Exelon Generation®

10 CFR 50.54(f)

RS-12-178
RA-12-117

November 19, 2012

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

Oyster Creek Nuclear Generating Station
Renewed Facility Operating License No. DPR-16
NRC Docket No. 50-219

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. 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
3. NRC Letter, Endorsement of Nuclear Energy Institute (NEI) 12-07, "Guidelines For Performing Verification Walkdowns of Plant Flood Protection Features," dated May 31, 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 (Reference 2) requested in Enclosure 4 of Reference 1, confirming that EGC would use the NRC-endorsed flooding walkdown procedure.

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 3), 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 Oyster Creek Nuclear Generating Station (OCNGS) 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.

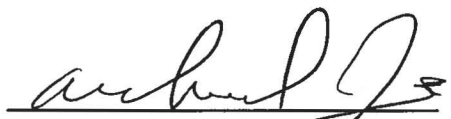
Enclosure 1 to this letter provides the requested information for OCNGS and references the current UFSAR. On October 29, 2012 Oyster Creek and the surrounding area was impacted by the effects of Hurricane Sandy. This large storm resulted in the area reaching and exceeding historical records for local flooding levels. The current UFSAR description will be revised in the next periodic update to incorporate the flooding information obtained during the storm into the station's UFSAR.

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 19th day of November 2012.

Respectfully,



Michael D. Jesse
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 Oyster Creek Nuclear Generating Station

2. Summary of Regulatory Commitments

cc: Director, Office of Nuclear Reactor Regulation
Regional Administrator - NRC Region I
NRC Senior Resident Inspector – OCNGS
NRC Project Manager, NRR – OCNGS
Director, Bureau of Nuclear Engineering – New Jersey Department of Environmental Protection
Mayor of Lacey Township, Forked River, NJ

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 Oyster Creek Nuclear Generating Station

(52 pages)

FLOODING WALKDOWN REPORT

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

for the

OYSTER CREEK NUCLEAR GENERATING STATION
Route 9 South PO Box 388
Forked River, New Jersey, 08731
Facility Operating License No. DPR-16
NRC Docket No. 50-219

Exelon Generation Company, LLC
300 Exelon Way
Kennett Square, PA 19348
Prepared by:
ENERCON
400 Valley Rd Suite 301
Mount Arlington, New Jersey 07856

October 31, 2012

	Printed Name/Title	Affiliation	Signature	Date
Preparer:	Julien Abramovici	ENERCON	for Julien Abramovici	10/31/2012
Reviewer:	Christopher Prather	ENERCON		10/31/2012
Approver:	Ray Sacramo	ENERCON		10/31/2012
Lead Responsible Engineer:	Ruben Martinez	EXELON		10/31/2012
Branch Manager	Ralph Larzo	EXELON		10/31/2012
Senior Manager Design Engineering:	Howie Ray	EXELON		10/31/2012
Corporate Acceptance:	Joseph V. Bellini	EXELON		11/01/2012

Contents

1. EXECUTIVE SUMMARY

This Flooding Walkdown Report provides the Oyster Creek Nuclear Generating Station (OCNGS) response to the March 12, 2012 10 CFR50.54(f) letter concerning the Near Term Task Force (NTTF) review of the accident at the Fukushima-Dai-ichi nuclear facility, Recommendation 2.3 Flooding. To address Recommendation 2.3, walkdowns were performed to verify that plant features credited in the Current Licensing Basis (CLB) for protection and mitigation from external flood events are available, functional, and properly maintained. The OCNGS credited flood protection system does not require the implementation of procedures involving manual actions so no reasonable simulations were required.

The effort was accomplished by following the guidance in NEI 12-07, Rev. 0-A, "Guidelines for Performing Verification Walkdowns of Plant Flood Protection Features". The CLB flood levels were identified and then plant features credited in the CLB to protect against the flood level and/or mitigate the flood were identified. The features include passive items such as walls, doors, and penetration seals. Walkdown packages were assembled for each feature to identify its location, critical characteristics, and acceptance criteria in order to be properly prepared for the visual inspection performed on the walkdown.

The scope of the OCNGS walkdowns included a visual inspection of all features currently credited for protection from external floods. The features provide the external flood barrier for the Reactor Building, Turbine Building, and the Emergency Diesel Generator (EDG) Building.

The visual inspections revealed that the majority of the features met the acceptance criteria. Features not immediately judged to be acceptable were entered into the Corrective Action Program (CAP) and/or correlated to an existing action request addressing flooding concerns. For those features classified as inaccessible, reasonable assurance based on available visual observations that these items could perform their flood protection function was provided on the individual walkdown record forms. 421 features were included in the walkdown scope.

- 225 of these features met the acceptance criteria. See Table 3, Section 5.
- 120 features were classified as restricted access and were deferred to the upcoming October 2012 1R24 Refueling Outage. See Table 5, Section 5.
- 47 features were determined to be inaccessible. See Table 6, Section 5.
- 36 features could not be immediately judged acceptable and were entered in the CAP system. 12 Incident Reports (IRs) were written to document and evaluate these observations. See Table 4, Section 5.

Of the 36 features with observations, 22 were identified as deficient by site CAP. 2 roof drains and 1 scupper at 46' on the Turbine building were observed to be partially obstructed by debris. 2 penetrations were observed to have cut, uncapped conduit pipe. Those five deficiencies are scheduled to be resolved by 11/27/2012.

17 conduit penetrations associated with the EDG cables show evidence of water leakage. These observations were entered into CAP, and it was determined that the penetrations are deficient by the standards of the CLB. Water ingress rate is negligible, and sealing the conduits would extend the exposure of safety related cables to ground water. Therefore, the penetrations were deemed acceptable. See section 4(f) for details.

It was determined that inspecting electrical conduits in manholes and tunnels in the yard was unnecessary for OCNGS. Internal conduit and external penetration seals create a flood barrier at the walls of the Turbine and Reactor Buildings, therefore conduits and penetrations need not be inspected in manholes or tunnels. See section 4(d) for more information.

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:

(1) [NTTF] Recommendation 2.1: Seismic

(2) [NTTF] Recommendation 2.1: Flooding

(3) [NTTF] Recommendation 2.3: Seismic

(4) [NTTF] Recommendation 2.3: Flooding

(5) [NTTF] Recommendation 9.3: EP

(6) 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, 2012, 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, 2012 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

Oyster Creek Nuclear Generating Station is located in Lacey Township, New Jersey, roughly 9 miles south of Toms River and 50 miles east of Philadelphia, Pennsylvania. The site is adjacent to Oyster Creek, about two miles inland from the shore of Barnegat Bay. Because of the shallowness of Barnegat Bay, normal tidal fluctuations of water level in Oyster Creek are only 0.5 feet, on a 12.7 hour tidal cycle. The site is located directly west of US route 9 (at 19' MSL).

The plant site is about 10 acres in size, and is mostly covered in buildings, roads, and other structures. Plant grade around safety related buildings is 23' MSL. The exact topography is such that water on site flows from the center of the island towards the intake canal to the north and west, the discharge canal to the south and west, and Route 9 to the east. The entrances to all site buildings with the exception of the Emergency Diesel Generator Building (EDG Building) are at 23.5'. The entrances to the EDG Building are at 23', with dikes around the building entrances up to elevation 23.5'. The Reactor Building and Turbine Building are located in the center of the site, with the EDG Building to the southwest, near the discharge canal.

The current licensing basis includes two bounding floods, the Probable Maximum Hurricane (PMH) and the Probable Maximum Precipitation (PMP). The chances of a tsunami affecting the plant site were considered to be insignificant in the CLB. Dam failure was evaluated and no flooding which would affect safety related structures was postulated for the site. The effects of probable ice blockage on plant safety related SSCs were deemed insignificant. As stated in the UFSAR, section 2.4, the greatest flood level ever recorded at plant site was 4.5' feet MSL in 1962, prior to plant construction.

The PMH postulated for OCNGS is evaluated in UFSAR section 2.4, Appendix A. The hurricane considered is a Category 4 storm with wind speeds of 133 mph, a forward speed between 12 knots and 23 knots, occurring along with an astronomical high open-ocean tide of 2.7' MSL. This storm results in a storm surge still water level of 22' MSL, with waves at plant site of up to 1' high. The main plant grade is at 23' MSL.

The PMP event postulated for OCNGS was evaluated most recently in the site Individual Plant Examination of External Events (IPEEE) Request for Additional Information (RAI) response (Reference 37). The site was divided up into nine watersheds, two of which were postulated to have significant ponding. The Reactor Building sits in these areas, but neither the Turbine Building nor the EDG Building do. Onsite water levels were calculated to be 23.6' immediately adjacent to the Reactor Building and 23.5' over the remainder of the site. The PMP is not assumed to occur coincidental to the PMH.

Site topography has changed since the IPEEE RAI PMP calculation, with security features added, new buildings constructed, and a wall installed around the EDG Building. Not all of these new changes have been evaluated for impact on site runoff, so a new site drainage calculation is being prepared (see IR 01404344).

Power and control cables run from the EDG Building to the Southwest Corner of the Turbine Building. These cables are in concrete duct banks buried below grade. Cables are designed to be water resistant, and the conduits and penetrations were designed to include seals.

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 10 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

Exelon's approach to the flooding walkdowns included three phases:

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

The walkdown list was developed using the guidance provided in Section 4.2 of NEI 12-07. The existing design and licensing documents such as the UFSAR, plant drawings, and severe weather response procedures were reviewed to identify the plant features credited for protection and mitigation against external flooding events. Plant specific documents used to develop the walkdown list are identified in the

Reference Section. The critical attributes of each feature are reported in Part A of the NEI 12-07 Walkdown Record Form. Topics and items reviewed to develop the walkdown list included the following:

- The barriers important to resisting the effects of external flooding (e.g., structures, walls, floors, doors, etc.).
- Penetrations through barriers, such as trenches and cable openings, that could provide a path for flood water to enter buildings and the means to seal these penetrations. Temporary penetrations and equipment hatches that could provide a path for floodwater to enter buildings were also identified. The means and process to isolate these penetrations, if they are open, within the required time will be identified.
- Instrumentation relied upon to detect water in rooms and the associated warning system.
- Features or pathways credited for flood water relief (e.g., surface drainage swales, subsurface drainage system, culverts, floor/yard drains, etc.).
- Plant response procedures for external floods to identify any incorporated or exterior equipment that is credited for flood protection or mitigation.
- Situations for which temporary plant equipment (e.g., portable pumps, sandbags, temporary barriers, etc.) is credited to protect or mitigate the effects of the external flooding event.
- Flood response procedures to evaluate the practicality of the associated actions performed by site personnel, i.e., Reasonable Simulation.
- Training provided to support implementation of plant flood procedures to determine if it is adequate (content, frequency, and participants) and reflects any time sensitive actions.

A walkdown package was developed for each feature. The purpose of the packages was to provide the teams with relevant information for efficient and thorough walkdowns.

In preparation for the walkdowns preliminary walkthroughs of the different areas were conducted. This activity helped familiarize the team with the conditions as well as offering an opportunity to identify additional credited features that may not have been identified by review of plant documentation.

Each team member was trained to NEI 12-07 and took and passed the NANTEL Generic Verification Walkdowns of Plant Flood Protection Features test. Confined space and fall protection training was obtained to prepare for the need to enter confined spaces such as manholes, and access features via ladders and scaffolding.

Phase 2 – Inspections and Reasonable Simulations

Visual inspection of each accessible feature was performed and the observations documented on the walkdown record forms. The condition of each feature was compared to the acceptance criteria defined in the Supplemental Walkdown/Inspection Guidance (Reference 2). The OCNGS credited flood protection system does not require the implementation of procedures involving manual actions so no reasonable simulations were required.

Phase 3 – Final Reporting

The walkdown record forms for each feature were assembled into a package that includes a summary and a cover page to document 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 was prepared to address the items outlined in the "Requested Information" section of the "Recommendation 2.3: Flooding" enclosure from the 10 CFR 50.54(f) letter.

c. Reasonable Simulations

A procedure walk-through, or 'Reasonable Simulation', is required for temporary and/or active features that require manual/operator actions to perform their intended flood protection function. The purpose of the reasonable simulations is to verify the procedure or activity can be executed as specified/written. Per NEI 12-07 (Reference 2), reasonable simulation included 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.

OCNGS is a zero flood plant. As such, water is not expected to enter the Reactor, Turbine Building and Emergency Diesel Building. The OCNGS credited flood protection system does not require the implementation of procedures involving manual actions so no reasonable simulations were required.

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 design basis flood hazard is a PMP event with a maximum still-water level of 23.6' MSL adjacent to the Reactor Building and 23.5' MSL over the remainder of the site. This level accounts for the highest possible ponding of water on plant site resulting from the PMP event. A PMH event with a maximum still-water storm surge level of 22' MSL and duration as shown in the figure below, with up to 1' of wave run-up, is also considered in the current licensing basis. See Figure 1.

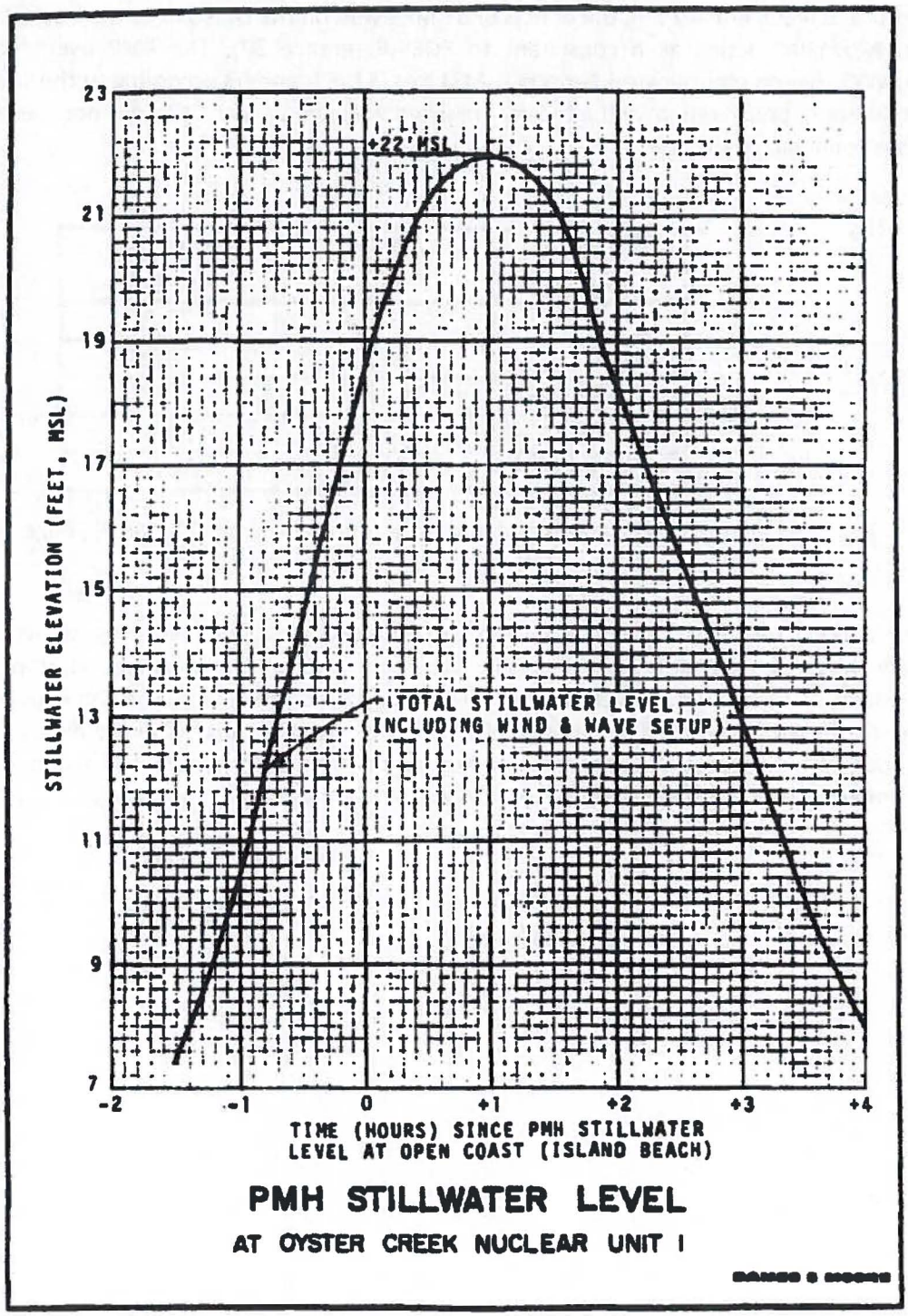


Figure 1: PMH Stillwater Level vs. Time. (Ref 13, Appendix 2.4A, Plate 3)

As part of the IPEEE RAI in 2000, the effects of a PMP event on the OCNGS site were calculated by Professor Robert Moynihan acting as a consultant to EQE (Reference 37). The PMP event was derived from NOAA/NWS Hydrometeorological Reports (HMR) Nos. 51, 52, and 53 according to the site IPEEE RAI reply. Storm duration, precipitation, and intensity are listed in Figure 2. The CLB does not specify which of these events is bounding on the site.

Duration (min)	PMP (in)	Intensity (in/hr)
5	6.1	73.2
15	9.5	38.0
30	13.6	27.2
60	18.0	18.0
24 hours	35.0	Varies

Figure 2: PMP Durations and Intensities Considered by CLB (Ref 37, Page 24)

For the analysis, the OCNGS site was divided into nine distinct watershed areas, shown in Figure 3. The tributary areas for the watersheds include the roof areas of the buildings abutting them. This is conservative, as the roof drains for the Reactor Building, Turbine Building, and Old Radwaste Building flow directly to the 30" overboard drain instead of the site storm drains. The wording in the IPEEE RAI is ambiguous as to whether site storm drains are considered in the runoff calculation. See Figure 3 for subcatchments and flow directions.

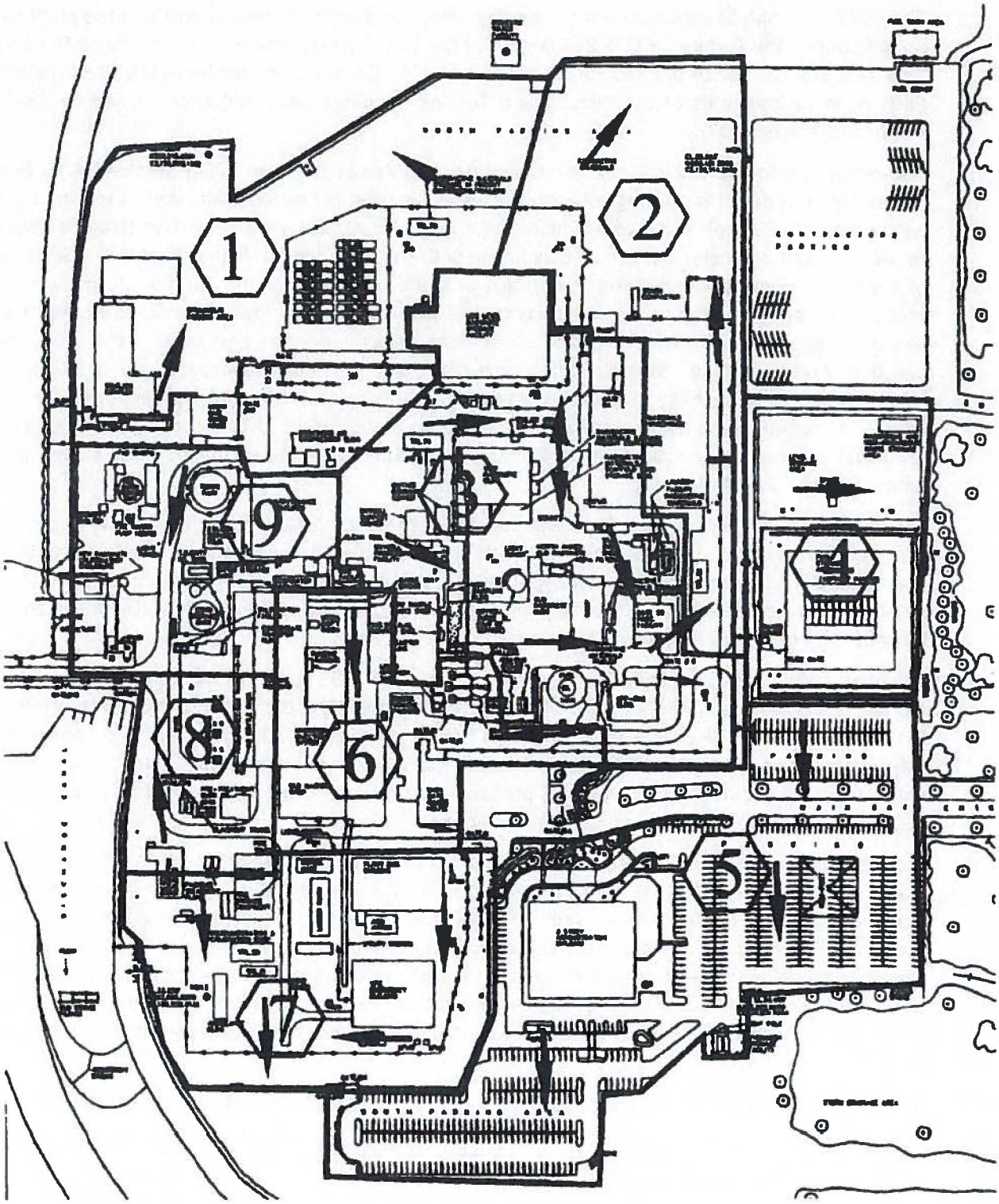


Figure 3: Site Plan View showing Subcatchments (Ref 37, Page 31, Figure 8)

The IPEEE RAI analysis established that ponding would only occur in areas 3 and 6 of the plant site, which do not contact the Turbine or EDG Buildings. For the flooding response walkdowns, the PMP flood level of 23.6' MSL was applied to the Reactor Building and 23.5' MSL to the remainder of the site. The effects of a PMP event on the roofs of the Reactor and Turbine Buildings were evaluated as part of the IPEEE RAI response (Reference 37).

The PMH event for OCNGS was calculated by Burns and Roe in 1972 per UFSAR section 2.4 (Reference 13). The storm considered is a Category 4 on the Saffir-Simpson Hurricane scale, with a maximum sustained wind speed of 133 mph and a central barometric pressure of 27.1 inches Hg. This storm is considered to move at 12 and 23 knots, and occurs concurrent with the astronomical high tide of 2.7' MSL at the mouth of the bay. Slower speed storms were also evaluated, but the 12 and 23 knot storms were found to produce the bounding flood. Assumptions on the storm surge overflow of Barnegat Bay were evaluated based on experience with landfall of hurricanes along the United States east coast. 10' to 20' of horizontal beach loss was assumed. Wave runup at the plant area was calculated based on USGS topographical information. The probability of the calculated PMH occurring at plant site was characterized by Burns and Roe as "so remote as to be almost inconceivable". As stated in the UFSAR section 2.4, the highest flood level ever recorded at the plant site is 4.5' MSL, based on evidence left behind after a 1962 storm (pre-dating construction of the plant).

The PMH still-water storm surge level was calculated to be 22' MSL, with up to 1' of wave runup at plant site. As plant grade is at 23' MSL, the CLB PMH is not postulated to impact any safety critical buildings on plant site. All safety critical plant buildings have been evaluated for hydrostatic forces associated with the PMH storm surge water levels, as well as the potential for buoyancy. The service water intake structure will be underwater during a PMH event.

The effects of dam breaches and flooding due to PMP on OCNGS and the Forked River were evaluated, but did not result in water levels at the OCNGS site greater than those created by the PMH. Therefore, the PMH bounds those PMF conditions. Per UFSAR Section 2.4 (Ref. 13), the chance of a tsunami affecting the plant site on the east coast of the United States is so small as to be insignificant. Thus, tsunami events were not evaluated for OCNGS. The effects of probable ice blockage in the intake canal on plant safety related SCCs were evaluated, and deemed to be insignificant.

The groundwater table at OCNGS is 12' MSL under normal conditions, reaching 19' to 22' MSL during a PMH storm surge (Reference 13, section 2.4.11 and Table 2.4-7). There is no information on design basis groundwater levels during a PMP event. The OCNGS Systematic Evaluation Program (SEP) Final Report (Reference 33), Topic III-3.A discusses the effects of groundwater on the plant. Per subsection (3), "all penetrations below grade are designed to be leak tight", to prevent groundwater ingress. SEP Supplement 1 states that "on the basis of the factors of safety obtained against flotation, the adequacy of the subgrade walls, and the adequacy of bearing capacity, the OCNGS facility can adequately withstand a groundwater level of 23 feet MSL."

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.

The bounding licensing basis floods for OCNGS are the PMP and PMH, as discussed in section 4a. Incorporated and external passive features are credited in the CLB to prevent water from entering the Turbine and EDG Buildings at grade, to minimize water ingress at grade into the Reactor Building, to

prevent failure of the Reactor and Turbine building roofs, and to prevent any groundwater ingress into safety critical buildings.

As discussed previously, the maximum flood level due to PMH is 22' MSL. The plant grade, 23' MSL, is one foot above the PMH flood level. Therefore, the PMH flood will not directly affect or enter the plant safety critical buildings above grade. However, the circulating water intake structure will be under water. This deck supports the circulating water pumps and the emergency service water pumps. During a PMH flood, the circulating water and service water pumps will become inoperable and thus emergency plant procedures (ABN-32) have been instituted which require the plant to shut down when water levels at the intake reach 4.5' MSL and the reactor to scram at 6' MSL to ensure a safe plant shutdown. As the time to SCRAM the reactor is insignificant, compared to the time for still-water to reach PMH levels at site, the plant is considered in hot shutdown for the purposes of the PMH flood. Procedure ABN-31 (high winds) requires contact with the NWS every 30 minutes during a hurricane watch or warning for updates on the specifics of the storm, and water level at the intake to be logged at the same interval. Wind speeds of up to 133 miles per hour are assumed to be concurrent with the PMH event. For the purposes of our walkdowns, a loss of offsite power was assumed. PMH flood water level over time is given in Figure 1 (see section 4(a)). Storm surge still water level will be greater than the normal ground water level for approximately 4 hours.

As discussed previously, the maximum flood level due to PMP is 23.5', except immediately adjacent to the Reactor Building. The entrances to all safety critical plant buildings (except for the EDG Building) are at 23.5' MSL. The two entrances to the EDG Building are at elevation 23' MSL, which is 6 inches below the PMP flooding level. Dikes rising 6 inches above plant grade are provided at the entrances to protect against flooding of the EDG Building. Therefore, water will not enter through the Turbine Building doors or overtop EDG Building dikes in a PMP flood.

The maximum flood level due to PMP is 23.6' adjacent to the Reactor Building. The entrances to the Reactor Building are 3 sets of airlock doors which remain closed during normal operation. The airlock doors' credited flood protection function is to "remain in place and minimize water intrusion into the building." The IPEEE RAI response does not discuss the volume of water allowed into the Reactor Building, but it does state that it "does not contribute to severe accident risk at OCNGS."

Without proper drainage, the PMP event could potentially cause the roofs of the Turbine and Reactor Buildings to exceed design live load and fail. To prevent roof failure, area drains were installed on the roofs of the Turbine and Reactor Buildings at the time of plant construction, and scuppers were added per commitments made in SEP section 4.5.3 (Roof Drains) (Reference 33). Calculations performed in the IPEEE RAI responses demonstrate that the revised PMP will not cause failure of the Turbine or Reactor Building roofs. As a PMP event can arise suddenly and without warning, no assumption can be made about plant configuration. No warning is assumed for the PMP flood. For the purposes of our walkdowns, a loss of offsite power was assumed. No controlling duration is given for the PMP flood in the IPEEE RAI; the longest duration evaluated is 24 hours.

Flood protection below grade for the PMP, PMH, and groundwater intrusion is provided by the CLB requirement that all below-grade penetrations be sealed against water intrusion. The external walls and floors below flood level of the Turbine Building, Reactor Building, and EDG Building are flood protection features, as are the seals for all penetrations through these barriers. All internal seals of conduits that penetrate these barriers must be considered as 'inaccessible' flood protection features. Additionally, the airlock expansion joints connecting the two buildings are flood protection features, as both the Turbine and

Reactor Buildings contain safety related equipment. If all of these flood protection features perform their intended functions, water will not enter the plant buildings below grade.

Procedures ABN-31, ABN-32, and OP-OC-108-109-1001 were evaluated to determine if any simulations were required. ABN-31 requires manning the combustion turbines in the event of a hurricane event, but the Combustion Turbines were deemed to be outside the scope of our walkdowns, as they are not part of the plant and not required to maintain safe shutdown. A loss of offsite power was assumed instead. ABN-32 requires monitoring water level at the intake. No reasonable simulation is required for that action.

OP-OC-108-109-1001 requires that if building flooding conditions exist, then temporary flood protection features should be installed "as necessary". Further, work support is required to stage sandbags near the Turbine Building truck bay to protect the 4160V room. The procedure lacks any guidance as to where this equipment is to be stored, how much of it is to be stored, when and where it is to be deployed in a flooding event, and how to compensate for the lack of warning for a PMP. The procedure needed to be upgraded and IR 01398217 was issued. No action was committed to in the CLB since implementing OP-OC-108-109-1001 would only add margin above CLB flood level. Therefore, no reasonable simulations of the procedure were required.

As there are no CLB features requiring manual actions for implementation, no reasonable simulations are required for deployment and operability.

There is no discussion in the OCNGS CLB about plant configurations during a flooding event. For the purposes of these walkdowns, the plant was assumed to be in hot shutdown per ABN-31 and ABN-32 for a PMH, and in any configuration for a PMP event. The flood protection features evaluated protect plant safety related features in any configuration. As all features below grade were in the walkdown scope, protection against groundwater intrusion during normal and PMH conditions is captured in the walkdowns performed.

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

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

There are no room water level warning systems that are credited for external flood protection in OCNGS's CLB.

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 3.d, 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 CAP where an evaluation of the observation can be made.

Visual inspections of the external flood protection features were performed with the objective of comparing the observed condition of the feature to the acceptance criteria as defined in Section 6 of NEI 12-07 and the Supplemental Walkdown Inspection Guidance. Observations not immediately judged as acceptable were entered into the CAP, per section 4(f) and Table 4 of section 5 of this report.

Table 3 in Section 5 of this report lists the features that were immediately judged as acceptable via the visual inspections. Details of these acceptable features are as follows.

With the exception of the inaccessible Turbine Building base slab, the concrete walls and floors identified as external flood barriers were inspected and found to have no signs of material degradation. There were no signs of water intrusion through the walls and floors; the only observed water intrusion was directly attributable to specific penetrations. Observations indicate that all walls and floors meet the acceptance criteria in Reference 2. The expansion joints between the Turbine and Reactor Buildings were inspected and found to have no signs of material degradation. No signs of past water intrusion into the airlocks between the buildings was observed. These observations also met the acceptance criteria in Reference 2. The protective dikes around the EDG Building entrances were evaluated and determined to be the correct height and in good condition (see IR 01410069).

The Reactor Building Airlock Doors DR-814-038, DR-814-040, and DR-814-042 were found to be in place and in good structural condition. The gaps between the doors and the Reactor Building floor were measured and found to be acceptable. The doors were closed, as required by procedure. All observations met the acceptance criteria in Reference 2 for a credited non-watertight door.

The majority of penetrations and penetration seals had no signs of material degradation. A number of the penetrations had superficial oxidation, and one appeared to have recently been re-sealed after past water intrusion. Nevertheless, the aforementioned cases were judged to meet the acceptance criteria in Reference 2. However, there were penetrations where either active water intrusion was observed, or there was evidence of past water intrusion with no clearly sufficient repairs. These penetrations were entered into the CAP, and IRs written to document these conditions. The CAP disposition resulted in 19 penetrations found to be deficient.

A majority of all roof drains and scuppers were found to be in place, without debris buildup or any other blockage. Three drains on the Heater Bay and Fan Roofs of the Turbine Building were found to be partially obstructed, and the drain cover of one of them was installed upside down. These drains were entered into the CAP and found to be deficient. All roof drains and scuppers taken credit for as part of the IPEEE RAI roof drainage calculation were in acceptable condition.

The manholes in the yard were not inspected to determine if the manhole could be a source of water for conveyance into a building via a conduit that penetrates the building. These inspections were deemed unnecessary, as walkdowns were able to establish that the incorporated passive flood protection features of the Turbine and Reactor buildings provide a flood barrier. Water from manholes would be prevented from entering safety critical buildings by penetration and conduit internal seals. See above for discussion of penetration seals, and section 4(f) for discussion of conduit internal seals.

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.

The selection of the walkdown team considered site familiarity and diversity of disciplines. The walkdown team consisted of members from the mechanical, electrical and civil/structural disciplines. Two members of the team have experience with plant modifications.

All ENERCON team members, as well as the OCNGS site Lead Responsible Engineer (LRE), participated in eight hours of training conducted by Exelon that reviewed the content of the Reference 2, NEI 12-07 guidelines. Team members were required to pass the NANTEL Generic Flood Protection Awareness training course, and the NANTEL Generic Verification Walkdowns of Plant Flood Protection Features test.

Familiarization with the basis for walkdown scope and items to be inspected was established by having each member of the walkdown team involved in some aspect of evaluation of the CLB and defining the walkdown flood protection features to be inspected. A walkdown record form template was developed. The template cross referenced sections of the guidelines to the questions being asked on the form so that a better understanding of form completion requirements could be understood by each member of the team.

Prior to performing any walkdown inspections the walkdown team members completed Parts A, B1, B2 and B3 of the walkdown record forms and developed the necessary walkdown packages. In order to complete these four pages of the walkdown record form, acceptance criteria, preventive maintenance records, and operating procedures were reviewed.

Pre walkthroughs of many areas to be inspected were conducted. There activities resulted in walkdown team members becoming more familiar with the scope prior to any inspections being performed. The walkdowns, with the exception for those of the Torus room and Reactor Building Equipment Drain Tank (RBEDT) room, were conducted by teams of two to three ENERCON engineers, accompanied by the OCNGS flooding response LRE and up to two other OCNGS personnel. In order to keep dose As Low As Reasonably Achievable (ALARA), the walkdown team for the RBEDT room consisted of one ENERCON engineer and the OCNGS LRE, and the walkdown team for the Torus room consisted of one ENERCON engineer, the OCNGS LRE, and the OCNGS Task Manager. At least two NANTEL Flood Protection trained engineers were on every walkdown, and video and photographs of features evaluated on ALARA-constrained walkdowns were reviewed by the remainder of the ENERCON team.

During the visual inspection each flood protection feature was identified by each member of the team to ensure that data being collected was associated with the same plant feature.

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.

Observations not immediately judged as acceptable

Observations made during the visual inspections not immediately judged as acceptable were entered into the CAP. The features contained in this category are listed in Table 4 in Section 5 of this report. The table identifies the actions taken to evaluate potential deficiencies and resolve the conditions.

12 penetrations (including 1 conduit with an internal seal) in the Reactor Building corner rooms and Torus room showed signs of past water intrusion in the form of rust stains on the wall. 3 of those penetrations also showed stalactite growth. These penetrations were entered into CAP (See Table 4 of Section 5 for the list of IRs), and it was determined there is no active leakage from these penetrations. ARs have been generated to paint these walls.

A walkdown of the plant site was performed to evaluate plant topography, and several deviations from the topography assumed in the design basis PMP runoff calculation were noted. Deviations include post-9/11 security improvements, an ISFSI expansion, and the construction of the contractor building. The ISFSI expansion was evaluated for runoff impact, but flooding considerations were screened out or not considered for other changes. These observations were documented, and dispositioned as IR 01404344. It was determined that these alterations did not constitute a "significant" change since 2000, and "no safety related equipment is affected." A new PMP/LIP flooding study is being performed as part of OCNGS's Fukushima response.

Observations Designated through CAP as Deficient

In the Southwest corner of the Turbine Building basement, 2 cut and uncapped conduit pipes penetrate the west wall. As the penetrations are not '4" Conduit Penetration' features, credit cannot be taken for visually inspected internal seals. IRs 01406952 and 01406089 were written to evaluate these conditions, and ARs A2313037 and A2313043 were issued to correct the deficiencies. Repairs are scheduled to be completed by 11/27/2012.

During walkdowns on the Heater Bay and Fan Roofs of the Turbine Building, 2 area drains and 1 scupper were observed to be partially obstructed by debris. Further, one of the drain's cover appears to be installed upside down which puts it at greater risk of blockage. IR 01419031 was written to evaluate this condition, and AR A2313982 was issued to correct the deficiencies. Repairs are scheduled to be completed by 11/27/2012.

Active water intrusion into the southwest corner of the Turbine Building basement at a rate of about 40 drops per minute was observed during a rainfall event. Eight penetrations were allowing the water in. As 6 of the penetrations are permanently covered in fireproofing, they could not all be observed directly. These penetrations are associated with the cables for the number 2 EDG, and leakage from them has been noted and documented in the past. The observation was entered into the CAP as IR 01405765.

Per IR 01405765, Assignment 3 (Reference 36), during a rain event the soil outside the Turbine Building became saturated to grade level. The hydrostatic head on the Turbine Building penetrations created by this storm is only slightly less than that which would be created by a PMP event. Flooding in the Turbine Basement does not impact plant safety unless it causes the airlocks between the Turbine and Reactor Buildings to fail. The airlocks can withstand water up to elevation 7' MSL. Computations by site staff in response to this IR demonstrate that the water inflow that could be expected from a PMP in 24 hours is several orders of magnitude less than that required to flood the basement to 7' MSL. A PMH will only

maintain a storm surge greater than 18' MSL (the lowest elevation of effected penetrations) for 2.2 hours per the UFSAR.

It was concluded that the impact of leakage through the EDG 2 conduits on the Turbine Building basement is minimal. Per IR 01405765, Assignment 2, it is desirable to keep the cables inside the conduits dry, in order to prevent degradation of the cables. Therefore, it was concluded in Assignment 4 that it was more desirable to allow the conduits to drain into the Turbine Building basement than it would be to re-seal the conduits and allow standing water in them. The penetrations are deficient by the standards of the CLB, but deemed acceptable.

Evidence of past water leakage from nine conduit penetrations associated with cables for the number 1 EDG was similarly observed in the Turbine Building basement. It was entered into the CAP and dispositioned in IR 01406841. Site engineers came to the conclusion that "The leak noted in [Turbine Building] basement is from conduit that goes to EDG. This is expected leakage. The design is to prevent any water from accumulating in conduit, instead any water that enters conduit is directed to the 1-5 sump". These penetrations are similarly deficient by the standards of the CLB, but deemed acceptable.

Observations Awaiting Final Disposition in CAP

None

Restricted Access Areas

108 features could not be inspected during the original walkdowns due to high radiation fields in the Turbine Building (Condenser Bay, Steam Jet Air Ejector Room, and High Low Room). 10 conduit penetrations in cable trenches in the EDG Building could not be observed due to close proximity to high voltage cables that could become energized, posing a severe risk to personnel safety. 2 wall penetration seals (1 in the Reactor Building, 1 in the Turbine Building) are not accessible from normal personnel access areas due to height. All of these 120 features were designated as 'restricted access' and will be evaluated during the 1R24 refueling outage in October 2012.

Inaccessible Areas

A total of 47 inaccessible features were identified. 26 of them are internal seals of 4" conduits penetrating into the Reactor and Turbine Buildings. These conduits are not designed to provide easy access for inspection, and so major disassembly would be required to look inside. 4" conduit penetrations 007, 011, 014, 015, 018, 020, 022, and 031 were all open on the interior of the plant, allowing the internal seal against water intrusion to be visually inspected. Further, there is a SEP requirement that all below-grade penetrations be designed to be leak tight. Also, the interface between conduit and conduit penetration generally used by the plant does not appear to be water-tight, so any water intrusion would become apparent by inspecting walls and the conduit exteriors for signs of water intrusion. These factors provide reasonable assurance that seals are in place and functional for 25 of these 26 features. The remaining feature was dispositioned in IR 01407010, and determined to be satisfactory.

15 of the remaining inaccessible features are conduit penetrations, either covered in fireproofing material, covered in a plaster-like material, or where a seal was not able to be observed and inspection with a ladder or scaffold would be impossible or very unsafe due to interference with existing equipment. Major equipment disassembly would be required to inspect these penetrations. Reasonable assurance is provided as above for 9 of the 15 features. 6 of the features had observed leakage and were dispositioned

in IR 01405765 (see above, under "observations designated through the CAP as deficient", for evaluation of the aggregate effect of this observation).

Two 4" floor drains in the EDG Building are located directly beneath the EDG units, and inspection would require disassembling the EDGs. No signs of ponding on the EDG floor were noted, even after rain events, and the 4 area drains inspected at floor level in each EDG room were unblocked. The 30" overboard drain system is largely buried, but water was observed flowing from it with no restrictions.

The bottoms of Sump 1-5 and Sump 1-1 are both inaccessible due to standing water in each sump, leaving no practical means of access. Sump 1-1 is not adjacent to any exterior Turbine Building wall. The bottom of Sump 1-1 is at El. (-) 4' MSL, and is separated from the ground under the Turbine Building by 6' of reinforced concrete, making water intrusion unlikely. No unusual run times for the 1-1 sump have been reported, which is inconsistent with the characteristics of a groundwater ingress path. All of the above offer reasonable assurance that there is not groundwater intrusion into the 1-1 sump.

Sump 1-5 is adjacent to the South and West walls of the Turbine Building. The bottom of the sump is at El. (-) 6' MSL. The South and West walls are each 3' thick reinforced concrete, and the Turbine Building base slab is 6' deep under the 1-5 Sump. A high density polyurethane liner was installed in the sump in 1985. Analysis of Sump 1-5 run times from 2010 to 2012 revealed several 2 to 3 week periods where the sump was not required to pump any water. Given that the bottom of the sump is 18' below the water table and 6' below sea level, this is inconsistent with the sump being a groundwater infiltration path. The 1-5 sump collects water from the Turbine Building floor and equipment drains, as well as the deficient Turbine Building west wall penetrations mentioned above. Water in the sump can be attributed to these sources. It can be said with reasonable assurance that the 1-5 sump is a functional groundwater barrier.

The base slab of the Turbine Building, outside of the Condenser Bay, is almost entirely covered by the Turbine Building floor at elevation 3.5' MSL, and a bed of sand between the two concrete slabs. As the Turbine Building floor cannot be dug up to inspect the base slab, there is no reasonable means of access and the feature is inaccessible. There is a history of water buildup in the area between the Turbine Building floor slab and base slab. A comprehensive study on Turbine Building basement water intrusion performed in 2002 (Reference 38) attributed water intrusion primarily to deficient wall penetrations in the southwest of the Turbine Building, and internal water seeping from corroded drain lines. Remedial actions taken by OCNGS since the problem was discovered include replacing cables and conduit seals, constructing water resistant vaults where water used to pool between the Turbine and Reactor Buildings, and repairing the drain system. These activities have dramatically reduced the amount of water entering between the floor and the base slab. If the base slab were a groundwater infiltration path, it would be expected that remediating penetrations and drains would have minimal impact on water levels between the floor and the base slab. All inspected OCNGS walls and floors, as well as the portion of the base slab visible in the hallway along the North Wall of the Turbine Building, are acceptable. The Turbine Building base slab is 6' of reinforced concrete, so failure is exceedingly unlikely. All of the above provide reasonable assurance that the Turbine Building base slab is in good condition. The base slab is visible in the Condenser Bay, and will be inspected during the 1R24 outage (see 'Restricted Access Areas', above).

Original walkdown record forms are available on-site for review, as required.

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 the guidance provided in NEI 12-07 and the final resolution to FAQ-006. APM was collected 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. IR 01422582 was written to document cases of small margin, significant consequences, and to disposition them in the site CAP.

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.

There are no newly installed or planned flood protection features at OCNGS at the time of the writing of this report.

5. CONCLUSIONS

This section of the report includes 6 tables that provide the results of the walkdowns. Table 1 provides a summary of the number and type of features included in the walkdown scope. A total of 421 features were included in the scope of this effort.

Table 2 summarizes the reasonable simulations performed. As no reasonable simulations were performed, this table is empty.

The results of the visual inspections during the flooding walkdowns showed that 225 features meet the NEI 12-07 acceptance criteria. Table 3 provides this list of features that were immediately judged to be acceptable.

Table 4 provides the list of 36 features that were not immediately judged as acceptable during the walkdowns. The table provides the tracking mechanism for CAP resolution of the identified conditions.

Table 5 lists the features classified as being in restricted access areas. The reason for being classified as restricted access is provided along with the planned future time for inspection. 120 features are classified as in restricted access areas.

Table 6 lists 47 features that are classified as in inaccessible areas. The reason for this classification is provided along with a summary of the reasonable assurance that the feature can perform its intended function (as applicable). Detailed discussions of reasonable assurance are provided in Section 4(f) of this report. 7 of these features were entered into the CAP because of observations associated with them.

The only findings that were found to be deficient per the CLB were 17 conduit penetrations showing signs of water intrusion, 2 cut and uncapped conduit in the Reactor Building and Turbine Building, and 3 partially blocked drains on the Turbine Building Heater Bay and Fan roofs. The leakage rate through the 17 penetrations were evaluated, and found to be orders of magnitude lower than that which would threaten plant SSCs. The other deficiencies will be resolved no later than 11/27/2012. No other findings challenge the CLB. Water intrusion into the Reactor Building is expected in the CLB during a PMP event, and it was verified that the airlock doors are in place to "minimize water intrusion into the building." Per the IPEEE RAI response, this CLB water intrusion "does not contribute to severe accident risk at OCNGS."

The flooding walkdown record forms document the details of all observations for all flood protection features inspected, and are available for on-site review. Except as noted above, OCNGS flood protection features met the NEI 12-07 Supplemental Guidance acceptance criteria and were found to be in accordance with the site CLB.

Table # 1: Summary – Features Included in the Walkdown Scope

Feature Type	Total Number
Passive – Incorporated	421
Passive – Temporary	0
Active – Incorporated	0
Active – Temporary	0

Table # 2: Reasonable Simulations

#	Description	Purpose
N/A	No Reasonable Simulations were performed.	N/A

Table #3 - List of Features Immediately Judged as Acceptable			
#	Feature ID #	Description	Passive/Active Incorporated/Temporary
1	16" Pipe Sleeve 219	Pipe Penetration Seal	Passive – Incorporated
2	20" Pipe Sleeve 220	Pipe Penetration Seal	Passive – Incorporated
3	8" Pipe Sleeve 221	Pipe Penetration Seal	Passive – Incorporated
4	20" Pipe Sleeve 222	Pipe Penetration Seal	Passive – Incorporated
5	8" Pipe Sleeve 223	Pipe Penetration Seal	Passive – Incorporated
6	4" Conduit Penetration 224	Conduit Penetration Seal	Passive – Incorporated
7	4" Conduit Penetration 225	Conduit Penetration Seal	Passive – Incorporated
8	4" Conduit Penetration 226	Conduit Penetration Seal	Passive – Incorporated
9	4" Conduit Penetration 227	Conduit Penetration Seal	Passive – Incorporated
10	4" Conduit Penetration 228	Conduit Penetration Seal	Passive – Incorporated
11	NW corner room floor	Floor	Passive – Incorporated
12	NE corner room floor	Floor	Passive – Incorporated
13	Reactor Build to Turbine Building Expansion Joints (T-114)	Building Expansion Joints	Passive – Incorporated
14	6" Pipe Sleeve 275	Pipe Penetration Seal	Passive – Incorporated
15	6" Pipe Sleeve 276	Pipe Penetration Seal	Passive – Incorporated
16	12" Pipe Sleeve 277	Pipe Penetration Seal	Passive – Incorporated
17	SE corner room floor	Floor	Passive – Incorporated
18	4" Conduit Penetration 247	Conduit Penetration Seal	Passive – Incorporated
19	4" Conduit Penetration 248	Conduit Penetration Seal	Passive – Incorporated
20	4" Conduit Penetration 287	Conduit Penetration Seal	Passive – Incorporated
21	4" Conduit Penetration 357	Conduit Penetration Seal	Passive – Incorporated
22	4" Conduit Penetration 359	Conduit Penetration Seal	Passive – Incorporated
23	Rectangular Penetration 4'x2' 267	Penetration Seal	Passive – Incorporated
24	10" Pipe Sleeve 268	Pipe Penetration Seal	Passive – Incorporated
25	SW corner room floor	Floor	Passive – Incorporated
26	Reactor Build to Turbine Building Expansion Joints (T-113)	Building Expansion Joints	Passive – Incorporated

Table #3 - List of Features Immediately Judged as Acceptable			
#	Feature ID #	Description	Passive/Active Incorporated/Temporary
27	12" Pipe Sleeve 272	Pipe Penetration Seal	Passive – Incorporated
28	10" Pipe Sleeve 274	Pipe Penetration Seal	Passive – Incorporated
29	6" Penetration S	Pipe Penetration Seal	Passive – Incorporated
30	Rectangular Penetration 8'x8' 279	Penetration Seal	Passive – Incorporated
31	Rectangular Penetration 3'x2' 280	Penetration Seal	Passive – Incorporated
32	12" Pipe Sleeve 284	Pipe Penetration Seal	Passive – Incorporated
33	6" Penetration N	Pipe Penetration Seal	Passive – Incorporated
34	Torus Room floor	Floor	Passive – Incorporated
35	Personnel Air Lock 285 (DR-814-042)	Door	Passive – Incorporated
36	Personnel Air Lock 286 (DR-814-038)	Door	Passive – Incorporated
37	Personnel Air Lock 380 (DR-814-040)	Door	Passive – Incorporated
38	Area Drain 288	Area Drain	Passive – Incorporated
39	Area Drain 289	Area Drain	Passive – Incorporated
40	Area Drain 290	Area Drain	Passive – Incorporated
41	Area Drain 291	Area Drain	Passive – Incorporated
42	6" Scupper Type Roof Drain 378	Scupper	Passive – Incorporated
43	6" Scupper Type Roof Drain 379	Scupper	Passive – Incorporated
44	East Wall Reactor Building	Wall	Passive – Incorporated
45	North Wall Reactor Building	Wall	Passive – Incorporated
46	South Wall Reactor Building	Wall	Passive – Incorporated
47	West Wall Reactor Building	Wall	Passive – Incorporated
48	East Wall Turbine Building	Wall	Passive – Incorporated
49	North Wall Turbine Building	Wall	Passive – Incorporated
50	South Wall Turbine Building	Wall	Passive – Incorporated
51	1 1/2" Conduit Penetration	Penetration Seal	Passive – Incorporated
52	Area Drain 352	Area Drain	Passive – Incorporated
53	Area Drain 354	Area Drain	Passive – Incorporated
54	Area Drain 355	Area Drain	Passive – Incorporated

Table #3 - List of Features Immediately Judged as Acceptable			
#	Feature ID #	Description	Passive/Active Incorporated/Temporary
55	Area Drain 356	Area Drain	Passive – Incorporated
56	Area Drain 360	Area Drain	Passive – Incorporated
57	4" Scupper Type Roof Drain 368	Scupper	Passive – Incorporated
58	4" Scupper Type Roof Drain 369	Scupper	Passive – Incorporated
59	4" Scupper Type Roof Drain 370	Scupper	Passive – Incorporated
60	4" Scupper Type Roof Drain 371	Scupper	Passive – Incorporated
61	4" Scupper Type Roof Drain 372	Scupper	Passive – Incorporated
62	4" Scupper Type Roof Drain 373	Scupper	Passive – Incorporated
63	6" Scupper Type Roof Drain 374	Scupper	Passive – Incorporated
64	6" Scupper Type Roof Drain 375	Scupper	Passive – Incorporated
65	6" Scupper Type Roof Drain 376	Scupper	Passive – Incorporated
66	6" Scupper Type Roof Drain 377	Scupper	Passive – Incorporated
67	Area Drain 293	Area Drain	Passive – Incorporated
68	Area Drain 294	Area Drain	Passive – Incorporated
69	Area Drain 296	Area Drain	Passive – Incorporated
70	Area Drain 297	Area Drain	Passive – Incorporated
71	Area Drain 300	Area Drain	Passive – Incorporated
72	Area Drain 301	Area Drain	Passive – Incorporated
73	4" Scupper Type Roof Drain 292	Scupper	Passive – Incorporated
74	4" Scupper Type Roof Drain 298	Scupper	Passive – Incorporated
75	4" Scupper Type Roof Drain 302	Scupper	Passive – Incorporated
76	24" Pipe Sleeve 004	Pipe Penetration Seal	Passive – Incorporated
77	Rectangular Penetration 3 x 1'-6" 005	Penetration Seal	Passive – Incorporated
78	4" Conduit Penetration 007	Conduit Penetration Seal	Passive – Incorporated
79	4" Conduit Penetration 008	Conduit Penetration Seal	Passive – Incorporated
80	4" Conduit Penetration 009	Conduit Penetration Seal	Passive – Incorporated
81	4" Conduit Penetration 010	Conduit Penetration Seal	Passive – Incorporated
82	4" Conduit Penetration 011	Conduit Penetration Seal	Passive – Incorporated

Table #3 - List of Features Immediately Judged as Acceptable			
#	Feature ID #	Description	Passive/Active Incorporated/Temporary
83	4" Conduit Penetration 012	Conduit Penetration Seal	Passive – Incorporated
84	4" Conduit Penetration 013	Conduit Penetration Seal	Passive – Incorporated
85	4" Conduit Penetration 014	Conduit Penetration Seal	Passive – Incorporated
86	4" Conduit Penetration 015	Conduit Penetration Seal	Passive – Incorporated
87	4" Conduit Penetration 016	Conduit Penetration Seal	Passive – Incorporated
88	4" Conduit Penetration 017	Conduit Penetration Seal	Passive – Incorporated
89	4" Conduit Penetration 018	Conduit Penetration Seal	Passive – Incorporated
90	4" Conduit Penetration 019	Conduit Penetration Seal	Passive – Incorporated
91	4" Conduit Penetration 020	Conduit Penetration Seal	Passive – Incorporated
92	4" Conduit Penetration 021	Conduit Penetration Seal	Passive – Incorporated
93	4" Conduit Penetration 022	Conduit Penetration Seal	Passive – Incorporated
94	4" Conduit Penetration 023	Conduit Penetration Seal	Passive – Incorporated
95	4" Conduit Penetration 024	Conduit Penetration Seal	Passive – Incorporated
96	4" Conduit Penetration 025	Conduit Penetration Seal	Passive – Incorporated
97	4" Conduit Penetration 026	Conduit Penetration Seal	Passive – Incorporated
98	Rectangular Penetration 5'9" x 1'-6" 027	Penetration Seal	Passive – Incorporated
99	24" Pipe 242	Penetration Seal	Passive – Incorporated
100	MW-13	Monitor Well	Passive – Incorporated
101	4" Conduit Penetration 028	Conduit Penetration Seal	Passive – Incorporated
102	4" Conduit Penetration 029	Conduit Penetration Seal	Passive – Incorporated
103	4" Conduit Penetration 030	Conduit Penetration Seal	Passive – Incorporated
104	4" Conduit Penetration 031	Conduit Penetration Seal	Passive – Incorporated
105	4" Conduit Penetration 033	Conduit Penetration Seal	Passive – Incorporated
106	4" Conduit Penetration 034	Conduit Penetration Seal	Passive – Incorporated
107	4" Conduit Penetration 035	Conduit Penetration Seal	Passive – Incorporated
108	4" Conduit Penetration 037	Conduit Penetration Seal	Passive – Incorporated
109	4" Conduit Penetration 038	Conduit Penetration Seal	Passive – Incorporated
110	4" Conduit Penetration 039	Conduit Penetration Seal	Passive – Incorporated

Table #3 - List of Features Immediately Judged as Acceptable			
#	Feature ID #	Description	Passive/Active Incorporated/Temporary
111	2" Conduit Penetration 041	Conduit Penetration Seal	Passive – Incorporated
112	2" Conduit Penetration 042	Conduit Penetration Seal	Passive – Incorporated
113	2" Conduit Penetration 043	Conduit Penetration Seal	Passive – Incorporated
114	2" Conduit Penetration 044	Conduit Penetration Seal	Passive – Incorporated
115	4" Conduit Penetration 047	Conduit Penetration Seal	Passive – Incorporated
116	4" Conduit Penetration 048	Conduit Penetration Seal	Passive – Incorporated
117	4" Conduit Penetration 052	Conduit Penetration Seal	Passive – Incorporated
118	4" Conduit Penetration 056	Conduit Penetration Seal	Passive – Incorporated
119	4" Conduit Penetration 057	Conduit Penetration Seal	Passive – Incorporated
120	4" Conduit Penetration 058	Conduit Penetration Seal	Passive – Incorporated
121	4" Conduit Penetration 059	Conduit Penetration Seal	Passive – Incorporated
122	4" Conduit Penetration 060	Conduit Penetration Seal	Passive – Incorporated
123	4" Conduit Penetration 061	Conduit Penetration Seal	Passive – Incorporated
124	4" Conduit Penetration 062	Conduit Penetration Seal	Passive – Incorporated
125	4" Conduit Penetration 063	Conduit Penetration Seal	Passive – Incorporated
126	4" Conduit Penetration 064	Conduit Penetration Seal	Passive – Incorporated
127	4" Conduit Penetration 065	Conduit Penetration Seal	Passive – Incorporated
128	4" Conduit Penetration 066	Conduit Penetration Seal	Passive – Incorporated
129	4" Conduit Penetration 067	Conduit Penetration Seal	Passive – Incorporated
130	4" Conduit Penetration 068	Conduit Penetration Seal	Passive – Incorporated
131	4" Conduit Penetration 069	Conduit Penetration Seal	Passive – Incorporated
132	4" Conduit Penetration 070	Conduit Penetration Seal	Passive – Incorporated
133	4" Conduit Penetration 071	Conduit Penetration Seal	Passive – Incorporated
134	4" Conduit Penetration 072	Conduit Penetration Seal	Passive – Incorporated
135	2" Conduit Penetration 073	Conduit Penetration Seal	Passive – Incorporated
136	2" Conduit Penetration 074	Conduit Penetration Seal	Passive – Incorporated
137	2" Conduit Penetration 075	Conduit Penetration Seal	Passive – Incorporated
138	4" Conduit Penetration 076	Conduit Penetration Seal	Passive – Incorporated

Table #3 - List of Features Immediately Judged as Acceptable			
#	Feature ID #	Description	Passive/Active Incorporated/Temporary
139	2" Conduit Penetration 077	Conduit Penetration Seal	Passive – Incorporated
140	2" Conduit Penetration 078	Conduit Penetration Seal	Passive – Incorporated
141	2" Conduit Penetration 079	Conduit Penetration Seal	Passive – Incorporated
142	4" Conduit Penetration 080	Conduit Penetration Seal	Passive – Incorporated
143	4" Conduit Penetration 081	Conduit Penetration Seal	Passive – Incorporated
144	4" Conduit Penetration 082	Conduit Penetration Seal	Passive – Incorporated
145	4" Conduit Penetration 083	Conduit Penetration Seal	Passive – Incorporated
146	4" Conduit Penetration 084	Conduit Penetration Seal	Passive – Incorporated
147	4" Conduit Penetration 086	Conduit Penetration Seal	Passive – Incorporated
148	4" Conduit Penetration 087	Conduit Penetration Seal	Passive – Incorporated
149	4" Conduit Penetration 088	Conduit Penetration Seal	Passive – Incorporated
150	4" Conduit Penetration 090	Conduit Penetration Seal	Passive – Incorporated
151	4" Conduit Penetration 091	Conduit Penetration Seal	Passive – Incorporated
152	4" Conduit Penetration 092	Conduit Penetration Seal	Passive – Incorporated
153	4" Conduit Penetration 094	Conduit Penetration Seal	Passive – Incorporated
154	4" Conduit Penetration 095	Conduit Penetration Seal	Passive – Incorporated
155	4" Conduit Penetration 096	Conduit Penetration Seal	Passive – Incorporated
156	4" Conduit Penetration 098	Conduit Penetration Seal	Passive – Incorporated
157	4" Conduit Penetration 099	Conduit Penetration Seal	Passive – Incorporated
158	4" Conduit Penetration 100	Conduit Penetration Seal	Passive – Incorporated
159	4" Conduit Penetration 101	Conduit Penetration Seal	Passive – Incorporated
160	4" Conduit Penetration 102	Conduit Penetration Seal	Passive – Incorporated
161	4" Conduit Penetration 103	Conduit Penetration Seal	Passive – Incorporated
162	4" Conduit Penetration 104	Conduit Penetration Seal	Passive – Incorporated
163	4" Conduit Penetration 105	Conduit Penetration Seal	Passive – Incorporated
164	Rectangular Penetration 3'-3" x 2'-0" 106	Penetration Seal	Passive – Incorporated
165	4" Conduit Penetration 107	Conduit Penetration Seal	Passive – Incorporated

Table #3 - List of Features Immediately Judged as Acceptable			
#	Feature ID #	Description	Passive/Active Incorporated/Temporary
166	4" Conduit Penetration 108	Conduit Penetration Seal	Passive – Incorporated
167	4" Conduit Penetration 109	Conduit Penetration Seal	Passive – Incorporated
168	4" Conduit Penetration 110	Conduit Penetration Seal	Passive – Incorporated
169	4" Conduit Penetration 111	Conduit Penetration Seal	Passive – Incorporated
170	4" Conduit Penetration 112	Conduit Penetration Seal	Passive – Incorporated
171	4" Conduit Penetration 113	Conduit Penetration Seal	Passive – Incorporated
172	4" Conduit Penetration 114	Conduit Penetration Seal	Passive – Incorporated
173	4" Conduit Penetration 115	Conduit Penetration Seal	Passive – Incorporated
174	4" Conduit Penetration 116	Conduit Penetration Seal	Passive – Incorporated
175	4" Conduit Penetration 118	Conduit Penetration Seal	Passive – Incorporated
176	4" Conduit Penetration 127	Conduit Penetration Seal	Passive – Incorporated
177	4" Conduit Penetration 128	Conduit Penetration Seal	Passive – Incorporated
178	4" Conduit Penetration 129	Conduit Penetration Seal	Passive – Incorporated
179	4" Conduit Penetration 131	Conduit Penetration Seal	Passive – Incorporated
180	24" Pipe Sleeve 133	Pipe Penetration Seal	Passive – Incorporated
181	West Wall Turbine Building (excluding condenser bay)	Wall	Passive – Incorporated
182	6" Dike 362	Dike	Passive – Incorporated
183	6" Dike 363	Dike	Passive – Incorporated
184	4" Area Drain 366	Area Drain	Passive – Incorporated
185	6" Dike 364	Dike	Passive – Incorporated
186	6" Dike 365	Dike	Passive – Incorporated
187	4" Area Drain 367	Area Drain	Passive – Incorporated
188	4" Floor Drain 306	Area Drain	Passive – Incorporated
189	4" Floor Drain 320	Area Drain	Passive – Incorporated
190	4" Floor Drain 321	Area Drain	Passive – Incorporated
191	4" Floor Drain 323	Area Drain	Passive – Incorporated
192	4" Floor Drain 324	Area Drain	Passive – Incorporated

Table #3 - List of Features Immediately Judged as Acceptable			
#	Feature ID #	Description	Passive/Active Incorporated/Temporary
193	1'6" x 2' Duct Bank 307	Duct Bank	Passive – Incorporated
194	1' x 2' Duct Bank 316	Duct Bank	Passive – Incorporated
195	4" Conduit 308	Conduit Penetration Seal	Passive – Incorporated
196	4" Conduit 309	Conduit Penetration Seal	Passive – Incorporated
197	4" Conduit 312	Conduit Penetration Seal	Passive – Incorporated
198	3" Conduit 314	Conduit Penetration Seal	Passive – Incorporated
199	3" Conduit 315	Conduit Penetration Seal	Passive – Incorporated
200	4" Conduit 317	Conduit Penetration Seal	Passive – Incorporated
201	4" Conduit 318	Conduit Penetration Seal	Passive – Incorporated
202	4" Conduit 319	Conduit Penetration Seal	Passive – Incorporated
203	EDG1 floors	Wall	Passive – Incorporated
204	1'6" x 2' Duct Bank 326	Duct Bank	Passive – Incorporated
205	1' x 2' Duct Bank 335	Duct Bank	Passive – Incorporated
206	4" Floor Drain 325	Area Drain	Passive – Incorporated
207	4" Floor Drain 340	Area Drain	Passive – Incorporated
208	4" Floor Drain 341	Area Drain	Passive – Incorporated
209	4" Floor Drain 342	Area Drain	Passive – Incorporated
210	4" Floor Drain 344	Area Drain	Passive – Incorporated
211	3" Conduit 333	Conduit Penetration Seal	Passive – Incorporated
212	4" Conduit 336	Conduit Penetration Seal	Passive – Incorporated
213	4" Conduit 337	Conduit Penetration Seal	Passive – Incorporated
214	4" Conduit 338	Conduit Penetration Seal	Passive – Incorporated
215	EDG2 floors	Floor	Passive – Incorporated
216	East Wall Emergency Diesel Generator Building	Wall	Passive – Incorporated
217	North Wall Emergency Diesel Generator Building	Wall	Passive – Incorporated
218	South Wall Emergency Diesel Generator Building	Wall	Passive – Incorporated

Table #3 - List of Features Immediately Judged as Acceptable			
#	**Feature ID #**	**Description**	**Passive/Active Incorporated/Temporary**
219	West Wall Emergency Diesel Generator Building	Wall	Passive – Incorporated
220	D. O. Tank Sump	Sump	Passive – Incorporated
221	8" Sleeve 303	Penetration Seal	Passive – Incorporated
222	North Wall Emergency Diesel Generator Building DO Vault	Wall	Passive – Incorporated
223	South Wall Emergency Diesel Generator Building DO Vault	Wall	Passive – Incorporated
224	West Wall Emergency Diesel Generator Building DO Vault	Wall	Passive – Incorporated
225	D.O. floors	Floor	Passive – Incorporated

Table # 4: List of Features Not Immediately Judged as Acceptable					
#	Feature ID #	Description	Observation	Component Operability	Resolution
1	16" Pipe Sleeve 281	Pipe Penetration Seal	Corrosion on penetration and signs of water seepage on wall.	Yes – Documented in IR 01402009	AR A2312529 has been issued to paint the area under the penetration. Approved, not scheduled yet.
2	6" Pipe Sleeve 282	Pipe Penetration Seal			
3	16" Pipe Sleeve 283	Pipe Penetration Seal			
4	Rectangular Penetration 4'x2' 278	Penetration Seal	Corrosion on penetration pipe flange and signs of water seepage on wall.	Yes – Documented in IR 01402045	AR A2312528 has been issued to paint the area under the penetration. Approved, not scheduled yet.
5	4" Conduit Penetration 245	Conduit Penetration Seal	There is extensive corrosion on these penetration sleeves, and stalactite growth underneath the penetration and cap.	Yes – Documented in IR 01407010	AR A2313047 Issued to clean the area under the penetrations. Not scheduled yet. Closed to existing preventative maintenance.
6	4" Conduit Penetration 246	Conduit Penetration Seal			
7	4" Conduit Penetration 358	Conduit Penetration Seal			
8	4" Conduit Seal 358A	Conduit Internal Seal	There is stalactite growth underneath this conduit.		
9	Rectangular Penetration 3' x 2' 229	Penetration Seal	Corrosion on penetration and signs of water seepage on wall.	Yes – Documented in IR 01412372	AR A2313693 has been issued to paint area under the penetration. Not yet scheduled

Table # 4: List of Features Not Immediately Judged as Acceptable					
#	Feature ID #	Description	Observation	Component Operability	Resolution
10	Rectangular Penetration 4'x2' 269	Penetration Seal	Corrosion on penetration and signs of water seepage on wall.	Yes – Documented in IR 01412397	AR A2313692 has been issued to paint the area under the penetration. Has not been scheduled yet.
11	Rectangular Penetration 3'x2' 270	Penetration Seal			
12	Rectangular Penetration 3'x2' 271	Penetration Seal			
13	Rectangular Penetration 4'x2' 273	Penetration Seal	Corrosion on penetration and signs of water seepage on wall.	Yes – Documented in IR 01415778	Area under the penetration to be painted. Has not been scheduled yet.
14	Rectangular Penetration 4'-6" x 1'6" 040	Penetration Seal	Penetrating conduit is cut and uncapped.	No – Documented in IR 01406089. See discussion in Resolution column	AR A2313043 issued to cap conduit, scheduled to be completed no later than 11/27/2012
15	4" Conduit Penetration 045	Conduit Penetration Seal	Water intrusion through these penetrations was observed at roughly 40 drops per minute during a light rainstorm.	No – Documented in IR 01405765. See discussion in Resolution column.	According to plant engineers, "The documentation provided in assignment 01405765-04 states the impact on flooding is negligible... cable drainage is preferred because it minimizes the amount of time the electrical cables are wetted... from a flooding electrical standpoint, the
16	4" Conduit Penetration 046	Conduit Penetration Seal			
17	4" Conduit Penetration 049	Conduit Penetration Seal			
18	4" Conduit Penetration 050	Conduit Penetration Seal			
19	4" Conduit Penetration 051	Conduit Penetration Seal			
20	4" Conduit Penetration 053	Conduit Penetration Seal			

Table # 4: List of Features Not Immediately Judged as Acceptable					
#	Feature ID #	Description	Observation	Component Operability	Resolution
21	4" Conduit Penetration 054	Conduit Penetration Seal			seals do not need to be repaired. No further actions required"
22	4" Conduit Penetration 055	Conduit Penetration Seal			
23	4" Conduit Penetration 117	Conduit Penetration Seal	Penetration seals appear to be severely degraded, and signs of past water intrusion are apparent on walls underneath penetrations.	**No –** Documented in IR 01406841. See discussion in Resolution column.	According to plant engineers, "The leak noted in [Turbine Building] basement is from conduit that goes to EDG. This is expected leakage. The design is to prevent any water from accumulating in conduit, instead any water that enters conduit is directed to the 1-5 sump"
24	4" Conduit Penetration 119	Conduit Penetration Seal			
25	4" Conduit Penetration 120	Conduit Penetration Seal			
26	4" Conduit Penetration 121	Conduit Penetration Seal			
27	4" Conduit Penetration 122	Conduit Penetration Seal			
28	4" Conduit Penetration 123	Conduit Penetration Seal			
29	4" Conduit Penetration 124	Conduit Penetration Seal			
30	4" Conduit Penetration 125	Conduit Penetration Seal			
31	4" Conduit Penetration 126	Conduit Penetration Seal			

Table # 4: List of Features Not Immediately Judged as Acceptable					
#	Feature ID #	Description	Observation	Component Operability	Resolution
32	6" Pipe Sleeve 134	Pipe Penetration Seal	Penetrating conduit is cut and uncapped. A seal inside the penetrating conduit is not visible.	**No –** Documented in IR 01406952. See discussion in Resolution column	AR A2313037 issued to cap conduit, scheduled to be completed no later than 11/27/2012
33	OCNGS Site Topography		Since the most recent PMP flooding calculation in 2000, site topography has changed, including the installation of security barriers and new buildings, and re-grading around the EDG building.	**Yes –** Documented in IR 01404344. See discussion in Resolution column	Current site topography is being documented, and a revised PMP flooding study is being performed as part of the Fukushima Response Effort. Current configuration determined not to negatively impact SSCs.
34	Area Drain 351	Area Drain	Area drains and scupper are partially clogged with debris. Area Drain 353's drain cap appears to have been installed upside down.	**No –** Documented in IR 01419031. Se discussion in Resolution column	AR A2313982 issued to repair drains, scheduled to be completed no later than 11/27/2012
35	Area Drain 353	Area Drain			
36	4" Scupper Type Roof Drain 295	Scupper			

Table # 5: List of Features in Restricted Access Areas				
#	Feature ID #	Description	Reason	Resolution
1	2" Conduit Penetration 136	Conduit Penetration Seal	These features are in the Condenser Bay, SJAE room, and High Low Room, all of which are significantly lower dose during outage.	To be evaluated during the 1R24 Refueling Outage October 2012
2	2" Conduit Penetration 137	Conduit Penetration Seal		
3	2" Conduit Penetration 138	Conduit Penetration Seal		
4	4" Conduit Penetration 139	Conduit Penetration Seal		
5	2" Conduit Penetration 140	Conduit Penetration Seal		
6	2" Conduit Penetration 141	Conduit Penetration Seal		
7	2" Conduit Penetration 142	Conduit Penetration Seal		
8	4" Conduit Penetration 143	Conduit Penetration Seal		
9	4" Conduit Penetration 144	Conduit Penetration Seal		
10	4" Conduit Penetration 145	Conduit Penetration Seal		
11	4" Conduit Penetration 146	Conduit Penetration Seal		
12	24" Pipe Sleeve 147	Pipe Penetration Seal		
13	Rectangular Penetration 3 x 1'-6" 148	Penetration Seal		
14	2" Conduit Penetration 149	Conduit Penetration Seal		
15	2" Conduit Penetration 150	Conduit Penetration Seal		
16	2" Conduit Penetration 151	Conduit Penetration Seal		
17	2" Conduit Penetration 152	Conduit Penetration Seal		
18	4" Conduit Penetration 153	Conduit Penetration Seal		

Table # 5: List of Features in Restricted Access Areas				
#	Feature ID #	Description	Reason	Resolution
19	4" Conduit Penetration 154	Conduit Penetration Seal	These features are in the Condenser Bay, SJAE room, and High Low Room, all of which are significantly lower dose during outage.	To be evaluated during the 1R24 Refueling Outage October 2012
20	4" Conduit Penetration 155	Conduit Penetration Seal		
21	4" Conduit Penetration 156	Conduit Penetration Seal		
22	4" Conduit Penetration 157	Conduit Penetration Seal		
23	4" Conduit Penetration 158	Conduit Penetration Seal		
24	4" Conduit Penetration 159	Conduit Penetration Seal		
25	4" Conduit Penetration 160	Conduit Penetration Seal		
26	4" Conduit Penetration 161	Conduit Penetration Seal		
27	4" Conduit Penetration 162	Conduit Penetration Seal		
28	4" Conduit Penetration 163	Conduit Penetration Seal		
29	4" Conduit Penetration 164	Conduit Penetration Seal		
30	4" Conduit Penetration 165	Conduit Penetration Seal		
31	4" Conduit Penetration 166	Conduit Penetration Seal		
32	4" Conduit Penetration 167	Conduit Penetration Seal		
33	4" Conduit Penetration 168	Conduit Penetration Seal		
34	4" Conduit Penetration 169	Conduit Penetration Seal		
35	4" Conduit Penetration 170	Conduit Penetration Seal		
36	4" Conduit Penetration 171	Conduit Penetration Seal		

Table # 5: List of Features in Restricted Access Areas				
#	Feature ID #	Description	Reason	Resolution
37	4" Conduit Penetration 172	Conduit Penetration Seal	These features are in the Condenser Bay, SJAE room, and High Low Room, all of which are significantly lower dose during outage.	To be evaluated during the 1R24 Refueling Outage October 2012
38	4" Conduit Penetration 173	Conduit Penetration Seal		
39	4" Conduit Penetration 174	Conduit Penetration Seal		
40	4" Conduit Penetration 175	Conduit Penetration Seal		
41	4" Conduit Penetration 176	Conduit Penetration Seal		
42	4" Conduit Penetration 177	Conduit Penetration Seal		
43	4" Conduit Penetration 178	Conduit Penetration Seal		
44	4" Conduit Penetration 179	Conduit Penetration Seal		
45	4" Conduit Penetration 180	Conduit Penetration Seal		
46	4" Conduit Penetration 181	Conduit Penetration Seal		
47	4" Conduit Penetration 182	Conduit Penetration Seal		
48	4" Conduit Penetration 183	Conduit Penetration Seal		
49	4" Conduit Penetration 184	Conduit Penetration Seal		
50	4" Conduit Penetration 185	Conduit Penetration Seal		
51	4" Conduit Penetration 186	Conduit Penetration Seal		
52	4" Conduit Penetration 187	Conduit Penetration Seal		
53	4" Conduit Penetration 188	Conduit Penetration Seal		
54	4" Conduit Penetration 189	Conduit Penetration Seal		

Table # 5: List of Features in Restricted Access Areas				
#	Feature ID #	Description	Reason	Resolution
55	4" Conduit Penetration 190	Conduit Penetration Seal	These features are in the Condenser Bay, SJAE room, and High Low Room, all of which are significantly lower dose during outage.	To be evaluated during the 1R24 Refueling Outage October 2012
56	4" Conduit Penetration 191	Conduit Penetration Seal		
57	4" Conduit Penetration 192	Conduit Penetration Seal		
58	2" Conduit Penetration 193	Conduit Penetration Seal		
59	2" Conduit Penetration 194	Conduit Penetration Seal		
60	2" Conduit Penetration 195	Conduit Penetration Seal		
61	2" Conduit Penetration 196	Conduit Penetration Seal		
62	18" Pipe Sleeve 197	Pipe Penetration Seal		
63	4" Conduit Penetration 198	Conduit Penetration Seal		
64	4" Conduit Penetration 199	Conduit Penetration Seal		
65	4" Conduit Penetration 200	Conduit Penetration Seal		
66	4" Conduit Penetration 201	Conduit Penetration Seal		
67	4" Conduit Penetration 202	Conduit Penetration Seal		
68	4" Conduit Penetration 203	Conduit Penetration Seal		
69	4" Conduit Penetration 204	Conduit Penetration Seal		
70	4" Conduit Penetration 205	Conduit Penetration Seal		
71	4" Conduit Penetration 206	Conduit Penetration Seal		
72	4" Conduit Penetration 207	Conduit Penetration Seal		
73	10" Pipe Sleeve 208	Pipe Penetration Seal		

Table # 5: List of Features in Restricted Access Areas				
#	Feature ID #	Description	Reason	Resolution
74	16" Pipe Sleeve 209	Pipe Penetration Seal	These features are in the Condenser Bay, SJAE room, and High Low Room, all of which are significantly lower dose during outage.	To be evaluated during the 1R24 Refueling Outage October 2012
75	3" Pipe Sleeve 210	Pipe Penetration Seal		
76	16" Pipe Sleeve 211	Pipe Penetration Seal		
77	16" Pipe Sleeve 212	Pipe Penetration Seal		
78	4" Conduit Penetration 213	Conduit Penetration Seal		
79	4" Conduit Penetration 214	Conduit Penetration Seal		
80	4" Conduit Penetration 215	Conduit Penetration Seal		
81	4" Conduit Penetration 216	Conduit Penetration Seal		
82	4" Conduit Penetration 346	Conduit Penetration Seal		
83	4" Conduit Penetration 347	Conduit Penetration Seal		
84	4" Conduit Penetration 348	Conduit Penetration Seal		
85	4" Conduit Penetration 349	Conduit Penetration Seal		
86	20" Pipe Sleeve 217	Pipe Penetration Seal		
87	Manhole Cover 243	Manhole Cover and Seal		
88	Manhole Cover 244	Manhole Cover and Seal		
89	Condenser Bay floor	Condenser Bay floor		
90	West Wall Turbine Building Condenser Bay	Wall		
91	Rectangular Penetration 3'6" x 3'6" 218	Penetration Seal		
92	4" Conduit Penetration 230	Conduit Penetration Seal		
93	4" Conduit Penetration 231	Conduit Penetration Seal		
94	4" Conduit Penetration 232	Conduit Penetration Seal		

Table # 5: List of Features in Restricted Access Areas				
#	Feature ID #	Description	Reason	Resolution
95	4" Conduit Penetration 233	Conduit Penetration Seal	These features are in the Condenser Bay, SJAE room, and High Low Room, all of which are significantly lower dose during outage.	To be evaluated during the 1R24 Refueling Outage October 2012
96	4" Conduit Penetration 234	Conduit Penetration Seal		
97	4" Conduit Penetration 235	Conduit Penetration Seal		
98	4" Conduit Penetration 236	Conduit Penetration Seal		
99	4" Conduit Penetration 237	Conduit Penetration Seal		
100	4" Conduit Penetration 238	Conduit Penetration Seal		
101	4" Conduit Penetration 239	Conduit Penetration Seal		
102	4" Conduit Penetration 240	Conduit Penetration Seal		
103	4" Conduit Penetration 241	Conduit Penetration Seal		
104	40" Pipe Sleeve 001	Pipe Penetration Seal		
105	40" Pipe Sleeve 002	Pipe Penetration Seal		
106	Rectangular Penetration 3 x 1'-6" 003	Penetration Seal		
107	East Wall Turbine Building (SJAE/High-Low Room)	Wall		
108	South Wall Turbine Building (SJAE Room)	Wall		
109	3" Pipe Sleeve (plant ground penetration)	Pipe Penetration Seal	These features seals are inside long lengths of pipe, and will require special equipment in order to observe	
110	6" Pipe Sleeve 135	Pipe Penetration Seal		
111	4" Conduit 310	Penetration Seal	These features are in the DG1 and DG2 cable trenches, and can only be accessed when the Diesel	
112	4" Conduit 311	Penetration Seal		
113	4" Conduit 313	Penetration Seal		
114	4" Conduit 327	Penetration Seal		

Table # 5: List of Features in Restricted Access Areas				
#	Feature ID #	Description	Reason	Resolution
115	4" Conduit 328	Penetration Seal	Generators are offline to ensure they are denergized.	To be evaluated during the 1R24 Refueling Outage October 2012
116	4" Conduit 329	Penetration Seal		
117	4" Conduit 330	Penetration Seal		
118	4" Conduit 331	Penetration Seal		
119	4" Conduit 332	Penetration Seal		
120	4" Conduit 334	Penetration Seal		

Table # 6: List of Features in Inaccessible Areas				
#	Feature ID #	Description	Reason	Resolution
1	4" Conduit Seal 224A	Conduit Internal Seal	Conduits at OCNGS could not be disassembled for inspection during the walkdown, and no accommodation for inspection of the internal seals was made when the plant was built. Major equipment disassembly would be required to access.	Reasonable Assurance Documented in Part E of the Walkdown Record Forms
2	4" Conduit Seal 225A	Conduit Internal Seal		
3	4" Conduit Seal 226A	Conduit Internal Seal		
4	4" Conduit Seal 248A	Conduit Internal Seal		
5	4" Conduit Seal 287A	Conduit Internal Seal		
6	4" Conduit Seal 357A	Conduit Internal Seal		
7	4" Conduit Seal 359A	Conduit Internal Seal		
8	4" Conduit Seal 008A	Conduit Internal Seal		
9	4" Conduit Seal 009A	Conduit Internal Seal		
10	4" Conduit Seal 010A	Conduit Internal Seal		
11	4" Conduit Seal 012A	Conduit Internal Seal		
12	4" Conduit Seal 013A	Conduit Internal Seal		
13	4" Conduit Seal 016A	Conduit Internal Seal		
14	4" Conduit Seal 067A	Conduit Internal Seal		
15	4" Conduit Seal 068A	Conduit Internal Seal		
16	4" Conduit Seal 069A	Conduit Internal Seal		
17	4" Conduit Seal 070A	Conduit Internal Seal		
18	4" Conduit Seal 072A	Conduit Internal Seal		

Table # 6: List of Features in Inaccessible Areas				
#	Feature ID #	Description	Reason	Resolution
19	4" Conduit Seal 081A	Conduit Internal Seal	Conduits at OCNGS could not be disassembled for inspection during the walkdown, and no accommodation for inspection of the internal seals was made when the plant was built. Major equipment disassembly would be required to access.	Reasonable Assurance Documented in Part E of the Walkdown Record Forms
20	4" Conduit Seal 115A	Conduit Internal Seal		
21	4" Conduit Seal 116A	Conduit Internal Seal		
22	4" Conduit Seal 127A	Conduit Internal Seal		
23	4" Conduit Seal 128A	Conduit Internal Seal		
24	4" Conduit Seal 129A	Conduit Internal Seal		
25	4" Conduit Seal 131A	Conduit Internal Seal		
26	Rectangular Penetration 3 x 1'-6" 006	Penetration Seal	This penetration includes a cut conduit, and the camera on a pole used for OCNGS walkdowns was not able to capture images of the inside. To access this penetration by ladder or scaffold, a cable tray would need to be removed. Major equipment disassembly would be required to access.	
27	4" Conduit Penetration 032	Conduit penetration seal	The camera on a pole was not able to capture images of internal seals, and access would require major disassembly of equipment	
28	4" Conduit Penetration 036	Conduit penetration seal		
29	4" Conduit Penetration 085	Conduit penetration seal	Conduits are permanently covered with a plaster-like coating that prevents direct inspection. Major equipment disassembly would be required to access.	
30	4" Conduit Penetration 089	Conduit penetration seal		
31	4" Conduit Penetration 093	Conduit penetration seal		
32	4" Conduit Penetration 097	Conduit penetration seal		

Table # 6: List of Features in Inaccessible Areas				
#	Feature ID #	Description	Reason	Resolution
33	4" Conduit Penetration 130	Conduit penetration seal		Reasonable Assurance Documented in Part E of the Walkdown Record Forms
34	4" Conduit Penetration 132	Conduit penetration seal		
35	4" Floor Drain 322	Area Drain	These floor drains are located directly under Diesel Generators 1 and 2, and cannot be observed. Major equipment disassembly would be required to access.	
36	4" Floor Drain 343	Area Drain		
37	30" O.V. Drain	Roof & Overboard Drainage System	Much of the system is buried, and could not be observed during the walkdowns. There is no practical way to inspect this whole system.	
38	Sump 1-1	Turbine Building	There is no practical means to evaluate the bottom of the 1-1 and 1-5 sump, as both are under water.	
39	Sump 1-5	Turbine Building		
40	Turbine Building Base Slab	Turbine Building	The Turbine Building base slab is at 0' MSL, and buried under the Turbine Building floor and a bed of sand. There is no reasonable means of access.	
41	4" Conduit Penetration 045	Conduit penetration seal	These penetrations are permanently covered in fireproofing, which is required to provide separation between DG1 and DG2 cables. Major equipment disassembly would be required to access.	These features were entered into site CAP due to observations associated with them. See Table 4.
42	4" Conduit Penetration 046	Conduit penetration seal		
43	4" Conduit Penetration 049	Conduit penetration seal		
44	4" Conduit Penetration 050	Conduit penetration seal		
45	4" Conduit Penetration 053	Conduit penetration seal		
46	4" Conduit Penetration 054	Conduit penetration seal		

Table # 6: List of Features in Inaccessible Areas				
#	Feature ID #	Description	Reason	Resolution
47	4" Conduit Seal 358A	Conduit Internal Seal	Conduits at OCNGS could not be disassembled for inspection during the walkdown	

6. REFERENCES

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23. DWG 3E-151-02-003, Rev. 11 – General Arrangement Turbine Building Plan Floor Elevation 23'-6"
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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 120 features classified as restricted access.	OC1R24 Fall 2012	Yes	No