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 Byron Station, Unit 1, Report Number: 12Q0108.20-R-001, Revision 1

(700 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

BYRON GENERATING STATION UNIT 1
4450 NORTH GERMAN CHURCH ROAD, BYRON, ILLINOIS 61010-9794
Facility Operating License No. NPF-37
NRC Docket No. STN 50-454
Correspondence No.: RS-12-161

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Report Number: 12Q0108.20-R-001, Rev. 1

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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. 8) In particular, this report provides information requested to address Enclosure 3, Recommendation 2.3: Seismic, of the March 12, 2012 letter. (Ref. 8)

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. 10) 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. 8) 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 Byron 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. 8) 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/Byron 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 Byron Unit 1, the SWEL is comprised of:

- SWEL 1 resulted with 106 items for walkdown.
- SWEL 2 resulted with 21 items for walkdown.
- There are no SSCs associated with spent fuel pool rapid drain-down to be 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 Byron Unit 1 were performed during the weeks of August 6 and August 20, 2012. During the majority of the walkdown activities, the walkdown team consisted of two (2) Seismic Walkdown Engineers (SWEs), the station Lead Responsible Engineer (LRE), a station Equipment Operator, and a station Operations person. The outage walkdowns occurred on September 19 and 22, 2012 with a similar walkdown team.

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 walked down 127 of the 127 components on the SWEL. For Byron Unit 1, anchorage verification was required for minimum of 38 components to meet the 50% verification requirements of the EPRI guidance document. (Ref. 1) A total of 45 anchorage configurations were confirmed to be installed in accordance with the station documentation.

Following the completion of the online seismic walkdowns, the industry was made aware that the NRC staff had clarified a position on opening electrical cabinets to inspect for other adverse seismic conditions. Supplemental inspections of 45 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 Byron Unit 1 twenty-four (24) Issue Reports (IRs) were issued for conditions such as open fluorescent light fixture S-hooks and cracks in grout pads. Open fluorescent light fixture S-hook conditions were found to be the most common. After evaluation through the CAP, it was determined that none of the conditions identified in the IRs were adverse seismic conditions.

Through the efforts of the seismic walkdowns and development of this report, IR 1431416 was initiated to share lessons learned with various workgroups across the station. In particular, the IR was issued to create an action to tailgate lessons learned with Electrical Maintenance, Electrical Maintenance Work Planning, and the Maintenance Contractor. The focal point of the lessons learned is in regards to open fluorescent light fixture S-hooks. The expected S-hook configuration is that they are closed sufficiently to prevent the support chain links from passing though the S-hook up to metal-to-metal contact.

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/Byron utilized the existing processes and procedures (Site CAP Expectations) to identify, evaluate and document conditions identified during the Seismic Walkdowns.

In accordance with Exelon/Byron 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 CAP 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 it, 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) 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. All IPEEE plant improvements and associated actions are complete.

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 Byron 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 CAP.

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 several minor conditions predominantly pertaining to cracks in grout pads and open fluorescent light fixture S-hooks. 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 supplemental inspections of 45 electrical cabinets. Area Walk-Bys will be complete, as required, during these follow-on inspections.

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. 8) In particular, this report provides information requested to address Enclosure 3, Recommendation 2.3: Seismic, of the March 12, 2012 letter. (Ref. 8)

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. 10) 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. 8) 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 Byron 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. 8) 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/Byron has utilized this NRC endorsed guidance as the basis for the seismic walkdowns and this report. (Ref. 1)

1.3 PLANT OVERVIEW

The Byron Station nuclear power plant consists of two nearly identical generating units, and two pressurized water reactors (PWR) Nuclear Steam Supply System (NSSS) and turbine-generators furnished by Westinghouse Electric Corporation (Westinghouse). (Ref. 2 section 1.1)

The Byron Station Units 1 and 2 are rated at a Licensed power level of 3586.6 MWt. (Operating License; Unit 1 License No. NPF-37 and Unit 2 License No. NPF-66)

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)

Byron Station is located in north central Illinois, near the town of Byron and near the Rock River. Cooling for the plant is provided by two natural draft cooling towers for nonessential service water cooling, and by mechanical draft cooling towers for essential service water cooling. The fuel loading dates for the two units were November 1984 and November 1986 for Units 1 and 2, respectively. The corresponding dates for commercial operation were September 1985 and August 1987. (Ref. 2 section 1.1)

1.4 APPROACH

The EPRI guidance document is used for the Byron Unit 1 engineering walkdowns and evaluations described in this report. (Ref. 1) 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 Byron 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 (CAP).

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 several minor conditions predominantly pertaining to cracks in grout pads and open fluorescent light fixture S-hooks. 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 supplemental inspections of 45 electrical cabinets. Area Walk-Bys will be complete, as required, during these follow-on inspections.

2 Seismic Licensing Basis

2.1 OVERVIEW

This section of the report summarizes the seismic licensing basis for the Byron 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 Byron 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 UFSAR is a jointly reviewed document and thus is referenced as Byron/Braidwood UFSAR.

The site response spectra, which are defined at the ground surface, are given in UFSAR Subsection 2.5.2 and are shown in UFSAR Figures 2.5-40 and 2.5-41 for the Byron site. Foundation level response spectra and time histories were generated by a deconvolution procedure described in UFSAR Subsection 3.7.1.2. 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 3.7-1 through 3.7-20 for the Byron site.

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. The UFSAR concludes 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.

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.

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.

Summary of Codes and Standards

The information presented below has been extracted from 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 Standards, Codes, and Specifications		
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 Standards, Codes, and Specifications		
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. Resumes provided 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		
J. Griffith			X	X		
T. Bacon						X
W. Djordjevic						X[2]
D. Shaw (Exelon Contractor)		X				
Davood Karimi (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. Throughout his years serving in the nuclear power industry, Mr. Perez has gained knowledge of plant operations, documentation, and SSCs necessary to capably select a broad distribution of SSCs for the SWEL. In addition, his experiences have provided him with knowledge of IPEEE and USI A-46 programs. 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. Throughout his years serving in the nuclear power industry, Mr. Hull has gained knowledge of plant operations, documentation, and SSCs necessary to capably select a broad distribution of SSCs for the SWEL. In addition, his experiences have provided him with knowledge of IPEEE and USI A-46 programs. 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. Throughout his years

serving in the nuclear power industry, Mr. Ram has gained knowledge of plant operations, documentation, and SSCs necessary to capably select a broad distribution of SSCs for the SWEL. In addition, his experiences have provided him with knowledge of IPEEE and USI A-46 programs. 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.

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

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

Georgia. Mr. Bacon has successfully completed the Near-Term Task Force Recommendation 2.3 – Plant Seismic Walkdowns Training Course.

Walter Djordjevic, P.E. Mr. Djordjevic is a Senior Consultant and serves as President of S&A with specialization in the dynamic analysis and design of structures and equipment for seismic, blast, fluid, and wind loads. He has managed and led seismic walkdowns and fragility analyses of structures and components for use in probabilistic risk assessments. Mr. Djordjevic has 37 years of seismic experience serving the nuclear industry. Mr. Djordjevic performed and managed more than 20 USI A-46 and IPEEE projects in response to the requirements of Generic Letters 87-02 and 88-20. Mr. Djordjevic has a Master of Science in Structural Engineering from the Massachusetts Institute of Technology. He has received industry training as a Seismic Capability Engineer (EPRI SQUG training), EPRI IPEEE Add-on, Seismic Fragility and Seismic Walkdown Engineer (SWE).

3.2.2 *Additional Personnel*

Exelon plant Operations contract support staff member Mr. David Shaw reviewed the SWEL. Mr. Shaw was an operator on shift at the Byron Station for 28 years and held many positions from entry level Non Licensed Operator up to a licensed Senior Reactor Operator (SRO) in the Control Room. He is familiar with all aspects of the station operating procedures. Mr. Shaw provided the Operations' review of the SWEL development and final acceptance in accordance with the EPRI guidance document. (Ref. 1) Various station personnel also provided support to the SWEL preparer in identifying major equipment or system modifications, equipment and systems located in different environments, and equipment and systems that would be accessible for inspection during the plant walkdowns, in accordance with Reference 1.

Exelon Engineering staff member Mr. Davood Karimi performed the IPEEE Vulnerabilities Review based, in part, on the Byron IPEEE submittal along with subsequent correspondence and station records. (Ref. 3) Mr. Karami is a civil/structural/mechanical engineer in the Exelon Engineering Department. He has worked at Byron since the beginning of 2012 and was in a similar position at Limerick Station for four (4) years. He has completed the NTTF Recommendation 2.3 Training Course (SWE). He has been a lead engineer and representative for several modifications, is a structural monitoring inspector, and is the structural/seismic representative for the Fukushima Project at Byron.

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 list for Byron 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) At the request of Byron personnel, the Diesel Driven Essential Service Water Make-Up Pumps and representative supporting Seismic Category I components located in the River Screen House were added to the SPEL. The resulting amended 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 amended IPEEE SPEL was reviewed to determine if it had a defined seismic licensing basis. All items identified as Safety Category I, as defined in Byron UFSAR Chapter 3, were identified as having a defined seismic licensing basis. 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 amended 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' (SSHVAC), 'Support System AC Power' (SSAC), 'Support System DC Power' (SSDC), 'Engineered Safety Features Actuation System' (ESFAS) or 'Cooling Water' (UHS) 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 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. 11)

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 Byron 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. 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 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 in the SWEL2 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 includes items that have been modified or replaced over the past several years. No such equipment has been identified.

C. A variety of types of equipment

The equipment class is identified for each item on SWEL 2. The equipment included on SWEL 2 is a representative sample from each of the classes of equipment listed in Reference 1 Appendix B: Classes of Equipment. Where appropriate, at least one piece of equipment from each class is included on SWEL 2.

The 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 Byron 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. 4, 5, and 6)

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 Byron 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 is no rapid drain down consideration included in the Byron 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 weeks of August 6 and August 20, 2012 and on September 19 and 22, 2012. It is noted that during the walkdowns the SWEs were generally accompanied by Operations and Engineering staff. The Seismic Walkdowns and Area Walk-Bys are discussed in more detail in the following 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 1 and SWEL 2 as provided in Appendix B of this report. The Seismic Walkdowns also evaluated the potential for nearby SSCs to cause adverse seismic interactions with the SWEL items. The Seismic Walkdowns focused on the following adverse seismic conditions associated with the subject item of equipment:

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

The results of the Seismic Walkdowns have been documented on the Seismic Walkdown Checklist (SWC) provided in the EPRI guidance document, Appendix C. Seismic Walkdowns were performed and a SWC completed for 127 of the 127 items identified on the Byron 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.

It is noted that Question 6 on the SWCs is answered Y (yes) for all components unless a specific anchorage issue is identified. This is pointed out because for certain

components Question 6 does not apply. However, the checkbox N/A (not applicable) is not provided as an option to address Question 6.

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 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
1	106	35	36	42
2	21	17	2	3
Totals	127	52	38	45

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 the 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 conditions identified during the equipment Seismic Walkdowns. The equipment Seismic Walkdowns resulted in a total of eleven (11) conditions identified and each of these was entered into the station's CAP. All of the identified conditions were assessed and it was concluded that the condition would not prevent the associated equipment from performing its safety-related function(s). None of the conditions identified by the SWEs during the equipment Seismic Walkdowns were concluded to be adverse seismic conditions.

The bases of the panels located in the Auxiliary Electric Equipment Rooms (AEER) are covered by a plastic cove molding. This molding prevents the visual inspection of the base weld anchorage detail for each panel. These panels were included on the SWEL because they were identified as IPEEE enhancements in that the panels were not connected together and in a seismic event could result in contact between the panels. The panels are also important components for functionality in a seismic event. The inspections by the SWEs did verify that the cabinets have been bolted to adjacent panels in response to the IPEEE enhancements. The welds at the base can be seen through the molding as "bumps" in the material at most locations. It is assumed that these are the connection welds since the spacing of the bumps closely approximates the detail as specified on Drawing 6E-0-3391C Revision BE. The seismic walkdown team could not determine if there were any cracks in the welds however the panels are non-vibratory and therefore, cracking of the welds is unlikely. The seismic walkdown team could not determine if there was any corrosion of the weld however the AEER is a very dry environment so corrosion is unlikely. Note that for 2 cabinets, the welds at the front of the panel could be visually inspected since the molding was not present due to a panel ventilation grate. The welds for these 2 cabinets met the drawing requirements with no corrosion and no cracking. Based on these observations, it is adjudged acceptable to not remove the cove molding to perform an inspection of the anchorage

detail. The panels impacted are: 1PA01J – 1PA12J, 1PA14J, 1PA28J, 1PA33J, 1PA34J, 1PA51J, and 1PA52J.

There are instances in which small/hairline cracks in concrete have been identified on the SWCs as a note and/or with a photograph. These small/hairline cracks are not of structural/seismic consequence due to their small size.

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 51 Area Walk-bys were performed for Byron Unit 1.

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

- Anchorage conditions (if visible without opening equipment)
- Significantly degraded equipment in the area
- A visual assessment (from the floor) of cable/conduit raceways and HVAC ducting (e.g., condition of supports or fill conditions of cable trays)
- Potentially adverse seismic interactions including those that could cause flooding, spray, and fires in the area
- Other housekeeping items that could cause adverse seismic interaction (including temporary installations and equipment storage)
- Scaffold construction was inspected to meet Exelon Procedure NES-MS-04.1, Seismic Prequalified Scaffolds
- Seismic housekeeping was examined to meet station procedure T&RM MA-BY-716-026-1001, Seismic Housekeeping

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.

Inspections of masonry walls were performed during the Area Walk-Bys. Masonry walls were identified as seismic either by their placards and/or construction details such as block wall columns. Based on the IPEEE SER, all block walls in seismic areas are built to seismic standards. (Ref. 7)

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. Thirteen (13) 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.

Through the efforts of the seismic walkdowns and development of this report, IR 1431416 was initiated to share lessons learned with various workgroups across the station. In particular, the IR was issued to create an action to tailgate lessons learned with Electrical Maintenance, Electrical Maintenance Work Planning, and the Maintenance Contractor. The focal point of the lessons learned is in regards to open fluorescent light fixture S-hooks. The expected S-hook configuration is that they are closed sufficiently to prevent the support chain links from passing though the S-hook up to metal-to-metal contact.

It is noted that open fluorescent light fixture S-hooks identified during the Area Walk-Bys were deemed acceptable because they were found only slightly or partially open. In the configuration they were found, it is unlikely that the chain and S-hook could become disengaged.

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

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)
1RH01PB	BORIC ACID BUILD UP ON BOLTS	1403165	Yes
1RH01PB	CRACK IN 1" GROUT PAD AT 2 OF 3 BOLTS	1403131	Yes
1VA02SB	CRACK IN GROUT PAD	1403145	Yes
0WO01CB	CRACK IN GROUT PAD	1402735	Yes
1AP38E	SEISMIC HOUSEKEEPING	1399382	Yes
1AP11E	MISSING BOLTS ON PANEL COVER	1398659	No
1DC01E	FLUORESCENT LIGHTING FIXTURE: OPEN S-HOOKS IN BATTERY ROOM 111	1399377	No
1DC02E	FLUORESCENT LIGHTING FIXTURE: OPEN S-HOOKS IN BATTERY ROOM 112	1399380	No
1DO01TB	CRACKS IN GROUT	1398190	Yes
1VD01CB	PERMANENT SCAFFOLD LABELING	1398177	Yes
1PA09J	GAP BETWEEN AEER CABINETS	1397709 (1419018)	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 CAP.

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

Item ID	Description of Issue	Action Request ID (IR)	Actions Complete Yes/No (See Notes 1 & 2)
AREA WALK-BY 01 UNIT 1 AND 2 CONTROL ROOM	Main Control Room Panel fasteners require repairs	1399487	No
Area Walk-by 16 ESWCT El 377 Unit 1 SX A Cooling Room /Area Walk-by 20, ESWCT South Elec Room	FLUORESCENT LIGHTING FIXTURE: Open S hooks	1398127	No
Area Walk-by 09 Aux El 451 Unit 1 and 2 (U1 HV - 0VC01JA, 0VC15J, 0VC02FA)	FP Valve 0FP332 is leaking	1397710	No
Area Walk-by 09 Aux El 451 Unit 1 and 2 (U1 HV - 0VC01JA, 0VC15J, 0VC02FA)	Roof drain concern (roof drain is shaped like a U without a drain at the low points and having victaulic couplings)	1397711	Yes
Area Walk-by 32, Aux El 426, Div 12 Switchgear Room /Area Walk-by 33, Aux El 426, U1 4kV Div 1/Div 11 Room	FLUORESCENT LIGHTING FIXTURE: Open S hooks	1398568	No
Area Walk-by 44, FH El 401 Adjacent to trackway	WATER IN TRACKS (NRC IDENTIFIED NON-SEISMIC)	1399113	Yes
Area Walk-by 14 Aux El 377 MSIV 1A/1D Room	CRACKED FME COVER	1398194	Yes
Area Walk-by 15 Aux El 401 MSIV 1A/1D Room	FLOOR SEAL	1398191	No
AREA WALK-BY 01 UNIT 1 AND 2 CONTROL ROOM	DIFFUSER DEGRADED	1397699	No
Area Walk-by 08 Aux El 451 Unit 1 AEER	FLUORESCENT LIGHTING FIXTURE: Open S hooks	1397693	No
GENERAL	FLUORESCENT LIGHTING FIXTURE: Open S hooks	1399405	No
Area Walk-by 39, Area 5 Curved Wall by Penetrations	1CV063 BORIC ACID ACCUMULATION	1398667	Yes
Area Walk-by 45, River Screen House	FLUORESCENT LIGHTING FIXTURE: Open S hooks	1399104	No

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 CAP.

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 CAP. In lieu of this process, Exelon/Byron utilized the existing processes and procedures (Site CAP Expectations) to identify, evaluate and document conditions identified during the Seismic Walkdowns.

In accordance with Exelon/Byron 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 CAP 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 Individual Plant Examination of External Events (IPEEE) Submittal Report and the Staff Evaluation Report of Individual Plant Examination of External Events (IPEEE) submittal of Byron Station, Units 1 and 2 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 not identified in the IPEEE submittal. (Ref. 3 and 7) 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
- Observation of seismic walkdown on August 6, 2012 by Peer Review Team Leader, Mr. Walter Djordjevic
- 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 K. L. Graesser to Office of Nuclear Reactor Regulation, dated December 23,. 1996, Subject: Transmittal of Byron Station Individual Plant Examination of External Events Submittal Report
4. Byron Station Drawing M-63, Sheet 1A, Rev. BH, Diagram of Fuel Pool Cooling and Clean-up
5. Byron Station Drawing M-63, Sheet 1B, Rev. BB, Diagram of Fuel Pool Cooling and Clean-up
6. Byron Station Drawing M-63, Sheet 1C, Rev. AV, Diagram of Fuel Pool Cooling and Clean-up
7. Staff Evaluation Report of Individual Plant Examination of External Events (IPEEE) submittal of Byron Station, Units 1 and 2 dated May 30, 2001
8. NRC (E Leeds and M Johnson) Letter to All Power Reactor Licensees et al., "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendation 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," Enclosure 2.3, "Recommendation 2.3: Seismic," dated March 12, 2012
9. Not used
10. "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. ML11186107, July 12, 2011
11. BY-MISC-019 Rev. 0, "Byron Risk Importance Listings to Support Development of Seismic Walkdown Equipment List (SWEL)."

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. Lory (16 PDH)
Bruce M. Lory - 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

Neal C. Smith
SQUG Representative

April 20-24, 1998
Date of Course

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

Date: 06/26/12

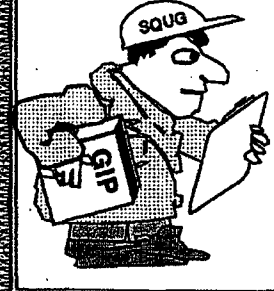
SQUG

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

Neil P. Smith
SQUG Representative

Bruce M. Long
Training Course Administrator

STEVENSON & ASSOCIATES

JAMES D. GRIFFITH

QUALIFICATIONS

Knowledgeable professional with over 23 years of diverse experience in structural engineering. Thorough, results-oriented problem solver with excellent communication skills. Works well independently or as part of a team. Highly skilled in all project phases from design through construction and specializes in field problem resolution.

PROFESSIONAL EXPERIENCE

Project Engineer (Stevenson & Associates, 2000 to present)

Responsible for all aspects of civil structural design. Also provides interface between clients, vendors, constructors and Stevenson & Associates.

Decommissioning Design Engineer (ComEd, 1998 to 2000)

Responsible for structural design work during conversion from generating to storage facility. Gathered design information during conceptual field walkdowns and prepared design calculations and drawings. Provided field support during construction.

- Designed all component supports and concrete foundations for various new indoor equipment.
- Managed construction during installation of new roof-mounted HVAC system.
- Designed structural steel support framing and access gallery for new outdoor cooling towers.

Maintenance Engineer (ComEd, 1995 to 1998)

Responsible for the design of structural repairs to station equipment and facilities. Interfaced with maintenance and construction personnel and performed evaluations of rigging, lead shielding, and scaffolding. Investigated and developed solutions for structural problems in the field and provided field support during installation of modifications.

- Designed and supervised field installation of heavy-duty rigging apparatus for replacement of large overhead crane motor.
- Performed conceptual design and supervised field construction of 60 foot high scaffold work platform for valve replacement.
- Prepared and reviewed calculations to justify structural acceptability of station equipment during successful completion of Seismic Qualification Utility Group (SQUG) evaluation program.
- Acted as engineering liaison to other station departments (Maintenance, Operations, Radiation Protection, etc) to resolve emergent problems regarding:
    - Rigging for lifting various plant equipment
    - Placement and support of temporary lead shielding
    - Storage of equipment in safety related seismic areas of the plant
    - Structural repairs and improvements to plant buildings and equipment

Structural Engineer (Sargent and Lundy, 1983 to 1995)

Responsible for design of structural modifications to various components of power generating facilities. Prepared and reviewed design calculations and drawings

- Designed numerous modifications to existing structural steel framing members and end connections.

- Supported field installation of modifications and provided solutions to problems encountered in the field.
- Designed and monitored field installation of new access galleries for various pieces of equipment.

EDUCATION

B.S., Civil and Environmental Engineering, University of Wisconsin, Madison, Wisconsin

Continuing Education

"Concrete Evaluation and Repair Seminar", Portland Cement Association, Skokie, Illinois, 1996

"STAAD III Program Training", Sargent and Lundy Engineers, Chicago, Illinois, 1995

"Piping Design, Analysis and AUTOPIPE Training"
Vectra Technologies, Inc., Zion, Illinois, 1995

"SQUG Walkdown Screening and Seismic Evaluation Training Course",
Seismic Qualification Utility Group through ComEd, Downers Grove, Illinois, 1994

PROFESSIONAL REGISTRATIONS

Licensed Professional Engineer in State of Wisconsin

Certificate of Completion

Jim Griffith

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

Jim Griffith

has Completed the SQUG Walkdown Screening and Seismic Evaluation Training Course

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

Paul C. 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

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 resolving 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 fragility 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 Conference, "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. Long (16 PDH)
Bruce M. Long - Instructor
NTTF 2.3 Seismic Walkdown Course

Date: 06/26/12

Stevenson & Associates
Engineering Solutions for Nuclear Power

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www.vecsa.com

Todd A Bacon

Education

1976 – 1980	University of Illinois – Urbana-Champaign Bachelor of Science – Civil Engineering

Registration / Certification

Professional Engineer: California License No. C-0336104 (Civil), Georgia License. No. 015562, Ohio License No. E-57497

Professional History

2012 – Present	Stevenson & Associates, Charlotte, North Carolina, Senior Consultant and General Manager, Charlotte, NC Office
1980 – 2012	AREVA Inc., Charlotte, NC, Engineering Manager

Professional Experience

Mr. Bacon has thirty years of experience in the design and modification of mechanical and structural systems. His responsibilities as an Engineering Manager have included work from the conceptual design through to the installation support phases of projects. Mr. Bacon has served as Project Engineer and Project Manager for numerous work scope efforts, including coordination of personnel in multiple locations. The efforts have also included significant client and/or regulatory interface, as required. These activities have also included responsibility for budgets, schedules and the technical accuracy of work performed. In addition, he has extensive experience in proposal and report development, as well as personnel training activities.

Mr. Bacon has thirty years of experience in the design and modification of mechanical and structural systems. His responsibilities as an Engineering Manager have included work from the conceptual design through to the installation support phases of projects. Mr. Bacon has served as Project Engineer and Project Manager for numerous work scope efforts, including coordination of personnel in multiple locations. The efforts have also included significant client and/or regulatory interface, as required. These activities have also included responsibility for budgets, schedules and the technical accuracy of work performed. In addition, he has extensive experience in proposal and report development, as well as personnel training activities.

Mr. Bacon's work has involved extensive use of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, including various piping system related committees. These have included the design group for the HDPE buried pipe group of Section III, and the Flaw Analysis group of Section XI. Other Code experience includes the American Institute of Steel Construction (AISC), American Concrete

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Institute (ACI), and ASME (ANSI) B31.1 and B31.3 codes. He serves on the AREVA College of Experts in the areas of structural and dynamic analysis and is also fluent in using numerous piping and finite element computer programs, as well as in typical frame analysis programs.

Engineering Manager, Civil and Layout Department
AREVA NP Inc.

Mr. Bacon served as an Engineering Manager in the Civil and Layout Department in Charlotte, North Carolina. In this role he was responsible for the efforts involving work on the 3D model for an AREVA US EPR plant being designed for the Calvert Cliffs site in Maryland. His areas of responsibility also included the balance of plant piping system design efforts for the plant. In this role, he was involved with interfaces with numerous groups utilizing the 3D model information, as well as consortium partner Bechtel Power, and AREVA offices throughout the US and Europe who served as subcontractors for various portions of the overall project scope of work. This included coordinating the efforts of approximately fifty individuals for these efforts involving technical resolution of issues, manpower planning, personnel issues, and development of the group.

In addition to the managerial responsibilities, he was a member of the AREVA College of Experts in the area of mechanics and fluid mechanics. This group was comprised of approximately one percent of the company worldwide which served as the technical leaders for the company, sharing best practices and knowledge throughout the global organization.

In addition to the New Plants activities in the US, Mr. Bacon supported efforts involving current activities for the International Thermonuclear Experimental Reactor (ITER) effort in which AREVA had the responsibility for the Cooling System involving the piping system evaluations and development of Technical Guides and impact to the building resulting from the piping system.

He previously served as an Engineering Manager in the Structural and Engineering Mechanics Group, working on projects involving operating plants. As a Project Engineer and Manager, he helds responsibility for leading project teams in technical areas, as well as in budget and schedule item tracking functions.

Examples of typical projects include the following:

Mixed Oxide (MOX) Fuel Fabrication Facility, Savannah River Site - Conducted third party review of overall project identifying ways to achieve efficiencies and improve production rates for the building design and construction effort. This resulted in numerous recommendations for the site to improve production in the areas of scheduling, group interfacing (engineering disciplines, construction, etc.), procedural development as well as improvements through procedural revisions. This also included performing as the lead engineer on projects for the facility involving development of procedures for field routing of small bore piping systems, as well as conduit runs.

ECCS Debris Blockage Issue, Tokyo Electric Power Company (TEPCO) – Established contact and led proposal efforts to obtain contracts for ECCS suction strainer replacements for first plant performing this

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scope in Japan. Subsequently won contracts for two additional TEPCO units as well, resulting in $ 8M in revenue for AREVA. This work involved extensive interface and oversight of the strainer hardware vendor during the design, fabrication and construction phases of the projects.

ASME BPVC Work, Various Facilities - Served in positions of increasing responsibility performing and reviewing ASME Boiler and Pressure Vessel Code work in the Structural and Engineering Mechanics Group. Work included Class 1 analyses of flued heads, mechanical equipment evaluations and numerous piping system analyses.

ECCS Debris Blockage Issue, involving numerous US BWR clients - Served in various roles including Project Engineer, Project Manager, and Technical Consultant. Had a significant amount of involvement with this issue including involvement with the BWR Owner's Group for this issue spanning numerous years.

GL 96-06 Operability and Design Basis Resolution, Oconee Nuclear Station, Duke Power - Served as the Project Engineer for the Operability Evaluation for the Oconee Nuclear Station in an effort to show all three units operable under the additional loadings resulting from the USNRC Generic Letter. This assessment included evaluation of the LPSW system, including piping, supports, equipment nozzles, as well as structural platforms and associated components. In addition, operability guidelines were developed for Oconee during this effort.

Reactor Cavity Drain Line Modifications, Palisades Nuclear Power Plant, Consumers Power - Project Manager for the Reactor Cavity Drain Line modifications and letdown piping support modifications at the Palisades Plant. Work scopes included both engineering functions and the generation of modification package paperwork.

NRC Bulletin 79-14 Large-Bore Piping Project Evaluation, D. C. Cook Nuclear Power Plant, Indiana/Michigan Power - Work included serving as Project Engineer to evaluate the adequacy of D.C. Cook's NRC Bulletin 79-14 Large-Bore Piping Project. The work scope involved supervising a project team performing piping and piping support evaluations. Conclusions drawn from this study have enabled the client to realize significant cost savings during recent maintenance outages through discrepancy trending and margin assessment studies.

Reactor Pressure Vessel Bottom Head Drain Line Unplugging Project, Dresden Nuclear Generating Station Units 2 & 3, Commonwealth Edison. Included serving as Project Engineer responsible for unplugging reactor pressure vessel bottom head drain lines for Dresden Units 2 and 3. This project was successfully completed within schedule and budget constraints, and also was part of the Unit 2 critical path outage work.

HPCI System Sparger Modification, Quad Cities Nuclear Generating Station, ComEd - Served as the Structural and Engineering Mechanics Project Engineer and Manager for Quad Cities Unit 1 and 2 high pressure coolant injection (HPCI) system modification, which resulted in the addition of a sparger assembly inside the torus. The project also included the addition of platforms to provide accessibility for personnel performing maintenance activities at both units.

Hardened Wetwell Vent Project Third Party Reviews, Dresden and Quad Cities Nuclear Generating

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Stations, ComEd - Led the third party reviews of the hardened wetwell vent projects for the Dresden and Quad Cities stations. These projects involved the evaluation of existing, as well as new, piping and auxiliary steel. Design codes used for the mechanical work included ASME Section III, Subsections NC, ND, NE and NF, as well as AISC and Uniform Building Code (UBC) standards for the structural evaluations.

Structural Projects, Various Facilities - Past projects have included extensive structural experience, such as the Hope Creek Nuclear Generating Station's drywell inner water seal plate analysis, and also Mark I piping and pipe support evaluations. Previous work also included extensive experience working on various mechanical and structural design projects.

Licensing and Special Projects, Comanche Peak Steam Electric Station, TU Electric - Involved in licensing and special studies projects for the Comanche Peak Station.

SSFI Audit Responses, ComEd - Participated in responding to concerns raised during safety system functional inspection (SSFI) audits.

Project Summary Reports and Operability Guidelines, ComEd and AEPSC - Wrote numerous project summary reports and operability guidelines for Commonwealth Edison (ComEd) and American Electric Power Company (AEPC).

Piping, Piping Support and HVAC Modifications, Various Facilities - Served as Project Engineer for piping, piping support and HVAC modification work for various nuclear plants, including Dresden Units 2 and 3, Quad Cities Units 1 and 2, D. C. Cook Units 1 and 2, and Duane Arnold. Project Engineer responsibilities included coordinating schedule and budget issues, as well as addressing technical questions as they arose.

Control Rod Drive Frame Analysis, Browns Ferry Nuclear Power Plant, Tennessee Valley Authority (TVA) - Involved in the analysis of the control rod drive frames for the Browns Ferry Plant.

Certificate of Completion

Todd Bacon

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

DAVOOD KARIMI

PROFESSIONAL EXPERIENCE

Exelon Nuclear Corp, Byron, IL — January, 2012 – Present
CIVIL/STRUCTURAL/MECHANICAL ENGINEER

- Structural/Seismic Engineer representative for Fukushima Project.
- EPRI Seismic Walkdown Engineer (SWE) training, 2012
- Lead Responsible Engineer for River Screen House Air Compressor Modification.
- Structural monitoring program inspector of all nuclear power plant A1 and A2 structures.
- Scaffolding qualification expert.

Exelon Nuclear Corp, Limerick, PA — January, 2008 – December, 2011
CIVIL/STRUCTURAL/MECHANICAL ENGINEER

- Lead Responsible Engineer for MUR-PU Implementation Project at LGS.
- Lead Responsible Engineer for Replacement of all GE-BETZ Chemical Treatment Systems with new NALCO Chemical Treatment Systems.
- Mechanical Engineer representative for replacing Reactor Recirc Motor Generator Sets with Adjustable Speed Drives.
- Lead Responsible Engineer for design and application of chemical skid project.
- Structural monitoring program inspector of all nuclear power plant A1 and A2 structures.
- License renewal document reviewer for station civil/structural documents.

PROFESSIONAL DEVELOPMENT

Education — BS in Civil Engineering, December 2007 - University of Illinois at Chicago
FE/EIT Engineer, 2008

Activities — ASCE Member, Society of Hispanic Professional Engineers (SHPE), North American Young Generation in Nuclear (NA-YGN)

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Certificate of Completion

Davood Karimi

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.

The following contents are found in Appendix B:

Stevenson & Associates

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

Byron Generating Station Unit 1

Kim L. Hull	07/31/2012
Equipment Selection Preparer	date
Tony Perez	07/31/2012
Equipment Selection Reviewer	date
David Shaw	7/31/2012
Station Operations Staff Member Refer to Attachment 3 for synopsis of Station Operations role and responsibility.	date

Table B-1. Base List 1

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
0	0WW01PA	ASSY - PUMP DEEP WELL M-83 M-3 GL	Out	400	401 OUTSIDE
0	0WW01PB	ASSY - PUMP DEEP WELL M-83 M-3 GL	Out	400	401 OUTSIDE
0	0CC01P	ASSY - U-0 CC PP	Aux	364	364 15-21/L-Q GENERAL AREA
0	0PM01J	PANEL CONT MCB GEN SERV 0-3378 MCR	Aux	451	451 MAIN CONTROL RM U-1 & U-2
0	0PM02J	ANNUNCIATOR RSH CONTROL PANEL	Aux	451	451 MAIN CONTROL RM U-1 & U-2
0	0VC15J	MCR U-1 HVAC START PNL	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0CC01E	CC PP 0 BRKR	Aux	383	383 15-21/N-Q GENERAL AREA
0	0SX02AA	0A SXCT BASIN	ESWCT	868	ESWCT
0	0SX02AB	0B SXCT BASIN	ESWCT	868	ESWCT
0	0WW019A	ASSY - AOV 0B DEEP WELL PP 0WW01PB TO 0A SXCT LCV	ESWCT	860	ESWCT
0	0WW019B	ASSY - AOV 0A DEEP WELL PP 0WW01PA TO 0B SXCT LCV	ESWCT	860	ESWCT
0	0WO01CA	0A MCR CHLR	Aux	383	383 CHILLED WTR RMS (8-10/L-P)
0	0WO01CB	0B MCR CHLR	Aux	383	383 CHILLED WTR RMS (8-10/L-P)
0	0WO01PA	ASSY - 0A MCR WO PP	Aux	383	383 CHILLED WTR RMS (8-10/L-P)
0	0WO01PB	ASSY - 0B MCR WO PP	Aux	383	383 CHILLED WTR RMS (8-10/L-P)
0	0WO144A	0A MCR WO M/U PRV	Aux	383	3
0	0WO144B	0B MCR WO M/U PRV	Aux	383	3
0	0WO14MA	SEPARATOR AIR M-118	Aux	383	383 CHILLED WTR RMS (8-10/L-P)
0	0WO14MB	SEPARATOR AIR M-118	Aux	383	383 CHILLED WTR RMS (8-10/L-P)
0	0VC01AA	0A MCR CHLD WTR CLG COILS & CAB	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC01AB	0B MCR CHLD WTR CLG COILS & CAB	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC01CA	ASSY - 0A MCR HVAC SUP FAN	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC01CB	ASSY - 0B MCR HVAC SUP FAN	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC01FA	0A MCR HVAC SUP FLTRS	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC01FB	0B MCR HVAC SUP FLTRS	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC01JA	MCR HVAC 0A LOC CONT PNL	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC01JB	MCR HVAC 0B LOC CONT PNL	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC01SA	0A MCR HVAC M/U AIR FLTR UNIT	Aux	463	463 HVAC GENERAL ARA (11-15/L-Q)
0	0VC01SB	0B MCR HVAC M/U AIR FLTR UNIT	Aux	463	463 HVAC GENERAL ARA (21-25/L-Q)

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
0	0VC01YA	DAMPER ISO FC 38WX34H	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC01YB	DAMPER ISO FC 38WX34H	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC02CA	ASSY - 0A MCR HVAC RTRN FAN	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC02CB	ASSY - 0B MCR HVAC RTRN FAN	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC02FA	0A MCR HVAC RECIRC CHAR ADSORB	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC02FB	0B MCR HVAC RECIRC CHAR ADSORB	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC03CA	ASSY - 0A MCR M/U AIR FLTR UNIT 0VC01SA FAN	Aux	463	463 HVAC GENERAL ARA (11-15/L-Q)
0	0VC03CB	ASSY - 0B MCR M/U AIR FLTR UNIT FAN	Aux	463	463 HVAC GENERAL ARA (21-25/L-Q)
0	0VC05YA	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC05YB	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC05YC	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC05YD	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC06YA	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC06YB	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC06YC	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC06YD	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC08Y	DAMPER MOD FO 18WX28H	Aux	463	463 HVAC GENERAL ARA (21-25/L-Q)
0	0VC09Y	DAMPER ISO FO BF-20IN	Aux	451	451 U-2 HVAC EQUIP RM (25-26/L-Q)
0	0VC16J	MCR U-2 HVAC START PNL	Aux	463	451 U-2 AUX ELECTRIC EQUIP RM (23-25/M-Q)
0	0VC17YA	DAMPER ISO FC 38WX34H	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC17YB	DAMPER ISO FC 38WX34H	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC21YA	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC21YB	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC21YC	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC21YD	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC22YA	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC22YB	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC22YC	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC22YD	DAMPER ISO/MOD FO BF-54	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0VC24Y	DAMPER MOD FO 18WX28H	Aux	463	463 HVAC GENERAL ARA (11-15/L-Q)

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
0	0VC25Y	DAMPER ISO/MOD FO BF-20	Aux	451	451 U-1 HVAC EQUIP RM (10-11/L-Q)
0	0SX007	ASSY - MOV U-0 CC HX 0CC01A SX OUTLET ISOL VLV	Aux	346	+12 (EOP VLV)
00	0SX03CA	ASSY - 0A SXCT FAN	ESWCT	909	ESWCT
0	0SX03CB	ASSY - 0B SXCT FAN	ESWCT	909	ESWCT
0	0SX03CC	ASSY - 0C SXCT FAN	ESWCT	909	ESWCT
0	0SX03CD	ASSY - 0D SXCT FAN	ESWCT	909	ESWCT
0	0SX03CE	ASSY - 0E SXCT FAN	ESWCT	909	ESWCT
0	0SX03CF	ASSY - 0F SXCT FAN	ESWCT	909	ESWCT
0	0SX03CG	ASSY - 0G SXCT FAN	ESWCT	909	ESWCT
0	0SX03CH	ASSY - 0H SXCT FAN	ESWCT	909	ESWCT
0	0SX146	ASSY - MOV U-0 CC HX T0 U-1 SX RTRN HDR ISOL VLV	Aux	346	346 15-23/N-Q GENERAL AREA
0	0SX147	ASSY - MOV U-0 CC HX TO U-2 SX RTRN HDR ISOL VLV	Aux	346	346 15-23/N-Q GENERAL AREA
0	0SX157A	ASSY - MOV 0A SX M/U PP TO 0A SXCT BASIN ISOL VLV	ESWCT	872	+04 N CNR VLV RM
00	0SX157B	ASSY - MOV 0B SX M/U PP TO 0B SXCT BASIN ISOL VLV	ESWCT	872	+04 S CNR VLV RM
00	0SX158A	ASSY - MOV 0A SX M/U PP TO 0A SXCT BASIN ISOL VLV	ESWCT	872	+04 N CNR VLV RM
00	0SX158B	ASSY - MOV 0B SX M/U PP TO 0B SXCT BASIN ISOL VLV	ESWCT	872	+04 S CNR VLV RM
00	0SX162A	ASSY - MOV 0A SXCT TO BASIN BYP VLV	ESWCT	872	+01 0A VLV RM, (EOP VLV)
0	0SX162B	ASSY - MOV 0B SXCT TO BASIN BYP VLV	ESWCT	872	+01 0B VLV RM, (EOP VLV)
0	0SX162C	ASSY - MOV 0A SXCT TO BASIN BYP VLV	ESWCT	872	+01 0A VLV RM, (EOP VLV)
0	0SX162D	ASSY - MOV 0B SXCT TO BASIN BYP VLV	ESWCT	872	+01 0B VLV RM, (EOP VLV)
0	0SX163A	SXCT 0A RISER VLV 0A L/S HTR	ESWCT	874	ESWCT
0	0SX163B	SXCT 0A RISER VLV 0B L/S HTR	ESWCT	874	ESWCT
0	0SX163C	SXCT 0A RISER VLV 0C L/S HTR	ESWCT	874	ESWCT
0	0SX163D	SXCT 0A RISER VLV 0D L/S HTR	ESWCT	874	ESWCT
0	0SX163E	SXCT 0B RISER VLV 0E L/S HTR	ESWCT	874	ESWCT
0	0SX163F	SXCT 0B RISER VLV 0F L/S HTR	ESWCT	874	ESWCT
0	0SX163G	SXCT 0B RISER VLV 0G L/S HTR	ESWCT	874	ESWCT
0	0SX163H	SXCT 0B RISER VLV 0H L/S HTR	ESWCT	874	ESWCT

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
0	0CC01A	U-0 CC HX	Aux	364	364 15-21/L-Q GENERAL AREA
0	0TE-0675	CC HEAT EXCHANGER O DISCH 100 OHM PLATINUM RTD	Aux	364	364 15-21/L-Q GENERAL AREA
0	0WO029A	0A MCR CLG COIL 0VC01AA WO INLET HDR DRN VLV	Aux	451	1
0	0WO029B	0B MCR CLG COIL 0VC01AB WO INLET HDR DRN VLV	Aux	451	1
0	0WO111A	0A MCR WO AIR SEP 0WO14MA DRN HOSE CONN ISOL VLV	Aux	383	2
0	0WO111B	0B MCR WO AIR SEP 0WO14MB DRN HOSE CONN ISOL VLV	Aux	383	2
0	0WO2142A	0A MCR WO STANDPIPE 0WO20MA DEMIN WTR QUICK FILL ISOL VLV	Aux	383	5
0	0WO2142B	0B MCR WO STANDPIPE 0WO20MB DEMIN WTR QUICK FILL ISOL VLV	Aux	383	5
0	0WO205A	0A MCR CHLR WTR M/U CHK VLV	Aux	383	3
0	0WO205B	0B MCR CHLR WTR M/U CHK VLV	Aux	383	3
0	0VC02Y	DAMPER ISO/MOD FC BF-54	Aux	451	
0	0VC033Y	DAMPER ISO FC 84WX34H	Aux	451	
0	0VC03Y	DAMPER ISO FO 54WX46H	Aux	451	
0	0VC094Y	DAMPER ISO FO 20WX46H	Aux	463	
0	0VC095Y	DAMPER ISO FO 40WX20H	Aux	463	
0	0VC104Y	DAMPER ISO FO 36WX24H	Aux	463	8
0	0VC133Y	DAMPER ISO FO 36WX24H	Aux	463	
0	0VC140Y	DAMPER ISO FO 36WX24H	Aux	463	
0	0VC172Y	DAMPER ISO FC 84WX34H	Aux	451	
0	0VC175Y	DAMPER ISO FO 42WX20H	Aux	463	
0	0VC182Y	DAMPER ISO FO 20WX48H	Aux	463	
0	0VC18Y	DAMPER ISO/MOD FC BF-54	Aux	451	
0	0VC19Y	DAMPER ISO FO 54WX46H	Aux	451	
0	0VC217Y	DAMPER ISO FO 22WX38H	Aux	463	
0	0VC312Y	DAMPER ISO FC 22WX22H	Aux	451	
0	0VC313Y	DAMPER ISO FC 16WX30H	Aux	451	
0	0VC51Y	DAMPER ISO FC 38WX34H	Aux	451	
0	0SX028A	0A SX M/U PP 0SX02PA DSCH CHK VLV	RSH	686	2

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
0	0SX028B	0B SX M/U PP 0SX02PB DSCH CHK VLV	RSH	686	2
0	0SX063A	ASSY - MOV 0A MCR CHLR CNDSR SX INLET VLV	Aux	383	+10 (EOP VLV)
00	0SX063B	ASSY - MOV 0B MCR CHLR CNDSR SX INLET VLV	Aux	383	+10 (EOP VLV)
00	0SX064A	ASSY - HMOV 0A MCR CHLR CNDSR SX OUTLET TCV	Aux	383	8
0	0SX064B	ASSY - HMOV 0B MCR CHLR CNDSR SX OUTLET TCV	Aux	383	8
0	0SX167A	SX TO RESID CHLORINE ANAL 0CF03J ISOL VLV	Aux	346	+6 4' S OF Q11
0	0SX167B	SX TO RESID CHLORINE ANAL 0CF04J ISOL VLV	Aux	346	+9 8' W OF Q
0	0SX169A	SX M/U HDR 0A VAC RLF VLV	Out	400	BTWN RSH & PLANT
0	0SX169B	SX M/U HDR 0B VAC RLF VLV	Out	400	BTWN RSH & PLANT
0	0SX169C	SX M/U HDR 0C VAC RLF VLV	Out	400	BTWN RSH & PLANT
0	0SX169D	SX M/U HDR 0D VAC RLF VLV	Out	400	BTWN RSH & PLANT
0	0SX169E	SX M/U HDR 0E VAC RLF VLV	Out	400	BTWN RSH & PLANT
0	0SX169F	SX M/U HDR 0F VAC RLF VLV	Out	400	BTWN RSH & PLANT
0	0SX174	SX TO AUX BLDG FP RING HDR XTIE ISOL VLV (EOP VLV)	Aux	346	10
0	0SX172	SX TO AUX BLDG FP RING HDR XTIE ISOL VLV (EOP VLV)	Aux	383	2
0	0SX02PB	DIESEL DRIVEN SX MAKE-UP PUMP	RSH	686'6"	686'6" 2C
0	0DO08TB	0B SX Pp 2000 GALLON DIESEL OIL STORAGE TANK	RSH	702	702 1C7
0	0SX02JA	0A SX M/U PP 0A Control Cabinet	RSH	702'	702' 06 BA
1	1AF006A	ASSY - MOV 1A AF PP SX SUCT DWST ISOL VLV	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AP38E	ASSY - 480V AUX BLDG MCC 133X1A	Aux	346	346 10-18/L-N GENERAL AREA
1	1AP11E	480V ESF UNIT SUBSTA 131X XFMR	Aux	426	426 ESF SWGR RM - DIV 11
1	1AP13E	480V ESF UNIT SUBSTA 132X XFMR	Aux	426	426 ESF SWGR RM - DIV 11
1	1CC01PB	ASSY - 1B CC PP	Aux	364	364 15-21/L-Q GENERAL AREA
1	1CC01PA	ASSY - 1A CC PP	Aux	364	364 15-21/L-Q GENERAL AREA

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1TE-0674	CC HEAT EX 1 DISCH RTD 100 OHMS PLATINUM TEMP ELEM	Aux	364	364 15-21/L-Q GENERAL AREA
1	1PM01J	PANEL CONT MAIN BOARD GEN/AUX PWR 0-3378 MCR	Aux	451	451 MAIN CONTROL RM U-1 & U-2
1	1PM04J	PANEL CONT MAIN BOARD FEEDWATER 0-3378 MCR	Aux	451	451 MAIN CONTROL RM U-1 & U-2
1	1PM05J	PANEL CONT MAIN BOARD RX/CV 0-3378 MCR	Aux	451	451 MAIN CONTROL RM U-1 & U-2
1	1PM06J	PANEL CONT MAIN BOARD ENG SAFETY 0-3378 MCR	Aux	451	451 MAIN CONTROL RM U-1 & U-2
1	1PM07J	PANEL INST NUCLEAR W-RACK 1-4 0-3378 MCR	Aux	451	451 MAIN CONTROL RM U-1 & U-2
1	1PM11J	PANEL ISOLATION CONTAINMENT 0-3378 MCR	Aux	451	451 MAIN CONTROL RM U-1 & U-2
1	1PM12J	PANEL INST MISC 0-3378 MCR	Aux	451	451 MAIN CONTROL RM U-1 & U-2
1	1IP05E	INVERTER INST BUS 111 1-3371 AB1	Aux	451	451 DIV 11 MISC ELEC EQUIP RM (9-10/L-M)
1	1IP06E	INVERTER INST BUS 112 1-3371 AB1	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)
1	1IP07E	INVERTER INST BUS 113 1-3371 AB1	Aux	451	451 DIV 11 MISC ELEC EQUIP RM (9-10/L-M)
1	1IP08E	INVERTER INST BUS 114 1-3371 AB1	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)
1	1AP21E	ASSY - 480V AUX BLDG ESF MCC 131X1	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1AF017B	ASSY - MOV 1B AF PP SX SUCT UPST ISOL VLV	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1CV8152	ASSY - AOV U-1 LTDWN HDR ISOL VLV (EOP VLV)	Aux	374	383 U-1 AREA 5 CURVED WALL AREA
1	1CV112E	ASSY - MOV RWST TO U-1 CHG PPS SUCT ISOL VLV	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1RD05E	REACTOR TRIP SWITCHGEAR	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)
1	1DG01SB	AIR COMPRESSOR PACKAGE 1B	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1AP10E	ASSY - 480V ESF SWGR 131X	Aux	426	426 ESF SWGR RM - DIV 11

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1AP92E	ASSY - 480V SXCT MCC 132Z1, SOUTH ELEC RM	ESWCT	874	ESWCT
1	1AP93E	ASSY - 480V SXCT MCC 131Z1, NORTH ELEC RM	ESWCT	874	ESWCT
1	1AP99E	ASSY - 480V ESF SXCT UNIT SUBSTA 131Z, NORTH ELEC RM	ESWCT	874	ESWCT
1	1AP98E	ASSY - 480V ESF SXCT UNIT SUBSTA 132Z, SOUTH ELEC RM	ESWCT	874	ESWCT
1	1PA01J	U-1 PROC I&C RACK PROTECT CH 1 CAB 1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA02J	U-1 PROC I&C RACK PROTECT CH 2 CAB 2	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA03J	U-1 PROC I&C RACK PROTECT CH 3 CAB 3	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA04J	U-1 PROC I&C RACK PROTECT CH 4 CAB 4	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA06J	U-1 PROC I&C RACK CONT GRP 2 CAB 6	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA07J	PROC I&C RACK CONT GRP 3 CAB 7	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA08J	U-1 PROC I&C RACK	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA09J	CAB PROT SYST SOL ST RX/ESF TRN A 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA10J	CAB PROT SYST SOL ST RX/ESF TRN B 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA12J	CAB TEST SAFEGUARD TRN B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA14J	CAB ESF SEQ/ACT TRN B 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA27J	CAB RELAY AUX SAFEGUARD TRN A 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA28J	CAB RELAY AUX SAFEGUARD TRN B 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1PA33J	CAB CONT SYSTEM ESF 11 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA34J	CAB CONT SYSTEM ESF 12 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA51J	CAB HJTC RX VESSEL LEVEL CH A 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA52J	CAB HJTC RX VESSEL LEVEL CH B 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA11J	CAB TEST SAFEGUARD TRN A 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1PA13J	CAB ESF SEQ/ACT TRN A 0-3371B AB1	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1DC02E	125V DC BATT 112	Aux	451	451 DIV 12 BATTERY RM 112 (7.7-9/P-Q)
1	1AP25E	ASSY - 480V AUX BLDG ESF MCC 131X2	Aux	414	414 CURVED WALL AREA - AREA 5
1	1AP27E	ASSY - 480V AUX BLDG ESF MCC 132X2	Aux	426	426 AREA 5 CURVED WALL AREA
1	1DC03E	125V DC BATT CHGR 111	Aux	451	451 DIV 11 MISC ELEC EQUIP RM (9-10/L-M)
1	1DC04E	125V DC BATT CHGR 112	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)
1	1DC05E	125V DC ESF DISTR CENTER BUS 111	Aux	451	451 DIV 11 MISC ELEC EQUIP RM (9-10/L-M)
1	1DC06E	125V DC ESF DISTR CENTER BUS 112	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)
1	1DC01E	125V DC BATT 111	Aux	451	451 DIV 11 BATTERY RM 111 (6-7.7/L-Q)
1	1IP02E	TRANSFORMER REG INSTRUMENT BUS 112	Aux	451	
1	1IP04E	TRANSFORMER REG INSTRUMENT BUS 114	Aux	451	
1	1SX147B	ASSY - AOV 1B CNMT CHLR SX BYP VLV	Aux	401	401 AREA 5 CHILLED WTR PUMP RM (11-15/Q-V)
1	1PL04J	RSD DIV 11 CONT PNL	Aux	383	383 U-1 REMOTE SHUTDOWN RM / AREA (23-24/N-P)
1	1AB02T-FLOOD	Recycle Monitor Tank(s)	Aux		

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1SX112A	ASSY - AOV 1A CNMT CHLR 1WO01CA SX SUP VLV	Aux	401	401 AREA 5 CHILLED WTR PUMP RM (11-15/Q-V)
1	1SX112B	ASSY - AOV 1B CNMT CHLR 1WO01CB SX SUP VLV	Aux	401	401 AREA 5 CHILLED WTR PUMP RM (11-15/Q-V)
1	1WO006A	ASSY - MOV 1A & 1C RCFC WO INLET HDR OUTSIDE ISOL VLV	Aux	374	401 AREA 5 CURVED WALL AREA
1	1WO006B	ASSY - MOV 1B & 1D RCFC CLG COILS WO INLET HDR OUTSIDE CN	Aux	401	401 AREA 5 CURVED WALL AREA
1	1WO020A	ASSY - MOV 1A & 1C RCFC WO OUTLET HDR OUTSIDE ISOL VLV	Aux	374	401 AREA 5 CURVED WALL AREA
1	1WO020B	ASSY - MOV 1B & 1D RCFC WO OUTLET HDR OUTSIDE ISOL VLV	Aux	401	401 AREA 5 CURVED WALL AREA
1	1WO056A	ASSY - MOV 1A & 1C RCFC WO OUTLET HDR INSIDE ISOL VLV	Cont	401	+05 (EOP VLV)
01	1WO056B	ASSY - MOV 1B & 1D RCFC WO OUTLET HDR INSIDE ISOL VLV	Cont	401	+05 (EOP VLV)
01	1VX01C	ASSY - FAN VENT ESF SWGR 12 HVAC M-115 M-1285 AB1	Aux	426	426 ESF SWGR RM - DIV 12
1	1VX01J	ESF SWGR RM DIV 11 VENT LOC CONT PNL	Aux	426	426 ESF SWGR RM - DIV 11
1	1VX02J	ESF SWGR RM DIV 12 VENT LOC CONT PNL	Aux	426	426 ESF SWGR RM - DIV 12
1	1VX04C	ASSY - FAN VENT ESF 11 HVAC M-115 M-1285 2 LCSR+08	Aux	439	426 ESF SWGR RM - DIV 11
1	1VX05C	ASSY - FAN VENT BUS 131Z HVAC M-119 M-1288 SXCT	ESWCT	888	ESWCT
1	1VX05J	0A SXCT SUBSTA BUS 131Z HVAC LOC CONT PNL	ESWCT	874	ESWCT
1	1VX06C	FAN VENT BUS 132Z HVAC M-119 M-1288 SXCT	ESWCT	888	ESWCT
1	1VX06J	0B SXCT SUBSTA BUS 132Z HVAC LOC CONT PNL	ESWCT	874	ESWCT
1	1VX07J	ESF SWGR RM DIV 12 HVAC DMPR START PNL	Aux	426	426 ESF SWGR RM - DIV 12

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1VX08J	ESF SWGR RM DIV 11 HVAC DMPR START PNL	Aux	426	426 ESF SWGR RM - DIV 11
1	1VX98J	0A SXCT DIV 11 HVAC DMPR START PNL	ESWCT	874	ESWCT
1	1VX99J	0B SXCT DIV 12 HVAC DMPR START PNL	ESWCT	874	ESWCT
1	1VP01AA	RCFC 1A ESW COILS	Cont	377	
1	1VP01AB	RCFC 1B ESW COILS	Cont	377	
1	1VP01AC	RCFC 1C ESW COILS	Cont	377	
1	1VP01AD	RCFC 1D ESW COILS	Cont	377	
1	1VP01CA	PRIM. CNMT VENT SYSTEM RCFC FAN, MOTOR	Cont	377	
1	1VP01CB	PRIM. CNMT VENT SYSTEM RCFC FAN, MOTOR	Cont	377	
1	1VP01CC	PRIM. CNMT VENT SYSTEM RCFC FAN, MOTOR	Cont	377	
1	1VP01CD	PRIM. CNMT VENT SYSTEM RCFC FAN, MOTOR	Cont	377	
1	1VE01C	ASSY - U-1 MISC ELEC EQUIP RM VENT FAN, BATT RM ROOF	Aux	463	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)
1	1VE01J	U-1 MISC ELEC EQUIP RM VENT LOC CONT PNL	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)
1	1VE01Y	DAMPER MOD FO 30WX72H	Aux	451	
1	1VE02C	ASSY - BATT RM 112 EXH FAN, ROOF	Aux	463	451 DIV 12 BATTERY RM 112 (7.7-9/P-Q)
1	1VE03C	ASSY - BATT RM 111 EXH FAN, ROOF	Aux	463	451 DIV 11 BATTERY RM 111 (6-7.7/L-Q)
1	1VE04C	ASSY - U-1 MISC ELEC EQUIP RM DIV 11 EXH FAN	Aux	463	451 DIV 11 MISC ELEC EQUIP RM (9-10/L-M)
1	1VE04J	U-1 MISC ELEC EQUIP RM DMPR START PNL	Aux	451	451 NON-ESF SWGR RM (6-7.7/L-Q)
1	1VE05C	ASSY - U-1 MISC ELEC EQUIP RM DIV 12 EXH FAN	Aux	463	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)
1	1VD01CA	ASSY - 1A DG RM VENT FAN	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1VD01CB	ASSY - 1B DG RM VENT FAN	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1VD01JA	1A DG RM VENT LOC CONT PNL	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1VD01JB	1B DG RM VENT LOC CONT PNL	Aux	401	401 1B DG RM (6-7.7/L-Q)

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1VD02YA	DAMPER MOD FC 53WX52H	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1VD02YB	DAMPER MOD FC 33WX52H	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1VD04J	1A DG RM HVAC DMPR START PNL	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1VD05J	1B DG RM HVAC DMPR START PNL	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1VD08YA	DAMPER FIRE SLV-55WX59H		401	
1	1VD08YB	DAMPER FIRE SLV-55WX59H		401	
1	1VD10YA	DAMPER MOD FC 53WX52H	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1VD10YB	DAMPER MOD FC 53WX52H	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1VD22YA	DAMPER FIRE SLV-55WX59H		401	
1	1VD22YB	DAMPER FIRE SLV-55WX59H		401	
1	1VA01SA	SX PP AREA 1A CUB CLR	Aux	330	330 13-18/L-S SX PUMP RM
1	1VA01SB	SX PP AREA 1B CUB CLR	Aux	330	330 18-23/L-S SX PUMP RM
1	1VA02SA	1A RH PP CUB CLR	Aux	343	346 12-15/U-V A RH PUMP RM - U-1
1	1VA02SB	1B RH PP CUB CLR	Aux	343	346 1B RH PUMP RM (13/X)
1	1VA04SA	1A SI PP CUB CLR	Aux	364	364 1A SI PUMP RM (15/Q)
1	1VA04SB	1B SI PP CUB CLR	Aux	364	364 1B SI PUMP RM (13/Y)
1	1VA06SA	1A CV PP CUB CLR	Aux	364	364 1A CV PUMP RM (15-17/U)
1	1VA06SB	1B CV PP CUB CLR	Aux	379	364 1B CV PUMP RM (13/Y)
1	1VA08S	1B DSL DRV AF PP CUB CLR	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1VA08CB	ASSY - 1B DSL DRV AF PP CUB CLR 1VA08S 1B FAN	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1VA01J	1A SX PP CUB CLR LOC CONT PNL	Aux	330	330 13-18/L-S SX PUMP RM
1	1VA02J	1B SX PP CUB CLR LOC CONT PNL	Aux	330	330 18-23/L-S SX PUMP RM
1	1VA03J	1A RH PP CUB CLR LOC CONT PNL	Aux	343	346 12-15/U-V A RH PUMP RM - U-1
1	1VA04J	1B RH PP CUB CLR LOC CONT PNL	Aux	343	346 1B RH PUMP RM (13/X)
1	1VA10J	1A CV PP CUB CLR LOC CONT PNL	Aux	364	364 1A CV PUMP RM (15-17/U)
1	1VA11J	1B CV PP CUB CLR LOC CONT PNL	Aux	364	364 1B CV PUMP RM (13/Y)
1	1SX001A	ASSY - MOV 1A SX PP 1SX01PA SUCT ISOL VLV	Aux	346	+ (EOP VLV), IN PIT
1	1SX001B	ASSY - MOV 1B SX PP 1SX01PB SUCT ISOL VLV	Aux	346	+ (EOP VLV), IN PIT
1	1SX01AA	1A SX PP 1SX01PA OIL CLR	Aux	330	330 13-18/L-S SX PUMP RM
1	1SX01AB	1B SX PP 1SX01PB OIL CLR	Aux	330	330 18-23/L-S SX PUMP RM
1	1SX01FA	1A SX PP DSCH STRN	Aux	330	330 13-18/L-S SX PUMP RM
1	1SX01FB	1B SX PP DSCH STRN	Aux	330	330 18-23/L-S SX PUMP RM

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1SX01K	1B AF PP ENG CLSD CYCLE HX	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1SX01PA	ASSY - 1A SX PP	Aux	330	330 13-18/L-S SX PUMP RM
1	1SX01PA-C	1A SX PP AUX LUBE OIL PP	Aux	330	330 13-18/L-S SX PUMP RM
1	1SX01PA-M	1A SX PP MTR	Aux	330	330 13-18/L-S SX PUMP RM
1	1SX01PB	ASSY - 1B SX PP	Aux	330	330 18-23/L-S SX PUMP RM
1	1SX01PB-C	1B SX PP AUX LUBE OIL PP	Aux	330	330 18-23/L-S SX PUMP RM
1	1SX01PB-M	1B SX PP MTR	Aux	330	330 18-23/L-S SX PUMP RM
1	1SX02K	1B AF PP RHT ANGLE GEAR LUBE OIL CLR	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1SX101A	SOV 1A MTR DRV AF PP OIL CLR 1AF01AA SX OUTLET VLV	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1SX114A	ASSY - AOV 1A CNMT CHLR 1WO01CA SX RTRN VLV	Aux	401	401 AREA 5 CHILLED WTR PUMP RM (11-15/Q-V)
1	1SX114B	ASSY - AOV 1B CNMT CHLR 1WO01CB SX RTRN VLV	Aux	401	401 AREA 5 CHILLED WTR PUMP RM (11-15/Q-V)
1	1SX169A	ASSY - AOV 1A DG JW HX SX OUTLET VLV (EOP VLV)	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1SX169B	ASSY - AOV 1B DG JW HX SX OUTLET VLV (EOP VLV)	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1SX173	ASSY - AOV 1B DSL DRV AF PP CLG WTR SUP VLV (EOP VLV)	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1SX178	ASSY - AOV 1B AF PP HX'S SX RTRN VLV (EOP VLV)	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1SX147A	ASSY - AOV 1A CNMT CHLR SX BYP VLV	Aux	401	401 AREA 5 CHILLED WTR PUMP RM (11-15/Q-V)
1	1FT-SI050	SI PMP COLD INJ ORIFICE LOOP 2 FLOW TRANS	Cont	412	5
1	1FT-SI051	SI PMP COLD INJ ORIFICE LOOP 3 FLOW TRANS	Cont	377	5
1	1LS-0940A	CONTAINMENT SUMP LEVEL	Cont	377	5
1	1LS-0941A	CONTAINMENT SUMP LEVEL	Cont	377	5
1	1LT-0930	REF WTR STG TK LEVEL D/P XMTTR	Aux	379	379 U-1 RWST TUNNEL
1	1LT-0931	REF WTR STG TK LVL D/P XMTTR	Aux	379	379 U-1 RWST TUNNEL
1	1LT-0932	REF WTR STG TK LVL D/P XMTTR	Aux	379	379 U-1 RWST TUNNEL
1	1LT-0933	REF WTR STG TK LVL D/P XMTTR	Aux	379	379 U-1 RWST TUNNEL

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1PT-0935	CNMT PRESS XMTTR	Cont	451	451 U-1 CURVED WALL AREA - AREA 5
1	1PT-0936	CONT PRESS XMTTR	Cont	451	451 U-1 CURVED WALL AREA - AREA 5
1	1SI01T	U-1 RWST, W OF FHB	Out	400	401 FH OUTSIDE
1	1SI05TA	SUMP CNMT RECIRC M-61-4 M-195 BOT 367 RX1	Cont	377	
1	1SI05TB	SUMP CNMT RECIRC M-61-4 M-195 BOT 367 RX1	Cont	377	
1	1SI8811A	ASSY - MOV 1A CNMT RECIRC SUMP OUTLET ISOL VLV	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1SI8811B	ASSY - MOV 1B CNMT RECIRC SUMP OUTLET ISOL VLV	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1SI8812A	ASSY - MOV 1A RH PP RWST SUCT ISOL VLV	Aux	343	346 1A CS PUMP RM (13/V)
1	1SI8812B	ASSY - MOV 1B RH PP RWST SUCT ISOL VLV	Aux	343	346 1B RH PUMP RM (13/X)
1	1SI8809A	ASSY - MOV 1A RH HX SI OUTLET DWST ISOL VLV	Aux	374	+13 (EOP VLV)
01	1SI8840	MOV U-1 RH HXS TO 1A/1C LOOP HL ISOL VLV	Aux	374	+05 (EOP VLV)
01	1SI8801A	ASSY - MOV U-1 CV PPS TO CL 1A ISOL VLV	Aux	374	383 U-1 AREA 5 CURVED WALL AREA
1	1SI8801B	ASSY - MOV U-1 CV PPS TO CL 1B ISOL VLV	Aux	374	383 U-1 AREA 5 CURVED WALL AREA
1	1LT-0459	PRZR LEVEL D/P TRANSMITTER	Cont	377	
1	1LT-0460	PRZR LEVEL D/P TRANSMITTER	Cont	377	6
1	1LT-0461	PRZR LEVEL D/P TRANSMITTER	Cont	377	
1	1PT-0455	PRZR PRESS XMTTR	Cont	377	1PL50J
1	1PT-0456	PRZR PRESS XMTTR	Cont	377	6
1	1PT-0457	PRZR PRESS XMTTR	Cont	377	1PL52J
1	1PT-0458	PRZR PRESS XMTTR	Cont	377	1PL75J
1	1RY01S	U-1 PZR	Cont	401	
1	1RY01T	U-1 PZR RLF TK	Cont	377	

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1RY030A	1A PORV ACCUM 1RY32MA TO PORV 1RY455A RLF VLV	Cont	451	6
1	1RY030B	1B PORV ACCUM 1RY32MB TO PORV 1RY456 RLF VLV	Cont	451	6
1	1RY32MA	1A PORV ACCUM, OUTSIDE PZR WALL	Cont	453	
1	1RY32MB	1B PORV ACCUM, OUTSIDE PZR WALL	Cont	453	
1	1RY455A	ASSY - AOV U-1 PZR PORV (EOP VLV)	Cont	461	1
1	1RY455B	ASSY - AOV 1D PZR LOOP SPRAY VLV (EOP VLV)	Cont	390	1
1	1RY455C	ASSY - AOV 1C PZR LOOP SPRAY VLV (EOP VLV)	Cont	390	1
1	1RY456	ASSY - AOV U-1 PZR PORV (EOP VLV)	Cont	456	1
1	1RY8000A	ASSY - MOV 1A PZR RLF ISOL VLV	Cont	461	+01 (EOP VLV)
01	1RY8000B	ASSY - MOV 1B PZR RLF ISOL VLV	Cont	451	+01 (EOP VLV)
01	1RY8010A	1A PZR RLF VLV	Cont	451	2
1	1RY8010B	1B PZR RLF VLV	Cont	451	2
1	1RY8010C	1C PZR RLF VLV	Cont	451	2
1	1RY8028	ASSY - AOV U-1 PRT PW SUP OUTSIDE CNMT ISOL VLV (EOP VLV)	Aux	374	383 U-1 AREA 5 CURVED WALL AREA
1	1IY-0606	RH HX 1A OUT I/P TRANSDUCER	Aux	364	364 17-19/Q-W GENERAL AREA - AREA 6
1	1IY-0607	RH HX #1B OUT I/P TRANSDUCER	Aux	364	364 17-19/Q-W GENERAL AREA - AREA 6
1	1RH01PA	ASSY - 1A RH PP	Aux	343	346 12-15/U-V A RH PUMP RM - U-1
1	1RH01PA-A	1A RH PP SEAL CLR	Aux	343	346 12-15/U-V A RH PUMP RM - U-1
1	1RH01PB	ASSY - 1B RH PP	Aux	343	346 1B RH PUMP RM (13/X)
1	1RH01PB-A	COOLER SEAL RHR PUMP M-62 RXB2	Aux	343	346 1B RH PUMP RM (13/X)
1	1RH02AA	1A RH HX	Aux	357	364 1A RHR HT EXCH RM (15/S)
1	1RH02AB	2B RH HX	Aux	357	364 1B RHR HT EXCH RM (15/W)
1	1RH610	ASSY - MOV 1A RH PP 1RH01PA RECIRC VLV	Aux	357	346 15/S GENERAL AREA U-1
1	1RH611	ASSY - MOV 1B RH PP 1RH01PB RECIRC VLV	Aux	357	364 1B RHR HT EXCH RM (15/W)
1	1RH8701A	ASSY - MOV 1A RH PP SUCT FROM 1A HL DWST ISOL VLV	Cont	377	+03 (EOP VLV)

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
01	1RH8701B	ASSY - MOV 1A RH PP SUCT FROM 1A HL UPST ISOL VLV	Cont	377	+13 (EOP VLV)
01	1RH8702A	ASSY - MOV 1B RH PP SUCT FROM 1C HL DWST ISOL VLV	Cont	377	+03 (EOP VLV)
01	1RH8702B	ASSY - MOV 1B RH PP SUCT FROM 1C HL UPST ISOL VLV	Cont	377	+13 (EOP VLV)
01	1RH8716A	ASSY - MOV 1A RH HX 1RH02AA OUTLET ISOL VLV	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1RH8716B	ASSY - MOV 1B RH HX 1RH02AB OUTLET ISOL VLV	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1TE-0604	RHR LP 1A RETURN RTD	Aux	374	364 U-1 AREA 5 CURVED WALL AREA
1	1TE-0605	PLATINUM RTD RHR LP 2 RETURN	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1RF026	AOV U-1 RF PPS DSCH HDR INSIDE CNMT ISOL VLV	Cont	377	13
1	1RF027	AOV U-1 RF PPS DSCH HDR OUTSIDE CNMT ISOL VLV	Aux	374	383 U-1 AREA 5 CURVED WALL AREA
1	1RE9170	AOV U-1 RCDT PPS DSCH HDR OUTSIDE CNMT ISOL VLV	Aux	401	401 AREA 5 CURVED WALL AREA
1	1PT-0403	W-RNG RX COOLANT PRESS LP 1A HOT LEG XMTTR	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1PT-0405	W-RNG RX COOLANT PRESS LP 1C HOT LEG XMTTR	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1PT-0406	RC HOT LEG WIDE RANGE PRESSURE TRANSMITTER	Cont	377	1PL75J
1	1PT-0407	RC HOT LEG WIDE RANGE PRESSURE TRANSMITTER	Cont	377	1PL66J
1	1RC01BA	STEAM GENERATOR 1A	Cont	390	
1	1RC01BB	STEAM GENERATOR 1B	Cont	390	
1	1RC01BC	STEAM GENERATOR 1C	Cont	390	
1	1RC01BD	STEAM GENERATOR 1D	Cont	390	
1	1RC01PA	REACTOR COOLANT PUMP 1A	Cont	390	
1	1RC01PB	REACTOR COOLANT PUMP 1B	Cont	390	
1	1RC01PC	REACTOR COOLANT PUMP 1C	Cont	390	

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1RC01PD	REACTOR COOLANT PUMP 1D	Cont	390	
1	1RC01R	U-1 RX VESSEL	Cont	400	
1	1RC8001A	ASSY - MOV 1A RC LOOP HL STOP VLV	Cont	401	+ BY 1A S/G
01	1RC8001B	ASSY - MOV 1B RC LOOP HL STOP VLV	Cont	401	+ BY 1B S/G
01	1RC8001C	ASSY - MOV 1C RC LOOP HL STOP VLV	Cont	401	+ BY 1C S/G
01	1RC8001D	ASSY - MOV 1D RC LOOP HL STOP VLV	Cont	401	+ BY 1D S/G
01	1RC8002A	ASSY - MOV 1A RC LOOP CL STOP VLV	Cont	401	+
1	1RC8002B	ASSY - MOV 1B RC LOOP CL STOP VLV	Cont	401	1
1	1RC8002C	ASSY - MOV 1C RC LOOP CL STOP VLV	Cont	401	1
1	1RC8002D	ASSY - MOV 1D RC LOOP CL STOP VLV	Cont	401	+
1	1TE-RC022A	RC WIDE RANGE LP 1A TEMP	Cont	390	3
1	1TE-RC022B	RC WIDE RANGE LP 1A TEMP	Cont	390	3
1	1TE-RC023A	RC WIDE RANGE LP 1B TEMP	Cont	390	3
1	1TE-RC023B	RC WIDE RANGE LP 1B TEMP	Cont	390	3
1	1TE-RC024A	RC WIDE RANGE LP 1C TEMP	Cont	390	3
1	1TE-RC024B	RC WIDE RANGE LP 1C TEMP	Cont	390	5
1	1TE-RC025A	RC WIDE RANGE LP 1D TEMP	Cont	390	3
1	1TE-RC025B	RC WIDE RANGE LP 1D TEMP	Cont	390	3
1	1PL05J	RSD DIV 12 CONT PNL	Aux	383	383 U-1 REMOTE SHUTDOWN RM / AREA (23-24/N-P)
1	1PL07J	1A DG 1DG01KA CONT PNL	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1PL08J	1B DG 1DG01KB CONT PNL	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1PL10J	U-1 PEN AREA FIRE HAZARDS PANEL	Aux	426	426 AREA 5 CURVED WALL AREA
1	1PL50J	RX1 CNMT LOC INST PNL	Cont	377	
1	1PL52J	RX1 CNMT LOC INST PNL	Cont	377	
1	1PL56J	RX1 CNMT LOC INST PNL	Cont	412	
1	1PL57J	RX1 CNMT LOC INST PNL	Cont	412	
1	1PL66J	RX1 CNMT LOC INST PNL	Cont	377	
1	1PL67J	RX1 CNMT LOC INST PNL	Cont	377	
1	1PL69J	RX1 CNMT LOC INST PNL	Cont	401	
1	1PL71J	RX1 CNMT LOC INST PNL	Cont	412	
1	1PL72J	RX1 CNMT LOC INST PNL	Cont	412	
1	1PL75J	RX1 CNMT LOC INST PNL	Cont	377	
1	1PL77JC	1B SAFETY VLV RM LOC INST PNL	Aux	377	377 U-1 MSIV RM B/C
1	1PL79JB	1A SAFETY VLV RM LOC INST PNL	Aux	377	377 U-1 MSIV RM A/D

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1PL84JB	LOC INST PNL	Aux	364	383 GENERAL AREA (12-15/N-Q)
1	1PL86J	LOC INST PNL	Aux	364	364 17-19/Q-W GENERAL AREA - AREA 6
1	1PL97J	LOC INST PNL	Aux	364	364 17-19/Q-W GENERAL AREA - AREA 6
1	1PL84JA	LOC INST PNL	Aux	364	383 GENERAL AREA (12-15/N-Q)
1	1NR11E	NEUTRON DETECTOR	Cont	377	6
1	1NR13E	NEUTRON DETECTOR	Cont	377	6
1	1MS001A	ASSY - HOV 1A S/G MS ISOL VLV	Aux	377	377 U-1 MSIV RM A/D
1	1MS001B	ASSY - HOV 1B S/G MS ISOL VLV	Aux	377	377 U-1 MSIV RM B/C
1	1MS001C	ASSY - HOV 1C S/G MS ISOL VLV	Aux	377	377 U-1 MSIV RM B/C
1	1MS001D	ASSY - HOV 1D S/G MS ISOL VLV	Aux	377	377 U-1 MSIV RM A/D
1	1MS013A	1A S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM A/D
1	1MS013B	1B S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM B/C
1	1MS013C	1C S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM B/C
1	1MS013D	1D S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM A/D
1	1MS014A	1A S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM A/D
1	1MS014B	1B S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM B/C
1	1MS014C	1C S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM B/C
1	1MS014D	1D S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM A/D
1	1MS015A	1A S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM A/D
1	1MS015B	1B S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM B/C
1	1MS015C	1C S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM B/C
1	1MS015D	1D S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM A/D
1	1MS016A	1A S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM A/D
1	1MS016B	1B S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM B/C
1	1MS016C	1C S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM B/C
1	1MS016D	1D S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM A/D
1	1MS017A	1A S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM A/D
1	1MS017B	1B S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM B/C
1	1MS017C	1C S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM B/C
1	1MS017D	1D S/G MS OUTLET HDR ATMOS RLF VLV	Aux	401	401 U-1 MSIV RM A/D
1	1MS018A	ASSY - HOV 1A S/G MS PORV	Aux	401	401 U-1 MSIV RM A/D
1	1MS018B	ASSY - HOV 1B S/G MS PORV	Aux	401	401 U-1 MSIV RM B/C
1	1MS018C	ASSY - HOV 1C S/G MS PORV	Aux	401	401 U-1 MSIV RM B/C

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1MS018D	ASSY - HOV 1D S/G MS PORV	Aux	401	401 U-1 MSIV RM A/D
1	1IP01E	TRANSFORMER REG INSTRUMENT BUS 111	Aux	451	
1	1IP01J	PANEL DIST INSTRUMENT BUS 111 120VAC	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1IP02J	PANEL DIST INSTRUMENT BUS 112 120VAC	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1IP03E	TRANSFORMER REG INSTRUMENT BUS 113	Aux	451	
1	1IP03J	PANEL DIST INSTRUMENT BUS 113 120VAC	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1IP04J	PANEL DIST INSTRUMENT BUS 114 120VAC	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)
1	1LT-0501	SG LOOP 1A W-RNG LEVEL D/P XMTTR	Cont	377	1PL50J
1	1LT-0502	SG LOOP 1B W-RNG LEVEL D/P TRANSMITTER	Cont	377	1PL67J
1	1LT-0503	SG LOOP 1C W-RNG LEVEL D/P TRANSMITTER	Cont	377	1PL75J
1	1LT-0504	SG LOOP 1D W-RNG LEVEL D/P TRANSMITTER	Cont	377	1PL52J
1	1LT-0517	S/G LOOP 1A LEVEL D/P XMTTR W/FILLED LEG	Cont	401	
1	1LT-0518	S/G 1A LEVEL LOOP D/P XMTTR 2/FILLED LEG	Cont	412	
1	1LT-0519	S/G LOOP LA LEVEL D/P XMTTR W/FILLED LEG	Cont	412	
1	1LT-0527	S/G LOOP 1B LEVEL D/P TRANSMITTER W/FILLED LEG	Cont	377	
1	1LT-0528	S/G 1B LEVEL D/P TRANSMITTER W/FILLED LEG	Cont	412	
1	1LT-0529	S/G LOOP 1B LEVEL D/P XMTTR W/FILLED LEG	Cont	412	
1	1LT-0537	S/G LP 1C LVL D/P TRANSMITTER W/FILLED LEG	Cont	377	

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1LT-0538	S/G 1C LEVEL LOOP D/P XMITTER W/FILLED LEG	Cont	412	
1	1LT-0539	S/G LP 1C LVL D/P TRANSMITTER W/FILLED LEG	Cont	412	
1	1LT-0547	S/G LP 1D LVL D/P TRANSMITTER W/FILLED LEG	Cont	401	
1	1LT-0548	S/G 1D LEVEL LOOP D/P XMTTR W/FILLED LEG	Cont	412	
1	1LT-0549	S/G 1D LVL LOOP D/P TRANSMITTER W/FILLED LEG	Cont	412	
1	1LT-0556	S/G LOOP 1A LEVEL D/P TRANSMITTER W/FILLED LEG	Cont	412	
1	1LT-0557	S/G 1B LEVEL LP D/P TRANSMITTER W/FILLED LEG	Cont	412	
1	1LT-0558	S/G LOOP 1C LEVEL D/P TRANSMITTER W/FILLED LEG	Cont	412	
1	1LT-0559	S/G LOOP 1D LEVEL D/P TRANSMITTER W/FILLED LEG	Cont	412	
1	1PT-0514	S/G LOOP 1A STM PRESS TRANSMITTER	Aux	377	377 U-1 MSIV RM A/D
1	1PT-0515	S/G LOOP 1A STM PRESS PRESS XMTTR	Aux	377	377 U-1 MSIV RM A/D
1	1PT-0516	S/G LOOP 1A STM PRESS XMTTR	Aux	377	377 U-1 MSIV RM A/D
1	1PT-0524	S/G LOOP 1B STM PRESS XMTTR	Aux	377	377 U-1 MSIV RM B/C
1	1PT-0525	S/G LOOP 1B STM PRESS PRESS XMTTR	Aux	377	377 U-1 MSIV RM B/C
1	1PT-0526	S/G LOOP 1B STM PRESS XMTTR	Aux	377	377 U-1 MSIV RM B/C
1	1PT-0534	S/G LP 1C STM PRESS XMTTR	Aux	377	377 U-1 MSIV RM B/C
1	1PT-0535	S/G LP 1C STM PRESS PRESSURE XMTTR	Aux	377	377 U-1 MSIV RM B/C
1	1PT-0536	S/G LO 1C PRES PRESS TRANSMITTER	Aux	377	377 U-1 MSIV RM B/C
1	1PT-0544	S/G LP 1D STM PRESS PRESSURE XMTTR	Aux	377	377 U-1 MSIV RM A/D
1	1PT-0545	S/G LOOP 1D STM PRESS XMTTR	Aux	377	377 U-1 MSIV RM A/D
1	1PT-0546	S/G LP 1D STM PRESS XMTTR	Aux	377	377 U-1 MSIV RM A/D
1	1FW009A	HOV 1A S/G FW ISOL VLV	Aux	377	377 U-1 MSIV RM A/D
1	1FW009B	HOV 1B S/G FW ISOL VLV	Aux	377	377 U-1 MSIV RM B/C
1	1FW009C	HOV 1C S/G FW ISOL VLV	Aux	377	377 U-1 MSIV RM B/C
1	1FW009D	HOV 1D S/G FW ISOL VLV	Aux	377	377 U-1 MSIV RM A/D

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1FW035A	AOV 1A S/G FW TEMPERING LINE DWST ISOL VLV (EOP VLV)	Aux	377	377 U-1 MSIV RM A/D
1	1FW035B	AOV 1B S/G FW TEMPERING LINE DWST ISOL VLV (EOP VLV)	Aux	377	377 U-1 MSIV RM B/C
1	1FW035C	AOV 1C S/G FW TEMPERING LINE DWST ISOL VLV (EOP VLV)	Aux	377	377 U-1 MSIV RM B/C
1	1FW035D	AOV 1D S/G FW TEMPERING LINE DWST ISOL VLV (EOP VLV)	Aux	377	377 U-1 MSIV RM A/D
1	1FP010	AOV RX1 CNMT FP SUP ISOL VLV (EOP VLV)	Aux	374	383 U-1 AREA 5 CURVED WALL AREA
1	1DO01PA	ASSY - 1A DG 1A FO XFER PP	Aux	373	383 U-1 DIESEL OIL STORAGE TANK RMS (6-8/L-P)
1	1DO01PB	ASSY - 1B DG 1B FO XFER PP	Aux	373	383 U-1 DIESEL OIL STORAGE TANK RMS (6-8/L-P)
1	1DO01PC	ASSY - 1A DG 1C FO XFER PP	Aux	373	383 U-1 DIESEL OIL STORAGE TANK RMS (6-8/L-P)
1	1DO01PD	ASSY - 1B DG 1D FO XFER PP	Aux	373	383 U-1 DIESEL OIL STORAGE TANK RMS (6-8/L-P)
1	1DO01TA	1A DO STO TK, 25,000 GAL	Aux	373	383 U-1 DIESEL OIL STORAGE TANK RMS (6-8/L-P)
1	1DO01TB	1B DO STO TK, 25,000 GAL	Aux	373	383 U-1 DIESEL OIL STORAGE TANK RMS (6-8/L-P)
1	1DO01TC	1C DO STO TK, 25,000 GAL	Aux	373	383 U-1 DIESEL OIL STORAGE TANK RMS (6-8/L-P)
1	1DO01TD	1D DO STO TK, 25,000 GAL	Aux	373	383 U-1 DIESEL OIL STORAGE TANK RMS (6-8/L-P)
1	1DO02TA	1A DG FO DAY TK, 500 GAL	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1DO02TB	1B DG FO DAY TK	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1DO10T	U-1 DO DAY TK, 500 GAL	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1DO12MA	EXHAUST SILENCER	Aux	477	477 ROOF OF 1A & 1B DG RMS (6-10/L-Q)
1	1DO12MB	EXHAUST SILENCER	Aux	477	477 ROOF OF 1A & 1B DG RMS (6-10/L-Q)
1	1DG01EA	1A DG GENERATOR	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1DG01EB	1B DG GENERATOR	Aux	401	401 1B DG RM (6-7.7/L-Q)

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1DG01KA	ASSY - 1A DG DSL ENGINE	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1DG01KB	ASSY - 1B DG DSL ENGINE	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1DG01SA	AIR COMPRESSOR PACKAGE 1A	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1DG18MA	INTAKE SILENCER	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1DG18MB	INTAKE SILENCER	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1DG19MA	FILTER AIR INTAK 1DG01KA M-152-17	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1DG19MB	FILTER AIR INTAK 1DG01KB M-152-17	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1DG04EA	DIESEL GENERATOR 1A SYNCHRO-CHECK RELAY BOX	Aux	426	426 ESF SWGR RM - DIV 11
1	1DG04EB	DIESEL GENERATOR 1B SYNCHRO-CHECK RELAY BOX	Aux	426	426 ESF SWGR RM - DIV 12
1	1DC10J	125V DC FUSE PNL ESF 11	Aux	451	451 DIV 11 MISC ELEC EQUIP RM (9-10/L-M)
1	1DC11J	125V DC FUSE PNL ESF 12	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)
1	1CV01FA	1A CV SEAL WTR INJ FLTR	Aux	391	383 GENERAL AREA (12-15/N-Q)
1	1CV01FB	1B CV SEAL WTR INJ FLTR	Aux	391	383 GENERAL AREA (12-15/N-Q)
1	1CV01PA	ASSY - 1A CV CENT CHG PP	Aux	364	364 1A CV PUMP RM (15-17/U)
1	1CV01PA-A	1A CV CENT CHG PP AUX LUBE OIL PP	Aux	364	364 1A CV PUMP RM (15-17/U)
1	1CV01PB	ASSY - 1B CV CENT CHG PP	Aux	364	364 1B CV PUMP RM (13/Y)
1	1CV01PB-A	1B CV CENT CHG PP AUX LUBE OIL PP	Aux	364	364 1B CV PUMP RM (13/Y)
1	1CV02A	U-1 CV SEAL WTR HX	Aux	383	383 U-1 SEAL WTR HT EXCH RM (15-17/U)
1	1CV02F	U-1 CV SEAL WTR RTRN FLTR	Aux	391	383 GENERAL AREA (12-15/N-Q)
1	1CV02SA	1A CV CENT CHG PP GEAR CLR	Aux	364	364 1A CV PUMP RM (15-17/U)
1	1CV02SB	1B CV CENT CHG PP GEAR CLR	Aux	364	364 1B CV PUMP RM (13/Y)
1	1CV03SA	1A CV PP LUBE OIL CLR	Aux	364	364 1A CV PUMP RM (15-17/U)
1	1CV03SB	1B CV PP LUBE OIL CLR	Aux	364	364 1B CV PUMP RM (13/Y)
1	1CV112B	ASSY - MOV U-1 VCT OUTLET UPST ISOL VLV	Aux	426	426 AREA 6 GENERAL AREA U-1/2 VCT TANK RMS
1	1CV112C	ASSY - MOV U-1 VCT OUTLET DWST ISOL VLV	Aux	426	426 AREA 6 GENERAL AREA U-1/2 VCT TANK RMS
1	1CV112D	ASSY - MOV RWST TO U-1 CHG PPS SUCT ISOL VLV	Aux	364	364 U-1 AREA 5 CURVED WALL AREA

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1CV459	ASSY - AOV U-1 RC CL LOOP 3 LTDWN 2ND ISOL VLV (EOP VLV)	Cont	412	2
1	1CV460	ASSY - AOV U-1 RC CL LOOP 3 LTDWN 1ST ISOL VLV (EOP VLV)	Cont	377	12
1	1CV8100	ASSY - MOV U-1 RC PPS SEAL L/O HDR OUTSIDE CNMT ISOL VLV	Aux	374	383 U-1 AREA 5 CURVED WALL AREA
1	1CV8105	ASSY - MOV U-1 CV CHG PPS DSCH HDR DWST ISOL VLV	Aux	374	364 U-1 AREA 5 CURVED WALL AREA
1	1CV8106	ASSY - MOV U-1 CV CHG PPS DSCH HDR UPST ISOL VLV	Aux	374	364 U-1 AREA 5 CURVED WALL AREA
1	1CV8110	ASSY - MOV 1B CV PP MINIFLOW ISOL VLV	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1CV8111	ASSY - MOV 1A CV PP MINIFLOW ISOL VLV	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1CV8112	ASSY - MOV U-1 RC PPS SEAL L/O HDR INSIDE CNMT ISOL VLV	Cont	377	+18 (EOP VLV)
01	1CV8114	SOV 1A CV PP ESF MINIFLOW ISOL VLV (EOP VLV)	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1CV8116	SOV 1B CV PP ESF MINIFLOW ISOL VLV (EOP VLV)	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1CV8804A	ASSY - MOV 1A RH HX TO U-1 CV PPS SUCT HDR ISOL VLV	Aux	364	364 U-1 AREA 5 CURVED WALL AREA
1	1FT-0121	CHARGING LINE D/P CELL FLOW XMTTR	Aux	364	364 17-19/Q-W GENERAL AREA - AREA 6
1	1FT-0132	LETDN FLOW D/P CELL	Aux	383	383 GENERAL AREA - AREA 6 (17-19/Q-W)
1	1FT-0139	LOOP FILL HEADER FLOW XMTTR	Aux	383	383 GENERAL AREA - AREA 6 (17-19/Q-W)
1	1CV02P-C	U-1 CV PD CHG PP FLUID DRIVE OIL CLR	Aux	364	364 PDP PUMP RM (15/U)
1	1CV04AA	1A CV LTDWN HX	Aux	383	383 U-1 LETDOWN HT EXCH RM (15-17/U-V)
1	1CV04AB	1B CV LTDWN HX	Aux	383	383 U-1 LETDOWN HT EXCH RM (15-17/U-V)
1	1CV8160	ASSY - AOV U-1 LTDWN ORIFICES OUTLET HDR ISOL VLV (EOP VL	Cont	377	15

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1CO01J	CO2 FP AREA 1S2 LOC CONT CAB	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1CO02J	CO2 FP AREA 1S4 LOC CONT CAB	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1CO03J	CO2 FP AREA 1S1 LOC CONT CAB	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1CO04J	CO2 FP AREA 1S3 LOC CONT CAB	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1CO17JA	1A DG RM FIRE DMPR CONT PNL	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1CO17JB	1B DG RM FIRE DMPR CONT PNL	Aux	401	401 1B DG RM (6-7.7/L-Q)
1	1CO19JA	U-1 LCSR & CBL TNL FIRE DMPR CONT PNL	Aux	401	401 1A DG RM (7.7-10/L-Q)
1	1CO19JB	U-1 LCSR FIRE DMPR CONT PNL	Aux	439	439 GENERAL AREA (17/Q)
1	1CO20J	U-1 UCSR FIRE DMPR CONT PNL	Aux	426	426 GENERAL AREA - AREA 2 & 3 (10-21/L-Q)
1	1CC01A	U-1 CC HX	Aux	364	364 15-21/L-Q GENERAL AREA
1	1CC01T	U-1 CC SURGE TK	Aux	426	426 GENERAL AREA - AREA 2 & 3 (10-21/L-Q)
1	1CC053	SOV AOV U-1 PEN CLG SUP FCV-CBL# 1CC226	Cont	377	+16 (1HS-CC070)
1	1CC9437B	ASSY - AOV U-1 EXC LTDWN HX CC RTRN VLV (EOP VLV)	Aux	374	383 U-1 AREA 5 CURVED WALL AREA
1	1FT-0688	RESID HT EXCH 1B CCW OUT DP FLOW XMTTR	Aux	364	364 17-19/Q-W GENERAL AREA - AREA 6
1	1FT-0689	RESID HX 1A CCW OUT DP FLOW XMTTR	Aux	364	364 15-21/L-Q GENERAL AREA
1	1CC9412A	ASSY - MOV 1A RH HX 1RH02AA CC OUTLET ISOL VLV	Aux	364	364 17-19/Q-W GENERAL AREA - AREA 6
1	1CC9412B	ASSY - MOV 1B RH HX 1RH02AB CC OUTLET ISOL VLV	Aux	364	364 17-19/Q-W GENERAL AREA - AREA 6
1	1AP05E	ASSY - 4160V ESF SWGR 141	Aux	426	426 ESF SWGR RM - DIV 11
1	1AP06E	ASSY - 4160V ESF SWGR 142	Aux	426	426 ESF SWGR RM - DIV 12
1	1AP12E	ASSY - 480V ESF SWGR 132X	Aux	426	426 ESF SWGR RM - DIV 12
1	1AP22E	ASSY - 480V AUX BLDG ESF MCC 131X3	Aux	383	383 15-21/N-Q GENERAL AREA
1	1AP23E	ASSY - 480V AUX BLDG ESF MCC 132X1	Aux	364	364 15-21/L-Q GENERAL AREA
1	1AP24E	ASSY - 480V AUX BLDG ESF MCC 132X3	Aux	383	383 15-21/N-Q GENERAL AREA
1	1AP26E	ASSY - 480V AUX BLDG ESF MCC 131X4	Aux	414	414 CURVED WALL AREA - AREA 5
1	1AP28E	ASSY - 480V AUX BLDG ESF MCC 132X4	Aux	426	426 AREA 5 CURVED WALL AREA
1	1AP30E	ASSY - 480V AUX BLDG ESF MCC 131X5	Aux	426	426 GENERAL AREA - AREA 2 & 3 (10-21/L-Q)

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1AP32E	ASSY - 480V AUX BLDG ESF MCC 132X5	Aux	426	426 GENERAL AREA - AREA 2 & 3 (10-21/L-Q)
1	1AP39E	ASSY - 480V AUX BLDG MCC 134V1	Aux	346	346 10-18/L-N GENERAL AREA
1	1AF006B	ASSY - MOV 1B AF PP SX SUCT DWST ISOL VLV	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF017A	ASSY - MOV 1A AF PP SX SUCT UPST ISOL VLV	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01AA	1A MTR DRV AF PP OIL CLR	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01AB	1B DSL DRV AF PP OIL CLR	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01EA-1	1B DSL DRV AF PP 1B BATT CHGR	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01EA-A	1B DSL DRV AF PP #1 BATT	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01EA-B	1B DSL DRV AF PP #1A BATT	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01EB-1	1B DSL DRV AF PP 1B BATT CHGR	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01EB-A	1B DSL DRV AF PP #2 BATT	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01EB-B	1B DSL DRV AF PP #2A BATT	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01J	1B DSL DRV AF PP STARTUP CONT PNL	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01PA	ASSY - 1A MTR DRV AF PP	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01PA-A	1A MTR DRV AF PP AUX LUBE OIL PP	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01PA-L	1A MTR DRV AF PP MAIN LUBE OIL PP	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01PA-M	1A MTR DRV AF PP MOTOR	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01PB	ASSY - 1B DSL DRV AF PP	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01PB-A	1B DSL DRV AF PP AUX LUBE OIL PP	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01PB-B	1B DSL DRV AF PP CONT JB	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01PB-K	1B DSL DRV AF PP DIESEL ENGINE	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF01PB-L	1B DSL DRV AF PP MAIN LUBE OIL PP	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1AF02A	1B DSL DRV AF PP GEAR OIL CLR	Aux	383	383 U-1 AFW PUMP RM (15-18/L-N)
1	1FT-AF011	AUX FW TO SG 1A FLOW XMTTR	Aux	364	364 10-15/N-Q GENERAL AREA
1	1FT-AF012	AUX FW TO SG 1A FLOW XMTTR	Aux	364	364 10-15/N-Q GENERAL AREA
1	1FT-AF013	AUX FW TO SG 1B FLOW XMTTR	Aux	364	364 10-15/N-Q GENERAL AREA
1	1FT-AF014	AUX FW TO SG 1B FLOW XMTTR	Aux	364	364 10-15/N-Q GENERAL AREA
1	1FT-AF015	AUX FW TO SG 1C FLOW XMTTR	Aux	364	364 10-15/N-Q GENERAL AREA
1	1FT-AF016	AUX FW TO SG 1C FLOW XMTTR	Aux	364	364 10-15/N-Q GENERAL AREA
1	1FT-AF017	AUX FW TO SG 1D FLOW XMTTR	Aux	364	364 10-15/N-Q GENERAL AREA
1	1FT-AF018	AUX FW TO SG 1D FLOW XMTTR	Aux	364	364 10-15/N-Q GENERAL AREA

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1PL06J	REMOTE CONTROL PANEL (Remote Shutdown Panel)	Aux	383	383 U-1 REMOTE SHUTDOWN RM / AREA (23-24/N-P)
1	1WO007A	ISOLATION VALVE - CHECK VALVE	Cont	401	7
1	1WO007B	ISOLATION VALVE - CHECK VALVE	Cont	401	2
1	1WM191	ISOLATION VALVE - CHECK VALVE	Cont	377	12
1	1WE010A	SX STRAINER DRAIN MANUAL ISOLATION VALVE	Aux	330	
1	1WE010B	SX STRAINER DRAIN MANUAL ISOLATION VALVE	Aux	330	
1	1VX01Y	DAMPER MOD FO 40WX56H	Aux	426	
1	1VX04Y	DAMPER MOD FO 72WX46H	Aux	426	
1	1VX30Y	DAMPER MOD FC 24WX36H	ESWCT	888	
1	1VX31Y	DAMPER ISO FC 48WX24H	ESWCT	874	
1	1VX33Y	DAMPER MOD FC 24WX36H	ESWCT	888	
1	1VX34Y	DAMPER ISO FC 48WX24H	ESWCT	874	
1	1VQ003	AOV U-1 POST LOCA PURGE FLTR INLET VLV (EOP VLV)	Aux	467	6
1	1VQ004A	AOV U-1 MINIFLOW PURGE SUP INSIDE ISOL VLV	Cont	455	6
1	1VQ004B	AOV U-1 MINIFLOW PURGE SUP OUTSIDE ISOL VLV	Aux	451	12
1	1VQ005A	AOV U-1 MINIFLOW PURGE EXJ INSIDE ISOL VLV	Cont	471	3
1	1VQ005B	AOV U-1 MINIFLOW PURGE EXH OUTSIDE UPST ISOL VLV (EOP VLV	Aux	467	
1	1VQ005C	AOV U-1 MINIFLOW PURGE EXH OUTSIDE DWST ISOL VLV (EOP VLV	Aux	467	
1	1VD01YA	DAMPER MOD FO 72WX48H	Aux	401	
1	1VD01YB	DAMPER MOD FO 72WX48H	Aux	401	
1	1VD09YA	DAMPER MOD FO 72WX48H	Aux	401	
1	1VD09YB	DAMPER MOD FO 72WX48H	Aux	401	
1	1VD16YA	DAMPER FIRE SLV-60WX43H	Aux	401	
1	1VD16YB	DAMPER FIRE SLV-60WX43H	Aux	401	
1	1VD17YA	DAMPER FIRE SLV-55WX59H	Aux	401	
1	1VD17YB	DAMPER FIRE SLV-55WX59H	Aux	401	

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1VD23YA	DAMPER FIRE SLV-60WX43H	Aux	401	
1	1VD23YB	DAMPER FIRE SLV-60WX43H	Aux	401	
1	1VD24YA	DAMPER FIRE SLV-55WX59H	Aux	401	
1	1VD24YB	DAMPER FIRE SLV-55WX59H	Aux	401	
1	1SX004	ASSY - MOV U-1 CC HX 1CC01A SX SUP ISOL VLV	Aux	330	11
1	1SX005	ASSY - MOV U-0 CC HX 0CC01A SX SUP ISOL VLV	Aux	330	+06 (EOP VLV)
01	1SX007	ASSY - MOV U-1 CC HX 1CC01A SX OUTLET ISOL VLV	Aux	346	+13 (EOP VLV)
01	1SX010	ASSY - MOV SXCT BASIN 1A RTRN HDR ISOL VLV	Aux	346	+07 (EOP VLV)
01	1SX011	ASSY - MOV SXCT BASIN 1A/1B RTRN HDR XTIE ISOL VLV	Aux	346	+07 (EOP VLV)
01	1SX016A	ASSY - MOV 1A & 1C RCFC SX SUP ISOL VLV	Aux	374	+29 (EOP VLV), P-15
01	1SX016B	ASSY - MOV 1B & 1D RCFC SX SUP ISOL VLV	Aux	401	+02 (EOP VLV), P-7
01	1SX027A	ASSY - MOV 1A & 1C RCFC SX RTRN HDR ISOL VLV	Aux	374	+29 (EOP VLV), P-14
01	1SX027B	ASSY - MOV 1B & 1D RCFC SX RTRN HDR ISOL VLV	Aux	401	+02 (EOP VLV), P-9
01	1SX104A	U-1 DG'S JW HXS SX SUP HDR XTIE ISOL VLV	Aux	401	14
1	1SX150A	ASSY - MOV 1A SX STRN BKWH OUTLET TO TR SYS ISOL VLV	Aux	330	1
1	1SX150B	ASSY - MOV 1B SX STRN BKWH OUTLET TO TR SYS ISOL VLV	Aux	330	1
1	1SX168	ASSY - AOV 1B AF PP CUB CLR 1VA08S SX OUTLET VLV	Aux	383	10
1	1SX192A	1A SX PP DSCH HYPO SUP CHK VLV	Aux	330	12
1	1SX192B	1B SX PP DSCH HYPO SUP CHK VLV	Aux	330	10
1	1SX194	AF PPS RECIRC RTRN TO SX CHK VLV	Aux	383	11
1	1SX243	1A AF PP SX SUCT FLUSH CONN 2ND ISOL VLV	Aux	383	7

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1SX033	MOV 1A SX PP DSCH HDR XTIE ISOL VLV	Aux	330	+05 (EOP VLV)
01	1SX034	MOV 1B SX PP DSCH HDR XTIE ISOL VLV	Aux	330	+05 (EOP VLV)
01	1SX104B	U-1 DG'S JW HXS SX RTRN HDR XTIE ISOL VLV	Aux	401	8
1	1SX105A	U-1 DG'S JW HXS SX SUP HDR XTIE ISOL VLV	Aux	401	14
1	1SX105B	U-1 DG'S JW HXS SX RTRN HDR XTIE ISOL VLV	Aux	401	8
1	1SX136	ASSY - MOV SX BASIN 1B RTRN HDR ISOL VLV	Aux	346	7
1	1SI8804B	ASSY - MOV 1B RH HX TO 1B SI PP SUCT HDR ISOL VLV	Aux	364	+15 (EOP VLV)
01	1SI8807A	ASSY - MOV SI TO U-1 CV PPS SUCT HDR 1A XTIE ISOL VLV	Aux	364	+02 (EOP VLV)
01	1SI8807B	ASSY - MOV SI TO U-1 CV PPS SUCT HDR 1B XTIE ISOL VLV	Aux	364	+03 (EOP VLV)
01	1SI8808A	ASSY - MOV 1A ACCUM 1SI04TA OUTLET ISOL VLV	Cont	412	+01 (EOP VLV)
01	1SI8808B	ASSY - MOV 1B ACCUM 1SI04TB OUTLET ISOL VLV	Cont	412	+01 (EOP VLV)
01	1SI8808C	ASSY - MOV 1C ACCUM 1SI04TC OUTLET ISOL VLV	Cont	412	+01 (EOP VLV)
01	1SI8808D	ASSY - MOV 1D ACCUM 1SI04TD OUTLET ISOL VLV	Cont	412	+01 (EOP VLV)
01	1SI8809B	ASSY - MOV 1B RH HX SI OUTLET DWST ISOL VLV	Aux	374	+14 (EOP VLV)
01	1SI8815	U-1 COLD LEG HDR SI SUP CHK VLV	Cont	377	20
1	1SI8818A	LOOP 1 COLD LEG ACCUM INJ CHK VLV	Cont	412	10
1	1SI8818B	LOOP 2 COLD LEG ACCUM INJ CHK VLV	Cont	412	6
1	1SI8818C	LOOP 3 COLD LEG ACCUM INJ CHK VLV	Cont	377	10
1	1SI8818D	LOOP 4 COLD LEG ACCUM INJ CHK VLV	Cont	377	12
1	1SI8819A	LOOP 1 COLD LEG SI CHK VLV	Cont	412	3
1	1SI8819B	LOOP 2 COLD LEG SI CHK VLV	Cont	412	2
1	1SI8819C	LOOP 3 COLD LEG SI CHK VLV	Cont	377	5
1	1SI8819D	LOOP 4 COLD LEG SI CHK VLV	Cont	377	10

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1SI8856A	1A RH HX TO 1A/1D LOOP CL RLF VLV	Aux	374	+15 P-50 UPST 1SI8809A
01	1SI8856B	1B RH HX TO 1B/1C LOOP CL RLF VLV	Aux	374	+14 P-51 UPST 1SI8809B
01	1SI8948A	1A ACCUM OUTLET TO RC LOOP 1 2ND CHK VLV	Cont	390	4
1	1SI8948B	1B ACCUM OUTLET TO RC LOOP 2 2ND CHK VLV	Cont	390	4
1	1SI8948C	1C ACCUM OUTLET TO RC LOOP 3 2ND CHK VLV	Cont	390	4
1	1SI8948D	1D ACCUM OUTLET TO RC LOOP 4 2ND CHK VLV	Cont	390	4
1	1SI8949A	LOOP 1 HOT LEG RH SUCT CHK VLV	Cont	377	8
1	1SI8949B	LOOP 2 HOT LEG RH SUCT CHK VLV	Cont	390	5
1	1SI8949C	LOOP 3 HOT LEG RH SUCT CHK VLV	Cont	377	8
1	1SI8949D	LOOP 4 HOT LEG RH SUCT CHK VLV	Cont	390	5
1	1SI8956A	1A ACCUM OUTLET TO RC LOOP 1 1ST CHK VLV	Cont	377	7
1	1SI8956B	1B ACCUM OUTLET TO RC LOOP 2 1ST CHK VLV	Cont	377	9
1	1SI8956C	1C ACCUM OUTLET TO RC LOOP 3 1ST CHK VLV	Cont	377	9
1	1SI8956D	1D ACCUM OUTLET TO RC LOOP 4 1ST CHK VLV	Cont	390	5
1	1SI8841A	LOOP 3 HOT LEG RH SUCT 1ST CHK VLV	Cont	377	8
1	1SI8841B	LOOP 1 HOT LEG RH SUCT 1ST CHK VLV	Cont	377	2
1	1RY086A	1A PORV ACCUM 1RY32MA AIR INLET 2ND CHK VLV	Cont	451	4
1	1RY086B	1B PORV ACCUM 1RY32MB AIR INLET 2ND CHK VLV	Cont	451	4
1	1RY8030	ASSY - AOV U-1 PRT PW SUP INSIDE CNMT ISOL VLV	Cont	390	+1 ABOVE PRT
01	1RY8031	ASSY - AOV U-1 PRT TO RCDT DRN VLV	Cont	377	+3 W OF PRT
01	1RY8046	U-1 PRT 1RY01T PW SUP CHK VLV	Cont	377	18
1	1RY8081	U-1 VLV L/O TO PRT 1RY01T CHK VLV	Cont	390	6
1	1RH606	ASSY - AOV 1A RH HX 1RH02AA OUTLET VLV (EOP VLV)	Aux	357	10

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1RH607	ASSY - AOV 1B RH HX 1RH02AB OUTLET VLV (EOP VLV)	Aux	357	11
1	1RH618	ASSY - AOV 1A RH HX 1RH02AA BYP VLV (EOP VLV)	Aux	357	10
1	1RH619	ASSY - AOV 1B RH HX 1RH02AB BYP VLV (EOP VLV)	Aux	357	10
1	1RH8708A	1A RH PP SUCT HDR RLF VLV	Aux	364	16
1	1RH8708B	1B RH PP SUCT HDR RLF VLV	Aux	364	16
1	1RH8734A	1A RH HX OUTLET TO LTDWN HX ISOL VLV (EOP VLV)	Aux	364	1
1	1RH8734B	1B RH HX OUTLET TO LTDWN HX ISOL VLV (EOP VLV)	Aux	364	1
1	1RH8735	U-1 RH RECIRC TO RWST ISOL VLV (EOP VLV)	Aux	364	12
1	1RE1003	AOV U-1 RCDT PP DSCH INSIDE CNMT ISOL VLV (EOP VLV)	Cont	377	11
1	1RC8003A	ASSY - MOV 1A RC LOOP BYP VLV	Cont	390	4
1	1RC8003B	ASSY - MOV 1B RC LOOP BYP VLV	Cont	390	4
1	1RC8003C	ASSY - MOV 1C RC LOOP BYP VLV	Cont	390	4
1	1RC8003D	ASSY - MOV 1D RC LOOP BYP VLV	Cont	390	+04 BTWN HL & CL
01	1RC8037A	ASSY - AOV 1A RC LOOP DRN VLV (EOP VLV)	Cont	377	1
1	1RC8037B	ASSY - AOV 1B RC LOOP DRN VLV (EOP VLV)	Cont	377	1
1	1RC8037C	ASSY - AOV 1C RC LOOP DRN VLV (EOP VLV)	Cont	377	1
1	1RC8037D	ASSY - AOV 1D RC LOOP DRN VLV (EOP VLV)	Cont	377	3
1	1RC8038A	1A RC LOOP CVCS FILL ISOL VLV	Cont	377	9
1	1RC8038B	1B RC LOOP CVCS FILL ISOL VLV	Cont	377	+10 BTWN 1B S/G & RCP
01	1RC8038C	1C RC LOOP CVCS FILL ISOL VLV	Cont	377	9
1	1RC8038D	1D RC LOOP CVCS FILL ISOL VLV	Cont	377	9
1	1RC8040A	1A RC LOOP HL DRN VLV	Cont	377	7
1	1RC8040B	1B RC LOOP HL DRN VLV	Cont	377	7
1	1RC8040C	1C RC LOOP HL DRN VLV	Cont	377	7

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1RC8040D	1D RC LOOP HL DRN VLV	Cont	377	7
1	1RC8045A	1A RC LOOP BYP VLV 1RC8003A DISC PRESS EQUAL/OVERPRESS CH	Cont	390	1
1	1RC8045B	1B RC LOOP BYP VLV 1RC8003B DISC PRESS EQUAL/OVERPRESS CH	Cont	390	1
1	1RC8045C	1C RC LOOP BYP VLV 1RC8003C DISC PRESS EQUAL/OVERPRESS CH	Cont	390	1
1	1RC8045D	1D RC LOOP BYP VLV 1RC8003D DISC PRESS EQUAL/OVERPRESS CH	Cont	390	1
1	1RC8057	1D RC LOOP CL DRN 1ST ISOL VLV	Cont	377	+5 ABOVE RECIRC SUMP
01	1MS021A	1A S/G MS OUTLET HDR DRN DWST ISOL VLV (EOP VLV)	MSIV	377	5
1	1MS021B	1B S/G MS OUTLET HDR DRN DWST ISOL VLV (EOP VLV)	MSIV	377	5
1	1MS021C	1C S/G MS OUTLET HDR DRN DWST ISOL VLV (EOP VLV)	MSIV	377	6
1	1MS021D	1D S/G MS OUTLET HDR DRN DWST ISOL VLV (EOP VLV)	MSIV	377	6
1	1MS101A	ASSY - AOV 1A MSIV BYP VLV (EOP VLV)	MSIV	377	15
1	1MS101B	ASSY - AOV 1B MSIV BYP VLV (EOP VLV)	MSIV	377	15
1	1MS101C	ASSY - AOV 1C MSIV BYP VLV (EOP VLV)	MSIV	377	15
1	1MS101D	ASSY - AOV 1D MSIV BYP VLV (EOP VLV)	MSIV	377	15
1	1FW036A	1A S/G FW TEMPERING LINE CHK VLV	MSIV	377	10
1	1FW036B	1B S/G FW TEMPERING LINE CHK VLV	MSIV	377	10
1	1FW036C	1C S/G FW TEMPERING LINE CHK VLV	MSIV	377	10
1	1FW036D	1D S/G FW TEMPERING LINE CHK VLV	MSIV	377	10
1	1FW039A	AOV 1A FW PREHTR BYP DWST ISOL VLV (EOP VLV)	MSIV	377	15
1	1FW039B	AOV 1B FW PREHTR BYP DWST ISOL VLV (EOP VLV)	MSIV	377	12
1	1FW039C	AOV 1C FW PREHTR BYP DWST ISOL VLV (EOP VLV)	MSIV	377	15
1	1FW039D	AOV 1D FW PREHTR BYP DWST ISOL VLV (EOP VLV)	MSIV	377	15
1	1FW043A	AOV 1A S/G FWIV BYP VLV (EOP VLV)	MSIV	377	2

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1FW043B	AOV 1B S/G FWIV BYP VLV (EOP VLV)	MSIV	377	3
1	1FW043C	AOV 1C S/G FWIV BYP VLV (EOP VLV)	MSIV	377	3
1	1FW043D	AOV 1D S/G FWIV BYP VLV (EOP VLV)	MSIV	377	3
1	1FW079A	1A S/G FW SUP CHK VLV	MSIV	377	15
1	1FW079B	1B S/G FW SUP CHK VLV	MSIV	377	15
1	1FW079C	1C S/G FW SUP CHK VLV	MSIV	377	15
1	1FW079D	1D S/G FW SUP CHK VLV	MSIV	377	15
1	1FP345	RX1 CNMT FP SUP CHK VLV	Cont	377	13
1	1FC009	ISOLATION VALVE	Cont	377	10
1	1FC012	ISOLATION VALVE	Cont	377	14
1	1DO055A	1A & 1C DO XFER PP RECIRC TO STO TK ISOL VLV	Aux	373	+20 NE OF 1C DO STO TK
01	1DO055B	1B & 1D XFER PP RECIRC TO DO STO TK ISOL VLV	Aux	373	23
1	1CV01AA	1A CV EXC LTDWN HX	Cont	401	15
1	1CV01AB	1B CV EXC LTDWN HX	Cont	401	15
1	1CV121	ASSY - AOV U-1 CV PPS DSCH HDR FCV (EOP VLV)	Aux	364	7
1	1CV184	ASSY - AOV U-1 RC LOOP FILL HDR FCV	Aux	364	+26 BELOW BIT N WALL
01	1CV8117	U-1 LTDWN ORIFICE OUTLET HDR RLF VLV	Cont	412	+10 6' FROM RO5
1	1CV8121	U-1 PRT 1RY01T RLF VLV	Cont	377	+22 8' FROM RO5 ON WALL
1	1CV8123	U-1 SEAL WTR HX INLET HDR RLF VLV	Aux	383	+5 1' FROM 1A LTDWN HX RM WAL
1	1CV8124	U-1 CV CHG PP SUCT HDR RLF VLV	Aux	364	+7 4' E OF S
1	1CV8145	ASSY - AOV U-1 PZR AUX SPRAY HDR ISOL VLV (EOP VLV)	Cont	412	2
1	1CV8355A	ASSY - MOV 1A RC PP SEAL WTR INJ INLET ISOL VLV	Aux	374	+18 (EOP VLV), P-33
01	1CV8355B	ASSY - MOV 1B RC PP SEAL WTR INJ INLET ISOL VLV	Aux	374	+12 (EOP VLV), P-53
01	1CV8355C	ASSY - MOV 1C RC PP SEAL WTR INJ INLET ISOL VLV	Aux	374	+12 (EOP VLV), P-53
01	1CV8355D	ASSY - MOV 1D RC PP SEAL WTR INJ INLET ISOL VLV	Aux	374	+18 (EOP VLV), P-33
01	1CV8377	U-1 PZR 1RY01S AUX SPRAY HDR CHK VLV	Cont	401	15

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1CV8378A	U-1 RC CL LOOP 2 CHG WTR INLET 2ND CHK VLV	Cont	377	2
1	1CV8379A	U-1 RC CL LOOP 1 CHG WTR INLET 2ND CHK VLV	Cont	377	2
1	1CV8387A	1A CV PP DSCH FCV BYP VLV (EOP VLV)	Aux	364	9
1	1CV8387B	1B CV PP DSCH FCV BYP VLV (EOP VLV)	Aux	364	9
1	1CV8394	U-1 CV PD CHG PP 1CV02P SUCT ISOL VLV	Aux	364	3
1	1CV8399	U-1 SEAL WTR RTRN FLTR 1CV02F BYP VLV	Aux	383	+2 FLTR VLV AISLE
01	1CV8442	U-1 CV EMER BORATION INLET CHK VLV	Aux	426	2
1	1CV8445	PW TO U-1 CV EMER BORATE CHK VLV	Aux	426	2
1	1CV8482	U-1 SEAL WTR HX OUTLET TO VCT ISOL VLV (EOP VLV)	Aux	426	2
1	1CV8497	U-1 CV PDCP 1CV02P DSCH CHK VLV	Aux	364	4
1	1CS009A	CS PUMP 1A SUMP SUCTION VALVE - MOV	Aux	343	+05 (EOP VLV)
01	1CS009B	CS PUMP 1B SUMP SUCTION VALVE - MOV	Aux	343	+01 (EOP VLV)
01	1CS007A	MOV 1A CS PP DSCH HDR ISOL VLV	Aux	374	+33 (EOP VLV), ABOVE 1A REC
01	1CS007B	MOV 1B CS PP DSCH HDR ISOL VLV	Aux	374	+34 (EOP VLV), ABOVE 1B REC
01	1CS008A	1A CS PP 1CS01PA SPRAY NOZL HDR CHK VLV	Cont	401	2
1	1CS008B	1B CS PP 1CS01PB SPRAY NOZL HDR CHK VLV	Cont	401	2
1	1CC050	ASSY - AOV U-1 PRI WALL PEN CLG FCV	Cont	377	17
1	1CC051	U-1 PRI WALL PEN CLG RTRN CHK VLV	Cont	377	6
1	1CC060	U-1 PEN CLG RTRN CHK VLV	Cont	377	30
1	1CC061	U-1 PEN CLG RTRN CHK VLV	Cont	412	6
1	1CC062	U-1 PEN CLG RTRN CHK VLV	Cont	412	7
1	1CC070A	WM M/U TO U-1 CC SURGE TK 1CC01T INLET CHK VLV	Aux	426	3
1	1CC070B	PW M/U TO U-1 CC SURGE TK 1CC01T INLET CHK VLV	Aux	426	3
1	1CC130A	ASSY - AOV 1A LTDWN HX OUTLET TCV (EOP VLV)	Aux	383	5
1	1CC130B	ASSY - AOV 1B LTDWN HX OUTLET TCV (EOP VLV)	Aux	383	5

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1CC685	ASSY - MOV U-1 RC PPS THERM BARR CC RTRN ISOL VLV	Aux	374	+21 (EOP VLV)
01	1CC9413A	ASSY - MOV U-1 RC PPS CC SUP UPST ISOL VLV	Aux	374	+23 (EOP VLV)
01	1CC9413B	ASSY - MOV U-1 RC PPS CC SUP DWST ISOL VLV	Aux	374	+23 (EOP VLV)
01	1CC9414	ASSY - MOV U-1 RC PPS CC RTRN OUTSIDE CNMT ISOL VLV	Aux	374	+23 (EOP VLV)
01	1CC9415	ASSY - MOV U-1 SERV LOOP ISOL VLV	Aux	364	+09 (EOP VLV)
01	1CC9416	ASSY - MOV U-1 RC PPS CC RTRN INSIDE CNMT ISOL VLV	Cont	377	+24 (EOP VLV)
01	1CC9427	U-1 PEN CLG RTRN RLF VLV (EOP VLV)	Cont	377	21
1	1CC9437A	ASSY - AOV U-1 EXC LTDWN HX CC SUP VLV (EOP VLV)	Aux	374	13
1	1CC9438	ASSY - MOV U-1 RC PPS THERM BARR CC RTRN ISOL VLV	Cont	377	+17 (EOP VLV)
01	1CC9473A	ASSY - MOV U-1 CC PP DSCH HDR 1A XTIE ISOL VLV	Aux	364	+10 (EOP VLV)
01	1CC9473B	ASSY - MOV U-1 CC PP DSCH HDR 1B XTIE ISOL VLV	Aux	364	+10 (EOP VLV)
01	1CC9422A	1A RH HX CC OUTLET HDR RLF VLV	Aux	357	9
1	1CC9422B	1B RH HX CC OUTLET HDR RLF VLV	Aux	364	12
1	1AF001A	U-1 CST 1CD01T TO 1A AF PP 1AF01PA SUCT CHK VLV	Aux	383	10
1	1AF001B	U-1 CST 1CD01T TO 1B AF PP 1AF01PB SUCT CHK VLV	Aux	383	10
1	1AF004A	ASSY - AOV 1A AF PP 1AF01PA DSCH VLV (EOP VLV)	Aux	383	6
1	1AF004B	ASSY - AOV 1B AF PP 1AF01PB DSCH VLV (EOP VLV)	Aux	383	1
1	1AF005A	ASSY - AOV 1A AF PP DSCH TO 1A S/G FCV (EOP VLV)	Aux	364	4
1	1AF005B	ASSY - AOV 1A AF PP DSCH TO 1B S/G FCV (EOP VLV)	Aux	364	5

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1AF005C	ASSY - AOV 1A AF PP DSCH TO 1C S/G FCV (EOP VLV)	Aux	364	4
1	1AF005D	ASSY - AOV 1A AF PP DSCH TO 1D S/G FCV (EOP VLV)	Aux	364	5
1	1AF005E	ASSY - AOV 1B AF PP DSCH TO 1A S/G FCV (EOP VLV)	Aux	364	4
1	1AF005F	ASSY - AOV 1B AF PP DSCH TO 1B S/G FCV (EOP VLV)	Aux	364	5
1	1AF005G	ASSY - AOV 1B AF PP DSCH TO 1C S/G FCV (EOP VLV)	Aux	364	5
1	1AF005H	ASSY - AOV 1B AF PP DSCH TO 1D S/G FCV (EOP VLV)	Aux	364	5
1	1AF013A	ASSY - MOV 1A AF PP DSCH HDR TO 1A S/G ISOL VLV	Aux	367	+01 (EOP VLV)
01	1AF013B	ASSY - MOV 1A AF PP DSCH HDR TO 1B S/G ISOL VLV	Aux	362	+01 (EOP VLV)
01	1AF013C	ASSY - MOV 1A AF PP DSCH HDR TO 1C S/G ISOL VLV	Aux	362	+01 (EOP VLV)
01	1AF013D	ASSY - MOV 1A AF PP DSCH HDR TO 1D S/G ISOL VLV	Aux	367	+01 (EOP VLV)
01	1AF013E	ASSY - MOV 1B AF PP DSCH HDR TO 1A S/G ISOL VLV	Aux	367	+01 (EOP VLV)
01	1AF013F	ASSY - MOV 1B AF PP DSCH HDR TO 1B S/G ISOL VLV	Aux	362	+01 (EOP VLV)
01	1AF013G	ASSY - MOV 1B AF PP DSCH HDR TO 1C S/G ISOL VLV	Aux	362	+01 (EOP VLV)
01	1AF013H	ASSY - MOV 1B AF PP DSCH HDR TO 1D S/G ISOL VLV	Aux	367	+01 (EOP VLV)
01	1AF022A	ASSY - AOV 1A AF PP DSCH TO CST RECIRC VLV (EOP VLV)	Aux	383	1
1	1AF022B	ASSY - AOV 1B AF PP DSCH TO CST RECIRC VLV (EOP VLV)	Aux	383	1
1	1AF024	ASSY - AOV U-1 AF PPS DSCH TO SX RECIRC VLV (EOP VLV)	Aux	383	15

UNIT	ID	DESCRIPTION	BUILDING	ELEVATION	LOCATION
1	1AB8629A	U-1 CV CHARGING PUMP TO RECYCLE EVAPORATOR DEMINERALIZER	Aux		

Table B-2. Base List 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 ISOL	AUX	364	12 S
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

ID	Description	Building	Elevation	Column
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

Table B-3. SWEL 1

ID	DESCRIPTION	CLASS	BUILDING	ELEVATION	LOCATION	SYSTEM	Seismic Cat. 1?	Safety Function(s)	New or Replace ?	IPEEE Enhancement?	Comments
1SX01FB	1B SX PP DSCH STRN	(00) Other	Auxiliary	330	330 18-23/	SX	Y	UHS			
0SX162A	ASSY - MOV 0A SXCT TO BASIN BYP VLV	(08) Motor-Operated and Solenoid-Operated Valves	ESWCT	872	+01 0A VLV RM, (EOP VLV)	SX	Y	UHS			
1AP21E	480V AUX BLDG ESF MCC 131X1 XFORMER	(04) Transformers	Auxiliary	364	364 U-1 AR	AP	Y	SSAC		Y	
1AF006B	AUXILIARY FEEDWATER PMP 1B SX SUCT VLV ASMBLY; 6"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	383	All	AF	Y	DHR			
1AP22E	480V AUX BLDG ESF MCC 131X3 ASMBLY	(01) Motor Control Centers	Auxiliary	383	All	AP	Y	SSAC		Y	
1AF017B	AUXILIARY FEEDWATER PMP 1B SX SUCT VLV ASMBLY; 6"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	383	All	AF	Y	DHR			
1AP24E	EQ 480 V AUX BLDG ESF MCC 132X3 ASMBLY	(01) Motor Control Centers	Auxiliary	383	All	AP	Y	SSAC		Y	
1CC685	CC FROM RC PMPS THERMAL BARRIER ISOL VLV ASMBLY; 3"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	395	383 U-374+21 U1 AR	CC	Y	CF			Penetration # 24
0VC08Y	TRAIN B MAKEUP AIR FLTR UNIT FAN 0B DISCH FLOW CONTROL	(10) Air Handlers	Auxiliary	463	463 HVAC G	VC	Y	SSHVAC			
1AP27E	EQ 480V AUX BLDG MCC 132X2 ASMBLY	(01) Motor Control Centers	Auxiliary	426	426 AREA 5	AP	Y	SSAC		Y	
1CV112E	RWST TO CHG PMPS SUCT VLV (C/S AT 1PM05J) ASMBLY; 8"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	364	364 U-1 AR	CV		RCIC		Y	
0VC09Y	TRAIN B EMERGENCY MAKEUP INTAKE FROM TURB BLDG	(10) Air Handlers	Auxiliary	451	451 U-2 HV	VC	Y	SSHVAC			
1AP38E	ASSY - 480V AUX BLDG MCC 133X1A	(01) Motor Control Centers	Auxiliary	346	346 10-18/	AP	Y	SSAC		Y	
1VA02SB	1B RHR PUMP ROOM CUB CLR ASMBLY	(10) Air Handlers	Auxiliary	346	346 1B RH	VA	Y	SSHVAC			
1AP99E	ASSY - 480V ESF SXCT UNIT SUBSTA 131Z, NORTH ELEC RM	(01) Motor Control Centers	ESWCT	874	ESWCT	AP		SSAC		Y	
1MS018A	S/G 1A PORV ASMBLY; 8"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	401	401 U-1 MS	MS	Y	DHR	Y		
1VA06SA	COOLER,CENTRIFUGAL CHARGING PUMP 1A	(10) Air Handlers	Auxiliary	364	364 1A CV	VA	Y	SSHVAC			
1AP06E	4160 VOLT ESF SWITCH BUS 142	(03) Medium Voltage Switchgear	Auxiliary	426	426 ESF SW	AP	Y	SSAC			
1MS018B	S/G 1B PORV ASMBLY; 8"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	401	401 U-1 MS	MS	Y	DHR	Y		
1VA08CB	1B DIESEL DRIVEN AF PUMP CUBICLE CLR (1VA08S) 1B FAN	(10) Air Handlers	Auxiliary	383	All	VA	Y	SSHVAC			
1AP11E	EQ 480V ESF UNIT SUB 131X TRANSFORMER 1AP086	(04) Transformers	Auxiliary	426	426 ESF SW	AP	Y	SSAC		Y	
1RH8702A	RC LOOP 1C TO RH PMP 1B SUCT ISOL VLV ASMBLY; 12"	(08) Motor-Operated and Solenoid-Operated Valves	Cont	377	OMB PEN 75	RH	Y	CF			
1VP01AA	CNMT ESS'L SERVICE WATER COIL 1A (RCFC)	(10) Air Handlers	Cont	377	377-R-16	VP	Y	CF			
1AF01PB	DIESEL DRIVEN AUX FEED PUMP 1B_ASMBLY	(05) Horizontal Pumps	Auxiliary	383	All	AF	Y	DHR	Y		PRA:F-V=4.16E-02, RAW=5.10
1RY8028	PW TO PRT CONTAINMENT ISOLATION VLV	(08) Motor-Operated and Solenoid-Operated Valves	Aux RXB1	387	374 + 13 12U P-44	RY	Y	CF			Penetration #44

ID	DESCRIPTION	CLASS	BUILDING	ELEVATION	LOCATION	SYSTEM	Seismic Cat. 1?	Safety Function(s)	New or Replace ?	IPEEE Enhancement?	Comments
1DC10J	125V DC FUSE PANEL - DIV. 11	(14) Distribution Panels	Auxiliary	451	451 DIV 11	DC	Y	SSDC			
1CC01PB	1B PUMP, COMPONENT COOLING 12X14-18 M66-3 ASMBLY	(05) Horizontal Pumps	Auxiliary	364	364 15-21/	CC	Y	DHS			PRA:F-V=8.337E-03,RAW=1.07
1SI8804B	ASSY - MOV 1B RH HX TO 1B SI PP SUCT HDR ISOL VLV	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	364	364 UNIT 1	SI	Y	RCIC			
1DC11J	125V DC FUSE PANEL - DIV. 12	(14) Distribution Panels	Auxiliary	451	451 DIV 12	DC	Y	SSDC			
1CV01PB	PUMP,1B CENTRIFUGAL CHARGING ASMBLY	(05) Horizontal Pumps	Auxiliary	364	364 1B CV	CV	Y	RCIC	Y		
1SI8809B	RH TO COLD LEGS 1B/1C ISOL VLV (1PM06J) ASMBLY; 8"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	364	383 U-1 AR	SI	Y	RCIC			
1AF01EA-1	AF PUMP 1B BATTERY CHARGER	(15) Batteries on Racks	Auxiliary	383	All	AF	Y	SSDC			
1SX01PB	PUMP,1B ESSENTIAL SER WTR ASMBLY	(05) Horizontal Pumps	Auxiliary	330	330 18-23/	SX	Y	UHS			PRA:F-V=4.27E-02, RAW=1.77
1AF01EB-A	AF BATTERY Bank B BATT A AUXILIARY FEEDWATER PUMP 1B	(15) Batteries on Racks	Auxiliary	383	All	AF	Y	SSDC			
1VA01SB	1B SX Pp Cub Cooler ESSENTIAL SERVICE WATER PUMP 95-10	(05) Horizontal Pumps	Auxiliary	330	330 18-23/	VA	Y	UHS			
1SX005	U-0 CC HX INLT VLV ASMBLY; 30"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	330	330 18-23/	SX	Y	DHR			
1DC01E	125V BATTERY 111 DIV. 11 AND Rack	(15) Batteries on Racks	Auxiliary	451	451 DIV 11	DC	Y	SSDC	Y		PRA:F-V=2.62E-02, RAW=2.69
1RH01PB	PUMP,1B RESIDUAL HEAT REMOVAL ASMBLY	(06) Vertical Pumps	Auxiliary	364	346 1B RH	RH	Y	DHR			
1SX173	SX SUP VLV TO ENG Driven CLG WTR PP FOR Diesel Driven AF PP_ASSY; 6"	(08) Motor-Operated and Solenoid-Operated Valves	Auxiliary	383	All	SX	Y	DHR			
1DC02E	125V BATTERY 112 DIV. 12 and Rack	(15) Batteries on Racks	Auxiliary	451	451 DIV 12	DC	Y	SSDC	Y		PRA:F-V=2.62E-02, RAW=2.69
0SX02PB	DIESEL DRIVEN SX MAKE-UP PUMP	(06) Vertical Pumps	RSH	686'6"	686'6" 2C	SX	Y	UHS			PRA:F-V=2.96E-01, RAW=7.91
1VD01CB	1B DG ROOM HVAC FAN ASMBLY	(09) Fans	Auxiliary	401	401 1B DG	VD	Y	SSHVAC			PRA: F-V=1.85E-02
1IP05E	INVERTER INST BUS 111 1-3371 AB1	(16) Battery Chargers and Inverters	Aux	451	451 DIV 11 MISC ELEC EQUIP RM (9-10/L-M)	PO	Y	SSDC		Y	
0WW019A	ASSY - AOV 0B DEEP WELL PP 0WW01PB TO 0A SXCT LCV	(07) Pneumatic-Operated Valves	ESWCT	874	ESWCT	WW	Y	UHS			
1VE05C	ASSY - U-1 MISC ELEC EQUIP RM DIV 12 EXH FAN	(09) Fans	Auxiliary	463	451 DIV 12	VE	Y	SSHVAC			
1AF005E	S/G 1A FLOW CONT VLV ASMBLY; 4"	(07) Pneumatic-Operated Valves	Auxiliary	364	364 10-15/	AF	Y	DHR	Y		
1AF024	AF PP SX RECIRC VLV_ASMBLY; 3"	(07) Pneumatic-Operated Valves	Auxiliary	383	All	AF	Y	DHR			
1MS001A	MS ISOL VLV LOOP 1A ASMBLY; 30-1/4"	(07) Pneumatic-Operated Valves	Auxiliary	377	377 U-1 MS	MS	Y	DHR			
1RH607	RESIDUAL HEAT REMOVAL HX 1B FLOW CONT VLV ASMBLY; 8"	(07) Pneumatic-Operated Valves	Auxiliary	357	364 1B RHR	RH	Y	DHR			
1RY455A	PZR PORV (C/S AT 1PM05J) ASMBLY	(07) Pneumatic-Operated Valves	Cont	451	ABOVE PZR	RCS	Y	RCPC			
1SI8801B	CHG PMP TO COLD LEGS INJECTION ISOL VLV (C/S AT 1PM05J) ASMBLY; 4"	(07) Pneumatic-Operated Valves	Auxiliary	375	383 U-1 AR	SI	Y	RCIC			

ID	DESCRIPTION	CLASS	BUILDING	ELEVATION	LOCATION	SYSTEM	Seismic Cat. 1?	Safety Function(s)	New or Replace ?	IPEEE Enhancement?	Comments
1SX169B	DG 1B SX VLV ASMBLY; 10"	(07) Pneumatic-Operated Valves	Auxiliary	401	401 1B DG	SX	Y	UHS			PRA: F-V=2.74E-02, RW=2.19
1DC04E	125V DC BATT CHGR 112	(16) Battery Chargers and Inverters	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)	DC	Y	SSDC		Y	PRA:F-V=2.62E-02, RAW=2.69
1DC05E	125V DC ESF DISTR CENTER BUS 111	(15) Batteries on Racks	Aux	451	451 DIV 11 MISC ELEC EQUIP RM (9-10/L-M)	DC	Y	SSDC		Y	
1DC06E	125V DC ESF DISTR CENTER BUS 112	(15) Batteries on Racks	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)	DC	Y	SSDC		Y	
1IP07E	INVERTER INST BUS 113 1-3371 AB1	(16) Battery Chargers and Inverters	Aux	451	451 DIV 11 MISC ELEC EQUIP RM (9-10/L-M)	PO	Y	SSAC		Y	
1IP08E	INVERTER INST BUS 114 1-3371 AB1	(16) Battery Chargers and Inverters	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)	PO	Y	SSAC		Y	
1DG01KB	1B DIESEL GENERATOR	(17) Engine-Generators	Auxiliary	401	401 1B DG	DG	Y	SSAC			PRA: F-V=2.37E-01, RW=5.81
1FT-0121	CHARGING LINE D/P CELL FLOW XMITTR	(18) Instruments on Racks	Auxiliary	364	364 17-19/	FT	Y	RCIC			
1FT-0132	LETDOWN FLOW D/P CELL	(18) Instruments on Racks	Auxiliary	383	All	FT	Y	RCIC			
1FT-AF014	AF TO SG 1B FLOW TRANSMITTER	(18) Instruments on Racks	Auxiliary	364	364 10-15/	AF	Y	DHR			
1LT-0459	EQ PRESSURIZER LEVEL TRANSMITTER	(18) Instruments on Racks	Cont	377	377-R-12;	LT	Y	RCIC			
1LT-0518	S/G 1A LEVEL LOOP D/P XMTTR 2/FILLED LEG	(18) Instruments on Racks	Cont	412	(No Data)	LT	Y	DHR			
1LT-0932	REF WTR STG TK LVL D/P XMTTR	(18) Instruments on Racks	Auxiliary	379	379 U-1 RW	LT	Y	RCIC			
1PA01J	U-1 PROC I&C RACK PROTECT CH 1 CAB 1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PT-0516	S/G LOOP 1A STM PRESS XMTTR	(18) Instruments on Racks	Auxiliary	377	377 U-1 MS	PT	Y	DHR			
1PA02J	U-1 PROC I&C RACK PROTECT CH 2 CAB 2	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1TE-0604	RHR LP 1A RETURN TEMPERATURE RTD	(19) Temperature Sensors	Auxiliary	375	364 U-1 AR	TE	Y	DHR			
1PA03J	U-1 PROC I&C RACK PROTECT CH 3 CAB 3	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1TE-RC022A	RC WIDE RANGE LP 1A TEMP	(19) Temperature Sensors	Cont	390	3	TE	Y	DHR			
1PA04J	U-1 PROC I&C RACK PROTECT CH 4 CAB 4	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
0VC01JA	CONT RM HVAC LOCAL CONT PAN ASMBLY	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 U-1 HV	WO	Y	SSHVAC			
1PA06J	U-1 PROC I&C RACK CONT GRP 2 CAB 6	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	

ID	DESCRIPTION	CLASS	BUILDING	ELEVATION	LOCATION	SYSTEM	Seismic Cat. 1?	Safety Function(s)	New or Replace ?	IPEEE Enhancement?	Comments
0VC15J	MCR U-1 HVAC START PNL	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 U-1 HV	VC	Y	SSHVAC			
1PA07J	PROC I&C RACK CONT GRP 3 CAB 7	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA08J	U-1 PROC I&C RACK	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA09J	CAB PROT SYST SOL ST RX/ESF TRN A 0-3371B AB1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA10J	CAB PROT SYST SOL ST RX/ESF TRN B 0-3371B AB1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA12J	CAB TEST SAFEGUARD TRN B AB1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA14J	CAB ESF SEQ/ACT TRN B 0-3371B AB1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA27J	CAB RELAY AUX SAFEGUARD TRN A 0-3371B AB1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA28J	CAB RELAY AUX SAFEGUARD TRN B 0-3371B AB1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA33J	CAB CONT SYSTEM ESF 11 0-3371B AB1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA34J	CAB CONT SYSTEM ESF 12 0-3371B AB1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA51J	CAB HJTC RX VESSEL LEVEL CH A 0-3371B AB1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PA52J	CAB HJTC RX VESSEL LEVEL CH B 0-3371B AB1	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 U-1 AUX ELEC EQUIP RM (11-13/N-Q)	PA	Y	ESFAS		Y	
1PL08J	1B DG CONTROL PANEL	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	401	401 1B DG	PL	Y	SSAC			
1PM05J	MAIN CONTROL BOARD	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	451	451 MAIN C	PM	Y	ESFAS			
1VA11J	CENTRIFUGAL CHARGING PCUBICLE COOLER LOCAL CONTROL PANEL	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	364	364 1B CV	VA	Y	RCIC			

ID	DESCRIPTION	CLASS	BUILDING	ELEVATION	LOCATION	SYSTEM	Seismic Cat. 1?	Safety Function(s)	New or Replace ?	IPEEE Enhancement?	Comments
1RD05E	REACTOR TRIP SWITCHGEAR	(20) Instrumentation and Control Panels and Cabinets	Aux	451	451 DIV 12 MISC ELEC EQUIP RM (9-10/M-Q)	RD	Y	RRC		Y	
1VX07J	ESF SWGR RM DIV 12 HVAC DMPR START PNL	(20) Instrumentation and Control Panels and Cabinets	Auxiliary	426	426 ESF SW	VX	Y	SSHVAC			
1CV02SB	1B CENTRIFUGAL CHARGING PUMP GEAR COOLER	(21) Tanks and Heat Exchangers	Auxiliary	364	364 1B CV	CV	Y	SSHVAC			
1DO01TB	DIESEL OIL STORAGE TANK 1B	(21) Tanks and Heat Exchangers	Auxiliary	373	383 U-1 DI	DO	Y	SSAC			
1DO10T	500 GAL DIESEL OIL DAY TANK (AF)	(21) Tanks and Heat Exchangers	Auxiliary	383	All	DO	Y	DHR			
1RH01PB-A	RH PUMP 1B SEAL COOLER	(21) Tanks and Heat Exchangers	Auxiliary	346	346 1B RH	RH	Y	DHR			
1RY32MA	PORV ACCUMULATOR 1A	(21) Tanks and Heat Exchangers	Cont	426	426-R-8	RY	Y	RCPC			
1SI01T	REFUELING WATER STORAGE TANK	(21) Tanks and Heat Exchangers	FH Ou	401	401 FH OUT	SI	Y	RCIC			
0DO08TB	0B SX Pp 2000 GALLON DIESEL OIL STORAGE TANK	(21) Tanks and Heat Exchangers	RSH	702	702 1C7	DO	Y	UHS			
1AP12E	ASSY - 480V ESF SWGR 132X	(02) Low Voltage Switchgear	Aux	426	426 ESF SWGR RM - DIV 12	AP	Y	SSAC		Y	
1AP13E	480V ESF UNIT SUBSTA 132X XFMR	(04) Transformers	Aux	426	426 ESF SWGR RM - DIV 11	AP	Y	SSAC		Y	
1AP25E	ASSY - 480V AUX BLDG ESF MCC 131X2	(01) Motor Control Centers	Aux	414	414 CURVED WALL AREA - AREA 5	AP	Y	SSAC		Y	
1AP92E	ASSY - 480V SXCT MCC 132Z1, SOUTH ELEC RM	(01) Motor Control Centers	ESWCT	874	ESWCT	AP	Y	SSAC		Y	
1AP93E	ASSY - 480V SXCT MCC 131Z1, NORTH ELEC RM	(01) Motor Control Centers	ESWCT	874	ESWCT	AP	Y	SSAC		Y	
1AP98E	ASSY - 480V ESF SXCT UNIT SUBSTA 132Z, SOUTH ELEC RM	(01) Motor Control Centers	ESWCT	874	ESWCT	AP	Y	SSAC		Y	
1CV8152	ASSY - AOV U-1 LTDWN HDR ISOL VLV (EOP VLV)	(07) Pneumatic-Operated Valves	Aux	374	383 U-1 AREA 5 CURVED WALL AREA	CV	Y	RCIC		Y	
0WO01CB	0B MCR CHLR	(11) Chillers	Aux	383	CHILLED WTR RMS (8-10/L-P)	W0	Y	SSHVAC			

Table B-4. SWEL 2

ID	DESCRIPTION	Class	BUILDING	ELEVATION	LOCATION	SYSTEM	Seismic Cat. 1?	Associated with Rapid Draindown ?	Comments
0FC8754	SPENT FUEL PIT HX RTRN ISOL	(0) Other	FH	401	18 Y	FC	Y	N	
0FC8763	REFUELING WTR PURIF PMP 0A DISCH CHECK	(0) Other	AUX	364+18'	12 S	FC	Y	N	Area 5
1FC010	REFUELING WTR PURIF PMP SUCT FROM U-1 REFUEL CAV CNMT ISOL	(0) Other	AUX	364	12 U	FC	Y	N	Area 5
1FC8756	U1 SPENT FUEL PIT PMP SUCTION ISOL	(0) Other	FH	401	18 Y	FC	Y	N	
1FC8758	REFUELING WTR PURIF PMP SUCT FROM U-1 RWST	(0) Other	AUX	364	13 V	FC	Y	N	Area 5
1FC8762A	SPENT FUEL PIT HX INLET	(0) Other	FH	401	17 Z	FC	Y	N	
1FC8762B	U1 SPENT FUEL PIT HX OUTLET	(0) Other	FH	401	17 Z	FC	Y	N	
1FC8766	SPENT FUEL PIT FLTR DEMIN LOOP RTRN TO U-1 RWST CHECK VLV	(0) Other		364	14 V	FC	Y	N	Area 5
1FC8793	SPENT FUEL PIT PMP DISCH CHECK	(0) Other	FH	401	17 Y	FC	Y	N	
1FC8794	SPENT FUEL PIT FLTR DEMIN LOOP INLT ISOL	(0) Other	FH	401	17 Y	FC	Y	N	
1PI-0627	SPENT FUEL PUMP DISCHARGE PRESSURE GAGE	(18) Instrument Racks	FH	401	17 AA	FC	Y	N	
0FC03PA	PUMP REFUELING WTR PURIFICATION 0A ASMBLY	(5) Horizontal Pumps	AUX	364	12 S	FC	Y	N	Area 5
0PI-FC003	REFUELING WTR PURIFICATION PUMP 0A SUCT PRESS	(18) Instrument Racks	AUX	365	13 S	FC	Y	N	Area 5
0PI-FC005	RFLG WTR PURIF PUMP 0A DISCHARGE GAUGE	(18) Instrument Racks	AUX	364	17 S	FC	Y	N	Walkway
0TI-FC007	REFUELING WTR PURIFICATION PUMP 0A DISCH TEMP IND	(19) Temperature Sensors	AUX	364	12 S	FC	Y	N	Area 5
1FC01A	SPENT FUEL PIT HEAT EXCHANGER	(21) Tanks and Heat Exchangers	FH	401	17 Z	FC	Y	N	
1FC01P	U-1 FUEL POOL COOLING PUMP	(5) Horizontal Pumps	AUX	401	18 Y	FC	Y	N	
1HS-FC001	SPENT FUEL PIT PUMP C/S Box on wall	(18) Instrument Racks	FH	401	17 Y	FC	Y	N	
1PI-0633	SPENT FUEL PIT PUMP SUCTION PRESSURE INDICATO	(18) Instrument Racks	FH	401	AA-19	FC	Y	N	
1TI-0628	SPENT FUEL POOL HEAT EXCH OUTLET TEMP INDICAT	(19) Temperature Sensors	FH	426	20 X	FC	Y	N	
0TIS-0626	SPENT FUEL POOL TEMP INDICATING SWITCH	(18) Instrument Racks	FH	426	20 X	FC	Y	N	

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

ID	DESCRIPTION	Anchorage Configuration Verified	AREA WALK-BY	COMMENTS	PAGE
0DO08TB	0B SX Pp 2000 GALLON DIESEL OIL STORAGE TANK	Y	46		C - 8
0FC03PA	PUMP REFUELING WTR PURIFICATION 0A ASMBLY	Y	36	SWEL 2	C - 12
0FC8754	SPENT FUEL PIT HX RTRN ISOL	N/A	42	SWEL 2	C - 15
0FC8763	REFUELING WTR PURIF PMP 0A DISCH CHECK	N/A	36	SWEL 2	C - 18
0PI-FC003	REFUELING WTR PURIFICATION PUMP 0A SUCT PRESS	N/A	44	SWEL 2	C - 21
0PI-FC005	RFLG WTR PURIF PUMP 0A DISCHARGE GAUGE	N/A	61	SWEL 2	C - 24
0SX02PB	DIESEL DRIVEN SX MAKE-UP PUMP	Y	45		C - 27
0SX162A	ASSY - MOV 0A SXCT TO BASIN BYP VLV	N/A	18		C - 32
0TI-FC007	REFUELING WTR PURIFICATION PUMP 0A DISCH TEMP IND	N/A	36	SWEL 2	C - 36
0TIS-0626	SPENT FUEL POOL TEMP INDICATING SWITCH	N/A	40	SWEL 2	C - 39
0VC01JA	CONT RM HVAC LOCAL CONT PAN ASMBLY	N	9		C - 42
0VC08Y	TRAIN B MAKEUP AIR FLTR UNIT FAN 0B DISCH FLOW CONTROL	N/A	5		C - 48
0VC09Y	TRAIN B EMERGENCY MAKEUP INTAKE FROM TURB BLDG	N/A	6		C - 51
0VC15J	MCR U-1 HVAC START PNL	N	9		C - 56
0WO01CB	0B MCR CHILLER	Y	64a		C - 59
0WW019A	ASSY - AOV 0B DEEP WELL PP 0WW01PB TO 0A SXCT LCV	N/A	18		C - 62
1AF005E	S/G 1A FLOW CONT VLV ASMBLY; 4"	N/A	47		C - 65
1AF006B	AUXILIARY FEEDWATER PMP 1B SX SUCT VLV ASMBLY; 6"	N/A	58		C - 69
1AF017B	AUXILIARY FEEDWATER PMP 1B SX SUCT VLV ASMBLY; 6"	N/A	58		C - 72
1AF01EA-1	AF PUMP 1B BATTERY CHARGER	N	58		C - 75
1AF01EB-A	AF BATTERY Bank B BATT A AUXILIARY FEEDWATER PUMP 1B	Y	58		C - 78
1AF01PB	DIESEL DRIVEN AUX FEED PUMP 1B_ASMBLY	Y	58		C - 81
1AF024	AF PP SX RECIRC VLV_ASMBLY; 3"	N/A	58		C - 85

Table C-1 Page 1 of 6

ID	DESCRIPTION	Anchorage Configuration Verified	AREA WALK-BY	COMMENTS	PAGE
1AP06E	4160 VOLT ESF SWITCH BUS 142	Y	32		
1AP11E	EQ 480V ESF UNIT SUB 131X TRANSFORMER 1AP086	Y	33		C - 97
1AP12E	ASSY - 480V ESF SWGR 132X	Y	32		
1AP13E	480V ESF UNIT SUBSTA 132X XFMR	Y	32		C - 108
1AP21E	480V AUX BLDG ESF MCC 131X1 XFORMER	Y	36		C - 112
1AP22E	480V AUX BLDG ESF MCC 131X3 ASMBLY	Y	59		C - 115
1AP24E	EQ 480 V AUX BLDG ESF MCC 132X3 ASMBLY	Y	57		C - 119
1AP25E	ASSY - 480V AUX BLDG ESF MCC 131X2	Y	54		C - 123
1AP27E	EQ 480V AUX BLDG MCC 132X2 ASMBLY	Y	53		C - 127
1AP38E	ASSY - 480V AUX BLDG MCC 133X1A	Y	50		C - 131
1AP92E	ASSY - 480V SXCT MCC 132Z1, SOUTH ELEC RM	Y	20		C - 135
1AP93E	ASSY - 480V SXCT MCC 131Z1, NORTH ELEC RM	Y	16		C - 139
1AP98E	ASSY - 480V ESF SXCT UNIT SUBSTA 132Z, SOUTH ELEC RM	Y	20		C - 144
1AP99E	ASSY - 480V ESF SXCT UNIT SUBSTA 131Z, NORTH ELEC RM	Y	16		C - 149
1CC01PB	1B PUMP, COMPONENT COOLING 12X14-18 M66-3 ASMBLY	Y	61		C - 153
1CC685	CC FROM RC PMPS THERMAL BARRIER ISOL VLV ASMBLY; 3"	N/A	39		C - 156
1CV01PB	PUMP,1B CENTRIFUGAL CHARGING ASMBLY	Y	37		C - 159
1CV02SB	1B CENTRIFUGAL CHARGING PUMP GEAR COOLER	N	37		C - 162
1CV112E	RWST TO CHG PMPS SUCT VLV (C/S AT 1PM05J) ASMBLY; 8"	N/A	39		C - 165
1CV8152	ASSY - AOV U-1 LTDWN HDR ISOL VLV (EOP VLV)	N/A	39		C - 168
1DC01E	125V BATTERY 111 DIV. 11 AND Rack	Y	29		C - 171
1DC02E	125V BATTERY 112 DIV. 12 and Rack	Y	31		C - 174
1DC04E	125V DC BATT CHGR 112	Y	30		C - 177
1DC05E	125V DC ESF DISTR CENTER BUS 111	Y	28		C - 180

ID	DESCRIPTION	Anchorage Configuration Verified	AREA WALK-BY	COMMENTS	PAGE
1DC06E	125V DC ESF DISTR CENTER BUS 112	Y	30		C - 184
1DC10J	125V DC FUSE PANEL - DIV. 11	N	28		C - 188
1DC11J	125V DC FUSE PANEL - DIV. 12	N	30		C - 192
1DG01KB	1B DIESEL GENERATOR	Y	23		C - 195
1DO01TB	DIESEL OIL STORAGE TANK 1B	Y	26		C - 199
1DO10T	500 GAL DIESEL OIL DAY TANK (AF)	Y	58		C - 203
1FC010	REFUELING WTR PURIF PMP SUCT FROM U-1 REFUEL CAV CNMT ISOL	N/A	39	SWEL 2	C - 206
1FC01A	SPENT FUEL PIT HEAT EXCHANGER	Y	41	SWEL 2	C - 209
1FC01P	U-1 FUEL POOL COOLING PUMP	Y	42	SWEL 2	C - 212
1FC8756	U1 SPENT FUEL PIT PMP SUCTION ISOL	N/A	42	SWEL 2	C - 216
1FC8758	REFUELING WTR PURIF PMP SUCT FROM U-1 RWST	N/A	39	SWEL 2	C - 219
1FC8762A	SPENT FUEL PIT HX INLET	N/A	41	SWEL 2	C - 222
1FC8762B	U1 SPENT FUEL PIT HX OUTLET	N/A	41	SWEL 2	C - 225
1FC8766	SPENT FUEL PIT FLTR DEMIN LOOP RTRN TO U-1 RWST CHECK VLV	N/A	39	SWEL 2	C - 228
1FC8793	SPENT FUEL PIT PMP DISCH CHECK	N/A	41	SWEL 2	C - 231
1FC8794	SPENT FUEL PIT FLTR DEMIN LOOP INLT ISOL	N/A	41	SWEL 2	C - 234
1FT-0121	CHARGING LINE D/P CELL FLOW XMITTR	N/A	61		C - 237
1FT-0132	LETDOWN FLOW D/P CELL	N/A	59		C - 240
1FT-AF014	AF TO SG 1B FLOW TRANSMITTER	N/A	61		C - 243
1HS-FC001	SPENT FUEL PIT PUMP C/S Box on wall	N	42	SWEL 2	C - 246
1IP05E	INVERTER INST BUS 111 1-3371 AB1	Y	28		C - 249
1IP07E	INVERTER INST BUS 113 1-3371 AB1	Y	28		C - 252
1IP08E	INVERTER INST BUS 114 1-3371 AB1	Y	30		C - 255
1LT-0459	EQ PRESSURIZER LEVEL TRANSMITTER	N/A	Outage-6		C - 258
1LT-0518	S/G 1A LEVEL LOOP D/P XMTTR 2/FILLED LEG	N/A	Outage-3		C - 261
1LT-0932	REF WTR STG TK LVL D/P XMTTR	N/A	38		C - 264

Table C-1 Page 3 of 6

ID	DESCRIPTION	Anchorage Configuration Verified	AREA WALK-BY	COMMENTS	PAGE
1MS001A	MS ISOL VLV LOOP 1A ASMBLY; 30-1/4"	N/A	15		C - 267
1MS018A	S/G 1A PORV ASMBLY; 8"	N/A	15		C - 270
1MS018B	S/G 1B PORV ASMBLY; 8"	N/A	13		C - 274
1PA01J	U-1 PROC I&C RACK PROTECT CH 1 CAB 1	N	8		C - 277
1PA02J	U-1 PROC I&C RACK PROTECT CH 2 CAB 2	N	8		C - 280
1PA03J	U-1 PROC I&C RACK PROTECT CH 3 CAB 3	N	8		C - 283
1PA04J	U-1 PROC I&C RACK PROTECT CH 4 CAB 4	N	8		C - 286
1PA06J	U-1 PROC I&C RACK CONT GRP 2 CAB 6	N	8		C - 289
1PA07J	PROC I&C RACK CONT GRP 3 CAB 7	N	8		C - 292
1PA08J	U-1 PROC I&C RACK	N	8		C - 295
1PA09J	CAB PROT SYST SOL ST RX/ESF TRN A 0-3371B AB1	N	8		C - 298
1PA10J	CAB PROT SYST SOL ST RX/ESF TRN B 0-3371B AB1	N	8		C - 302
1PA12J	CAB TEST SAFEGUARD TRN B AB1	N	8		C - 305
1PA14J	CAB ESF SEQ/ACT TRN B 0-3371B AB1	N	8		C - 308
1PA27J	CAB RELAY AUX SAFEGUARD TRN A 0-3371B AB1	N	8		C - 311
1PA28J	CAB RELAY AUX SAFEGUARD TRN B 0-3371B AB1	N	8		C - 314
1PA33J	CAB CONT SYSTEM ESF 11 0-3371B AB1	N	8		C - 318
1PA34J	CAB CONT SYSTEM ESF 12 0-3371B AB1	N	8		C - 321
1PA51J	CAB HJTC RX VESSEL LEVEL CH A 0-3371B AB1	N	8		C - 324
1PA52J	CAB HJTC RX VESSEL LEVEL CH B 0-3371B AB1	N	8		C - 327
1PI-0627	SPENT FUEL PUMP DISCHARGE PRESSURE GAGE	N/A	44	SWEL 2	C - 330
1PI-0633	SPENT FUEL PIT PUMP SUCTION PRESSURE INDICATO	N/A	44	SWEL 2	C - 333
1PL08J	1B DG CONTROL PANEL	N	23		C - 336
1PM05J	MAIN CONTROL BOARD	Y	1		C - 340
1PT-0516	S/G LOOP 1A STM PRESS XMTTR	N/A	14		C - 343
1RD05E	REACTOR TRIP SWITCHGEAR	Y	28		C - 347

ID	DESCRIPTION	Anchorage Configuration Verified	AREA WALK-BY	COMMENTS	PAGE
1RH01PB	PUMP,1B RESIDUAL HEAT REMOVAL ASMBLY	Y	66		C - 350
1RH01PB-A	RH PUMP 1B SEAL COOLER	N/A	66		C - 353
1RH607	RESIDUAL HEAT REMOVAL HX 1B FLOW CONT VLV ASMBLY; 8"	N/A	64		C - 356
1RH8702A	RC LOOP 1C TO RH PMP 1B SUCT ISOL VLV ASMBLY; 12"	N/A	Outage-4		C - 359
1RY32MA	PORV ACCUMULATOR 1A	N	Outage-1		C - 363
1RY455A	PZR PORV (C/S AT 1PM05J) ASMBLY	N/A	Outage-2		C - 367
1RY8028	PW TO PRT CONTAINMENT ISOLATION VLV	N/A	39		C - 371
1SI01T	REFUELING WATER STORAGE TANK	N	12		C - 374
1SI8801B	CHG PMP TO COLD LEGS INJECTION ISOL VLV (C/S AT 1PM05J) ASMBLY; 4"	N/A	39		C - 377
1SI8804B	ASSY - MOV 1B RH HX TO 1B SI PP SUCT HDR ISOL VLV	N/A	38		C - 380
1SI8809B	RH TO COLD LEGS 1B/1C ISOL VLV (1PM06J) ASMBLY; 8"	N/A	39		C - 383
1SX005	U-0 CC HX INLT VLV ASMBLY; 30"	N/A	52		C - 386
1SX01FB	1B SX PP DSCH STRN	Y	52		C - 389
1SX01PB	PUMP,1B ESSENTIAL SER WTR ASMBLY	Y	52		C - 393
1SX169B	DG 1B SX VLV ASMBLY; 10"	N/A	23		C - 396
1SX173	SX SUP VLV TO ENG Driven CLG WTR PP FOR Diesel Driven AF PP_ASSY; 6"	N/A	58		C - 399
1TE-0604	RHR LP 1A RETURN TEMPERATURE RTD	N/A	39		C - 402
1TE-RC022A	RC WIDE RANGE LP 1A TEMP	N/A	Outage-7		C - 405
1TI-0628	SPENT FUEL POOL HEAT EXCH OUTLET TEMP INDICAT	N/A	41	SWEL 2	C - 408
1VA01SB	1B SX Pp Cub Cooler ESSENTIAL SERVICE WATER PUMP 95-10	Y	52		C - 411
1VA02SB	1B RHR PUMP ROOM CUB CLR ASMBLY	Y	66		C - 414
1VA06SA	COOLER,CENTRIFUGAL CHARGING PUMP 1A	Y	62		C - 418
1VA08CB	1B DIESEL DRIVEN AF PUMP CUBICLE CLR (1VA08S) 1B FAN	N/A	58		C - 421
1VA11J	CENTRIFUGAL CHARGING PCUBICLE COOLER LOCAL CONTROL PANEL	N	37		C - 424
1VD01CB	1B DG ROOM HVAC FAN ASMBLY	Y	23		C - 427

ID	DESCRIPTION	Anchorage Configuration Verified	AREA WALK-BY	COMMENTS	PAGE
1VE05C	ASSY - U-1 MISC ELEC EQUIP RM DIV 12 EXH FAN	N	30		C - 431
1VP01AA	CNMT ESS'L SERVICE WATER COIL 1A (RCFC)	N	Outage-5		C - 434
1VX07J	ESF SWGR RM DIV 12 HVAC DMPR START PNL	Y	32		C - 439

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0DO08TB

Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: 0B SX Pp 2000 GALLON DIESEL OIL STORAGE TANK

Project: Byron 1 SWEL

Location (Bldg, Elev, Room/Area): RSH, 702.00 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-1227 Sheet 1 Revision R*	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.: 0DO08TB

Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: 0B SX Pp 2000 GALLON DIESEL OIL STORAGE TANK

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? *Lights supported on S-hooks. See IR 1399104 for open S-hooks. Note that the S-hooks are partially open and it is unlikely that they would become disengaged in a seismic event. Also lights would not damage equipment if they fell.*	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? *Some leaking (not diesel fuel, appears to be water) on floor but not a structural/seismic issue.*	Yes

Comments

Seismic walkdown team M. Delaney & P. Gazda 8/9/12 pm

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

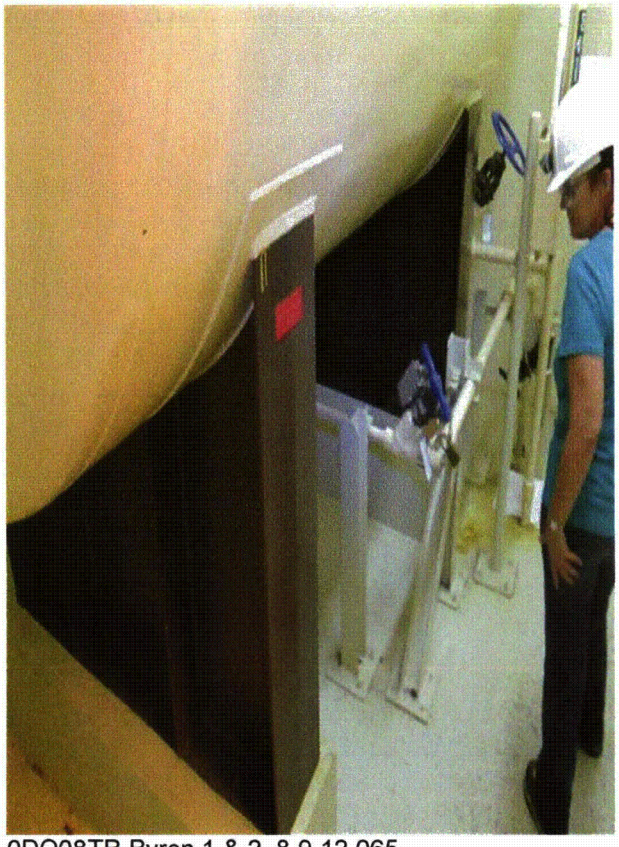
Equipment ID No.: 0DO08TB

Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: 0B SX Pp 2000 GALLON DIESEL OIL STORAGE TANK

Photos

0DO08TB Byron 1 & 2 8-9-12 064



0DO08TB Byron 1 & 2 8-9-12 065

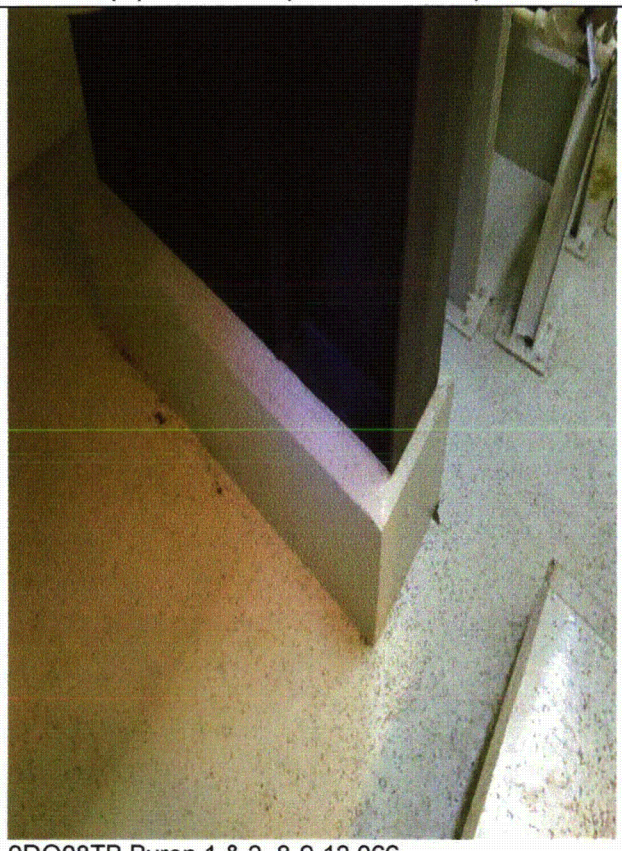
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0DO08TB

Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: 0B SX Pp 2000 GALLON DIESEL OIL STORAGE TANK



0DO08TB Byron 1 & 2 8-9-12 066

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: Byron 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 6 Revision J Detail 64A* *Pump contaminated but bolt diameter visually verified*	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 team M. Delaney & P. Gazda 8/8/12 pm

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

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 Byron 1 & 2 8-8-12 040

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC8754

Equipment Class: (0) Other

Equipment Description: SPENT FUEL PIT HX RTRN ISOL

Project: Byron 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

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? *Masonry walls are seismic and would not collapse on 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 team M. Delaney & P. Gazda 8/9/12 am

Evaluated by: Marlene Delaney Date: 10/5/2012

P. Gazda Philip Gazda 10/5/2012

Status: [Y] N U

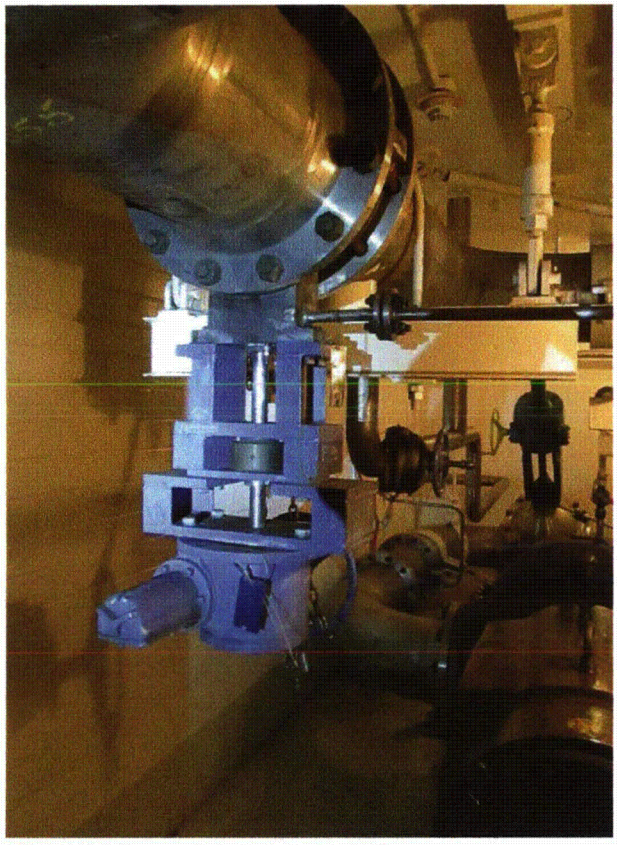
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC8754

Equipment Class: (0) Other

Equipment Description: SPENT FUEL PIT HX RTRN ISOL

Photos



0FC8754 Byron 1 & 2 8-9-12 017

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

Project: Byron 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 382.00 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

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? *No structural/seismic issues*	Yes

Comments

Seismic walkdown team M. Delaney & P. Gazda 8/8/12 pm

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

Status: [Y] N U

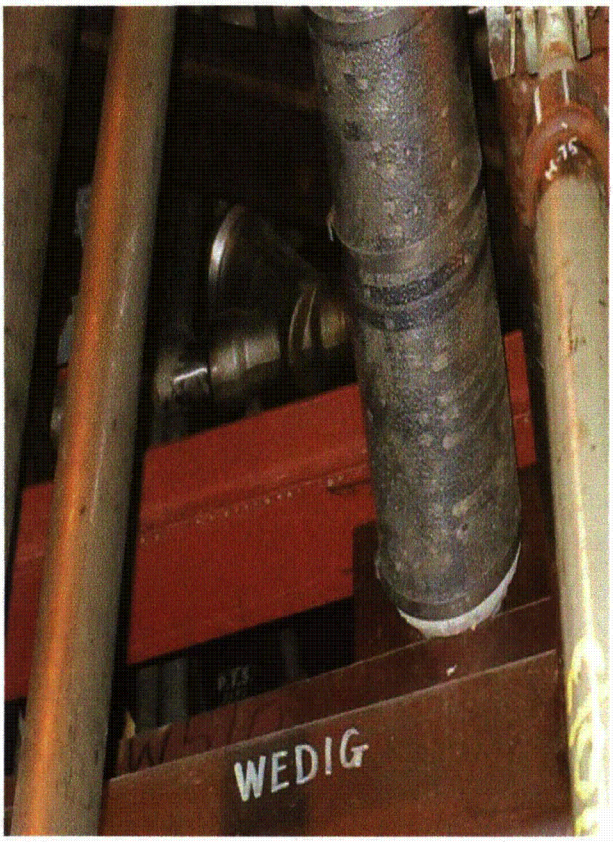
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0FC8763

Equipment Class: (0) Other

Equipment Description: REFUELING WTR PURIF PMP 0A DISCH CHECK

Photos



0FC8763 Byron 1 & 2 8-8-12 042

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: Byron 1 SWEL

Location (Bldg, Elev, Room/Area): Auxiliary, 365.00 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? *Instrument securely mounted to well-anchored rack*	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?	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 team M. Delaney & P. Gazda 8/8/12 pm

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

Status: [Y] N U

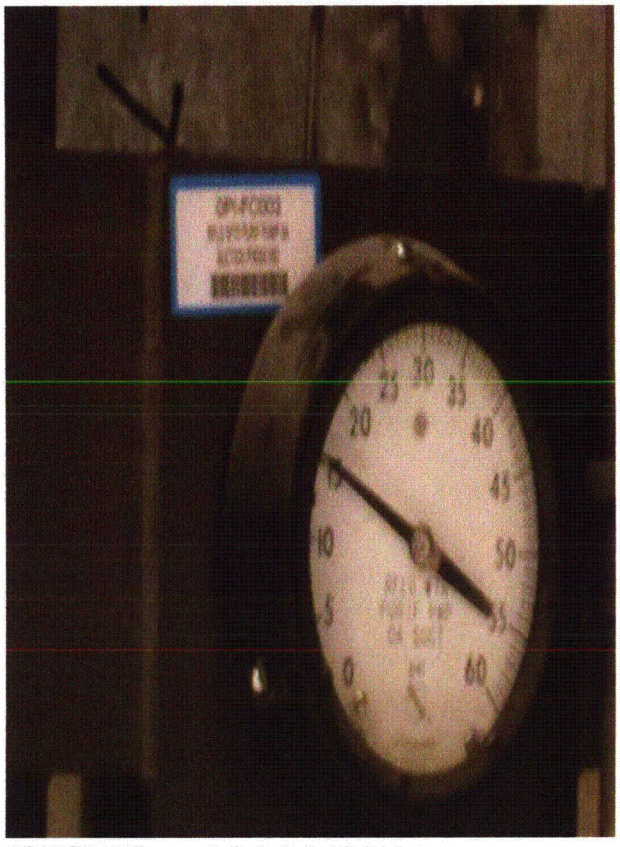
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0PI-FC003

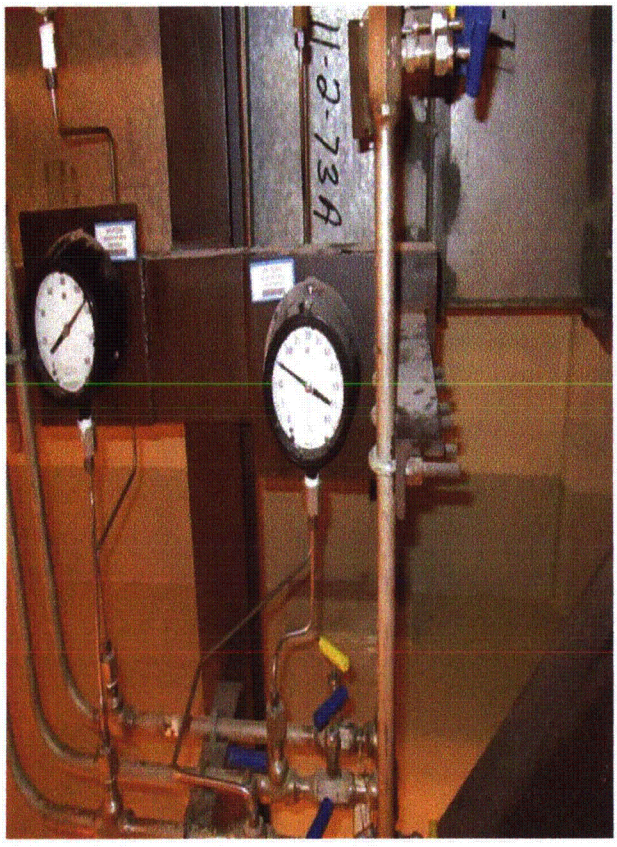
Equipment Class: (18) Instruments on Racks

Equipment Description: REFUELING WTR PURIFICATION PUMP 0A SUCT PRESS

Photos



0OIFC003 Byron 1 & 2 8-8-12 044



0PI-FC003 Byron 1 & 2 8-8-12 043

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: Byron 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? *Instrument is securely attached to well-supported rack*	Yes

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
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 team M. Delaney & P. Gazda 8/20/12 pm

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

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

Photos

0PI-FC005 Byron 1 & 2 8-20-12 065

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0SX02PB

Equipment Class: (6) Vertical Pumps

Equipment Description: DIESEL DRIVEN SX MAKE-UP PUMP

Project: Byron 1 SWEL

Location (Bldg, Elev, Room/Area): RSH, 686.50 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-1227 Sheet 2 Revision K Detail 13*	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.: 0SX02PB

Equipment Class: (6) Vertical Pumps

Equipment Description: DIESEL DRIVEN SX MAKE-UP PUMP

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 Team M. Delaney & P. Gazda 8-9-12 pm

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

Status: [Y] N U

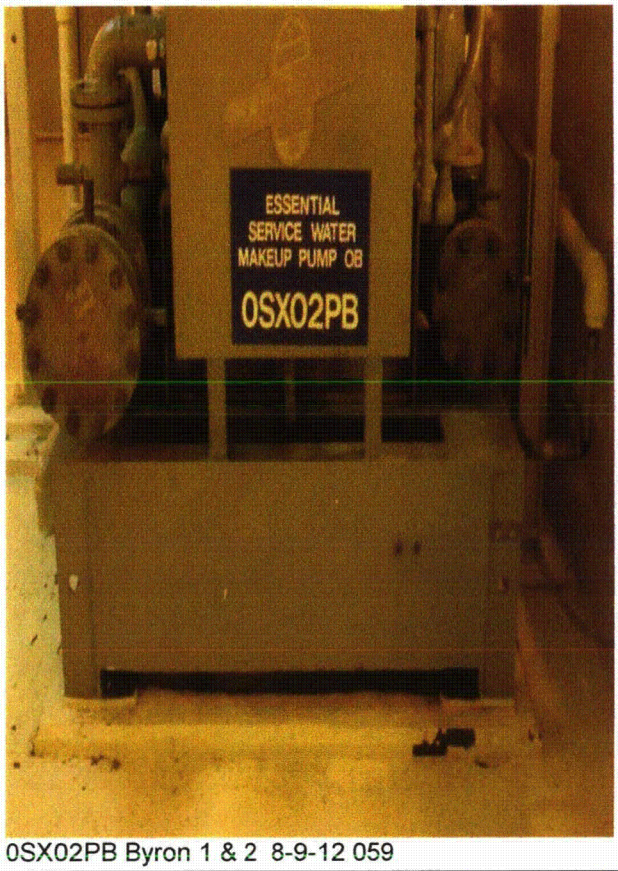
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0SX02PB

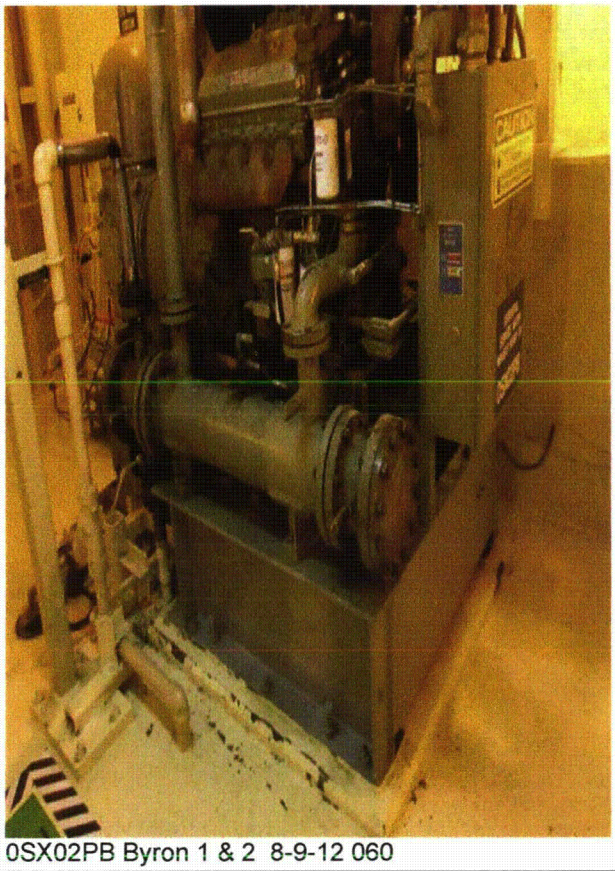
Equipment Class: (6) Vertical Pumps

Equipment Description: DIESEL DRIVEN SX MAKE-UP PUMP

Photos



0SX02PB Byron 1 & 2 8-9-12 059



0SX02PB Byron 1 & 2 8-9-12 060

Status: [Y] N U

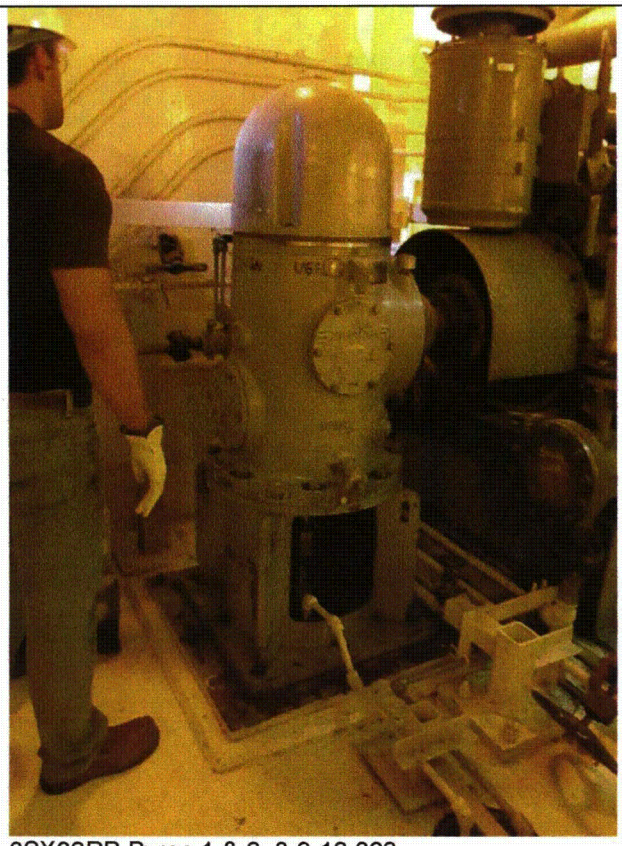
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0SX02PB

Equipment Class: (6) Vertical Pumps

Equipment Description: DIESEL DRIVEN SX MAKE-UP PUMP

0SX02PB Byron 1 & 2 8-9-12 061



0SX02PB Byron 1 & 2 8-9-12 062

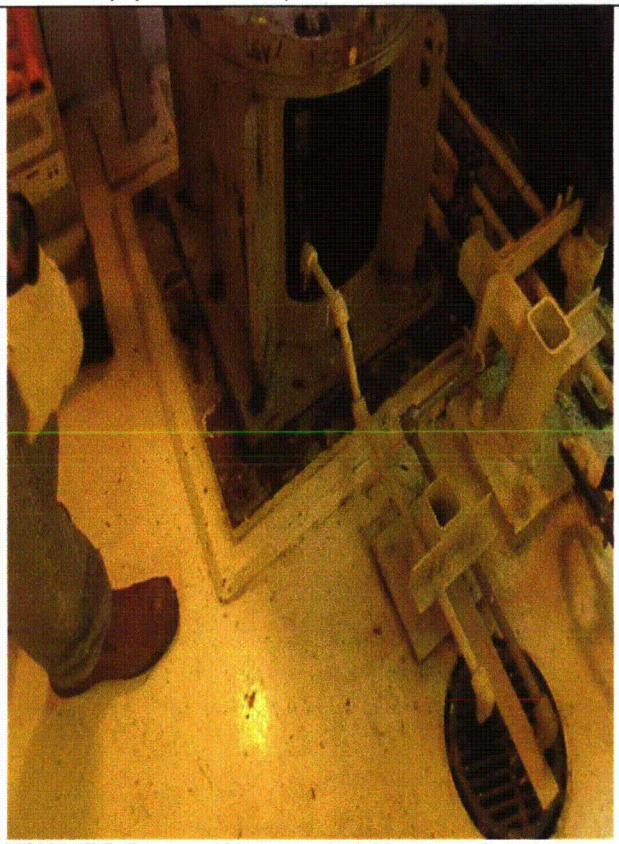
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0SX02PB

Equipment Class: (6) Vertical Pumps

Equipment Description: DIESEL DRIVEN SX MAKE-UP PUMP



0SX02PB Byron 1 & 2 8-9-12 063

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0SX162A

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

Equipment Description: ASSY - MOV 0A SXCT TO BASIN BYP VLV

Project: Byron 1 SWEL

Location (Bldg, Elev, Room/Area): ESWCT, 872.00 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.: 0SX162A

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

Equipment Description: ASSY - MOV 0A SXCT TO BASIN BYP VLV

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? *Hairline crack in nearby wall is small and not a structural/seismic concern.*	Yes

Comments

Seismic Walkdown Team M. Delaney & P. Gazda 8/7/12 am

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

Status: [Y] N U

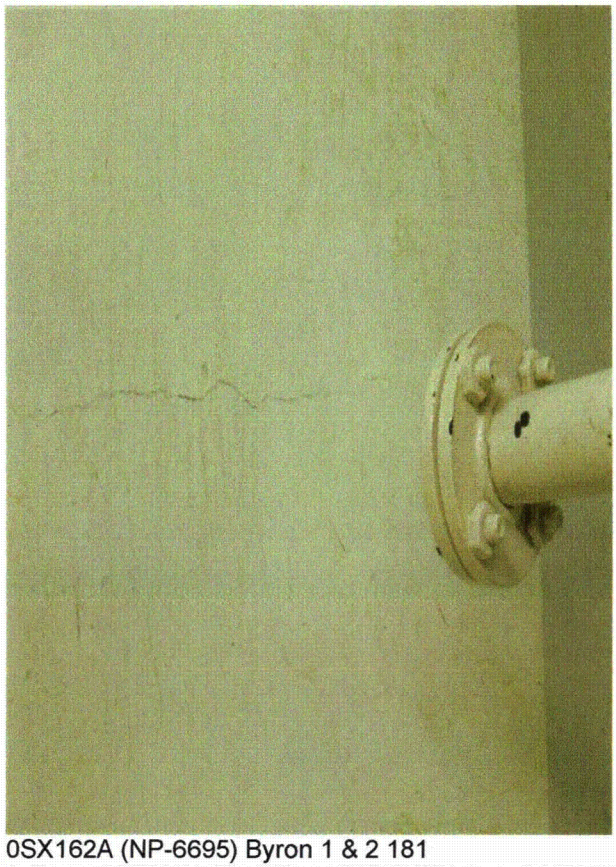
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0SX162A

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

Equipment Description: ASSY - MOV 0A SXCT TO BASIN BYP VLV

Photos



0SX162A (NP-6695) Byron 1 & 2 181

0SX162A Byron 1 & 2 179

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0SX162A

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

Equipment Description: ASSY - MOV 0A SXCT TO BASIN BYP VLV

0SX162A Byron 1 & 2 180

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: Byron 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? *No structural/seismic issues*	Yes

Comments

Seismic walkdown team M. Delaney & P. Gazda 8/8/12 pm

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

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

None.

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: Byron 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? *Instrument securely supported on well-anchored rack*	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 team M. Delaney & P. Gazda 8/9/12 am

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

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 Byron 1 & 2 8-9-12 002

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: Byron 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
   Panel is welded at base with greater than 2" of weld at approximately 8" spacing which exceeds the typical cabinet base weld.

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? *Roof drain line with Victaulic couplings enters room and drops down and up (similar to a U shape) and exits room. Line could swing from side to side resulting in leaking at the top couplings however the equipment below is partially sealed with closed entry points and tops so no water damage could occur. IR 1397711 was written.*	Yes

Comments

Seismic walkdown team M. Delaney & P. Gazda 8/6/12 pm

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

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 Byron 1 & 2 128

0VC01JA Byron 1 & 2 129

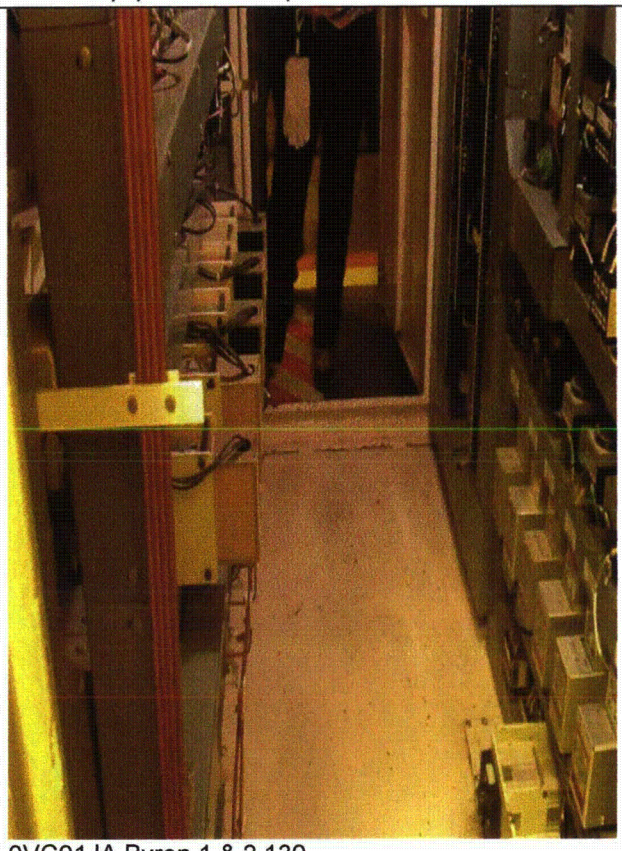
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

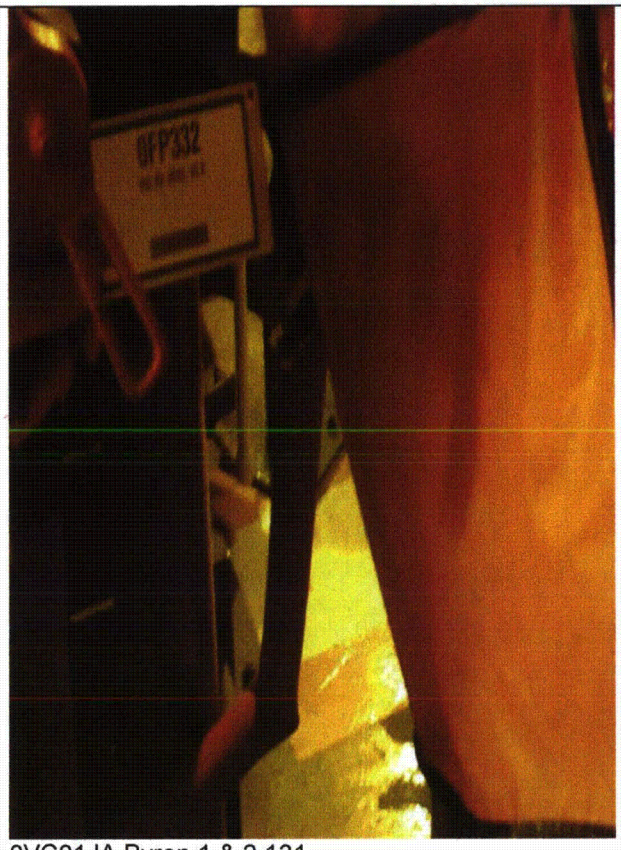
Equipment ID No.: 0VC01JA

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

Equipment Description: CONT RM HVAC LOCAL CONT PAN ASMBLY



0VC01JA Byron 1 & 2 130



0VC01JA Byron 1 & 2 131

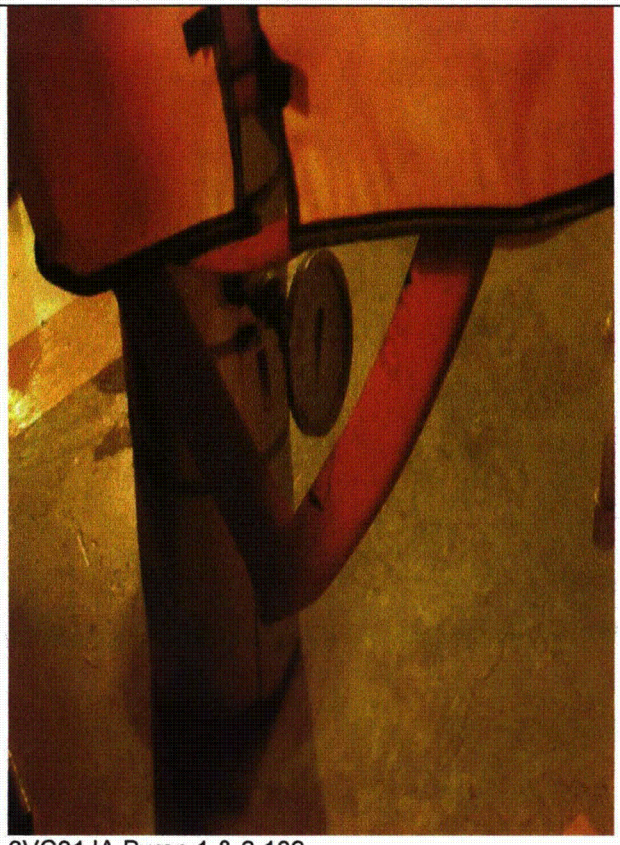
Status: [Y] N U

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



0VC01JA Byron 1 & 2 132

0VC01JA Byron 1 & 2 133

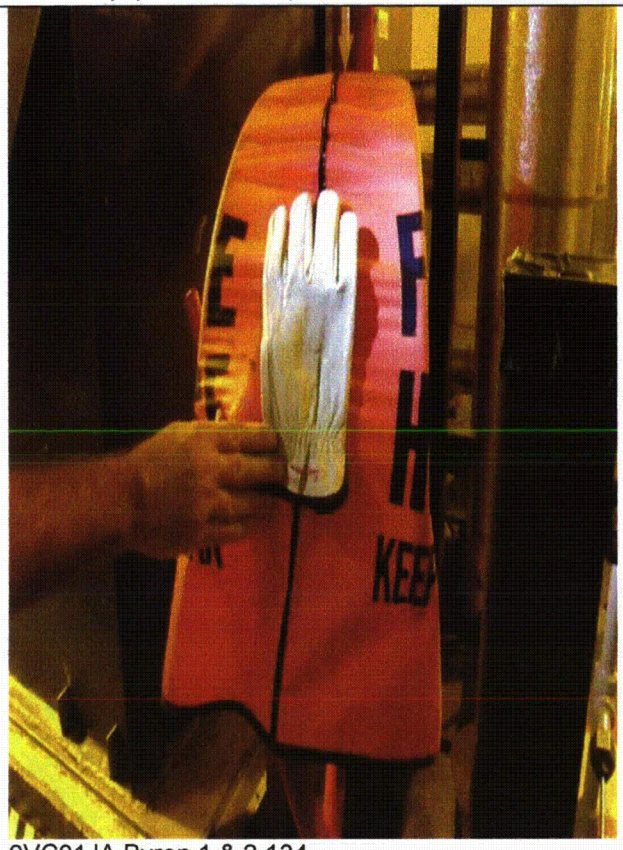
Status: [Y] N U

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



0VC01JA Byron 1 & 2 134

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: Byron 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? *An anchorage verification/inspection is not required since the equipment is mounted in-line without direct anchorage to the civil structure*	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 team 8/6/12 pm M Delaney and P Gazda

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

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

None.

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: Byron 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? *An anchorage verification/inspection is not required since the equipment is mounted in-line without direct anchorage to the civil structure*	Yes

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?	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? *Water on the floor is not a structural/seismic issue and is not near critical components. The bent cable tray cover is not a structural/seismic issue since the cover is not a structural component.*	Yes

Comments

Seismic walkdown team M. Delaney & P. Gazda 8/6/12 pm

Evaluated by: Marlene Delaney Date: 10/5/2012

Philip Gazda 10/5/2012

Status: [Y] N U

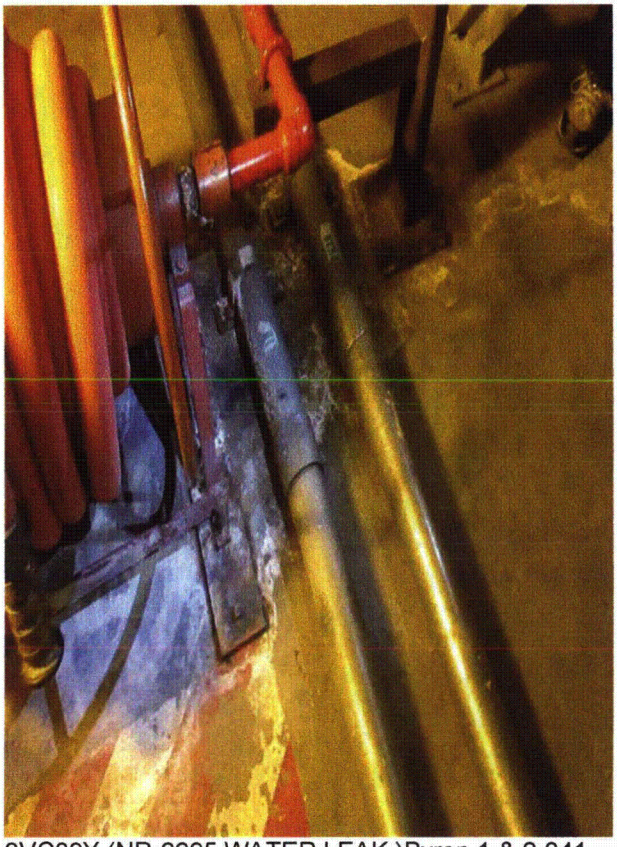
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC09Y

Equipment Class: (10) Air Handlers

Equipment Description: TRAIN B EMERGENCY MAKEUP INTAKE FROM TURB BLDG

Photos



0VC09Y (NP-6695 WATER LEAK)Byron 1 & 2 041

0VC09Y BENT CABLE TRAY COVER)Byron 1 & 2 042

Status: [Y] N U

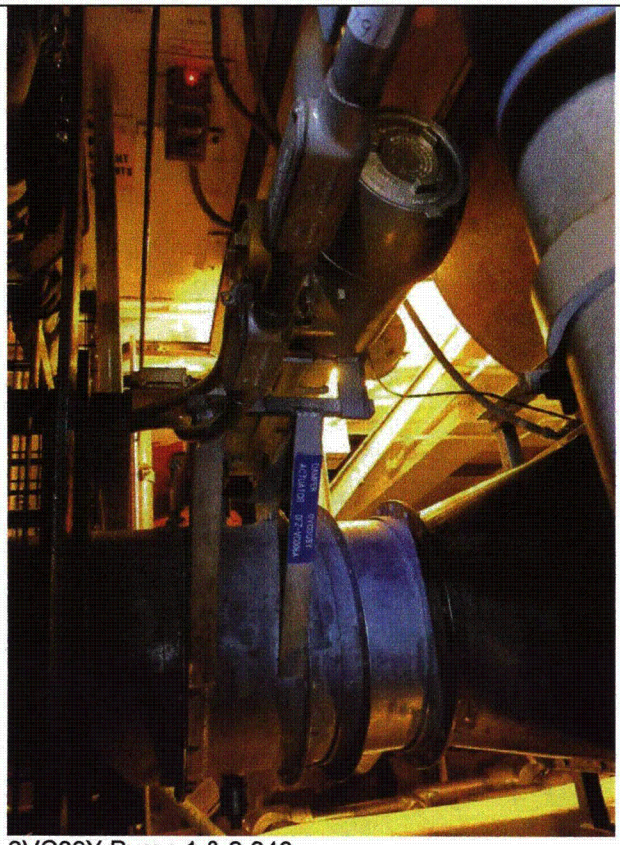
Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC09Y

Equipment Class: (10) Air Handlers

Equipment Description: TRAIN B EMERGENCY MAKEUP INTAKE FROM TURB BLDG

0VC09Y Byron 1 & 2 040



0VC09Y Byron 1 & 2 043

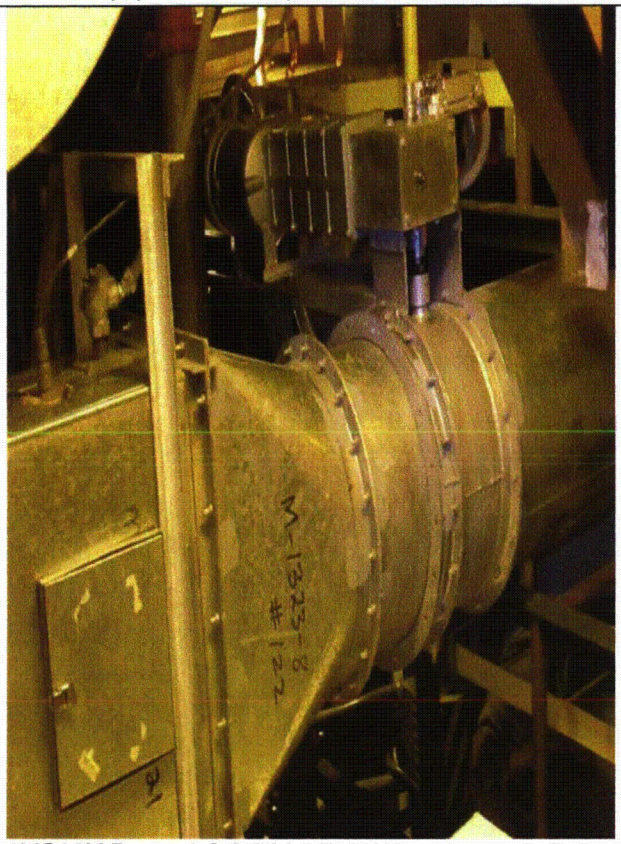
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: 0VC09Y

Equipment Class: (10) Air Handlers

Equipment Description: TRAIN B EMERGENCY MAKEUP INTAKE FROM TURB BLDG



0VC09Y Byron 1 & 2 044