Exelon Generation®

10 CFR 50.54(f)

RS-12-160

November 27, 2012

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Subject: Exelon Generation Company, LLC's 180-day Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding the Flooding Aspects of Recommendation 2.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident

References:

1. NRC Letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 12, 2012
2. NRC Letter, Endorsement of Nuclear Energy Institute (NEI) 12-07, "Guidelines For Performing Verification Walkdowns of Plant Flood Protection Features," dated May 31, 2012
3. Exelon Generation Company, LLC's 90-day Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendations 2.1 and 2.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident (Flooding), dated June 11, 2012

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Reference 1 to all power reactor licensees. Enclosure 4 of Reference 1 contains specific Requested Actions, Requested Information, and Required Responses associated with Recommendation 2.3 for Flooding. On June 11, 2012, Exelon Generation Company, LLC (EGC) submitted the 90-day response requested in Enclosure 4 of Reference 1, confirming that EGC would use the NRC-endorsed flooding walkdown procedure (Reference 3).

For flooding Recommendation 2.3 (walkdowns), Enclosure 4 of Reference 1 states that within 180 days of the NRC's endorsement of the walkdown process (Reference 2), each addressee will submit a final response, including a list of any areas that are unable to be inspected due to inaccessibility and a schedule for when the walkdown will be completed. This letter provides the Braidwood Station, Units 1 and 2 180-day response to Reference 1 for Flooding Recommendation 2.3.

Conditions identified during the walkdowns were documented and entered into the corrective action program.

Enclosure 1 to this letter provides the requested information for Braidwood Station Units 1 and 2.

This letter contains new regulatory commitments, which are identified in Enclosure 2.

Should you have any questions concerning the content of this letter, please contact Ron Gaston at (630) 657-3359.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 27th day of November 2012.

Respectfully,

Glen T. Kaegi
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Enclosures:

1. Flooding Walkdown Report In Response To The 50.54(f) Information Request Regarding Near-Term Task Force Recommendation 2.3: Flooding for the Braidwood Station, Units 1 and 2

2. Summary of Regulatory Commitments

cc: Director, Office of Nuclear Reactor Regulation
Regional Administrator - NRC Region III
NRC Senior Resident Inspector – Braidwood Units 1 and 2
NRC Project Manager, NRR – Braidwood Units 1 and 2
Illinois Emergency Management Agency - Division of Nuclear Safety

Enclosure 1

Flooding Walkdown Report In Response To The 50.54(f) Information Request Regarding Near-Term Task Force Recommendation 2.3: Flooding for the Braidwood Station, Units 1 and 2

(23 pages)

FLOODING WALKDOWN REPORT

IN RESPONSE TO THE 50.54(f) INFORMATION REQUEST REGARDING NEAR-TERM TASK FORCE RECOMMENDATION 2.3: FLOODING

for the
BRAIDWOOD NUCLEAR POWER STATION
35100 South Route 53 Braceville, IL 60407
Facility Operating License No. NPF-72/NPF-77
NRC Docket No. 50-456/50-457

Exelon Generation Company, LLC
4300 Winfield Road Warrenville, IL 60555

Prepared by:
Sargent & Lundy LLC
55 East Monroe Chicago, IL 60603

100% Report, Rev. 1
November 9, 2012

	Printed Name/Title	Signature	Date
Preparer:	Dean W. Robinson Program Manager, Sargent & Lundy		11-09-12
Reviewer:	Jeffrey Kerruish Manager, Sargent & Lundy		11/09/12
Approver:	Dinesh C. Patel Project Manager, Sargent & Lundy		11/09/12
Lead Responsible Engineer	THOMAS BARTOLINI		11/12/12
Branch Manager:	RAYMOND J. BELAIR / MECHANICAL & STRUCTURAL DESIGN MANAGER		11/12/12
Senior Manager:	Phillip J. Rausch / Sr. Manager Design		11/12/12
Corporate Acceptance:	Joseph V. Bellini/Corporate SME		11/13/12

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1. EXECUTIVE SUMMARY

In response to the Nuclear Regulatory Commission (NRC) Request for Information regarding Near-Term Task Force (NTTF) Recommendation 2.3, a flooding walkdown was conducted at Braidwood Power Station (BWD) to verify that plant features credited in the current licensing bases (CLB) for protection and mitigation from external flood events are available, functional, and properly maintained. The flooding walkdown was conducted between August 13 and August 17, 2012 and on October 16, 2012.

The scope of the flooding walkdown was developed following a detailed review of all relevant licensing documents. Since BWD is situated above the probable maximum flood (PMF) level, the station relies entirely on passive features incorporated in the design to keep water out of the plant, specifically site runoff from a local intense precipitation (LIP) event and groundwater. The flooding walkdown scope consisted of two main parts.

- An outdoor walkdown was conducted to verify that plant modifications implemented since original construction, such as security barrier installation and changes to topography, do not adversely affect plant flooding protection.
- The below-grade structures (i.e., basement walls and basement slabs and penetrations through these walls and floors) in the main power block that are credited in the CLB to keep groundwater and runoff from LIP out of the safety related buildings were inspected.

The methodology and acceptance criteria for the evaluation of flood protection features was developed based on NEI report 12-07 [Rev 0-A] (Reference 2), Guidelines for Performing Verification Walkdowns of Plant Protection Features. The walkdown scope developed included 31 flood protection features. Visual inspections of walls, floors and penetrations through the walls and floors were conducted to verify there are no observable structural deficiencies that may impact the structure's ability to perform its intended flood protection function. Inspections of walls, floors and penetrations confirmed that credited flood barriers are in place and appear to be capable of performing their intended function. Whether conduits from manholes or cable vaults that could provide a path for ground water or rain water to enter safety related buildings were considered relevant to the walkdown scope. Conduits from manholes/cable vaults generally are not routed to safety related buildings at BWD. In a few cases, there are entering conduits that turn up and terminate above grade level such that no path for water is provided. Evidence of groundwater/rainwater leakage through conduits into safety related buildings at BWD was not identified. Conduits at BWD do not provide a path for ground water or rain water to enter safety related buildings.

The Unit 1 auxiliary feedwater tunnel was considered a restricted access area and inspection was deferred until an outage. The next Unit 1 refueling outage is currently scheduled for September 2013.

Performance of the walkdowns provided confirmation that flood protection features are in place, are in good condition and will perform as credited in the current licensing basis. Observations not immediately judged as acceptable were addressed and dispositioned under the CAP program.

A total of 35 Incident Reports (IRs) were entered in the CAP as a result of this effort. These IRs are described in Table 2 in the Conclusion section of this report. The outcome of the CAP dispositions identified no reportable deficiency findings. There are no observations awaiting final disposition in CAP.

2. PURPOSE

a. Background

In response to the nuclear fuel damage at the Fukushima-Dai-ichi power plant due to the March 11, 2011 earthquake and subsequent tsunami, the United States Nuclear Regulatory Commission (NRC) established the Near Term Task Force (NTTF) to conduct a systematic review of NRC processes and regulations, and to make recommendations to the Commission for its policy direction. The NTTF reported a set of recommendations that were intended to clarify and strengthen the regulatory framework for protection against natural phenomena.

On March 12, 2012, the NRC issued an information request pursuant to Title 10 of the Code of Federal Regulations, Section 50.54 (f) (10 CFR 50.54(f) or 50.54(f)) (Reference 3) which included six (6) enclosures:

- [NTTF] Recommendation 2.1: Seismic
- [NTTF] Recommendation 2.1: Flooding
- [NTTF] Recommendation 2.3: Seismic
- [NTTF] Recommendation 2.3: Flooding
- [NTTF] Recommendation 9.3: EP
- Licensees and Holders of Construction Permits

In Enclosure 4 of Reference 3, the NRC requested that licensees 'perform flood protection walkdowns to identify and address plant-specific degraded, nonconforming, or unanalyzed conditions and cliff-edge effects (through the corrective action program) and verify the adequacy of monitoring and maintenance procedures'. (See note below regarding 'cliff-edge effects'.)

Structures, systems, and components (SSCs) important to safety are designed either in accordance with, or meet the intent of, Appendix A to 10 CFR Part 50, General Design Criteria (GDC) 2. GDC 2 states that SSCs important to safety at nuclear power plants must be designed to withstand the effects of natural phenomena, including floods, without loss of capability to perform their intended safety functions. For flooding walkdowns, identifying/addressing plant-specific degraded, nonconforming, or unanalyzed conditions (through the corrective action program) and verifying the adequacy of monitoring and maintenance procedures is associated with flood protection and mitigation features credited in the current design/licensing basis. New flood hazard information will be considered in response to Enclosure 2 of Reference 3.

On behalf of Exelon Generation Company, LLC (Exelon), this report provides the information requested in the March 12, 50.54(f) letter; specifically, the information listed under the 'Requested Information' section of Enclosure 4, paragraph 2 ('a' through 'h'). The 'Requested Information' section of Enclosure 4, paragraph 1 ('a' through 'j'), regarding flooding walkdown procedures, was addressed via Exelon's June 11, 2012, acceptance (Reference 1) of the industry walkdown guidance (Reference 2).

Note Regarding Cliff-Edge Effects

Cliff-edge effects were defined by the NTTF Report (Reference 5), which noted that 'the safety consequences of a flooding event may increase sharply with a small increase in the flooding level'. While the NRC used the same term as the NTTF Report in the March 12 50.54(f) information request (Reference 3), the information the NRC expects utilities to obtain during the Recommendation 2.3: Flooding

Walkdowns is different. To clarify, the NRC is now differentiating between cliff-edge effects (which are dealt with under Enclosure 2 of Reference 3) and a new term, Available Physical Margin (APM). APM information will be collected during the walkdowns, but will not be reported in the response to Enclosure 4 of Reference 3. The collected APM information will be available for use in developing the response to Enclosure 2 of Reference 3.

b. Site Description

Per Updated Final Safety Analysis Report (UFSAR) Section 2.4, Braidwood Station is located about 4 miles southwest of the Kankakee River near the town of Custer Park in a strip-mined region presently characterized by many water-filled trenches and ponds. The plant is sited on a low ridge southwest of the Kankakee River and east of the Mazon River. The Kankakee River joins the Des Plaines River about 10 miles directly north of the site to form the Illinois River at river mile 273. The Mazon River flows into the Illinois River at mile 264. Other streams in the area are Crane, Granary, and Horse Creeks. Except for ponded water in the strip-mined areas around Braidwood and Godley, there are no ponds in the region. (Reference 13)

Per UFSAR Section 2.4, the plant grade elevation is at 600.0 feet (all elevations refer to USGS 1929 datum) while the grade floors of the safety related building are at elevation 601.0 feet. (Reference 13) Floods on the Kankakee River would affect the river screen house, a non-safety related structure not protected from PMF. Should makeup water from the river screen house to the cooling pond be eliminated, the cooling pond can operate under a closed cycle system. The probable maximum flood (PMF) levels along the Kankakee River, Mazon River, and Granary Creek do not affect the site, since the maximum water surface elevations are 561.3, 582, and 576 feet, respectively; a minimum of 18 feet below the plant grade. Cooling water for the plant is supplied by a cooling pond which covers one of the strip-mined areas. The pond has an average depth of approximately 8.21 feet with a surface area of 2475 acres and a storage volume of 22,300 acre-feet at its normal pool elevation of 595 feet. The cooling pond is contained by dikes. (Reference 13)

Per UFSAR Section 2.4, the controlling event for flooding at Braidwood station is the PMF for the cooling pond. This event has been analyzed by applying a probable maximum precipitation (PMP) to the pond's watershed following an antecedent standard project flood (SPF) equivalent to one-half of the PMP. The maximum water surface elevation in the cooling pond resulting from the PMF with antecedent SPF is 598.17 feet. The cooling pond dike elevation is 600.0 feet, except for that area south of the plant where the dike elevation is 602.5 feet. The dike is maintained at a higher elevation in this area to prevent splash-over resulting from possible run-up due to wind wave action to elevation 602.34 feet. (Reference 13)

The site drainage system is designed to follow the natural drainage pattern and to drain the storm water away from the plant area. The areas surrounding the plant buildings are graded to direct the surface runoff towards north, west, and east of the plant area. A local intense precipitation (LIP) event is postulated to occur for a short period of time until the runoff drains from the plant site over the roads and railroads and the drainage system. (Reference 13)

The nearest highways to the site, Illinois State Routes 53 and 129, are adjacent to the northwest boundary of the site. Interstate 55 is less than 2 miles west-northwest of the site (centerline of the reactors), and

State Route 113 is approximately 2 miles north of the site. Access to the plant is via State Route 53. Onsite roads in the immediate plant area vary in elevation from 598.0 feet to 601.0 feet. None of these roads would be affected by the PMF from the rivers or cooling pond. The Illinois Central Gulf Railroad runs parallel to and between State Routes 53 and 129 provides spur track access to the site. (Reference 13)

c. Requested Actions

Per Enclosure 4 of Reference 3, the NRC requests that each licensee confirm use of the industry-developed, NRC-endorsed, flood walkdown procedures or provide a description of plant-specific walkdown procedures. In a letter dated June 11, 2012 (Reference 1), Exelon confirmed that the flooding walkdown procedure (Reference 2), endorsed by the NRC on May 31, 2012, will be used as the basis for the flooding walkdowns.

Other NRC's requested actions include:

(1) Perform flood protection walkdowns using an NRC-endorsed walkdown methodology;

(2) Identify and address plant-specific degraded, nonconforming, or unanalyzed conditions, as well as, cliff-edge effects through the corrective action program, and consider these findings in the Recommendation 2.1 hazard evaluations, as appropriate;

(3) Identify any other actions taken or planned to further enhance the site flood protection;

(4) Verify the adequacy of programs, monitoring and maintenance for protection features; and

(5) Report to the NRC the results of the walkdowns and corrective actions taken or planned.

Per Enclosure 4 of Reference 3 also states, 'If any condition identified during the walkdown activities represents a degraded, nonconforming, or unanalyzed condition (i.e. noncompliance with the current licensing basis) for an SSC, describe actions that were taken or are planned to address the condition using the guidance in Reference 6, including entering the condition in the corrective action program. Reporting requirements pursuant to 10 CFR 50.72 should also be considered.

d. Requested Information

Per Enclosure 4 of Reference 3,

1. The NRC requests that each licensee confirm that it will use the industry-developed, NRC endorsed, flooding walkdown procedures or provide a description of plant-specific walkdown procedures. As indicated previously, Exelon's letter dated June 11, 2012 (Reference 1), confirmed that the flooding walkdown procedure (Reference 2), endorsed by the NRC on May 31, 2012, will be used as the basis for the flooding walkdowns.
2. The NRC requests that each licensee conduct the walkdown and submit a final report which includes the following:
    a. Describe the design basis flood hazard level(s) for all flood-causing mechanisms, including groundwater ingress.
    b. Describe protection and mitigation features that are considered in the licensing basis evaluation to protect against external ingress of water into SSCs important to safety.
    c. Describe any warning systems to detect the presence of water in rooms important to safety.

d. Discuss the effectiveness of flood protection systems and exterior, incorporated, and temporary flood barriers. Discuss how these systems and barriers were evaluated using the acceptance criteria developed as part of Requested Information item 1.h.

e. Present information related to the implementation of the walkdown process (e.g., details of selection of the walkdown team and procedures,) using the documentation template discussed in Requested Information item 1.j, including actions taken in response to the peer review.

f. Results of the walkdown including key findings and identified degraded, nonconforming, or unanalyzed conditions. Include a detailed description of the actions taken or planned to address these conditions using the guidance in Regulatory Issues Summary 2005-20, Revision 1, Revision to NRC Inspection Manual Part 9900 Technical Guidance, "Operability Conditions Adverse to Quality or Safety," including entering the condition in the corrective action program.

g. Document any cliff-edge effects identified and the associated basis. Indicate those that were entered into the corrective action program. Also include a detailed description of the actions taken or planned to address these effects. See note in Section 1a regarding the NRC's change in position on cliff-edge effects.

h. Describe any other planned or newly installed flood protection systems or flood mitigation measures including flood barriers that further enhance the flood protection. Identify results and any subsequent actions taken in response to the peer review.

3. METHODOLOGY

a. Overview of NEI 12-07 (Walkdown Guidance)

In a collaborative effort with NRC staff, NEI developed and issued report 12-07 [Rev 0-A], *Guidelines for Performing Verification Walkdowns of Plant Protection Features*, dated May 2012 (Reference 2). The NRC endorsed NEI 12-07 on May 31, 2012 with amendments. NEI 12-07 was updated to incorporate the amendments and re-issued on June 18, 2012. On June 11, 2012, Exelon issued a letter to the NRC (Reference 1) stating that the endorsed flooding walkdown procedure (Reference 2) will be used as the basis for the flooding walkdowns. NEI 12-07 provides guidance on the following items:

- Definitions
  - Incorporated Barrier/Feature
  - Temporary Barrier/Feature
  - Exterior Barrier/Feature
  - Current Licensing Basis (CLB)
  - Design Bases
  - Inaccessible
  - Restricted Access
  - Deficiency
  - Flood Protection Features
  - Reasonable Simulation
  - Visual Inspection
  - Cliff-Edge Effects
  - Available Physical Margin

  - Variety Of Site Conditions
  - Flood Duration
- Scope
  - Basis for Establishing Walkdown Scope
  - Identify Flood Protection Features (Walkdown List)
- Methodology
  - Develop Walkdown Scope
  - Prepare Walkdown Packages
  - Walkdown Team Selection and Training
  - Perform Pre-Job Briefs
  - Inspection of Flood Protection And Mitigation Features
    - General
    - Incorporated or Exterior Passive Flood Protection Features
    - Incorporated or Exterior Active Flood Protection Features
    - Temporary Passive Flood Protection Features
    - Temporary Active Flood Protection Features
    - Procedure Walk-through and Reasonable Simulation
  - Review of The Maintenance and Monitoring of Flood Protection Features
  - Review of Operating Procedures
  - Documentation of Available Physical Margins
  - Documenting Possible Deficiencies
  - Restricted Access, or Inaccessible
- Acceptance Criteria
- Evaluation and Reporting Results of The Walkdown
- Related Information Sources
- Examples
- Walkdown Record Form
- Sample Training Content
- Walkdown Report

b. Application of NEI 12-07

At Braidwood, the approach to the flooding walkdowns included three phases:

Phase 1 – Preparation, Training, Data Gathering, and Scoping

Exelon developed a fleet-wide program and training course for walkdown team members to provide complete and consistent implementation of NEI 12-07 guidelines. In addition, all walkdown team members completed the applicable NANTeL training and testing. Data gathering began with identification of station-specific licensing commitments and station design basis relative to external flooding events. This included review of the Braidwood UFSAR Sections 2.4 and 3.4 (Reference 13), identification of drawings showing flood protection features and review of station procedures and calculations relative to external flooding events. A walkdown scope was developed to capture station features credited as performing a flood protection function in the current licensing basis. A walkdown list was prepared identifying the specific features to be inspected. For each feature on

the walkdown list, a walkdown package was prepared for use by the walkdown team in performing and documenting the walkdown.

The scope developed for the walkdowns at BWD included the following:

- The floors and exterior watertight walls (up to maximum groundwater water level) of the Auxiliary Building. The Containment Building was not included in the inspection scope because the exterior walls and the floor are credited with leak tightness based on the periodic ILRT testing.
- Whether conduits from manholes or cable vaults could provide a path for ground water or rain water to enter safety related buildings was considered relevant to the walkdown scope. Conduits from manholes/cable vaults generally are not routed to safety related buildings at BWD. In a few cases there are entering conduits that turn up and terminate above grade level such that no path for water is provided. Evidence of groundwater/rainwater leakage through conduits into safety related buildings at BWD has not been identified in the past and was not identified during the walkdowns. Conduits at BWD do not provide a path for ground water or rain water to enter safety related buildings.
- An outdoor walkdown was conducted to verify that plant modifications implemented since original construction, such as security barrier installation and changes to topography, do not adversely affect plant flooding protection.

Phase 2 – Inspections and Reasonable Simulations

Visual inspection of each feature was performed on the walkdowns and the results were documented on the Walkdown Record Forms. The condition of each feature as observed on the walkdowns was compared to the acceptance criteria defined in the Supplemental Walkdown/Inspection Guidance (Reference 19). No reasonable simulations were conducted at BWD since all features are incorporated passive.

Phase 3 – Final Reporting

The Walkdown Record Forms were completed and assembled into a package that included a summary and a cover page to document a management review of the entire package. Completion of the Walkdown Record Forms was performed in accordance with the guidance provided in Section 7 of NEI 12-07. A Flooding Walkdown Report (this report) was prepared to address the items outlined in the "Requested Information" section of the "Recommendation 2.3: Flooding" enclosure from the 10CFR50.54 (f) letter.

c. Reasonable Simulations

Per NEI 12-07 (Reference 2), reasonable simulation includes the following:

- Verify that any credited time dependent activities can be completed in the time required. Time-dependent activities include detection (some signal that the event will occur, has occurred, or is

occurring), recognition (by someone who will notify the plant), communication (to the control room), and action (by plant staff).

- Verify that specified equipment/tools are properly staged and in good working condition.
- Verify that connection/installation points are accessible.
- Verify that the execution of the activity will not be impeded by the event it is intended to mitigate or prevent. For example, movement of equipment across unpaved areas on the site could be impeded by soft soil conditions created by excessive water.
- Review the reliance on the station staff to execute required flood protection features. If during the review several activities are identified to rely on station staff, then perform and document an evaluation of the aggregate effect on the station staff to demonstrate all actions can be completed as required.
- Verify that all resources needed to complete the actions will be available. (Note that staffing assumptions must be consistent with site access assumptions in emergency planning procedures.)
- Show that the execution of the activity will not be impeded by other adverse conditions that could reasonably be expected to simultaneously occur (for example, winds, lightning, and extreme air temperatures).
- Personnel/departments that have responsibility for supporting or implementing the procedure should participate in the simulation effort.
- The simulation should demonstrate that the personnel assigned to the procedure do not have other duties that could keep them from completing their flood protection activities during an actual event. Actions that would be performed in parallel during an event should be simulated in parallel; not checked individually and the results combined.
- Reasonable simulation need not require the actual performance of the necessary activities if they have been previously performed and documented or it is periodically demonstrated and documented that the activities can be completed in the credited time.

The purpose of reasonable simulations is to verify required flood protection procedures or activities can be executed as specified/written. Braidwood flood protection features do not include any temporary or active features that require implementation of a procedure for performance of manual/operator actions in order for the feature to perform its intended flood protection function. Therefore, no procedure walk-through, or 'Reasonable Simulation', was conducted at Braidwood Station.

d. Walkdown Inspection Guidance

A 'Walkdown Inspection Guidance' was developed by Exelon to supplement NEI 12-07 (Reference 2), based largely on Appendix A of NEI 12-07 (Examples). The guidance was intended to supplement, not supersede, NEI 12-07 and provide inspection guidance for specific features, listed below.

- Incorporated or Exterior Passive Features:
    - Site Elevations and Topography
    - Earthen Features (i.e., Flood Protection Berm, Dike, Levee)
    - Concrete and Steel Structures

  - Wall, Ceiling, and Floor Seals (e.g. Penetration Seals, Cork Seals)
  - Passive Flood Barriers or Water Diversion Structures
  - Drains and Catch Basins
  - Plugs and Manhole Covers
  - Drainage Pathways (Swales, Subsurface Drainage System, etc.)
  - Piping and Cable Vaults and Tunnels, Electrical Cable Conduit
  - Floor Hatches
  - Flap Gate/Backwater Valve/Duckbill Valve
  - Flood Wall

- Incorporated or Exterior Active Features:
  - Credited Water Tight Doors
  - Credited Non-Watertight Doors
  - Pumps
  - Water Level Indication
  - Gate Valves

- Temporary Passive Features:
  - Portable Flood Barriers and Inflatable Rubber Seals
  - Flood Gate

- Temporary Active Feature
  - Pumps

4. RESULTS

The information requested in Reference 3, Enclosure 4, under paragraph 2 of the 'Requested Information' section, is provided below. The contents of each item were developed in accordance with Reference 2, Appendix D.

a. Requested Information Item 2(a) – Design Basis Flood Hazards

Describe the design basis flood hazard level(s) for all flood-causing mechanisms, including groundwater ingress.

The Braidwood Station design basis for external flooding is described in BWD UFSAR Sections 2.4 and 3.4 (Reference 13). Braidwood is designed to be protected from the effects of river flooding, cooling pond flooding and a LIP event. In addition, the safety related structures at Braidwood Station are designed to be protected against groundwater ingress. A summary of the Braidwood flooding hazards are provided in the table below:

No.	Hazard Type	Maximum Elevation (feet)	Source
1	Kankakee River Flooding	561.3	UFSAR Section 2.4.3
2	Mazon River Flooding	582	UFSAR Section 2.4.10
3	Granary Creek Flooding	576	UFSAR Section 2.4.10
4	Cooling Pond Flooding	602.34	UFSAR Section 2.4.10
5	Local Intense Precipitation	601.91	Calculation WR-BR-PF-10, Rev 14
6	Groundwater Ingress	600	UFSAR Section 2.4.13.3 and DT-ST-03-BY/BR, Rev. 23, Section 12.2.3.

All safety related equipment is protected from flood by virtue of its location above the highest PMF elevation and by being housed within flood-protected structures. The River Screen House is the only structure that could be affected by flooding from the Kankakee River. However, per UFSAR Section 2.4.2.2, the River Screen House is a non-safety related structure not protected from PMF. Per UFSAR Section 2.4.11.6, should makeup water from the river screen house to the cooling pond be eliminated, the cooling pond can operate under a closed cycle system. (Reference 13).

Per UFSAR Section 2.4.2.3 (Reference 13), the plant grade elevation is at 600.0 feet while the grade floors of the safety related building are at elevation 601.0 feet. The PMF along the Kankakee River, Mazon River, and Granary Creek do not affect the site, since the maximum water surface elevations are 561.3, 582, and 576 feet, respectively; a minimum of 18 feet below the plant grade.

The controlling event for flooding at Braidwood station is the PMF for the cooling pond. This event has been analyzed by applying the PMP to the pond watershed following an antecedent SPF, equivalent to one-half of the PMP. The maximum water surface elevation in the cooling pond resulting from the PMF with antecedent SPF is 598.17 feet (UFSAR Section 2.4.4, Reference 13). The cooling pond dike elevation is 600.0 feet, except for that area south of the plant where the dike elevation is 602.5 feet (UFSAR Section 2.4.8.2, Reference 13). The dike is maintained at a higher elevation in this area to prevent splash-over resulting from possible run-up due to wind wave action to elevation 602.34 feet (UFSAR Section 2.4.8.2, Reference 13).

Braidwood's main power block building is situated at grade elevation 600 feet, above the maximum PMF level. The portion of the building substructures located below the maximum groundwater level are designed to prevent groundwater ingress. The design groundwater elevation at Braidwood is 600 feet (Structural Project Design Criteria Section 12.2.3, Reference 13, 14).

The latest design basis calculation for effect of local probable maximum precipitation at plant site (Calculation WR-BR-PF-10, Rev. 14) lists the maximum flooding elevation in PMP Zone B as 601.91 feet. The resulting design basis LIP peak water elevation at the exterior power block walls is 601.91 feet. in the immediate station area where the safety related facilities are located (east half of the main power block structure). It is noted that the Braidwood walkdowns were conducted on the basis that the maximum LIP elevation for Zone B is 602 feet. A conservative assumption made in the design basis evaluation was that stormwater drainage system, including site ditches, does not function during the LIP (UFSAR Section 2.4.2.3, Reference 13). The areas surrounding the plant are graded to direct surface runoff away from the plant. Also, the equation for peak LIP flow conservatively assumed a runoff

coefficient of 1.0 (zero losses or 100% runoff). The station's safety related building floor is at elevation 601 feet.

Braidwood UFSAR Sections 2.4.4 through 2.4.7 addresses additional flooding mechanisms that are either not critical or not bounding for Braidwood. Probable maximum surge and seiche flooding is not bounding for Braidwood because there is no large body of water near the site where significant storm surges and seiche formations can occur. The station will not be subjected to the effects of tsunami flooding because the physical location of Braidwood Station is not adjacent to a coastal area. Similarly, a dam failure or the effects of ice jam flooding are determined to not affect the safety related facilities.

b. Requested Information Item 2(b) – CLB Protection and Mitigation Features

Describe protection and mitigation features that are considered in the licensing basis evaluation to protect against external ingress of water into SSCs important to safety.

Within the main power block structures, there is safety related equipment located below grade in the Auxiliary, Containment and Lake Screen House buildings. No below grade safety related equipment is located in the Fuel Handling, Turbine or Radwaste buildings. Potential sources of external flooding of the main power block buildings are LIP and groundwater ingress. The design groundwater elevation at Braidwood is 600 feet, which is the site grade elevation (UFSAR Section 2.4.2.3, Reference 13). In safety related buildings, waterstops are provided in all construction joints and water seals are provided for all penetrations (UFSAR Section 2.4.14.2, Reference 13). The design groundwater elevation at Braidwood is 600 feet (Structural Project Design Criteria Section 12.2.3, Reference 14). The maximum design basis LIP water surface elevation is 601.91 feet in the immediate station area where safety related facilities are located (Auxiliary, Containment and Fuel Handling building). Per Calculation WR-BR-PF-10 (Reference 22), local surface drainage systems are conservatively assumed not to function during the LIP event. The areas surrounding the plant are graded to direct surface runoff away from the plant.

All flood protection features at Braidwood that are designed to protect safety related equipment are passive incorporated features, and as such does not involve invoking any procedures. Such features include the walls, floors and ceilings of buildings which house the safety related equipment. Reinforced concrete curbs or steel barriers are provided at the entrance to the Main Steam Isolation Valve (MSIV) Rooms (Reference 16). In addition, two passive flood protection structures are provided, including a concrete slab in Radwaste Tunnel (Reference 23) and a concrete slab in the Fuel Handling Building inside the spent fuel pit pump rooms (Reference 17). No temporary flood protection features or procedures are included in the Braidwood design for protection of safety related equipment

The licensing basis does not explicitly address flood duration or adverse weather conditions concurrent with flooding, presumably because the protection features are all incorporated passive. In addition, Braidwood flood protection features are designed to function during any plant mode of operation.

The Braidwood Lake Screen House forebay houses safety related Essential Service Water (SX) System piping including manual valves 0SX115A/B/C/D/E/F (Reference 18) but contains no safety related electrical components. The piping provides suction to the safety related SX System pumps 1/2SX01PA/PB, which are located in the Auxiliary Building (Reference 18). The manual valves 0SX115A/B/C/D/E/F are normally open and are utilized for periodic inspection and maintenance purposes only. These valves are not required to be manipulated to respond to any plant design basis

accident (including all UFSAR chapter 15 accidents and internal Auxiliary Building flooding). Based on this information, the flood protection features of the Lake Screen House were not inspected.

Duct run drawings 20E-0-3680 and 20E-0-3681 (Reference 20) show there is no direct path from underground electrical manholes into the safety related Auxiliary and Containment Buildings.

c. Requested Information Item 2(c) – Flood Warning Systems

Describe any warning systems to detect the presence of water in rooms important to safety.

Per UFSAR Section 9.2.1.2.4 (Reference 13), leak detection is provided by means of system flow and pressure drop instrumentation and leak detection sumps in the Auxiliary Building basement where the essential service water pumps are installed. The 1A and 2A essential service water pumps are located in one compartment and the 1B and 2B pumps are located in a separate adjacent compartment. Each compartment contains an essential service water sump (Reference 21). Although designed to detect internal flooding, the leak detection sumps will also detect significant groundwater ingress into these rooms.

d. Requested Information Item 2(d) – Flood Protection System/Barrier Effectiveness

Discuss the effectiveness of flood protection systems and exterior, incorporated, and temporary flood barriers. Discuss how these systems and barriers were evaluated using the acceptance criteria developed as part of Requested Information Item 1.h [in Enclosure 4 of the March 12, 2012, 50.54(f) letter]

Section 6 of NEI 12-07 defines 'acceptance' as:

> *"Flood protection features are considered acceptable if no conditions adverse to quality were identified during walkdowns, verification activities, or program reviews as determined by the licensee's Corrective Action Program. Conditions adverse to quality are those that prevent the flood protection feature from performing its credited function during a design basis external flooding event and are 'deficiencies'. Deficiencies must be reported to the NRC in the response to the 50.54(f) letter."*

As indicated in Section 3d, inspection guidance was developed, supplementing NEI 12-07, to provide more specific criteria for judging acceptance. All observations that cannot be immediately judged as acceptable were entered into the site's Corrective Action Program (CAP) where an evaluation of the observation can be made.

Walkdowns were conducted to verify the exterior walls, floors, seals, and ceiling, credited for keeping water out of safety-related areas, are capable of performing their intended function based on visual observations. Flood protection features inspected at Braidwood also included the external hatches that provide access to the refueling water storage tank piping tunnels and the interface between the Radwaste Building and the Auxiliary Building Radwaste tunnel. The purpose of the walkdowns is to verify conformance with the Braidwood current licensing basis. The adequacy of the current licensing basis will be addressed in response to NTTF Recommendation 2.1. An outdoor walkdown was conducted to verify that plant modifications implemented since original construction, such as security barrier installation and changes to topography, do not adversely affect plant flooding protection.

Acceptance criteria for visual inspections performed during the walkdowns were developed to identify conditions adverse to quality and included the following considerations:

- Flood protection configuration is in accordance with design drawings and the station current licensing basis.
- Visual inspection did not identify any material degradation. A detailed listing of acceptance criteria for visual inspections was utilized by the walkdown team during performance of the walkdowns.
- No topography changes, including security barrier installations, were found to adversely affect the site drainage.

Whether conduits from manholes or cable vaults could provide a path for ground water or rain water to enter safety related buildings were considered relevant to the walkdown scope. Conduits from manholes/cable vaults generally are not routed to safety related buildings at BWD. In one location, there are conduits entering the Auxiliary Building from a duct run that turn up and rise embedded in the to wall to well above grade level such that no path for water is provided. Evidence of groundwater/rainwater leakage through conduits into safety related buildings at BWD was not identified. Conduits at BWD do not provide a path for ground water or rain water to enter safety related buildings. (Reference 20)

The flood protection features incorporated into the Braidwood design provide effective barriers for keeping external flooding from reaching safety-related systems and equipment. However, the walkdowns and document reviews resulted in observations that could not immediately be judged as acceptable. These were entered into the corrective action program (CAP) for disposition. All IR's entered in CAP have been dispositioned with no resulting reportable deficiencies identified.

In addition to these walkdowns, the station structural monitoring program (Reference 15) and various preventative maintenance activities provide for ongoing verification of flood barrier effectiveness.

e. Requested Information Item 2(e) – Implementation of Walkdown Process

Present information related to the implementation of the walkdown process (e.g., details of selection of the walkdown team and procedures) using the documentation template discussed in Requested Information Item 1.j [in Enclosure 4 of the March 12, 2012, 50.54(f) letter], including actions taken in response to the peer review.

Station walkdowns were implemented in accordance with the guidelines provided in NEI 12-07 (Reference 2). The Braidwood walkdown team included four Sargent & Lundy employees as well as the Braidwood Lead Responsible Engineer for flooding issues. All team members were familiar with the station licensing basis relative to external flooding, are badged at Braidwood and completed both NANTeL based training and Exelon specific training on implementation of the NEI 12-07 guidelines. The Sargent & Lundy team consisted of three mechanical engineers familiar with Braidwood Station and one civil engineer. At least two Sargent & Lundy team members performed all visual inspections. Walkdown results were documented using the NEI 12-07 recommended form. Walkdown packages, one for each feature, were prepared in advance and included the NEI 12-07 walkdown form with Parts A and B already completed as well as reference drawings and documentation. The remaining parts of the walkdown forms were finalized after the feature walkdown was completed, and the identification of observations entered into CAP. Walkdowns were conducted following the guidance of NEI 12-07 and no exceptions were taken to the guidance.

f. Requested Information Item 2(f) – Findings and Corrective Actions Taken/Planned

Results of the walkdown including key findings and identified degraded, non-conforming, or unanalyzed conditions. Include a detailed description of the actions taken or planned to address these conditions using the guidance in Regulatory Issues Summary 2005-20, Rev 1, Revision to NRC Inspection Manual Part 9900 Technical Guidance, "Operability Conditions Adverse to Quality or Safety," including entering the condition in the corrective action program.

The walkdown scope was developed to confirm that flood protection features credited in the current licensing basis are acceptable and capable of performing their credited flood protection functions. For Braidwood Power Station the scope primarily consisted of visual inspections of floors and exterior watertight walls in the main power block. The scope included visual inspection of all applicable penetrations and associated seals. In addition, an outdoor walkdown was conducted to confirm credited surface drainage provisions have not been impacted by changes to topography, such as installation of new security barriers. Inspections of credited walkdown features were performed by the walkdown team following the guidance provided in NEI 12-07 and were documented in walkdown packages using the NEI 12-07 walkdown forms. Walkdown record forms are not submitted to the NRC, but as discussed in Section 7 of Reference 2 are retained onsite for NRC inspection. Observations of degraded, non-conforming or unanalyzed conditions were documented and entered into the station corrective action program (CAP).

The inspections of walls, floors and penetrations/seals verified that credited flood barriers are in place and appear capable of performing their intended flood protection function. A total of 35 IRs were generated in the process of performing the walkdowns. These are summarized below and are listed, along with the resolution status, in a table in the Conclusions section of this report. All of the IRs were resolved in CAP and resulted in zero reportable deficiencies.

Observations Not Immediately Judged as Acceptable

- IRs 1400281, 1400274, 1400269, 1400261, 1400245, 1400732, 1400730, 1400728, 1400727, 1402930, 1403499, 1404165, 1404065, 1404765 and 1428041 document the evidence of past groundwater intrusion.
- IRs 1400267, 1402279 and 1402752 document current minor groundwater leakage.
- IR 1401170 documents a mound of soil on the north side of the turbine building that partially blocks rain drainage path.
- IRs 1402065 and 1402113 document small pipes inserted into expansion joint that requires repair. No evidence of water intrusion.
- IR 1402151 documents a pipe drain protruding from a RWST tunnel manhole curb. The pipe was determined not to be a potential flood path.
- IR 1402163 and 1402706 documented housekeeping issues identified during the flooding walkdown but unrelated to flood protection.
- IR 1402170 documents water condensation on RWST hatch.
- IR 1402633 documents degraded expansion joint. No evidence of leakage. The sealant is scheduled to be repaired to an acceptable condition.

- IR 1402965 documents a concrete spall in the CS pump room. No active leakage and no structural impact.
- IR 1403453 documents low available physical margin of 0.1 feet from flood elevation to top of concrete barrier in radwaste/service building tunnel. IR 1427443 identifies that the current PMP calculation can be revised so as to recover additional margin.
- IR 1404810 documents that it is unclear if the service building addition project was accounted for in the PMP calc.
- IR 1390831 documents water noted on floor under RWST hatch. Hatch repair is scheduled.
- IR 1427471 documents a puddle found in the aux. feedwater tunnel presumably from groundwater inleakage. Leak rate is slow and not impacting plant equipment. The issue will be investigated to develop repair recommendations if necessary.
- IR 1427832 documented a deficiency tag identifying groundwater inleakage. No work order documenting that this deficiency had been addressed was found. The issue will be investigated to develop repair recommendations if necessary.

Observations Designated through CAP as Deficient

None.

Observations Awaiting Final Disposition in CAP

None.

Restricted Access Areas

IR 1410811 documents deferral of inspection of the Unit 1 aux. feedwater tunnel until the next Unit 1 refueling outage, currently scheduled for September 2013. IR 1410845 documented deferral of the corresponding Unit 2 walkdown, however, this walkdown was subsequently performed during the October 2012 Unit 2 refueling outage.

Inaccessible Areas

None.

g. Requested Information Item 2(g) – Cliff –Edge Effects and Available Physical Margin

Document any cliff-edge effects identified and the associated basis. Indicate those that were entered into the corrective action program. Also include a detailed description of the actions taken or planned to address these effects.

Cliff-edge effects were defined in the NTTF Report (Reference 5) as “the safety consequences of a flooding event may increase sharply with a small increase in the flooding level”. As indicated in Sections 3.12 of NEI 12-07 (Reference 2), the NRC is no longer expecting the Recommendation 2.3: Flooding Walkdowns to include an evaluation of cliff-edge effects. The NRC is now differentiating between cliff-edge effects, which are addressed in Enclosure 2 of Reference 3, and Available Physical Margin (APM).

As indicated in Sections 3.13 of NEI 12-07 (Reference 2), APM describes the flood margin available for applicable flood protection features at a site (not all flood protection features have APMs). The APM for each applicable flood protection feature is the difference between licensing basis flood height and the flood height at which water could affect an SSC important to safety.

APM information was collected during the walkdowns in accordance with guidance provided in NEI 12-07 and the final resolution to FAQ-006. APM was collected to primarily support the response to Enclosure 2 of Reference 3 and, as such, is not included in this report. APM determinations did not involve calculating cliff-edge effects (i.e. the safety consequences). During the Integrated Assessment (see Enclosure 2 of Reference 3), the cliff-edge effects and the associated safety risks will be evaluated using the APMs and other information, such as the specific SSCs that are subjected to flooding and the potential availability of other systems to mitigate the risk.

Since the walkdowns potentially impacting cliff edge effects were completed prior to the final resolution of FAQ-006 (September 13, 2012), APM information was collected and documented on the Walkdown Record Form using the "old approach"; that is, a simple measurement of the difference between the licensing basis flood height and the flood height at which water could affect an SSC important to safety.

h. Requested Information Item 2(h) – Planned/Newly-Installed Flood Protection Enhancements

Describe any other planned or newly installed flood protection systems or flood mitigation measures including flood barriers that further enhance the flood protection. Identify results and any subsequent actions taken in response to the peer review.

No planned or newly-installed flood protection enhancements were determined to be necessary as a result of the flood walkdowns at Braidwood.

5. CONCLUSIONS

Inspections of walls, floors and penetrations confirmed that credited flood barriers appear to be capable of performing their intended function. All IRs entered into the CAP have been addressed and are not reportable deficiencies. Inspection of the Unit 1 auxiliary feedwater tunnel was deferred until an outage when access will be provided.

Table 1 provides a summary of the number and type of features included in the walkdown scope.

Table 2 provides the list of the IRs generated and entered into the station corrective action program (CAP) as a result of the walkdown. The status of each IR at the time of this report is indicated. None of these IRs resulted in an operability concern and none are reportable deficiencies.

Table 1: Features Included in the Walkdown Scope

Type	# of Visual Inspections	# of Simple Simulations	# of Complex Simulations	# of Drills or Exercises
Incorporated/Exterior Passive	31	0	0	0
Incorporated/Exterior Active	0	0	0	0
Temporary Passive	0	0	0	0
Temporary Active	0	0	0	0
Totals	31	0	0	0

Table 2: IRs Generated in CAP

IR Number	Description	Proposed Resolution	Status/Resolution
1400281	Unit 2, "B" SX pump room, evidence of past groundwater intrusion. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1400274	Unit 1, "A" SX pump room, evidence of past groundwater intrusion. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1400269	Unit 2, diesel oil tank room 2A, evidence of past groundwater intrusion. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1400267	Unit 1, main steam tunnel and MSIV rooms 1B and 1C, minor groundwater leakage. Currently monitored by station.	Close to actions taken and trend.	Close to actions taken.
1400261	Unit 1, main steam tunnel and MSIV rooms, evidence of past groundwater intrusion. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1400245	Unit 2, diesel oil tank room 2B, evidence of past groundwater intrusion. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1400732	Unit 2, 364' elevation in Area 7, evidence of past groundwater intrusion. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1400730	Unit 1, 343' and 346' elevation in Area 5, evidence of past groundwater intrusion. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1400728	Unit 2, 343' elevation in Area 7, evidence of past groundwater intrusion. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1400727	Unit 1, 364' elevation in Area 5, evidence of past groundwater intrusion. No active leakage.	Close to actions taken and trend.	Close to actions taken.

Table 2: IRs Generated in CAP			
IR Number	**Description**	**Proposed Resolution**	**Status/Resolution**
1401170	Unit 1, A mound of soil on north side of turbine building partially blocks rain drainage path.	RP to present to PHC for disposition of the soil.	Close to pre-existing ATI 1383021-05.
1402065	Unit 2, A ½" diameter pipe found inserted into expansion joint between outside containment wall and 2A/2D MSIV room. Pipe needs to be removed and sealant repaired. No evidence of water intrusion in MSIV room in this area.	Sponsored work authorization required to initiate repair.	Close to WR 409627. Completed WO 1566821-01 10/23/12 by Luse.
1402113	Unit 2, A ½" diameter pipe found inserted into expansion joint between outside containment wall and 2B/2C MSIV room. Pipe needs to be removed and sealant repaired. No evidence of water intrusion in MSIV room in this area.	Sponsored work authorization required to accelerate repair schedule.	Close to WR 409617. Close to WO 1566822 being performed by Luse during A2R16.
1402151	Units 1&2, A pipe drain was found protruding from curb of RWST tunnel manhole. Determined not to be a PMP flood path.	Need for drain may have been eliminated. Engineering to evaluate.	ER 406310 initiated to evaluate this. Drain line is installed as required by mod E20-1-94-245.
1402163	Unit 2, seismic housekeeping issues identified in mechanical maintenance hot shop in auxiliary building.	Issues have been addressed.	Close to actions taken.
1402170	Unit 2, Water condensation noted on RWST hatch.	Sponsored work authorization required to initiate repair.	Work to be performed during A2R16 under WO 1497725-31.
1402279	Unit 1, Very minor ground water intrusion noted in main steam tunnel. Area should be monitored to determine need to schedule repairs.	Monitor through Structures Monitoring Program. Close to actions taken and trend.	Close to actions taken.
1402633	Unit 2, Vertical interior expansion joint between containment and MSIV 2A/2D is degraded. No evidence of water intrusion in MSIV room in this area.	Initiated WR 409752 to repair.	Close to WR 409752. This WO 1572429 is cancelled to a duplicate WO 01068681-04 / IR 666968 being performed during A2R16.
1402706	Unit 1, carpenter's hammer found in a horizontal support member above VLV leak off drain tank pump.	Hammer has been removed.	Close to actions taken.
1402752	Unit 2, Very minor ground water intrusion noted in main steam tunnel and MSIV rooms. Area is currently monitored to determine need to schedule repairs.	Monitor through structural monitoring program. Close to actions taken and trending.	Close to actions taken.
1402930	Unit 2, evidence of past groundwater intrusion in MSIV tunnel and MSIV rooms. No active leakage at these locations.	Close to actions taken and trend.	Close to actions taken.
1402965	Unit 1, Concrete spall found in wall in containment spray pump room. No active leakage and no structural impact.	Monitor through structural monitoring program. Close to actions taken and trending.	Close to actions taken.

Table 2: IRs Generated in CAP			
IR Number	**Description**	**Proposed Resolution**	**Status/Resolution**
1403453	Radwaste/service building tunnel flood barrier slab has low available physical margin of 0.1' from flood elevation to top of slab.	No actions required at this time.	Close to information provided in the IR.
1403499	Evidence of past groundwater leakage in Radwaste tunnel. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1404165	Unit 1, Evidence of past groundwater leakage on aux. building L line wall. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1404065	Unit 2, Evidence of past groundwater leakage on aux. building L line wall. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1404765	Unit 2, Evidence of past groundwater leakage on aux. building floor in Area 7. No active leakage.	Close to actions taken and trend.	Close to actions taken.
1404810	Unclear if the service building addition project was accounted for the PMP calc.	Verify service building addition project is accounted for the PMP calc. Potential impact of issue determined to not be significant.	Based on conversations with engineering, the identified issue would have no significant impact on previous analysis and conclusions; therefore no previous analysis is challenged. ATI 1404810-02 to determine if PMP event has been appropriately addressed when service building was installed.
1410811	Unit 1, walkdown of aux. feedwater tunnel deferred to next refueling outage due to difficulty of access.	Walkdown of Unit 1 aux. feedwater tunnel deferred to next refueling outage (A1R17).	Walkdown deferred to outage.
1410845	Unit 2, walkdown of aux. feedwater tunnel deferred to next refueling outage due to difficulty of access.	Walkdown of Unit 2 aux. feedwater tunnel deferred to next refueling outage (A2R16).	Walkdown deferred to outage. This walkdown has been completed 10/16/12.
1390831	Unit 1, water noted on floor under RWST hatch in RWST tunnel.	Scheduled hatch repair should eliminate any hatch leakage.	Actioned to WR 00407567. Identified during seismic walkdown. WO 1566429 working 10/25/12 – 10/26/12 A2R16.
1428041	Unit 2, Evidence of past groundwater leakage in the aux feed tunnel.	Close to actions taken and trend.	Close to actions taken.
1427471	Unit 2, Puddle found at bottom of ladder in the aux feed tunnel – apparently groundwater inleakage.	Evaluate and provide recommendations for repair if necessary	See IRs 1426707 and 1430611.
1427832	Unit 2, Deficiency tag found identifying groundwater inleakage.	Evaluate and provide recommendations for repair if necessary	EMD / CE to perform work during A2R17 created from IR 1430611. WR #415440
1427443	Unit 1 & 2, PMP calculation issue discovered.	Revise calculation to recover margin.	Calc WR-BR-PF-10 has been revised to Rev 14 to recover margin.

6. REFERENCES

1. Exelon Letter to U.S. Nuclear Regulatory Commission. *Exelon Generation Company, LLC's 90-Day Response to March 12, 2012 Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1 and 2.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident (Flooding).* June 11, 2012.
2. Nuclear Energy Institute (NEI), Report 12-07 [Rev 0-A]. *Guidelines for Performing Verification Walkdowns of Plant Protection Features*. May 2012 [NRC endorsed May 31, 2012; updated and re-issued June 18, 2012].
3. U.S. Nuclear Regulatory Commission. Letter to Licensees. *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of the Near Term Task Force Review of Insights from the Fukushima Dai-ichi Accident*. March 12, 2012.
4. U.S. Nuclear Regulatory Commission. *Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire.* NUREG-1852. October 2007.
5. U.S. Nuclear Regulatory Commission. *Recommendations for Enhancing Reactor Safety in the 21st Century, The Near Term Task Force Review of Insights from the Fukushima Dai-ichi Accident*. July 12, 2011.
6. U.S. Nuclear Regulatory Commission. *Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety*. NRC Inspection Manual. Part 9900: Technical Guidance. Regulatory Issues Summary 2005-20, Revisions 1. September 26, 2005.
7. Institute of Nuclear Power Operations. *Fukushima Dai-ichi Nuclear Station Fuel Damage Caused by Earthquake and Tsunami.* INPO Event Report 11-1. March 15, 2011.
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9. U.S. Nuclear Regulatory Commission. *Inspection of Structures, Passive Components, and Civil Engineering Features at Nuclear Power Plants*. Inspection Manual. Inspection Procedure 62002. Section 03.01(h), Dams, Embankments and Canals.
10. U.S. Nuclear Regulatory Commission. *Evaluate Readiness to Cope with External Flooding*. Inspection Procedures. Attachment 71111.01. *Adverse Weather Protection*. Section 02.04.
11. U.S. Nuclear Regulatory Commission. *NRC Inspector Field Observation Best Practices*. NUREG/BR-0326, Rev. 1. August 2009.
12. U.S. Nuclear Regulatory Commission. *Flood Protection for Nuclear Power Plants*. Regulatory Guide 1.102.
13. Braidwood UFSAR Rev. 14.
14. Byron/Braidwood Structural Project Design Criteria, DC-ST-03-BB Rev. 23.
15. Exelon Procedure ER-AA-450, Rev. 1, *Structures Monitoring*
16. Drawings S-899 Rev. X, S-900 Rev. AA, S-973 Rev. W, S-974 Rev. AB

17. Drawing S-812 Rev. AH
18. Drawing M-42, Sheet 1A, Rev. BI
19. Supplemental Walkdown/Inspection Guidance, Rev. 0, 8/7/12
20. Drawings 20E-0-3680 Rev. AA and 20E-0-3667 Rev. BE
21. Drawing M-11 Rev. P
22. Calculation WR-BR-PF-10 Rev. 14, *Effect of Local Probable Maximum Precipitation (PMP) at Plant Site*
23. Drawing A-47 Rev. AS

Enclosure 2

SUMMARY OF REGULATORY COMMITMENTS

The following table identifies commitments made in this document. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (Yes/No)	PROGRAMMATIC (Yes/No)
Exelon Generation Company, LLC (EGC) will complete the inspection of the Braidwood Unit 1 Auxiliary Feedwater tunnel classified as restricted access and deferred due to inaccessibility.	A1R17 Fall 2013	Yes	No
Exelon Generation Company, LLC (EGC) will complete the inspection of the Braidwood Unit 2 Auxiliary Feedwater tunnel classified as restricted access and deferred due to inaccessibility.	A2R17 Spring 2014	Yes	No