Enclosure 1

Seismic Walkdown Report In Response To The 50.54(f) Information Request Regarding Fukushima Near-Term Task Force Recommendation 2.3: Seismic for the Braidwood Station, Unit 1, Report Number: 12Q0108.10-R-001, Revision 0

(610 pages)

SEISMIC WALKDOWN REPORT

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

for the

BRAIDWOOD NUCLEAR POWER STATION UNIT 1
35100 South Route 53, Braceville, Illinois, 60407
Facility Operating License No. NPF-72
NRC Docket No. STN 50-456
Correspondence No.: RS-12-159

Exelon Generation Company, LLC (Exelon)
PO Box 805398
Chicago, IL 60680-5398

Prepared by:
Stevenson & Associates
1661 Feehanville Drive, Suite 150
Mount Prospect, IL 60056

Report Number: 12Q0108.10-R-001, Rev. 0

	Printed Name	Signature	Date
Preparer:	Marlene Delaney	Marlene M Delaney	11/13/2012
Reviewer:	Tony Perez	Tony Perez	11/13/2012
Approver:	Tony Perez	Tony Perez	11/13/2012
Peer Review Team Leader:	Bruce Lory	Bruce M. Lory	11/13/2012
Lead Responsible Engineer:	Thomas Bortolini	Thomas Bortolini	11/16/2012
Branch Manager:	Ray Belair	Ray Belair	11/16/12
Senior Manager Design Engineering:	Phil Raush	Phil Raush	11/16/12
Corporate Acceptance:	Jeffrey S. Clark	Jeffrey S. Clark	11/16/12

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This document has been prepared in accordance with the S&A Quality Assurance Program Manual, Revision 17 and project requirements:

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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. 11) 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 Braidwood Generating Station Unit 1 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/Braidwood 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 maximum horizontal and vertical ground accelerations at the foundation level are 20% of gravity for the safe shutdown earthquake (SSE). (Ref. 2 section 3.7.1.1)

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 Braidwood Unit 1, the SWEL is comprised of:

- SWEL 1 resulted with 100 items for walkdown.
- SWEL 2 resulted with 21 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 Braidwood Unit 1 were performed during the week of July 16, 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 105 of the 121 components on the SWEL (comprised of SWEL 1 and SWEL 2). Walkdowns for 16 components were deferred due to accessibility issues such as being located in containment or energized equipment. The 16 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 42 anchorage configurations were confirmed to be installed in accordance with the station documentation and an additional 6 anchor configurations will be confirmed as the 16 deferred items are inspected.

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 28 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 Braidwood Unit 1 twenty-one (21) Issue Reports (IRs) were issued. After evaluation through the CAP, it was determined that none of the issues identified in the IRs were 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 Corrective Action Program (CAP). In lieu of this process, Exelon/Braidwood utilized the existing processes and procedures (Site CAP Expectations) to identify, evaluate and document conditions identified during the Seismic Walkdowns.

In accordance with Exelon/Braidwood 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 and Appendix G of this report. No vulnerabilities were identified as a result of the effort that addressed the Individual Plant Examination of External Events (IPEEE). (Ref. 3 and 5) However, plant improvements were identified in section 7 of Reference 3. Table G-1 provides the list of plant improvements, the IPEEE proposed resolution, the actual resolution and resolution date.

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 Braidwood Generating Station Unit 1 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 with 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 with no adverse seismic conditions associated with other SSCs located in the vicinity of the SWEL item(s).

The Seismic Walkdowns identified 21 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 16 items deferred due to inaccessibility along with

supplemental inspections of 28 electrical cabinets. Area Walk-Bys will be complete, as required, during these follow-on activities.

All IPEEE plant improvements and associated actions are complete.

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. 11) 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 Braidwood Generating Station Unit 1 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/Braidwood has utilized this NRC endorsed guidance as the basis for the seismic walkdowns and this report. (Ref. 1)

1.3 PLANT OVERVIEW

The Braidwood nuclear power plant consists of two nearly identical generating units, and two pressurized water reactors (PWR) (NSSS) and turbine-generators furnished by Westinghouse Electric Corporation (Westinghouse). The reactor containments are of post-tensioned concrete construction with a carbon steel liner. Sufficient free volume is provided to contain the energy released in a major accident without need for "pressure

suppression" devices. Sargent & Lundy was responsible for containment design. (Ref. 2 section 1.1)

The Braidwood Station is located in northeastern Illinois, near the town of Braidwood and near the Kankakee River. Cooling for the plant is provided by a large man-made cooling pond of approximately 2500 acres constructed over a previously strip-mined area. Essential service cooling is provided by a 99-acre auxiliary cooling pond which is integral with the main pond. The fuel loading dates for the two units were October 1986 and December 1987 for Units 1 and 2, respectively. The corresponding dates for commercial operation were July 1988 and October 1988. (Ref. 2 section 1.1)

1.4 APPROACH

The EPRI guidance document is used for the Braidwood Generating Station Unit 1 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 SSCs
- Seismic Walkdowns and Area Walk-Bys
- Licensing Basis Evaluations
- IPEEE Vulnerabilities Resolution Report
- Peer Review

1.5 CONCLUSION

Seismic walkdowns have been performed at the Braidwood Generating Station Unit 1 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 with 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 with no adverse seismic conditions associated with other SSCs located in the vicinity of the SWEL item(s).

The Seismic Walkdowns identified 21 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 16 items deferred due to inaccessibility along with supplemental inspections of 28 electrical cabinets. Area Walk-Bys will be complete, 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 Braidwood Generating 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 maximum horizontal and vertical ground accelerations at the foundation level are 20% of gravity for the safe shutdown earthquake (SSE). (Ref. 2 section 3.7.1.1)

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 Braidwood Station UFSAR sections:

- 3.2 Classification of Structures, Components, and Systems
- 3.7 Seismic Design
- Attachment 3.7A – Reevaluation and Validation of the Byron/Braidwood Seismic Design Basis
- 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 3.2 Classification of Structures, Components, and Systems

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

Summary of Seismic Design

The site response spectra, which are defined at the ground surface, are given in section 2.5.2 of Reference 2 and are shown in UFSAR Figures 2.5-47 and 2.5-48 for the Braidwood site. Foundation level response spectra and time histories were generated by a deconvolution procedure described in section 3.7.1.2 of Reference 2. The maximum horizontal and vertical ground accelerations at the foundation level are 20% of gravity for the safe shutdown earthquake (SSE) and 9% of gravity for operating basis

earthquake (OBE). The comparisons between the free field seismic design motion applied at the surface and the corresponding foundation (rock) spectra for 2%, 3%, 4%, 5%, and 7% damping ratios are shown in UFSAR Figures 3.7-21 through 3.7-40 for the Braidwood site. (Ref. 2 section 3.7.1.1)

During the review of the FSAR for an Operating License, the Byron/Braidwood seismic design was reevaluated using the Regulatory Guide 1.60 spectra without the application of a deconvolution analysis. UFSAR Attachment 3.7A contains the specific NRC questions/responses on seismic design. These questions and responses document the historical evolution of certain aspects of the Byron/Braidwood seismic design. UFSAR Attachment 3.7A also provides the details and results of this reevaluation. It is concluded that the present seismic design of Byron/Braidwood is conservative. Based on the reevaluation described in UFSAR Attachment 3.7A, the Byron/Braidwood seismic design basis is acceptable and will therefore be used for all future seismic evaluations. (Ref. 2 section 3.7.1.1)

Seismic Class I structures are designed for seismic forces calculated from the aforementioned spectra using a response spectrum method of analysis. The directional combination rule uses three components of earthquake motions (two horizontal directions with vertical direction) combined by the square-root-sum-of-the-squares (SRSS) method. For evaluation of Seismic Class I components, In Structure Response Spectra (ISRS) are used. For horizontal directions, ISRS are generated using an input acceleration time history at the base (foundation) of mathematical models that represent the plant structures. (Ref. 3)

To determine the foundation (rock) level motion, the soil rock profile above the foundation was modeled as a one-dimensional continuous shear layer system. The ground surface spectra consistent time histories were applied at the ground surface and the foundation level motion was obtained using the SHAKE program. For all of the structures founded on rock, the foundation level motion was used directly to excite the fixed base model. (Ref. 3)

Summary of Codes and Standards

The information presented below has been extracted from the section 3.8 of Reference 2. 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:

- Containment - the applicable codes, standards, and specifications for the containment are 1 through 23 in Table 2-1 below.
- Containment Internal Structures – all of the items listed in Table 2-1 below are applicable for the containment internal structures.
- Safety-Related Structures Outside of Containment - all of the items listed in Table 2-1 below are applicable, with the exception of Items 17 and 18.
- Foundations for Seismic Category I Structures - the applicable codes, standards, and specifications are 1 through 14 and 19 through 23 in Table 2-1 below.

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

UFSAR Table 3.8-2 – List of Specifications, Codes, and Standards		
Specification Reference Number	Specification or Standard Designation	Title
1	ACI 318-71, 77, 83	Building Code Requirements for Reinforced Concrete
2	ACI 301	Specifications for Structural Concrete for Buildings
3	ACI 347 ANSI A145.1	Recommended Practice for Concrete Formwork
4	ACI 305 ANSI A170.1	Recommended Practice for Hot Weather Concreting
5	ACI 211.1	Recommended Practice for Selecting Proportions for Normal Weight Concrete
6	ACI 304	Recommended Practice for Measuring, Mixing, Transporting, and placing concrete
7	ACI 315	Manual of Standard Practice for Detailing Reinforced Concrete Structures
8	ACI 306	Recommended Practice for Cold Weather Concreting
9	ACI 309	Recommended Practice for Consolidation of Concrete
10	ACI 308	Recommended Practice for Curing Concrete
11	ACI 214 ANSI A146.1	Recommended Practice for Evaluation of Compression Test Results of Field
12	ACI 311	Recommended Practice for Concrete Inspection
13	ACI 304	Preplaced Aggregate Concrete for Structural and Mass Concrete
14	Report by ACI Committee 304	Placing Concrete by Pumping Method
15	AISC-69,78	Specification for the Design, Fabrication, and Erection of Structural Steel for Building
16	AWS D1.1	Structural Welding Code
17	ASME	Boiler & Pressure Vessel Code, Section III
	ASME-1971, S73	Division 1, Subsection NE
	ASME-1974, S75	Division 1, Subsection NF
	ASME-1973	Division 2, Proposed Standard Code for Concrete Reactor Vessels and Containments Issued for Trial Use and Comments
	ASME-1980	Division 2, CC 6000
	ASME-1992	1992 Addenda, Division 1, Section XI, Subsection IWL, IWE
18	American Public Health Assoc. (APHA)	Test Methods Sulphides in Water, Standard Methods for the Examination of Water and Waste Water
19	ASTM	Annual Books of ASTM Standards
20	CRSI MSP-1	Manual of Standard Practice

UFSAR Table 3.8-2 – List of Specifications, Codes, and Standards		
Specification Reference Number	Specification or Standard Designation	Title
21	ANSI N45.2.5	Proposed Supplementary Q.A. Requirements for Installation, Inspection and Testing of Structural Concrete and Structural Steel During Construction Phase of Nuclear Power Plants
22	CRD	Chief of Research and Development Standards, Department of the Army, Handbook for Concrete and Cement Volume I and II, Corps of Engineers U.S. Army
23	ACI-349-76, 85	Code Requirements for Nuclear Safety Related Concrete Structures
24	AISI	Specification for design of cold-formed steel structural members

Seismic qualification of Seismic Category I instrumentation and electrical equipment is in accordance with IEEE 344-1971 or IEEE 344-1975, IEEE Recommended Practices of Seismic Qualification of Class IE Equipment for Nuclear Power Generating Stations. (Ref. 2 section 3.10)

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 included in Appendix A provide detail on each person's qualifications for his or her role.

3.2 WALKDOWN 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)
M. Delaney			X	X		
P. Gazda			X	X		
B. Lory						X(2)
W. Djordjevic						X
R. Richard (Exelon)		X				
D. Shaw (Exelon Contractor)		X				
T. Bortolini (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.

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

Engineer in the State of Illinois and has a licensed Professional Engineer in several states. She is a SQUG Qualified Seismic Capability Engineer (SCE) and has completed the NTTF Recommendation 2.3 Training Course (SWE). In addition to her involvement in design and analysis of structures, systems, and components at nuclear power plants, she has performed SQUG walkdowns at various nuclear power plants.

Phil Gazda, P.E., S.E.: Mr. Gazda is a Senior Consultant and serves as the Vice President of S&A as well as the Office Manager of the S&A Chicago, IL Office. He is an advanced degree structural engineering graduate and has more than 35 years of experience in the nuclear power plant industry. He is a licensed Structural Engineer in the State of Illinois and has a licensed Professional Engineer 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 been involved in SQUG and IPEEE walkdowns and assessments at ten nuclear plants and led the ComEd team performing the SQUG program at Zion Station. Mr. Gazda has also been the moderator for three SQUG qualification training classes provided for utility engineers. In addition, Mr. Gazda was the Project Manager for the seismic assessment of HVAC ducts at another utility based on EPRI document Seismic Evaluation Guidelines for HVAC Duct and Damper Systems Revision to 1007896.

Bruce Lory Mr. Lory is a Senior Engineer III in the S&A Chicago, IL Office. He has a Bachelor of Science degree in mechanical engineering and has more than 30 years of experience in the nuclear power plant industry. He is a SQUG Qualified Seismic Capability Engineer (SCE) and is the instructor of the Fundamentals of Equipment Seismic Qualification training course for EPRI, and is the co-instructor of the Fukushima Seismic Walkdown training course in response to NTTF 2.3. In addition, he has been involved with equipment modifications for Extended Power Uprates (EPU), as well as Seismic Qualification (SQ) and Environmental Qualification (EQ) of equipment/components at numerous nuclear power plants.

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).

3.3 ADDITIONAL PERSONNEL

Exelon plant Operations staff members Messrs. R. Richard and D. Shaw reviewed the SWEL. Mr. Richard is a previously licensed Senior Reactor Operator (SRO) at Braidwood Station with numerous years of experience in various aspects of plant operations. Mr. Shaw is a previously licensed SRO at Byron Station with numerous years of experience in various aspects of plant operations.

Various additional station personnel also provided support to the SWEL preparer to help identify 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, in accordance with Reference 1.

Exelon Engineering staff member Mr. T. Bortolini performed the IPEEE Vulnerabilities Review based, in part, on the Braidwood IPEEE submittal along with subsequent correspondence and station records. (Ref. 3) Mr. Bortolini is a Structural Engineer in the Exelon Engineering Department. He has over 38 years of engineering experience and has worked at Braidwood since 1998. Mr. Bortolini has completed the NTTF Recommendation 2.3 Training Course (SWE).

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 Braidwood Generating Station Unit 1. (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 Seismic Individual Plant Examination for External Events (IPEEE) Success Path Equipment List (SPEL). (Ref. 3) The IPEEE SPEL was then subjected to 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 1**

   As described in Reference 1, only items that have a defined seismic licensing basis are to be included in SWEL 1. Each item on the IPEEE SPEL was reviewed to determine if it had a defined seismic licensing basis. All items identified as Safety Category I, as defined in the Byron/Braidwood UFSAR Chapter 3, were identified as having a defined seismic licensing basis. (Ref. 2) Electrical enclosures containing Class 1E devices were identified as Safety Category I. Safety Category I and Class 1E determination was made through a review of current design and licensing basis documentation.

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 further reduced the IPEEE SPEL of any Safety Category I Structures, Containment Penetrations, Safety Category I Piping Systems, cable/conduit raceways and HVAC ductwork.

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

This screen narrowed 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.

As described in Appendix E of Reference 1, the safety function for each item on the IPEEE SPEL was identified. It is noted that items on SWEL 1 with a specific safety function(s) are considered frontline systems. Items with a safety-function designation of 'Support System HVAC', 'Support System AC Power', 'Support System DC Power', 'Engineered Safety Features Actuation System' (ESFAS) or 'Cooling Water' may be a frontline or support system. Items with a safety function designation of 'Support System HVAC', 'Support System AC Power', 'Support System DC Power', 'Engineered Safety Features Actuation System' (ESFAS) or 'Cooling Water' 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) 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 1 (Safety 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

The equipment included on SWEL 1 includes several items that have been modified or replaced over the past several years. Each item on SWEL 1 that is new or replaced is 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:

- (12) Air Compressors
- (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

The equipment included on SWEL 1 includes several items that were enhanced as a result of the IPEEE program. Each item on SWEL 1 that was enhanced as a result of the IPEEE program is identified.

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. 7)

4.2.2 SWEL 2 – 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 1

Only those items identified as Seismic Category 1 (Safety Category I) 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 1 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.

Per the Braidwood UFSAR Chapters 3 and 9, portions of the SFP SSCs are classified as Safety Category I and are screened into the SWEL 2 list. These Safety Category I SSCs include; the Spent Fuel Pit Heat Exchanger, Spent Fuel Pit Pump, Refueling Water Purification Pump 0A, associated instrumentation, piping and manual/check valves. Development of the Braidwood Unit 1 SWEL 2 list includes components associated with the common (Unit 0) Refueling Water Purification Pump 0A. Note, these pump's motors are Safety Category II, even though the Refueling Water Purification Pump 0A has an ESF power source. There are no Motor, Air or Fluid operated valves in the Safety Category I SSC flow paths.

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

   This screen considers only those items associated with the SFP that are appropriate for an equipment walkdown process.

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 1 (Safety Category I) equipment and systems to meet the objectives of the NRC 50.54(f) letter. 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 a representative sample of the systems associated with the SFP and its cooling system.

      The SFP pump, Refueling Water Purification Pump 0A, and SFP heat exchanger are included on the SWEL 2 list. A representative sample of instrumentation, manual valves, and check valves are also included.

   B. Major new and replacement equipment

      The equipment included on SWEL 2 should include items that have been modified or replaced over the past several years. However, a review was performed that found none of the proposed equipment on SWEL 2 has been modified or replaced.

   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 classes/types of equipment include; (5) Horizontal Pumps, (21) Tanks and Heat Exchangers, (18) Instrument Racks, (19) Temperature Sensors, and (0) Other. The manual and check valves are included in the "(0) Other" class.

   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. All items are in the Auxiliary Building or Fuel Handling 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 1 (Safety Category I) items, but is 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.

Excerpts from the Braidwood UFSAR 9.1.3.2 System Description document the design features which preclude rapid drain down of the Spent Fuel Pit.

The Safety Category I spent fuel pool cooling system shown in Drawing M-63 consists of two complete cooling trains. The spent fuel pool cooling system (piping, pumps, valves, and heat exchangers) is Safety Category I, Quality Group C. The 3-inch piping from the refueling water storage tanks to the refueling water purification pump, the pump, and its associated piping and valves are Safety Category I, Quality Group C. A 2-inch Safety Category I, Quality Group C line from the discharge of the refueling water purification pump to the spent fuel pool is permanently installed. This is the Category I water makeup circuit. The backup Safety Category I makeup system consists of piping and hoses from the Safety Category I fire protection system. The primary water makeup system non-Category I takes water from both primary water storage tanks and routes the water through the spent fuel pool water filter and then to the return header as indicated in Drawing M-63. In addition, primary water may be added to the spent fuel pool via a fire hose connection in the fuel handling building. In summary, there are three sources of makeup water available, a primary unborated non-Category I source, a borated Safety Category I source, and an unborated fire protection Safety Category I water system. (Ref. 2, 8, 9, & 10)

The spent fuel pool system piping arrangement precludes siphoning after any failure by containing a 1/2-inch diameter hole four inches below the water level. Ten feet above the active fuel corresponds to an elevation of 410'-0". Both the cooling and skimmer systems meet this requirement. No piping in the pool extends below the 410'-0" elevation except the spent fuel pool cooling system discharge pipe. This pipe contains an anti-siphon hole near the surface of the spent fuel pool. Therefore, piping connections to the SPF explicitly contain anti-siphon features which preclude a rapid drain down of the SFP.

Excerpts from the Braidwood UFSAR Section 9.1.3.3 Safety Evaluation discuss SFP Dewatering incidents. Incident C discussed is a sluice/transfer gate failure with the transfer canal empty, an open/empty transfer tube and an empty refueling cavity. In this incident, the spent fuel pool water level would be lowered approximately 22 feet 10 inches to the bottom sill of the sluice/transfer gate. This leaves at least 2 feet 6 inches of water as shielding over the active portion of the spent fuel in storage.

This incident is not considered a rapid drain down transient. The gate is a structural element, seismically designed as part of the SFP structural analysis, and is a passive barrier with no active components.

There are no rapid drain-down considerations included in the Braidwood Unit 1 SWEL 2 list.

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 week of July 16, 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 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 105 of the 121 items identified on the Braidwood Unit 1 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 16 items to a unit outage or appropriate 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."

5.2.2 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 (CAP) as a potentially adverse seismic condition.

5.2.3 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 or USI A-46 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	121	59	31	48[1]

Notes:
1) Six (6) anchorage verifications have been deferred and will be completed as outlined in Appendix E

5.2.4 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 EPRI guidance document, Appendix D: Seismic Spatial Interaction.

The Seismic Walkdown Engineers exercised their judgment to identify seismic interaction hazards. Section 5.2.6 provides a summary of issues identified during the Seismic Walkdowns.

5.2.5 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.

5.2.6 Conditions Identified 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 four (4) 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 45 Area Walk-bys were performed for Braidwood Unit 1. It is noted that additional area walk-bys will be completed, as required, 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 clearances and tie offs were reviewed to meet Exelon Standard NES-MS-04.1, Rev. 6 Seismic Prequalified Scaffolds
- Seismic housekeeping was examined to meet station procedure BwAP 1100-23, Seismic Housekeeping Requirements for the Temporary Storage of Materials in Category I Area.

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.

5.3.1 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.

5.3.2 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.

5.3.3 Conditions Identified 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. Seventeen (17) 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 INTERNAL 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)
1VX07J	Junction box 1VX07J was not mounted per the design drawing (Item on SWEL)	1389727 (WO 1560290)	No
1DO01TB	Tank 1DO01TB (Diesel Oil Storage Tank) has hairline cracks at 2 of the 12 anchor bolts (Found in area walk-by of Tank 1DO01TD)	1389743	No
1DC01E	Open S-hook on one chain at one light in room	1395981	Yes
1DC02E	Open S-hook on one chain at one light in room	1395992	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/Area	Description of Issue	Action Request ID (IR)	Actions Complete Yes/No (See Notes 1 & 2)
Unit 1 Diesel Oil Storage Tank Room (Area Walk-by 12)	Tank 1DO01TD (Diesel Oil Storage Tank) has hairline cracks at 2 of the 12 anchor bolts (Item on SWEL)	1389755	No
Unit 1 Auxiliary Electric Equipment Room (Area Walk-by 3)	During the area walk-by in the Unit 1 Aux Electric Equipment Room, a temporary MESAC was not properly shimmed at the base. The shims were intended to fit tight but were loose. The unit was anchored at the top with ropes to avoid tipping.	1389428	Yes
Unit 1 Fuel Handling Building adjacent to truck bay (Area Walk-by 30)	During the area walk-by in the Fuel Handling Building at El. 401'-0", adjacent to the truck bay, 4 tool cabinets appeared to be in violation of BwAP 1100-23 Seismic Housekeeping Requirements for the Temporary Storage of Materials in Category 1 Areas.	1390326	Yes
Unit 1 MEER Room (Area Walk-by 5)	During Fukushima Seismic Walkdowns a vertical scaffold pole was found approximately 1" from fire damper 1VE21Y in the Unit 1 MEER at El 451 of the Aux Building	1397564	Yes
Unit 1 RWST Tunnel (Area Walk-by 39)	It was noted that there was a small amount of water on the floor directly below the RWST hatch - likely from previous day's rain. There was no water on the components in the tunnel.	1390831	Yes
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 401 near Column S-15	During Fukushima Seismic Walkdowns, a laundry container for slings and a configuration control cabinet were found less than 2" away from safety related Blockwall 5A-141 which does not meet the 12" minimum requirement of BwAP 1100-23. These items are located near Column S-15 at El. 401 in the Aux Building.	1397682	Yes

Item ID/Area	Description of Issue	Action Request ID (IR)	Actions Complete Yes/No (See Notes 1 & 2)
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 401 Column U-17	During Fukushima Seismic Walkdowns a Shaw Knack tool storage box was found approximately 3" away from safety related Blockwall 5A-140 which does not meet the 12" minimum requirements of BwAP 1100-23 (Seismic Houskeeping). This box is located near Column U-17 at Elevation 401' in Aux Building.	1397680	Yes
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 346' 15' south of S-18	During Fukushima Seismic Walkdowns an OP's corrosive storage cabinet approximately 5' high was found less than 12" or height plus 12" from a safety related block wall per requirements of BwAP 1100-23 (seismic housekeeping) 15' south of Column S-18 at El 346' in Aux Building.	1397642	Yes
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 346' 15' south of S-18	During Fukushima Seismic Walkdowns an RP storage cabinet approximately 6' high was found less than 12" or height plus 12" from safety related Blockwall 2A-48 per BwAP 1100-23 (Seismic Housekeeping) 15' south of Column S-18 at El. 346' in Aux Building	1397636	Yes
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 346' 10' south of Column Q-15	During Fukushima Seismic Walkdowns an RP storage cabinet approximately 6' high was found less than 12" or height plus 12" from safety related Blockwall 2A-45 per requirements of BwAP 1100-23 (Seismic Housekeeping) 10' south of Column Q-15 at El 346' in Aux Building	1397627	Yes
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 346 Column S-17	During Fukushima Seismic Walkdowns two RP storage cabinets approximately 6' high were found less than 12" or height plus 12" from safety related Blockwall 2A-48 per requirements of BwAP 1100-23 (Seismic Housekeeping) near Column S-17 at El 346' in Aux Building.	1397619	Yes

Item ID/Area	Description of Issue	Action Request ID (IR)	Actions Complete Yes/No (See Notes 1 & 2)
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 364 at Column P-21	During Fukushima Seismic Walkdowns a Shaw Knaack tool storage box was found less than 1" away from safety related Block wall which does not meet the 12" minimum requirements of BwAP 1100-23 (Seismic Housekeeping). This box is located near Column L-15 at Elevation 346' in Aux Building.	1397654	Yes
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 401 at elevator	During Fukushima Seismic Walkdowns two MMD stoarage cabinets (caustic or acid) approximately 5'-6" high were found less than 12" or height plus 12" from safety related Blockwall 5A-59 per requirements of BwAP 1100-23 (Seismic Housekeeping) east of the elevator door at El 401' in Aux Building	1397941	Yes
SEISMIC HOUSEKEEPING AUX BLDG: Unit 1 Aux Bldg El 426 Column U-18	During Fukushima Seismic Walkdowns an RP storage cabinet approximately 6' high was found less than 12" or height plus 12" from safety related Blockwall 6A-74 per requirements of BwAP 1100-23 (Seismic Housekeeping) near Column U-18 at El 426' in Aux Bldg	1397957	Yes
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 426 Column U-18	During Fukushima Seismic Walkdowns an MMD gray storage cabinet labeled "Outage Tools" approximately 5' high was found less than 12" or height plus 12" from safety related Blockwall 6A-74 per requiements of BwAP 1100-23 (Seismic Housekeeping) near Column U-18 in Aux Building	1397980	Yes

Item ID/Area	Description of Issue	Action Request ID (IR)	Actions Complete Yes/No (See Notes 1 & 2)
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 364 at Column P-21	During Fukushima Seismic Walkdowns a MMD valve team storage cabinet approximately 5'-6" high was found less than 12" or height plus 12" from safety related Blockwall 3A-61 per requirements of BwAP 1100-23 (Seismic Housekeeping) near Column Q-17 at El 364' in Aux Building. Another MMD configuration control cabinet was less than 1" from Blockwall 3A-27A south of Column P-21 at El 364' in Aux Building.	1398023	Yes
SEISMIC HOUSEKEEPING AUX BLDG:Unit 1 Aux Bldg El 383 at Column S-17	During Fukushima Seismic Walkdowns an RP storage cabinet approximately 6' high was found less than 12" or height plus 12" from a safety related blockwall per requirements of BwAP 1100-23 (Seismic Housekeeping) near Column S-17 at El 383' in Aux Building	1397949	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/Braidwood utilized the existing processes and procedures (Site CAP Expectations) to identify, evaluate and document conditions identified during the Seismic Walkdowns.

In accordance with Exelon/Braidwood 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

Per the ComED Transmittal of Braidwood Station Individual Plant Examination of External Events (IPEEE) Submittal Report, dated June 27, 1997 and the Staff Evaluation Report of Braidwood IPEEE dated May 30, 2001, an explicit definition of vulnerability was not provided and no vulnerabilities with respect to potential severe accidents related to external events were identified in the IPEEE submittal. (Ref. 3 and 6) However, plant improvements were identified in Sections 3 and 7 of Reference 3. Table G-1 in Appendix G lists the plant improvements, the IPEEE proposed resolution, the actual resolution and resolution date. No open items exist as a result of the seismic portion of the IPEEE program.

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. Byron/Braidwood Nuclear Stations Updated Final Safety Analysis Report (UFSAR), Revision 13.

3. ComEd letter from H. Gene Stanley to Office of Nuclear Reactor Regulation, dated June 27, 1997, Subject: Transmittal of Braidwood Station Individual Plant Examination of External Events Submittal Report

4. Not Used

5. Staff Evaluation Report of Braidwood Individual Plant Examination of External Events (IPEEE) dated May 30, 2001

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 3, "Recommendation 2.3: Seismic," dated March 12, 2012

7. BW-MISC-018 Rev. 0, "Braidwood Risk Importance to Support Development of Seismic Walkdown Equipment List".

8. Drawing M-63 Sheet 1A rev. AZ, "Diagram of Fuel Pool Cooling and Clean-Up Units 1&2"

9. Drawing M-63 Sheet 1B rev. BE, "Diagram of Fuel Pool Cooling and Clean-Up Units 1&2"

10. Drawing M-63 Sheet 1C rev. BB, "Diagram of Fuel Pool Cooling and Clean-Up Units 1&2"

11. "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

A

Project Personnel Resumes and SWE Certificates

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

Stevenson & Associates

Antonio J. Perez, P.E.

SUMMARY

Mr. Perez has over 15 years of experience in project management, project engineering, equipment design, and mechanical systems layout for nuclear and industrial facilities.

EDUCATION

B.S. – Mechanical Engineering
Michigan Technological University, Houghton, MI
Magna cum Laude

LICENSES

Professional Engineer, Wisconsin: September 2002
Minnesota: December 2010

PROFESSIONAL EXPERIENCE

Stevenson & Associates, Green Bay, WI

General Manager October 2010 – Present

- Responsible for interfacing with clients with a focus on continuously improving relationships.
- Responsible for managing staff resources to meet or exceed clients' needs.
- Responsible for recruiting and hiring staff necessary to meet resource requirements while effectively increasing capacity.
- Responsible for providing Engineering Consultation services to clients.

Project Manager March 2007 – October 2010

- Performing Project Management tasks including development of project plans, identification of resource needs, estimating task durations, developing project schedules, and monitoring budgets.
- Lead design team efforts at the Kewaunee Power Station on multiple projects that include two separate Auxiliary Feedwater flow control modifications, Auxiliary Feedwater flow monitoring instrumentation modifications, and Auxiliary Building roof modifications.
- Supported the Calculation Reconstitution and Improvement Project at the Prairie Island Nuclear Generating Plant by mapping calculations associated with the RHR system.

Dominion Energy Kewaunee (formerly Nuclear Management Company 2001 - 2005)
Kewaunee Power Station, Kewaunee, WI

Shift Technical Advisor (trainee) January 2006 – March 2007

- Trainee in a Senior Reactor Operator Certificate training program.

Stevenson & Associates

Antonio J. Perez, P.E.

Engineering Supervisor – ME/CE/SE Design May 2004 – January 2006

- Supervised a staff of 12 to 15 engineers (mechanical, civil, and structural design) who were charged with developing design changes, maintaining design and licensing basis documentation and supporting maintenance.
- Integrated the civil/structural engineering group and the mechanical engineering group into a cohesive unit that resulted in gained efficiency and a net reduction of one full time equivalent engineer.
- Substantially increased the quality of engineering products developed and published by the ME/CE/SE Design Engineering group through coaching and feedback as a result of increased supervisory oversight of engineering products.
- Developed a work management system for the group that provided a means for prioritizing activities, estimating the level of effort, and scheduling of activities. This system allowed for an increased understanding of workload and became an invaluable tool for prioritizing work and managing resources.
- Increased communications within the group by holding daily 15 minute meetings where station messages were delivered and where the group's resources were assessed and redirected as necessary to meet commitments. This resulted in an increase in morale and an increase in commitments met.
- Increased communications with other departments by establishing a central point of contact for the group and by assuring that the ME/CE/SE Design Engineering group was represented at Planning and Scheduling meetings.

Motor Operated Valve Engineer

June 2001 – May 2004

- Established a project plan and led the implementation effort that re-organized the Motor-Operated Valve Program at KPS. This effort consisted of developing a Program Manual, developing controlled calculations, performing Design Basis Reviews, and compiling and/or establishing plant positions on known industry issues. The result of this effort was a reduction of full time equivalent engineers, from 3 to 1, required to maintain the Program.
- Performed and reviewed MOV safety related calculations including Minimum Required Stem Thrust, Weak Link Analysis, and Available Margin.
- Assisted in MOV testing by providing engineering support to maintenance personnel.

DISTRIBUTION PLANNING, INC., Grandville, MI
Systems Mechanical Engineer 2000 – 2001

- Integrated mechanical systems and designed equipment for material handling systems.
- Procured equipment and coordinated delivery schedules with vendors.

Stevenson & Associates

Antonio J. Perez, P.E.

SMS SANDMOLD SYSTEMS, INC., Newaygo, MI
Project Engineer /Manager 1998 – 2000

- Led multi-discipline project design teams for several projects that ranged in size from a few thousand dollars up to $2.2 million.
- Coordinated efforts with engineering, manufacturing, and installation groups to establish and maintain project schedules that met or exceeded the client's expectations.
- Procured equipment and coordinated delivery schedules with vendors.
- Acted as the company's liaison with clients to work through issues that arose during projects. Provided project status updates to clients and management.
- Designed equipment such as sand storage bins – up to 540-ton live load capacity, bucket elevators, belt conveyors, screw conveyors, and mixers. Most of this equipment was for handling of bulk solids (foundry sand).
- Analyzed and designed structural support members for various types of equipment such as vibratory conveyors, mixers, and conveyors. Designed access structures such as stair towers, service platforms and catwalks.
- Calculated foundation loads and point loads of equipment support points.

LIFT-TECH INTERNATIONAL, Muskegon, MI
Project Engineer 1997 – 1998

- Performed engineering analyses, wrote critiques, and recommended design modifications of structural members for the purpose of upgrading bridge cranes and hoists.
- Implemented engineering design changes to enhance product development.

Certificate of Completion

Tony Perez

Successfully Completed

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

Bruce M. Lory (16 PDH)
Bruce M. Lory – Instructor
NTTF 2.3 Seismic Walkdown Course

Date: 06/26/12

KIM L. HULL

BACKGROUND SUMMARY

Accomplished **Lead Engineer/ Project Manager** with significant experience in commercial nuclear power industry. Demonstrated ability to lead and contribute on cross-functional project teams. Possess strong analytical, problem resolution, collaboration, and communication skills when interacting with diverse audiences including regulatory inspectors, internal inspectors, management, and employees. Respected trainer with ability to develop and present information and measure effectiveness through evaluation techniques. Strengths include:

Project Management	Design Modifications	Plant Operational Support
Procurement	Management/Leadership	Regulatory Compliance
Training/Coaching	Auditing	Inspections

KEY ACCOMPLISHMENTS

- Served as KNPP Lead Engineer/ Project Supervisor for approximately 125 plant design changes.
- Experienced in all aspects of nuclear power plant modification packages including development of calculations, design, engineering, and procurement specifications.
- Thorough understanding of configuration control, management, and preparation of 10CFR50.59 analyses.
- Participated in several regulatory and industry audits, including CDBI and INPO assessments.
- Experienced as a Technical Specialist performing NUPIC Audits.
- Well-developed communication skills for preparing technical presentations including lesson plans, project reports, and meetings in support of regulatory activities and inspections.
- Qualified Shift Technical Advisor for KNPP Operations Group (1980s).

PROFESSIONAL EXPERIENCE

STEVENSON & ASSOCIATES – Project Manager **2010 - Current**
National consulting engineering firm specializing in civil, structural and mechanical engineering for power, industrial and advanced technology facilities.

Project Manager
- Development of plant specific Seismic Walkdown Equipment Lists for multiple Units in response to NRC 50.54(f) requirements 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."
- Onsite at Kewaunee Power Station Consultant support to resolve Q-list Open Items
- On-site at Kewaunee Power Station Consultant support for Auxiliary Feedwater Flow Control Modification including preparation and review of design documentation.

WISCONSIN PUBLIC SERVICE RESOURCES / Nuclear Management Company
DOMINION ENERGY - Kewaunee, WI **1982 to 2010**

Senior Instructor (Maintenance) (2009 - 2010)
- Developed lesson plans and taught Basic Systems and Continuing Training Topics for Engineering and Technical Support training program.

Engineer III/Principal Engineer (2004 - 2009)
- Responsible for modifications and emergent issues including Steam Exclusion Boundaries, Fuel Transfer Carriage, Frazil Ice development on the KPS Circulating Water Intake, and NRC 96-06 Two Phase flow.
- Member of Dominion Fleet Calculation Quality Review Team and Mentor for Calculation training.
- Outage nightshift Lead Mechanical Design Engineer/Back-up Supervisor.
- KPS Engineering representative on the Independent Review Team developed to address CDBI

inspection findings. Assigned to review all calculations, modification packages, 10CFR 50.59 screenings, evaluations, and procurement packages.
- Technical Instructor for Administrative Process training for new engineers.

Mechanical Design Supervisor (2002 - 2004)
- Supervised nine engineers, analysts, and technicians assigned to the KNPP Mechanical Design Group.
- Provided Mechanical Design Oversight for all vendor activities impacting KNPP Mechanical Design Bases.
- Provided support for emergent plant issues, NRC Inspections, and Physical Change Packages.
- Subject Matter Expert Instructor for 10CFR 50.59 process training for new engineers.

Principal Engineer (Analytical Group SGR Project) (1998 - 2002)
- Contract Manager for Steam Generator Replacement (SGR).
- Responsible for coordination of SGE design, fabrication and installation contracts.
- Provided outage schedule development, coordination, and work process integration between Bechtel and KNPP.
- Coordinated contractor mobilization, badging, and plant specific training.
- Technical Specialist for Quality Assurance audits of vendors.
- SGR Shift Manager for night shift
- Responsible Engineer for SGR related Physical Change Packages.
- Responsible for SGR budget development up to 1998.
- Prepared, reviewed, and awarded Bechtel Installation contract.
- Participated in review and award of Ansaldo Fabrication contract.
- Served on team to review and award Westinghouse Design contract.
- Selected to work at Arkansas Nuclear One for their steam generator installation.

Senior Engineer (Analytical Group) (1994–1998)
- Responsible Engineer for Physical Change Packages.
- Member KNPP Engineering Reorganization Team.
- Recognized Technical Expert for KNPP systems.

Senior Project Supervisor (1992–1994)
- Provided project management and engineering services for KNPP DCR packages.
- Supervisor of KNPP NPM Project Attendants responsible for modification package organization and close out.

Nuclear Services Supervisor (1991–1992)
- Supervised initial Steam Generator replacement project effort.
- Provided specification development for services and major plant components.

Prior to 1992 – Held engineering positions from Associate Engineer to Nuclear Design Engineering Supervisor.

EDUCATION

Masters Program Coursework - Mechanical Engineering; Michigan State University - E. Lansing, MI
B.S. - Mechanical Engineering - Michigan State University - E. Lansing, MI
B.A. - Biology - Albion College - Albion, MI

Certificate of Completion

Kim Hull

Successfully Completed

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

Bruce M. Lowy (16 PDH)
Bruce M. Lowy - Instructor
NTTF 2.3 Seismic Walkdown Course

Date: 06/26/12

Stevenson & Associates

MARLENE M. DELANEY

PROFESSIONAL EXPERIENCE

March 1998 – Present
Stevenson & Associates
Project Engineer

Stevenson & Associates is a structural/mechanical engineering firm.

Job tasks as a Project Engineer include performing engineering and project engineering activities on a broad scope of projects. Typical engineering activities include:

- Seismic equipment qualification and anchorage design.
- Component and support evaluations including modifications and new designs.
- Analysis and modification design for cable tray systems.
- SQUG/IPEEE evaluations and walkdowns.
- Reinforced concrete analysis.
- Structural steel framing assessments.
- Detail fabrication drawings for steel modifications.
- Interface with clients on all aspects of projects.

January 1981 – February 1998
Sargent & Lundy Engineers
Senior Engineer, Engineer

Sargent & Lundy is an engineering firm that consults primarily to the power industry.

Job tasks as a Senior Engineer included:

- Performing project engineering and project management duties for numerous plant modification projects. Responsibilities included overall project scheduling, technical supervision, and budget control.
- Interfaced with clients, contractors on various projects.
- Prepared conceptual design report and cost estimates for rehabilitation of hazardous waste handling facility and canal water treatment facility owned by Argonne National Laboratories.
- Field engineer at LaSalle County Nuclear Station, Enrico Fermi Atomic Power plant and Zion Nuclear Station.
- Supervised and coordinated analysis of structural framing and designed modifications to such structures.
- Evaluated and designed modifications for railroad bridges.
- Detailed fabrication drawings.

EDUCATION

University of Wisconsin – Milwaukee, Bachelor of Science in Civil Engineering, Graduated with Honors.

PROFESSIONAL REGISTRATIONS

Licensed Professional Engineer in the State of Wisconsin
Licensed Structural Engineer in the State of Illinois
Licensed Professional Engineer in the State of Illinois

Certificate of Completion

Marlene Delaney

Successfully Completed

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

Bruce M. Lory (16 PDH)
Bruce M. Lory - Instructor
NTTF 2.3 Seismic Walkdown Course

Date: 06/26/12

SQUG

Certificate of Achievement

This is to Certify that

Marlene M. Delaney

has Completed the SQUG Walkdown Screening and Seismic Evaluation Training Course

April 20-24, 1998
Date of Course

Neil C. Smith
SQUG Representative

Training Course Administrator

STEVENSON & ASSOCIATES

PHILIP A. GAZDA

PROFICIENCIES

- Civil engineering
- Structural analysis and design
- Structural dynamics
- Plant betterment
- Specifications
- Project management
- Excellent communication, presentation and organizational skills
- Proven ability to function as part of a team
- SQUG and IPEEE assessments
- Strong commitment to customer service and long term relationships

EXPERIENCE

1997 – Present
Stevenson & Associates

General Manager, Stevenson & Associates – Chicago

Responsible for the day to day operation of the S&A Chicago office. Manages the engineering efforts of the Chicago office and coordinates the efforts with other S&A offices.

He is a SQUG Qualified Seismic Capability Engineer. He been involved in SQUG and IPEEE walkdowns and assessments at ten nuclear plants and led the ComEd team performing the SQUG program at Zion Station. Mr. Gazda has also been the moderator for three SQUG qualification training classes provided for utility engineers. In addition, Mr. Gazda was the Project Manager for the seismic assessment of HVAC ducts at another utility based on EPRI document Seismic Evaluation Guidelines for HVAC Duct and Damper Systems Revision to 1007896.

1995 – 1997
ComEd

Head - Maintenance Engineering Department, Zion Nuclear Power Station

Managed and coordinated the activities of thirty-five Mechanical, Electrical, Structural and Program Engineers who supported the operation and maintenance of the Zion Nuclear Power Station. Support activities included engineering trouble shooting and evaluations to repair degraded electrical, mechanical and structural components/systems. Oversaw engineering programs such as In Service Inspection, Vibration Testing, Thermographic Investigations and the Evaluation and repair of piping systems for the effects of Flow Accelerated Corrosion. Performed administrative duties related to the management of the Maintenance Engineering Department. Conducted and managed the Zion SQUG and IPEEE programs.

1973 – 1995
Sargent & Lundy

1986 – 1995, *Associate and Senior Project Engineer*

Managed, coordinated and was responsible for the activities of the structural team engaged in the analysis and design of the structural

and civil portions of power plants and other miscellaneous structures. Had ultimate responsibility and ownership for the quality of the structural team and the product produced by the team. The team included hydrologists, geologists, soils engineers, architects, designers and structural engineers depending on the expertise required for each project. Responsible for coordinating the structural work with that of the Mechanical and Electrical disciplines on the project team. Established the technical approach and design criteria for the work, set schedules, and authorized drawings for construction.

1983 – 1986, *Project Engineer*

The responsibilities are essentially the same as those described for the Senior Project Engineer (see above). Reported to the Senior Project Engineer.

1979 – 1983, *Supervising Design Engineer*

Supervised the team generating engineering analyses, calculations, sketches, designs and drawings for steel and concrete structures, foundations, and electrical and mechanical component supports. Reported to Project Engineer.

1978 – 1979, *Supervising Structural Engineering Specialist*

Supervised the team that performed the structural analysis and design of specialized power plant structures such as containments, fuel pools, base mats, and drywells. Reported to Project Engineer.

1973 – 1978, *Senior Structural Engineering Specialist (1976 - 1978) Structural Engineering Specialist (1973 -1976)*

Performed the analysis and design of power plant structures. This work included dynamic analysis for seismic and hydrodynamic loads, finite element analysis, and reinforced concrete and steel design for structures and foundations. Extensively involved in the analysis, design and construction of the heavy reinforced concrete structures for Illinois Power's Clinton Station. Reported to Project Engineer.

1972 – 1973
University of Illinois

Research Assistant

Performed research at the University of Illinois for the U.S. Department of Transportation tunnel liner support system project.

EDUCATION

- University of Illinois at Urbana, IL.
  M.S. Civil Engineering

- University of Illinois at Urbana, IL.
  B.S. Civil Engineering

REGISTRATIONS

- Licensed Structural Engineer - Illinois
- Licensed Professional Engineer - Wisconsin
- Licensed Professional Engineer – Texas
- Licensed Professional Engineer – Nebraska
- Licensed Professional Engineer – Minnesota

MEMBERSHIPS & AFFILIATIONS

- American Concrete Institute
- American Society of Civil Engineers
- Structural Engineers Association of Illinois
- University of Illinois Civil Engineering Alumni Association Board of Directors, 1992 – 2000
- University of Illinois Civil Engineering Student Mentor Program, 1993 – present

PUBLICATIONS

- "Using Advanced Computer Technology to Consolidate Project Information" (co-author), American Power Conference, Chicago, Illinois, April, 1993
- "Structural Considerations in Steam Generator Replacement" (co-author), American Power Conference, Chicago, Illinois, April 1991
- "Nuclear Plant License Renewal - Structural Issues" (co-author), American Power Conference, Chicago, Illinois, April 1991
- "Modifications at Operating Nuclear Power Plants" (co-author), American Society of Civil Engineers Convention, Denver, Colorado, April 1985
- "Engineering of Structural Modifications for Operating Nuclear Power Plants" (co-author), Seventh International Conference on Structural Mechanics in Reactor Technology, Chicago, Illinois, August 1983

Certificate of Completion

Phil Gazda

Successfully Completed

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

Bruce M. Lory (16 POH)
Bruce M. Lory - Instructor
NTTF 2.3 Seismic Walkdown Course

Date: 06/26/12

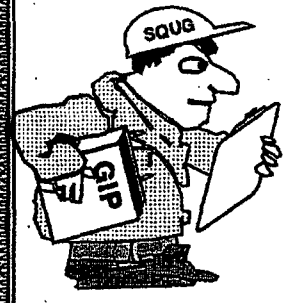
SQUG

Certificate of Achievement

This is to Certify that

Philip A. Gazda

has Completed the SQUG Walkdown Screening and Seismic Evaluation Training Course



Aug 2-4 & 10-11, 1994
Date of Course

Phil P. Smith
SQUG Representative

Bruce M. Long
Training Course Administrator

Tribhawan Ram

EDUCATION:

B.S. - Electrical Engineering, Punjab University, India, 1972
M.S. - Electrical Engineering, University of Cincinnati, 1977
M.S. - Nuclear Engineering, University of Cincinnati, 1982
M.B.A. - Bowling Green State University, 1996

PROFESSIONAL REGISTRATION:

State of Ohio

PROFESSIONAL HISTORY:

Stevenson & Associates, Inc., Senior Engineer, 2011 - present
Public Service Electric & Gas Co., Senior Plant Systems Engineer, Hancock Bridge, NJ, 2007 - 2011
Entergy Corporation, Plymouth, Massachusetts, Senior Design Engineer, 2002-2007
Various Companies, Contract Consulting Project Engineer, 1996 – 2002
Public Service Electric & Gas Co., Senior Staff Engineer, Hancock Bridge, NJ, 1983-1990
Toledo Edison Co., Toledo, Ohio, Senior Assistant Engineer, Associate Engineer, 1978-1983

PROFESSIONAL EXPERIENCE:

- Electrical and Controls Design Engineering
- Plant Systems Engineering
- Transformer and Relay(s) Spec Developer
- Plant Modification Engineering
- Systems and Component Test Engineering
- Factory Testing Witness
- 6 Month BWR Systems Engineering Training
- ETAP Trained
- Arc Flash IEEE 1584 Trained

Mr. Ram has over 28 years of electrical project, design and systems engineering experience in US nuclear plants. As part of the Seismic Margin Analysis (SMA) team, in 2012, Mr. Ram is leading the electrical engineering EPRI methodology effort to perform Post-Fukushima relay list development and evaluation to support Safe Shutdown Equipment List (SSEL), including relay functional screening and chatter analysis, for Taiwan nuclear plants (both PWR and BWR). In this effort, he is preparing the final reports including recommendations to replace any bad actor relays. Mr. Ram is preparing proposals to replace these bad actors including modification package development for field replacement of these relays. He has prepared proposals to lead similar forthcoming relay evaluation efforts for several Westinghouse plants in the USA. Mr. Ram has either prepared or peer reviewed the Seismic Walkdown Equipment Lists (SWEL 1 & 2) for several Exelon Plants.

As a senior plant systems engineer, Mr. Ram has: 1. Developed several test plans for modification packages for the replacement of low and medium voltage circuit breakers (ABB K-Line to Square D Masterpact; GE Magneblast to Wyle Siemens) and for the replacement of the entire Pressurizer Heater Bus switchgear; 2. Personally been involved in execution of these test plans during refueling outages; 3. Witnessed factory testing of Pressurizer Heater Bus Switchgear; 4. Interfaced with NRC in their biennial Component Design Basis Inspections (CDBI); Interfaced with INPO in their biennial evaluations; 5. Developed and executed Performance Centered Maintenance (PCM) strategies for Motor Control Centers (MCCs) and low and medium voltage circuit breakers and switchgear; 6. Developed and executed margin improvement strategies for pressurizer heater busses, for twin units, through obtaining funds and then equipment replacement; 7. Developed refueling outage scoping for low and medium voltage circuit breakers and MCCs through working with outage group, maintenance, operations, and work MGMT; 8. Resolved breaker grease hardening issue for ABB K-Line breakers, over a two year period, through working with maintenance and work MGMT in implementing accelerated overhauls with better grease; 9. Trained operations and engineering personnel in the Engaging People and Behavior Change process, as part of a case study team and; 10. Resolved day to day operations and maintenance issues with systems of responsibility (low and medium voltage systems)

Mr. Ram has regularly participated in the EPRI annual circuit breaker user group conferences; at the 2011 meeting, he made a presentation on circuit breaker as found testing vis-à-vis protection of equipment, cables, and containment penetrations, and selective coordination preservation.

As a Senior Design Engineer, Mr. Ram has: 1. Developed specifications and procured 345/4.16/4.16 kV and 23/4.16/4.16 kV transformers (ranging up to $1.25 million); 2. Prepared a modification package to install the 23 kV/4.16 kV/4.16 kV transformer, including leading the project team to get this transformer successfully installed, tested, and placed in service; 3. Developed ETAP scenarios and performed load flow studies to successfully support the 2006 INPO evaluation; 4. Performed arc flash calculations per IEEE 1584 methodology for 4 kV, 480V Load Centers, and MCCs, enabling a justification of reduced arc flash rated clothing, thereby allowing conversion of OUTAGE PMs into ONLINE PMs and; 5. Performed single point system vulnerability analysis.

As a Consulting Lead Project Engineer, Mr. Ram was heavily involved in resolution of the USI A-46 for several plants. He performed an extensive review of dozens of control circuits for relay chattering issues. To replace bad relay actors, Mr. Ram developed and/or supervised the development of many modification packages including: selection of replacement relays (both protective and auxiliary); preparation of relay testing specification with civil engineering input; working with and visiting seismic testing facilities for relay qualification and; developing pre and post installation instructions including test procedures. He worked closely with teams consisting of maintenance, operations, and work MGMT during the development and implementation of these projects. Besides the A-46 issue, Mr. Ram first developed and then was personally involved in the implementation of modification packages consisting of Cable, Conduit, Circuit Breaker and motor starter (contactor) replacements.

The following provides a list of USI A-46 resolution projects:

Northeast Utilities – Millstone Station
Consumers Power Co. - Palisades Nuclear Station
Boston Edison Co. - Pilgrim Nuclear Power Station
Commonwealth Edison Company- Dresden Station, Quad Cities Station

STEVENSON & ASSOCIATES
4350 DiPaolo Center, Suite H, Glenview, IL 60025

Tel: 847.795.0500
Fax: 847.795.0501
blory@vecsa.com

Bruce M. Lory

EDUCATION AND PROFESSIONAL AFFILIATIONS

- B.S., Mechanical Engineering, State University of New York at Buffalo, Buffalo, NY – 1982
- Exelon-certified instructor – 1992
- ASME Training certification - "Design and Repair of ASME Section I, IV, and VIII, Division 1 Pressure Vessels" – 2000
- Instructor of EPRI "Fundamentals of Equipment Seismic Qualification" course
- Member of 2003-11 IEEE Subcommittee-2 on Equipment Qualification
- Member of 2003-11 IEEE 323 Working Group (Environmental Qualification)
- Member of 2003-11 IEEE 344 Working Group (Seismic Qualification)

QUALIFICATIONS

Degreed Mechanical Engineer with over 30 years experience in the nuclear industry, with specific technical expertise in the field of overseeing equipment modifications for Extended Power Uprates (EPU), as well as Seismic Qualification (SQ) and Environmental Qualification (EQ) of equipment/components. Also possesses technical proficiency in design verification and project management for installation of single failure-proof cranes.

PROFESSIONAL EXPERIENCE – EPU PROJECTS

Provided staff augmentation services as utility responsible engineer, overseeing engineering activities necessary for developing engineering modifications packages for various EPU projects, including:

- Generator rewinds (LaSalle, Clinton, & Dresden), and associated GE support system modifications (SLMS package, flux probe, generator temperature monitoring, rotor torsional vibration monitoring system)
- HP Turbine replacement with new ADSP advanced GE turbine design
- RWCU pump replacements
- Reactor Feed Pump, Recirc Valve, and FW Reg. Valve replacements
- Stator Cooling system improvements (heat exchangers, filters, strainer)
- Replacement of entire IA system with 3 independent system trains in new building.

Activities included interface with Project Manager, Field Engineer, Work Planning, Construction, and Work Week Manager, as modification packages were developed, followed by implementation. Worked within INDUS PassPort program for populating ADL, AEL, loading engineering deliverables in PassPort, ECN processing. Performed owner's review of design descriptions, calculations, construction drawings. etc. Reviewed FAT test plans, as well as witnessed FAT activities at OEM locations, assisted supply chain oversight of OEM milestones and auditing OEM facilities and generating nonconformances. Provided technical interface with OEM as designs developed from mechanical & structural engineering perspectives. Reviewed resulting work order tasks in PassPort to get WO tasks to approved status. Produced CCNs in accordance with station procedures during installation phase to develop quick solution to engineering issues.

Bruce M. Lory

PROFESSIONAL EXPERIENCE – SEISMIC QUALIFICATION

Over 18 years of experience in Seismic Qualification of equipment and components, including seismic stress analyses, equipment foundation load analyses, equipment nozzle secondary stress analyses, and selection of vendors for replacement of seismically qualified Class 1E components. Well versed in requirements of IEEE 344-1975 for seismic qualification of Class 1E components, and use of SQUG methodology for demonstrating seismic adequacy of equipment. Excellent verbal/writing skills in field of SQ and EQ testing/analyses; responds well to organizational challenges, and relationship building. Member/ Chairperson of numerous EPRI EQ and SQ technical committees (see below). Proficient in PC software applications: Microsoft Word, Excel, MS Projects and PowerPoint as well as INDUS PassPort database.

Special expertise in preparation of SQ test plans, and witnessing of SQ tests; having witnessed over 100 seismic tests for numerous utilities. Excellent knowledge of seismic and environmental testing facilities, including Wyle (Norco and Huntsville), NLI, Southern Testing Services, Nutherm, NTS Acton, EGS, and Qualtech.

Served as ComEd (now Exelon) corporate subject matter expert in SQ, providing SQ guidance and policy for all five ComEd generating stations, including on-site SQ engineers. Developed and implemented ComEd ownership of SQ program by authoring corporate procedure and SQ review checklists in 1993. Also created existing ComEd SQ standards used at all sites.

Also served as subject matter expert for ComEd Corporate Engineering, providing technical guidance to Dresden, Quad Cities, and Zion sites required to complete the SQUG project. EPRI SQUG-certified Seismic Capability Engineer, and participated in all SQUG walkdowns at the three ComEd SQUG sites. Served on EPRI G-STERI, and SQURTS committees, as ComEd employee.

Specific SQ experience and special SQ projects includes:

- Designed temporary fix to broken auxiliary switch mounting on Merlin Gerin 4KV circuit breakers in support of restarting Dresden 2 & 3 and Quad Cities 1 & 2 after extended shutdown to investigate issue. Coordinated and witnessed expedited seismic testing of temporary design fix that resulted in NRC approval to restart affected units. Received "Engaging in Excellence" award from ComEd for solving problem (1997).

- Member of EPRI SQUG mock-NRC audit team which performed 1 week inspection of TMI SQUG program at TMI in preparation for formal NRC SQUG inspection (1998).

- Expedited SQ test procedure preparation and witnessed SQ testing and HELB (EQ) testing of Magnetrol level switch needed to replace Dresden HPCI Glo-SLO obsolete level switch, allowing Dresden to exit 14 day LCO (1999).

- Coordinated response to NRC resident inspector inquiry at Byron regarding SQ status of a racked out Westinghouse 4KV circuit breaker, reviewed third party calculation justifying the configuration as seismically qualified, interfaced with Resident Inspector at Byron, and consulted industry on the issue (2000).

- Chairman of 1 day EPRI technical workshop on issue of "racked out" circuit breakers, attended by over 30 utilities and contractors, EPRI NDE Center – Charlotte, NC (1997)

- Coordinated with Quad Cities SQ engineer the response to NRC concern regarding potential contact of 125VDC batteries against hard spot on associated battery racks under seismic loading. Solution involved SQ testing of non-conforming condition, SQ test procedure reviewed and SQ test witnessed as well (1998).

- Member of the special root cause investigative team formed in response to NRC audit concern on seismic qualification status of commercial grade-dedicated protective relays on Quad Cities EDGs (1999).

Bruce M. Lory

PROFESSIONAL EXPERIENCE – ENVIRONMENTAL QUALIFICATION
Possess over 15 years of EQ experience, in consulting services and in utility positions. Prepared and reviewed over 1 00 EQ Binders to meet re quirements station-specific EQ licen sing basis requirement.). Knowledgeable in EQ requirements for satisfying the different levels of EQ lice nsing basis, (10CFR50.49, NUREG 0588 – Category I and II, or DOR Guideline).

Prepared, reviewed over 20 EQ test pro cedures, and witne ssed numerous EQ tests as part of licensee's initial EQ program origination or EQ component replacement objectives. Well versed in EQ requirements contained in IEEE Standards 323, 382, 282, 317, and 649. Understand s differentiation between Arrhenius and Regression Line analysis methodologies for calculating thermal qualified life.

Have performed many F MEAs (Failure Mode Effe cts Analysis) on EQ com ponents down to part level to d etermine applicable failure mode and appropriate corresponding activation energy/regression line slope and intercept for calculating thermal qualified life of a given material. Have used Digital Engineering and Wyle Materials databases to assist FMEAs in selection of most applicable Arrhenius material properties for failure mode/part use.

Member of Corporate EQ group at Commonwealth Edison (ComEd) Downers Grove, IL overseeing EQ program compliance of all 6 nuclear stations (1991-1995). Served as backup EQ Engineer for

ComEd Corporate Engineering office (1998-2000). Specific EQ experience and special EQ projects includes:

- Prepared or reviewed over 100 EQ binders over entire six site ComEd EQ program (1983-1993)
- Project Engineer overseeing staff of 5 EQ engineers prepare 88 EQ binders for Fort St. Vrain EQ program creation from scratch. Nu merous technical challenges due to h igh temperature MSLB profile, necessitating thermal lag anal yses and design of the rmal protection modifications. Inclu ded lead role of defending EQ program in mock-NRC audit followed by successful NRC audit.
- Assisted in EQ impact evaluation for high drywell temperature excursion that o ccurred at ComEd Dresden Nuclear Station, asse ssing EQ life consequences on Class 1E components (1988).
- Assisted in preparation of EQ test pro cedure and witnessed EQ HELB testing of non-conforming Raychem NMCK and WCSF-N electrical splices for ComEd LaSalle County Nuclear Station in support of JCO (1986)
- Member of EQ insp ection team perfo rming mock-NRC audit of Q uad Cities EQ program with respect to co mpliance to R.G. 1.97, in cluding EQ walkdown discovery of Class 1E terminal blocks epoxy glued to junction boxes involving R.G. 1.97 instrumentation circuitry (1991).
- Member of EQ assessment team performing technical review of Consumers Energy - Palisades EQ program for compliance to DOR Guidelines and R.G. 1.97 (1990).
- Performed special EQ impact assessment of potentially non-EQ compon ents installed in Class 1E 480VAC MCCs at ComEd Braidwood Nuclear Station, reviewed over 1 50 NWRs for Stores Item # used for installation.
- Lead 5 EQ engineers on independent EQ asse ssment of Co mEd LaSalle County Nuclea r Station EQ prog ram re-baseline initiative to determin e remaining weaknesses in EQ prog ram and identify corrective actions needed in EQ analyses and component replacements (1997)

Bruce M. Lory

PROFESSIONAL EXPERIENCE – SINGLE FAILURE-PROOF CRANE DESIGN VERIFICATION
Performed utility owner's (CMS Energy – Big Rock Restoration Project) design review of all crane manufacturer's design stress analyses for use of single failure-proof Containment Building Crane for dry cask activities. Activities included assisting project manager in resolving design issues which arose during seismic qualification analyses by crane vendor, resolving crane manufacturer (Ederer) NCRs, and establishing protocol for identification of critical characteristics for commercial grade dedication of crane for safety related use. Crane expertise includes owner's review of manufacturer's design stress calculations for all operating load conditions per CMAA Spec. #70, and compliance with NUREG 0554.

Project highlights included:

- Visited crane manufacturer facility (Ederer) and vendor facility (Bigee) numerous times to resolve owner review comments on design stress calculations, attend project status meetings, and work with crane/vendor engineering staff towards final design resolutions.
- Reviewed over 30 design stress calculations for Ederer "X-SAM" single failure-proof crane trolley and hoist, including vendor bridge, column, and end truck design. Review resulted in three design changes to crane in order to comply with CMAA Spec. #70 and NUREG 0554 design margin requirements.
- Attended NRC meeting at NRR headquarters (Washington D.C.) with client to answer NRC and independent review team technical review questions on crane design and Ederer topical report.
- Assisted utility project manager in related engineering activities of commercial grade dedication, QA program establishment, and seismic qualification interface with Bigee Rigging.

EMPLOYMENT HISTORY
Stevenson & Associates – 2008 to present
EMS Inc. – 2000 - 2007
Commonwealth Edison, 1991-2000
ABB Impell, 1989 – 1991
Sargent & Lundy Engineers, 1979 – 1989

SPECIAL ACHIEVEMENTS & AFFILIATIONS

- Presented ComEd C-Team facility design for LOCA test chamber system to NUGEQ - 1991
- Inaugural Technical Program Chairman of EPRI – SQURTS program, 1993-95
- Member of EPRI – G-STERI program, 1995-98
- "Engaging in Excellence" award from ComEd for designing and seismically qualifying emergency fix to broken auxiliary switch mounting on Merlin-Gerin 4KV circuit breakers – 1997
- "Certificate of Appreciation" , ASME PVP Division for being Technical Program Representative of the OAC Committee for the 2000 ASME PVP Division International Conference – 2000
- Instructor of EPRI "Fundamentals of Equipment Seismic Qualification" training course - 2011

Walter Djordjevic

EDUCATION:

B.S. - Civil Engineering, University of Wisconsin at Madison, 1974
M.S. - Structural Engineering, Massachusetts Institute of Technology, 1976

PROFESSIONAL REGISTRATION:

State of California, State of Wisconsin, Commonwealth of Massachusetts, State of Michigan, State of Arizona, State of Missouri

PROFESSIONAL HISTORY:

Stevenson & Associates, Inc., President 1996 - present; Vice President and General Manager of the Boston area office, 1983 - 1995
URS/John A. Blume & Associates, Engineers, Boston, Massachusetts, General Manager, 1980 - 1983; San Francisco, California, Supervisory Engineer, 1979 - 1980
Impell Corporation, San Francisco, California, Senior Engineer, 1976 - 1979
Stone & Webster Engineering Corporation, Boston, Massachusetts, Engineer, 1974 - 1976

PROFESSIONAL EXPERIENCE:

- Structural Engineering
- Structural Dynamics
- Seismic Engineering
- Construction
- Vibration Engineering
- Expert Witness
- Committee Chairman

Mr. Djordjevic founded the Stevenson & Associates Boston area office in 1983 and serves as President and General Manager. Mr. Djordjevic is expert in the field of structural engineering – more specifically, in the areas of structural vulnerabilities to the effects of seismic and other extreme loading phenomena. As a structural dynamicist, Mr. Djordjevic also heads the Vibration Engineering Consultants corporate subsidiary of Stevenson & Associates for which he has overseen numerous designs of vibration sensitive microelectronics facilities for such clients as IBM, Intel, Motorola and Toshiba. He has personally been involved in such projects as resolvi ng vibration problems due to construction activities for the Central Artery Project (Big Dig) in Boston for which he was retained by Massport. Finally, Mr. Djordjevic has been personally retained as an Expert Witness a number of times relating to cases involving construction, structural and mechanical issues.

He has performed over a thousand hours of onsite seismic and other natural phenomena (including tornados, hurricanes, fire, and flooding) inspection walkdowns to assess structural soundness and vulnerabilities. He has inspected microelectronics fabrication facilities, power facilities, and hazardous material government and military reservations. He is one of the most experienced seismic walkdown

inspection screening and verification engineers having personally participated in seismic walkdowns at over 50 U.S. nuclear units.

In recent years, he has concentrated on screening inspection walkdowns and assessments for resolution of the USI A-46 and seismic IPEEE issues, on numerous facilities. The following provides a partial list of recent projects:

American Electric Power - D.C. Cook Station
Boston Edison Co. - Pilgrim Nuclear Power Station (SPRA)
Commonwealth Edison Company- Braidwood Station [PM], Byron Station [PM], Dresden Station [PM], Quad Cities Station [PM]
Consumers Power Co. - Palisades Nuclear Station [PM]
Entergy - Arkansas Nuclear One
Florida Power & Light - Turkey Point Station
New York Power Authority - James A. Fitzpatrick Nuclear Power Plant
Niagara Mohawk Power Corporation - Nine Mile Point Station [PM]
Northern States Power Co. - Monticello Nuclear Generating Plant
Northern States Power Co. - Prairie Island Nuclear Generating Plant
Omaha Public Power District – Fort Calhoun Station (SPRA)
Public Service Electric & Gas - Salem Nuclear Station
Rochester Gas & Electric - R.E. Ginna Station
Wisconsin Electric - Point Beach Nuclear Station [PM] (SPRA)
Wisconsin Public Service - Kewaunee Nuclear Power Plant [PM] (SPRA)
[PM] Indicates projects where Mr. Djordjevic served as Project Manager
Hanford Reservation
Savannah River Plant Reservation
Rocky Flats Reservation
Tooele US Army Depot
Anniston US Army Reservation
Umatilla US Army Reservation
Newport US Army Reservation
Aberdeen US Army Reservation

He is a member of the IEEE 344 Standards Committee, Chairman of the ASCE Working Group for Seismic Evaluation of Electrical Raceways, and Chairman of the IES Committee for Microelectronics Cleanroom Vibrations

Representative projects include overseeing the SEP shake-table testing of electrical raceways, in-situ testing of control panels and instrumentation racks at various nuclear facilities, equipment anchorage walkdowns and evaluations at various nuclear facilities. He is the principal author of the *CERTIVALVE* software package to evaluate nuclear service valves, and contributing author in the development of the *ANCHOR* and *EDASP* software packages commercially distributed by S&A.

Mr. Djordjevic is expert in the area of seismic fr agility analysis and dynamic qualification of electrical and mechanical equipment. He has participated in and managed over twenty major projects involving the evaluation and qualification of vibration sensitive equipment and seismic hardening of equipment. As demonstrated by his committee work and publications, Mr. Djordjevic has participated in and contributed steadily to the development of equipment qualification and vibration hardening methodology.

PROFESSIONAL GROUPS

Member, Institute of Electrical and Electronics Engineers, Nuclear Power Engineering Committee Working Group SC 2.5 (IEEE-344)

Chairman, American Society of Civil Engineers Nuclear Structures and Materials Committee, Working Group for the Analysis and Design of Electrical Cable Support Systems

Member, American Society of Mechanical Engineers Operation, Application, and Components Committee on Valves, Working Group SC-5

Chairman. Institute of Environmental Sciences, Working Group foe Standardization of Reporting and Measuring Cleanroom Vibrations

PARTIAL LIST OF PUBLICATIONS

1979 ASME PVP Conference, San Francisco, California, "Multi-Degree-of-Freedom Analysis of Power Actuated Valves", Paper No. 79-PVP-106.

1983 ASME PVP Conference, Portland, Oregon, "A Computer Code for Seismic Qualification of Nuclear Service Valves", Paper No. 83-PVP-81.

1983 ASME PVP Conference, Portland, Oregon, "Qualification of Electrical and Mechanical Equipment at Rocky Flats Reservation Using Prototype Analysis".

1984 ANS Conference, "Qualification of Class 1E Devices Using In-Situ Testing and Analysis."

1986 Testing of Lithography Components for Vibration Sensitivity, Microelectronics, Cahners Publishing

1990 Nuclear Power Plant Piping and Equipment Confer ence, "Development of Generic Amplification Factors for Benchboard and Relay Cabinet Assemblies", Paper No. 106, Structures and Components Symposium, held by North Carolina State University

1991 Electric Power Research Institute, "Development of In-Cabinet Response Spectra for Benchboards and Vertical Panels," EPRI Report NP-7146

Certificate of Completion

Walter Djordjevic

Successfully Completed

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

Bruce M. Lory (16 PDH)
Bruce M. Lory - Instructor
NTTF 2.3 Seismic Walkdown Course

Date: 06/26/12

THOMAS J. BORTOLINI, S.E., P.E.

QUALIFICATIONS

Proven civil engineer with extensive and diverse responsibilities in project management and structural engineering. Major strengths in design, organization, team building, and budget cost control. Well organized, adaptable to change, and demonstrated communication and leadership skills.

EXPERIENCE

EXELON CORPORATION, Braidwood, Illinois 1998 to Present

Structural Design Engineer
Responsible for engineering of structural modifications and technical interfaces with architect/engineers:

- Responsible for Security modifications
- ISFSI modifications
- New plant buildings
- Tank foundation modifications
- Single failure-proof crane modifications
- ISI examinations
- Responsible Engineer for concrete containment and containment metal liner

COMMONWEALTH EDISON, Zion, Illinois 1995 to 1998

Project Team Leader, Staff Engineer (1995 to 1996 and 1997 to Present)
Responsible for project management and engineering of structural modifications and technical interfaces with architect/engineers:

- Implemented department goal of using in-house engineering, relying less on A/Es as lead structural engineer for design of $1.5 million instrument air project.
- Tailored vehicle barrier system at $300,000 under projected costs.
- Designed spare main transformer foundation so that it could be moved on or off a rail car expeditiously, reducing downtime by over 50%.
- Developed new piping configuration and oversaw A/E piping analysis for overpressure protection of various piping systems.

Assistant Outage Director of Engineering (1996 to 1997)
Responsible for resolution of emergent engineering issues that affect outage critical path (special 8-month assignment).

- Identified, prioritized, disseminated, and followed through on all emergent engineering issues for over 120 engineers averting significant time delays and costs.
- Interacted with other Assistant Outage Directors to obtain support required by engineering groups.
- Performed peer reviews of station tests and procedures leading to successful test completions.

EXPERIENCE
(Cont'd)

VECTRA TECHNOLOGIES INC., Lincolnshire, Illinois 1987 to 1995
(Formerly IMPELL Corporation)

Supervising Engineer (1991 to 1995)
Responsible for project management and engineering of multiple structural modifications.

- Managed numerous concurrent on-site engineering modifications at Commonwealth Edison's Zion Station in support of department profit and sales goals.
- Site structural lead for $5 million emergency diesel generator controls modification.
- Played key roll as site support engineer for $10 million service water modification.
- Supported installation of the $5 million boric acid modification by resolving field installation problems with no schedule impact.

Engineering Site Coordinator (1989 to 1991)
Responsible for acquiring engineering projects by demonstrating ability to resolve complex technical issues while fostering client teamwork. Knowledgeable of all on-site activities and key interface with engineering groups and station manager.

- Responsible for starting field engineering office and generating $1.0 million in additional engineering services.
- Supervised six engineers and met quality, budgets, and schedules.
- Supported office projects with field support resulting in reducing costs due to minimal redesigns.

Project Engineer (1987 to 1989)
Responsible for issuing engineering modifications and resolving field interferences.

- Oversaw the design of control room ductwork, conduit supports, and suspended ceiling grid within schedule and budget.
- Coordinated and facilitated on site construction of control room ductwork and ceiling grid meeting client's expectation.

SARGENT AND LUNDY ENGINEERS, Chicago, Illinois 1974 to 1987

Senior Structural Engineer (1981 to 1987)
Managed the design of structural steel framing.

- Supervised work of 20 structural engineers performing gallery steel framing final load check.
- Resolved field interferences with the installation and reinforcement of structural members while assigned to Cincinnati Gas and Electric's Zimmer Station, resulting in minimal craft downtime.

Structural Engineer (1974 to 1981)
Analyzed and designed concrete and steel structural members.

EDUCATION

Graduate course work completed towards a Masters in Design and Construction Engineering
University of Cincinnati, Cincinnati, Ohio
Bachelor of Science, Civil Engineering, Valparaiso University, Valparaiso, Indiana

PROFESSIONAL AFFILIATIONS

Registered Structural Engineer, State of Illinois
Registered Professional Engineer, State of Illinois

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Certificate of Completion

Thomas Bortolini

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

B

Equipment Lists

Appendix B contains the equipment lists that were developed during SWEL development. Note that because no Rapid Drain-Down items existed for Braidwood Generating Station Unit 1, there is no Rapid Drain-Down Equipment List.

The following contents are found in Appendix B:

Stevenson & Associates

Seismic Walkdown Interim Report, Revision 0
In Response to NTTF Recommendation 2.3: Seismic

Braidwood Generating Station Unit 1

Kim L. Hull	07/13/2012
Equipment Selection Preparer	date
Tony Perez	07/13/2012
Equipment Selection Reviewer	date
Station Operations Staff Member	7/16/12 7/16/12 date

Refer to Attachment 3 for synopsis of Station Operations role and responsibility.

Dave Shaw/Ralph Richards

Table B-1. Base List 1
(Including Equipment Common with Unit 2)

ID	Description	System	Building	Elevation	Location
0CC01A	COMPONENT COOLING HEAT EXCHANGER	CC	Aux	364	ns
0CC01P	COMPONENT COOLING PUMP ASMBLY	CC	Aux	364	364-L-17
0PM01J	MAIN CONTROL BOARD	ns	Aux	451	Main Control Room
0PM02J	MAIN CONTROL BOARD	ns	Aux	451	Main Control Room
0SX007	0 CC HX OUTLT VLV ASMBLY	SX	ns	346	12' LOCATED SW OF M-16
0VC01AA	CONTROL ROOM HVAC SYST CHLD WTR COOLING COIL& CABINET	VC	Aux	451	ns
0VC01AB	CONTROL ROOM HVAC SYSTCHLD WTR COOLING COIL& CABINET	VC	Aux	451	ns
0VC01CA	MCR SUPPLY FAN 0A ASMBLY	VC	Aux	451	ns
0VC01CB	CONTROL ROOM HVAC SUPPLY FAN	VC	Aux	451	ns
0VC01FA	0A MCR HVAC SUP FLTRS	VC	Aux	451	ns
0VC01FB	0B MCR HVAC SUP FLTRS	VC	Aux	451	ns
0VC01JA	CONT RM HVAC LOCAL CONT PAN ASMBLY	VC	Aux	451	451-L-10
0VC01JB	CONTROL ROOM HVAC SYST LOCAL CONT PANEL ASMBLY	VC	Aux	451	451-L-26
0VC01SA	CONTROL ROOM HVAC SYSTMAKE UP AIR FILTER UNIT	VC	Aux	463	ns
0VC01SB	0B VC MAKE-UP FILTER UNIT	VC	Aux	463	463-L-24
0VC01YA	TRAIN B RTRN FAN 0B INLT DAMPER	VC	Aux	0	ns
0VC01YB	TRAIN B RTRN FAN 0B INLT DAMPER	VC	Aux	0	ns
0VC02CA	CONTROL ROOM HVAC RETURN FAN ASMBLY	VC	Aux	451	ns
0VC02CB	CONTROL ROOM HVAC RETURN FAN ASMBLY	VC	Aux	426	ns
0VC02FA	CONTROL RM REC CHARCOAL FILTER A TRAIN ASMBLY	VC	Aux	0	ns
0VC02FB	CONTROL RM RE CHARCOAL FILTER B TRAIN ASMBLY	VC	Aux	0	ns
0VC03CA	MAKE-UP FILTER FAN ASMBLY	VC	Aux	426	ns
0VC03CB	MAKE-UP FAN 0VC03CB HOUSING FILTER ASMBLY	VC	Aux	463	463
0VC05YA	ISOLATION DAMPER BUTTERFLY	VC	Aux	ns	ns
0VC05YB	TRAIN B RECIRC CHARCOAL ABSORBER 0B INLT DAMPER	VC	Aux	ns	ns

ID	Description	System	Building	Elevation	Location
0VC05YC	TRAIN B RECIRC CHARCOAL ABSORBER 0B INLT DAMPER	VC	Aux	ns	ns
0VC05YD	TRAIN B RECIRC CHARCOAL ABSORBER 0B INLT DAMPER	VC	Aux	ns	ns
0VC06YA	0B VC ABSORBER OUTLET DAMPER A ISOL DAMPER	VC	Aux	ns	ns
0VC06YB	TRAIN B RECIRC CHARCOAL ABSORBER 0B DISCH DAMPER	VC	Aux	ns	ns
0VC06YC	TRAIN B RECIRC CHARCOAL ABSORBER 0B DISCH DAMPER	VC	Aux	ns	ns
0VC06YD	TRAIN B RECIRC CHARCOAL ABSORBER 0B DISCH DAMPER	VC	Aux	ns	ns
0VC08Y	TRAIN B MAKEUP AIR FLTR UNIT FAN 0B DISCH FLOW CONTROL	VC	Aux	ns	ns
0VC09Y	TRAIN B EMERGENCY MAKEUP INTAKE FROM TURB BLDG	VC	Aux	ns	ns
0VC15J	MCR U-1 HVAC START PNL	VC	Aux	451	ns
0VC16J	MCR U-2 HVAC START PNL	VC	Aux	463	ns
0VC17YA	ISOLATION DAMPER OPPOSED BLADE	VC	Aux	ns	ns
0VC17YB	TRAIN A RTRN FAN 0A INLT DAMPER	VC	Aux	ns	ns
0VC24Y	TRAIN A MAKEUP AIR FLTR UNIT FAN 0A DISCH FLOW CONTROL	VC	Aux	ns	ns
0VC25Y	TRAIN A EMERGENCY MAKEUP INTAKE FROM THE TURB BLDG	VC	Aux	ns	ns
0WO01CA	CHILLED WATER SYS CONTROL ROOM REFRIGERATION UNIT 0A	WO	Aux	383	ns
0WO01CB	CHILLED WATER SYS CONTROL ROOM REFRIGERATION UNIT 0B	WO	Aux	383	ns
0WO01PA	0A CONTROL ROOM CHILLED WATER PUMP ASMBLY	WO	Aux	383	383-N-8
0WO01PB	0B CONTROL ROOM CHILLED WATER PUMP ASMBLY	WO	Aux	383	383-N-9
0WO14MA	SEPARATOR AIR M-118	WO	Aux	383	+04
0WO14MB	SEPARATOR AIR M-118	WO	Aux	383	+04
1AF006A	AUXILIARY FEEDWATER PMP 1A SX SUCT VLV ASMBLY; 6"	AF	Aux	383	ns
1AF006B	AUXILIARY FEEDWATER PMP 1B SX SUCT VLV ASMBLY; 6"	AF	Aux	383	IN PP RM
1AF017A	AUXILIARY FEEDWATER PMP 1A SX SUCT VLV ASMBLY; 6"	AF	Aux	383	ns
1AF017B	AUXILIARY FEEDWATER PMP 1B SX SUCT VLV ASMBLY; 6"	AF	Aux	383	IN PP RM
1AF01AA	MOTOR DRIVEN AF OIL COOLER	AF	Aux	383	ns
1AF01AB	DIESEL AF PUMP OIL COOLER	AF	Aux	383	Aux FW Pump Diesel Rm
1AF01EA-1	AFW BATTERY CHARGER	AF	Aux	ns	ns
1AF01EA-A	AF PUMP 1B BATTERY CHARGER	AF	Aux	383	ns

ID	Description	System	Building	Elevation	Location
1AF01EA-B	AF PUMP 1B BATTERY CHARGER	AF	Aux	383	ns
1AF01EB-1	AFW PUMP 1B DIESEL ENGINE BATTERY CHARGER	AF	Aux	383	ns
1AF01EB-A	AF BATTERY 2 AUXILIARY FEEDWATER PUMP 1B	AF	Aux	383	ns
1AF01EB-B	AF BATTERY 2 AUXILIARY FEEDWATER PUMP 1B	AF	Aux	383	ns
1AF01J	AF LOCAL CONT PANEL 1B ASMBLY	AF	Aux	383	383-M-15
1AF01PA	PUMP AUX FEEDWATER, MOTOR DRIVEN ASMBLY	AF	Aux	392	393-N-17
1AF01PA-A	1A AUX FEEDWATER PUMP AUX LUBE OIL PUMP	AF	Aux	383	ns
1AF01PA-L	AUX FEEDWATER PUMP 1A MAIN LUBE OIL PUMP	AF	Aux	383	ns
1AF01PA-M	1A AUX FEEDWATER PUMP MOTOR	AF	Aux	383	ns
1AF01PB	DIESEL DRIVEN AUX FEED PUMP 1B_ASMBLY	AF	Aux	383	ns
1AF01PB-A	1B AUX FEEDWATER PUMP AUX LUBE OIL PUMP	AF	Aux	383	ns
1AF01PB-B	AUX FW PUMP 1B ENG AUX START RLY BATT 1	AF	Aux	ns	ns
1AF01PB-B	AUX FW PUMP 1B ENG AUX START RLY BATT 2	AF	Aux	ns	ns
1AF01PB-K	1B DIESEL DRIVEN AUX FEED PUMP ENGINE	AF	Aux	383	383-M-17
1AF01PB-L	AUX FEEDWATER PUMP 1B MAIN LUBE OIL PUMP	AF	Aux	383	ns
1AF02A	AFW PUMP 1B GEAR OIL COOLER	AF	Aux	383	Aux FW Pump Diesel Rm
1AP01E	UNIT AUX. POWER TRANSFORMER 141-1	AP	Out-side	401	ns
1AP03E	UAT 141-2	AP	ns	ns	TRANS YRD
1AP05E	EQ 4160 VOLT ESF SWITCH GEAR 141 1AP075 ASMBLY	AP	Aux	426	426-M-8
1AP06E	4160 VOLT ESF SWITCH BUS 142	AP	Aux	426	426
1AP10E	EQ 480V ESF SUBSTATION BUS 131X ASMBLY	AP	Aux	426	426-P-10
1AP11E	EQ 480V ESF UNIT SUB 131X TRANSFORMER 1AP086	AP	Aux	426	426-P-8
1AP12E	EQ SWGR 132X 480 VOLT ESF 1VA025 ASMBLY	AP	Aux	426	426-P-7
1AP13E	EQ UNIT SUBSTATION 132X TRAN 480V ESF 1AP420	AP	Aux	426	426-M-8
1AP21E	480V AUX BLDG ESF MCC 131X1 XFORMER	AP	Aux	364	ns
1AP22E	480V AUX BLDG ESF MCC 131X3 ASMBLY	AP	Aux	383	383-N-15
1AP23E	480V AUX BLDG ESF MCC 132X1 ASMBLY	AP	Aux	364	364-P-18
1AP24E	EQ 480 V AUX BLDG ESF MCC 132X3 ASMBLY	AP	Aux	383	383-P-17
1AP25E	480V AUX BLDG ESF MCC 131X2 ASMBLY	AP	Aux	414	414-S-11
1AP26E	480V. AUX BLDG ESF MCC 131X4 ASMBLY	AP	Aux	414	ns
1AP27E	EQ 480V AUX BLDG MCC 132X2 ASMBLY	AP	Aux	426	426-S-12
1AP28E	MCC 132X4 ASMBLY	AP	Aux	426	426-S-12
1AP30E	EQ 480V AUX BLDG ESF MCC 131X5 ASMBLY	AP	Aux	426	426-Q-16

ID	Description	System	Building	Elevation	Location
1AP32E	EQ 480V AUX BLDG MCC 132X5 ASMBLY	AP	Aux	426	426-P-17
1AP38E	ASSY - 480V AUX BLDG MCC 133X1A	AP	Aux	346	ns
1AP39E	ASS - 480V AUX BLDG MCC 134V1	AP	Aux	346	ns
1CC01A	COMPONENT COOLING HEAT EXCHANGER	CC	Aux	364	ns
1CC01PA	1A PUMP, COMPONENT COOLING 12X14-18 M66-3 ASMBLY	CC	Aux	364	364-M-17
1CC01PB	1B PUMP, COMPONENT COOLING 12X14-18 M66-3 ASMBLY	CC	Aux	364	364-M-17
1CC01T	COMPONENT COOLING SURGE TANK	CC	Aux	426	426-P-11
1CC053	INSIDE CNMT PEN CLG SUPPLY ASMBLY; 3"	CC	Cont	401	OMB -5'
1CC9412A	CC TO RH HX 1A ISOL VLV ASMBLY; 12"	CC	Aux	364	+11'
1CC9412B	CC TO RH HX 1B ISOL VLV ASMBLY; 12"	CC	Aux	364	+11'
1CC9422A	RHR RLF VLV; 2" - 1"	CC	Aux	364	IN RHR RM
1CC9422B	RHR HX RLF VLV; 2" - 1"	CC	Aux	364	0
1CC9437B	CC FROM EXCESS LETDOWN HX ISOL VLV ASMBLY; 3"	CC	Aux	401	PEN 22 CURVE WALL 1PM06J
1CO01J	DG 1A RM FP CTRL PANEL	CO	Aux	401	ns
1CO02J	DG 1A DAY TANK ROOM FP CONTROL PANEL	CO	Aux	401	ns
1CO03J	DG 1B ROOM FP CONTROL PANEL	CO	Aux	401	ns
1CO04J	DG 1B DAY TANK ROOM FP CONTROL PANEL	CO	Aux	401	ns
1CO17JA	DG 1A & DAY TANK FIRE DAMPER PANEL	CO	Aux	401	ns
1CO17JB	DG 1B & DAY TANK FIRE DAMPER PANEL	CO	Aux	401	ns
1CO19JA	LSCR & CAB TUN FIRE DAMPER PANEL	CO	Aux	401	ns
1CO19JB	LSCR FIRE DAMPER CONTROL PANEL	CO	Aux	439	ns
1CO20J	UCSR FIRE DAMPER CONTROL PANEL	CO	Aux	426	ns
1CV01FA	1A CV SEAL WATER INJECTION FILTER	CV	Aux	401	ns
1CV01FB	1B CV SEAL WATER INJECTION FILTER	CV	Aux	401	ns
1CV01PA	PUMP,1A CENTRIFUGAL CHARGING ASMBLY	CV	Aux	364	364-V-17
1CV01PA-A	PUMP, 1A CV PP AUX LUBE OIL PP	CV	Aux	364	364-F-17; (V - 17??)
1CV01PB	PUMP,1B CENTRIFUGAL CHARGING ASMBLY	CV	Aux	364	364-ZX-14
1CV01PB-A	1B CNTRFGL CHG PP AUX OIL PP	CV	Aux	364	ns
1CV02A	SEAL WATER HEAT EXCHANGER	CV	Aux	426	ns
1CV02F	SEAL WATER RETURN FILTER	CV	Aux	401	ns

ID	Description	System	Building	Elevation	Location
1CV02P-C	PD CHARGING PUMP FLUID DRIVE OIL COOLER	CV	Aux	364	ns
1CV02SA	1A CV PUMP GEAR COOLER	CV	Aux	ns	ns
1CV02SB	1B CENTRIFUGAL CHARGING PUMP GEAR COOLER	CV	Aux	ns	ns
1CV03SA	1A CV PUMP LUBE OIL COOLER	CV	Aux	ns	ns
1CV03SB	1B CV PUMP LUBE OIL COOLER	CV	Aux	ns	ns
1CV04AA	1A LETDOWN HEAT EXCHANGER	CV	Aux	383	ns
1CV04AB	1B LETDOWN HEAT EXCHANGER	CV	Aux	383	ns
1CV112B	VCT OUTLT ISOL VLV (C/S AT IPM05J) ASMBLY; 4"	CV	Aux	426	VCT VLV AISLE
1CV112C	VCT OUTLT ISOL VLV (C/S AT 1PM05J) ASMBLY; 4"	CV	Aux	426	VCT VLV AISLE
1CV112D	RWST TO CHG PMPS SUCT VLV (C/S AT 1PM05J) ASMBLY; 8"	CV	Aux	364	CURVE WALL +12'
1CV112E	RWST TO CHG PMPS SUCT VLV (C/S AT 1PM05J) ASMBLY; 8"	CV	Aux	364	CURVE WALL +10'
1CV8100	SEAL WTR RTRN CNMT ISOL VLV (C/S AT 1PM05J) ASMBLY; 2"	CV	Aux	364	PEN-28 1PM05J
1CV8105	CHG LINE CNMT ISOL VLV (C/S AT 1PMO5J) ASMBLY; 3"	CV	Aux	364	PEN-71
1CV8106	CHG LINE CNMT ISOL VLV (C/S AT 1PM05J) ASMBLY; 3"	CV	Aux	364	PEN-71
1CV8110	CV PMP MINIFLOW ISOL VLV (C/S AT 1PM05J) ASMBLY/ 2"	CV	Aux	364	CURVE WALL 1PM05J
1CV8111	CV PMP MINIFLOW ISOL VLV (C/S AT 1PM05J) ASMBLY; 2"	CV	Aux	364	CURVE WALL 1PM05J
1CV8112	SEAL WTR RTRN CNMT ISOL VLV (C/S AT 1PM05J) ASMBLY; 2"	CV	Cont	377	OMB PEN-28
1CV8114	CHARGING PMP MINIFLOW ISOL VLV COBALT-2Y; 2"	CV	Aux	ns	ns
1CV8116	1B CV PUMP MINFLOW VLV; 2"	CV	Aux	364	CWA
1CV8123	SEAL WTR HX INLT RLF VLV; 2" - 3"	CV	Aux	383	HX VLV AISLE
1CV8124	VCT SUP HDR RLF VLV; 3/4" - 1"	CV	Aux	364	CURVE WALL +7'
1CV8145	PZR AUXILIARY SPRAY VLV (C/S AT 1PM05J); 2"	CV	Cont	412	OMB

ID	Description	System	Building	Elevation	Location
1CV8152	LETDOWN LINE CONTAINMENT ISOLATION VLV	CV	ns	ns	ns
1CV8355A	RCP 1A SEAL INJECTION ISOL VLV (C/S AT 1PM05J) ASMBLY; 2"	CV	Aux	401	PEN 33
1CV8355B	RCP 1B SEAL INJECTION ISOL VLV (C/S AT 1PM05J) ASMBLY; 2"	CV	Aux	364	PEN 53
1CV8355C	RCP 1C SEAL INJECTION ISOL VLV (C/S AT 1PM05J) ASMBLY; 2"	CV	Aux	364	PEN 53
1CV8355D	RCP 1D SEAL INJECTION ISOL VLV (C/S AT 1PM05J) ASMBLY; 2"	CV	Aux	401	PEN 33
1CV8804A	RH HX 1A TO CV PMPS SUCT ISOL VLV (C/S AT 1PM05J) ASMBLY; 8"	CV	Aux	364	CURVE WALL WALL
1DC01E	125V BATTERY 111 DIV. 11	DC	Aux	451	ns
1DC02E	125V BATTERY 112 DIV. 12	DC	Aux	451	ns
1DC03E	BATTERY CHARGER 111 DIV.11	DC	Aux	451	ns
1DC04E	BATTERY CHARGER 112 DIV. 12	DC	Aux	451	ns
1DC05E	125V DC ESF DIST CENTER 111	DC	Aux	451	ns
1DC05EA	125V DC ESF DIST. PNL. 111	DC	Aux	451	ns
1DC06E	125V DC ESF DIST CENTER 112	DC	Aux	451	ns
1DC06EA	125V DC ESF DIST PNL 112	DC	Aux	451	ns
1DC10J	125V DC FUSE PANEL - DIV. 11	DC	Aux	451	ns
1DC11J	125V DC FUSE PANEL - DIV. 12	DC	Aux	451	ns
1DG01KA	1A DIESEL GENERATOR ENGINE	DG	Aux	401	ns
1DG01KB	1B DIESEL GENERATOR	DG	Aux	401	401-L-6
1DG01SA	AIR COMPRESSOR PACKAGE 1A	DG	Aux	401	ns
1DG01SB	AIR COMPRESSOR PACKAGE 1B	DG	Aux	401	ns
1DG04EA	DIESEL GENERATOR 1A SYNCHRO-CHECK RELAY BOX	DG	ns	ns	ns
1DG04EB	DIESEL GENERATOR 1B SYNCHRO-CHECK RELAY BOX	DG	ns	ns	ns
1DO01PA	20 GPM TRANSFER PUMP 1A	DO	Aux	373	Diesel Oil Storage Tank Rm - 1A
1DO01PB	20 GPM TRANSFER PUMP 1B	DO	Aux	373	Diesel Oil Storage Tank Rm - 1B

ID	Description	System	Building	Elevation	Location
1DO01PC	20 GPM TRANSFER PUMP 1C	DO	Aux	373	Diesel Oil Storage Tank Rm - 1A
1DO01PD	20 GPM TRANSFER PUMP 1D	DO	Aux	373	Diesel Oil Storage Tank Rm - 1B
1DO01TA	DIESEL OIL STORAGE TANK 1A	DO	Aux	373	Diesel Oil Storage Tank Rm - 1A
1DO01TB	DIESEL OIL STORAGE TANK 1B	DO	Aux	373	Diesel Oil Storage Tank Rm - 1B
1DO01TC	DIESEL OIL STORAGE TANK 1C	DO	Aux	373	Diesel Oil Storage Tank Rm - 1A
1DO01TD	DIESEL OIL STORAGE TANK 1D	DO	Aux	373	Diesel Oil Storage Tank Rm - 1B
1DO02TA	500 GAL DAY TANK 1A	DO	Aux	401	Diesel Oil Day Tank Rm #2
1DO02TB	500 GALLON DAY TANK 1B	DO	Aux	401	Diesel Oil Day Tank Rm #1
1DO10T	500 GAL DIESEL OIL DAY TANK	DO	Aux	383	Oil Day Tank Room #1
1FC009	ISOLATION VALVE	FC	Con	377	+10
1FC012	ISOLATION VALVE	FC	Con	377	+14
1FT-0121	CHARGING LINE D/P CELL FLOW XMITTR	ns	ns	ns	ns
1FT-0132	LETDOWN FLOW D/P CELL	ns	ns	ns	LOCAL MOUNT
1FT-0139	LOOP FILL HEADER FLOW XMITTR	ns	ns	ns	LOCAL MOUNT
1FT-0688	RESID HT EXCH 1B CCW OUT DP FLOW XMITTR	CC	ns	ns	ns
1FT-0689	RESID HX 1A CCW OUT DP FLOW XMITTR	CC	ns	ns	ns
1FT-AF011	SG 1A AUX FEED PUMP 1A FLOW XMTTR	AF	Aux	364	ns
1FT-AF012	AF TO SG 1A FLOW TRANSMITTER	AF	Aux	364	ns

ID	Description	System	Building	Elevation	Location
1FT-AF013	AF TO SB 1B FLOW TRANSMITTER	AF	Aux	364	ns
1FT-AF014	AF TO SG 1B FLOW TRANSMITTER	AF	Aux	ns	ns
1FT-AF015	AF TO SG 1C FLOW TRANSMITTER	AF	Aux	ns	ns
1FT-AF016	AF TO SG 1C FLOW TRANSMITTER	AF	Aux	ns	ns
1FT-AF017	AF TO SG 1D FLOW TRANSMITTER	AF	Aux	364	ns
1FT-AF018	AF TO SG 1D FLOW TRANSMITTER	AF	Aux	364	ns
1IP01E	INSTRUMENT BUS 111 TRANSFORMER - DIV. 11	IP	ns	ns	ns
1IP01J	120VAC INSTRUMENT BUS DISTRIBUTION PANEL 111 - DIV. 11	IP	Aux	451	ns
1IP02E	INSTRUMENT BUS 112 TRANSFORMER - DIV. 12	IP	ns	ns	ns
1IP02J	120 VAC INSTRUMENT BUS DISTRIBUTION PANEL 112 - DIV. 12	IP	Aux	451	ns
1IP03E	INSTRUMENT BUS 113 TRANSFORMER - DIV. 11	IP	ns	ns	ns
1IP03J	120 VAC INSTRUMENT BUS DISTRIBUTION PANEL 113 - DIV.11	IP	Aux	451	ns
1IP04E	INSTRUMENT BUS 114 TRANSFORMER - DIV. 12	IP	ns	ns	ns
1IP04J	120 VAC INSTRUMENT BUS DISTRIBUTION PANEL 114 - DIV 12	IP	Aux	451	ns
1IP05E	INSTRUMENT BUS 111 INVERTER - DIV. 11	IP	Aux	451	ns
1IP06E	INSTRUMENT BUS 112 INVERTER - DIV. 12	IP	Aux	451	ns
1IP07E	INSTRUMENT BUS 113 INVERTER - DIV. 11	IP	Aux	451	ns
1IP08E	INSTRUMENT BUS 114 INVERTER - DIV. 12	IP	Aux	451	ns
1IY-0606	RH HX 1A OUT I/P TRANSDUCER	RH	Aux	364	ns
1IY-0607	RH HX #1B OUT I/P TRANSDUCER	RH	Aux	364	ns
1LS-0940A	CONTAINMENT SUMP LEVEL SWITCH	SI	Cont	377	ns
1LS-0941A	CONTAINMENT SUMP LEVEL SWITCH	SI	Cont	377	ns
1LT-0459	EQ PRESSURIZER LEVEL TRANSMITTER	RY	Cont	377	377-R-12; 1PL50J
1LT-0460	EQ PRESSURIZER LEVEL TRANSMITTER	RY	Cont	377	377-R-16
1LT-0461	PZR LVL TRANSMITTER	RY	Cont	377	377-R-7
1LT-0501	SG LOOP 1A W-RNG LEVEL D/P XMTTR	FW	Con	377	1PL50J
1LT-0502	SG LOOP 1B W-RNG LEVEL D/P TRANSMITTER	FW	Con	377	1PL67J
1LT-0503	SG LOOP 1C W-RNG LEVEL D/P TRANSMITTER	FW	Con	377	1PL75J
1LT-0504	SG LOOP 1D W-RNG LEVEL D/P TRANSMITTER	FW	Con	377	1PL52J

ID	Description	System	Building	Elevation	Location
1LT-0517	S/G LOOP 1A LEVEL D/P XMTTR W/FILLED LEG	FW	Con	401	ns
1LT-0518	S/G 1A LEVEL LOOP D/P XMTTR 2/FILLED LEG	FW	Con	412	ns
1LT-0519	S/G LOOP LA LEVEL D/P XMTTR W/FILLED LEG	FW	Con	412	ns
1LT-0527	S/G LOOP 1B LEVEL D/P TRANSMITTER W/FILLED LEG	FW	Con	377	ns
1LT-0528	S/G 1B LEVEL D/P TRANSMITTER W/FILLED LEG	FW	Con	412	ns
1LT-0529	S/G LOOP 1B LEVEL D/P XMTTR W/FILLED LEG	FW	Con	412	ns
1LT-0537	S/G LP 1C LVL D/P TRANSMITTER W/FILLED LEG	FW	Con	377	ns
1LT-0538	S/G 1C LEVEL LOOP D/P XMITTER W/FILLED LEG	FW	Con	412	ns
1LT-0539	S/G LP 1C LVL D/P TRANSMITTER W/FILLED LEG	FW	Con	412	ns
1LT-0547	S/G LP 1D LVL D/P TRANSMITTER W/FILLED LEG	FW	Con	401	ns
1LT-0548	S/G 1D LEVEL LOOP D/P XMTTR W/FILLED LEG	FW	Con	412	ns
1LT-0549	S/G 1D LVL LOOP D/P TRANSMITTER W/FILLED LEG	FW	Con	412	ns
1LT-0556	S/G LOOP 1A LEVEL D/P TRANSMITTER W/FILLED LEG	FW	Con	412	ns
1LT-0557	S/G 1B LEVEL LP D/P TRANSMITTER W/FILLED LEG	FW	Con	412	ns
1LT-0558	S/G LOOP 1C LEVEL D/P TRANSMITTER W/FILLED LEG	FW	Con	412	ns
1LT-0559	S/G LOOP 1D LEVEL D/P TRANSMITTER W/FILLED LEG	FW	Con	412	ns
1LT-0930	REF WTR STG TK LEVEL D/P XMTTR	SI	RWST Tunnel	379	+05
1LT-0931	REF WTR STG TK LVL D/P XMTTR	SI	RWST Tunnel	379	+06
1LT-0932	REF WTR STG TK LVL D/P XMTTR	SI	RWST Tunnel	379	ns
1LT-0933	REF WTR STG TK LVL D/P XMTTR	SI	RWST Tunnel	379	ns
1MS001A	MS ISOL VLV LOOP 1A ASMBLY; 30-1/4"	MS	Aux	377	1PM06J
1MS001B	MS ISOL VLV LOOP 1B ASMBLY; 32-3/4"	MS	Aux	377	1PM06J
1MS001C	MS ISOL VLV LOOP 1C ASMBLY; 32-3/4"	MS	Aux	377	1PM06J
1MS001D	MS ISOL VLV LOOP 1D ASMBLY; 30-1/4"	MS	Aux	377	1PM06J
1MS013A	S/G 1A 1235 PS1G RELIEF; 6"	MS	Aux	401	A SAFETY VLV RM
1MS013B	S/G 1B 1235 PS1G RELIEF; 6"	MS	Aux	401	B SAFETY VLV RM
1MS013C	SG1C 1235 PS1G RELIEF; 6"	MS	Aux	401	C SAFETY VLV RM

ID	Description	System	Building	Elevation	Location
1MS013D	S/G 1D 1235 PS1G RELIEF; 6"	MS	Aux	401	D SAFETY VLV RM
1MS014A	S/G 1A 1220 PS1G RELIEF; 6"	MS	Aux	401	A SAFETY VLV RM
1MS014B	S/G 1B 1220 PS1G RELIEF; 6"	MS	Aux	401	B SAFETY VLV RM
1MS014C	S/G 1C 1220 PS1G RELIEF; 6"	MS	Aux	401	C SAFETY VLV RM
1MS014D	S/G 1D 1220 PS1G D RELIEF; 6"	MS	Aux	401	D SAFETY VLV RM
1MS015A	S/G 1A 1205 PS1G RELIEF; 6"	MS	Aux	401	A SAFETY VLV RM
1MS015B	S/G 1B 1205 PS1G RELIEF; 6"	MS	Aux	401	B SAFETY VLV RM
1MS015C	S/G 1C 1205 PS1G RELIEF; 6"	MS	Aux	401	C SAFETY VLV RM
1MS015D	S/G 1D 1205 PS1G RELIEF; 6"	MS	Aux	401	D SAFETY VLV RM
1MS016A	S/G 1A 1190 PSIG RELIEF; 6"	MS	Aux	401	A SAFETY VLV RM
1MS016B	S/G 1B 1190 PS1G RELIEF; 6"	MS	Aux	401	B SAFETY VLV RM
1MS016C	S/G 1C 1190 PSIG RELIEF; 6"	MS	Aux	401	C SAFETY VLV RM
1MS016D	S/G 1D 1190 PS1G RELIEF; 6"	MS	Aux	401	D SAFETY VLV RM
1MS017A	S/G 1A 1175 PS1G RELIEF; 6"	MS	Aux	401	A SAFETY VLV RM
1MS017B	S/G 1B 1175 PS1G RELIEF; 6"	MS	Aux	401	B SAFETY VLV RM
1MS017C	S/G 1C 1175 PS1G RELIEF; 6"	MS	Aux	401	C SAFETY VLV RM
1MS017D	S/G 1D 1175 PS1G RELIEF; 6"	MS	Aux	401	D SAFETY VLV RM
1MS018A	S/G 1A PORV ASMBLY; 8"	MS	Aux	401	ns

ID	Description	System	Building	Elevation	Location
1MS018B	S/G 1B PORV ASMBLY; 8"	MS	Aux	401	1PM03J
1MS018C	S/G 1C PORV ASMBLY; 8"	MS	Aux	401	1PM03J
1MS018D	S/G 1D PORV ASMBLY; 8"	MS	Aux	401	1PM03J
1NI-31B	SOURCE RANGE	ns	ns	ns	1PM07J
1NI-32B	SOURCE RANGE	ns	ns	ns	1PM07J
1NR11E	POSTACCIDENT NEUTRON DETECTOR	NR	Cont	ns	ns
1NR13E	POSTACCIDENT NEUTRON DETECTOR	NR	Cont	ns	ns
1PA01J	PROTECTION SYSTEM CABINET (I&E Prot. Cab. CH 1)	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA02J	PROTECTION SYSTEM CABINET (I&E Prot. Cab. CH 2)	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA03J	PROTECTION SYSTEM CABINET (I&E Prot. Cab. CH 3)	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA04J	PROTECTION SYSTEM CABINET (I&E Prot. Cab. CH 4)	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA06J	CONTROL SYSTEM CABINET (I&C Rack Ctrl. Cab. Grp. 2)	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA07J	PROC I&C RACK CONT GRP 3 CAB 7	PA	Aux	451	0
1PA08J	CONTROL SYSTEM CABINET (I&C Rack Ctrl. Cab. Grp. 4)	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA09J	PROTECTION SYSTEM CABINET (SSPS Cab. Train A)	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA10J	PROTECTION SYSTEM CABINET(SSPS Cab. Train B)	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA11J	SAFEGUARDS TEST CABINET TRAIN A	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)

ID	Description	System	Building	Elevation	Location
1PA12J	SAFEGUARDS TEST CABINET TRAIN B	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA13J	ESF SEQUENCING & ACTUATION CABINET TRAIN A	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA14J	ESF SEQUENCING & ACTUATION CABINET TRAIN B	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA27J	AUX SAFEGUARD RELAY CABINET (A)	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA28J	AUX SAFEGUARD RELAY CABINET (B)	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA33J	CONTROL SYSTEM CABINET ESF DIV. 11	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA34J	CONTROL SYSTEM CABINET ESF DIV. 12	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA51J	RX VESSEL LEVEL CHANNEL A HJTC CABINET	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PA52J	RX VESSEL LEVEL CHANNEL B HJTC CABINET	PA	Aux	451	Aux. Elect. Equip. Rm (AEER)
1PL04J	REMOTE CONTROL PANEL (Remote Shutdown Panel)	ns	Aux	383	ns
1PL05J	REMOTE CONTROL PANEL (Remote Shutdown Panel)	ns	Aux	383	ns
1PL06J	REMOTE CONTROL PANEL (Remote Shutdown Panel)	ns	Aux	383	ns
1PL07J	1A DG CONTROL PANEL	DG	Aux	401	ns
1PL08J	1B DG CONTROL PANEL	DG	Aux	401	ns
1PL10J	FIRE HAZARDS PANEL	ns	Aux	426	ns
1PL50J	LOCAL INSTRUMENT PANEL	ns	Cont	377	377-R-12
1PL52J	LOCAL INSTRUMENT PANEL	ns	Cont	377	ns

ID	Description	System	Building	Elevation	Location
1PL66J	LOCAL INSTRUMENT PANEL	ns	Cont	377	377-R-1
1PL67J	LOCAL INSTRUMENT PANEL	ns	Cont	377	377-R-21
1PL75J	LOCAL INSTRUMENT PANEL	ns	Cont	412	412-R-6
1PL77JC	LOCAL CONTROL PANEL	ns	Aux	377	1B MSIV Rm
1PL79JB	LOCAL CONTROL PANEL	ns	Aux	377	1A MSIV Rm
1PL84JA	LOCAL CONTROL PANEL	ns	Aux	383	ns
1PL84JB	LOCAL CONTROL PANEL	ns	Aux	383	ns
1PL85JB	LOCAL CONTROL PANEL	ns	Aux	383	ns
1PL86J	LOCAL CONTROL PANEL	ns	Aux	364	ns
1PL97J	LOCAL CONTROL PANEL	ns	Aux	364	ns
1PM01J	MAIN CONTROL BOARD	ns	Aux	451	Main Control Room
1PM04J	MAIN CONTROL BOARD	ns	Aux	451	Main Control Room
1PM05J	MAIN CONTROL BOARD	ns	Aux	451	Main Control Room
1PM06J	MAIN CONTROL BOARD	ns	Aux	451	Main Control Room
1PM07J	MAIN CONTROL BOARD	ns	Aux	451	Main Control Room
1PM11J	MAIN CONTROL BOARD	ns	Aux	451	Main Control Room
1PM12J	MAIN CONTROL BOARD	ns	Aux	451	Main Control Room
1PT-0455	EQ PZR PRESSURE CHANNEL 1	RY	Cont	377	377-R-12; 1PL50J
1PT-0456	EQ PRESSURIZER PRESSURE CHANNEL 2	RY	Cont	377	377-R-16
1PT-0457	PRZR PRESSURE TRANSMITTER	RY	Cont	377	377-R-7; 1PL52J
1PT-0458	PRZR PRESSURE TRANSMITTER	RY	Cont	0	1PL75J
1PT-0514	S/G LOOP 1A STM PRESS TRANSMITTER	FW	MSIV	377	ns
1PT-0515	S/G LOOP 1A STM PRESS PRESS XMTTR	FW	MSIV	377	ns
1PT-0516	S/G LOOP 1A STM PRESS XMTTR	FW	MSIV	377	ns
1PT-0524	S/G LOOP 1B STM PRESS XMTTR	FW	MSIV	377	ns

ID	Description	System	Building	Elevation	Location
1PT-0525	S/G LOOP 1B STM PRESS PRESS XMTTR	FW	MSIV	377	ns
1PT-0526	S/G LOOP 1B STM PRESS XMTTR	FW	MSIV	377	ns
1PT-0534	S/G LP 1C STM PRESS XMTTR	FW	MSIV	377	ns
1PT-0535	S/G LP 1C STM PRESS PRESSURE XMTTR	FW	MSIV	377	ns
1PT-0536	S/G LO 1C PRES PRESS TRANSMITTER	FW	MSIV	377	ns
1PT-0544	S/G LP 1D STM PRESS PRESSURE XMTTR	FW	MSIV	377	ns
1PT-0545	S/G LOOP 1D STM PRESS XMTTR	FW	MSIV	377	ns
1PT-0546	S/G LP 1D STM PRESS XMTTR	FW	MSIV	377	ns
1PT-0935	CNMT PRESS XMTTR	SI	Con	451	+04
1PT-0936	CONT PRESS XMTTR	SI	Con	451	+04
1PT-403	LOOP A RC HOT LET WIDE RANGE PRESSURE TRANSMITTER	RC	Cont	0	1PL75J
1PT-405	LOOP C RC HOT LET WIDE RANGE PRESSURE TRANSMITTER	RC	Cont	0	1PL66J
1PT-406	LOOP A RC HOT LEG WIDE RANGE PRESS TRANSMITTER	RC	Cont	0	1PL75J
1PT-407	LOOP C RC HOT LET WIDE RANGE PRESS TRANSMITTER	RC	Cont	0	1PL66J
1RC01BA	STEAM GENERATOR 1A	RC	Cont	ns	ns
1RC01BB	STEAM GENERATOR 1B	RC	Cont	ns	ns
1RC01BC	STEAM GENERATOR 1C	RC	Cont	ns	ns
1RC01BD	STEAM GENERATOR 1D	RC	Cont	ns	ns
1RC01PA	REACTOR COOLANT PUMP 1A	RC	Con	390	ns
1RC01PB	REACTOR COOLANT PUMP 1B	RC	Con	390	ns
1RC01PC	REACTOR COOLANT PUMP 1C	RC	Con	390	ns
1RC01PD	REACTOR COOLANT PUMP 1D	RC	Con	390	ns
1RC01R	REACTOR VESSEL (INTERNALS)	RC	Cont	ns	ns
1RD01E	1A MG SET	RD	Aux	451	Misc. Elect. Equip. Rm
1RD02E	1B MG SET	RD	Aux	451	Misc. Elect. Equip. Rm
1RD05E	RX TRIP BREAKERS	RD	ns	ns	ns
1RH01PA	PUMP, 1A RESIDUAL HEAT REMOVAL ASMBLY	RH	Aux	364	364-U-13
1RH01PA-A	RH PUMP 1A SEAL COOLER	RH	Aux	346	ns
1RH01PB	PUMP,1B RESIDUAL HEAT REMOVAL ASMBLY	RH	Aux	364	364-Y-13
1RH01PB-A	RH PUMP 1B SEAL COOLER	RH	Aux	346	ns

ID	Description	System	Building	Elevation	Location
1RH02AA	RESIDUAL HEAT REMOVAL HEAT EXCHANGER 1A	RH	Aux	364	ns
1RH02AB	RESIDUAL HEAT REMOVAL HEAT EXCHANGER 1B	RH	Aux	364	ns
1RH606	RESIDUAL HEAT REMOVAL HX 1A FLOW CONT VLV ASMBLY; 8"	RH	Aux	357	+10 1A RH HX RM N.E.
1RH607	RESIDUAL HEAT REMOVAL HX 1B FLOW CONT VLV ASMBLY; 8"	RH	Aux	357	+10' 1B RH HX RM N. OF HX
1RH610	RESIDUAL HEAT REMOVAL PMP 1A MINIFLOW VLV ASMBLY; 3"	RH	Aux	357	@FLOOR 1A RH HX RM N.E. OF HX
1RH611	RESIDUAL HEAT REMOVAL PMP 1B MINIFLOW VLV ASMBLY; 3"	RH	Aux	357	@FLOOR 1B RH HX RM N.W. OF HX
1RH8701A	RC LOOP 1A TO RH PMP 1A SUCT ISOL VLV ASMBLY; 12"	RH	Cont	377	OMB PEN 68
1RH8701B	RC LOOP 1A TO RH PMP 1A SUCT ISOL VLV ASMBLY; 12"	RH	Cont	377	+10' IMB NEAR RX FOUNDATIO N
1RH8702A	RC LOOP 1C TO RH PMP 1B SUCT ISOL VLV ASMBLY; 12"	RH	Cont	377	OMB PEN 75
1RH8702B	RC LOOP 1C TO RH PMP 1B SUCT ISOL VLV ASMBLY; 12"	RH	Cont	377	+10' IMB NEAR RX FOUNDATIO N
1RH8716A	HX 1A DISCH CROSSTIE VLV ASMBLY; 8"	RH	Aux	364	+11 NEAR S. WALL
1RH8716B	1B RH HX DISCHARGE XTIE VLV ASMBLY; 8"	RH	Aux	364	CWA +11' NEAR S. WALL
1RY01S	PRESSURIZER (SPIN RCP.CPR) ASMBLY	RY	Cont	426	ns
1RY01T	PRESSURIZER RELIEF TANK	RY	Cont	383	ns
1RY32MA	PORV ACCUMULATOR 1A	RY	Cont	426	ns
1RY32MB	PORV ACCUMULATOR 1B	RY	Cont	426	ns
1RY455A	PZR PORV (C/S AT 1PM05J) ASMBLY	RY	Cont	451	ABOVE PZR
1RY455B	PZR SPRAY VLV (C/S AT 1PM05J) ASMBLY	RY	Cont	390	IMB NEAR ID RCP RCP

ID	Description	System	Building	Elevation	Location
1RY455C	PZR SPRAY VLV (C/S AT 1PM05J) ASMBLY	RY	Cont	390	IMB NEAR ID RCP
1RY456	PZR PORV (C/S AT 1PM05J) ASMBLY	RY	Cont	451	TOP OF PZR
1RY8028	PW TO PRT CONTAINMENT ISOLATION VLV	RY	Cont	387	ns
1RY8046	U-I PRT 1RY01T PW SUP CHK VLV	RY	Cont	ns	ns
1SI01T	REFUELING WATER STORAGE TANK	SI	FH	401	ns
1SI05TA	CNMT RECIRC SUMP	SI	Cont	377	IMB
1SI05TB	CNMT RECIRC SUMP	SI	Cont	377	IMB
1SI8801A	CHG PMP TO COLD LEGS INJECTION ISOL (C/S AT 1PM05J) ASMBLY; 4"	SI	Aux	375	PEN 26 CWA
1SI8801B	CHG PMP TO COLD LEGS INJECTION ISOL VLV (C/S AT 1PM05J) ASMBLY; 4"	SI	Aux	375	PEN-26 CWA
1SI8811A	CNMT SUMP 1A ISOL VLV ASMBLY; 24"	SI	Aux	364	PEN AREA (1PM06J)
1SI8811B	EQ CNMT SUMP 1B ISOL VLV; 24"	SI	Aux	364	364-Y-13
1SI8812A	PMP 1A SUCT FROM RWST ISOL VLV ASMBLY; 12"	SI	Aux	343	1A CS PP RM (1PMO6J)
1SI8812B	ASSY - PMP 1B SUCT FROM RWST ISOL VLV ASMBLY; 12"	SI	Aux	343	1B RH PP RM (1PM06J)
1SI8840	MOV U-1 RH HXS TO 1A/1C LOOP HL ISOL VLV	SI	Aux	374	+05 (EOP VLV)
1SX001A	ESSENTIAL SERVICE WTR PMP 1A SUCT VLV ASMBLY/ 36"	SX	Aux	346	4' DOWN N VLV PIT
1SX001B	ESSENTIAL SERVICE WTR PMP 1B SUCT VLV ASMBLY; 36"	SX	Aux	346	4' DOWN N VLV PIT
1SX01AA	1A SX PUMP LUBE OIL COOLER	SX	Aux	ns	ns
1SX01AB	1B SX PUMP LUBE OIL COOLER	SX	Aux	ns	ns
1SX01FA	1A SX PP DSCH STRN	SX	Aux	330	+03
1SX01FB	1B SX PP DSCH STRN	SX	Aux	330	+03
1SX01K	DIESEL DRIVEN AF PUMP CLOSED CYCLE HX	SX	Aux	ns	ns
1SX01PA	PUMP, 1A ESSENTIAL SER WTR ASMBLY	SX	Aux	330	330-M-13
1SX01PA-C	1A SX PP AUX LUBE OIL PUMP	SX	Aux	330	330
1SX01PB	PUMP,1B ESSENTIAL SER WTR ASMBLY	SX	Aux	330	330-P-18
1SX01PB-C	SX PUMP 1B AUX LUBE OIL PP	SX	Aux	330	ns

ID	Description	System	Building	Elevation	Location
1SX02K	DIESEL DRIVEN AF PUMP RT ANG GEAR	SX	Aux	ns	ns
1SX101A	MOTOR DRIVEN AF PMP 1A OIL CLR SX OUTLT VLV ASMBLY; 1-1/2"	SX	Aux	383	+1'
1SX112A	CNMT CHILLER 1A INLT ISOL VLV ASMBLY; 10"	SX	Aux	401	+8' (0MP02J)
1SX112B	CNMT CHILLER 1B INLT ISOL VLV ASMBLY; 10"	SX	Aux	401	+9' (0PM02J)
1SX114A	ASSY - AOV 1A CNMT CHLR 1WO01CA SX RTRN VLV	SX	Aux	401	+7
1SX114B	ASSY - AOV 1B CNMT CHLR 1WO01CB SX RTRN VLV	SX	Aux	401	+7
1SX147A	RCFC CHILLER CNDSR 1A BYPASS VLV ASMBLY; 16"	SX	Aux	401	+8' (0PM02J)
1SX147B	RCFC CHILLER CNDSR 1B BYPASS VLV ASMBLY; 16"	SX	Aux	401	+9' (0PM02J)
1SX169A	DG 1A SX VLV ASMBLY; 10"	SX	Aux	401	NE CORNER DG RM 1A +13'
1SX169B	DG 1B SX VLV ASMBLY; 10"	SX	Aux	401	+13' 1B D/G RM NE CORNER
1SX173	SX SUP VLV TO ENG Driven CLG WTR PP FOR Diesel Driven AF PP_ASSY; 6"	SX	Aux	383	+10' AF PMP RM
1SX178	SX RETURN FROM 1B AUX FEED PMP HX ASMBLY; 6"	SX	Aux	383	+7' AF PMP RM
1TE-0463	PZR RELIEF DISCH RTD	RY	Cont	439	447-R-7
1TE-0464	PZR SAFE DISCH RTD	RY	Cont	435	435-R-7
1TE-0465	PRZR SAFE DISCH RTD	RY	Cont	435	438-R-7
1TE-0466	PZR SAFE DISCH RTD	RY	Cont	439	442-R-7
1TE-0604	RHR LP 1A RETURN TEMPERATURE RTD	RH	Aux	375	375-S-13
1TE-0605	RHR LP 1B RETURN TEMPERATURE RTD	RH	Aux	375	375
1TE-0674	CC HX DISCH RTD 100 OHMS PLATINUM TEMP ELEM	CC	ns	ns	ns
1TE-RC022A	RC WIDE RANGE LP 1A TEMP	RC	Con	390	+03
1TE-RC022B	RC WIDE RANGE LP 1A TEMP	RC	Con	390	+03
1TE-RC023A	RC WIDE RANGE LP 1B TEMP	RC	Con	390	+03
1TE-RC023B	RC WIDE RANGE LP 1B TEMP	RC	Con	390	+03

ID	Description	System	Building	Elevation	Location
1TE-RC024A	RC WIDE RANGE LP 1C TEMP	RC	Con	390	+03
1TE-RC024B	RC WIDE RANGE LP 1C TEMP	RC	Con	390	+05
1TE-RC025A	RC WIDE RANGE LP 1D TEMP	RC	Con	390	+03
1TE-RC025B	RC WIDE RANGE LP 1D TEMP	RC	Con	390	+03
1VA01J	EXX SERV WATER PMP 1A CUB COOLER LOCAL PNL	VA	Aux	330	ns
1VA01SA	COOLER ESSENTIAL SERV WATER PUMP 95-10	VA	Aux	330	330-P-15
1VA01SB	COOLER ESSENTIAL SERVICE WATER PUMP 95-10	VA	Aux	330	330-M-19
1VA02J	ESSENTIAL SERVICE WATE1B CUBICLE COOLER LOCA	VA	Aux	330	ns
1VA02SA	1A RHR PUMP ROOM CUB CLR ASMBLY	VA	Aux	346	346-13-U
1VA02SB	1B RHR PUMP ROOM CUB CLR ASMBLY	VA	Aux	346	346-X-13
1VA03J	RESIDUAL HEAT REMOVAL CUBICLE COOLER LOCAL P	VA	Aux	ns	ns
1VA04J	RESIDUAL HEAT REMOVAL CUBICLE COOLER LOCAL P	VA	Aux	346	ns
1VA04SA	1A SI PP CUB CLR	VA	Aux	364	ns
1VA04SB	1B SI PP CUB CLR	VA	Aux	364	ns
1VA06SA	COOLER,CENTRIFUGAL CHARGING PUMP 1A	VA	Aux	364	364-U-17
1VA06SB	CCOLER AUX BLDG HVAC SYS CEN CHG PP 1B 95-7	VA	Aux	364	364-U-17
1VA08S	AUX BLDG HVAC SYSTEM D-D AF PUMP-1B CUBICLE	VA	Aux	383	ns
1VA10J	CENTRIFUGAL CHARGING PCUBICLE COOLER LOCAL P	VA	Aux	364	ns
1VA11J	CENTRIFUGAL CHARGING PCUBICLE COOLER LOCAL P	VA	Aux	364	ns
1VD01CA	DIESEL GENERATOR ROOM VENT FAN ASMBLY	VD	Aux	401	401-Q-8
1VD01CB	1B DG ROOM HVAC FAN ASMBLY	VD	Aux	401	ns
1VD01JA	DIESEL GEN ROOM HVAC SYSTEM ANN PANEL 1A	VD	Aux	401	401-P-8
1VD01JB	DIESEL GEN ROOM HVAC SYSTEM ANN PANEL	VD	Aux	ns	ns
1VD04J	1A DG RM HVAC DMPR START PNL	VD	Aux	401	ns
1VD05J	1B DG RM HVAC DMPR START PNL	VD	Aux	401	ns
1VE01C	MISC ELECT EQUIP ROOM VENT FAN ASMBLY	VE	Aux	426	ns
1VE01J	MEER VENTILATION SYSTEM ANN. PANEL ASMBLY	VE	Aux	451	451-Q-8
1VE02C	BATTERY RM 112 EXHAUST FAN	VE	Aux	ns	ns
1VE03C	BATTERY RM 111 EXHAUST FAN	VE	Aux	451	ns
1VE04C	ASSY - U-1 MISC ELEC EQUIP RM DIV 11 EXH FAN	VE	Aux	463	+22

ID	Description	System	Building	Elevation	Location
1VE04J	MISC ELEC EQUIP RM DAMPER STARTER PANEL	VE	Aux	451	ns
1VE05C	ASSY - U-1 MISC ELEC EQUIP RM DIV 12 EXH FAN	VE	Aux	463	+13
1VP01AA	CNMT ESS'L SERVICE WATER COIL 1A (RCFC)	VP	Cont	377	ns
1VP01AB	CNMT ESS'L SERVICE WATER COIL 1B (RCFC)	VP	Cont	377	ns
1VP01AC	CNMT ESS'L SERVICE WATER COIL 1C (RCFC)	VP	Cont	377	ns
1VP01AD	CNMT ESS'L SERVICE WATER COIL 1D (RCFC)	VP	Cont	377	ns
1VP01CA	PRIM. CNMT VENT SYSTEM RCFC FAN, MOTOR	VP	Cont	377	ns
1VP01CB	PRIM. CNMT VENT SYSTEM RCFC FAN, MOTOR	VP	Cont	377	ns
1VP01CC	PRIM. CNMT VENT SYSTEM RCFC FAN, MOTOR	VP	Cont	377	ns
1VP01CD	PRIM. CNMT VENT SYSTEM RCFC FAN, MOTOR	VP	Cont	377	ns
1VX01C	DIV 12 ESF SWGR ROOM FAN ASMBLY	VX	aux	364	ns
1VX01J	ESF/BATTERY ROOM VENTILATION SYS ANN PANEL	VX	Aux	426	426-Q-10
1VX02J	MISC VENTILATION SYSTEM ANN PANEL	VX	Aux	426	426-P-6
1VX04C	ESF SWGR ROOM DIV 11 VENT FAN CABLE 1VX001 ASMBLY	VX	Aux	439	443-Q-7
1VX07J	ESF SWGR RM DIV 12 HVAC DMPR START PNL	VX	Aux	426	ns
1VX08J	ESF SWGR RM DIV 11 HVAC DMPR START PNL	VX	Aux	426	ns
1WO006A	Reactor CNMT Fan CLG 1A/1C Chiller WTR INLT CNMT ISOL VLV ASBLY; 10"	WO	Aux	401	ORC PEN 6 +6'
1WO006B	Reactor CNMT Fan CLRS 1B/1D CHLR WTR INLT CNMT ISOL VLV ASBLY; 10"	WO	Aux	375	ORC PEN 10
1WO020A	REACTOR CNMT FAN CLRS 1A/1C CHLR WTR OUTLT CNMT ISOL VLV ASSY; 10"	WO	Aux	401	ORC PEN 5 +6'
1WO020B	CNMT FAN COOLERS 1B/1D CHL WTR OUTLET CNMT ISOL ASMBLY; 10"	WO	Aux	375	CWA PEN 8
1WO056A	Reactor CNMT Fan CLRS 1A/1C Chiller WTR Outlet CNMT ISOL VLV ASSY; 10"	WO	Cont	401	PEN 5 +6'
1WO056B	Reactor CNMT Fan CLS 1B/1D Chiller WTR OUTLT CNMT ISOL VLV ASSY; 10"	WO	Cont	401	PEN 8

Table B-2. Base List 2
(Including Equipment Common with Unit 2)

ID	Description	Building	Elevation	Column
0FC001	REFUEL WTR PURIF PMPS DISCH TO FUEL CASK FILL	AUX	401	15 Y
0FC002A	REFUEL WTR PURIF PMPS DISCH TO SPENT FUEL PIT	AUX	385	15 X
0FC003	REFUELING WTR PURIF PMP 0B SUCTION ISO VLV		364	12 S
0FC004	REFUELING WTR PURIF PMP 0B DISCH CHECK	AUX	364'+8'	12 S
0FC006A	REFUELING WTR PURIF PMPS SUCT HDR INST ROOT TO 0PI-FC003		364	12 S
0FC007A	REFUELING WTR PURIF PMP 0A DISCH INST ROOT TO 0PI-FC005	AUX	364	12 S
0FC011	REFUELING WTR PURIF PMP 0A CASING DRN		364	12 S
0FC012	REFUELING WTR PURIF PMPS SUCT HDR INST ISOL TO 0PI-FC003	AUX	364	17 Q
0FC013	REFUELING WTR PURIF PMP 0A DISCH INST ISOL TO 0PI-FC005	AUX	364	17 Q
0FC03PA	PUMP REFUELING WTR PURIFICATION 0A ASMBLY	AUX	364	12 S
0FC8754	SPENT FUEL PIT HX RTRN ISOL	FH	401	18 Y
0FC8763	REFUELING WTR PURIF PMP 0A DISCH CHECK	AUX	364+18'	12 S
0FC8790	SPENT FUEL PIT HX TO BORON RECY HOLDUP TANKS ISOL	FH	401	18 Y
0HS-FC002	REFUELING WATER PURIF PUMP 0A	AUX	364	12 S
0LS-FC010	SPENT FUEL POOL LEVEL SWITCH		418	20 X
0PI-FC003	REFUELING WTR PURIFICATION PUMP 0A SUCT PRESS			
0PI-FC005	RFLG WTR PURIF PUMP 0A DISCHARGE GAUGE	AUX	364	17 S
0TEW-FC007	RFLG WTR PURIF PUMP 0A DISCH			
0TI-FC007	REFUELING WTR PURIFICATION PUMP 0A DISCH TEMP IND	AUX	364	12 S
0TIS-0626	SPENT FUEL POOL TEMP INDICATING SWITCH	FH	426	20 X
1FC004A	SPENT FUEL PIT HX TUBE SIDE VENT	FH	401	17 Z
1FC004B	SPENT FUEL PIT HX SHELL SIDE VENT	FH	401	17 Y
1FC005	SPENT FUEL PIT PMP CASING DRN	FH	401	18 Y
1FC006	SPENT FUEL PIT PMP CASING VENT	FH	401	18 Y
1FC007	REFUELING WTR PURIF PMP SUCT FROM U-1 REFU CAVITY DRN TEST CONN	AUX	364	12 U
1FC008	SPENT FUEL PIT FLT DEMIN RTRN TO U1 REFUEL CAV DRN TEST CONN	AUX	364	12 S
1FC009	REFUELING WTR PURIF PMP SUCT FROM U-1 REFUEL CAV CNMT ISOL	CNMT	377	7 R
1FC010	REFUELING WTR PURIF PMP SUCT FROM U-1 REFUEL CAV CNMT ISOL	AUX	364	12 U
1FC011	SPENT FUEL PIT FLTR DEMIN LOOP RTRN TO U-1 REFUEL CAV CNMT	AUX	364	12 S

ID	Description	Building	Elevation	Column
	ISOL			
1FC012	SPENT FUEL PIT FLTR DEMIN LOOP RTRN TO U-1 REFUEL CAV CNMT ISOL	CNMT	377	8 R
1FC013	REFUELING WTR PURIF PMP DISCH TO SPENT FUEL PIT FLTR DEMIN LOOP	AUX	401	17 Q
1FC01A	SPENT FUEL PIT HEAT EXCHANGER	FH	401	17 Z
1FC01P	U-1 FUEL POOL COOLING PUMP	AUX	401	18 Y
1FC021	SPENT FUEL PIT PMP DISCH INST ISOL TO 1PI-627	FH	401	17 AA
1FC022	SPENT FUEL PIT PMP SUCT INST ISOL TO 1PI-633	FH	401	19 AA
1FC02M	SPENT FUEL PIT PUMP START UP STRAINER			
1FC032	REFUEL WTR PURIF PUMP SUCT FROM U-1 REFUEL CAVITY DRN CONN		364	12 U
1FC03F	SPENT FUEL PIT STRAINER			
1FC03PA	PUMP, 0A REFUELING WATER PURIFICATION			
1FC8756	U1 SPENT FUEL PIT PMP SUCTION ISOL	FH	401	18 Y
1FC8757	SPENT FUEL PIT PMP SUCT INST ROOT TO 1PI-633	FH	401	18 Y
1FC8758	REFUELING WTR PURIF PMP SUCT FROM U-1 RWST	AUX	364	13 V
1FC8761	SPENT FUEL PIT PMP DISCH INST ROOT TO 1PI-627	FH	401	17 Y
1FC8762A	SPENT FUEL PIT HX INLET	FH	401	17 Z
1FC8762B	U1 SPENT FUEL PIT HX OUTLET	FH	401	17 Z
1FC8765	SPENT FUEL PIT FLTR DEMIN LOOP RTRN TO SPENT FUEL PIT	AUX	401	15 X
1FC8766	SPENT FUEL PIT FLTR DEMIN LOOP RTRN TO U-1 RWST CHECK VLV			
1FC8792A	SPENT FUEL PIT HX TUBE SIDE DRN	FH	401	17 Z
1FC8792B	SPENT FUEL PIT HX SHELL SIDE DRN	FH	401	17 Z
1FC8793	SPENT FUEL PIT PMP DISCH CHECK	FH	401	17 Y
1FC8794	SPENT FUEL PIT FLTR DEMIN LOOP INLT ISOL	FH	401	17 Y
1FI-0631	FC DEMIN FLOW INDICATOR	AUX	390	12 N
1HS-FC001	SPENT FUEL PIT PUMP	FH	401	
1PI-0627	GAUGE; PRESSURE, U.S. GAUGE CO.,0-160 PSIG	FH	401	17 AA
1PI-0630	SPENT FUEL POOL FILTER OUTLET PRESSURE INDICA			
1PI-0633	SPENT FUEL PIT PUMP SUCTION PRESSURE INDICATO	FH	401	AA-19
1TI-0628	SPENT FUEL POOL HEAT EXCH OUTLET TEMP INDICAT			
1TW-0628	SFP HX OUTLET WELL	AUX	364	14 V

DESCRIPTION	CLASS	BUILDING	ELEVATION	LOCATION	SYSTEM	Seismic Cat 1?	Safety Function(s)	New or Replace ?	IPEEE Enhancemer
KEUP AIR FLTR UNIT FAN _OW CONTROL	(10) Air Handlers	Auxiliary	463	463 HVAC G	VC	Y	Support System HVAC		
ERGENCY MAKEUP INTAKE 3 BLDG	(10) Air Handlers	Auxiliary	451	451 U-2 HV	VC	Y	Support System HVAC		
AC SUP FLTRS	(10) Air Handlers	Auxiliary	451	451 U-2 HV	VC	Y	Support System HVAC		
ROL BOARD	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 MAIN C	PM	Y	ESFAS		
N SYSTEM CABINET (I&E H 1)	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 U-1 AU	PA		ESFAS		Yes - Interactio concern. Adjac cabinets not bo together.
N SYSTEM CABINET (I&E H 3)	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 U-1 AU	PA	Y	ESFAS		Yes - Interactio concern. Adjac cabinets not bo together.
ACK CONT GRP 3 CAB 7	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 U-1 AU	PA	Y	ESFAS		Yes - Interactio concern. Adjac cabinets not bo together.
NCING & ACTUATION AIN B	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 U-1 AU	PA	Y	ESFAS		Yes - Interactio concern. Adjac cabinets not bo together.
UARD RELAY CABINET (B)	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 U-1 AU	PA	Y	ESFAS		Yes - Interactio concern. Adjac cabinets not bo together.
YSTEM CABINET ESF DIV.	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 U-1 AU	PA	Y	ESFAS		Yes - Interactio concern. Adjac cabinets not bo together.
TRUMENT BUS	(14) Distribution Panels						Support		

:OOM HVAC SYST CHLD NG COIL& CABINET	(10) Air Handlers	Auxiliary	451	451 U-1 HV	VC	Y	Support System HVAC		
DAMPER BUTTERFLY	(10) Air Handlers	Auxiliary	451	451 U-2 HV	VC	Y	Support System HVAC		
VAC LOCAL CONT PAN	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 U-1 HV	WO	Y	Support System HVAC		
'AC START PNL	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 U-1 HV	VC	Y	Support System HVAC		
MISC ELEC EQUIP RM DIV	(09) Fans	Auxiliary	463	451 DIV 12	VE	Y	Support System HVAC		
IT BUS 112 TRANSFORMER	(04) Transformers	Auxiliary	451	451 DIV 12	AP	Y	Support System DC Power		Yes - Interactio with adjacent M
F DIST CENTER 112	(14) Distribution Panels	Auxiliary	451	451 DIV 12	DC	Y	Support System DC Power		
SE PANEL - DIV. 12	(14) Distribution Panels	Auxiliary	451	451 DIV 12	DC	Y	Support System DC Power		
SE PANEL - DIV. 11	(14) Distribution Panels	Auxiliary	451	451 DIV 11	DC	Y	Support System DC Power		
:RY 112 DIV. 12	(15) Batteries on Racks	Auxiliary	451	451 DIV 12	DC	Y	Support System DC Power	Y	
:RY 111 DIV. 11	(15) Batteries on Racks	Auxiliary	451	451 DIV 11	DC	Y	Support System DC Power	Y	
HARGER 112 DIV. 12	(16) Battery Chargers and Inverters	Auxiliary	451	451 DIV 12	DC	Y	Support System DC Power		Yes - Interactio concern. Adjac cabinets not bo together. Calculated spe displacement exceeds availal clearance.
IT BUS 112 INVERTER - DIV.	(16) Battery Chargers and Inverters	Auxiliary	451	451 DIV 12	PO	Y	Support System AC		

IT BUS 114 INVERTER - DIV.	(16) Battery Chargers and Inverters	Auxiliary	451	451 DIV 12	PO	Y	Support System AC Power		
EAKERS	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 DIV 12	RD	Y	RRC		
F SUBSTATION BUS 131X	(02) Low Voltage Switchgear	Auxiliary	426	426 ESF SW	AP	Y	Support System AC Power		Yes - Interactio with adjacent M
LT ESF SWITCH GEAR 141 IBLY	(03) Medium Voltage Switchgear	Auxiliary	426	426 ESF SW	AP	Y	Support System AC Power		
F UNIT SUB 131X MER 1AP086	(04) Transformers	Auxiliary	426	426 ESF SW	AP	Y	Support System AC Power		Yes - Interactio with adjacent M
32X 480 VOLT ESF	(02) Low Voltage Switchgear	Auxiliary	426	426 ESF SW	AP	Y	Support System AC Power		Yes - Interactio with adjacent M
ESF SWITCH BUS 142	(03) Medium Voltage Switchgear	Auxiliary	426	426 ESF SW	AP	Y	Support System AC Power		Yes - Interactio with adjacent M
RM DIV 12 HVAC DMPR	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	426	426 ESF SW	VX	Y	Support System HVAC		
LV ASMBLY; 10"	(07) Pneumatic-Operated Valves	Auxiliary	401	401 1B DG	SX	Y	Support System cooling water		
M HVAC FAN ASMBLY	(09) Fans	Auxiliary	401	401 1B DG	VD	Y	Support System HVAC		
GENERATOR	(17) Engine-Generators	Auxiliary	401	401 1B DG	DG	Y	Support System AC Power		
TROL PANEL	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	401	401 1B DG	PL	Y	Support System AC Power		
IVAC DMPR START PNL	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	401	401 1B DG	VD	Y	Support System HVAC		
STORAGE TANK 1B	(21) Tanks and Heat Exchangers	Auxiliary	373	383 U-1 DI	DO	Y	Support System AC Power		

V ASMBLY; 8"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	401	401 U-1 MS	MS	Y	DHR	Y	
V ASMBLY; 8"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	401	401 U-1 MS	MS	Y	DHR		
WATER STORAGE TANK	(21) Tanks and Heat Exchangers	FH Ou	401	401 FH OUT	SI	Y	RCIC		
V LOOP 1A ASMBLY; 30-1/4"	(07) Pneumatic-Operated Valves	Auxiliary	377	377 U-1 MS	MS	Y	DHR		
A STM PRESS XMTTR	(18) Instruments on Racks	Auxiliary	377	377 U-1 MS	PT	Y	DHR		
X BLDG MCC 132X2	(01) Motor Control Centers	Auxiliary	426	426 AREA 5	AP	Y	Support System AC Power		Yes - Interactio with adjacent M
SEL OIL DAY TANK	(21) Tanks and Heat Exchangers	Auxiliary	383	All	DO	Y	DHR		
VEN AUX FEED PUMP	(05) Horizontal Pumps	Auxiliary	383	All	AF	Y	DHR		
DWATER PUMP AUX LUBE	(05) Horizontal Pumps	Auxiliary	383	All	AF	Y	DHR		
DRIVEN AUX FEED PUMP	(05) Horizontal Pumps	Auxiliary	383	All	AF	Y	DHR		
ECIRC VLV_ASMBLY; 3"	(07) Pneumatic-Operated Valves	Auxiliary	383	All	AF	Y	DHR		
TO ENG Driven CLG WTR sel Driven AF PP_ASSY; 6"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	383	All	SX	Y	DHR		
EEDWATER PMP 1B SX SMBLY; 6"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	383	All	AF	Y	DHR		
EEDWATER PMP 1B SX SMBLY; 6"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	383	All	AF	Y	DHR		
DRIVEN AF PUMP CUBICLE S) 1B FAN	(10) Air Handlers	Auxiliary	383	All	VA	Y	Support System HVAC		
3 BATTERY CHARGER	(15) Batteries on Racks	Auxiliary	383	All	AF	Y	Support System DC Power		
Y 2 AUXILIARY FEEDWATER	(15) Batteries on Racks	Auxiliary	383	All	AF	Y	Support System DC		

MP 1B ENG AUX START & 2	(15) Batteries on Racks	Auxiliary	383	All	AF	Y	Support System DC Power		
LDG ESF MCC 131X3	(01) Motor Control Centers	Auxiliary	383	All	AP	Y	Support System AC Power		
JX BLDG ESF MCC 132X3	(01) Motor Control Centers	Auxiliary	383	All	AP	Y	Support System AC Power		Yes - Interactio with adjacent M
LOW D/P CELL	(18) Instruments on Racks	Auxiliary	383	All	FT	Y	RCIC		
ATER SYS CONTROL ROOM TION UNIT 0B	(11) Chillers	Auxiliary	383	All	VC	Y	Support System HVAC		
N CONT VLV ASMBLY; 4"	(07) Pneumatic-Operated Valves	Auxiliary	364	364 10-15/	AF	Y	DHR	Y	Y
3 FLOW TRANSMITTER	(18) Instruments on Racks	Auxiliary	364	364 10-15/	AF	Y	DHR		
OMPONENT COOLING 66-3 ASMBLY	(05) Horizontal Pumps	Auxiliary	364	364 15-21/	CC	Y	Support System cooling water		
LINE D/P CELL FLOW	(18) Instruments on Racks	Auxiliary	364	364 17-19/	FT	Y	RCIC		
TLT VLV HEADER ASMBLY;	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	346	346 15-23/	SX	Y	Support System cooling water		
AUX BLDG MCC 133X1A	(01) Motor Control Centers	Auxiliary	346	346 10-18/	AP	Y	Support System AC Power		Yes - Interactio with adjacent M
SCH STRN	(00) Other	Auxiliary	330	330 18-23/	SX	Y	Support System cooling water		
SSENTIAL SER WTR	(05) Horizontal Pumps	Auxiliary	330	330 18-23/	SX	Y	Support System cooling water		
3 AUX LUBE OIL PP	(05) Horizontal Pumps	Auxiliary	330	330 18-23/	SX	Y	Support System cooling water		
SSENTIAL SERVICE WATER	(05) Horizontal Pumps	Auxiliary	330	330 18-23/	VA	Y	Support System cooling water		
NLT VLV ASMBLY; 30"	(08) Motor-Operated								No

T VLV ASMBLY; 30"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	330	330 13-18/	SX	Y	DHR		
TG TK LVL D/P XMTTR	(18) Instruments on Racks	Auxiliary	379	379 U-1 RW	LT	Y	RCIC		
ENTRIFUGAL CHARGING	(05) Horizontal Pumps	Auxiliary	364	364 1B CV	CV	Y	RCIC		
ESIDUAL HEAT REMOVAL	(06) Vertical Pumps	Auxiliary	364	346 1B RH	RH	Y	DHR		
1B RH HX TO 1B SI PP SOL VLV	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	364	364 UNIT 1	SI	Y	RCIC		
ENTRIFUGAL CHARGING	(10) Air Handlers	Auxiliary	364	364 1A CV		Y	Support System HVAC		
AL CHARGING PCUBICLE CAL P	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	364	364 1B CV	VA	Y	RCIC		
UGAL CHARGING PUMP ER	(21) Tanks and Heat Exchangers	Auxiliary	364	364 1B CV	CV	Y	Support System HVAC		
EAT REMOVAL HX 1B VLV ASMBLY; 8"	(07) Pneumatic-Operated Valves	Auxiliary	357	364 1B RHR	RH	Y	DHR		
MP ROOM CUB CLR ASMBLY	(10) Air Handlers	Auxiliary	346	346 1B RH		Y	Support System HVAC		
B SEAL COOLER	(21) Tanks and Heat Exchangers	Auxiliary	346	346 1B RH	RH	Y	DHR		
C PMPS THERMAL OL VLV ASMBLY; 3"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	401	383 U-1 AR	CC	Y	CF		
L INJECTION ISOL VLV (C/S ASMBLY; 2"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	401	383 U-1 AR	CV	Y	CF		
O COLD LEGS INJECTION /S AT 1PM05J) ASMBLY; 4"	(07) Pneumatic-Operated Valves	Auxiliary	375	383 U-1 AR	SI	Y	RCIC		
RETURN TEMPERATURE	(19) Temperature Sensors	Auxiliary	375	364 U-1 AR	TE	Y	DHR		
LDG ESF MCC 131X1	(01) Motor Control Centers	Auxiliary	364	364 U-1 AR	AP	Y	Support System AC Power		
O LEGS 1B/1C ISOL VLV SMBLY; 8"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	364	383 U-1 AR	SI	Y	RCIC		

HG PMPS SUCT VLV (C/S ASMBLY; 8"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	364	364 U-1 AR	CV		RCIC		Yes - Seismic impact of Opera on adjacent platform steel grating
HG PMPS SUCT VLV (C/S ASMBLY; 8"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	364	364 U-1 AR	CV	Y	RCIC		
EL LOOP D/P XMTTR G	(18) Instruments on Racks	Cont	412	(No Data)	LT	Y	DHR		
C PMPS ISOL VLV ASMBLY;	(08) Motor-Operated and Solenoid-Operated Valves	Cont	401	OMB 1PM06J	CC	Y	CF		
CONTAINMENT ISOLATION	(08) Motor-Operated and Solenoid-Operated Valves	Cont	387	(No Data)	RY	Y	CF		
C TO RH PMP 1B SUCT ISOL Y; 12"	(08) Motor-Operated and Solenoid-Operated Valves	Cont	377	OMB PEN 75	RH	Y	CF		
RIZER LEVEL ER	(18) Instruments on Racks	Cont	377	377-R-12;	LT	Y	RCIC		
ESSURE CHANNEL 1	(18) Instruments on Racks	Cont	377	377-R-12;	PT	Y	RCPC		
. SERVICE WATER COIL 1A	(10) Air Handlers	Cont	377	377-R-16	VP	Y	CF		
C/S AT 1PM05J) ASMBLY	(07) Pneumatic-Operated Valves	Cont	451	ABOVE PZR	RCS	Y	RCPC		
MULATOR 1A	(21) Tanks and Heat Exchangers	Cont	426	426-R-8	RY	Y	RCPC		
NGE LP 1A TEMP	(19) Temperature Sensors	Cont	390	3	TE	Y	DHR		

DESCRIPTION	Class	BUILDING	ELEVATION	LOCATION	SYSTEM	Seismic Cat 1?
HX RTRN ISOL	(0) Other	FH	401	18 Y	FC	Y
R PURIF PMP 0A DISCH CHECK	(0) Other	AUX	364+18'	12 S	FC	Y
R PURIF PMP SUCT FROM U-1 REFUEL CAV CNMT ISOL	(0) Other	AUX	364	12 U	FC	Y
PIT PMP SUCTION ISOL	(0) Other	FH	401	18 Y	FC	Y
R PURIF PMP SUCT FROM U-1 RWST	(0) Other	AUX	364	13 V	FC	Y
HX INLET	(0) Other	FH	401	17 Z	FC	Y
PIT HX OUTLET	(0) Other	FH	401	17 Z	FC	Y
FLTR DEMIN LOOP RTRN TO U-1 RWST CHECK VLV	(0) Other		364	14 V	FC	Y
PMP DISCH CHECK	(0) Other	FH	401	17 Y	FC	Y
FLTR DEMIN LOOP INLT ISOL	(0) Other	FH	401	17 Y	FC	Y
JRE, U.S. GAUGE CO.,0-160 PSIG	(18) Instrument Racks	FH	401	17 AA	FC	Y
IG WTR PURIFICATION 0A ASMBLY	(5) Horizontal Pumps	AUX	364	12 S	FC	Y
R PURIFICATION PUMP 0A SUCT PRESS	(18) Instrument Racks	AUX	365	13 S	FC	Y
F PUMP 0A DISCHARGE GAUGE	(18) Instrument Racks	AUX	364	17 S	FC	Y
R PURIFICATION PUMP 0A DISCH TEMP IND	(19) Temperature Sensors	AUX	364	12 S	FC	Y
HEAT EXCHANGER	(21) Tanks and Heat Exchangers	FH	401	17 Z	FC	Y
COOLING PUMP	(5) Horizontal Pumps	AUX	401	18 Y	FC	Y
PUMP	(18) Instrument Racks	FH	401	17 Y	FC	Y
PUMP SUCTION PRESSURE INDICATO	(18) Instrument Racks	FH	401	AA-19	FC	Y
OL HEAT EXCH OUTLET TEMP INDICAT	(19) Temperature Sensors	FH	426	20 X	FC	Y
OL TEMP INDICATING SWITCH	(18) Instrument Racks	FH	426	20 X	FC	Y

C

Seismic Walkdown Checklists (SWCs)

Table C-1 provides a description of each item, anchorage verification confirmation, a list of Area Walk-By Checklists associated with each item, comments, and page numbers of each Seismic Walkdown Checklist.

Table C-1. Summary of Seismic Walkdown Checklists

COMPONENT ID	DESCRIPTION	Anchorage Configuration Confirmed?	AWC	COMMENTS	PAGE
0FC03PA	PUMP REFUELING WTR PURIFICATION 0A ASMBLY	Y	41	SWEL 2	C- 9
0FC8754	SPENT FUEL PIT HX RTRN ISOL	N/A	33/34	SWEL 2	C- 12
0FC8763	REFUELING WTR PURIF PMP 0A DISCH CHECK	N/A	41	SWEL 2	C- 15
0PI-FC003	REFUELING WTR PURIFICATION PUMP 0A SUCT PRESS	N/A	31	SWEL 2	C- 18
0PI-FC005	RFLG WTR PURIF PUMP 0A DISCHARGE GAUGE	N/A	31	SWEL 2	C- 21
0SX147	CC HX 0 OUTLT VLV HEADER ASMBLY; 30"	N/A	26		C- 24
0TI-FC007	REFUELING WTR PURIFICATION PUMP 0A DISCH TEMP IND	N/A	33/34	SWEL 2	C- 27
0TIS-0626	SPENT FUEL POOL TEMP INDICATING SWITCH	N/A	32	SWEL 2	C- 31
0VC01AA	CONTROL ROOM HVAC SYST CHLD WTR COOLING COIL& CABINET	N	4		C- 34
0VC01FB	0B MCR HVAC SUP FLTRS	N	45		C- 37
0VC01JA	CONT RM HVAC LOCAL CONT PAN ASMBLY	N	4		C- 42
0VC05YA	ISOLATION DAMPER BUTTERFLY	N/A		LATER - OUTAGE	
0VC08Y	TRAIN B MAKEUP AIR FLTR UNIT FAN 0B DISCH FLOW CONTROL	N/A	1		C- 45
0VC09Y	TRAIN B EMERGENCY MAKEUP INTAKE FROM TURB BLDG	N/A	45		C- 49
0VC15J	MCR U-1 HVAC START PNL	N	4		C- 52
0WO01CB	CHILLED WATER SYS CONTROL ROOM REFRIGERATION UNIT 0B	N	22		C- 56
1AF005E	S/G 1A FLOW CONT VLV ASMBLY; 4"	N/A	23		C- 61
1AF006B	AUXILIARY FEEDWATER PMP 1B SX SUCT VLV ASMBLY; 6"	N/A	19		C- 64

COMPONENT ID	DESCRIPTION	Anchorage Configuration Confirmed?	AWC	COMMENTS	PAGE
1AF017B	AUXILIARY FEEDWATER PMP 1B SX SUCT VLV ASMBLY; 6"	N/A	19		C- 67
1AF01EA-A	AF PUMP 1B BATTERY CHARGER	Y	19		C- 70
1AF01EB-A	AF BATTERY 2 AUXILIARY FEEDWATER PUMP 1B	Y	19		C- 73
1AF01EB-B	AUX FW PUMP 1B ENG AUX START RLY BATT 1 & 2	Y	19		C- 76
1AF01PB	DIESEL DRIVEN AUX FEED PUMP 1B_ASMBLY	Y	19		C- 80
1AF01PB-A	1B AUX FEEDWATER PUMP AUX LUBE OIL PUMP	N/A	19		C- 83
1AF01PB-K	1B DIESEL DRIVEN AUX FEED PUMP ENGINE	Y	19		C- 86
1AF024	AF PP SX RECIRC VLV_ASMBLY; 3"	N/A	19		C- 91
1AP05E	EQ 4160 VOLT ESF SWITCH GEAR 141 1AP075 ASMBLY	Y (LATER)		LATER - OUTAGE	
1AP06E	4160 VOLT ESF SWITCH BUS 142	Y (LATER)		LATER - OUTAGE	
1AP10E	EQ 480V ESF SUBSTATION BUS 131X ASMBLY	Y (LATER)	9	OUTAGE FOR ANCHORAGE	
1AP11E	EQ 480V ESF UNIT SUB 131X TRANSFORMER 1AP086	Y	9		C- 94
1AP12E	EQ SWGR 132X 480 VOLT ESF	Y (LATER)	10	OUTAGE FOR ANCHORAGE	
1AP21E	480V AUX BLDG ESF MCC 131X1 XFORMER	Y	41		C- 97
1AP22E	480V AUX BLDG ESF MCC 131X3 ASMBLY	Y	20		C- 101
1AP24E	EQ 480 V AUX BLDG ESF MCC 132X3 ASMBLY	Y	20		C- 105
1AP27E	EQ 480V AUX BLDG MCC 132X2 ASMBLY	Y	17		C- 108
1AP38E	ASSY - 480V AUX BLDG MCC 133X1A	Y	27		C- 114
1CC01PB	1B PUMP, COMPONENT COOLING 12X14-18 M66-3 ASMBLY	Y	24		C- 119

COMPONENT ID	DESCRIPTION	Anchorage Configuration Confirmed?	AWC	COMMENTS	PAGE
1CC685	CC FROM RC PMPS THERMAL BARRIER ISOL VLV ASMBLY; 3"	N/A	43		C- 124
1CC9416	CC FROM RC PMPS ISOL VLV ASMBLY; 6"	N/A		LATER - OUTAGE	
1CV01PB	PUMP,1B CENTRIFUGAL CHARGING ASMBLY	Y	40		C- 127
1CV02SB	1B CENTRIFUGAL CHARGING PUMP GEAR COOLER	N/A	40		C- 131
1CV112D	RWST TO CHG PMPS SUCT VLV (C/S AT 1PM05J) ASMBLY; 8"	N/A	42		C- 134
1CV112E	RWST TO CHG PMPS SUCT VLV (C/S AT 1PM05J) ASMBLY; 8"	N/A	42		C- 137
1CV8355A	RCP 1A SEAL INJECTION ISOL VLV (C/S AT 1PM05J) ASMBLY; 2"	N/A	43		C- 140
1DC01E	125V BATTERY 111 DIV. 11	Y	7		C- 143
1DC02E	125V BATTERY 112 DIV. 12	Y	6		C- 147
1DC04E	BATTERY CHARGER 112 DIV. 12	Y	8		C- 150
1DC06E	125V DC ESF DIST CENTER 112	Y	8		C- 154
1DC10J	125V DC FUSE PANEL - DIV. 11	Y	5		C- 158
1DC11J	125V DC FUSE PANEL - DIV. 12	Y	8		C- 161
1DG01KB	1B DIESEL GENERATOR	Y	11		C- 165
1DO01TB	DIESEL OIL STORAGE TANK 1B	Y	12		C- 171
1DO10T	500 GAL DIESEL OIL DAY TANK	Y	18		C- 179
1FC010	REFUELING WTR PURIF PMP SUCT FROM U-1 REFUEL CAV CNMT ISOL	N/A	43	SWEL 2	C- 184
1FC01A	SPENT FUEL PIT HEAT EXCHANGER	Y	33/34	SWEL 2	C- 187
1FC01P	U-1 FUEL POOL COOLING PUMP	N	33/34	SWEL 2	C- 191
1FC8756	U1 SPENT FUEL PIT PMP SUCTION ISOL	N/A	33/34	SWEL 2	C- 195

COMPONENT ID	DESCRIPTION	Anchorage Configuration Confirmed?	AWC	COMMENTS	PAGE
1FC8758	REFUELING WTR PURIF PMP SUCT FROM U-1 RWST	N/A	42	SWEL 2	C- 198
1FC8762A	SPENT FUEL PIT HX INLET	N/A	33/34	SWEL 2	C- 201
1FC8762B	U1 SPENT FUEL PIT HX OUTLET	N/A	33/34	SWEL 2	C- 204
1FC8766	SPENT FUEL PIT FLTR DEMIN LOOP RTRN TO U-1 RWST CHECK VLV	N/A	41	SWEL 2	C- 207
1FC8793	SPENT FUEL PIT PMP DISCH CHECK	N/A	33/34	SWEL 2	C- 210
1FC8794	SPENT FUEL PIT FLTR DEMIN LOOP INLT ISOL	N/A	33/34	SWEL 2	C- 214
1FT-0121	CHARGING LINE D/P CELL FLOW XMITTR	N/A	25		C- 217
1FT-0132	LETDOWN FLOW D/P CELL	N/A	21		C- 221
1FT-AF014	AF TO SG 1B FLOW TRANSMITTER	N/A	23		C- 224
1HS-FC001	SPENT FUEL PIT PUMP	N	33/34	SWEL 2	C- 226
1IP02E	INSTRUMENT BUS 112 TRANSFORMER - DIV. 12	Y	8		C- 229
1IP02J	120 VAC INSTRUMENT BUS DISTRIBUTION PANEL 112 - DIV. 12	Y	3		C- 232
1IP06E	INSTRUMENT BUS 112 INVERTER - DIV. 12	Y	8		C- 235
1IP08E	INSTRUMENT BUS 114 INVERTER - DIV. 12	Y	8		C- 238
1LT-0459	EQ PRESSURIZER LEVEL TRANSMITTER	N/A		LATER - OUTAGE	
1LT-0518	S/G 1A LEVEL LOOP D/P XMTTR 2/FILLED LEG	N/A		LATER - OUTAGE	
1LT-0932	REF WTR STG TK LVL D/P XMTTR	N/A	39		C- 241
1MS001A	MS ISOL VLV LOOP 1A ASMBLY; 30-1/4"	N/A	16		C- 245
1MS018A	S/G 1A PORV ASMBLY; 8"	N/A	13		C- 248
1MS018B	S/G 1B PORV ASMBLY; 8"	N/A	14		C- 252
1PA01J	PROTECTION SYSTEM CABINET (I&E Prot. Cab. CH 1)	Y	3		C- 256
1PA03J	PROTECTION SYSTEM CABINET (I&E Prot. Cab. CH 3)	Y	3		C- 260

COMPONENT ID	DESCRIPTION	Anchorage Configuration Confirmed?	AWC	COMMENTS	PAGE
1PA07J	PROC I&C RACK CONT GRP 3 CAB 7	Y	3		C- 264
1PA14J	ESF SEQUENCING & ACTUATION CABINET TRAIN B	Y	3		C- 267
1PA28J	AUX SAFEGUARD RELAY CABINET (B)	Y	3		C- 271
1PA34J	CONTROL SYSTEM CABINET ESF DIV. 12	Y	3		C- 275
1PI-0627	GAUGE; PRESSURE, U.S. GAUGE CO.,0-160 PSIG	N/A	33/34	SWEL 2	C- 279
1PI-0633	SPENT FUEL PIT PUMP SUCTION PRESSURE INDICATO	N/A	30	SWEL 2	C- 282
1PL08J	1B DG CONTROL PANEL	N	11		C- 285
1PM05J	MAIN CONTROL BOARD	Y	2		C- 289
1PT-0455	EQ PZR PRESSURE CHANNEL 1	N/A		LATER - OUTAGE	
1PT-0516	S/G LOOP 1A STM PRESS XMTTR	N/A	16		C- 293
1RD05E	RX TRIP BREAKERS	Y (LATER)		LATER- OUTAGE	
1RH01PB	PUMP,1B RESIDUAL HEAT REMOVAL ASMBLY	Y	35		C- 296
1RH01PB-A	RH PUMP 1B SEAL COOLER	N/A	35		C- 299
1RH607	RESIDUAL HEAT REMOVAL HX 1B FLOW CONT VLV ASMBLY; 8"	N/A	36		C- 302
1RH8702A	RC LOOP 1C TO RH PMP 1B SUCT ISOL VLV ASMBLY; 12"	N/A		LATER - OUTAGE	
1RY32MA	PORV ACCUMULATOR 1A	N		LATER - OUTAGE	
1RY455A	PZR PORV (C/S AT 1PM05J) ASMBLY	N/A		LATER - OUTAGE	
1RY8028	PW TO PRT CONTAINMENT ISOLATION VLV	N/A		LATER - OUTAGE	
1SI01T	REFUELING WATER STORAGE TANK	N	15		C- 305
1SI8801B	CHG PMP TO COLD LEGS INJECTION ISOL VLV (C/S AT 1PM05J) ASMBLY; 4"	N/A	44		C- 309

COMPONENT ID	DESCRIPTION	Anchorage Configuration Confirmed?	AWC	COMMENTS	PAGE
1SI8804B	ASSY - MOV 1B RH HX TO 1B SI PP SUCT HDR ISOL VLV	N/A	38		C- 312
1SI8809B	RH TO COLD LEGS 1B/1C ISOL VLV (1PM06J) ASMBLY; 8"	N/A	44		C- 316
1SX004	CC HX 1 INLT VLV ASMBLY; 30"	N/A	29		C- 319
1SX005	U-0 CC HX INLT VLV ASMBLY; 30"	N/A	28		C- 322
1SX01FB	1B SX PP DSCH STRN	Y	28		C- 325
1SX01PB	PUMP,1B ESSENTIAL SER WTR ASMBLY	Y	28		C- 328
1SX01PB-C	SX PUMP 1B AUX LUBE OIL PP	N/A	28		C- 335
1SX169B	DG 1B SX VLV ASMBLY; 10"	N/A	11		C- 338
1SX173	SX SUP VLV TO ENG Driven CLG WTR PP FOR Diesel Driven AF PP_ASSY; 6"	N/A	19		C- 341
1TE-0604	RHR LP 1A RETURN TEMPERATURE RTD	N/A	41		C- 344
1TE-RC022A	RC WIDE RANGE LP 1A TEMP	N/A		LATER - OUTAGE	
1TI-0628	SPENT FUEL POOL HEAT EXCH OUTLET TEMP INDICAT	N/A	30	SWEL 2	C- 347
1VA01SB	COOLER ESSENTIAL SERVICE WATER PUMP 95-10	Y	28		C- 350
1VA02SB	1B RHR PUMP ROOM CUB CLR ASMBLY	Y	35		C- 354
1VA06SA	COOLER,CENTRIFUGAL CHARGING PUMP 1A	Y	37		C- 358
1VA08CB	1B DIESEL DRIVEN AF PUMP CUBICLE CLR (1VA08S) 1B FAN	N/A	19		C- 361
1VA11J	CENTRIFUGAL CHARGING PCUBICLE COOLER LOCAL P	N	40		C- 365
1VD01CB	1B DG ROOM HVAC FAN ASMBLY	Y	11		C- 368
1VD05J	1B DG RM HVAC DMPR START PNL	N	11		C- 372

COMPONENT ID	DESCRIPTION	Anchorage Configuration Confirmed?	AWC	COMMENTS	PAGE
1VE05C	ASSY - U-1 MISC ELEC EQUIP RM DIV 12 EXH FAN	N	8		C- 376
1VP01AA	CNMT ESS'L SERVICE WATER COIL 1A (RCFC)	Y (LATER)		LATER - OUTAGE	
1VX07J	ESF SWGR RM DIV 12 HVAC DMPR START PNL	N	10		C- 379

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC03PA

Equipment Class: (5) Horizontal Pumps

Equipment Description: PUMP REFUELING WTR PURIFICATION 0A ASMBLY

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 364.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1.	Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)?	Yes
2.	Is the anchorage free of bent, broken, missing or loose hardware?	Yes
3.	Is the anchorage free of corrosion that is more than mild surface oxidation?	Yes
4.	Is the anchorage free of visible cracks in the concrete near the anchors?	Yes
5.	Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) *Drawing M-1220 Sheet 5 Revision Y Detail 74* *The pump was contaminated so bolt size was not measured. However, bolt size was determined to be accurate based on visual observation.*	Yes
6.	Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions?	Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC03PA

Equipment Class: (5) Horizontal Pumps

Equipment Description: PUMP REFUELING WTR PURIFICATION 0A ASMBLY

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment?	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

Philip Gazda 10/1/2012

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC03PA

Equipment Class: (5) Horizontal Pumps

Equipment Description: PUMP REFUELING WTR PURIFICATION 0A ASMBLY

Photos

0FC03PA 7-19-12 027

0FC03PA 7-19-12 028

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC8754

Equipment Class: (0) Other

Equipment Description: SPENT FUEL PIT HX RTRN ISOL VALVE

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): FH, 401.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1.	Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)?	No
2.	Is the anchorage free of bent, broken, missing or loose hardware?	Not Applicable
3.	Is the anchorage free of corrosion that is more than mild surface oxidation?	Not Applicable
4.	Is the anchorage free of visible cracks in the concrete near the anchors?	Not Applicable
5.	Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.)	Not Applicable
6.	Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions?	Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC8754

Equipment Class: (0) Other

Equipment Description: SPENT FUEL PIT HX RTRN ISOL VALVE

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment?	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

P. Gazda Philip Gazda 10/1/2012

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC8754

Equipment Class: (0) Other

Equipment Description: SPENT FUEL PIT HX RTRN ISOL VALVE

Photos

0FC8754 7-18-12 060

0FC8754 7-18-12 061

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC8763

Equipment Class: (0) Other

Equipment Description: REFUELING WTR PURIF PMP 0A DISCH CHECK VALVE

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 364.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1.	Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)?	No
2.	Is the anchorage free of bent, broken, missing or loose hardware?	Not Applicable
3.	Is the anchorage free of corrosion that is more than mild surface oxidation?	Not Applicable
4.	Is the anchorage free of visible cracks in the concrete near the anchors?	Not Applicable
5.	Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.)	Not Applicable
6.	Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions?	Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC8763

Equipment Class: (0) Other

Equipment Description: REFUELING WTR PURIF PMP 0A DISCH CHECK VALVE

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment? *Valve is high overhead. Tag is not visible. Operations Equipment Operator identified valve.*	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

Philip Gazda 10/1/2012

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

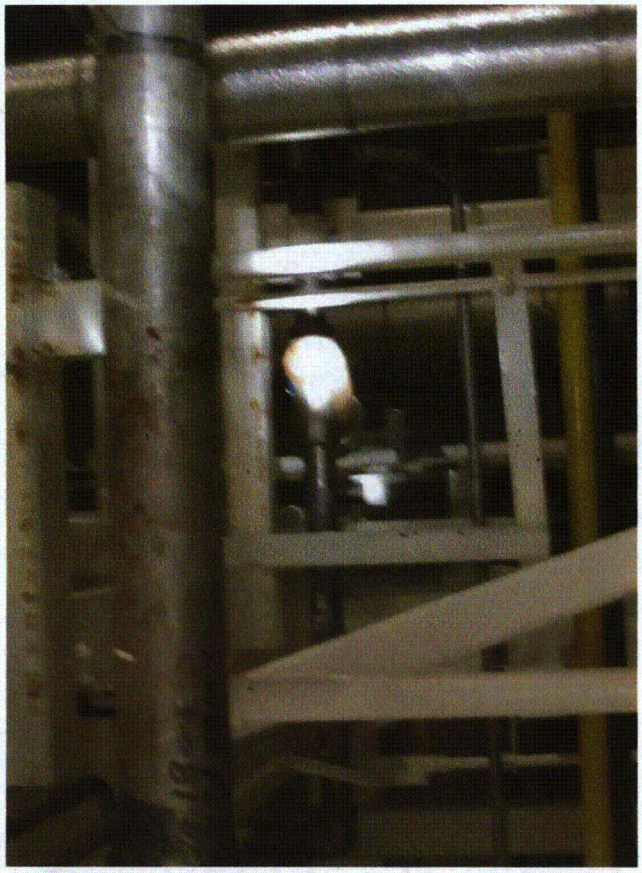
Equipment ID No.: 0FC8763

Equipment Class: (0) Other

Equipment Description: REFUELING WTR PURIF PMP 0A DISCH CHECK VALVE

Photos

0FC8763 7-19-12 031



0FC8763 7-19-12 032

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0PI-FC003

Equipment Class: (18) Instruments on Racks

Equipment Description: REFUELING WTR PURIFICATION PUMP 0A SUCT PRESS

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 364.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1.	Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)?	No
2.	Is the anchorage free of bent, broken, missing or loose hardware?	Not Applicable
3.	Is the anchorage free of corrosion that is more than mild surface oxidation?	Not Applicable
4.	Is the anchorage free of visible cracks in the concrete near the anchors?	Not Applicable
5.	Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.)	Not Applicable
6.	Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions?	Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0PI-FC003

Equipment Class: (18) Instruments on Racks

Equipment Description: REFUELING WTR PURIFICATION PUMP 0A SUCT PRESS

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? *Piping above is well-supported.* *Seismic block wall.*	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment?	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

P. Gazda Philip Gazda 10/1/2012

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0PI-FC003

Equipment Class: (18) Instruments on Racks

Equipment Description: REFUELING WTR PURIFICATION PUMP 0A SUCT PRESS

Photos

None.

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0PI-FC005

Equipment Class: (18) Instruments on Racks

Equipment Description: RFLG WTR PURIF PUMP 0A DISCHARGE GAUGE

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 364.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? — No

2. Is the anchorage free of bent, broken, missing or loose hardware? — Not Applicable

3. Is the anchorage free of corrosion that is more than mild surface oxidation? — Not Applicable

4. Is the anchorage free of visible cracks in the concrete near the anchors? — Not Applicable

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) — Not Applicable

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? — Yes
   Instrument is securely mounted to a rack that is well-supported.

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0PI-FC005

Equipment Class: (18) Instruments on Racks

Equipment Description: RFLG WTR PURIF PUMP 0A DISCHARGE GAUGE

Interaction Effects

7. Are soft targets free from impact by nearby equipment or structures? Yes

8. Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? Yes
   Seismic block wall.
   Overhead components are well-supported.

9. Do attached lines have adequate flexibility to avoid damage? Yes

10. Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? Yes

Other Adverse Conditions

11. Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment? Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: _____ Date: _____

_____ _____

Photos

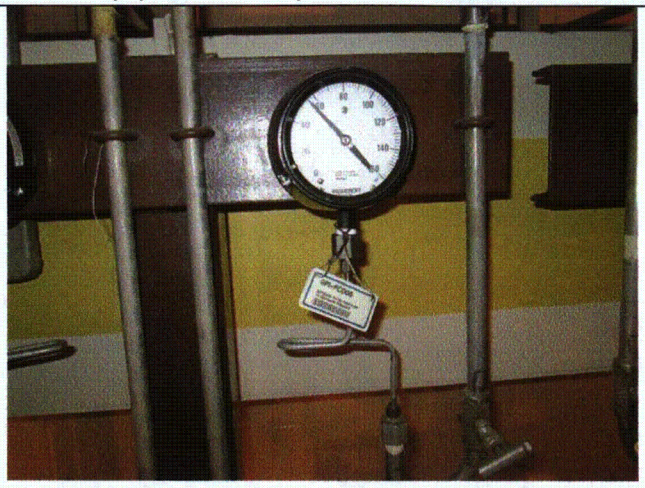
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0PI-FC005

Equipment Class: (18) Instruments on Racks

Equipment Description: RFLG WTR PURIF PUMP 0A DISCHARGE GAUGE



0PI-FC005 7-18-12 055

0PI-FC005 7-18-12 056

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0SX147

Equipment Class: (8) Motor-Operated and Solenoid-Operated Valves

Equipment Description: CC HX 0 OUTLT VLV HEADER ASMBLY; 30"

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 346.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1.	Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)?	No
2.	Is the anchorage free of bent, broken, missing or loose hardware?	Not Applicable
3.	Is the anchorage free of corrosion that is more than mild surface oxidation?	Not Applicable
4.	Is the anchorage free of visible cracks in the concrete near the anchors?	Not Applicable
5.	Is the anchorage configuration consistent with plant documentation? (Note: *This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.*)	Not Applicable
6.	Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions?	Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0SX147

Equipment Class: (8) Motor-Operated and Solenoid-Operated Valves

Equipment Description: CC HX 0 OUTLT VLV HEADER ASMBLY; 30"

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment? *Pipe is well-supported laterally in both directions*	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

Philip Gazda 10/1/2012

Status: [Y] N U

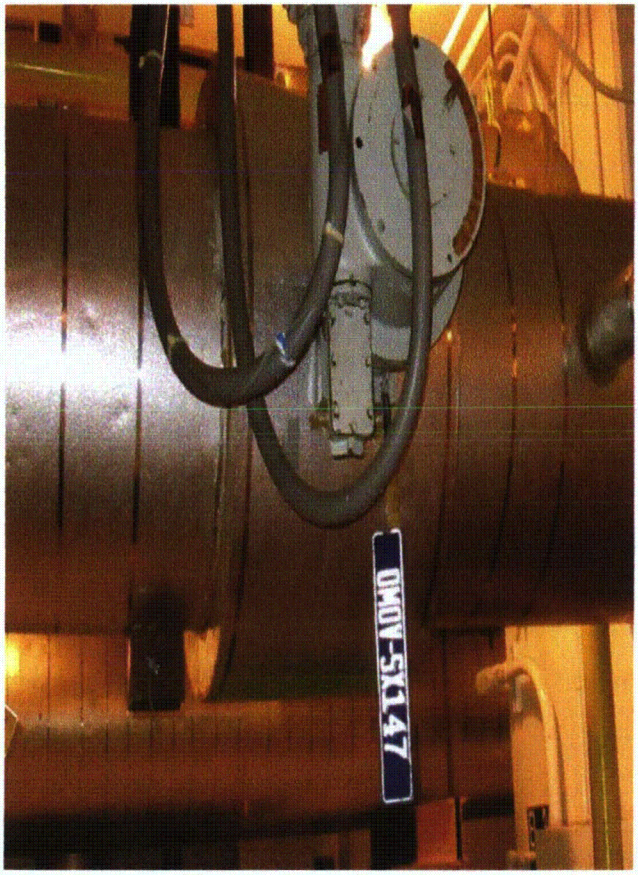
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0SX147

Equipment Class: (8) Motor-Operated and Solenoid-Operated Valves

Equipment Description: CC HX 0 OUTLT VLV HEADER ASMBLY; 30"

Photos



0SX147 7-18-12 025

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0TI-FC007

Equipment Class: (19) Temperature Sensors

Equipment Description: REFUELING WTR PURIFICATION PUMP 0A DISCH TEMP IND

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 364.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1.	Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)?	No
2.	Is the anchorage free of bent, broken, missing or loose hardware?	Not Applicable
3.	Is the anchorage free of corrosion that is more than mild surface oxidation?	Not Applicable
4.	Is the anchorage free of visible cracks in the concrete near the anchors?	Not Applicable
5.	Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.)	Not Applicable
6.	Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions?	Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0TI-FC007

Equipment Class: (19) Temperature Sensors

Equipment Description: REFUELING WTR PURIFICATION PUMP 0A DISCH TEMP IND

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment?	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

Philip Gazda 10/1/2012

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0TI-FC007

Equipment Class: (19) Temperature Sensors

Equipment Description: REFUELING WTR PURIFICATION PUMP 0A DISCH TEMP IND

Photos

0TI-FC007 (AWB - Water leakage) 7-19-12 033

0TI-FC007 7-19-12 029

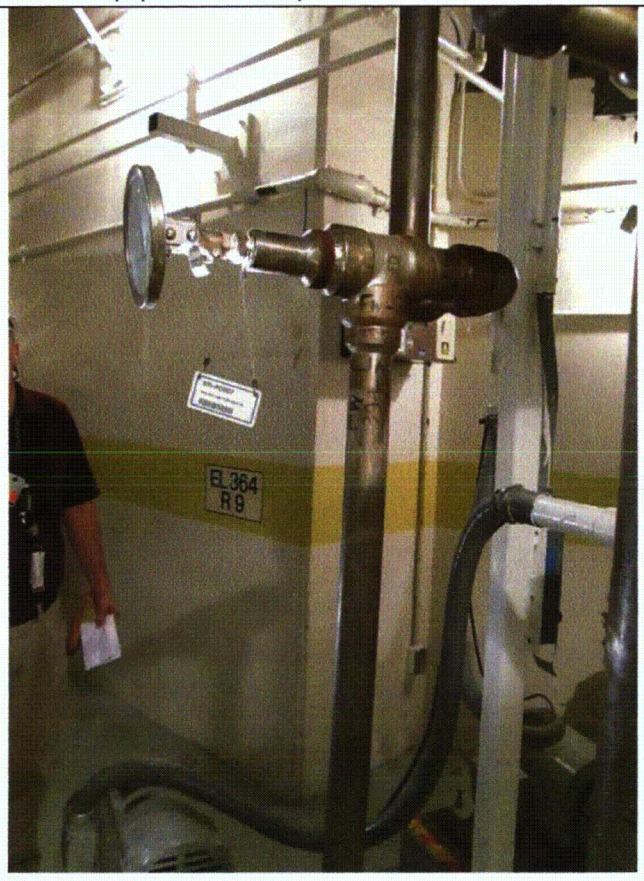
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0TI-FC007

Equipment Class: (19) Temperature Sensors

Equipment Description: REFUELING WTR PURIFICATION PUMP 0A DISCH TEMP IND



0TI-FC007 7-19-12 030

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0TIS-0626

Equipment Class: (18) Instruments on Racks

Equipment Description: SPENT FUEL POOL TEMP INDICATING SWITCH

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): FH, 426.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1.	Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)?	No
2.	Is the anchorage free of bent, broken, missing or loose hardware?	Not Applicable
3.	Is the anchorage free of corrosion that is more than mild surface oxidation?	Not Applicable
4.	Is the anchorage free of visible cracks in the concrete near the anchors?	Not Applicable
5.	Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.)	Not Applicable
6.	Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions?	Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0TIS-0626

Equipment Class: (18) Instruments on Racks

Equipment Description: SPENT FUEL POOL TEMP INDICATING SWITCH

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment?	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

Philip Gazda 10/1/2012

Status: [Y] N U

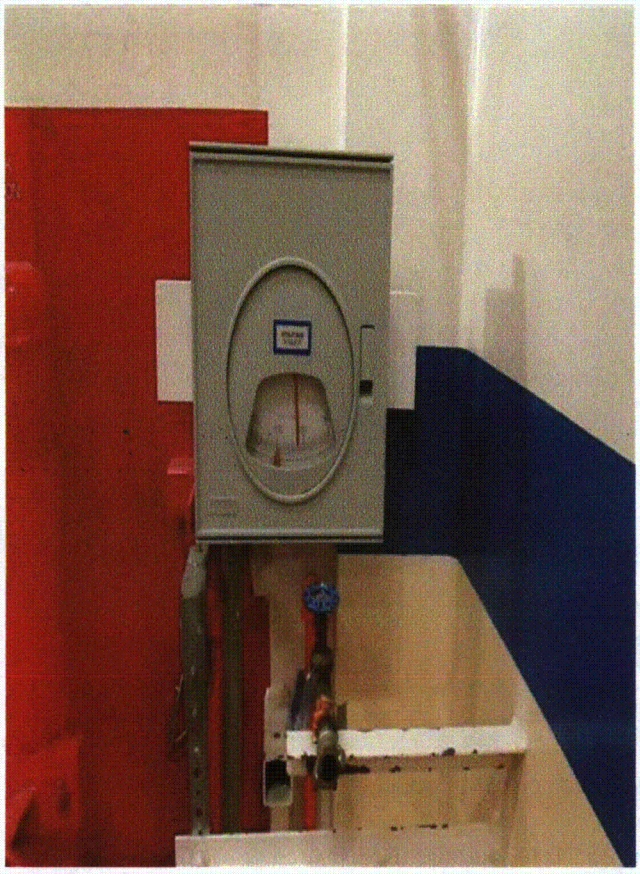
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0TIS-0626

Equipment Class: (18) Instruments on Racks

Equipment Description: SPENT FUEL POOL TEMP INDICATING SWITCH

Photos



0TIS 0626 7-18-12 057

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC01AA

Equipment Class: (10) Air Handlers

Equipment Description: CONTROL ROOM HVAC SYST CHLD WTR COOLING COIL& CABINET

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 451.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? — No
   Coating prevents measurement of weld size and length

2. Is the anchorage free of bent, broken, missing or loose hardware? — Yes

3. Is the anchorage free of corrosion that is more than mild surface oxidation? — Yes

4. Is the anchorage free of visible cracks in the concrete near the anchors? — Yes

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) — Not Applicable
   Drawing M-1320 Sheet 7, Rev AD, provides installation detail however floor is coated so weld cannot be verified. Also equipment is adjacent to wall which prevents visual inspection of anchorage along wall. Based on anchorage in area, it is judged that the welded detail is acceptable (dry environment, non-vibrating equipment).

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? — Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC01AA

Equipment Class: (10) Air Handlers

Equipment Description: CONTROL ROOM HVAC SYST CHLD WTR COOLING COIL& CABINET

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment?	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

Evaluated by: Philip Gazda 10/1/2012

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

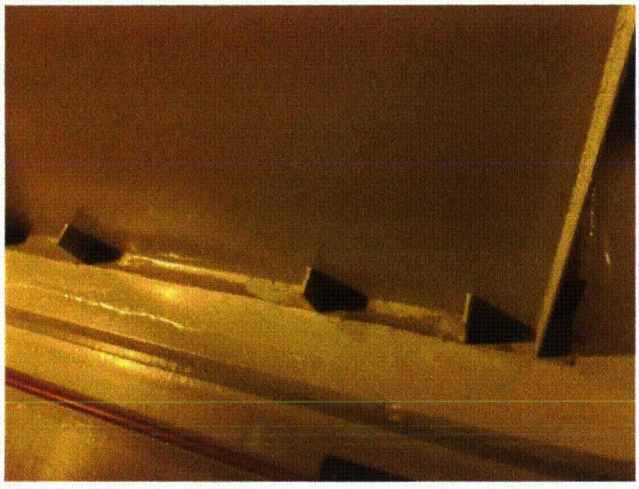
Equipment ID No.: 0VC01AA

Equipment Class: (10) Air Handlers

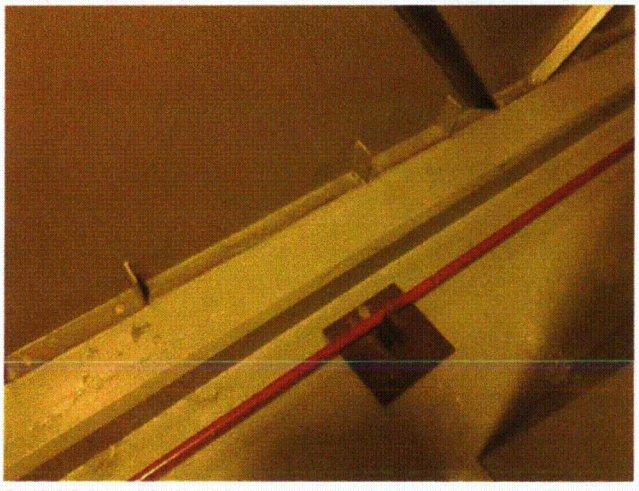
Equipment Description: CONTROL ROOM HVAC SYST CHLD WTR COOLING COIL& CABINET

Photos

0V01AA 7-16-12 033



0V01AA 7-16-12 034



0V01AA 7-16-12 035

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC01FB

Equipment Class: (10) Air Handlers

Equipment Description: 0B MCR HVAC SUP FLTRS

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 451.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? — No

2. Is the anchorage free of bent, broken, missing or loose hardware? — Yes

   Welded detail top and bottom of component - no issues

3. Is the anchorage free of corrosion that is more than mild surface oxidation? — Yes

4. Is the anchorage free of visible cracks in the concrete near the anchors? — Yes

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) — Not Applicable

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? — Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC01FB

Equipment Class: (10) Air Handlers

Equipment Description: 0B MCR HVAC SUP FLTRS

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment? *Nearby ladder is restrained in 3 directions.*	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

Philip Gazda 10/1/2012

Status: [Y] N U

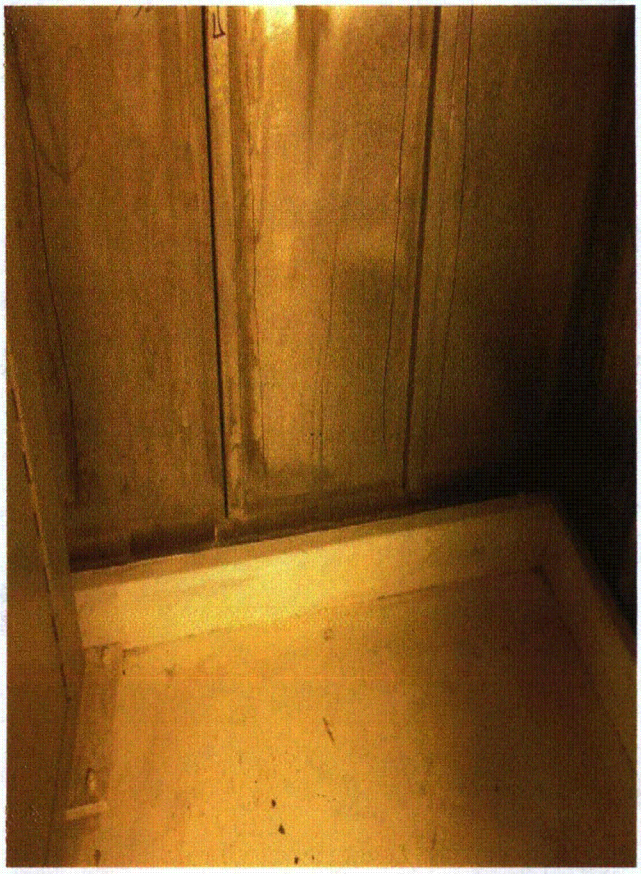
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC01FB

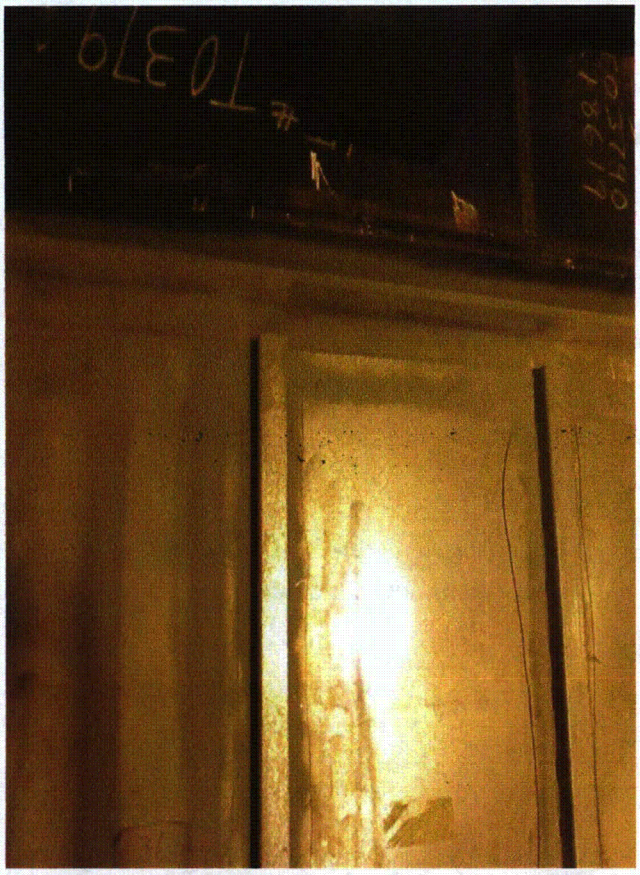
Equipment Class: (10) Air Handlers

Equipment Description: 0B MCR HVAC SUP FLTRS

Photos



0VC01FB 7-16-12 026



0VC01FB 7-16-12 027

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC01FB

Equipment Class: (10) Air Handlers

Equipment Description: 0B MCR HVAC SUP FLTRS

0VC01FB 7-16-12 028

0VC01FB 7-16-12 029

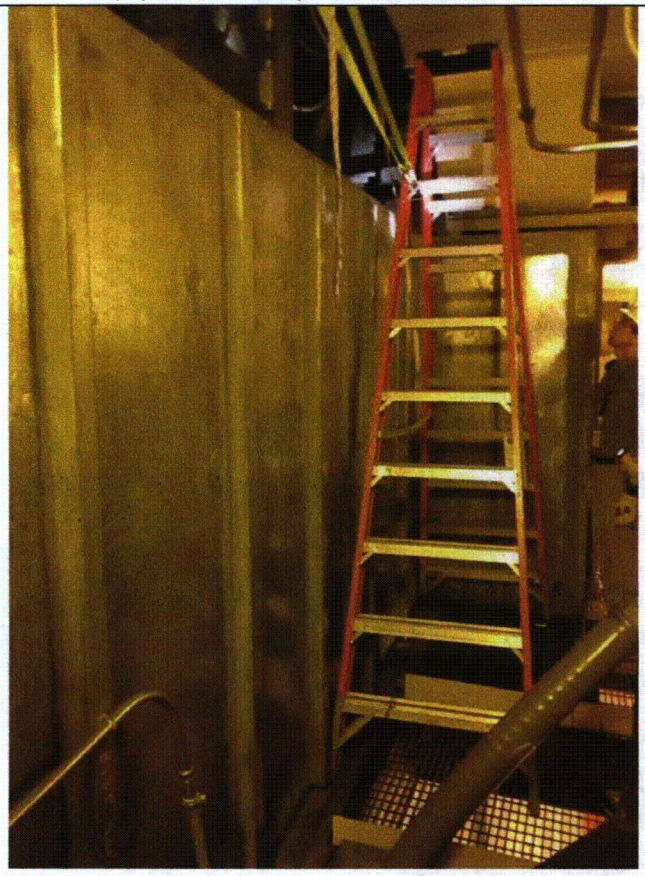
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC01FB

Equipment Class: (10) Air Handlers

Equipment Description: 0B MCR HVAC SUP FLTRS



0VC01FB 7-16-12 030

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC01JA

Equipment Class: (20) Instrumentation and Control Panels and Cabinets

Equipment Description: CONT RM HVAC LOCAL CONT PAN ASMBLY

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 451.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1.	Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)?	No
2.	Is the anchorage free of bent, broken, missing or loose hardware?	Yes
3.	Is the anchorage free of corrosion that is more than mild surface oxidation?	Yes
4.	Is the anchorage free of visible cracks in the concrete near the anchors?	Yes
5.	Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.)	Not Applicable
6.	Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions?	Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC01JA

Equipment Class: (20) Instrumentation and Control Panels and Cabinets

Equipment Description: CONT RM HVAC LOCAL CONT PAN ASMBLY

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment?	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

Philip Gazda 10/1/2012

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC01JA

Equipment Class: (20) Instrumentation and Control Panels and Cabinets

Equipment Description: CONT RM HVAC LOCAL CONT PAN ASMBLY

Photos

0VC01JA 7-16-12 036

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC08Y

Equipment Class: (10) Air Handlers

Equipment Description: TRAIN B MAKEUP AIR FLTR UNIT FAN 0B DISCH FLOW CONTROL

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 463.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1.	Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)?	No
2.	Is the anchorage free of bent, broken, missing or loose hardware?	Not Applicable
3.	Is the anchorage free of corrosion that is more than mild surface oxidation?	Not Applicable
4.	Is the anchorage free of visible cracks in the concrete near the anchors?	Not Applicable
5.	Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.)	Not Applicable
6.	Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? *No anchorage detail required to be verified since air handler is an in-line component. Air handler shown on Pacific Air Products Drawing No. 5600-411*	Yes

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC08Y

Equipment Class: (10) Air Handlers

Equipment Description: TRAIN B MAKEUP AIR FLTR UNIT FAN 0B DISCH FLOW CONTROL

Interaction Effects

7.	*Are soft targets free from impact by nearby equipment or structures?*	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects?	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment?	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

Philip Gazda 10/1/2012

Status: [Y] N U

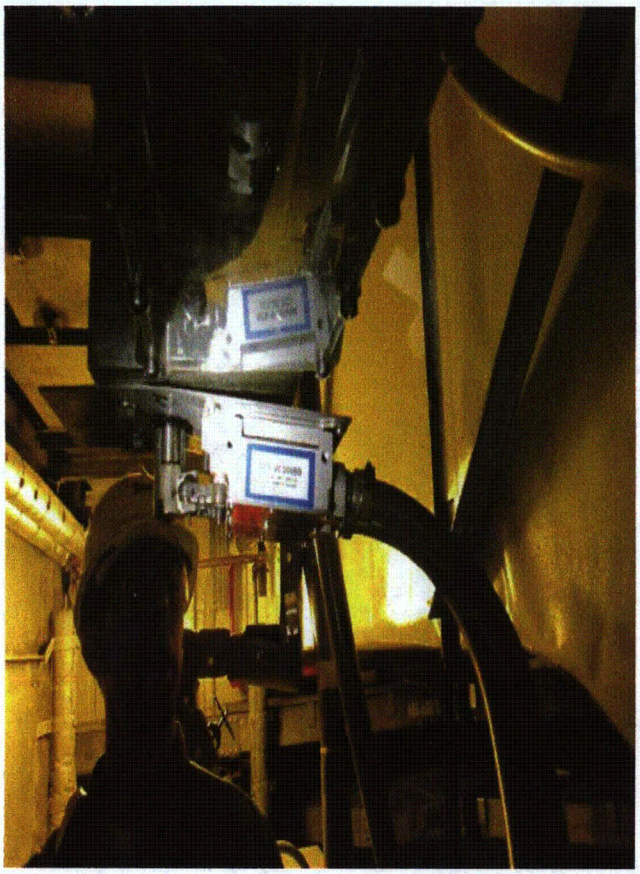
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC08Y

Equipment Class: (10) Air Handlers

Equipment Description: TRAIN B MAKEUP AIR FLTR UNIT FAN 0B DISCH FLOW CONTROL

Photos



0VC08Y 7-16-12 001

0VC08Y 7-16-12 002

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC08Y

Equipment Class: (10) Air Handlers

Equipment Description: TRAIN B MAKEUP AIR FLTR UNIT FAN 0B DISCH FLOW CONTROL

0VC08Y 7-16-12 003

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC09Y

Equipment Class: (10) Air Handlers

Equipment Description: TRAIN B EMERGENCY MAKEUP INTAKE FROM TURB BLDG

Project: Braidwood 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 451.00 ft, ALL

Manufacturer/Model:

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? — No

2. Is the anchorage free of bent, broken, missing or loose hardware? — Not Applicable

3. Is the anchorage free of corrosion that is more than mild surface oxidation? — Not Applicable

4. Is the anchorage free of visible cracks in the concrete near the anchors? — Not Applicable

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) — Not Applicable

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? — Yes
   Anchorage not required to be verified since it is an in-line component. Air handler shown on Pacific Air Products Drawing 5600-431.

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC09Y

Equipment Class: (10) Air Handlers

Equipment Description: TRAIN B EMERGENCY MAKEUP INTAKE FROM TURB BLDG

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? *Air handler covered in insulation but configuration matches drawing. Duct well supported.*	Yes

Other Adverse Conditions

11.	Have you looked for and found no adverse seismic conditions that could adversely affect the safety functions of the equipment?	Yes

Comments

Seismic walkdown performed week of 7/16/12 by M. Delaney & P. Gazda

Evaluated by: Marlene Delaney Date: 10/1/2012

Philip Gazda 10/1/2012

Status: [Y] N U

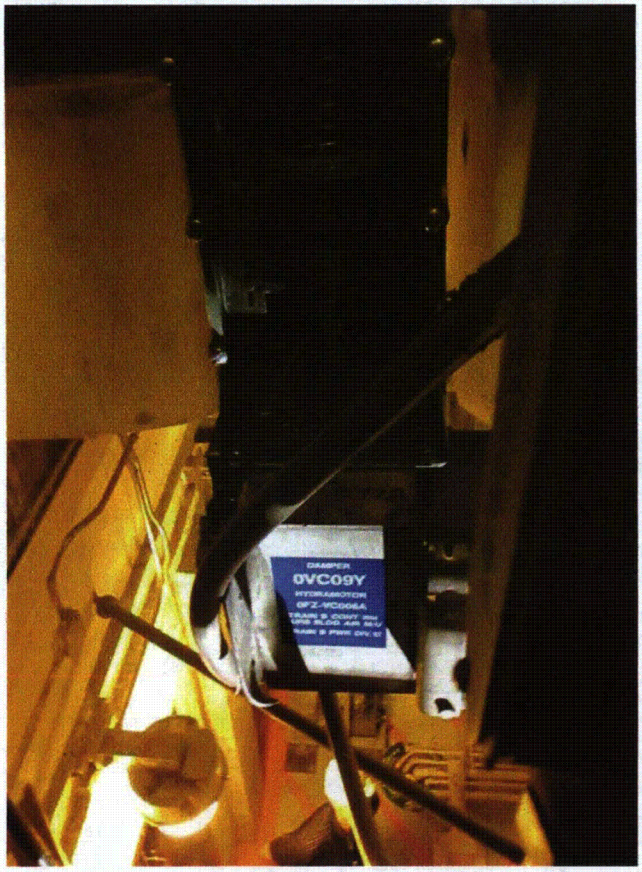
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC09Y

Equipment Class: (10) Air Handlers

Equipment Description: TRAIN B EMERGENCY MAKEUP INTAKE FROM TURB BLDG

Photos



0VC09Y 7-16-12 031

0VC09Y 7-16-12 032