed capability of the existing HCVS at each unit, will provide additional defense-in-depth measures and enhanced plant capability to mitigate the consequences of a beyond-design-basis external event and to prevent severe accident conditions. Therefore, the need for severe accident containment venting capability at Quad Cities Nuclear Power Station, Units 1 and 2 is extremely unlikely during the period of extended compliance.

Accordingly, EGC requests that the NRC Order EA-13-109, Section IV.B, Phase 1 implementation requirement date for Quad Cities Nuclear Power Station, Units 1 and 2, and NRC Order EA-12-049 for Quad Cities Nuclear Power Station, Units 1 and 2 be relaxed to allow completion no later than June 30, 2018. Additionally, EGC requests that the NRC Order EA-13-109, Section IV.B, Phase 2 implementation requirement date for Quad Cities Nuclear Power Station, Unit 2 be relaxed to allow completion no later than June 30, 2018.

A sequence of events such as those that occurred at the Fukushima Dai-ichi accident is unlikely to occur in the United States based on current regulatory requirements and existing plant capabilities, and the limited duration of the requested extension to comply with Phase 1 of NRC Order EA-13-109 and NRC Order EA-12-049 at Quad Cities Nuclear Power Station, Units 1 and 2, and with Phase 2 of NRC Order EA-13-109 for Quad Cities Nuclear Power Station, Unit 2. Therefore, the requested extension to the compliance requirements of NRC Orders EA-13-109 and EA-12-049 for Quad Cities Nuclear Power Station, Units 1 and 2 does not pose a significant increase in plant risk and does not reduce nuclear safety or safe plant operations.

#### **IV. Conclusion**

As a result of the recent decision to continue operations for Quad Cities Nuclear Power Station, Units 1 and 2, EGC will no longer permanently cease operation on June 1, 2018. Quad Cities Nuclear Power Station, Units 1 and 2 will conduct a refueling outage in March 2017 and March 2018, respectively, and continue to operate. This change in operational status for Quad Cities Nuclear Power Station, Units 1 and 2 was unforeseen. As described above, compliance with the NRC Order EA-13-109 schedule for implementation of Phase 1 requirements at Quad Cities Nuclear Power Station, Units 1 and 2, and Phase 2 requirements at Quad Cities Nuclear Power

**Request for Extension to Comply with NRC Order EA-13-109, Section IV Requirements Regarding Implementation of Phase 1 Severe Accident Capable Vents and NRC Order EA-12-049, Section IV Requirements Regarding Mitigation Strategies for Beyond-Design-Basis External Events for Quad Cities Nuclear Power Station, Units 1 and 2, and with NRC Order EA-13-109, Section IV Requirements Regarding Implementation of Phase 2 Severe Accident Capable Vents for Quad Cities Nuclear Power Station, Unit 2**

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Station, Unit 2, would result in hardship or unusual difficulty without a compensating increase in the level of safety. Additional time following startup from the Quad Cities Nuclear Power Station, Units 1 and 2 March 2017 and March 2018 refueling outage, respectively, is required in order to complete the Phase 1 and Phase 2 implementation activities identified above and complete all equipment installation and plant modifications required to achieve compliance with the Order. Accordingly, significant hardship and unusual difficulty exists in completing installation of the equipment and modifications required to implement Phase 1 of the Order at Quad Cities Nuclear Power Station, Units 1 and 2, and Phase 2 of the Order at Quad Cities Nuclear Power Station, Unit 2, in accordance with the original implementation schedule requirements. Therefore, in accordance with the provisions of Section IV of the Order, EGC has shown good cause and requests an extension to comply with the requirements in Section IV of NRC Order EA-13-109 concerning implementation of Phase 1 (wetwell vent), and Section IV of NRC Order EA-12-049, at Quad Cities Nuclear Power Station, Units 1 and 2, and an extension to comply with the requirements in Section IV of NRC Order EA-13-109 concerning implementation of Phase 2 (drywell vent) at Quad Cities Nuclear Power Station, Unit 2, to no later than June 30, 2018.

## **V. References**

1. NRC Order Number EA-13-109, "Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions," dated June 6, 2013
2. NRC Order Number 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
3. Exelon Generation Company, LLC Letter to USNRC, Certification of Permanent Cessation of Power Operations at Quad Cities Nuclear Power Station, Units 1 and 2, dated June 20, 2016
4. Exelon Generation Company, LLC Letter to USNRC, Request for Extension to Comply with NRC Order EA-13-109, "Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions" and NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design Basis External Events," dated November 16, 2016
5. Exelon Generation Company, LLC Letter to USNRC, Withdrawal of Certification of Permanent Cessation of Power Operations for Quad Cities Nuclear Power Station, Units 1 and 2 and Previously Submitted Licensing Actions in Support of Decommissioning, dated December 14, 2016 (RS-16-253)

**Request for Extension to Comply with NRC Order EA-13-109, Section IV Requirements Regarding Implementation of Phase 1 Severe Accident Capable Vents and NRC Order EA-12-049, Section IV Requirements Regarding Mitigation Strategies for Beyond-Design-Basis External Events for Quad Cities Nuclear Power Station, Units 1 and 2, and with NRC Order EA-13-109, Section IV Requirements Regarding Implementation of Phase 2 Severe Accident Capable Vents for Quad Cities Nuclear Power Station, Unit 2**

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6. NRC Letter to Exelon Generation Company, LLC, Quad Cities Nuclear Power Station, Units 1 and 2 – Relaxation of Certain Schedule Requirements for Order EA-12-049 "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External events," dated April 15, 2014