ENCLOSURE 1

Updated Transmittal # 1 (Annex A) Seismic Walkdown Report In Response To The 50.54(f) Information Request Regarding Fukushima Near-Term Task Force Recommendation 2.3: Seismic for the LaSalle County Station, Unit 2, Report No. RS-13-097

(176 Pages)

SEISMIC WALKDOWN REPORT

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

UPDATED TRANSMITTAL # 1 (ANNEX A)

for the

LA SALLE COUNTY GENERATING STATION UNIT 2
2601 North 21st Road, Marseilles, Illinois, 61341-9757
Facility Operating License No. NPF-18
NRC Docket No. 50-374
Correspondence No.: RS-13-097

Prepared by:
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SEISMIC WALKDOWN REPORT

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

for the

LASALLE COUNTY GENERATING STATION UNIT 2
2601 North 21st Road, Marseilles, Illinois, 61341-9757
Facility Operating License No. NPF-18
NRC Docket No. 50-374
Correspondence No.: RS-12-163

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Document Title:
SEISMIC WALKDOWN REPORT IN RESPONSE TO THE 50.54(f) INFORMATION REQUEST REGARDING FUKUSHIMA NEAR-TERM TASK FORCE RECOMMENDATION 2.3: SEISMIC for the LASALLE COUNTY GENERATING STATION UNIT 2

Document Type: Report

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Project Name:
NTTF R2.3 Seismic Walkdowns for Exelon - LaSalle
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Executive Summary

The purpose of this report is to provide information as requested by the Nuclear Regulatory Commission (NRC) in its March 12, 2012 letter issued to all power reactor licensees and holders of construction permits in active or deferred status. (Ref. 6) In particular, this report provides information requested to address Enclosure 3, Recommendation 2.3: Seismic, of the March 12, 2012 letter. (Ref. 6)

Following the accident at the Fukushima Dai-ichi nuclear power plant resulting from the March 11, 2011, Great Tohoku Earthquake and subsequent tsunami, the NRC established the Near Term Task Force (NTTF) in response to Commission direction. The NTTF issued a report - *Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident* - that made a series of recommendations, some of which were to be acted upon "without unnecessary delay." (Ref. 7) On March 12, 2012, the NRC issued a letter to all power reactor licensees in accordance with 10CFR50.54(f). The 50.54(f) letter requests information to assure that certain NTTF recommendations are addressed by all U.S. nuclear power plants. (Ref. 6) The 50.54(f) letter requires, in part, all U.S. nuclear power plants to perform seismic walkdowns to identify and address degraded, non-conforming or unanalyzed conditions and to verify the current plant configuration is within the current seismic licensing basis. This report documents the seismic walkdowns performed at LaSalle County Generating Station Unit 2 in response, in part, to the 50.54(f) letter issued by the NRC.

The Nuclear Energy Institute (NEI), supported by industry personnel, cooperated with the NRC to prepare guidance for conducting seismic walkdowns as required in the 50.54(f) letter, Enclosure 3, Recommendation 2.3: Seismic. (Ref. 6) The guidelines and procedures prepared by NEI and endorsed by the NRC were published through the Electric Power Research Institute (EPRI) as EPRI Technical Report 1025286, *Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic,* dated June 2012; henceforth, referred to as the "EPRI guidance document." (Ref. 1) Exelon/LaSalle has utilized this NRC endorsed guidance as the basis for the seismic walkdowns and this report. (Ref. 1)

The EPRI guidance document was used to perform the engineering walkdowns and evaluations described in this report. In accordance with the EPRI guidance document, the following topics are addressed in the subsequent sections of this report.

- Seismic Licensing Basis
- Personnel Qualifications
- Selection of Systems, Structures, and Components (SSC)
- Seismic Walkdowns and Area Walk-Bys
- Seismic Licensing Basis Evaluations
- IPEEE Vulnerabilities Resolution Report
- Peer Review

Seismic Licensing Basis

The Seismic Licensing Basis is briefly described in Section 2 of this report. The safe shutdown earthquake for the LaSalle County Station site is 0.20g horizontal ground acceleration and 0.133g vertical ground acceleration. (Ref. 2 section 3.7)

Personnel Qualifications

Personnel qualifications are discussed in Section 3 of this report. The personnel who performed the key activities required to fulfill the objectives and requirements of the 50.54(f) letter are qualified and trained as required in the EPRI guidance document. (Ref. 1) These personnel are responsible for:

- Selecting the SSCs that should be placed on the Seismic Walkdown Equipment List (SWEL),
- Performing the Seismic Walkdowns and Area Walk-Bys,
- Performing the seismic licensing basis evaluations, as applicable,
- Identifying the list of plant-specific vulnerabilities identified during the IPEEE program and describing the actions taken to eliminate or reduce them,
- Performing the peer reviews

Selection of SSCs

Selection of SSCs is discussed in Section 4 of this report. The process used to select the items that were included in the overall Seismic Walkdown Equipment List (SWEL) is described in detail in the EPRI guidance document, Section 3: Selection of SSCs. (Ref. 1) The SWEL is comprised of two groups of items, which are described at a high level in the following subsections.

Sample of Required Items for the Five Safety Functions -- SWEL 1

Screen #1 narrowed the scope of SSCs in the plant to those that are designed to Seismic Category I requirements because they have a seismic licensing basis.

Screen #2 narrowed the scope of SSCs by selecting only those that do not regularly undergo inspections to confirm that their configuration continues to be consistent with the plant licensing basis.

Screen #3 narrowed the scope of SSCs included on SWEL 1 as only those associated with maintaining the five safety functions. These five safety functions include the four safe shutdown functions (reactor reactivity control, reactor coolant pressure control, reactor coolant inventory control, and decay heat removal, which includes the Ultimate Heat Sink), plus the containment functions.

Screen #4 was a process intended to result in a SWEL 1 that sufficiently represented the broader population of plant equipment and systems needed to meet the objectives of the 50.54(f) letter. The following five sample attributes were used:

- A variety of types of systems
- Major new or replacement equipment
- A variety of types of equipment
- A variety of environments

- Equipment enhanced due to vulnerabilities identified during the IPEEE program

Spent Fuel Pool Related Items – SWEL 2

Screen #1 and Screen #2 were used to narrow the scope of spent fuel pool related SSCs to those that have a seismic licensing basis and those that are appropriate for an equipment walkdown process. Screen #3 was a process intended to result in SWEL 2 that sufficiently represents the broader population of spent fuel pool Seismic Category I equipment and systems to meet the objectives of the 50.54(f) letter, and included the following sample selection attributes:

- A variety of types of systems
- Major new or replacement equipment
- A variety of types of equipment
- A variety of environments

Screen #4 identified items of the spent fuel pool that could potentially cause a rapid drain-down of the pool, even if such items are not Seismic Category I. Rapid drain-down is defined as lowering of the water level to the top of the fuel assemblies within 72 hours after the earthquake. Any items identified as having the potential for rapidly draining the spent fuel pool were to be added to SWEL 2.

For LaSalle Unit 2, the SWEL is comprised of:

- SWEL 1 resulted with 113 items for walkdown.
- SWEL 2 resulted with 2 items for walkdown.
- No items associated with spent fuel pool rapid drain-down are included on SWEL 2.

Seismic Walkdowns and Area Walk-Bys

Section 5, Appendix C, and Appendix D of this report documents the equipment Seismic Walkdowns and the Area Walk-Bys. The online seismic walkdowns for LaSalle Unit 2 were performed during the weeks of August 27, September 3, September 10, and September 17 2012. During the walkdown activities, the walkdown team consisted of two (2) Seismic Walkdown Engineers (SWEs), a station Equipment Operator, and various station personnel.

The seismic walkdowns focused on the seismic adequacy of the items on the SWEL. The walkdowns focused on the following:

- Adverse anchorage conditions
- Adverse seismic spatial interactions
- Other adverse seismic conditions (e.g., degradation, configuration, etc.,)

Area Walk-Bys were conducted in each area of the plant that contained an item on the SWEL (generally within 35 feet of the SWEL component). The Area Walk-By was performed to identify potentially adverse seismic conditions associated with other SSCs located in the vicinity of the SWEL item. The key examination factors that were considered in the Area Walk-Bys included the following:

- Anchorage conditions (if visible without opening equipment)
- Significantly degraded equipment in the area
- Potential seismic interaction
- A visual assessment (from the floor) of cable/conduit raceways and HVAC ducting (e.g., condition of supports or fill conditions of cable trays)
- Potential adverse interactions that could cause flooding/spray and fire in the area
- Other housekeeping items, including temporary installations

The seismic walkdown team inspected 108 of the 115 components on the SWEL (comprised of SWEL 1 and SWEL 2). Walkdowns for seven (7) components were deferred due to accessibility issues such as being located in containment or energized equipment. The seven (7) remaining items will be inspected during a unit outage or another time when the equipment is accessible, as required. Anchorage verification was required for a minimum of 31 components. (Ref. 1) A total of 43 anchorage configurations were confirmed to be installed in accordance with the station documentation.

Following the completion of the online seismic walkdowns, the industry was made aware that the NRC staff had clarified a position on opening electrical cabinets to inspect for other adverse seismic conditions. Supplemental inspections of 18 electrical cabinets are planned and will be completed, as required, during a unit outage or another time when the equipment becomes accessible. The list of electrical cabinets along with the milestone completion schedule is provided in Table E-2.

During the seismic walkdowns at the LaSalle Unit 2 ten (10) Issue Reports (IRs) were issued. After evaluation through the corrective action program (CAP), it was determined that none of the conditions identified in the IRs were found to be adverse seismic conditions.

Seismic Licensing Basis Evaluations

The EPRI guidance document, Section 5: Seismic Licensing Basis Evaluation provides a detailed process to perform and document seismic licensing basis evaluations of SSCs identified when potentially adverse seismic conditions are identified. The process provides a means to identify, evaluate and document how the identified potentially adverse seismic condition meets a station's seismic licensing basis without entering the condition into a station's CAP. In lieu of this process, Exelon/LaSalle utilized the existing processes and procedures (Site CAP Expectations) to identify, evaluate and document conditions identified during the Seismic Walkdowns.

In accordance with Exelon/LaSalle processes and procedures, all questionable conditions identified by the SWEs during the walkdowns were entered into the station CAP to be further evaluated and addressed as required. The SWEs provided input to support the identification and evaluation (including seismic licensing basis evaluations, as required) of the potentially adverse seismic conditions entered into the CAP. The station corrective action program is a more robust process than that provided in the EPRI guidance document; in part, ensuring each condition is properly evaluated for conformance with design and licensing bases and corrected as required.

Conditions identified during the walkdowns were documented on the Seismic Walkdown Checklists (SWCs), Area Walk-By Checklists (AWCs), and entered into the CAP. For

those conditions that required, seismic licensing basis evaluations were completed and documented within the IR. Tables 5-2 and 5-3 in the report provide the IR, a summary of the condition, and the action completion status.

IPEEE Vulnerabilities

IPEEE vulnerabilities are addressed in Section 7 of this report. No vulnerabilities were identified as a result of the effort that addressed the Individual Plant Examination of External Events (IPEEE). (Ref. 5) Further, no anomalies, outliers, findings, or plant improvements were identified as a result of the IPEEE program. (Ref. 3 & 5)

Peer Reviews

A peer review team consisting of at least two individuals was assembled and peer reviews were performed in accordance with Section 6: Peer Reviews of the EPRI guidance document. The Peer Review process included the following activities:

- Review of the selection of SSCs included on the SWEL
- Review of a sample of the checklists prepared for the Seismic Walkdowns and Area Walk-Bys
- Review of licensing basis evaluations, as applicable
- Review of the decisions for entering the potentially adverse conditions into the CAP process
- Review of the submittal report
- Provided a summary report of the peer review process in the submittal report

Section 8 of this report contains a summary of the Peer Review. The Peer Review determined that the objectives and requirements of the 50.54(f) letter are met. Further, it was concluded by the peer reviews that the efforts completed and documented within this report are in accordance with the EPRI guidance document.

Summary

In summary, seismic walkdowns have been performed at the LaSalle County Generating Station Unit 2 in accordance with the NRC endorsed walkdown methodology. All potentially degraded, nonconforming, or unanalyzed conditions identified as a result of the seismic walkdowns have been entered into the corrective action program.

Evaluations of the identified conditions are complete and documented within the CAP. These evaluations determined the Seismic Walkdowns resulted in no adverse anchorage conditions, no adverse seismic spatial interactions, and no other adverse seismic conditions associated with the items on the SWEL. Similarly, the Area Walk-Bys resulted in no adverse seismic conditions associated with other SSCs located in the vicinity of the SWEL item(s).

The Seismic Walkdowns identified ten (10) minor conditions. Other than these minor conditions, the Seismic Walkdowns identified no degraded, nonconforming, or unanalyzed conditions that required either immediate or follow-on action. No planned or newly identified protection or mitigation features have resulted from the efforts to address the 50.54(f) letter.

Follow-on activities required to complete the efforts to address Enclosure 3 of the 50.54(f) letter include inspection of seven (7) items deferred due to inaccessibility along

with supplemental inspections of 18 electrical cabinets. Area Walk-Bys will be completed, as required, during these follow-on activities.

To address the items deferred due to inaccessibility and the supplemental inspections of electrical cabinets, follow-on Seismic Walkdowns and Area Walk-Bys were conducted during the first quarter of 2013. No degraded, nonconforming, or unanalyzed conditions that required either immediate or follow-on actions were identified.

Annex A to this report provides:

1) Additional information obtained from these follow-on inspections performed on the open items listed on Table E-1 and E-2, and

2) Status updates on the conditions identified during the previous walkdowns and walk-Bys, listed on Table 5-2 and Table 5-3.

As of May 10, 2013, remaining follow-on activities required to complete the efforts to address Enclosure 3 of the 50.54(f) letter include the supplemental inspection of 5 electrical cabinets listed in Table E-2 of the initial report, which are to be completed on or before the original commitment date of Spring 2015 (L2R15 Outage). These items are listed in Table AE-2 of Annex A.

1 Introduction

1.1 PURPOSE

The purpose of this report is to provide information as requested by the Nuclear Regulatory Commission (NRC) in its March 12, 2012 letter issued to all power reactor licensees and holders of construction permits in active or deferred status. (Ref. 6) In particular, this report provides information requested to address Enclosure 3, Recommendation 2.3: Seismic, of the March 12, 2012 letter. (Ref. 6)

1.2 BACKGROUND

Following the accident at the Fukushima Dai-ichi nuclear power plant resulting from the March 11, 2011, Great Tohoku Earthquake and subsequent tsunami, the NRC established the Near Term Task Force (NTTF) in response to Commission direction. The NTTF issued a report - *Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident* - that made a series of recommendations, some of which were to be acted upon "without unnecessary delay." (Ref. 7) On March 12, 2012, the NRC issued a letter to all power reactor licensees in accordance with 10CFR50.54(f). The 50.54(f) letter requests information to assure that certain NTTF recommendations are addressed by all U.S. nuclear power plants. (Ref. 6) The 50.54(f) letter requires, in part, all U.S. nuclear power plants to perform seismic walkdowns to identify and address degraded, non-conforming or unanalyzed conditions and to verify the current plant configuration is within the current seismic licensing basis. This report documents the seismic walkdowns performed at LaSalle County Generating Station Unit 2 in response, in part, to the 50.54(f) letter issued by the NRC.

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1.3 PLANT OVERVIEW

The LaSalle County Station consists of two operating boiling water reactor (BWR) generating units. The site is located in the agricultural area of Brookfield Township, LaSalle County, Illinois. It is approximately 55 direct-line miles southwest of Chicago and 20 miles west of Dresden Nuclear Power Station. (Ref. 2 section 1.1)

The station utilizes two single-cycle forced-circulation boiling water reactors, rated at 3546 MWt and designed for 3559 MWt. Both units' containment design employs the BWR Mark II concept of over-under pressure suppression with multiple downcomers connecting the reactor drywell to the water-filled pressure suppression chamber. The NSSS supplier was GE (Nuclear Energy Division). The plant, except for the NSSS, was designed by Sargent & Lundy (S&L) Engineers. (Ref. 2 section 1.1)

Unit 1 was authorized to commence power operation under license No. NPF-11 which was granted on April 17, 1982. Unit 2 was authorized to commence power operation under license No. NPF-18 which was granted on December 16, 1983. (Ref. 19 and 20)

1.4 APPROACH

The EPRI guidance document is used for the LaSalle County Generating Station Unit 2 engineering walkdowns and evaluations described in this report. In accordance with Reference 1, the following topics are addressed in the subsequent sections of this report:

- Seismic Licensing Basis
- Personnel Qualifications
- Selection of Systems, Structures, and Components (SSC)
- Seismic Walkdowns and Area Walk-Bys
- Seismic Licensing Basis Evaluations
- IPEEE Vulnerabilities Resolution Report
- Peer Review

1.5 CONCLUSION

Seismic walkdowns have been performed at the LaSalle County Generating Station Unit 2 in accordance with the NRC endorsed walkdown methodology. All potentially degraded, nonconforming, or unanalyzed conditions identified as a result of the seismic walkdowns have been entered into the corrective action program.

Evaluations of the identified conditions are complete and documented within the CAP. These evaluations determined the Seismic Walkdowns resulted in no adverse anchorage conditions, no adverse seismic spatial interactions, and no other adverse seismic conditions associated with the items on the SWEL. Similarly, the Area Walk-Bys resulted in no adverse seismic conditions associated with other SSCs located in the vicinity of the SWEL item(s).

The Seismic Walkdowns identified ten (10) minor conditions. Other than these minor conditions, the Seismic Walkdowns identified no degraded, nonconforming, or

unanalyzed conditions that required either immediate or follow-on action. No planned or newly identified protection or mitigation features have resulted from the efforts to address the 50.54(f) letter.

Follow-on activities required to complete the efforts to address Enclosure 3 of the 50.54(f) letter include inspection of seven (7) items deferred due to inaccessibility along with supplemental inspections of 18 electrical cabinets. Area Walk-Bys will be completed, as required, during these follow-on activities.

2 Seismic Licensing Basis

2.1 OVERVIEW

This section of the report summarizes the seismic licensing basis for the LaSalle County Station Unit 1 and Unit 2. The safe shutdown earthquake and a summary of the codes, standards, and methods used in the design of Seismic Category I SSCs are presented. This section does not establish or change the seismic licensing basis of the facility and is intended to provide a fundamental understanding of the seismic licensing basis of the facility.

2.2 SAFE SHUTDOWN EARTHQUAKE (SSE)

The safe shutdown earthquake for the LaSalle County Station site is 0.20g horizontal ground acceleration and 0.133g vertical ground acceleration. (Ref. 2 section 3.7)

2.3 DESIGN OF SEISMIC CATEGORY I SSCS

A full description of the Safe Shutdown Earthquake along with the codes, standards, and methods used in the design of the Seismic Category I SSCs for meeting the seismic licensing basis requirements is provided in the following LaSalle County Station UFSAR sections:

- 3.7 Seismic Design
- 3.8 Design of Category I Structures
- 3.9 Mechanical Systems and Components
- 3.10 Seismic Qualification of Seismic Category I Instrumentation and Electrical Equipment

These UFSAR sections should be referred to for a detailed understanding of the seismic licensing basis.

2.3.1 Summary of Seismic Design

Design Response Spectra

The site response spectra which are defined at the free field foundation level for the SSE and the operating basis earthquake (OBE) are presented in UFSAR Subsection 2.5.2 and are shown in UFSAR Figures 2.5-39 and 2.5-40. The maximum horizontal ground acceleration at the free field foundation level, corresponding to above site response spectra, is 20% gravity for SSE and 10% gravity for OBE. Vertical response spectra used are 2/3 of the horizontal response spectra. Earthquake history, site geology, and seismology are discussed in UFSAR Section 2.5. (Ref. 2 section 3.7)

Design Time History

In the design of the station, time-history response analyses are used to determine the seismic environment in which internal equipment systems and components must be designed to function. The site response spectra cannot be used directly as the seismic load in the time-history analysis; rather, equivalent time-history forcing functions are used as the seismic load. (Ref. 2 section 3.7)

Spectrum compatible time history is obtained by modifying an actual earthquake time-history record in such a way that its response spectrum matches closely with the given OBE spectrum. The matching of the response spectrum is done such that the points which are higher are suppressed first. To suppress the response spectrum, the selected time-history motion is passed through a two parameter frequency-suppression filter. The first parameter is a damping parameter that mainly controls the amount of suppression at the given period, and the second parameter controls the band width of suppression. These two parameters are adjusted such that the desired suppression effect is obtained at a given period. After that, raising of response spectrum at required periods is done by adding sine waves of appropriate amplitude and phase lag. UFSAR Figures 3.7-1 and 3.7-2 illustrate the horizontal synthetic time histories in both N-S and E-W directions. These two synthetic time histories are statistically independent. The vertical synthetic time history is taken from the horizontal E-W synthetic time history with a 1/3 overall reduction in acceleration. (Ref. 2 section 3.7)

Modified 1940 El Centro earthquake records for N-S and E-W components are used for these compatible time-history forcing functions. Compatibility is verified by generating response spectra for 2% and 5% damping ratios as shown in UFSAR Figures 3.7-3 through 3.7-6. In generating these spectra, 72 period intervals from 0.02 to 2.0 seconds are considered. The period intervals at which the response spectra are calculated are as follows:

Period Range (sec)	Increment (sec)
0.02 - 0.1	0.005
0.1 - 0.4	0.01
0.4 - 0.5	0.02
0.5 - 1.0	0.05
1.0 - 2.0	0.1

(Ref. 2 section 3.7)

2.3.2 Summary of Codes and Standards

The information presented below has been extracted from the UFSAR Section 3.8. This section summarizes the codes, specifications, standards of practice, and other accepted industry guidelines which are adopted to the extent applicable, in the design and construction of the following. The specification reference(s) associated with each item below are the applicable Codes, standards, and specifications listed in Table 2-1 of this report.

- Concrete Containment – specification reference numbers 1-13, 16-19, 21, 22, 24, 27-29, and 31
- Steel pressure retaining components of the containment – specification reference numbers 12, and 27-29
- Drywell Floor - specification reference numbers 1-10, 16-19, 21, 22, 24, and 27-29

- Reactor Stabilizer Structure - specification reference numbers 12, 16-19, 24, and 27-29
- Reactor Pedestal - specification reference numbers 1-10, 16-19, 21, 22, 24, and 27-29
- Reactor Shield - specification reference numbers 3-5, 8-10, 12, 16- 19, 24, and 27-29
- Platforms, Galleries and Downcomer Bracing - specification reference numbers 12, 16-19, and 24
- Other Seismic Category I Structures - specification reference numbers 1-10, 12, and 14-31

Table 2-1. List of Codes, Standards, and Specifications

UFSAR Table 3.8-2 List of Specifications, Codes, and Standards				
SPECIFICATION REFERENCE NUMBER	SPECIFICATION OR STANDARD DESIGNATION	TITLE	EDITION	REMARKS
1	ACI 318	Building Code Requirements for Reinforced Concrete	1963	
2	ACI 318	Building Code Requirements for Reinforced Concrete	1971	
3	ACI 214	Recommended Practice for Evaluation of Compression Test Results	1965	
4	ACI 301	Specifications for Structural Concrete for Buildings	1972	Exceptions are listed in UFSAR Appendix E
5	ACI 306	Recommended Practice for Cold Weather Concreting	1966	Additions are listed in UFSAR Appendix E
6	ACI 315	Manual of Standard Practice for Detailing Reinforced Concrete Structures	1957	
7	ACI 347	Recommended Practice for Concrete Formwork	1968	

UFSAR Table 3.8-2 List of Specifications, Codes, and Standards				
SPECIFICATION REFERENCE NUMBER	SPECIFICATION OR STANDARD DESIGNATION	TITLE	EDITION	REMARKS
8	ACI 605	Recommended Practice for Hot Weather Concreting	1959	Exceptions are listed in UFSAR Appendix E
9	ACI 211.1	Recommended Practice for Selecting Proportions for Concrete	1970	Normal and Heavyweight
10	ACI-304 -73	Recommended Practice for Measuring, Mixing, and Placing Concrete	1973	
11	ACI-ASCE	Tentative Recommendations for Concrete Members Pre-stressed with Unbonded Tendons (Committee 423)	1969	
12	AISC	Manual of Steel Construction	1969	
13	ANSI B31.1.0	Standard Code for Pressure Piping, Power Piping	1967	
14	ANSI A123.1	Standard Nomenclature for Steel Door and Steel Door Frames	1967	
15	AWS D1.0	Code for Welding in Building Construction	Addenda of March 1965	
16	AWS A3.0	Definitions for Welding and Cutting	1969	
17	AWS A5.1	Mild Steel Arc-Welding Electrodes	1969	
18	AWS A6.1	Recommended Safe Practice for Inert-Gas Metal-Arc Welding	1966	
19	AWS D12.1	Recommended Practice for Welding Reinforcing Steel	1971	

UFSAR Table 3.8-2
List of Specifications, Codes, and Standards

SPECIFICATION REFERENCE NUMBER	SPECIFICATION OR STANDARD DESIGNATION	TITLE	EDITION	REMARKS
20	CRSI	Manual of Standard Practice	1970	
21	CRSI	Recommended Practice for Placing Reinforcing Bars	1968	
22	AISI	Light Gage Cold-Formed Steel Design Manual	1962	
23	ASTM	Annual Books of ASTM Standards	1972	For applicable ASTM Standards see UFSAR Appendix E
24	ASA B1.1	Unified Inch Screw Threads	1960	
25	ASA B18.2	Square and Hexagonal Bolts and Nuts	1960	
27	ASME	ASME Boiler and Pressure Vessel Code, Section III and Section IX	Summer of 1972 Addenda	
28	ASME	1971 ASME Boiler & Pressure Vessel Code, Material Specifications, Section II	Summer of 1972 Addenda	
29	ASME	ASME Boiler and Pressure Vessel Code, Section XI, "In Service Inspection of Nuclear Reactor Coolant System"	1974 Edition Summer of 1975 Addenda	
30	API Spec No 620	Specification for Welded Steel Storage Tanks	February 1970	
31	Standard Assoc of Australia AS1250	The use of Steel in Structures	1981	

3 Personnel Qualifications

3.1 Overview

This section of the report identifies the personnel that participated in the NTTF 2.3 Seismic Walkdown efforts. A description of the responsibilities of each Seismic Walkdown participant's role(s) is provided in Section 2 of the EPRI guidance document. (Ref. 1) Resumes provided in Appendix A provide detail on each person's qualifications for his or her role.

3.2 Project Personnel

Table 3-1 below summarizes the names and corresponding roles of personnel who participated in the NTTF 2.3 Seismic Walkdown effort.

Table 3-1. Personnel Roles

Name	Equipment Selection Engineer	Plant Operations	Seismic Walkdown Engineer (SWE)	Licensing Basis Reviewer	IPEEE Reviewer	Peer Reviewer
A. Perez	X					
K. Hull	X					
T.K. Ram						X(1)
D. Carter			X	X		
M. Wodarcyk			X	X		
J. Griffith			X	X		
M. Etre			X	X		
T. Bacon						X
W. Djordjevic						X(2)
T. Dean (Exelon)		X				
Jorge Sanchez (Exelon)				X	X	

Notes:
1. Peer Review Team member for SWEL review only.
2. Peer Review Team Leader.

3.2.1 Stevenson & Associates Personnel

The following provides a synopsis of each individual's background and experiences.

Antonio Perez, P.E.: Mr. Perez is a Senior Engineer III and serves as the General Manager of the S&A Hudson, WI office. He earned his Bachelor of Science degree in Mechanical Engineering at Michigan Technological University and is a licensed Professional Engineer in the states of Wisconsin and Minnesota. Mr. Perez has over 15 years of experience in project management, project engineering, equipment design, and mechanical systems design and has served in the nuclear power industry for over 11 years. He has extensive experience in Program and Design Engineering and has held positions such as MOV Engineer, Responsible Design Engineer, Design Engineering Supervisor and STA Trainee in the nuclear power industry. Mr. Perez has successfully completed the Near-Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns Training Course.

Kim Hull: Mr. Hull is a Senior Engineer III in the S&A Hudson, WI office. He earned his Master of Science degree in Mechanical Engineering at Michigan State University. Mr. Hull has over 30 years of experience in the nuclear power industry and has held positions such as Shift Technical Advisor, Principal Engineer, Senior Instructor, and Mechanical Design Supervisor. He has an extensive background in all aspects of nuclear power plant modifications with a thorough understanding of configuration control/management along with design and licensing basis of nuclear power plants. Mr. Hull has successfully completed the Near-Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns Training Course.

Tribhawan K. Ram, P.E.: Mr. Ram is a Senior Engineer III in the S&A Phoenix, AZ Office. He has over 28 year experience in the nuclear power industry with expertise in plant systems and design engineering. Currently, Mr. Ram is leading the electrical engineering effort in support of Post-Fukushima Seismic Margin Analysis (SMA) for two Taiwan nuclear stations (PWR and BWR). This effort, in support of the plant Safe Shutdown Equipment List (SSEL), consists of relay list development, relay screening (using GERS, SQURTS or other available testing data), and relay chatter analysis. Mr. Ram was involved in resolving USI A-46 relay outliers for several plants (Dresden, Quad Cities, Millstone, Palisades, and Pilgrim). He evaluated dozens of control circuits for relay chattering issues. To replace outliers, Mr. Ram developed and/or supervised the development of modification packages including: replacement relay selection; relay testing specification preparation; and seismic testing facility visits for relay qualification. As a systems manager, Mr. Ram conducted periodic system walkdowns to discover and then pursue resolutions for any design, maintenance or operational issues with equipment. He has developed test plans for circuit breaker and other electrical equipment replacement, including involvement in test plan execution during refueling outages. Mr. Ram has interfaced, with NRC in their biennial Component Design Basis Inspections (CDBI), and with INPO in their biennial evaluations. Mr. Ram has MS degrees in Nuclear and Electrical Engineering from the University of Cincinnati, and an MBA from Bowling Green State University. He is a licensed Professional Engineer (electrical) in Ohio. Mr. Ram has completed a six month training course in BWR systems.

David Carter, P.E., S.E. Mr. Carter is a Senior Engineer III in the S&A Chicago, IL Office. He has a Bachelor of Science degree in civil engineering and has more than 30 years of experience in the nuclear power plant industry. He is a licensed Structural

Engineer in the State of Illinois and is a licensed Professional Engineering in several states. He is a SQUG Qualified Seismic Capability Engineer (SCE) and has completed the NTTF Recommendation 2.3 Training Course (SWE). In addition to his involvement in design and analysis of structures, systems, and components at nuclear power plants, he has performed SQUG walkdowns at various nuclear power plants. He has worked for over ten years as a Seismic Qualification Engineer at another utility performing seismic evaluations of plant equipment, input to procurement documents, and reviewing seismic qualification reports for new plant equipment.

Michael Wodarcyk, E.I.T. Mr. Wodarcyk is a Staff Engineer in the S&A Chicago, IL Office. He has a Master of Science Degree in Civil Engineering and has been working in the nuclear power plant industry for slightly more than one year. He has completed the NTTF Recommendation 2.3 Training Course (SWE). He has been involved in the design and analysis of rigging configurations, piping and pipe supports, and other various structures.

Jim Griffith, P.E. Mr. Griffith is a Senior Engineer III in the S&A Chicago, IL Office. He has a Bachelor of Science degree in civil engineering and has more than 25 years of experience in the nuclear power plant industry. He is a licensed Professional Engineer in the State of Wisconsin. He is a SQUG Qualified Seismic Capability Engineer (SCE) and has completed the NTTF Recommendation 2.3 Training Course (SWE). In addition to his involvement in design and analysis of structures, systems, and components at nuclear power plants, Mr. Griffith has many years of experience working at numerous nuclear power plants in support of construction, design, outage, and walkdown activities including SQUG walkdowns.

Mark Etre: Mr. Etre is a Senior Engineer III in the S&A Boston, MA office. He has managed and led seismic walkdowns and analyses of structures and components. Mr. Etre has more than 20 years of seismic experience serving the nuclear industry. Mr. Etre has participated in numerous USI A-46 and IPEEE projects in response to the requirements of Generic Letters 87-02 and 88-20. Mr. Etre has a Master of Science in Structural Engineering from the Worcester Polytechnic Institute. He has received industry training as a Seismic Capability Engineer (EPRI 5-day SQUG training) and has successfully completed the Near-Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns Training Course.

Todd Bacon: Mr. Bacon is a Senior Consultant in the S&A Boston, MA office. He has over 30 years of experience in evaluations of nuclear systems, structures and components, with specialization in the dynamic analysis and design of piping systems, structures and equipment for seismic, other dynamic, fluid, and wind loads. He has managed various ASME Code related tasks for numerous US and international utilities. Mr. Bacon has been involved with the dynamic analyses of systems associated with the Main Steam and other NSSS systems, as well as many other plant systems. In addition, Mr. Bacon has led the analysis and subsequent regulatory response for a number of issues including GL 96-03 and masonry block wall assessments related to IEB 80-11. He is a licensed Professional Engineer (civil) in the states of California, Ohio, and Georgia. Mr. Bacon has successfully completed the Near-Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns Training Course.

Walter Djordjevic, P.E. Mr. Djordjevic is a Senior Consultant and serves as President of S&A with specialization in the dynamic analysis and design of structures and equipment for seismic, blast, fluid, and wind loads. He has managed and led seismic walkdowns and fragility analyses of structures and components for use in probabilistic risk

assessments. Mr. Djordjevic has 37 years of seismic experience serving the nuclear industry. Mr. Djordjevic performed and managed more than 20 USI A-46 and IPEEE projects in response to the requirements of Generic Letters 87-02 and 88-20. Mr. Djordjevic has a Master of Science in Structural Engineering from the Massachusetts Institute of Technology. He has received industry training as a Seismic Capability Engineer (EPRI SQUG training), EPRI IPEEE Add-on, Seismic Fragility and Seismic Walkdown Engineer (SWE).

3.2.2 Additional Personnel

Exelon plant Operations staff member Thomas Dean, reviewed the SWEL. Mr. Dean is the Manager of Operations Support at LaSalle County Station. He is currently a licensed SRO and has been since 2002. Mr. Dean has worked in the operations department for 12 years and is familiar with all aspects of the station operating procedures.

Various station personnel also provided support to the SWEL preparer in identifying major equipment or system modifications, equipment and systems located in different environments, and equipment and systems that would be accessible for inspection during the plant walkdowns.

Exelon Engineering staff member Mr. Jorge Sanchez performed the IPEEE Vulnerabilities Review based, in part, on the IPEEE submittal along with subsequent correspondence and station records. (Ref. 3) Mr. Sanchez is a Structural Engineer in the Exelon Engineering Department. He has a Bachelor of Science degree in civil engineering and a Master of Science degree in structural engineering. He has worked at LaSalle since 2010. He has successfully completed Seismic Evaluations Training and the Near-Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns Training Course. Mr. Sanchez is a licensed Professional Engineer and Structural Engineer in the State of Illinois.

4 Selection of SSCs

4.1 OVERVIEW

This section of the report describes the process used to select structures, systems, and components, (SSCs) that were included in the Seismic Walkdown Equipment List (SWEL). The actual equipment lists that were developed in this process are found in Appendix B and are as follows:

- Table B-1, Base List 1
- Table B-2, Base List 2
- Table B-3, SWEL 1
- Table B-4, SWEL 2

4.2 SWEL DEVELOPMENT

The selection of SSCs process described in EPRI Technical Report 1025286, *Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic*, dated June 2012, was utilized to develop the SWEL for LaSalle County Generating Station Unit 2. (Ref. 1)

The SWEL is comprised of two groups of items:

- SWEL 1 is a sample of items to safely shut down the reactor and maintain containment integrity
- SWEL 2 is a list of spent fuel pool related items

4.2.1 SWEL 1 – Sample of Required Items for the Five Safety Functions

The process for selecting a sample of SSCs for shutting down the reactor and maintaining containment integrity began with the composite list of Safety Related systems, structures, and components identified in the station master equipment list. This initial data set contained approximately 52, 831 items for LaSalle Unit 1, Unit 2, and common Unit. This data set was then screened based on the following four screens to identify the items to be included on the first Seismic Walkdown Equipment List (SWEL 1):

1. **Screen #1 – Seismic Category I**

   As described in Reference 1, only items that have a defined seismic licensing basis are to be included in SWEL 1. Consistent with the LaSalle County Power Station UFSAR Chapter 3, SSCs identified as Safety-Related are also Seismic Category I. (Ref. 2) As such, all items on the initial data set are included for consideration to be added to SWEL 1.

2. Screen #2 – Equipment or Systems

This screen narrowed the scope of items to include only those that do not regularly undergo inspections to confirm that their configuration is consistent with the plant licensing basis. This screen reduced the data set of any Class I Structures, Containment Penetrations, Class I Piping Systems, cable/conduit raceways and HVAC ductwork. Major pieces of equipment in the Nuclear Steam Supply System (NSSS) located inside the containment were also removed from the data set.

3. Screen #3 – Support for the Five Safety Functions

This screen is intended to narrow the scope of items included on the SWEL 1 to only those associated with maintaining the following five safety functions:

A. Reactor Reactivity Control (RRC)

B. Reactor Coolant Pressure Control (RCPC)

C. Reactor Coolant Inventory Control (RCIC)

D. Decay Heat Removal (DHR)

E. Containment Function (CF)

The first four functions are associated with bringing the reactor to a safe shutdown condition. The fifth function is associated with maintaining containment integrity.

This screen began as an effort to assign safety function(s) to each item in the data set. This was accomplished on a 'system' based effort by utilizing Reference 1 Appendix E: Systems to Support Safety Functions. Reference 1 Appendix E provides guidance to identify systems that support each of the safety functions.

It is noted that items on SWEL 1 with a specific safety function(s) are considered frontline systems. Items with a safety function of 'Auxiliary & Support', 'Electrical Systems', or 'Racks & Panels' may be a frontline or support system. Items with a safety function of 'Auxiliary & Support', 'Electrical Systems', or 'Racks & Panels' support at least one of the five safety functions however, the specific safety function(s) is not indicated as identification of the specific safety function(s) supported is not required by Reference 1.

The resultant equipment list after Screen #3 is defined in the EPRI guidance document as Base List 1 and is included in Appendix B. (Ref. 1)

4. Screen #4 – Sample Considerations

This screen is intended to result in a SWEL 1 that sufficiently represents a broad population of plant Seismic Category I equipment and systems to meet the objectives of the NRC 50.54(f) letter. The following attributes were considered in the selection process for items included on SWEL 1:

A. A variety of types of systems

The system is identified for each item on SWEL 1. The equipment included on SWEL 1 is a representative sample of several systems that perform one or multiple safety functions. Further, the systems represented include both frontline and support systems as listed in Reference 1 Appendix E: Systems to Support Safety Function(s).

B. Major new and replacement equipment

As described in Reference 1, the intent of this screening element is to ensure that equipment that has been modified or was not included as part of the seismic evaluations performed to address the Individual Plant Examination of External Events (IPEEE) program is included on the SWEL 1. However, based on References 3 and 5, seismic evaluations of SSCs were not conducted at the LaSalle County station as part of the IPEEE program. Instead, the licensee relied exclusively on the level III PRA developed to address the IPEEE program. Further, a review of Reference 4 Section 8 revealed that LaSalle specific equipment fragilities were limited to a very small population of equipment and that generic seismic equipment fragilities were relied on for most equipment. This is an important point because it reveals an absence of extensive seismic evaluations of equipment generally necessary to develop equipment specific fragilities.

Because conducting seismic evaluations was not a major element of the IPEEE program at LaSalle, there is no need to identify equipment that has been modified or replaced since the completion of the IPEEE program. However, as a measure to meet the intent of this element, Reference 4, Table 8.2 *LaSalle specific equipment fragilities*, was reviewed and of the 39 items listed at least 12 were added to the SWEL 1. These items are not specifically identified.

C. A variety of types of equipment

The equipment class is identified for each item on SWEL 1. The equipment included on SWEL 1 is a representative sample from each of the classes of equipment listed in Reference 1 Appendix B: Classes of Equipment. Where appropriate, at least one piece of equipment from each class is included on SWEL 1.

Screening #1, #2, and #3 resulted in no equipment in the following classes:

- 11. Chillers
- 13. Motor Generators.

D. A variety of environments

The location for each item is identified on SWEL 1. The equipment included on SWEL 1 is a representative sample from a variety of environments (locations) in the station.

E. Equipment enhanced due to vulnerabilities identified during the IPEEE program

No vulnerabilities or plant improvements were identified as a result of the IPEEE program. (Ref. 3 and 5)

F. Contribution to risk

In selecting items for SWEL 1 that met the attributes above, some items with similar attributes were selected based on their higher risk-significance. To determine the relative risk-significance, the Risk Achievement Worth (RAW) and Fussell-Vesely importance for a Loss of Off-Site Power (LOOP) scenario from the internal plant PRA were used. Additionally, the list of risk-significant components for the LOOP PRA were compared with the draft SWEL 1 to

confirm that a reasonable sample of risk-significant components (relevant for a seismic event) were included on SWEL 1. (Ref. 8)

4.2.2 SWEL 2 Development – Spent Fuel Pool Related Items

The process for selecting a sample of SSCs associated with the spent fuel pool (SFP) began with a review of the station design and licensing basis documentation for the SFP and the interconnecting SFP cooling system. The following four screens narrowed the scope of SSCs to be included on the second Seismic Walkdown Equipment List (SWEL 2):

1. **Screen #1 - Seismic Category I**

   Only those items identified as Seismic Category I (having defined seismic licensing basis) are to be included on SWEL 2 with exception to the SFP structure. As described in Reference 1, the adequacy of the SFP structure is assessed by analysis as a Seismic Category I structure. Therefore, the SFP structure is assumed to be seismically adequate for the purposes of this program and is not included in the scope of items included on SWEL 2.

   The review of design and licensing basis documentation for the SFP revealed there are SSCs that are Seismic Category I for LaSalle County Generating Station Unit 2. (Ref. 2) UFSAR Table 3.2-1 item XX indicates that the Spent Fuel Pool pumps, piping and valves are Seismic Category II. However, Note (18) of UFSAR Table 3.2-1 states, in part, *piping which provides a flow path from the fuel pool skimmer surge tanks to the RHR system and back to the fuel pool up to and including the isolation valves, which provide pressure boundary for this mode of operation* is Seismic Category I. Based on this Note, the indicated piping and valves were included for further selection of SSC for SWEL 2.

   It is noted the Spent Fuel Pool Emergency Make-Up Pumps, valves, and piping is Category I. However, this system piping terminates with a normally closed valve and capped end that does not communicate directly with the SFP or the SFP cooling system. This equipment was not included for consideration to be added to the SWEL 2.

2. **Screen #2 – Equipment or Systems**

   This screen considers only those items associated with the SFP that are appropriate for an equipment walkdown process. The only equipment identified for consideration to be added to SWEL 2 included piping and manual valves. Only the manual valves are considered appropriate for inclusion to SWEL 2.

3. **Screen #3 – Sample Considerations**

   This screen represents a process that is intended to result in a SWEL 2 that sufficiently represents a broad population of SFP Seismic Category I equipment and systems to meet the objectives of the NRC 50.54(f) letter. (Ref. 1) The following attributes were considered in the development of SWEL 2:

   A. A variety of types of systems

      The system is identified for each item on SWEL 2. The equipment included on SWEL 2 is to be a representative sample of the systems associated with the SFP and its cooling system. The only equipment considered for inclusion to SWEL 2 is within the Spent Fuel Pool Cooling system.

B. Major new and replacement equipment

The equipment included on SWEL 2 includes items that have been modified or replaced over the past several years. Each item on SWEL 2 that is new or replaced is identified. There was no modified or replacement equipment identified.

C. A variety of types of equipment

The equipment class is identified for each item on SWEL 2. The equipment included on SWEL 2 is a representative sample from each of the classes of equipment listed in Reference 1 Appendix B: Classes of Equipment. Where appropriate, at least one piece of equipment from each class is included on SWEL 2. The only equipment for consideration to be included on SWEL 2 is manual valves which are class (00) Other.

D. A variety of environments

The location for each item is identified on SWEL 2. The equipment included on SWEL 2 is a representative sample from a variety of environments (locations) for equipment associated with the SFP and its cooling system. The only equipment considered to be included on the SWEL 2 is located in the Reactor Building.

4. Screen #4 – Rapid Drain-Down

This screen identifies items that could allow the spent fuel pool to drain rapidly. Consistent with Reference 1, the scope of items included in this screen is limited to the hydraulic lines connected to the SFP and the equipment connected to those lines. For the purposes of this program it is assumed the SFP gates are installed and the SFP cooling system is in its normal alignment for power operations. The SFP gates are passive devices that are integral to the SFP. As such, they are considered capable of withstanding a design basis earthquake without failure and do not allow for a rapid drain-down of the SFP.

The SSCs identified in this screen are not limited to Seismic Category I (having defined seismic licensing basis) items, but are limited to those items that could allow rapid drain-down of the SFP. Rapid drain-down is defined as lowering of the water level to the top of the fuel assemblies within 72 hours after the earthquake.

An assessment of the LaSalle County Generating Station Unit 2 spent fuel pools and their cooling systems was performed and found no SFP penetrations below 10 feet above the top of the fuel assemblies. (Ref. 2, 9, 10, 11, 12, 13, 14, 15, 16, 17, & 18) As such, and consistent with Reference 1, there is no potential for rapid drain-down and no items were added to SWEL 2.

It is noted the isolation valve between the RHR system and the spent fuel pool return line is located upstream of the spent fuel pool return line siphon breaks. As such, these valves were not considered to be included on the SWEL 2. (Ref. 9)

Two (2) items were identified to be included in the scope of SWEL 2 for LaSalle County Generating Station Unit 2.

5 Seismic Walkdowns and Area Walk-Bys

5.1 Overview

Seismic Walkdowns and Area Walk-Bys were conducted by two (2) person teams of trained Seismic Walkdown Engineers (SWEs) in accordance with the EPRI guidance document during the weeks of August 27, 2012, September 3, 2012, September 10, 2012, and September 17, 2012. The Seismic Walkdowns and Area Walk-Bys are discussed in more detail in the following sub-sections.

Consistent with the EPRI guidance document, Section 4: Seismic Walkdowns and Area Walk-Bys, the SWEs used their engineering judgment, based on their experience and training, to identify potentially adverse seismic conditions. Where needed, the engineers were provided the latitude to rely upon new or existing analyses to inform their judgment.

The SWEs conducted the Seismic Walkdowns and Area Walk-Bys together as a team. During the evaluations, the SWEs actively discussed their observations and judgments with each other. The results of the Seismic Walkdowns and Area Walk-Bys reported herein are based on the comprehensive agreement of the SWEs.

5.2 Seismic Walkdowns

The Seismic Walkdowns focused on the seismic adequacy of the items on the SWEL (SWEL 1 and SWEL 2) as provided in Appendix B of this report. The Seismic Walkdowns also evaluated the potential for nearby SSCs to cause adverse seismic interactions with the SWEL items. The Seismic Walkdowns focused on the following adverse seismic conditions associated with the subject item of equipment:

- Adverse anchorage conditions
- Adverse seismic spatial interactions
- Other adverse seismic conditions

The results of the Seismic Walkdowns have been documented on the Seismic Walkdown Checklist (SWC) provided in the EPRI guidance document, Appendix C. Seismic Walkdowns were performed and a SWC completed for 108 of the 115 total items identified on the LaSalle Unit 2 SWEL. The completed SWCs are provided in Appendix C of this report. Additionally, photos have been included with most SWCs to provide a visual record of the item along with any comments noted on the SWC. Drawings and other plant records are cited in some of the SWCs, but are not included with the SWCs because they are readily retrievable documents through the station's document management system.

Seismic Walkdowns are deferred for the remaining seven (7) items to a unit outage or another time when the equipment is accessible. These items could not be walked down during the 180-day period following the issuance of the 10CFR50.54(f) letter due to their being inaccessible. Inaccessibility of this equipment was either based on the location of

the equipment (environment that posed personnel safety concerns while the unit is operating) or due to the electrical safety hazards posed while the equipment is operating. Appendix E of this report identifies the inaccessible equipment along with the plan for future Seismic Walkdowns.

The following subsections describe the approach followed by the SWEs to identify potentially adverse anchorage conditions, adverse seismic interactions, and other adverse seismic conditions during the Seismic Walkdowns.

5.2.1 *Adverse Anchorage Conditions*

Guidance for identifying anchorage that could be degraded, non-conforming, or unanalyzed relied on visual inspections of the anchorage and verification of anchorage configuration. Details for these two types of evaluations are provided in the following two subsections.

The evaluation of potentially adverse anchorage conditions described in this subsection applies to the anchorage connections that attach the identified item of equipment to the civil structure on which it is mounted. For example, the welded connections that secure the base of a Motor Control Center (MCC) to the steel embedment in the concrete floor would be evaluated in this subsection. Evaluation of the connections that secure components within the MCC is covered later in the subsection "Other Adverse Seismic Conditions."

Visual Inspections

The purpose of the visual inspections was to identify whether any of the following potentially adverse anchorage conditions were present:

- Bent, broken, missing, or loose hardware
- Corrosion that is more than mild surface oxidation
- Visible cracks in the concrete near the anchors
- Other potentially adverse seismic conditions

Based on the results of the visual inspection, the SWEs judged whether the anchorage was potentially degraded, non-conforming, or unanalyzed. The results of the visual inspection were documented on the SWC, as appropriate. If there was clearly no evidence of degraded, nonconforming, or unanalyzed conditions, then it was indicated on the checklist and a licensing basis evaluation was not necessary. However, if it was not possible to judge whether the anchorage is degraded, nonconforming, or unanalyzed, then the condition was entered into the Corrective Action Program as a potentially adverse seismic condition.

5.2.2 *Configuration Verification*

In addition to the visual inspections of the anchorage as described above, the configuration of the installed anchorage was verified to be consistent with existing plant documentation for at least 50% of the items on the SWEL.

Line-mounted equipment (e.g., valves mounted on pipelines without separate anchorage) was not evaluated for anchorage adequacy and was not counted in establishing the 50% sample size.

Examples of documentation that was considered to verify that the anchorage installation configurations are consistent with the plant documentation include the following:

- Design drawings
- Seismic qualification reports of analyses or shake table tests
- IPEEE program documentation, as applicable

The Table C-1 of Appendix C indicates the anchorage verification status for components as follows:

N/A: components that are line-mounted and/or are not directly anchored (with separate anchorage) to the civil structure and therefore do not count in the anchorage confirmation total

Y: components that are anchored to the civil structure which were confirmed to be consistent with design drawings and/or other plant documentation

N: components that are anchored to the civil structure for which anchorage drawings were not identified and/or retrieved

See Table 5-1 below for the accounting of the 50% anchorage configuration confirmations, and the individual SWC forms in Appendix C for the specific drawings used for each anchorage verification confirmation.

Table 5-1. Anchorage Configuration Confirmation

SWEL	No. of SWEL Items (A)	N/A Items (B)	Required to Confirm? (A-B)/2	Items Confirmed
Total	115	54	31	43

5.2.3 Adverse Seismic Spatial Interactions

An adverse seismic spatial interaction is the physical interaction between the SWEL item and a nearby SSC caused by relative motion between the two during an earthquake. An inspection was performed in the area adjacent to and surrounding the SWEL item to identify any seismic interaction conditions that could adversely affect the capability of that SWEL item to perform its intended safety-related functions.

The three types of seismic spatial interaction effects that were considered are as follows:

- Proximity
- Failure and falling of SSCs (Seismic II over I)
- Flexibility of attached lines and cables

Detailed guidance for evaluating each of these types of seismic spatial interactions is described in the EPRI guidance document, Appendix D: Seismic Spatial Interaction.

The Seismic Walkdown Engineers exercised their judgment to identify seismic interaction hazards. Section 5.2.5 provides a summary of issues identified during the Seismic Walkdowns.

5.2.4 *Other Adverse Seismic Conditions*

In addition to adverse anchorage conditions and adverse seismic interactions, described above, other potentially adverse seismic conditions that could challenge the seismic adequacy of a SWEL item could have been present. Examples of the types of conditions that could pose potentially adverse seismic conditions include the following:

- Degraded conditions
- Loose or missing fasteners that secure internal or external components to equipment
- Large, heavy components mounted on a cabinet that are not typically included by the original equipment manufacturer
- Cabinet doors or panels that are not latched or fastened
- Other adverse conditions

Any identified other adverse seismic conditions are documented on the items' SWC, as applicable.

5.2.5 *Conditions Identification during Seismic Walkdowns*

Table 5-2 provides a summary of the conditions identified during the equipment Seismic Walkdowns. The equipment Seismic Walkdowns resulted in a total of seven (7) conditions identified which were entered into the station's CAP. The conditions were assessed and it was concluded that the conditions would not prevent the associated equipment from performing its safety-related function(s). The conditions identified by the SWEs during the equipment Seismic Walkdowns were concluded to not be adverse seismic conditions.

5.3 AREA WALK-BYS

The purpose of the Area Walk-Bys is to identify potentially adverse seismic conditions associated with other SSCs located in the vicinity of the SWEL items. Vicinity is generally defined as the room containing the SWEL item. If the room is very large (e.g., Turbine Hall), then the vicinity is identified based on judgment, e.g., on the order of about 35 feet from the SWEL item. This vicinity is described on the Area Walk-By Checklist (AWC), shown in Appendix D of this report. A total of 47 AWCs were completed for LaSalle Unit 2. It is noted that additional AWCs will be completed as deferred and supplemental inspections are completed.

The key examination factors that were considered during Area Walk-Bys include the following:

- Anchorage conditions (if visible without opening equipment)
- Significantly degraded equipment in the area
- A visual assessment (from the floor) of cable/conduit raceways and HVAC ducting (e.g., condition of supports or fill conditions of cable trays)
- Potentially adverse seismic interactions including those that could cause flooding, spray, and fires in the area

- Other housekeeping items that could cause adverse seismic interaction (including temporary installations and equipment storage)
- Scaffold construction was inspected to meet Exelon Procedure NES-MS-04.1 Seismic Prequalified Scaffolds
- Seismic housekeeping was examined to meet station procedure LAP-100-56, Equipment / Parts Storage in Plant Areas Containing Safety-Related Equipment

The Area Walk-Bys are intended to identify adverse seismic conditions that are readily identified by visual inspection, without necessarily stopping to open cabinets or taking an extended look. Therefore, the Area Walk-By took significantly less time than it took to conduct the Seismic Walkdowns described above for a SWEL item. If a potentially adverse seismic condition was identified during the Area Walk-By, then additional time was taken, as necessary, to evaluate adequately whether there was an adverse condition and to document any findings.

The results of the Area Walk-Bys are documented on the AWCs included in Appendix D of this report. A separate AWC was filled out for each area inspected. A single AWC was completed for areas where more than one SWEL item was located.

Additional details for evaluating the potential for adverse seismic interactions that could cause flooding, spray, or fire in the area are provided in the following two subsections.

Seismically-Induced Flooding/Spray Interactions

Seismically-induced flooding/spray interactions are the effect of possible ruptures of vessels or piping systems that could spray, flood or cascade water into the area where SWEL items are located. This type of seismic interaction was considered during the IPEEE program. Those prior evaluations were considered, as applicable, as information for the Area Walk-Bys.

One area of particular concern to the industry is threaded fire protection piping with long unsupported spans. If adequate seismic supports are present or there are isolation valves near the tanks or charging sources, flooding may not be a concern. Numerous failures have been observed in past earthquakes resulting from sprinkler head impact. Less frequent but commonly observed failures have occurred due to flexible headers and stiff branch pipes, non-ductile mechanical couplings, seismic anchor motion and failed supports.

Examples where seismically-induced flooding/spray interactions could occur include the following:

- Fire protection piping with inadequate clearance around fusible-link sprinkler heads
- Non-ductile mechanical and threaded piping couplings can fail and lead to flooding or spray of equipment
- Long, unsupported spans of threaded fire protection piping
- Flexible headers with stiffly supported branch lines
- Non-Seismic Category I tanks

The SWEs exercised their judgment to identify only those seismically-induced interactions that could lead to flooding or spray.

Seismically-Induced Fire Interactions

Seismically-induced fire interactions can occur when equipment or systems containing hazardous/flammable material fail or rupture. This type of seismic interaction was considered during the IPEEE program. Those prior evaluations were considered, as applicable, as information for the Area Walk-Bys.

Examples where seismically-induced fire interactions could occur include the following:

- Hazardous/flammable material stored in inadequately anchored drums, inadequately anchored shelves, or unlocked cabinets
- Natural gas lines and their attachment to equipment or buildings
- Bottles containing acetylene or similar flammable chemicals
- Hydrogen lines and bottles

Another example where seismically-induced fire interaction could occur is when there is relative motion between a high voltage item of equipment (e.g., 4160 volt transformer) and an adjacent support structure when they have different foundations. This relative motion can cause high voltage busbars, which pass between the two, to short out against the grounded bus duct surrounding the busbars and cause a fire.

The Seismic Walkdown Engineers exercised their judgment to identify only those seismically-induced interactions that could lead to fires.

5.3.1 Conditions Identification during Area Walk-bys

Table 5-3 at the end of this section provides a summary of the conditions identified during the Area Walk-Bys. Four (4) conditions were identified during the Area Walk-Bys and entered into the station CAP. No potentially adverse seismic conditions were identified that resulted in a seismic licensing basis evaluation. No seismically-induced flooding or spray interactions were identified during the Area Walk-Bys. No seismically-induced fire interactions were identified during the Area Walk-Bys.

5.4 SUPPLEMENTAL INFORMATION ON ELECTRICAL CABINET INSPECTIONS

Following the completion of the online seismic walkdowns, the industry was made aware that the NRC staff had clarified a position on opening electrical cabinets to inspect for other adverse seismic conditions. The purpose for opening these cabinets is to inspect for evidence of:

- internal components not being adequately secured,
- whether fasteners securing adjacent cabinets together are in place, and
- other adverse seismic conditions.

Appendix E of this report includes Table E-2 which identifies components in the specified equipment classes that would be considered as electrical cabinets:

1. Motor Control Centers and Wall-Mounted Contactors
2. Low Voltage Switchgear and Breaker Panels
3. Medium Voltage, Metal-Clad Switchgear

4. Transformers
14. Distribution Panels and Automatic Transfer Switches
16. Battery Chargers and Inverters
20. Instrumentation and Control Panels

Components that are identified on Table E-1 (inaccessible and deferred components) are not listed on Table E-2 to avoid redundancy. Table E-2 indicates internal accessibility of each cabinet. Cabinets that have been identified as requiring these supplemental internal inspections are those with doors or panels with latches or thumbscrews and can be readily opened during normal maintenance activities. Also provided for each cabinet is a proposed milestone schedule for performing these internal inspections and the associated station tracking number (IR number).

The Seismic Walkdown Checklists (SWC) for the components identified in Table E-2 that can be opened for internal inspections will be revised at the time of the supplemental walkdown to indicate the results of these internal inspections.

Table 5-2. Conditions Identified during Seismic Walkdowns

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete (Yes/No, See Notes 1 & 2)
2C11-D001002, 2C11-D001090, 2C11-D001095, 2C11-D001184, 2C11-D2259-125, 2C11-D2259-126, 2C11-D2259-127, 2C11-D2603-125, 2C11-D2603-126, 2C11-D2603-127, 2C11-D3459-125, 2C11-D3459-126, 2C11-D3459-127, 2C11-D3807-125, 2C11-D3807-126, 2C11-D3807-127	During the performance of Fukushima Seismic Walkdowns on Unit Two, it was noted that the S-hooks associated with the chains holding fluorescent lighting fixtures were not completely crimped closed. Two of the areas noted were in the vicinity of the Unit 2 North and South Hydraulic Control Unit (HCU) banks in the Reactor Building (761' Elevation). It should be noted that the S-hooks are closed enough such that they would not allow the fixture to become disconnected during a seismic event; therefore, this is not a seismic issue per Engineering. However, these S-hooks should be completely crimped closed as per normal maintenance standards.	1406922	No
2AP21-303B	During the performance of Fukushima Seismic Walkdowns, base plate thread engagements on a population of Switchgears and Transformers were inspected as part of the walkdown. On Transformer 236X (2AP21E-303B), the southwest 1-inch diameter anchor bolt has 7/8 inch thread engagement, 1/8 inch with no thread engagement. A preliminary evaluation was performed by Engineering. Per Engineering, there is no structural adequacy concern; therefore the anchor bolt as-found thread engagement is not a seismic issue, and the transformer remains fully-functional.	1405542	Yes

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete (Yes/No, See Notes 1 & 2)
2DG01K	Out of the 34 anchor bolts connecting the 2A Diesel Generator Skid to the foundation, the one on the SE corner is missing a washer and a nut. The bolt is 1.5" diameter with 2" of clearance from top of the bolt to the skid. The issue was identified during NRC Near Term Task Force Fukushima Seismic Walkdown. The skid beam is embedded in the foundation and there is no indication of uplift in the anchorage area. The rest of the bolts have the required washers and nuts. The DG has been functioning well with this existing condition. Engineering performed a preliminary evaluation for this condition and found that the existing condition meets all design requirements with substantial margin on bolt stresses.	1405600	Yes
2E12-D300B	For the 2A RHR WS Strainer 2E12-D300B, two south anchor nuts on the Strainer legs were found not fully tightened. There was a 1/4 inch to 1/2 inch gap under the installed nuts. Based on a preliminary evaluation by Engineering, the 2E12-D300B Strainer would have still performed its design function during a seismic event even with the nuts not fully tightened.	1406061	Yes
2DG01K	Installed missing nut and washer on anchor bolt (see IR 1405600). Nut is mechanically tight but does not have full thread engagement as procedure requires. 2A DG remains fully operational per Engineering preliminary evaluation.	1406114	Yes

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete (Yes/No, See Notes 1 & 2)
2C11-D001095, 2C11-D3459-125, 2C11-D3459-126, 2C11-D3459-127	During the performance of Fukushima Seismic Walkdowns in the Unit Two Reactor Building, it was noted that a lighting fixture located on the 761' Elevation by the CRD Accumulator (Northwest) has three chains supporting the lighting fixture. The fixture should have four chains supporting the fixture. Per Engineering, this is not a seismic issue due to the fact that the fixture is being supported by the third chain and is also supported by the flex conduit going into the fixture. However, the chain and associated S-hook should be replaced due to housekeeping issues.	1411336	Yes
2E22-N004, 2E22-N005	During the performance of Fukushima Seismic Walkdowns in the Unit 2 Reactor Building, it was noted that there was a pipe clamp that was not installed on a short run of tube above valve 2E22-N005-HRR on instrument panel 2H22-P024. Per Engineering, this is not a seismic concern since the short unsupported length of the tube is less than the maximum permitted unsupported length set forth in the design requirements in PI-LSNS-16. Moreover, the line is robustly supported along its entire run from containment to the subject instrument panel.	1419068	Yes

Notes:
1) "Yes" indicates that any corrective actions resulting from the issue are complete.
2) "No" indicates that any corrective actions resulting from the issue are NOT complete. Actions are tracked by the IR number in the station Corrective Action Program.

Table 5-3. Conditions Identified during Area Walk-Bys

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete (Yes/No, See Notes 1 & 2)
1-01, 3-04, 3-05	During the performance of Fukushima Seismic Walkdowns on Unit Two, it was noted that the S-hooks associated with the chains holding fluorescent lighting fixtures were not completely crimped closed. The areas noted were the Unit Two Diesel Generator Penthouse, as well as the Unit Two Hydraulic Control Units (HCUs) in the Reactor Building (761' Elevation). It should be noted that the S-hooks are closed enough such that they would not allow the fixture to become disconnected during a seismic event; therefore, this is not a seismic issue per Engineering. However, these S-hooks should be completely crimped closed as per normal maintenance standards.	1406922	No
1-01	During the performance of Fukushima Seismic Walkdowns, populations of lighting fixtures were inspected as part of the walkdown. Three lighting fixtures located in the Unit 2 Diesel Generator Penthouse, elevation 736 (J & 22) need repair. The north and middle 4 foot-long lighting fixtures have broken plastic covers that must be replaced. The south 4 foot-long lighting fixture S-hooks on the chains are not closed properly. There is no safety-related equipment near the light fixtures that would be impacted during a seismic event due to light fixtures falling from the S-hooks.	1405563	No
1-20	During the performance of Fukushima Seismic Walkdowns in the Unit Two "B" RHR Heat Exchanger Room (Elevation 694'), it was noted that there is a two inch by four inch piece of wood in the overhead stuck between pipes. If the piece of wood were to become dislodged during a seismic event, there are no soft targets in the area below. Therefore, this is not a seismic interaction issue, but rather a housekeeping issue per Engineering.	1406885	Yes

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete (Yes/No, See Notes 1 & 2)
4-02	During the performance of Fukushima Seismic Walkdowns in the Unit Two Reactor Building, it was noted that 2B33-S001B "2B Reactor Recirculation Pump Low Frequency Motor Generator Set" motor termination junction box had a missing bolt. The missing bolt is located on the north end, west side of the box. The missing bolt is one of several bolts that attach the cover plate to the junction box. The missing bolt has no significant effect on the junction box integrity, therefore per Engineering this is not a seismic issue.	1414874	Yes

Notes:
1) "Yes" indicates that any corrective actions resulting from the issue are complete.
2) "No" indicates that any corrective actions resulting from the issue are NOT complete. Actions are tracked by the IR number in the station Corrective Action Program.

6
Licensing Basis Evaluations

The EPRI guidance document, Section 5: Seismic Licensing Basis Evaluation provides a detailed process to perform and document seismic licensing basis evaluations of SSCs identified when potentially adverse seismic conditions are identified. The process provides a means to identify, evaluate and document how the identified potentially adverse seismic condition meets a station's seismic licensing basis without entering the condition into a station's Corrective Action Program (CAP). In lieu of this process, Exelon/LaSalle utilized the existing processes and procedures (Site CAP Expectations) to identify, evaluate and document conditions identified during the Seismic Walkdowns.

In accordance with Exelon/LaSalle processes and procedures, all questionable conditions identified by the SWEs during the walkdowns were entered into the station CAP to be further evaluated and addressed as required. The SWEs provided input to support the identification and evaluation (including seismic licensing basis evaluations, as required) of the potentially adverse seismic conditions entered into the CAP. The station corrective action program is a more robust process than that provided in the EPRI guidance document; in part, ensuring each condition is properly evaluated for conformance with design and licensing bases and corrected as required.

Conditions identified during the walkdowns were documented on the SWCs, AWCs, and entered into the CAP. For those conditions that required, seismic licensing basis evaluations were completed and documented within the IR. Tables 5-2 and 5-3 in the report provide the IR, a summary of the condition, and the action completion status.

7

IPEEE Vulnerabilities Resolution Report

A review of the LaSalle County Nuclear Power Station Individual Plant Examination of External Events (IPEEE) Submittal along with the NRC Staff Evaluation Report of the IPEEE found that no vulnerabilities were identified and no plant improvements resulted from the IPEEE program. (Ref. 3 and 5)

8 Peer Review

A peer review team consisting of at least two individuals was assembled and peer reviews were performed in accordance with Section 6: Peer Reviews of the EPRI guidance document. The Peer Review process included the following activities:

- Review of the selection of SSCs included on the SWEL
- Review of a sample of the checklists prepared for the Seismic Walkdowns and Area Walk-Bys
- Review of Licensing basis evaluations, as applicable
- Review of the decisions for entering the potentially adverse conditions into the CAP process
- Review of the submittal report
- Provide a summary report of the peer review process in the submittal report

The peer reviews were performed independently from this report and the summary Peer Review Report is provided in Appendix F of this report.

9 References

Reference drawings related to SWEL items are provided in the Seismic Walkdown Checklists and if applicable, in the Area-Walkdown Checklists.

1. EPRI Technical Report 1025286, *Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic*, dated June 2012

2. LaSalle County Power Station Updated Final Safety Analysis Report (UFSAR), Revision 19, April 2012

3. Nuclear Regulatory Commission letter to Mr. Oliver D. Kingsley, Commonwealth Edison Company, dated December 8, 2000, Subject: LaSalle County Station, Units 1 and 2 NRC Staff evaluation of the Individual Plant Examination of External Events (IPEEE) Submittal (TAC NOS. M83634 And M83635)

4. NUREG/CR-4832, Analysis of the LaSalle Unit 2 Nuclear Power Plant: Risk Methods Integration and Evaluation Program (RMIEP), Vol. 8

5. Commonwealth Edison Letter from Gary G. Benes to U.S. Nuclear Regulatory Commission, dated December 12, 1994, Subject: LaSalle County Nuclear Power Station, Individual Plant Examination and Individual Plant Examination (External Events) Submittal, NRC Dockets 50-373 and 50-374

6. NRC (E Leeds and M Johnson) Letter to All Power Reactor Licensees et al., "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendation 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," Enclosure 2.3, "Recommendation 2.3: Seismic."

7. "Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-term Task Force Review of Insights from the Fukushima Dai-ichi Accident," ADAMS Accession No. ML111861807, July 12, 2011

8. Internal RM Document LS-MISC-16, Rev. 0, SWEL Risk Importance Input

9. Drawing M-134, Sheet 1 Rev. AT, P&ID CSCS Equipment Cooling Water System

10. Drawing M-134, Sheet 2 Rev. AK, P&ID CSCS Equipment Cooling Water System

11. Drawing M-134, Sheet 3 Rev. O, P&ID CSCS Equipment Cooling Water System

12. Drawing M-144, Sheet 1 Rev. AL, P&ID Fuel Pool Cooing Filter & Demineralizing System

13. Drawing M-144, Sheet 2 Rev. W, P&ID Fuel Pool Cooing Filter & Demineralizing System

14. Drawing M-87, Sheet 2 Rev. AR, P&ID Core Standby Cooling System Equipment Cooling Water System

15. Drawing M-770, Sheet 13 Rev. D, Substructure Piping

16. Drawing S-781, Rev. O, Reactor Building Pool Liner Top Plan Elevation 843'-6"

17. Drawing S-782, Rev. K, Reactor Building Pool Liner Bottom Plan

18. Drawing S-784, Rev. L, Reactor Building Pool Liner Sections & Details

19. Exelon Generation Company, LLC, Docket No. 50-373, LaSalle County Station, Unit 1, Facility Operating License, License No. NPF-11

20. Exelon Generation Company, LLC, Docket No. 50-374, LaSalle County Station, Unit 2, Facility Operating License, License No. NPF-18

Contents of Annex A

Appendices

Tables

A1 Introduction

A1.1 PURPOSE

This updated transmittal report is being provided in compliance with the requirements contained in Enclosure 3 of the NRC 50.54(f) letter dated March 12, 2012 (Ref. 6). This new report section, Annex A, contains the results of the follow-on inspection activities that have been completed to address commitments contained in Exelon letter to the NRC, "180-day Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding the Seismic Aspects of Recommendation 2.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated November 27, 2012 (RS-12-163). Annex A, includes follow-on seismic walkdown results associated with NRC Commitment Nos. 2 and 4 listed in Enclosure 3 of the above Exelon letter. Additionally, the update includes the current status of the resolution of conditions found during the initial seismic walkdowns and area walk-bys as documented in Tables 5-2 and Table 5-3, respectively, from Enclosure 2 of the above Exelon letter.

Commitment No. 2, for the completion of the 7 remaining inspection (SWEL) items previously deferred due to inaccessibility listed in Table E-1 of Enclosure 2, has been completed. All 7 inspection items were completed by the commitment outage L2R14 (Spring 2013) and the results are documented in this update.

Commitment No. 4, for the completion of the 18 remaining internal electrical cabinet inspections listed in Table E-2 of Enclosure 2, remains open. This update documents the completion of 13 of the 18 inspection items in accordance with the individual item completion schedule. The remaining inspection items will be completed by the original commitment outage L2R15 (Spring 2015). A subsequent NRC transmittal will be issued to document results of these inspections and the completion of Commitment No. 4.

Annex A, includes updates to each report section where the status has changed or new information is available in accordance with Section 8 of EPRI Technical Report 1025286, "Seismic Walkdown Guidance For Resolution of Fukushima Near Term Task Force Recommendation 2.3 Seismic" (Ref. 1). This report follows the same structure as the previous transmittal; however, every section begins with an "A" to differentiate from the previous report.

A1.2 BACKGROUND

See Section 1.2 of Enclosure 2 of Exelon letter to the NRC (RS-12-163).

A1.3 PLANT OVERVIEW

See Section 1.3 of Enclosure 2 of Exelon letter to the NRC (RS-12-163).

A1.4 APPROACH

See Section 1.4 of Enclosure 2 of Exelon letter to the NRC (RS-12-163).

A1.5 CONCLUSION

As of February 22, 2013, Seismic Walkdowns scheduled for L2R14 have been completed at the LaSalle County Generating Station Unit 2. The seven (7) items deferred due to inaccessibility along with thirteen (13) of the remaining supplemental inspections of electrical cabinets scheduled for L2R14 were performed in accordance with the NRC endorsed walkdown methodology. Area Walk-Bys were also completed, as required, during these follow-on activities. No potentially degraded, nonconforming, or unanalyzed conditions were identified during these follow-on activities. No planned or newly identified protection or mitigation features have resulted from the efforts to address the 50.54(f) letter.

As of May 10, 2013, all conditions identified during the initial Seismic Walkdowns and Area Walk-Bys as documented in the Issue Reports listed in Table 5-2 and Table 5-3 of Enclosure 2 of Exelon letter to the NRC (RS-12-163) have been corrected. No IRs were generated during the follow-on walkdowns. The updated completion status for the previous Issue Reports is shown in Table A5-2 and Table A5-3 in Section A5 of this Annex A.

A2 Seismic Licensing Basis

See Section 2 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no new licensing basis evaluations resulted from the follow-on walkdown activities.

A3 Personnel Qualifications

A3.1 Overview

This section of the report identifies the additional personnel that participated in the NTTF 2.3 Seismic Walkdown efforts. A description of the responsibilities of each Seismic Walkdown participant's role(s) is provided in Section 2 of the EPRI guidance document. (Ref. 1) Resumes provided in Appendix A of Enclosure 2 of Exelon letter to the NRC (RS-12-163), and Appendix AA in this Annex A provide details on each person's qualifications for his or her role.

A3.2 Project Personnel

Table A3-1 below summarizes the names and corresponding roles of personnel who participated in the NTTF 2.3 Seismic Walkdown efforts.

Table A3-1. Personnel Roles

Name	Equipment Selection Engineer	Plant Operations	Seismic Walkdown Engineer (SWE)	Licensing Basis Reviewer	IPEEE Reviewer	Peer Reviewer
A. Perez	X					
K. Hull	X					
T.K. Ram						X(1)
D. Carter			X	X		
M. Wodarcyk			X	X		
J. Griffith			X	X		
M. Etre			X	X		
T. Bacon						X
W. Djordjevic						X(2)
T. Dean (Exelon)		X				
Jorge Sanchez (Exelon)			X	X	X	
Aram Zare (Exelon) *			X	X		
Gregory Engels (Exelon)*						X(2)
Jeffrey Snyder (Exelon)*						X

Notes:

1. Peer Review Team member for SWEL review only.
2. Peer Review Team Leader.

* Additional Personnel for follow-on inspections.

A3.2.1 Stevenson & Associates Personnel

See Section 3.2.1 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no new S&A personnel participated in the follow-on activities.

A3.2.2 Additional Personnel

See Section 3.2.2 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), the following additional Exelon personnel participated in the follow-on activities:

Exelon Engineering staff member Aram Zare performed a review of Report Annex as well as assisted in the follow-on walkdown activities. Mrs. Zare is a Structural Engineer in the Exelon Engineering Department. She has a Bachelor of Science degree in civil engineering and a Master of Science degree in civil/structural engineering. She has worked at LaSalle since 2011. She has successfully completed Seismic Evaluations Training and the Near-Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns Training Course.

Exelon Engineering staff members Gregory Engels and Jeffrey Snyder performed a peer review of the Report Annex. Prior to performing the peer review both Mr. Engels and Mr. Snyder thoroughly reviewed and familiarized themselves with the EPRI guidance document and used it as the basis for the preparation of their peer report.

Mr. Engels is a Mechanical Engineer in the Exelon Engineering Department. He has Bachelor and Master of Science degrees in mechanical engineering. He has worked at LaSalle since 2010, has his structural qualification, and is in the process of attaining his seismic qualification. Mr. Engels seismic/dynamic experience includes approximately 10 years of environmental and dynamic qualification of structural components for the aerospace industry. Mr. Engels is a licensed Professional Engineer in the State of Illinois.

Mr. Snyder is a Mechanical Engineer in the Exelon Engineering Department. He has a Bachelor of Science degree in mechanical engineering. He has worked at LaSalle since 2011, is currently VT-1, 2, & 3 qualified, and is in the process of attaining his seismic qualification. His prior experience includes over 20 years of mechanical, civil and structural design in the petrochemical industry. This included the design and inspection of concrete structures, structural steel framing for pipe supports, and equipment anchorage supports. Mr. Snyder is a licensed Professional Engineer in the State of Illinois.

A4 Selection of SSCs

See Section 4 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no changes were made to the SWEL for the follow-on walkdowns.

A5 Seismic Walkdowns and Area Walk-Bys

A5.1 Overview

Follow-on Seismic Walkdowns and Area Walk-Bys were conducted by a two (2) person team of trained Seismic Walkdown Engineers (SWEs), in accordance with the EPRI guidance document during the first quarter of 2013. The Seismic Walkdowns and Area Walk-Bys are discussed in more detail in the following sub-sections.

Consistent with the EPRI guidance document, Section 4: Seismic Walkdowns and Area Walk-Bys, the SWEs used their engineering judgment, based on their experience and training, to identify potentially adverse seismic conditions. Where needed, the engineers were provided the latitude to rely upon new or existing analyses to inform their judgment.

The SWEs conducted the Seismic Walkdowns and Area Walk-Bys together as a team. During the evaluations, the SWEs actively discussed their observations and judgments with each other. The results of the Seismic Walkdowns and Area Walk-Bys reported herein are based on the comprehensive agreement of the SWEs.

A5.2 Seismic Walkdowns

These follow-on Seismic Walkdowns focused on the seismic adequacy of the items previously deferred due to inaccessibility listed on Table E-1of Enclosure 2 of Exelon letter to the NRC (RS-12-163). The Seismic Walkdowns also evaluated the potential for nearby SSCs to cause adverse seismic interactions with the items being inspected. The Seismic Walkdowns focused on the following adverse seismic conditions associated with the subject item of equipment:

- Adverse anchorage conditions
- Adverse seismic spatial interactions
- Other adverse seismic conditions

The results of the follow-on Seismic Walkdowns were documented in Appendix AC of this Annex A, using the Seismic Walkdown Checklist (SWC) template provided in the EPRI guidance document. Seismic Walkdowns were performed and SWCs were completed for all seven (7) of the items identified on Table E-1 of Enclosure 2 of Exelon letter to the NRC (RS-12-163). Additionally, photos have been included with most SWCs to provide a visual record of the item along with any comments noted on the SWC. Drawings and other plant records are cited in some of the SWCs, but are not included with the SWCs because they are readily retrievable documents through the station's document management system.

The following subsections describe the approach followed by the SWEs to identify potentially adverse anchorage conditions, adverse seismic interactions, and other adverse seismic conditions during the Seismic Walkdowns.

A5.2.1 Adverse Anchorage Conditions

See Section 5.2.1 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no adverse anchorage conditions were identified during the follow-on walkdowns.

A5.2.2 Configuration Verification

See Section 5.2.2 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no additional configuration verification was required and none was performed during the follow-on walkdowns.

A5.2.3 Adverse Seismic Spatial Interactions

See Section 5.2.3 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no adverse seismic spatial interactions were identified during the follow-on walkdowns.

A5.2.4 Other Adverse Seismic Conditions

See Section 5.2.4 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no other adverse seismic conditions were identified during the follow-on walkdowns.

A5.2.5 Conditions Identification during Seismic Walkdowns

See Section 5.2.5 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no other adverse seismic conditions were identified during the follow-on walkdowns.

A5.3 Area Walk-Bys

The purpose of the Area Walk-Bys is to identify potentially adverse seismic conditions associated with other SSCs located in the vicinity of the items being inspected. Vicinity is generally defined as the room containing the item. If the room is very large (e.g., Turbine Deck), then the vicinity is identified based on judgment, e.g., on the order of about 35 feet from the item. Additional vicinities associated with these follow-on seismic walkdowns but not covered in Appendix D of Enclosure 2 of Exelon letter to the NRC (RS-12-163), are described on the Area Walk-By Checklists (AWCs), shown in Appendix AD of this Annex A. A total of three (3) additional AWCs were completed for LaSalle Unit 2 as a result of these follow-on walkdowns.

The key examination factors that were considered during Area Walk-Bys include the following:

- Anchorage conditions (if visible without opening equipment)
- Significantly degraded equipment in the area
- A visual assessment (from the floor) of cable/conduit raceways and HVAC ducting (e.g., condition of supports or fill conditions of cable trays)
- Potentially adverse seismic interactions including those that could cause flooding, spray, and fires in the area
- Other housekeeping items that could cause adverse seismic interaction (including temporary installations and equipment storage)

- Scaffold construction was inspected to meet Exelon Procedure NES-MS-04.1, Seismic Prequalified Scaffolds
- Seismic housekeeping was examined to meet station procedure LAP-100-56, Equipment / Parts Storage in Plant Areas Containing Safety-Related Equipment

The Area Walk-Bys are intended to identify adverse seismic conditions that are readily identified by visual inspection, without necessarily stopping to open cabinets or taking an extended look. Therefore, the Area Walk-By took significantly less time than it took to conduct the Seismic Walkdowns described above. If a potentially adverse seismic condition was identified during the Area Walk-By, then additional time was taken, as necessary, to evaluate adequately whether there was an adverse condition and to document any findings.

The results of the Area Walk-Bys were documented on the AWCs included in Appendix AD of this Annex A. A separate AWC was filled out for each area inspected. A single AWC was completed for areas where more than one item was located.

Additional details for evaluating the potential for adverse seismic interactions that could cause flooding, spray, or fire in the area are provided in Section 5.3 of Enclosure 2 of Exelon letter to the NRC (RS-12-163).

A5.3.1 Conditions Identification during Area Walk-Bys

No conditions were identified during the Area Walk-Bys associated with the follow-on walkdowns.

During the previous seismic walkdowns, conditions were identified and entered into CAP. Subsequent to the issuance of the last report, corrective actions were completed to address these conditions. Tables A5-2 and A5-3 of this Annex A provide an updated summary of the conditions and the status of the corrective actions to address these conditions.

A5.4 SUPPLEMENTAL INFORMATION ON ELECTRICAL CABINET INSPECTIONS

Follow-on walkdowns completed the supplemental internal inspections of thirteen (13) open items on Table E-2 of Enclosure 2 of Exelon letter to the NRC (RS-12-163). No adverse conditions were identified during these supplemental internal inspections.

The Seismic Walkdown Checklists (SWC) for these thirteen (13) supplemental internal cabinet inspections were completed and documented in Appendix AC of this Annex A. These Checklists reference the previous SWCs of Enclosure 2 of Exelon letter to the NRC (RS-12-163).

Table A5-2. Conditions Identified during Seismic Walkdowns

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete (Yes/No, See Notes 1 & 2)
2C11-D001002, 2C11-D001090, 2C11-D001095, 2C11-D001184, 2C11-D2259-125, 2C11-D2259-126, 2C11-D2259-127, 2C11-D2603-125, 2C11-D2603-126, 2C11-D2603-127, 2C11-D3459-125, 2C11-D3459-126, 2C11-D3459-127, 2C11-D3807-125, 2C11-D3807-126, 2C11-D3807-127	During the performance of Fukushima Seismic Walkdowns on Unit Two, it was noted that the S-hooks associated with the chains holding fluorescent lighting fixtures were not completely crimped closed. Two of the areas noted were in the vicinity of the Unit 2 North and South Hydraulic Control Unit (HCU) banks in the Reactor Building (761' Elevation). It should be noted that the S-hooks are closed enough such that they would not allow the fixture to become disconnected during a seismic event; therefore, this is not a seismic issue per Engineering. However, these S-hooks should be completely crimped closed as per normal maintenance standards.	1406922	*Yes
2AP21-303B	During the performance of Fukushima Seismic Walkdowns, base plate thread engagements on a population of Switchgears and Transformers were inspected as part of the walkdown. On Transformer 236X (2AP21E-303B), the southwest 1-inch diameter anchor bolt has 7/8 inch thread engagement, 1/8 inch with no thread engagement. A preliminary evaluation was performed by Engineering. Per Engineering, there is no structural adequacy concern; therefore the anchor bolt as-found thread engagement is not a seismic issue, and the transformer remains fully-functional.	1405542	Yes

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete (Yes/No, See Notes 1 & 2)
2DG01K	Out of the 34 anchor bolts connecting the 2A Diesel Generator Skid to the foundation, the one on the SE corner is missing a washer and a nut. The bolt is 1.5" diameter with 2" of clearance from top of the bolt to the skid. The issue was identified during NRC Near Term Task Force Fukushima Seismic Walkdown. The skid beam is embedded in the foundation and there is no indication of uplift in the anchorage area. The rest of the bolts have the required washers and nuts. The DG has been functioning well with this existing condition. Engineering performed a preliminary evaluation for this condition and found that the existing condition meets all design requirements with substantial margin on bolt stresses.	1405600	Yes
2E12-D300B	For the 2A RHR WS Strainer 2E12-D300B, two south anchor nuts on the Strainer legs were found not fully tightened. There was a 1/4 inch to 1/2 inch gap under the installed nuts. Based on a preliminary evaluation by Engineering, the 2E12-D300B Strainer would have still performed its design function during a seismic event even with the nuts not fully tightened.	1406061	Yes
2DG01K	Installed missing nut and washer on anchor bolt (see IR 1405600). Nut is mechanically tight but does not have full thread engagement as procedure requires. 2A DG remains fully operational per Engineering preliminary evaluation.	1406114	Yes

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete (Yes/No, See Notes 1 & 2)
2C11-D001095, 2C11-D3459-125, 2C11-D3459-126, 2C11-D3459-127	During the performance of Fukushima Seismic Walkdowns in the Unit Two Reactor Building, it was noted that a lighting fixture located on the 761' Elevation by the CRD Accumulator (Northwest) has three chains supporting the lighting fixture. The fixture should have four chains supporting the fixture. Per Engineering, this is not a seismic issue due to the fact that the fixture is being supported by the third chain and is also supported by the flex conduit going into the fixture. However, the chain and associated S-hook should be replaced due to housekeeping issues.	1411336	Yes
2E22-N004, 2E22-N005	During the performance of Fukushima Seismic Walkdowns in the Unit 2 Reactor Building, it was noted that there was a pipe clamp that was not installed on a short run of tube above valve 2E22-N005-HRR on instrument panel 2H22-P024. Per Engineering, this is not a seismic concern since the short unsupported length of the tube is less than the maximum permitted unsupported length set forth in the design requirements in PI-LSNS-16. Moreover, the line is robustly supported along its entire run from containment to the subject instrument panel.	1419068	Yes

Notes:
1) "Yes" indicates that any corrective actions resulting from the issue are complete.
2) "No" indicates that any corrective actions resulting from the issue are NOT complete. Actions are tracked by the IR number in the station Corrective Action Program.
* Denotes updated item from the original report.

Table A5-3. Conditions Identified during Area Walk-Bys

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete (Yes/No, See Notes 1 & 2)
1-01, 3-04, 3-05	During the performance of Fukushima Seismic Walkdowns on Unit Two, it was noted that the S-hooks associated with the chains holding fluorescent lighting fixtures were not completely crimped closed. The areas noted were the Unit Two Diesel Generator Penthouse, as well as the Unit Two Hydraulic Control Units (HCUs) in the Reactor Building (761' Elevation). It should be noted that the S-hooks are closed enough such that they would not allow the fixture to become disconnected during a seismic event; therefore, this is not a seismic issue per Engineering. However, these S-hooks should be completely crimped closed as per normal maintenance standards.	1406922	*Yes
1-01	During the performance of Fukushima Seismic Walkdowns, populations of lighting fixtures were inspected as part of the walkdown. Three lighting fixtures located in the Unit 2 Diesel Generator Penthouse, elevation 736 (J & 22) need repair. The north and middle 4 foot-long lighting fixtures have broken plastic covers that must be replaced. The south 4 foot-long lighting fixture S-hooks on the chains are not closed properly. There is no safety-related equipment near the light fixtures that would be impacted during a seismic event due to light fixtures falling from the S-hooks.	1405563	*Yes
1-20	During the performance of Fukushima Seismic Walkdowns in the Unit Two "B" RHR Heat Exchanger Room (Elevation 694'), it was noted that there is a two inch by four inch piece of wood in the overhead stuck between pipes. If the piece of wood were to become dislodged during a seismic event, there are no soft targets in the area below. Therefore, this is not a seismic interaction issue, but rather a housekeeping issue per Engineering.	1406885	Yes

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete (Yes/No, See Notes 1 & 2)
4-02	During the performance of Fukushima Seismic Walkdowns in the Unit Two Reactor Building, it was noted that 2B33-S001B "2B Reactor Recirculation Pump Low Frequency Motor Generator Set" motor termination junction box had a missing bolt. The missing bolt is located on the north end, west side of the box. The missing bolt is one of several bolts that attach the cover plate to the junction box. The missing bolt has no significant effect on the junction box integrity, therefore per Engineering this is not a seismic issue.	1414874	Yes

Notes:
1) "Yes" indicates that any corrective actions resulting from the issue are complete.
2) "No" indicates that any corrective actions resulting from the issue are NOT complete. Actions are tracked by the IR number in the station Corrective Action Program.
* Denotes updated item from the original report.

A6 Licensing Basis Evaluations

See Section 6 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no new licensing basis evaluations were performed as a result of conditions identified during the follow-on Walkdowns or Area Walk-Bys.

A7 IPEEE Vulnerabilities Resolution Report

See Section 7 of Enclosure 2 of Exelon letter to the NRC (RS-12-163).

A8 Peer Review

A peer review team consisting of at least two individuals was assembled and peer reviews were performed in accordance with Section 6: Peer Reviews of the EPRI guidance document. The Peer Review process included the following activities:

- Review of a sample of the checklists prepared for the Seismic Walkdowns and Area Walk-Bys
- Review of Licensing basis evaluations, as applicable
- Review of the decisions for entering the potentially adverse conditions into the CAP process
- Review of the submittal report
- Provide a summary report of the peer review process in the submittal report

The peer reviews were performed independently from this report and the summary Peer Review Report is provided in Appendix AF of this Annex A.

A9 References

See Section 9 of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no new references were added for this Annex A.

AA

Project Personnel Resumes and SWE Certificates

During the follow-on inspections, three additional personnel were required as Seismic Walkdown Engineer and Peer Reviewers. The resumes and certificates (where applicable) of the Seismic Walkdown Team can be found in Appendix A of Enclosure 2 of Exelon letter to the NRC (RS-12-163) and Appendix AA of this Annex A.

Resumes and certificates (where applicable) for the following people are found in Appendix AA of this Annex A:

ARAM ZARE, E.I.T

EXPERIENCE SUMMARY

Exelon Nuclear, LaSalle, IL, *Design Engineer, Structural* 2011-present

- Responsible for component support designs, heavy load rigging, scaffold erections, and direct applied or shadow lead shielding installations for various modification projects.
- Prepared structural computations in support of qualifying existing structural framing (steel and concrete) for proposed loadings from major plant modifications, such as Low Level Waste Storage and an Independent Spent Fuel System Installation.

***Environmental Design International Inc., Chicago, IL**, Design Engineer* 2009

- Responsible for design and layout of urban enhancement projects for the City of Chicago, IL. Prepared complete construction plan drawings and design reports in accordance with IDOT and ADA standards.

***Know How Industrial Consultants, Tehran, Iran**, Structural Engineer* 2006-2008

- Analyzed and designed a mid-size industrial steel structure using SAP and SAFE software in accordance with the ACI and AISC code provisions and prepared detailed calculation report. Was also responsible for preparation of the design criteria and interfaced with the client throughout the design process to ensure client satisfaction.
- Managed two and three-dimensional finite element modeling of several existing structures of a cement silo complex using SAP and SAFE software to implement major structural modifications due to mechanical equipment changes. Analyzed, qualified and where required designed modifications for the steel and concrete elements of these structures. Revised all construction drawings and calculation reports.
- Analyzed and designed a number of residential buildings of a Copper Complex using ETABS and SAFE software.

EDUCATION

B.S. Civil Engineering, Baha'i Institute for Higher Education, Tehran, Iran, 2006
M.S. Civil Engineering, Illinois Institute of Technology, Chicago, IL, 2012

QUALIFICATIONS

Engineer-in-Training, 2011

ORGANIZATIONS

- American Institute of Steel Construction
- North American Young Generation in Nuclear
- American Society of Civil Engineers

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Certificate of Completion

Aram Zare

Training on Near Term Task Force Recommendation 2.3 - Plant Seismic Walkdowns

June 27, 2012
Date

R.P. Kassawara
Robert K. Kassawara
EPRI Manager,
Structural Reliability & Integrity

GREGORY A. ENGELS, P.E.

EXPERIENCE SUMMARY

Exelon Nuclear, LaSalle, IL, *Design Engineer* 2010-present

- Qualifications in Configuration Change Responsible Engineer, Engineering Reviewer, Calculations, General Structural Activities, and 50.59 BWR Screener
- Involved in all aspects of plant modification/configuration change activities at LaSalle Station including design modification packages and calculations.
- Currently working towards completion of Engineering Component Seismic Qualification.

Chamlin & Associates, Peru, IL, *Professional Engineer* 2005-2010

- Responsible for civil engineering design and project management as a member of a consulting firm.
- Responsible for a wide range of projects in all aspects and phases of design from proposal through final construction for industrial, commercial, institutional, municipal and state clients.
- Civil engineering projects include bridge hydraulic and drainage studies and storm water management designs in support of site developments and roadway improvements.
- Manage air and water discharge permits for commercial and municipal clients.

MPC Products, Skokie, IL, *Design Engineer* 1997-2002/2003-2005

- Responsible for mechanical aspects of electronic packaging and design for aerospace electro-mechanical applications from conceptual layout through production.
- Utilized software design packages such as ANSYS (Finite Element Analysis) and IDEAS software to satisfy static and dynamic thermal and structural product design requirements.

Decrane Aircraft Seating Company, Peshtigo, WI, *Project Engineer* 2002-2003

- Responsible for project design and production aspects of commercial aircraft seating.
- Oversight of new product dynamic testing to meet FAA certification.

Illinois Department of Transportation, Ottawa, IL, *Engineering Intern (Summers)* 1993-1994

- Responsible for the daily quantity computations and documentation of construction materials and monthly contractor pay requests.
- Construction layout, inspection and contractor oversight.
- Maintained quality control through documentation and testing of construction materials to ensure accordance with State contract documents.

EDUCATION

B.S. Mechanical Engineering, University of Illinois, Champaign, Urbana, IL, 1995
M.S. Mechanical Engineering, Arizona State University, Tempe, AZ, 1997

QUALIFICATIONS AND TRAINING

Registered Professional Engineer / Illinois - 2006

Jeffrey R. Snyder, P.E.

EXPERIENCE SUMMARY

Exelon Nuclear, LaSalle, IL, *Design Engineer* 2011-present

- Qualifications in Configuration Change Responsible Engineer, Engineering Reviewer, Calculations, and 50.59 BWR Screener. In addition to the previously mentioned qualifications, also K-T and Support Refute trained and Qualified.
- Involved in all aspects of plant modification/configuration change activities at LaSalle Station including design modification packages and calculations.
- Currently working towards completion of Engineering Component Seismic Qualification, VT-1,2, and 3 Qualifications, Root Cause Investigator Qualification, and Operability Evaluations Qualifications

Chamlin & Associates, Peru, IL, *Professional Engineer* 2005-2011

- Responsible for civil engineering design and project management. Managed engineers and technical personnel to meet project goals and budgets.
- Responsible for a wide range of projects in all aspects and phases of design from proposal through final construction processes for industrial, commercial, municipal and state clients. Civil engineering projects include municipal infrastructure design, airport design, land development improvements, drainage studies in support of site developments, and roadway improvements. Provided mechanical engineering and process support to commercial and industrial clients including detailed HVAC design and process improvement project designs.

M&K Chemical Engineering Consultants, LaSalle, IL, *Sr. Project Engineer* 1993-2005

- Responsible for mechanical engineering design and project management. Managed engineers and technical personnel to meet project goals and budgets.
- Responsible for a wide range of projects in all aspects and phases of design and construction from proposal through final construction industrial, petrochemical, pharmaceuticals, and general chemical facilities.

Burbach Municipal & Civil Engineers, Platteville, WI, *Project Engineer* 1991-1993

- Responsible for mechanical and civil engineering design and project management municipal aquatic facilities. Provided project design and construction management for commercial and municipal clients.
- Responsible for projects in all aspects and phases of design and construction of commercial and municipal aquatic facilities.

EDUCATION

University of Wisconsin Platteville, Platteville, WI – B.S. Mechanical Engineering, 1992

QUALIFICATIONS AND TRAINING

Registered Professional Engineer / Illinois - 2007

ACTIVITIES

- North American Young Generation in Nuclear (NA-YGN)
- American Institute of Steel Construction

AB

Equipment Lists

See Appendix B of Enclosure 2 of Exelon letter to the NRC (RS-12-163), no changes were made to the SWEL or equipment lists.