Enclosure to ET 12-0032

WCAP-17678-NP, Revision 0

Wolf Creek Generating Station Post-Fukushima NTTF 2.3 Seismic Walkdown Submittal Report

(816 pages)

Westinghouse Non-Proprietary Class 3

WCAP-17678-NP
Revision 0

November 2012

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Seismic Walkdown Submittal Report

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November 2012

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RECORD OF REVISIONS

Revision	Date	Author	Description
0	11/2012	J. Bass (Editor)	Original Issue

EXECUTIVE SUMMARY

On March 11, 2011, the Fukushima Daiichi nuclear power plant suffered a devastating accident as a result of the Tohoku earthquake and subsequent tsunami. In response, the Nuclear Regulatory Commission (NRC) established the Near-Term Task Force (NTTF) to evaluate the catastrophe in Japan and determine what action, if any, was necessary to protect U.S. nuclear power plants. Upon review of the details of the accident at Fukushima Daiichi, the NTTF issued a report that made a series of recommendations resulting in the NRC issuing a 50.54(f) letter that requests information from the U.S. nuclear power plants. One such recommendation in the 50.54(f) letter was contained in Enclosure 3 and is titled Recommendation 2.3: Seismic.

To assist the U.S. nuclear power plants with meeting the request for information, the Nuclear Energy Institute (NEI), through the Electric Power Research Institute (EPRI), developed a guidance document that meets the intent of Enclosure 3 to the NRC 50.54(f) letter. The industry guidance document, "Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic," EPRI, Palo Alto, CA: 2012. 1025286, was endorsed by the NRC on May 31, 2012.

Enclosure 3 to the NRC 50.54(f) letter states the following purposes of the NRC request:

- To gather information with respect to Near-Term Task Force Recommendation 2.3, as amended by staff requirements memorandum (SRM) associated with SECY-11-0124 and SECY-11-0137.
- To request licensees to develop a methodology and acceptance criteria for seismic walkdowns to be endorsed by the NRC staff.
- To request licensees to perform seismic walkdowns using the NRC endorsed walkdown methodology.
- To identify and address degraded, nonconforming, or unanalyzed conditions through the corrective action program.
- To verify the adequacy of licensee monitoring and maintenance procedures.

The purpose of this report is to document the conformance of Wolf Creek Nuclear Operating Corporation to the EPRI Guidance in order to meet the NRC's request for information. The report covers the methods used to develop a representative list of equipment to be walked down, a list of that equipment, methods used during the actual walk down, observations collected by the walkdown team, and corrective actions taken to address the walkdown team observations. All degraded, nonconforming or unanalyzed conditions are identified and addressed within the corrective action program to ensure compliance with the design basis. Action plans addressing the licensing basis evaluations have either been completed or are in the process of being completed by the site corrective action process.

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
- Licensing Basis Evaluations
- Peer Review
- IPEEE Vulnerabilities Resolution Report

Enclosure 3 of the NRC 50.54(f) letter stipulated that each licensee submit a final report that includes the following:

1. Information on the plant-specific hazard licensing bases and a description of the protection and mitigation features considered in the licensing basis evaluation.

   Wolf Creek's current Seismic Licensing Basis (seismic codes, standards, and methods) is documented in report Section 1.0 and was used as input to seismic walkdown Licensing Basis Evaluations.

2. Information related to the implementation of the walkdown process.

   The approach used to implement the Seismic Walkdown Guidance is described in detail in report Sections 3.0 through 5.0. The approach documented within this report is in accordance with the EPRI Technical Report, TR-1025286, and therefore meets the requirements of the 50.54(f) letter.

3. A list of plant-specific vulnerabilities (including any seismic anomalies, outliers, or other findings) identified by the IPEEE and a description of the actions taken to eliminate or reduce them (including their completion dates).

   The results of the Individual Plant Examination of External Events program are described in report Section 7.0.

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

   The summary of the key findings of the Seismic Walkdowns and Area Walk-bys are described in Section 4.0. The licensing basis evaluation of potentially adverse seismic conditions and their resolutions are described in Section 5.0 and Appendix C. Several minor non-seismic housekeeping issues were observed and are discussed at the end of Section 4.3. Use of the site's CAP is documented in Section 4.0 and Appendix C. Twenty-four (24) Licensing Basis

Evaluations were generated and presented in Appendix C. None of these identified conditions prevent the equipment from performing its intended safety function during or after a design basis seismic event. Results of the Seismic Walkdowns and Area Walk-bys are documented on EPRI TR-1025286 Checklists in Appendix A and Appendix B of this report, respectively.

5. Any planned or newly-installed protection and mitigation features

   No planned or newly identified protection or mitigation features have resulted from the efforts to address the 50.54(f) letter.

6. Results and any subsequent actions taken in response to the peer review

   A Peer Review Team was assembled and peer reviews were performed in accordance with Section 6: Peer Reviews of the EPRI Guidance document. The Peer Review Team confirmed the Selection of SSCs process, provided real-time feedback to the Seismic Walkdown Engineers during performance of the walkdowns, and confirmed that the licensing basis evaluations carefully compared the actual as-found plant configurations to the current licensing basis documentation. Peer Reviewer activities are described in Section 6. The Peer Review Team determined that the objectives and requirements of the 50.54(f) letter were met, and that the efforts completed and documented within this report are in accordance with the EPRI Guidance document.

Follow-on activities required to complete the efforts to address Enclosure 3 of the 50.54(f) letter include inspection of 18 items that were inaccessible for inspection. These items are identified in Table 3-7. In addition, the 6 required supplemental cabinet inspections per EPRI/NRC guidance on FAQ 4.20 are identified in Table 3-8.

The conduct of the walkdown team in assessing the current state of safety related equipment and areas, in concert with the site response to identified observations, confirms the adequacy of the Wolf Creek monitoring and maintenance procedures. In total, this submittal report demonstrates compliance for the Wolf Creek Generating Station to the requirements of EPRI Technical Report 1025286, and therefore meets the intent of Enclosure 3 to the NRC 50.54(f) letter.

ACKNOWLEDGMENTS

We wish to acknowledge all the following contributors to this report for all their hard work and effort.

Eric Carlson – WCNOC

Richard Foust – WCNOC

Robert Kopecky – WCNOC

Jay Sawicki – WCNOC

Tim Solberg – WCNOC

Jon Weber – WCNOC

Gary Douglas – Westinghouse

Joe Somsel – Westinghouse

Todd Bacon – Stevenson & Associates

Tim Nealon – Stevenson & Associates

Hunter Young – Stevenson & Associates

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LIST OF ACRONYMS AND ABBREVIATIONS

A/C	Air Conditioning
AB	Main Steam
ACI	American Concrete Institute
AE	Main Feedwater
AFW	Auxiliary Feedwater
AHU	Air Handling Unit
AISC	American Institute of Steel Construction
AL	Auxiliary Feedwater
ASCE	American Society of Civil Engineers
AWC	Area Walk-By Checklist
BB	Reactor Coolant
BG	Chemical & Volume Control System
BIT	Boron Injection Tank
BL	Reactor Makeup Water
BM	Steam Generator Blowdown
BN	Borated Refueling Water Storage
BSCE	Bachelor of Science in Civil Engineering
CA	Corrective Action
CAP	Corrective Action Program
CCP	Centrifugal Charging Pump
CCW	Component Cooling Water
CF	Containment Function
CFR	Code of Federal Regulations
CLB	Current Licensing Basis
CR	Condition Report
CRDM	Control Rod Drive Mechanism
CSEE	Civil, Structural, & Environmental Engineering Department
CVCS	Chemical and Volume Control System
DCN	Design Change Notice
DG	Diesel Generator
DHR	Decay Heat Removal
EC	Fuel Pool Cooling & Cleanup
ECCS	Emergency Core Cooling System
ECU	Engineering Consultants Union
EF	Essential Service Water
EG	Component Cooling Water
EJ	Residual Heat Removal
EM	High Pressure Coolant Injection – SI, BIT
EN	Containment Spray
EP	Accumulator Safety Injection
EPRI	Electric Power Research Institute
ESF	Engineered Safety Feature
ESFAS	Engineered Safety Features Actuation System
ESW	Essential Service Water

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

FC	Auxiliary Turbines
FCV	Flow Control Valve
FRS	Floor Response Spectra
FSAR	Final Safety Analysis Report
FW	Feedwater
GD	Essential Service Water Building HVAC
GF	Miscellaneous Buildings HVAC
GG	Fuel Building Ventilation HVAC
GK	Control Building HVAC
GL	Auxiliary Building Ventilation
GM	Diesel Generator Building HVAC
GN	Containment Cooling
GS	Containment Hydrogen Control
GT	Containment Purge
HB	Liquid Radwaste
HCLPF	High Confidence of Low Probability of Failure
HSS	Hollow Structural Steel
HVAC	Heating, Ventilation and Air Conditioning
HX	Heat Exchanger
IC	Reactor Coolant Inventory Control
IE	Wolf Creek Internal Event
IPEEE	Individual Plant Evaluation for External Events
JE	Emergency Fuel Oil
KA	Compressed Air
KJ	Standby Diesel Engines
LF	Floor & Equipment Drains
LLC	Limited Liability Company
MCB	Main Control Board
MCC	Motor Control Center
MOV	Motor-Operated Valve
NB	Lower Medium Voltage System
NE	Diesel Generator
NF	Load Shedding & Emergency Load Sequencer
NG	Low Voltage System (480)
NK	125 VDC (Class 1E)
NN	Instrument AC Power
NRC	U.S. Nuclear Regulatory Commission
NTTF	Near-Term Task Force
OBE	Operating Basis Earthquake
OQCM	Operational Quality Control Manual
P&ID	Piping & Instrumentation Diagram
PC	Reactor Coolant Pressure Control
PIR	Plant Improvement Request

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

PN	Instrument AC Power
POV	Pneumatic-Operated Valve
PRA	Probabilistic Risk Assessment
PZR	Pressurizer
RAW	Risk Achievement Worth
RC	Reactor Reactivity Control
RCDT	Reactor Coolant Drain Tank
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RG	Regulatory Guide
RHR	Residual Heat Removal
RLE	Review Level Earthquake
RP	Miscellaneous Control Panels
RPV	Reactor Pressure Vessel
RWST	Refueling Water Storage Tank
S&A	Stevenson and Associates
SA	Engineered Safety Feature Actuation
SB	Reactor Protection
SCE	Seismic Capable Engineer
SC-I	Seismic Category 1
SE	Excore Neutron Monitoring
SFP	Spent Fuel Pool
SG	Steam Generator
SI	Safety Injection
SIP	Safety Injection Pump
SMA	Seismic Margin Assessment
SNUPPS	Standardized Nuclear Unit Power Plant System
SRT	Seismic Review Team
SSC	Structures, Systems, and Components
SSE	Safe Shutdown Earthquake
SSEL	Safe Shutdown Equipment List
STARS	Strategic Teaming and Resource Sharing
SW	Service Water
SWC	Seismic Walkdown Checklist
SWE	Seismic Walkdown Engineer
SWEL	Seismic Walkdown Equipment List
SWGR	Switchgear
SWT	Seismic Walkdown Team
TDAFP	Turbine-Driven Auxiliary Feedwater Pump
UHS	Ultimate Heat Sink
USAR	Updated Safety Analysis Report
VCT	Volume Control Tank

LIST OF ACRONYMS AND ABBREVIATIONS (cont.)

WR	Work Request
WCNOC	Wolf Creek Nuclear Operating Corporation
WCGS	Wolf Creek Generating Station

1 SEISMIC LICENSING BASIS

1.1 GROUND RESPONSE SPECTRA

The licensing basis for Seismic Category I (SC-I) equipment at Wolf Creek Generating Station (WCGS) is defined in the Updated Safety Analysis Report (USAR Reference 1) Section 3.7. Site powerblock design response spectra for the Safe Shutdown Earthquake (SSE) are provided in USAR Figures 3.7(B)-1 and 3.7(B)-2 and adhere to Regulatory Guide 1.60, Design Response Spectra for Seismic Design of Nuclear Power Plants (Reference 2). The horizontal and vertical ground acceleration values for the SSE are 0.20g. The design response spectra and earthquake time histories are applied in the free field at finished grade.

Per Section 3.7(B) of the USAR, the seismic responses of the major Seismic Category I structures (i.e., powerblock structures: containment, auxiliary/control, diesel generator, and fuel buildings) were originally generated for four SNUPPS sites (Callaway, Wolf Creek, Sterling, and Tyrone). Seismic design envelopes were developed by the use of the most restrictive site conditions imposed by any one of the four original sites or by generic design criteria which are conservative for each of the sites. With the cancellation of the Tyrone plant, however, the four site enveloping approach was modified, for work not yet completed, to include only the three remaining sites. The seismic design envelopes were not revised later to reflect the cancellation of the Sterling plant. Therefore, since the design of all powerblock structures, systems, and components is based on the responses of three or four sites, the design is conservative for the remaining two sites. Although the licensed design response spectra are 0.20g and 0.12g for the SSE and OBE events, respectively, further conservatism is applied as the original in-structure response spectra used in much of the design was based on the enveloped responses of three or four SNUPPS plant sites for an SSE anchored at 0.25g.

Damping values for SC-I equipment are listed in USAR Table 3.7(B)-1 and conform to Regulatory Guide 1.61, Damping Values for Seismic Design of Nuclear Power Plants (Reference 3).

Additional safety-related components that were included in the 2.3 Seismic Walkdowns exist in the ESW pumphouse which was designed separately from the initial multi-site SNUPPS design of the plant. This structure exists outside of the powerblock, but is still a seismic Category I structure and is designed to different site-specific ground motions. Per Section 3.7(S) of the USAR, the site design response spectra in both the horizontal and vertical directions for the SSE and OBE are 0.12g and 0.06g, respectively. Similar to the powerblock design ground motions, this spectrum is enveloped by a Regulatory Guide 1.60 spectrum anchored at 0.15g.

1.2 IN-STRUCTURE RESPONSE SPECTRA

A time history analysis was used to develop in-structure response spectra (ISRS) for buildings housing SC-I equipment. Modeling techniques such as the selection of the minimum number of mass points, number of dynamic degrees of freedom per mass point, and torsional effects, are described in BC-TOP-4-A (Reference 4) and were input into the FLUSH computer program. The seismic input was defined in terms of the free field acceleration time history and the soil-structure interaction parameters. The structural damping values used were per Reg. Guide 1.61 (Reference 3). Acceleration time-histories obtained from the FLUSH finite element analyses were used in computing the floor response spectra for

the major seismic Category I structures. The spectra were generated following the procedures outlined in Section 5.2 of BC-TOP-4-A, using the SPECTRA computer program.

1.3 SEISMIC QUALIFICATION OF SC-I EQUIPMENT

SC-I equipment is classified according to Regulatory Guide 1.29, Seismic Design Classification (Reference 5), and is discussed in USAR Section 3.2:

> *Seismic Category 1 structures, components, and systems are designed to withstand the safe shutdown earthquake (SSE), as discussed in Sections 3.7(B) and 3.7(N), and other applicable load combinations, as discussed in Sections 3.8.1 through 3.8.5. Seismic Category 1 structures are sufficiently isolated or protected from the other structures to ensure that their integrity is maintained.*

Per USAR Section 3.10(B)-2, SC-I electrical equipment was qualified per IEEE Standard 344-75 (Reference 6) and Regulatory Guide 1.100 (Reference 7). Seismic qualification of electrical equipment was performed by analysis, testing, or a combination of both all in accordance with IEEE 344-75.

Per Section 3.9(B) of the USAR, seismic qualification of mechanical equipment is performed by analysis, dynamic testing, or a combination of analysis and dynamic testing. Seismic qualification of equipment by analysis is utilized when the equipment can be adequately represented by a model and the analysis can determine its structural and functional adequacy. Acceptance criteria for qualification by analysis are based upon design load combinations and allowable stresses as shown in Tables 3.9(B)-2 through 3.9(B)-12 of the USAR. For qualification by testing, tests must demonstrate that the component can performs its safety-related function during and after the test.

2 PERSONNEL QUALIFICATIONS

2.1 EQUIPMENT SELECTION PERSONNEL

The Seismic Walkdown Equipment List (SWEL) development was performed by Westinghouse Electric Company personnel, David A. Bersi and Derek Seaman. Mr. Bersi is a Principal Engineer in the Core Design and Safety Analysis Group of Westinghouse's Nuclear Services Division. David is located in the Westinghouse Engineering Services – Texas office in Dallas and has over 25 years of experience in the nuclear energy industry. While at TXU Electric's Comanche Peak Nuclear Power Plant, David worked in a variety of plant engineering groups related to startup and operation of the plant. These included Design Basis Engineering, the Joint Engineering Team, System Engineering, and Mechanical Project Engineering. Significant projects while at CPNPP included installation of Radioactive Waste Effluent Hold Up Tanks, Spent Fuel Pool high density racks, Unit 1 Replacement Reactor Vessel Closure Head, and Unit 1 Replacement Steam Generators. While at Westinghouse, David has been involved in support of modifications and system reviews for several plant sites and support of new plant design. Mr. Seaman is a Senior Engineer in the Risk Applications and Methods Group of Westinghouse's Nuclear Services Division. Derek has over 6 years of experience in Westinghouse in the nuclear engineering area. Derek has rotated through various plant outage positions including reload engineering analyses and project management of fuel reload campaigns. Derek has evaluated power increase proposals from a safety analysis perspective and has designed and implemented quality assurance systems in the nuclear engineering area. Résumés are provided Appendix H. The development of the SWEL began in July 2012, and was completed on September 6, 2012.

2.2 SEISMIC WALKDOWN ENGINEERS

The seismic walkdown team (SWT) consisted of seismic walkdown engineers (SWEs) from Stevenson and Associates (S&A). S&A is recognized internationally as a leading seismic consultant to the nuclear industry and as a regular contributor to the advancement of earthquake engineering knowledge through funded research projects. The professional staff has expertise and capabilities in earthquake engineering, structural dynamics, and structural design. S&A has performed seismic evaluations of US nuclear power plants, using either Seismic Probabilistic Risk Assessment (PRA) or Seismic Margin Assessment, to address US Nuclear Regulatory Commission (NRC) Individual Plant Evaluation for External Events (IPEEE) for over 35 US and European plants. S&A conducted seismic PRA analyses for all of the US Army depots that are demilitarizing their stores of nerve gas ordnance.

The SWT for WCGS consisted of Hunter Young and Timothy Nealon of S&A (Résumés are provided in Appendix H). Tim Solberg led the support from WCGS for walkdowns as well as the interface with plant operators. Other WCGS professional staff provided support and guidance and these persons are acknowledged within this report.

Hunter Young, P.E. Mr. Young is a Senior Engineer in the S&A Phoenix office with specialization in the dynamic analysis and design of structures and equipment for seismic, blast, fluid, and wind loads. In addition to performing NTTF Recommendation 2.3: Seismic walkdowns at WCNOC, Mr. Young performed walkdowns at Palo Verde Nuclear Generating Station Units 1, 2, and 3 in addition to Port St. Lucie Units 1 and 2. He has also managed and led seismic walkdowns and fragility analyses of structures and components for use in probabilistic risk assessments. Mr. Young has performed the seismic

analyses of braced steel frames, concrete foundations, masonry walls, large storage tanks, and electrical and mechanical equipment anchorages. In addition, Mr. Young has executed the walkdown and analysis of tank structures and their associated leak-path piping to assess loss of inventory in the event of beyond design basis seismic events using manual and finite element methods. Mr. Young has a Master of Engineering in Structural Engineering from the Massachusetts Institute of Technology and Bachelors of Science in Civil Engineering (BSCE) from the University of Notre Dame. He is a licensed P.E. (civil) in California and has completed the 5-day SQUG Walkdown training course.

Timothy Nealon: Mr. Nealon is an Engineer in the S&A Phoenix office with specialization in the dynamic analysis and design of structures and equipment for seismic, blast, fluid, and wind loads. In addition to performing NTTF Recommendation 2.3: Seismic walkdowns at WCNOC, Mr. Nealon performed walkdowns at Comanche Peak Units 1 and 2 in addition to Palo Verde Nuclear Generating Station Units 1 and 3. He has also participated in seismic walkdowns and fragility analyses of structures and components for use in probabilistic risk assessments. In addition, Mr. Nealon has conducted walkdowns and analysis of tank structures and their associated leak-path piping to assess loss of inventory in the event of beyond design basis seismic events using various methods. Furthermore he has completed the 2-day Seismic Walkdown Course and has conducted NTTF 2.3 Fukushima response seismic walkdowns at multiple nuclear stations. Mr. Nealon has a Master of Science in Structural Engineering and BSCE from the University at Buffalo.

2.3 LICENSING BASIS REVIEWERS

The Licensing Basis Reviewers for WCGS consisted of Mr. Hunter Young and Mr. Timothy Nealon from the SWT with the assistance of Mr. Tim Solberg of WCNOC. Their qualifications are provided under Section 2.2 or Appendix H.

2.4 IPEEE REVIEWERS

The IPEEE Reviewers consisted of a combination of the Equipment Selection Personnel and the SWT. Mr. David Bersi and Mr. Derek Seaman of Westinghouse (qualifications listed in Section 2.1 and Appendix H) identified equipment subject to IPEEE enhancements for incorporation into SWEL 1. Mr. Hunter Young and Mr. Timothy Nealon of S&A (qualifications listed in Section 2.2 and Appendix H) performed the identification of actions taken to eliminate or reduce the IPEEE vulnerabilities previously identified.

2.5 PEER REVIEW TEAM

The peer reviewers for WCGS are Messrs. Todd Bacon of S&A and Gary Douglas of Westinghouse. Mr. Bacon is also designated the peer review Team Leader. None of the peer review team was involved in the seismic walkdown inspection process as to maintain their independence from the project.

Mr. Bacon is a civil engineer with over thirty years of experience. He has been also trained to the EPRI Seismic Walkdown Engineer (SWE) training. Mr. Douglas is a nuclear engineer with fifteen years of nuclear engineering experience and ten years of aerospace engineering experience. Résumés are provided in Appendix H. All peer review activities were performed by at least two engineers.

3 SELECTION OF SSCS

3.1 SWEL DEVELOPMENT OVERVIEW

This section describes the process used by Westinghouse to select the structures, systems, and components (SSCs) that were included in the Wolf Creek Generating Station Seismic Walkdown Equipment List (SWEL). The Seismic Walkdown Equipment List is comprised of a sample of Seismic Category 1 (SC-I) equipment required to meet the objectives of the 10CFR50.54(f) letter (Reference 8). The process described in "Section 3: Selection of SSCs" of "Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic," EPRI, Palo Alto, CA: 2012. 1025286, (Reference 9), was used as guidance to develop the Wolf Creek SWEL.

The SWEL is comprised of two groups of items:

- SWEL 1 – Items required to safely shut down the reactor and maintain containment integrity.
- SWEL 2 – Items related to the Spent Fuel Pool (SFP), including items that could result in a rapid drain down of the SFP.

The SSCs from these two groups were then combined into a single SWEL to be used during the Seismic Walkdowns and Area Walk-Bys.

The following steps, based on the integrated project schedule, outline the process used to produce the SWEL:

- Project Kickoff Meeting
- Obtain customer inputs
  - Original Wolf Creek Individual Plant Examination for External Events (IPEEE)
  - Containment function equipment
  - List of SC-I equipment for the site
  - Modifications since IPEEE
  - Recently modified/upgraded equipment
  - Seismic vulnerabilities from Corrective Action Program (CAP)
  - Components of high Risk Significance
  - SFP equipment
  - Obtain remote access to site documentation (design drawings, system health reports, SSC equipment list data base, USAR, etc.)
- Assemble preliminary Base List 1
  - Perform Screen #1 – Seismic Category 1 (non-SC-I SSCs screen out)
  - Perform Screen #2 – Regular Inspections (Structure, Piping, Penetrations screen out)
  - Perform Screen #3 – Support for the five Safety Functions (see Section 3.2.1)
- Assemble preliminary Base List 2
  - Perform Screen #1 – Seismic Category 1 (non-SC-I SSCs screen out)
  - Perform Screen #2 – Appropriate for walkdown

- Site visit
  - Confirm preliminary Base Lists 1 and 2
- Finalize Base Lists 1 and 2
- Start selection of SWEL
- Select SWEL 1 (from Base List 1)
  - Perform Screen #4 –
    - System variety
    - Equipment type variety
    - Environment variety
    - Risk importance considerations
    - Major new or replacement equipment
    - Recently modified/upgraded (zone of influence effects)
    - IPEEE seismic vulnerability findings
    - Consider equipment accessibility
- Select SWEL 2 (from Base List 2)
  - Perform Screen #3 –
    - System variety
    - Equipment type variety
    - Environment variety
    - Major new or replacement equipment
    - Recently modified/upgraded (zone of influence effects)
    - Consider equipment accessibility
  - Perform Screen #4 – Rapid Drain-Down assessment
- Confirm SWEL (SWEL 1 + SWEL 2) with Seismic Walkdown Engineers (SWEs)
- Obtain Wolf Creek Operations approval of SWEL
- SWEL Peer Review

Weekly status meetings with the utility were established to monitor and control progress.

A SWEL development site visit was held August 27th through August 28th, 2012 to conduct working sessions with Wolf Creek Operations and Design Engineering staff members to confirm the Base List and perform the screens and reviews necessary for selecting equipment to the Wolf Creek SWEL. The agenda followed during the site visit included:

- Pre Job Brief of the SWEL selection project
- Discuss high-level approach to SWEL Development
- Review Base List 1 for accuracy and completeness
- Populate the SWEL 1 Screen #4 Sample selection attributes
- Select the SWEL 1 items
- Identify items for follow-up
- Review Base List 2 for accuracy and completeness
- Populate the SWEL 2 Screen #3 Sample selection attributes

- Select the SWEL 2 items
- Identify items for follow-up
- Summary

The following personnel participated in this site visit:

Attendee	Company	Position
Rick Foust	WCNOC	Wolf Creek Site Lead
Robert Kopecky	WCNOC	Outage Superintendent/Engineering
Tim Solberg	WCNOC	Seismic Engineering
Jon Weber	WCNOC	Operations
Eric Carlson *	WCNOC	Operations (participated in the final SWEL approval)
Jeffrey Bass	Westinghouse	Project Manager
David Bersi	Westinghouse	SWEL Development Lead
Derek Seaman	Westinghouse	SWEL Developer

Note:
* Not present but signed for Jon Weber on the final SWEL approval.

In advance of the Walkdowns and Area Walk-bys, the completed SWEL (presented in Appendix G) was reviewed and signed by Wolf Creek Operations and forwarded to the Seismic Walkdown Engineers for review and to begin compilation of the walkdown packages.

The completed SWEL was peer reviewed on September 7th, 2012 by a team of peer reviewers which included representatives from Westinghouse Engineering (Gary Douglas) and Stevens & Associates Engineering (Todd Bacon).

3.2 SWEL 1 – SAMPLE OF REQUIRED ITEMS FOR THE FIVE SAFETY FUNCTIONS

The Wolf Creek IPEEE Safe Shutdown Equipment List, "List of Equipment Included in the Primary and Alternate Safe Shutdown Paths for the Wolf Creek Generating Station" (Table 3.6 in Reference 10) was used as the starting point for selecting SSCs for inclusion in Base List 1. Sections 2.3.1, 3.3.2.2, and 3.3.2.3 of the Wolf Creek IPEEE (Reference 10) provided justification that the core protection safety functions of Reactivity Control, Reactor Coolant System Pressure Control, Reactor Coolant System Inventory Control, and Decay Heat Removal, as well as the Containment Function, which are required as part of the SWEL development process guidance (Reference 9), had been addressed during the development of the Wolf Creek IPEEE SSEL.

The IPEEE effort was conducted between January 1993 and March 1995 using the guidance of NUREG-1407 (Reference 11). The methodologies used in performance of the IPEEE are those listed as acceptable in Generic Letter 88-20, Supplement 4. The seismic evaluations were performed in accordance with the Electric Power Research Institute (EPRI) seismic margins methodology and the guidance provided in NUREG-1407 for a "reduced scope" plant. Although the WCGS is classified as a "focused

scope" plant in the generic letter supplement, WCNOC believes the seismic risk for WCGS is comparable to and/or less than the seismic risk of plants originally binned as "reduced scope."

Although a "reduced scope" IPEEE assessment is performed at the plant design basis seismic input level (Safe Shutdown Earthquake, SSE), the seismic capability screening walkdowns considered the guidance of EPRI NP-6041-SL (Reference 12) and information from a preliminary assessment of seismic demand on Wolf Creek structures and components for an Seismic Margins Earthquake (SME) of 0.30g pga. Accordingly, most components were screened to a minimum SME of 0.30g pga. Twelve components (four battery racks and eight cabinets) which are acceptable in terms of the WCGS seismic design basis were not screened against the SME of 0.30g. None are judged to have a High Confidence of Low Probability of Failure (HCLPF) low enough to be considered for possible modification. WCNOC also performed a relay review for "bad actors," although not required for a "reduced scope" assessment. Although seismically sensitive relays were found in safe shutdown equipment, evaluation of the locations, state, and use of these relays shows that relay chatter is not expected to cause equipment loss in a seismic event. It must be emphasized that no weaknesses in design were discovered. The only instances of seismic weakness identified by the SMA were identified during walkdowns.

3.2.1 Base List 1

The screens required by the Seismic Walkdown Guidance (Reference 9) were applied to the IPEEE SSEL, the starting list of equipment, to assign appropriate SSCs to Base List 1.

Screen #1 screened out equipment that was not identified as active SC-I components in the Wolf Creek site equipment database. Only the SC-I components have a defined seismic licensing basis to evaluate against the as-installed configuration.

Out of 738 SSCs initially considered, 715 passed Screen #1.

Screen #2 screened out SSCs which regularly undergo inspections in order to confirm their configuration continues to be consistent with the established plant licensing basis. SSCs such as structures, containment penetrations, and piping components are filtered out.

Manual valves, check valves, flow orifices, fire dampers, and relief valves were also excluded in accordance with the guidance, since they are either considered in-line components or equipment that is regularly inspected.

Out of 715 items coming in from Screen #1, 667 passed Screen #2.

Screen #3 screened out components that provide no support for any of the five safety functions. As part of the Reference 2 guidance, the SSCs selected to be included in Base List 1 need to support at least one of the following five safety functions:

- Reactor Reactivity Control (RC)
- Reactor Coolant Pressure Control (PC)
- Reactor Coolant Inventory Control (IC)
- Decay Heat Removal (DHR), including Ultimate Heat Sink (UHS)
- Containment Function (CF)

The first four safety functions are associated with bringing the reactor to a safe shutdown condition, and the fifth safety function is associated with maintaining containment integrity. SSCs corresponding to the Ultimate Heat Sink (UHS) represent additional Decay Heat Removal capabilities. UHS equipment at Wolf Creek was identified by a review of the Wolf Creek USAR, Section 9.2.5 (Reference 1). The identified UHS components that passed Screens #1 and #2 were added to Base List 1. Containment function equipment for Wolf Creek is incorporated throughout the IPEEE SSEL (Table 3.6 in Reference 10). As part of the SWEL development site visit, Wolf Creek Operations and Engineering personnel reviewed each component to determine the safety function(s) supported.

Out of 667 items coming in from Screen #2, 616 passed Screen #3. The equipment coming out of Screen #3 and entering Screen #4 is defined as Base List 1. The resulting Base List 1 comprised of the 616 SSCs is tabulated by system in Appendix E.

3.2.2 SWEL 1

With Base List 1 established, the SSC selection process entered Screen #4 of the Reference 9 guidance (i.e., Sample Considerations). Screen #4 is intended to result in a SWEL 1 that sufficiently represents a broad spectrum of plant SSCs based on plant systems, equipment types, environments, and component enhancements, upgrades, and replacements. In addition, the development of SWEL 1 needed to take into consideration the components that Wolf Creek deemed as risk significant to the safe operation of the plant.

During the SWEL development site visit, Wolf Creek Operations personnel identified that Train B would be available for inspections the week of September 17, 2012 during the at-power Seismic Walkdowns and Area Walk-Bys. Thus, the components selected for the walkdowns were mainly focused on those which were identified as being part of Train B.

Screen #4 was applied as described below.

System Variety

SWEL 1 selections began with a review by system. Various equipment types within each system were selected. At least one SSC was selected per system with the exception of systems EC (Fuel Pool Cooling and Cleanup) and GG (Fuel Building Ventilation HVAC), which are represented in SWEL 2, system GD (Essential Service Water Building HVAC), the components of which were not accessible without scaffolding, and GF (Miscellaneous Building HVAC), KC (Fire Protection), which are systems with a low number of items available for selection, and SP (Process Radiation Monitoring), which is a non safety related system included in the IPEEE and therefore included in the SSEL. The equipment types available for selection from the non-represented systems and their support functions were adequately represented by multiple equipment selections from several other systems.

The Wolf Creek Generating Station system acronyms and the number of SSCs considered and selected for the Walkdown are indicated as follows in Table 3-1.

Table 3-1 System Descriptions and Quantities of SSCs Selected

System	Description	Quantity of Items by System in SWEL 1	Quantity Selected for Walkdown
AB	Main Steam	26	3
AE	Main Feedwater	24	3
AL	Auxiliary Feedwater	35	3
BB	Reactor Coolant	32	2
BG	Chemical & Volume Control System	23	6
BL	Reactor Makeup Water	1	1
BM	Steam Generator Blow-Down	4	1
BN	Borated Refueling Water Storage	14	3
EC	Fuel Pool Cooling & Cleanup	0	0
EF	Essential Service Water	54	7
EG	Component Cooling Water	39	8
EJ	Residual Heat Removal	29	4
EM	High Pressure Coolant Injection – SI, BIT	24	3
EN	Containment Spray	8	1
EP	Accumulator Safety Injection	4	1
FC	Auxiliary Turbines	3	2
GD	Essential Service Water Building HVAC	15	0
GF	Miscellaneous Buildings HVAC	4	0
GG	Fuel Building Ventilation HVAC	0	0
GK	Control Building HVAC	15	4
GL	Auxiliary Building Ventilation	12	3
GM	Diesel Generator Building HVAC	10	4
GN	Containment Cooling	22	2
GS	Containment Hydrogen Control	10	1
GT	Containment Purge	12	1
HB	Liquid Radioactive Waste	2	1
JE	Emergency Fuel Oil	11	2
KA	Compressed Air	8	2
KC	Fire Protection	1	0
KJ	Standby Diesel Engines	26	10
LF	Floor & Equipment Drains	2	1
NB	Lower Medium Voltage System	10	2
NE	Diesel Generator	6	1

Table 3-1 (cont.) System Descriptions and Quantities of SSCs Selected			
System	**Description**	**Quantity of Items by System in SWEL 1**	**Quantity Selected for Walkdown**
NF	Load Shedding & Emergency Load Sequencer	3	1
NG	Low Voltage System (480)	30	8
NK	125 VDC (Class 1E)	18	6
NN	Instrument AC Power (Class 1E)	8	1
PN	Instrument AC Power	6	1
RL	Main Control Board	16	3
RP	Miscellaneous Control Panels	10	2
SA	Engineered Safety Feature Actuation	7	1
SB	Reactor Protection	19	4
SE	Excore Neutron Monitoring	26	4

Equipment Type Variety

Following system variety SWEL 1 selections, Base List 1 was re-evaluated to ensure all available equipment types were represented in SWEL 1. Additional SWEL 1 selections were made to ensure at least one item from each equipment type category listed in EPRI NP-6041-SL (Reference 12) was represented. Equipment type categories 11 (Chillers), 12 (Air Compressors), and 13 (Motor Generators) were not represented because the Wolf Creek site has no SC-I chillers, air compressors, or motor generators.

The Wolf Creek Generating Station equipment type categories and the number of SSCs considered and selected for the Walkdown are indicated as follows in Table 3-2.

Table 3-2 Equipment Types and Quantities of SSCs Selected			
Equipment Type	**Description**	**Quantity of Items by Equip Type in SWEL 1**	**Quantity Selected for Walkdown**
0	Miscellaneous	36	4
1	Motor Control Centers	14	3
2	Low Voltage Switchgear	10	3
3	Medium Voltage Switchgear	8	2
4	Transformers	14	3
5	Horizontal Pumps	20	7
6	Vertical Pumps	6	2
7	Fluid Operated Valves	51	12

Table 3-2 (cont.) Equipment Types and Quantities of SSCs Selected			
Equipment Type	**Description**	**Quantity of Items by Equip Type in SWEL 1**	**Quantity Selected for Walkdown**
8	Motor Operated or Solenoid Operated Valves	152	19
9	Fans	4	1
10	Air Handlers	22	5
11	Chillers	0	0
12	Air Compressors	0	0
13	Motor Generators	0	0
14	Distribution Panels	14	3
15	Batteries on Racks	4	2
16	Battery Chargers and Inverters	8	2
17	Engine Generators	4	2
18	Instruments on Racks	117	12
19	Temperature Sensors	18	3
20	Instrumentation and Control Panels	76	17
21	Tanks and Heat Exchangers (GIP Section 7)	38	10

Environment Variety

Equipment environments were considered by performing a review of USAR (Reference 1) Table 3.11(B)-1. All equipment environments were represented in SWEL 1. The equipment selected for the SWEL was from different operating environments (e.g., dry and hot, wet and cold, and inside and outside buildings).

The Wolf Creek Environmental Classifications are based on the following, using room temperature and humidity values presented in USAR Table 3.11(B)-1:

- Harsh > 130F
- Hot > 110F
- Cool < 95F
- Humid > 90%
- Dry < 60%
- Chemical = Contains Potential Chemical Exposure
- The "Mild" classification depicts the temperature range between "Hot" and "Cool"

Note that the containment is universally classified as hot and humid.

IPEEE Vulnerability Enhancement

A summary of the seismic walkdown findings and resolutions from the IPEEE (Reference 10) was reviewed. The issues, and their subsequent resolutions, are as follows:

- Results of the Seismic Margins Assessment (SMA) are summarized first for those actions required to restore WCGS equipment to as tested conditions and second, for enhancements which may be implemented to add margin beyond the design basis requirements. Four issues were identified during the course of plant walkdowns where actual field installation did not conform to the seismic design configuration. These issues are:

  1. A transformer on an inverter was not bolted to the frame on one side; (Note that NN011 was not selected since it was not scheduled to be worked on in the near future. Due to safety considerations, an available battery charger was selected instead.)

  2. Instances of structural members were identified in close proximity to electrical cabinets;

  3. A Victaulic coupling on a drain line in the Diesel Generator Building was identified in close proximity to a Motor Control Center and was evaluated at the time of the walkdowns;

  4. Loose/missing bolting hardware and/or shims on an intercooler heat exchanger and chiller/AC units was identified.

  These issues were immediately identified on Work Requests for corrective actions. Several housekeeping issues with respect to temporary items (trash barrels, storage cabinets) stored near safety-related components were also identified. These issues were identified on Plant Improvement Request (PIR) 94-1066.

Components described above were considered for selection to SWEL 1 (i.e., Screens #1 through #4 were performed). Of those, the following components enhanced due to vulnerabilities, as identified above, have been selected to SWEL 1 and annotated with the IPEEE walkdown information to assess current conditions. These are shown in Table 3-3 below:

Table 3-3 SWEL 1 Items with IPEEE Vulnerabilities

Walkdown Equipment for Unit 1	Walkdown Equipment Class	Description
NG002	Low Volt Switchgear	480 VAC (Item #2 above)
SGK04B	Air Handling Unit	CONTROL ROOM A/C UNITS (Item #4 above)
SGK05B	Air Handling Unit	CLASS 1E ELEC. EQUIP. A/C UNIT (Item #4 above)

Major New and Replacement Equipment (includes recent modifications)

During the SWEL development site visit, Wolf Creek Operations and Engineering Personnel identified 40 Capital Project Modifications of plant equipment items which occurred since the IPEEE, in the years 2000 through 2012. The listing included 14 modifications which have modified or upgraded plant equipment items within approximately the last year. Additionally, a search of the Condition Reporting database was performed by WCGS using the keywords "Seismic," "Safe Shutdown," "IPEEE," "Individual Plant Examination," and "Anchorage" to identify any recent seismic-related Condition Reports (CRs). From 52 items identified, a sampling of 16 components was selected to be included in SWEL 1 and they are listed in Table 3-4.

Table 3-4 Major New and Replacement Equipment included in SWEL 1

Equipment ID	Equipment Description
ABHV0014	LOOP-1 MAIN STEAM ISOLATION VALVE
AEFV0039	EBB01A FEEDWATER ISOLATION VALVE
EFHV0024	ESW B/SERVICE WATER CROSS CONNECT VALVE
EFHV0040	ESW TRAIN B TO SW CROSS CONNECT VALVE
EGHV0016	CCW TRAIN B RETURN ISO VALVE
EKJ03B	INTERCOOLER HEAT EXCHANGER
EKJ04B	LUBE OIL COOLER
EKJ06B	DIESEL JACKET WATER HEAT EXCHANGER
FC0219	LOCAL CONTROL PANEL FOR TD AFW PUMP
FEF02B	ESW SELF-CLEAN STRAIN. (MTR OP.-IN MOV PROG.)
GNV0002	CTMT COOLER B ESW OUTLET FLOW CONTROL VLV
PBG02B	BORIC ACID TRANSFER PUMP MOTOR
PEJ01B	RESIDUAL HEAT REMOVAL PUMP
PKJ03B	AUXILIARY LUBE-OIL (KEEP-WARM) PUMP FOR KKJ01B
SGK04B	CONTROL ROOM A/C UNITS
SGK05B	CLASS IE ELEC. EQUIP. A/C UNIT

Risk Significant Equipment

In order to identify risk significant SSCs, the WCGS Internal Events (IE) PRA model (Reference 13) was used. The associated Risk Achievement Worth (RAW) values for basic events in the IE PRA model were linked to individual SSC component IDs. Equipment in Base List 1 with a RAW value greater than 2.0 was deemed risk significant and considered for SWEL 1 selection. Sixty-seven risk significant SSCs were included in Base List 1. Of these 27 SSCs were selected to SWEL 1.

The output from Screen #4 constitutes the Selection of SSCs to SWEL 1. SWEL 1 is tabulated by equipment type in Appendix F and provides the detail for each SSC selected. Appendix G provides the transmittal of the SWEL to the utility, including the SWEL revisions incorporated based on the walkdown activities.

3.3 SWEL 2 – SPENT FUEL POOL RELATED ITEMS

The process for selecting a sample of the SSCs associated with the Spent Fuel Pool (SFP) to SWEL 2 included the following screens:

- Screen 1 – Seismic Category I
- Screen 2 – Equipment or Systems
- Screen 3 – Sample Considerations
- Screen 4 – Rapid Drain-Down

3.3.1 Base List 2

Base List 2 was developed from the population of Seismic Category I equipment currently identified in the site's equipment database from the Fuel Pool Cooling and Cleanup (EC) and Fuel Building Ventilation HVAC (GG) Systems.

The recommended Seismic Walkdown Guidance screens were applied to this starting listing of equipment to assign appropriate equipment to Base List 2.

Screen #1 screened out no equipment; all items were designated Seismic Category I.

Screen #2 screened out structures and equipment not appropriate for the Spent Fuel Pool walkdown process. Equipment that is integral with piping or undergoes regular inspection, such as blind flanges, snubbers, check valves, local manual valves, orifice and flow elements, thermowells, resin traps, and relief valves were screened out. Equipment located inside the Spent Fuel Pool or Transfer Canal, and abandoned, unused, and dry cask service items were screened out. Equipment located in the Fuel Building but providing no direct support for the Spent Fuel Pool was screened out.

The resulting Base List 2 is comprised of 10 items and is tabulated by system in Table 3-5. Each item was reviewed with the utility to confirm the screen results.

Table 3-5 Base List 2					
Base List 2 Item Number	**Walkdown Equipment**	**Description**	**Equipment Class**	**System Type**	**Building**
1	EEC001A	FUEL POOL COOLING HEAT EXCHANGER	Heat Exchangers	EC	Fuel Bldg
2	EEC001B	FUEL POOL COOLING HEAT EXCHANGER	Heat Exchangers	EC	Fuel Bldg
3	SGG04A	SFP PUMP ROOM COOLER A	AHU	GG	Fuel Bldg
4	SGG04B	SFP PUMP ROOM COOLER B	AHU	GG	Fuel Bldg
5	PEC01A	FUEL POOL COOLING PUMP	PUMP	EC	Fuel Bldg
6	PECO1B	FUEL POOL COOLING PUMP	PUMP	EC	Fuel Bldg
7	ECHV011	FUEL POOL HEAT EXCHANGER SHELL SIDE OUTLET ISO	MOV	EC	Fuel Bldg
8	ECHV012	FUEL POOL HEAT EXCHANGER SHELL SIDE OUTLET ISO	MOV	EC	Fuel Bldg
9	ECFT0017	FUEL POOL COOLING PUMP DISCHARGE FLOW TRANSMITTER	Inst. Racks	EC	Fuel Bldg
10	ECFT0018	FUEL POOL COOLING PUMP DISCHARGE FLOW TRANSMITTER	Inst. Racks	EC	Fuel Bldg

3.3.2 Rapid Drain-Down

Screen #4 considered potential Rapid Drain-Down items.

Potential Rapid Drain-Down items are those pieces of equipment that could fail during a seismic event and cause lowering of the Spent Fuel Pool water level to the top of the fuel assemblies within 72 hours after the earthquake. As noted on page 1-4 of the Seismic Walkdown Guidance (Reference 9), all structures, systems, and components (not just safety-related) need to be considered. The Seismic Walkdown Guidance specifies the following:

> *"Determine whether there are SFP penetrations below about 10 feet above the top of the fuel assemblies. If there are no such penetrations, then no rapid drain-down items would be added to SWEL 2."*

This 10 foot criterion is cited in the Wolf Creek USAR Section 9.1 (Reference 1). USAR Section 9.1.2.2 (page 9.1-11) states the following:

> *"The concrete structures for the refueling pool, spent fuel pool, cask loading pool, and fuel transfer canal are designed in accordance with the criteria for seismic Category I structures contained in Sections 3.7(B) and 3.8. As such, they are designed to maintain leak tight integrity to prevent the loss of cooling water from the pools. In the event of a loss of integrity of the watertight gate, while one of the small pools is drained, a minimum of 10 feet of water is maintained above the top of the fuel. In addition, all piping penetrations into the pool are designed to preclude draining the pool down to an unacceptable limit, as described in Section 9.1.3."*

USAR Section 9.1.3.1.1 (page 9.1-17) states the following regarding the Fuel Pool Cooling and Cleanup System:

> *"System piping is arranged so that loss of piping integrity or operator error does not result in draining of the fuel storage pool below a minimum depth above the stored fuel to ensure sufficient cooling media for cooling the stored spent fuel (Regulatory Guide 1.13)."*

Pool connections to the spent fuel pool, fuel transfer canal, and wet cask pit have been verified by a review of the referenced spent fuel pool P&IDs (Reference 20), piping isometrics (Reference 21), and USAR Sections 9.1.2 and 9.1.3. The integrity of the SC-I spent fuel pool liners are subject to regular surveillance test procedures per standard Tech Specs and are excluded per NEI guidance. The fuel pool cooling P&ID shows several connections to the pool with anti-siphoning holes and vents per the drawing notes. The current design drawings (including piping isometrics) were reviewed and support the assertions in the USAR concerning pool drain-down protection. Some of these drawings are titled as SNUPPS documents.

The lines in the pit and the canal can be dismissed because the pit and canal are normally isolated from the pool by SC-I gates. The gates are considered part of the SFP structure and, therefore per the Reference 2 guidance, the gates screen out from the SWEL. Level instrument sensing connections shown on the P&ID are either directly submerged or can be considered too small to rapidly drain down the pool within 72 hours and has no apparent power source to do so – no line sizes are shown on the drawing.

The fuel handling building has a high capacity overhead crane for moving spent fuel shipping casks. The normal operating practice for the crane is to park the crane in an area outside the perimeter of the SFP when not in use. At times, the crane is secured to the rails adding additional restraint from falling. Since the time the crane spends over the pool is relatively insignificant, and the crane is parked in a safe portion of the rail length when not in use, the crane was screened out as having the potential to fall into the SFP and displace sufficient inventory to be deemed a drain down concern.

Based on documentation and review, there are no Rapid Drain-Down items for input to SWEL 2.

3.3.3 SWEL 2

In order to complete the SWEL 2 development, Screen #3 was applied to the items in Base List 2. Screen #3 is intended to result in a sufficient sample of SC-I equipment supporting the Spent Fuel Pool.

System Variety

SWEL 2 selections began with a review by system. Various equipment types within each system were selected. At least one item was selected from the represented systems: EC and GG.

Equipment Type Variety

Base List 2 was re-evaluated to ensure the available equipment types were represented in SWEL 2. Of the five available equipment types, at least one component representing each equipment type was selected.

Environment Variety

Equipment environments were considered by performing a review of USAR (Reference 1) Table 3.11(B)-1. Hot/humid and cool/dry environment types were represented in SWEL 2.

Major New and Replacement Equipment (including recent modifications)

No spent fuel pool related major modifications were identified during the SWEL development site visit.

SWEL 2 is defined as the equipment coming out of Screen #3 (5 items), plus the equipment coming out of Screen #4 (no items). The SWEL 2 list is provided in Table 3-6. The components excluded from the SWEL 2 selection list were excluded based on equipment redundancy and inaccessibility for walkdown (i.e., Train B components were selected since Train A would not be accessible during the walkdown).

Table 3-6 SWEL 2

SWEL Item Number	Walkdown Equipment	Description	Equipment Class	System Type	Building
1	EEC001B	FUEL POOL COOLING HEAT EXCHANGER	Heat Exchangers	EC	Fuel Bldg
2	SGG04B	SFP PUMP ROOM COOLER B	AHU	GG	Fuel Bldg
3	PECO1B	FUEL POOL COOLING PUMP	PUMP	EC	Fuel Bldg
4	ECHV012	FUEL POOL HEAT EXCHANGER SHELL SIDE OUTLET ISO	MOV	EC	Fuel Bldg
5	ECFT0018	FUEL POOL COOLING PUMP DISCHARGE FLOW TRANSMITTER	Inst. Racks	EC	Fuel Bldg

3.4 ADDITIONAL INSPECTIONS

3.4.1 Inaccessible Items

There were 18 items that were inaccessible during the scheduled Wolf Creek Generating Station at-power walkdown dates (the week of September 17, 2012). These items are identified in Table 3-7. The walkdown and area walk-bys of equipment inaccessible during the scheduled at-power walkdown dates will be performed prior to startup from the next refueling outage, presently scheduled for Spring 2013.

Table 3-7 Wolf Creek Equipment Inaccessible During the Scheduled Walkdown

SWEL 1 Item No.	Equipment ID	Description	Building
53	GTRE031	CTMT ATMOSPHERE RADIATION MONITOR	AUX
60	NB002	4.16 KV BUS #2	CB/CC
61	NB00213	CTRL BLDG LC NG02 SWGR BRKR	CB/CC
64	NG002	480 VAC	CB/CC
65	NG00201	MAIN BREAKER	CB/CC
66	NG00206	NG02A FDR BRKR	CB/CC
40	EPHV8808B	ACCUMULATOR TANK B OUTLET ISO VALVE <TIME CRITICAL ACTION EQUIPMENT>	RB
54	HBHV7176	RCDT PUMPS DISCH HDR INSIDE CTMT ISO	RB
6	AELT0519	STM GEN LEVEL A NARROW RANGE	RB
9	BBPT0456	PRESSURIZER PRESSURE	RB
70	NK004	125 VDC BUS SWITCHBOARD	CB/CC
73	NK024	125 VDC NO 4	CB/CC
74	NK044	DIST 125 VDC	CB/CC
75	NK054	DIST 125 VDC	CB/CC
76	NN014	7.5 KVA	CB/CC
51	GNV0002	CTMT COOLER B ESW OUTLET FLOW CONTROL VLV	RB
5	AELT0502	STM GEN B WIDE RANGE	RB
112	XPN08B	120 V INSTRUMENT AC TRANSFORMER	CB/CC

3.4.2 Supplemental Inspections

During the performance of the at-power seismic walkdowns, the industry was made aware that the NRC staff had clarified their position on the opening of electrical cabinets to inspect for other adverse seismic conditions (EPRI/NRC guidance – FAQ 4.20). Supplemental inspections ("flashlight inspections" of the cabinet internals) of 6 electrical cabinets that were not opened during the at-power seismic walkdown will be required to comply with the updated guidance. The anchorages for these items were external and satisfactorily inspected during the seismic walkdown process; however, no "flashlight inspection" of the internals was conducted at that time. These supplemental inspections require de-energizing, dismantling, or special precautions. Supplemental inspections of 6 electrical cabinets to conform to EPRI/NRC guidance on FAQ 4.20 will be performed prior to startup from the next refueling outage, presently scheduled for Spring 2013. The list of electrical cabinets requiring supplemental inspection is included in Table 3-8.

Table 3-8 WCNOC Supplemental Cabinet Inspections

SWEL 1 Item Number	Equipment ID	Description	Building
67	NG002B	480 VAC	AUX
68	NG004C	480 VAC	AUX
69	NG006E	480 VAC	ESW
41	FC0219	LOCAL CONTROL PANEL FOR TD AFW PUMP	AUX
97	SE054B	W NUC INSTM NIS 2	CB/CC
98	SENY061A	EXCORE NEUTRON DETECTOR AMPLIFIER	AUX

With respect to these supplemental inspections, FAQ 4.20 states:

> *In addition, electrical cabinets on the SWEL that have doors that can be unlatched should be opened during the Seismic Walkdowns whether or not it is necessary to look inside to check the anchorage. This additional requirement applies only to those classes of electrical equipment that have doors that can be unlatched; it does not apply to panels or structures that require removal of fasteners (e.g., with a screwdriver or wrench) to gain access to the interior.*

Consistent with the guidance described above, Table 3-9 identifies those components (with external anchorages that were inspected during the walkdowns) that were not included in the table for supplemental inspections above (Table 3-8) because they require the removal of fasteners in order to access the insides of the cabinet.

Table 3-9 Wolf Creek Cabinets Not Included in the Supplemental Inspections			
SWEL 1 Item Number	**Equipment ID**	**Description**	**Building**
96	SE032	SOURCE RANGE CHANNEL 2 PREAMP	AUX
99	XNG02	CLASS 1E LOAD CENTER TRANSFORMER	CB/CC
100	XNG06	FEEDS MCC NG06E	ESW

3.5 COMPOSITE SWEL

A copy of the WCGS Seismic Walkdown Equipment List is presented in Appendix G.

4 SEISMIC WALKDOWNS AND AREA WALK-BYS

4.1 BACKGROUND

Seismic Walkdowns and Area Walk-Bys were performed in accordance with the requirements of Section 4 of EPRI 1025286 (Reference 9). The walkdowns were conducted by the SWT consisting of the two SWEs mentioned in Section 2.2 of this report. The SWEs utilized engineering judgment based upon experience and training indicated in Section 2.2, supplemented by existing plant documentation and analyses, where applicable, to identify potentially adverse seismic conditions. For items on the SWEL, these potential seismic conditions included any adverse anchorage conditions, adverse seismic spatial interactions, or other adverse seismic conditions. The results of the walkdowns and any pertinent observations were documented for each item on the SWEL using the Seismic Walkdown Checklists (SWCs) included in Appendix A. In addition to potentially adverse seismic conditions, observations described in the SWCs include features that, after discussion between the SWEs, were determined to be adequate.

Area Walk-Bys were conducted by the SWT in each area of the plant that contains an item on the SWEL. The Area Walk-Bys identified potentially adverse seismic conditions associated with other SSCs located in the vicinity of the SWEL item (Section 4 of Reference 9 states the vicinity is generally defined as the room containing the SWEL item. If the room is very large (e.g., Turbine Hall), then the vicinity should be identified based on judgment, e.g., on the order of about 35 feet from the SWEL item.). The area examinations identified any adverse anchorage conditions, significantly degraded equipment in the area, potential seismic interactions, adverse assessments of cable/conduit raceways and HVAC ducting, potential interactions that could cause flooding/spray or fire in the area, and other adverse housekeeping items, including temporary installations. The results of the walk-by and any pertinent observations were documented for each inspected area using Area Walk-By Checklists (AWCs), which are included in Appendix B. Observations described on the AWCs include potentially adverse seismic conditions as well as conditions that were discussed during the walk-by and determined to be adequate at that time.

The SWT was assisted by other individuals present on the walkdown, including members of WCNOC Operations and Engineering. The SWT for WCNOC consisted of Hunter Young and Timothy Nealon of S&A. Tim Solberg led the support from WCNOC Engineering for walkdowns as well as the interface with plant operators. Other WCNOC professional staff provided support and guidance and these persons are acknowledged within this report. These accompanying individuals facilitated access to equipment and provided additional information regarding plant procedures and Safety Related functions of SWEL items and nearby equipment and systems that could cause adverse seismic interaction. Any issue that could not be resolved by consensus of the SWEs during the walkdowns and easily determined to be acceptable was identified as a potentially adverse seismic condition on the SWC or AWC (as applicable). The conditions identified were evaluated with respect to the current licensing basis (CLB). These evaluations are listed and described in Appendix C.

4.2 PREPARATION FOR SEISMIC WALKDOWNS

In preparation for the Seismic Walkdowns and Area Walk-Bys, the SWT obtained the SWEL and selected 50% of the SWEL items that have anchorages (excluding line-mounted equipment) for anchorage configuration verification. A total of 80 components were identified as potential anchorage verification

candidates and 41 were chosen to meet or exceed the 50% anchorage configuration verification requirement (thus, 51 percent of eligible equipment was verified against plant documentation). WCNOC design drawings and vendor/supplier documents (SDOCs) were reviewed and later taken to the field to verify as-installed configurations were consistent with the CLB established by these documents. The SWT also obtained WCNOC equipment layout drawings to establish a detailed walkdown schedule.

To prepare for potential interaction with masonry block walls, the SWT reviewed the IE Bulletin 80-11 documentation for WCNOC (Reference 14). It was observed that all block walls within the zone of influence of SWEL and Area Walk-By components were capable of withstanding SSE demand accelerations so as to preclude collapse. This enabled the SWT to conclude that the SWEL items were free of seismic spatial interaction due to masonry block wall collapse. However, the SWT still assessed SWEL and Area Walk-By equipment for seismic spatial interaction due to differential movement between the equipment and the masonry block walls.

In anticipation of potential flooding/spray interaction hazards due to threaded fire piping, the SWT obtained fire suppression diagrams provided by WCNOC (Reference 15). These diagrams were later used in the field for Area Walk-Bys to determine whether threaded fire piping, where present, was normally wet or pre-actuated and dry. Preliminary review of the fire suppression diagrams indicated that areas with threaded fire piping are generally pre-activated sprinkler systems and therefore are normally dry, thus precluding potential flooding/spray interaction hazards. However, the SWT was cognizant of exceptions where threaded piping could be normally wet. For these cases, the SWT would look for long spans with flexible supports, which may lead to excessive threaded joint rotation and potential spray.

Additional current licensing basis documentation obtained and reviewed to support the walkdowns included: the in-structure floor response spectra for the SSE (Reference 16), the WCNOC scaffolding procedure (Reference 17), the WCNOC housekeeping procedure (Reference 18), and the WCNOC lighting details (Reference 19). The WCNOC IPEEE Report (Reference 10) was also obtained and reviewed. This document is discussed in further detail in Section 7 of this report.

4.3 WALKDOWN RESULTS

The SWT conducted the Seismic Walkdowns at WCGS September 17, 2012 through September 20, 2012. Detailed walkdown results are provided on the SWCs and AWCs in Appendices A and B, respectively. A summary of initial walkdown statistics follows:

- A total of 99 SWEL components were walked down and 36 Area Walk-Bys were performed.

- Eighteen (18) components could not be inspected (see Table 3-7) due to having either inaccessible electrical cabinet interiors (12 items) or being located inside Containment (6 items). In addition, 6 items (see Table 3-8) were inspected for anchorage and spatial interaction concerns during the initial on-line walkdowns but require additional inspection of electrical cabinet interiors to verify that no other adverse conditions are present in compliance with supplemental EPRI/NRC FAQ 4.20. Accordingly, SWC Question #11 for those six components was answered as U (or Unknown) on the walkdown checklists. Overall, these 24 items will be inspected at either their next electrical maintenance outage or refueling outage.

- Seventy-six (76) components and 33 Area Walk-Bys were resolved in the field as having no potentially adverse seismic concerns.

- Two (2) Area Walk-Bys were confirmed in the field to have adverse seismic concerns involving housekeeping.

- Nineteen (19) components and 5 Area Walk-Bys had observations that could not be readily resolved by the consensus of the SWEs and were considered potentially adverse seismic conditions requiring further evaluation. Eight (8) SWEL items requiring further review involved potential anchorage concerns; 11 involved potential seismic spatial interaction concerns; and 7 involved other potential adverse concerns (Note that some items had more than one observation). Twenty-three (23) of the 24 potentially adverse conditions were determined to meet their seismic licensing basis while one (AWC for CTRL 3601—Control Room) was found not in conformance with seismic licensing criteria, specifically pertaining to seismic housekeeping. All 24 Licensing Basis Evaluation items are discussed in Section 5 and Appendix C of this report.

- Upon completion of the walkdowns and Licensing Basis Evaluations, 3 Area Walk-Bys were confirmed to have adverse seismic concerns, all involving housekeeping.

Summaries of seismic walkdown observations follow.

Potentially Adverse Anchorage Conditions

Eight instances were observed where SWEL components were identified as having potential adverse anchorage or anchorage configuration conditions:

- One instance of a potentially non-conforming condition was observed during the walkdowns. Standby Diesel Generator KKJ01B (which is on a common skid with NE002) was found to have one anchor bolt with a 10" projection whereas design drawings called for a maximum projection of 8". Given the concern for potentially limited resistance to uplift, WCNOC generated CR #57391 and subsequent Operability Evaluation KJ-12-015, which determined the as-installed condition to not be in violation of the seismic licensing basis given that all bolts undergo zero net uplift under all design load combinations (Items 5 & 6 in Appendix C).

- Six occurrences were noted where the as-installed anchorage configurations identified in the field could not be verified by the anchorage documentation taken in the field. Discrepancies or insufficient information were noted for components SB079, SE054B, GNPT0934, EKJ03B, FKJ02C, and SGK04B (Items 2, 3, 4, 14, 15, and 16 in Appendix C). A notable discrepancy was observed for the Control Room A/C Unit, SGK04B, where the SWT could not visually identify two interior anchor bolts on the North side of the air handling unit (Item 16 in Appendix C). Additional plant documentation to validate the as-installed configurations was reviewed for all cases as part of the Licensing Basis Evaluation process.

The SWT observed no indications of reinforcement yielding and no signs of corrosion indicative of strength loss for in-scope Safety Related equipment. It is worth noting, however, that several bolted

components showed signs of moderate surface corrosion given harsh environments, most notably in the Emergency Service Water structure.

Potentially Adverse Seismic Spatial Interactions

Seven instances were encountered where SWEL or Area Walk-by components were identified as having potential interaction hazards with permanent equipment in near proximity:

- On the 2047.5' elevation of the Auxiliary Building, the SWT observed a 1-7/8" gap oriented between the drip shield of MCC NG004C and the concrete wall to the south. Given the typically lower fundamental frequency of MCCs in the front-to-back direction and the possible high demand due to the floor elevation, the SWT decided to check the adequacy of the gaps as part of the Licensing Basis Evaluation process (Item 8 in Appendix C).

- Three other potential interaction hazards between SWEL components and permanent equipment were discovered outside the Control Room envelope on the 2047.5' elevation of the Control Building. Cabinet SB041 was noted as having ¼" vertical clearance to cable tray supported by the elevation above (Item 13 in Appendix C). The concern is that differential movement between floors could cause equipment to impact and possibly induce equipment malfunction. NF039B and SA036E were both observed as having near-flush cabinets, for which the presence of bolting between cabinets could not be confirmed (Items 7 and 10 in Appendix C). The concern for these two components is that out-of-phase movement between individual cabinets not positively fastened together could cause impact and possibly induce equipment malfunction. The adequacy of the ¼" gap for SB041 and whether the adjacent cabinets for NF039B and SA036E were bolted together were addressed as part of the Licensing Basis Evaluation process.

- In Room 1409 of the Auxiliary Building, vertical cable tray supports were observed to be welded to the floor and connected to the elevation above (Item 24 in Appendix C). The concern of the SWT was that the HSS tubing or its connections could fail due to vertical differential movement between floors if the upper HSS connection transfers vertical load. Verification of the upper connection type or whether the condition was analyzed was sought as part of the Licensing Basis Evaluation process.

- In the Diesel Generator "B" Room 5201, two overhead concerns were raised by the SWT. Rod-hung, threaded fire piping with Victaulic couplings were noted as possible impact hazards for safety-related soft targets below that required verification of two-over-one seismic qualification. Additionally, large lighting supported by its own conduit spanning horizontally approximately 4' between supports was identified as an impact hazard that required additional verification. Both of these issues were addressed as part of the Licensing Basis Evaluation process (Item 20 in Appendix C).

- SWT observed bolting from XNG02 to adjacent (and flush) cabinet NG002. While it was confirmed that adequate bolting was provided to preclude chatter, one bolt hole was noted to be empty without a bolt. This issue was addressed as part of the Licensing Basis Evaluation process (Item 19 in Appendix C).

Six occurrences were encountered where either temporary or transient equipment was identified as having potential spatial interaction hazards with SWEL or Area Walk-By components:

- Two items on the 2047.5' elevation of the Control Building were identified as spatial interaction concerns due to seismic housekeeping. A portable metal table with a high aspect ratio (greater than 2:1) located approximately ¾" from a control panel raised a concern that the table could rock and impact the panel (Item 22 in Appendix C). The on-duty shift manager informed the SWT that the table was qualified for SSE excitation. Qualification documentation was sought as part of the Licensing Basis Evaluation process. The other housekeeping issue involved a trash can immediately adjacent to control panel RL021, which was moved immediately by WCNOC Operations (see CR #57422).

- On the 1974' elevation of the Control Building, safety-related air tubing was located within the zone of influence of Health Physics stanchions that were not installed on level bases. The SWT alerted WCNOC Operations regarding the concern for the stanchions to overturn and damage the air tubing, after which Operations immediately moved the stanchions to a safe position (see CR #57418).

- One scaffold installation was identified by the SWT as posing potential spatial interaction hazards to nearby safety-related equipment including the CCW surge tank (TEG01B) and "B" level transmitter (EGLT0002) (also noted in Area Walk-By – AUX 1502). The top bay of three-bay tall scaffolding was noted as having no bracing or wall anchorage. Given that all scaffolding installations encountered during the walkdowns throughout the unit were braced in every bay, the SWT sought scaffolding qualification documentation from the site as part of the Licensing Basis Evaluation process to resolve the 3 items pertaining to scaffolding (Items 1, 18, and 21 in Appendix C).

The SWT inspected overhead piping and distribution systems including cable tray and found them well-anchored and ruggedly supported throughout the unit (with exceptions indicated above).

As indicated in Section 4.2, all SWEL and Area Walk-By equipment within the zone of influence of masonry block walls were previously analyzed and demonstrated under the IE Bulletin 80-11 program (see Reference 14) to have sufficient capacity so as to preclude collapse during an SSE event.

In many of the areas inspected, WCNOC employed chain-hung lighting secured by S-hooks. While several S-hooks were noted as being partially open, no instances were noted where the S-hooks were open enough so as to allow lighting to "jump" out of hooks due to random horizontal oscillations. Moreover, since there is effectively zero frequency in the upward direction and accordingly no relative displacement between the hooks and lights in that direction, all S-hook configurations encountered were determined to pose no fall hazard to SWEL or Area Walk-By components. WCNOC documented all partially open S-hook connections and entered them into the CAP for resolution (see CR #57608).

No concerns were noted regarding attached lines and piping to SWEL or Area Walk-By equipment having inadequate flexibility.

Other Potentially Adverse Seismic Conditions

While inspecting for other degraded conditions, missing equipment fasteners, or irregular mountings on equipment, the SWT observed eight occurrences where SWEL or Area Walk-By components had other potential adverse seismic conditions that could not be readily resolved in the field. The SWT noted six instances (SE054B, RP081A/B, SB032C, SB032D, SB041, and the Area Walk-By for Room 3605) where an apparent modification was installed to attach the tops of electrical cabinets outside the Control Room envelope so as to prevent equipment chatter due to out-of-phase movement. These items were reserved for Licensing Basis Evaluations to verify whether the equipment qualifications were reconciled in order to ensure that the original equipment seismic qualifications were not invalidated by the modification (Items 9, 11, 12, 13, 15, and 23 in Appendix C). The SWT also observed a tubing support mounted off of the air handling unit for SGK05B that was presumed to be from a modification and not per the original equipment qualification. This item was also reserved for a Licensing Basis Evaluation to verify whether equipment qualifications were reconciled (Item 17 in Appendix C). In addition, the scaffolding installation noted above was observed to be anchored to the CCW surge tank "B" (TEG01B) support legs. While the tank legs and anchorage appeared to be adequately rugged to withstand the relatively low additional lateral load due to the scaffold, the SWT reserved this item for a Licensing Basis Evaluation to determine whether plant documentation validates the implementation of the scaffold installation (Item 18 in Appendix C).

Potential Flooding/Spray Hazards

No potential seismically induced flooding or spray interaction hazards were noted for WCNOC. The SWT was cognizant of potential spray and flooding hazards particularly from threaded fire piping. Overhead fire piping was generally found to be ruggedly supported at short and regular intervals. Areas that had threaded piping were either confirmed to be pre-activated and therefore normally dry or regularly supported at intervals sufficient to precluded spray due to excessive joint rotation.

Potential Seismically Induced Fire Interactions

No potential seismically induced fire interaction hazards were noted for WCNOC. This included no observations of hazardous/flammable material stored in inadequately anchored drums, hydrogen and oxygen tanks, inadequately anchored shelves, or unlocked cabinets; and no adverse natural gas or hydrogen lines.

Non-NTTF 2.3 Related Observations

The SWT (including WCNOC Operators and Engineering SWE) were also cognizant of issues not necessarily pertaining to the seismic qualification of safety related equipment. The SWT noted conditions such as:

- Broken/missing fasteners
- Floor grating fasteners were missing.

- Mild surface corrosion was found on the bolted connections
- General housekeeping issues such as:
  - Insulation was loosely attached to the valve piping,
  - Oil reservoir had oil leakage on top of reservoir,
  - Unattended ladder left on the side of a walkway

All Non-NTTF 2.3 related observations were recorded on the SWCs/AWCs and entered into the WCNOC CAP. Many of these conditions were also corrected on-the-spot.

5 LICENSING BASIS EVALUATIONS

The 24 potentially adverse seismic conditions identified in either the equipment Seismic Walkdowns or the Area Walk-Bys as discussed in Section 4 of this report were evaluated with respect to their seismic licensing basis. Eight (8) items requiring further review involved potential anchorage concerns; 11 involved potential seismic spatial interaction concerns; and 7 involved other potential adverse concerns. Twenty-three (23) of the 24 potentially adverse conditions were determined to meet their seismic licensing basis while one (AWC for CTRL 3601—Control Room – Item 22 in Appendix C) was found not in conformance with seismic licensing criteria, specifically pertaining to seismic housekeeping. This item was entered into the site Corrective Action Program (CAP) as a Condition Report (CR). All 24 potentially adverse conditions are included in Appendix C, along with their detailed dispositions.

General methodologies adopted by the Licensing Basis Reviewers listed in Section 2.3 for addressing the observations noted in Section 4 of this report are summarized in the following subsections.

Evaluations of Potentially Adverse Anchorage Conditions

As noted in Section 4 of this report, the Diesel Generator "B" anchor bolt exceeding its maximum projection was documented under CR #57391 and the consequent Operability Evaluation KJ-12-015 generated by WCNOC. The Operability Evaluation determined that the as-installed condition is not in violation of the seismic licensing basis given that all bolts undergo zero net uplift under all design load combinations.

For the anchorage observations noted in Section 4 of this report that involved discrepancies between the as-installed configurations and the anchorage documentation (plant drawings and vendor documentation) taken into the field, the Licensing Basis Reviewers received additional documentation from WCNOC representing the Current Licensing Basis. Upon completion of the Licensing Basis Evaluations for anchorage concerns, all as-installed anchorage configurations were determined to meet their configuration documentation.

Evaluations of Potentially Adverse Seismic Spatial Interactions

Observations involving the possibility of insufficient clearances between Safety Related components were generally resolved by estimating relative displacement from the in-structure response spectra of Reference 2. Given equipment anchorage and spatial configuration, the Licensing Basis Reviewers determined lower-bound estimates of component frequencies. These frequency estimates along with the appropriate damping values from the USAR (Reference 1) were used to obtain spectral accelerations. Component displacement was then estimated by the following formula (Reference 22):

$$d = SF * \frac{S_a * 386.4 \frac{in}{s^2}}{(\omega * 2\pi)^2}$$

where:

SF = modal shape factor (1.6 for cantilever)
S_a = spectral acceleration (g) from response spectra
ω = fundamental frequency (Hz)

If the combinations of component displacements under SSE loadings did not exceed the gap noted in the walkdown, the gap was noted as sufficient to preclude impact. This methodology was applied for NG004C for which the gap was shown to be acceptable.

In some instances, licensing basis evaluations of potential spatial interactions were resolved by inspection of plant documentation provided by WCNOC. This disposition method was applied for SWEL components EGLT0002, SB041, NF039B, and SA036E in addition to Area Walk-Bys for Diesel Generator Building Room 5201, Auxiliary Building Room 1409, Auxiliary Building Room 1502, Control Building Room 3601, and Control Building Room 3605.

For the Area Walk-By in Control Building Room 3601, no CLB documentation allowing the portable metal table to be located adjacent to safety-related equipment was readily found. Accordingly, the portable metal table was relocated to a safe position and CR #57419 was generated by WCNOC.

Evaluations of Other Potentially Adverse Seismic Conditions

In order to evaluate the other potentially adverse seismic conditions noted by the SWT in Section 4, additional plant documentation was received from WCNOC. Calculation XX-FH-009-002 (Reference 23) validated the modification fastening the tops of cabinets outside the Control Room envelope. Regarding the scaffolding installation in proximity of the CCW surge tank "B," Scaffold Request #12-S0189 consisted of an engineering evaluation to ensure compliance with the site scaffolding procedure.

Evaluations of Potential Flooding/Spray Hazards

No potential seismically induced flooding/spray hazards were noted for WCNOC by the SWT; therefore, there are no Licensing Basis Evaluations.

Evaluations of Potential Seismically Induced Fire Interactions

No potential seismically induced fire interactions were noted for WCNOC by the SWT; therefore, there are no Licensing Basis Evaluations.

6 PEER REVIEW

6.1 OVERVIEW

This section documents the independent peer review for the NTTF Recommendation 2.3 Seismic Walkdowns that were performed by S&A and Westinghouse for the Wolf Creek Generating Station. The peer review addresses the following activities:

- Review of the selection of the structures, systems, and components, (SSCs) that are included in the Seismic Walkdown Equipment List (SWEL).
- Observation of the seismic walkdowns on September 18 – 20, 2012 and adherence to the Seismic Walkdown Guidance (Reference 9) by the Peer Reviewers: Messrs. Todd Bacon and Gary Douglas.
- Review of a sample of the checklists prepared for the Seismic Walkdowns & Walk-bys.
- Review of licensing basis evaluations, as applicable.
- Review of the decisions for entering the potentially adverse conditions into the plant's Corrective Action Plan (CAP).
- Review of the final submittal report.

The peer reviewers for WCNOC are Messrs. Todd A. Bacon of S&A and Gary Douglas of Westinghouse. Mr. Bacon is designated the Peer Review Team Leader. Neither of the aforementioned engineers is involved in the seismic walkdown inspection process so that they can maintain their independence from the project. Mr. Bacon is a civil-structural engineer with over thirty years of nuclear engineering experience and has received the Seismic Walkdown Engineer (SWE) training. Mr. Douglas is a nuclear engineer with fifteen years of experience in the nuclear engineering field. Mr. Douglas has been trained as an SWE. Mr. Bacon led the seismic peer review activities and Mr. Douglas led the SWEL selection peer review. Mr. Bacon, as Peer Review Team Leader, has participated in all phases of the peer review process for Wolf Creek.

The SWEL development was performed by Messrs. David Bersi and Derek Seaman of Westinghouse. All items on the SWEL peer review checklist were addressed in the final SWEL development. The completed SWEL Peer Review Checklist is found in Appendix D. The discussion for the SWEL development peer review is found in Section 6.2.

The peer review of the seismic walkdown inspection started on September 18, 2012 with a peer check of the actual walkdowns. Messrs. Bacon and Douglas joined the walkdown team for a portion of the day's planned walkdowns to observe the conduct of walkdowns and adherence to the SWG. Interviews were conducted by Messrs. Bacon and Douglas with the SWE inspection team after review of a sample of the Seismic Walkdown Checklists (SWCs) and the Area Walk-by Checklists (AWCs) to ascertain procedural compliance with the SWG. The interviews were conducted with Messrs. Timothy Nealon and Hunter Young of the SWE inspection team on October 4, 2012. The discussion of the sample SWCs and AWCs is provided in Section 6.3.

Issues that were identified during the walkdowns that challenged the CLB are discussed in Section 6.4.

6.2 PEER REVIEW – SELECTION OF SSCS

6.2.1 Purpose

The purpose of this section is to describe the process that was used to perform the peer review of the selected structures, systems, and components, (SSCs) that were included in the SWEL for Wolf Creek. The final SWEL is composed of SWEL 1 and SWEL 2 as described in Section 3 above.

6.2.2 Peer Review Activity – Selection of SSCs

The guidance in EPRI Technical Report (Reference 9) was used as the basis for this review.

This peer review was based on reviews of the spreadsheets utilized by the SWEL developers to generate the Base Lists and Seismic Equipment Walkdown Lists. This peer review was based on interviews with the following individuals who were directly responsible for development of the SWEL:

- Mr. David Bersi, Principal Engineer
- Mr. Derek Seaman, Senior Engineer

This peer review utilized the checklist shown in the SWG, Appendix F: Checklist for Peer Review of SSC Selection.

For SWEL 1 development, the following actions were completed in the peer review process:

- Verification that the SSCs selected represented a diverse sample of the equipment required to perform the following five safety functions:

  - Reactor Reactivity Control (RRC)
  - Reactor Coolant Pressure Control (RCPC)
  - Reactor Coolant Inventory Control (RCIC)
  - Decay Heat Removal (DHR)
  - Containment Function (CF)

  This peer review determined that the SSCs selected for the seismic walkdowns represent a diverse sample of equipment required to perform the five safety functions.

- Verification that the SSCs selected include an appropriate representation of items having the following sample selection attributes:

  - Various types of systems
  - Major new and replacement equipment
  - Various types of equipment
  - Various environments

- Equipment enhanced based on the findings of the IPEEE
- Risk insight consideration

This peer review determined that the SSCs selected for the seismic walkdowns include a sample of items that represent each attribute/consideration identified above.

For SWEL 2 development, the following actions were completed in the peer review process:

- Verification that spent fuel pool related items were considered and appropriately added to SWEL 2.

  This peer review determined that spent fuel pool related items were given appropriate consideration. Portions of the spent fuel pool cooling system are classified as Seismic Category 1 and SWEL 2 was sufficiently populated as appropriate.

- Verification that appropriate justification was documented for spent fuel pool related items that were not added to the SWEL 2.

  This peer review determined that an appropriate level of justification was documented for those items related to the spent fuel pool that were not added to SWEL 2.

6.2.3 Peer Review Findings – Selection of SSCs

This peer review found that the process for selecting SSCs that were added to the SWEL was consistent with the process outlined in Reference 9, Section 3: Selection of SSCs. 112 items were selected to SWEL 1 and 5 items were selected to SWEL 2.

The peer reviewers verified that the SSCs selected represented a diverse sample of the equipment required to perform the five safety functions. The bases for items selected to SWEL 1 were the IPEEE Report, Appendix 3.2 (Reference 10), which listed safe shutdown equipment from each redundant train of the systems supporting the five safety functions, and Seismic Category I items from the Internal Events Probability Risk Assessment (IE-PRA) database (Reference 13). A breakdown of the safety functions represented by the SWEL 1 selections follows:

- Reactivity control – 61 SWEL selections support this function
- Pressure control – 63 SWEL selections support this function
- Inventory control – 72 SWEL selections support this function
- Decay heat removal/Ultimate heat sink – 90 SWEL selections support this function
- Containment function – 58 SWEL items support this function

The peer reviewers verified that the SSCs selected to SWEL 1 include an appropriate representation of items having the required sample selection attributes. A breakdown of the sample selection attributes represented by the SWEL 1 selections follows:

- Thirty-eight (38) of 41 systems were represented in the SWEL 1 list. Components from the unrepresented systems were component types that were adequately represented by other systems

selections. Since all five safety functions are also adequately represented by the SWEL the peer review team concluded that the "various types of systems" sample selection attribute was satisfactorily represented.

- Sixteen (16) of 52 major new or replacement items were represented in the SWEL 1 list. The sources for these items were a review of the Wolf Creek corrective actions related to seismic equipment as well a review of a database for major capital projects since 1998. Several of the new or replacement items involved a change to a group of similar items, and at least one item was selected from each group to represent the change. Operations personnel were also questioned to ensure recent changes or upgrades to plant equipment were reviewed. The peer review team concluded that the "major new and replacement equipment" sample selection attribute was satisfactorily represented.

- Nineteen (19) of 22 types of equipment were represented in the SWEL 1 list. The equipment types not represented were "chillers", "compressors" and "motor-generator sets". The site does not have safety related equipment in these equipment types. The peer review team concluded that the "various types of equipment" sample selection attribute was satisfactorily represented.

- All environments were represented in the SWEL 1 list. The Wolf Creek Environmental Classifications are based on room temperature and humidity presented in USAR Table 3.11(B)-1. Since at least one item was selected from each environment classification the peer review team concluded that the "various environments" sample selection attribute was satisfactorily represented.

- Three (3) of 8 items were added to the SWEL 1 list based on findings of the IPEEE program. Several of the IPEEE program items involved a change to a group of similar items. The peer review team concluded that the "IPEEE program" sample selection attribute was satisfactorily represented.

- Twenty-seven (27) of 67 risk significant items were represented in the SWEL list. Risk insights were applied from the Internal Events PRA model to the selection of items to the SWEL. The peer review team concluded that the "risk insights" sample selection attribute was satisfactorily represented.

The peer reviewers verified that spent fuel pool related items were considered and appropriately added to SWEL 2.

- Spent fuel pool related items considered were based on a review of design basis manual descriptions, piping and instrumentation drawings, and isometric drawings. Five (5) items were selected to SWEL 2.

The peer reviewers verified that appropriate justification was documented for spent fuel pool related items that were not included in SWEL 2.

- The justification for screening out spent fuel pool related items was reviewed and found to be supported by the Seismic Walkdown Guidance (Reference 9). Components in-line with Seismic Category I equipment were screened out. No rapid drain-down items were included in SWEL 2. This conclusion was supported by a review of the FSAR (Reference 1) which determined that pipes extending down into the pool have siphon breaker holes at or above the minimum required water level of 10 ft. Spent Fuel Pool equipment that passed screen 2 and are part of Train B were selected, since Train A was not available during the scheduled seismic walkdown at power. The peer review team concluded that appropriate justification was documented.

The completed peer review checklist in Appendix D documents the peer review results.

6.2.4 Resolution of Peer Review Comments – Selection of SSCs

The peer review comments documented in the peer review checklist in Appendix D were resolved in a timely manner and improved the seismic walkdown process as summarized below:

- Editorial corrections were made to the SWEL report to correct minor errors; this provided for a complete and accurate report.

- Notations were added to the SWEL report to explain the sources of information that supported the SWEL selections based on modifications, IPEEE enhancements and recent upgrades/changes; this provided for a complete and accurate report.

- Notation was added to the SWEL report to explain why equipment types were not represented on the SWEL; this provided for sample selection clarity in the report.

- Notation was added to the SWEL report to explain the sources of information that supported the SWEL 2 selections; this provided for clarity in the report.

All comments requiring resolution were incorporated prior to completion of this peer review.

6.2.5 Conclusion of Peer Review – Selection of SSCs

This peer review concludes that the process for selecting SSCs to be included on the seismic walkdown equipment list appropriately followed the process outlined in the SWG, Section 3: Selection of SSCs. It is further concluded that the SWEL sufficiently represents a broad population of plant Seismic Category 1 equipment and systems to meet the objectives of the NRC 50.54(f) letter (Reference 8).

6.3 REVIEW OF SAMPLE SEISMIC WALKDOWN & AREA WALK-BYS CHECKLISTS

6.3.1 Overview

A peer review of the SWCs and AWCs was performed on September 18 – 20, 2012, after which an interview was conducted by Messrs. Bacon and Douglas with the SWE inspection team in accordance with the SWG requirements on October 4, 2012. The SWE trained walkdown engineers were Messrs. Timothy Nealon and Hunter Young.

6.3.2 Sample Checklists

Table 6-1 lists the SWC and AWC samples which represent approximately 30% of the SWCs and 29% of the AWCs. The sample includes the equipment inspected during the peer review participation and other equipment items from other classes to introduce diversity to the sampling procedure.

Table 6-1 Table of SWC and AWC Samples from Seismic Walkdown Inspection

Equipment Identification	Equipment Class (GIP)	Walkdown Item	Observations
RL017	20 – Instrumentation and Control Panels and Cabinets	ESF MCB	No concern
GKV0768	8 – Motor-Operated and Solenoid-Operated Valves	SGK05B Water Regulating Valve	No concern
EFTE0062	19 – Temperature Sensors	EWS B TEMPT to Power Block	No concern
EFHV0040	8 – Motor-Operated and Solenoid-Operated Valves	ESW Train B to SW Cross Connect Valve	No concern
EFHV0024	8 – Motor-Operated and Solenoid-Operated Valves	ESW B/SW Cross Connect Valve	No concern
NK014	15 – Batteries on Racks	125-VDC No. 4 60-cell Battery	No concern
NK012	15 – Batteries on Racks	125-VDC No. 4 60-cell Battery	No concern
BNLT0931	18 – Instruments on Racks	RWST Level Transmitter (2)	No concern
BNV0011	8 – Motor-Operated and Solenoid-Operated Valves	RWST Outlet Iso Valve	No concern
NG006E	1 – Motor Control Centers	480 VAC	No concern
EFHV0098	8 – Motor-Operated and Solenoid-Operated Valves	ESW Pump B Discharge Recirc. Valve	No concern

Table 6-1 (cont.) Table of SWC and AWC Samples from Seismic Walkdown Inspection			
Equipment Identification	**Equipment Class (GIP)**	**Walkdown Item**	**Observations**
EF156	20 – Instrumentation and Control Panels and Cabinets	ESW Control Panel	No concern
FKJ02C	0 – Other	KKJ01B Air Intake Filter	No concern
EKJ04B	21 – Tanks and Heat Exchangers	Lube Oil Cooler	No concern
TKJ04B	21 – Tanks and Heat Exchangers	D/G Aux. Lube Oil Tank	No concern
XNG02	4 – Transformers	Class 1E Load Center Transformer	Bolting connecting cabinets XNG02 & NG02 appears to be missing middle bolt as seen from outside of cabinet through side vent. Verify if bolt req'd. The SWT concluded that the presence of bolting is not required to preclude seismic chatter; therefore no adverse seismic condition.
KJ0122	20 – Instrumentation and Control Panels and Cabinets	Gauge Panel	No concern
TKJ01B	21 – Tanks and Heat Exchangers	D/G B Jacket Water Expansion Tank	No concern
PKJ03B	5 – Horizontal Pumps	Aux. Lube Oil (Keep Warm) Pump for KKJ01B	No concern
KKJ01B	17 – Engine-Generators	Standby Diesel Generator	One anchor bolt has projection of 10" – drawing calls for 8" projection. Operability Evaluation KJ-12-015 via CR# 57391 determined that the as-installed condition is not in violation of the seismic licensing basis given that all bolts undergo zero net uplift under all design load combinations.
ECFT0018	18 – Instruments on Racks	FP Cooling Pump Dis. Flow Transmitter	No concern

Table 6-1 (cont.) Table of SWC and AWC Samples from Seismic Walkdown Inspection

Equipment Identification	Equipment Class (GIP)	Walkdown Item	Observations
SB041	20 – Instrumentation and Control Panels and Cabinets	W Process Analog Prot. Set CAB-04	Verify 1/4" clearance OK between top of cabinet and cable tray. Inspection of vertical response spectra at this level confirms that 1/4" is more than adequate separation for vertically rigid components. No adverse seismic concern. Verify mod. documents qualify bolted configuration of RP018, SB041, SB042 (bolted at top). Condition is analyzed per WCNOC Calc XX-FH-009-002. No adverse seismic concern.
SB032C	20 – Instrumentation and Control Panels and Cabinets	W SS Prot. Sys. Out 1 TRN	Verify documentation for mod. to fasten cabinets SBD37D to 33A. Condition is analyzed per WCNOC Calc XX-FH-009-002. No adverse seismic concern.
SE054B	20 – Instrumentation and Control Panels and Cabinets	W Nuc. Inst. NIS 2	Verify qualification of weld configuration matches documentation. As-installed configuration verified per NCR ISN21407EW against Dwg C-0008. Verify qualification of bolting to adjacent panel SD055A matches field configuration. Condition is analyzed per WCNOC Calc XX-FH-009-002. No adverse seismic concern.
PECO1B	5 – Horizontal Pumps	Fuel Pool Cooling Pump	No concern
SGG04B	10 – Air Handlers	SFP Pump Room Cooler B	No concern
EEC001B	21 – Tanks and Heat Exchangers	Fuel Pool Cooling Heat Exchanger	No concern

Table 6-1 (cont.) Table of SWC and AWC Samples from Seismic Walkdown Inspection			
Equipment Identification	**Equipment Class (GIP)**	**Walkdown Item**	**Observations**
SGK05B	10 – Air Handlers	Class 1E Elec., Equipment A/C Unit	Tubing/piping support mounted on Air Handling Unit, verify configuration qualified matches field. SWT inspected WCNOC DCP #09879, qualification of the AHU remains valid. No adverse seismic concern.
Area Walkdown Description		**Observations**	
DGB, 2000 Ft., Area 5201		Rod hung FP piping w/ vitaulic couplings – verify 2/1 adequacy for qualification. Electrical components have drip shields and fire piping verified as pre-activated per fire suppression drawings. Therefore no spray hazard.	
ESW, 2000 Ft.		No concern	
YRD, 2000Ft.		No concern	
CTRL, 1974 Ft., Area 3101		Signposts near SR air tubing – corrected while in field immediately.	
CTRL, 2016 Ft., Area 3411		No concern	
CTRL, 2016 Ft., Area 3405		No concern	
CTRL, 2016 Ft., Area 3415		No concern	
CTRL, 2000 Ft., Area 3302		No concern	
CTRL, Area 3601		Table 3/4" from SR panel – shift manager indicated table was qualified seismically. Verify whether documentation is available for this configuration. No qualification document was identified to justify presence of table in proximity to safety-related control panel equipment. CR 57419 was issued by WCNOC documenting removal of table to safe location.	
FB, 2000 Ft., Area 6104		No concern	
CTRL, Area 3605		Trash can was against RL021 – Moved immediately while in field. Bolted connections of cabinets in the control room area are analyzed per WCNOC Calculation XX-FH-009-002. No adverse seismic concern.	

6.3.3 Evaluation of Findings

The peer reviewers provided the following observations based on the seismic walkdowns and review of the checklists:

Several occurrences of seismic interactions were observed involving temporary or portable equipment found in close proximity to safety related equipment. A plant-wide review of the housekeeping procedure is recommended to reinforce the importance of managing portable equipment in the plant with the intent of eliminating inappropriate placement of temporary equipment.

Several occurrences of seismic interactions were observed involving permanent items found in close proximity to safety related equipment. These gaps were appropriately evaluated and found to be acceptable.

Twenty-three of the 24 potentially adverse seismic conditions were determined to meet their seismic licensing basis while one (AWC for CTRL 3601—Control Room) was found not in conformance with seismic licensing criteria, specifically pertaining to seismic housekeeping. This item was entered into the site Corrective Action Program (CAP) as a Condition Report (CR). All 24 potentially adverse conditions are included in Appendix C, along with their detailed dispositions. The scaffolding and seismic housekeeping procedures were reviewed by the SWEs in order to gain a full understanding of the plant practices in regard to those procedures. There were no seismic concerns noted with regard to scaffold erection. The scaffolds were properly tied off and braced, and properly tagged with respect to the procedure.

Concerning seismic housekeeping, there was one instance found throughout the plant concerning ladder storage adjacent to a tank. It can be concluded that WCGS implements their seismic housekeeping program consistently and to a high standard. There were some instances of partially open s-hooks on light fixtures in the Control Building, none of which were deemed a seismic performance concern for SWEL or other Class 1 equipment, and they are dispositioned in a general IR for light fixtures specific to the Control Building (see CR 57608).

Items identified during the Seismic Walkdowns and Area Walk-bys were ultimately not judged to be "Potentially Adverse Seismic Conditions," as summarized above. The Seismic Walkdown Checklists document the details of all issues identified, the action taken and the conclusion rendered by the SWE inspectors.

The peer reviewers consider the judgments made by the SWEs to be appropriate and in concurrence with the SWG.

6.4 REVIEW OF LICENSING BASIS ASSESSMENTS

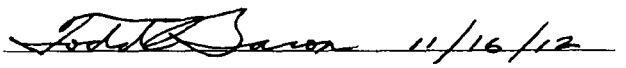
Appendix C provides a list of the potentially adverse seismic conditions identified during the seismic walkdowns and how they were addressed. Messrs. Bacon and Douglas conducted an interview with the SWE inspection team on October 4, 2012, to discuss the issues identified to determine if, in the opinion of the peer reviewers, any of them potentially affected the current licensing basis of the plant. A tracking list for resolution of any potential licensing basis items was maintained up to closure for this report.

As noted in Section 5, there were 24 potentially adverse seismic conditions identified in either the equipment Seismic Walkdowns or the Area Walk-Bys requiring evaluation with respect to their seismic licensing basis. The peer reviewers performed a review of all licensing basis evaluations and the walkdown team's decisions for entering these potentially adverse seismic conditions into the plant's CAP. The peer reviewers determined that all evaluations complied with the seismic walkdown guidance, and the decisions for entering conditions into the plant's CAP complied with plant requirements.

6.5 REVIEW FINAL SUBMITTAL REPORT & SIGN-OFF

The final submittal report has been reviewed by Messrs. T. A. Bacon and G. L. Douglas and found to meet the requirements of the Seismic Walkdown Guidance (Reference 9). The Peer Review determined that the objectives and requirements of the 50.54(f) letter (Reference 8) are met. Further, the efforts completed and documented within the final submittal report are in accordance with the EPRI guidance document.

Peer Review Approval

Todd Bacon, Stevenson & Associates (Lead PR) 

7 IPEEE VULNERABILITIES

A summary of IPEEE seismic observations is available in *Wolf Creek Generating Station Individual Plant Examination of External Events* (Reference 10), in which WCNOC performed a Seismic Margins Assessment (SMA) in accordance with EPRI NP-6041-SL (Reference 12). Four issues were identified whereas installed configurations did not conform to seismic design configurations.

These issues included:

- A transformer on an inverter was not bolted to the frame on one side. Work Request 2857-94 was issued to install the two missing hold down bolts.

- Instances of structural members with fire protection material were identified in close proximity to electrical cabinets. Work Request 5996-94 was issued to trim the non-load bearing portion of support EF08-RW2.

- A Victaulic coupling on a drain line in the Diesel Generator Building was identified in close proximity to a Motor Control Center. Work Request 2756-94 was issued to rotate the Victaulic coupling to provide sufficient clearance between the coupling and the MCC.

- Loose/missing bolting hardware and/or shims were identified on an intercooler heat exchanger and chiller/AC units. Work Request 01344-94 was issued to tighten the loose jam nuts on the diesel generator intercooler heat exchanger.

Several housekeeping issues with respect to temporary items (trash barrels, storage cabinets) stored near safety-related components were also identified on Plant Improvement Request (PIR) 94-1066.

A Seismic Margins Earthquake (SME) of 0.30g was employed for screening components. Twelve components (four battery racks and eight cabinets) were not screened for the SME but were acceptable in terms of the WCNOC seismic design basis. Per the report, none of these components are judged to have a High Confidence of Low Probability of Failure (HCLPF) low enough to be considered for possible modification. Although not required for a "reduced scope" assessment as was permitted for WCNOC, a relay review was performed for "bad actors." The IPEEE report concluded that relay chatter is not expected to cause equipment loss in a seismic event. The report also emphasized that no weaknesses in design were discovered but only those issues identified during walkdowns and resolved afterwards.

8 REFERENCES

1. Wolf Creek Updated Safety Analysis Report, Revision 25, March 12, 2012.

2. Regulatory Guide 1.60, "Design Response Spectra for Seismic Design of Nuclear Power Plants," Revision 1, December 1973.

3. Regulatory Guide 1.61, "Damping Values for Seismic Design of Nuclear Power Plants," Revision 0, October 1973.

4. Bechtel Topical Report BC-TOP-4-A Rev. 3, "Seismic Analysis of Structures and Equipment for Nuclear Power Plants," November 1974.

5. Regulatory Guide 1.29, "Seismic Design Classification," Revision 1, August 1973.

6. Institute of Electric and Electronic Engineers Standard IEEE 344-75, "Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations."

7. Regulatory Guide 1.100, Rev. 03 "Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants," September 2009.

8. NRC Letter to All Power Reactor Licensees et al., "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendation 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," Enclosure 3, "Recommendation 2.3: Seismic."

9. "Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic," EPRI, Palo Alto, CA: 2012. 1025286.

10. Wolf Creek Generating Station Individual Plant Examination of External Events (IPEEE), June 1995.

11. NUREG-1407, "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," June 1991.

12. EPRI NP-6041-SL, "A Methodology for Assessment of Nuclear Power Plant Seismic Margin (Revision 1)," August 1991.

13. Wolf Creek Internal Events PRA Model, Revision 5.

14. Wolf Creek IE Bulletin 80-11 Report; July 29, 1980.

15. Wolf Creek Fire Suppression Diagrams.

16. Calculation 10-19-F,"Refined "As-Built" FRS Curves," Rev. 0.

17. Wolf Creek Scaffolding Procedure AP 14A-003,"Scaffold Construction and Use for Category 1 Buildings and Structures," Rev. 18A.

18. Wolf Creek Housekeeping Procedure AP 12-001, "Housekeeping Control," Rev. 10.

19. Wolf Creek Drawing E-1L8900, "Lighting Notes, Symbols, and Details," Rev. 64.

20. Wolf Creek Drawing M-12EC01, Revision 19, "Wolf Creek Piping and Instrumentation Diagram Fuel Pool Cooling and Cleanup System."

21. Wolf Creek Drawing M-13EC04, Revision 04, "Wolf Creek Piping Isometric Fuel Pool Cooling and Cleanup System Fuel Building."

22. Chopra, Anil K, Dynamics of Structures, Theory and Applications to Earthquake Engineering. University of California at Berkeley.

23. Wolf Creek Calculation XX-FH-009, "Design of Connections for Class 1E / Non 1E and Class 1E/ Class 1E with Proximity Concerns," Rev. 2.

24. Engineering Evaluation for Scaffold Request #12-S0189, Work Order #11-345393.

25. Wolf Creek Drawing C-1C5111, "Diesel Generator Bldg – Area 1 Contrete Neat lines Plan-Base Slab EL. 2000'-0," Rev. 4.

26. Wolf Creek Drawing C-0033, "Civil Structural Standard Anchor Bolts Schedule," Rev. 14.

27. Wolf Creek Drawing M-771-00048, "Containment Pressure Transmitter Installation," Rev. W04.

28. Operability Evaluation KJ-12-015, Rev. 0.

29. Wolf Creek Drawing C-0008, "Civil-Structural Standard Details Sht. No. 5," Rev. 14.

30. Design Change Package #09879, "Replace SGK04A/B and SGK05A/B Air Conditioning Units," Rev. 31.

31. Specification M-650, "Technical Specification for Contract for Furnishing, Installing, and Testing Sprinkler and Water Spray Systems for the Standardized Nuclear Unit power Plant System (SNUPPS)," Rev. 7.

32. Wolf Creek Drawing C-1408, "Typical Details Cable Tray Supports Sheet 8," Rev. 0.

APPENDIX A
SEISMIC WALKDOWN CHECKLISTS (SWCS)

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ABHV0014

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LOOP-1 MAIN STEAM ISOLATION VALVE

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2026.00 ft, 1411B

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.: ABHV0014

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LOOP-1 MAIN STEAM ISOLATION VALVE

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures? *Noted approximately 1/8" clearance to bolt on floor framing. Since MSIV is covered in approximately 2" of insulation and the valve is supported laterally in close proximity, the clearance is judged as adequate. No hazard.*	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? *Noted overhead crane with rugged supports and chains well tied off. Therefore, no hazard.*	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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

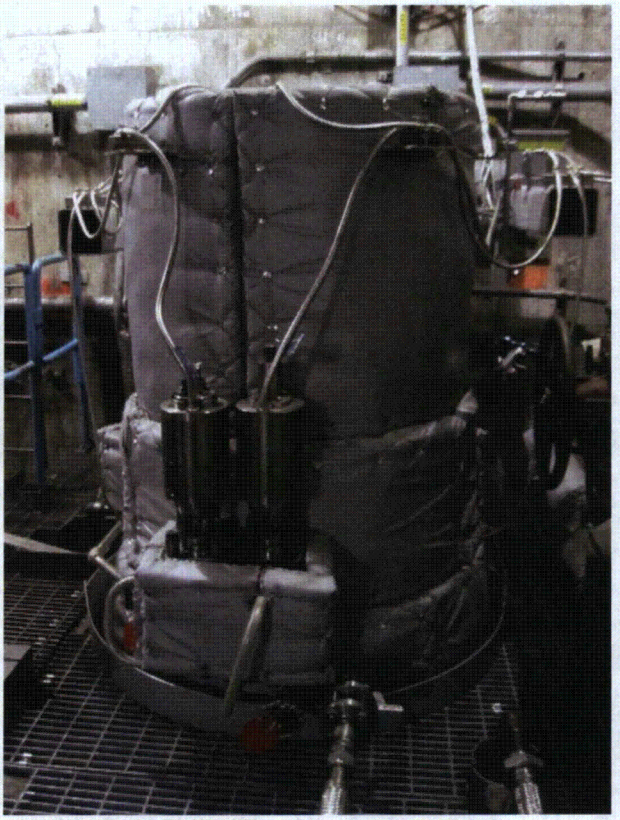
Equipment ID No.: ABHV0014

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LOOP-1 MAIN STEAM ISOLATION VALVE

Photos

ABHV0014 9-20 002



ABHV0014 9-20 003

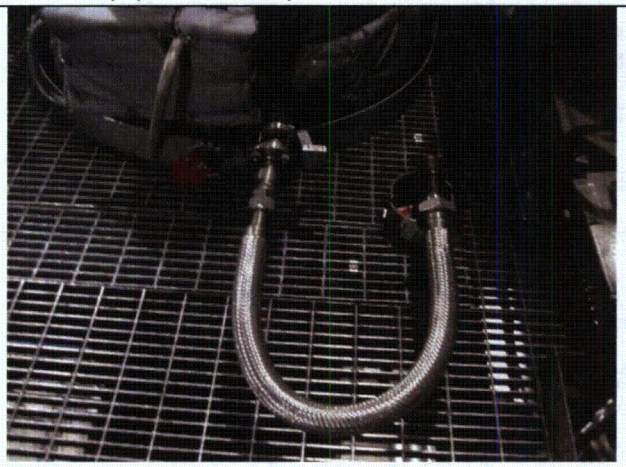
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ABHV0014

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LOOP-1 MAIN STEAM ISOLATION VALVE



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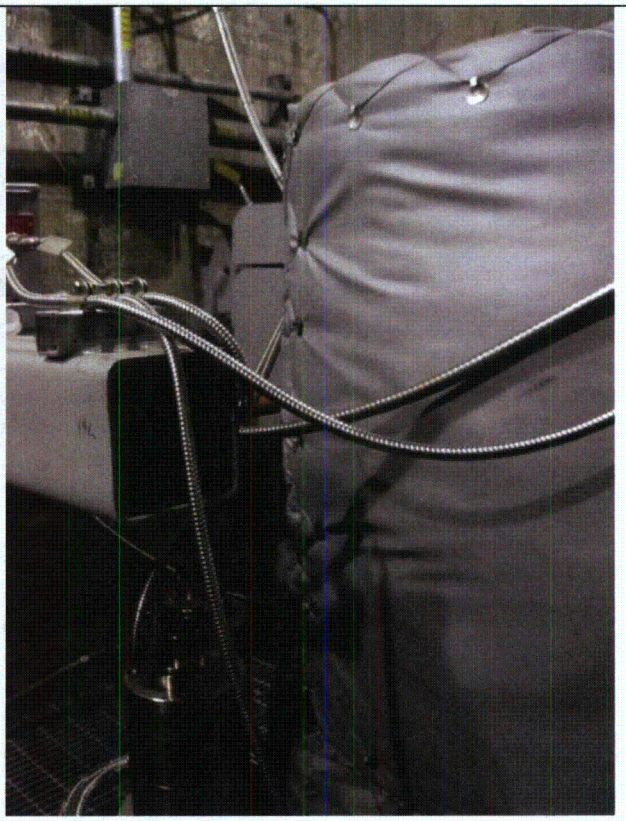


ABHV0014 9-20 005

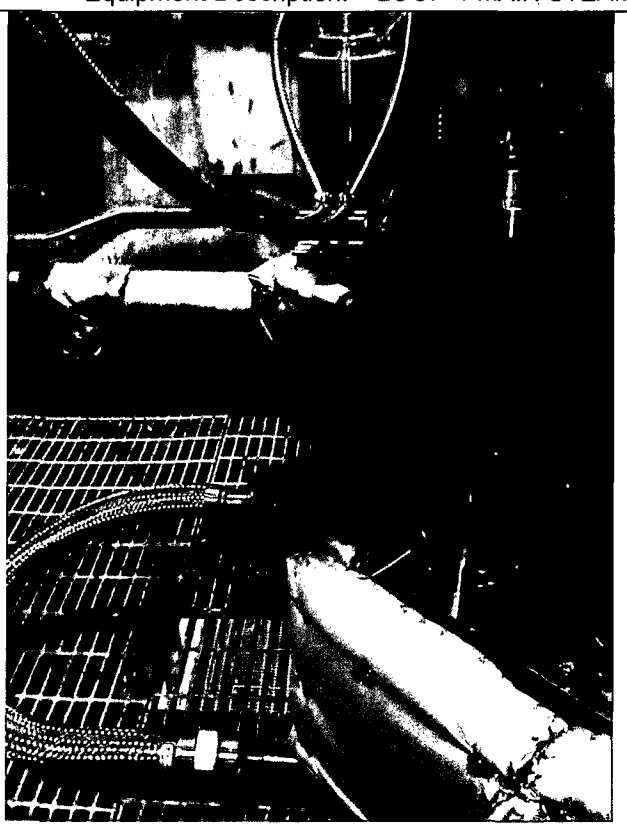
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

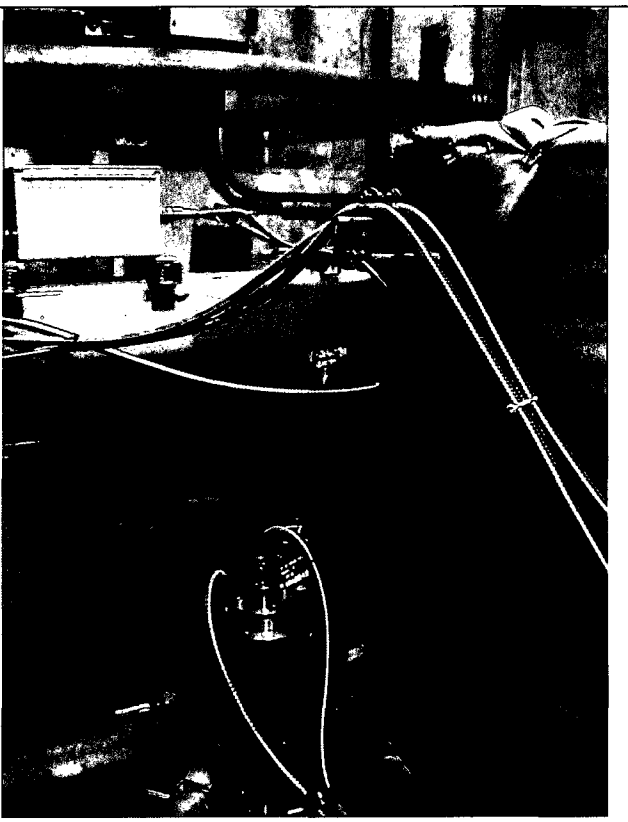
Equipment ID No.: ABHV0014

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LOOP-1 MAIN STEAM ISOLATION VALVE



ABHV0014 9-20 006



ABHV0014 9-20 007

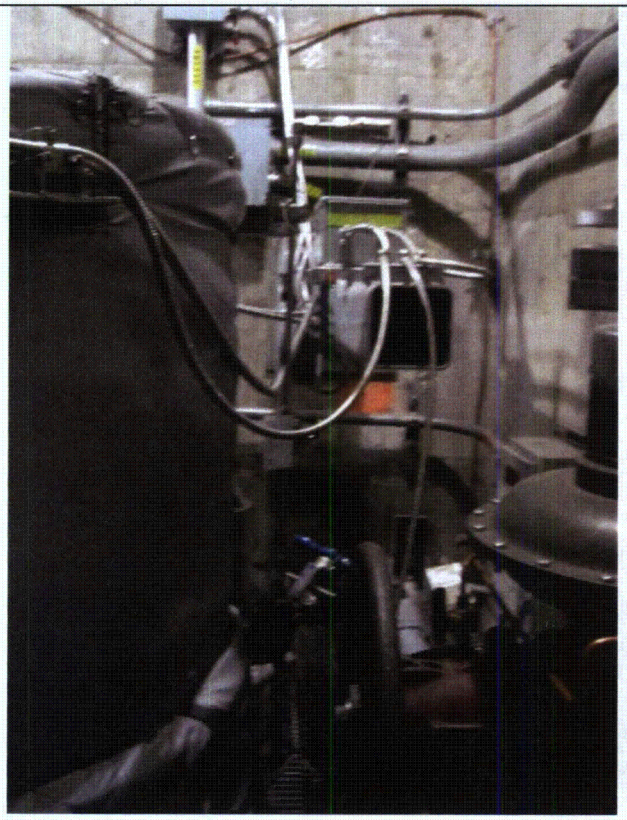
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

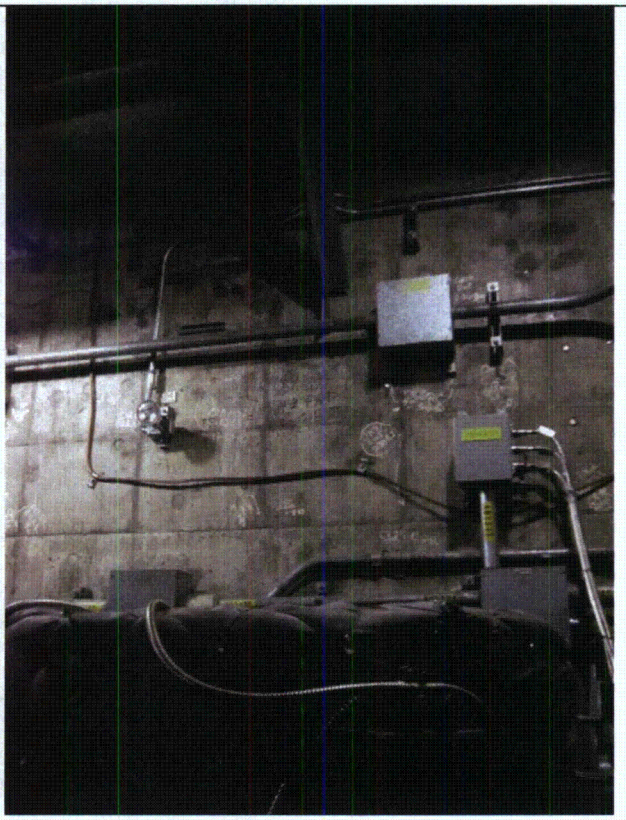
Equipment ID No.: ABHV0014

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LOOP-1 MAIN STEAM ISOLATION VALVE



ABHV0014 9-20 008



ABHV0014 9-20 009

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ABHV0014

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LOOP-1 MAIN STEAM ISOLATION VALVE

ABHV0014 9-20 010

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	ABPT0002
Equipment Class:	(18) Instruments on Racks
Equipment Description:	STM GEN B STEAMLINE PRESSURE <TIME CRITICAL ACTION EQUIPMENT>
Project:	WCNOC SWEL
Location (Bldg, Elev, Room/Area):	AUX, 2000.00 ft, 1305
Manufacturer/Model:	

Instructions for Completing Checklist

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

Anchorage

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

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ABPT0002

Equipment Class: (18) Instruments on Racks

Equipment Description: STM GEN B STEAMLINE PRESSURE <TIME CRITICAL ACTION EQUIPMENT>

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

Evaluated by: Hunter Young Date: 11-15-12

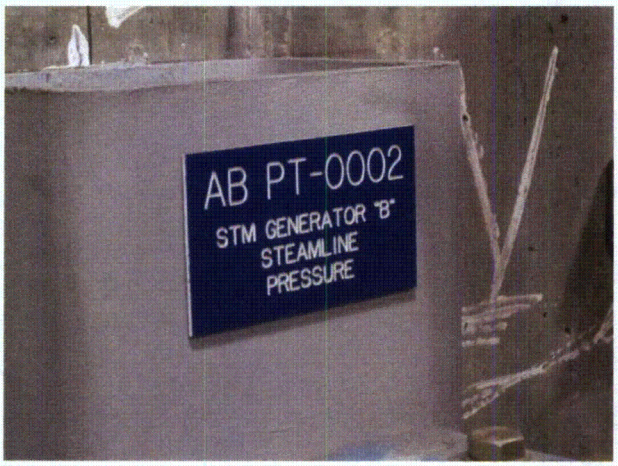
Timothy Nealon 11-15-12

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	ABPT0002
Equipment Class:	(18) Instruments on Racks
Equipment Description:	STM GEN B STEAMLINE PRESSURE <TIME CRITICAL ACTION EQUIPMENT>

Photos



ABPT0002 9-19 336

ABPT0002 9-19 337

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	ABPT0002
Equipment Class:	(18) Instruments on Racks
Equipment Description:	STM GEN B STEAMLINE PRESSURE <TIME CRITICAL ACTION EQUIPMENT>

ABPT0002 9-19 338

ABPT0002 9-19 339

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ABPV0002

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: SG B ATMOSPHERIC RELIEF VLV

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2026.00 ft, 1509

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.: ABPV0002

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: SG B ATMOSPHERIC RELIEF VLV

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures? *Scaffolding is somewhat flexible in N-S direction but is still incapable of impacting the valve. Therefore no hazard.*	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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

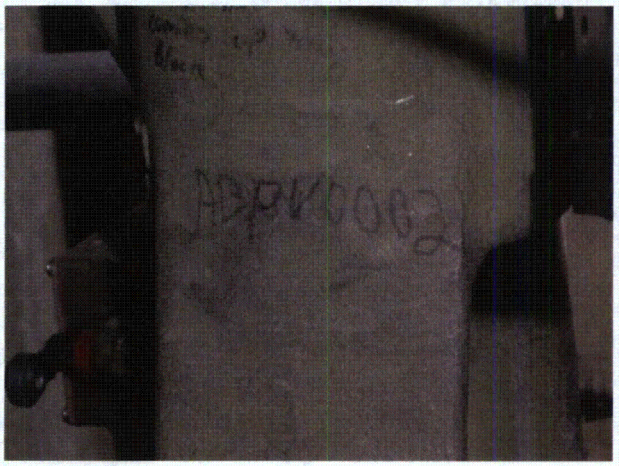
Seismic Walkdown Checklist (SWC)

Equipment ID No.: ABPV0002

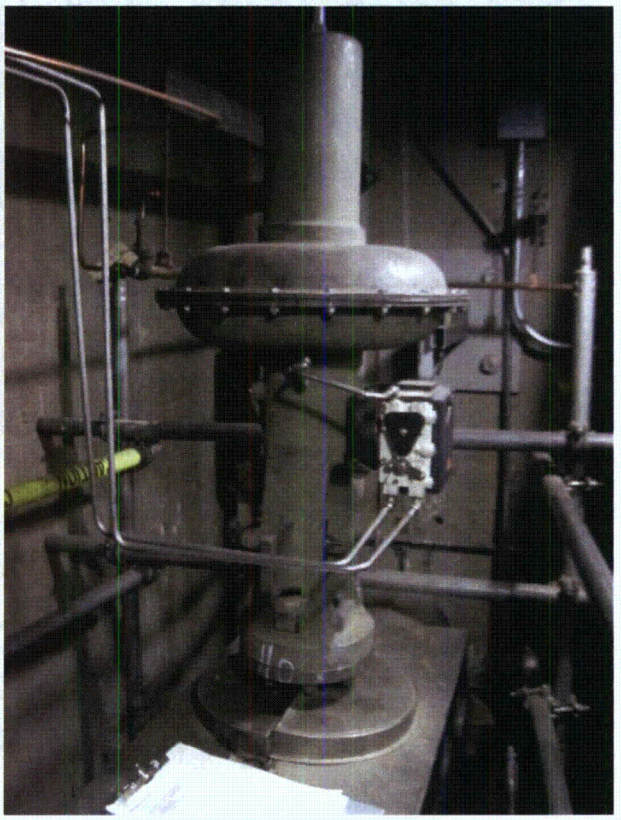
Equipment Class: (7) Fluid-Operated Valves

Equipment Description: SG B ATMOSPHERIC RELIEF VLV

Photos



ABPV0002 9-20 020



ABPV0002 9-20 021

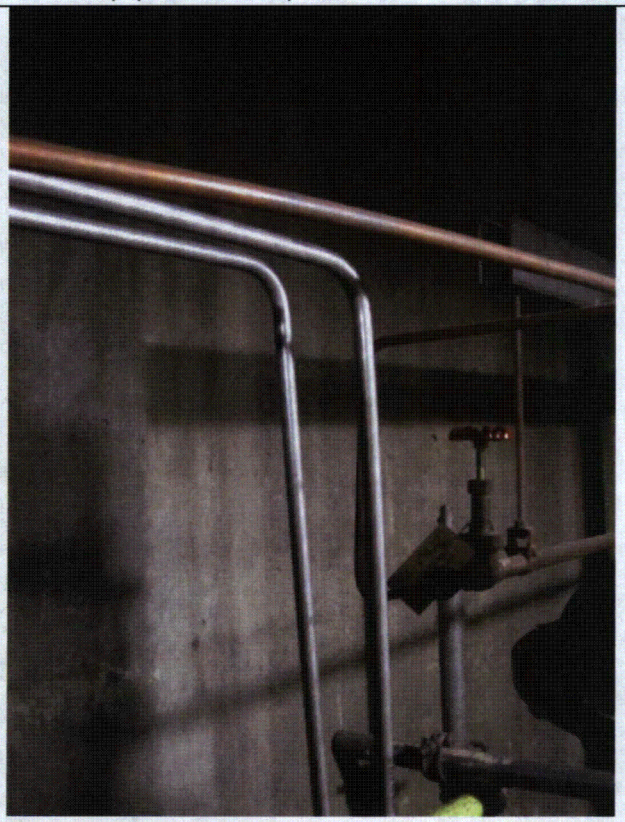
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ABPV0002

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: SG B ATMOSPHERIC RELIEF VLV



ABPV0002 9-20 022

ABPV0002 9-20 023

Status: [Y] N U

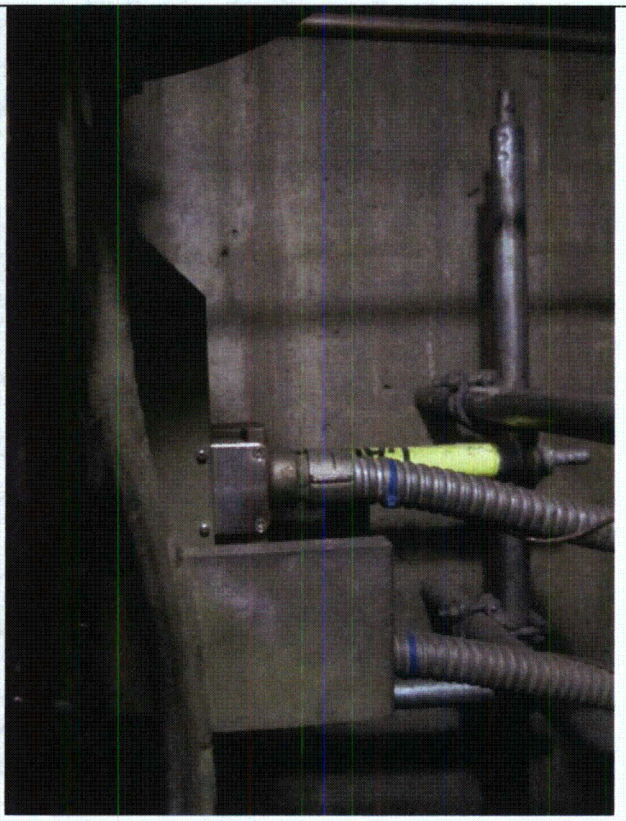
Seismic Walkdown Checklist (SWC)

Equipment ID No.: ABPV0002

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: SG B ATMOSPHERIC RELIEF VLV

ABPV0002 9-20 024



ABPV0002 9-20 025

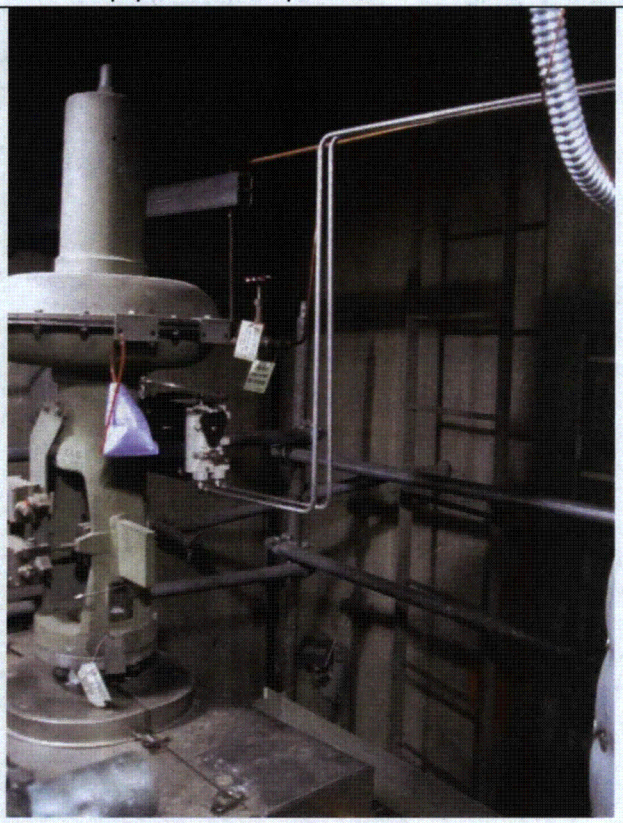
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ABPV0002

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: SG B ATMOSPHERIC RELIEF VLV



ABPV0002 9-20 026

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: AEFV0039

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: EBB01A FEEDWATER ISOLATION VALVE

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2026.00 ft, 1411

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.: AEFV0039

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: EBB01A FEEDWATER ISOLATION VALVE

Interaction Effects

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

Other Adverse Conditions

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

Comments

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

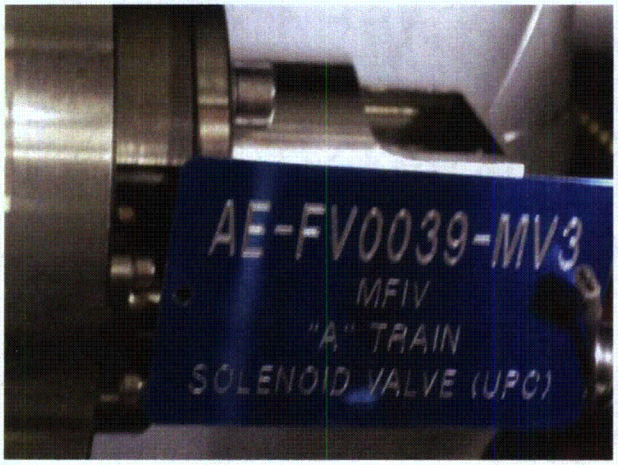
Seismic Walkdown Checklist (SWC)

Equipment ID No.: AEFV0039

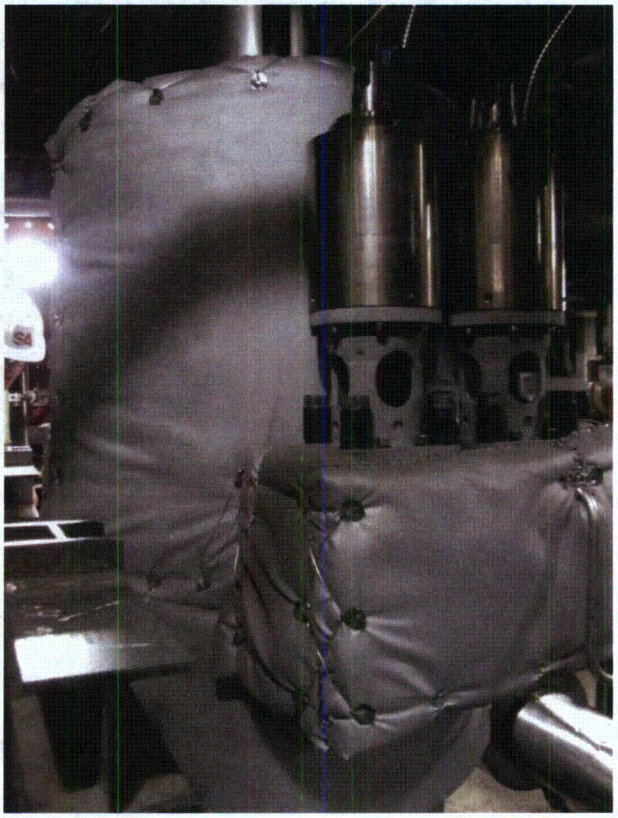
Equipment Class: (7) Fluid-Operated Valves

Equipment Description: EBB01A FEEDWATER ISOLATION VALVE

Photos

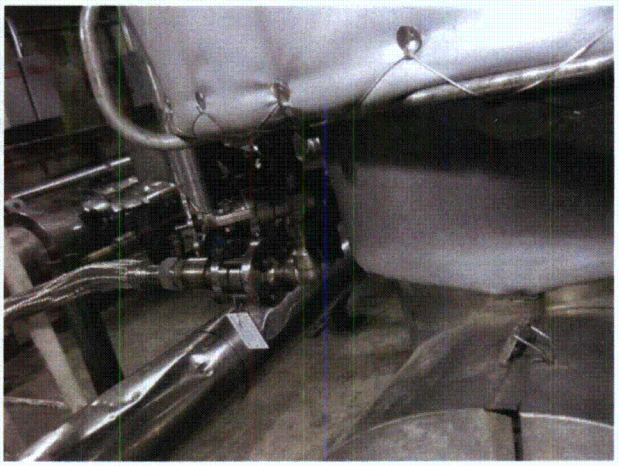


AEFV0039 9-20 054



AEFV0039 9-20 055

AEFV0039 9-20 056



AEFV0039 9-20 057

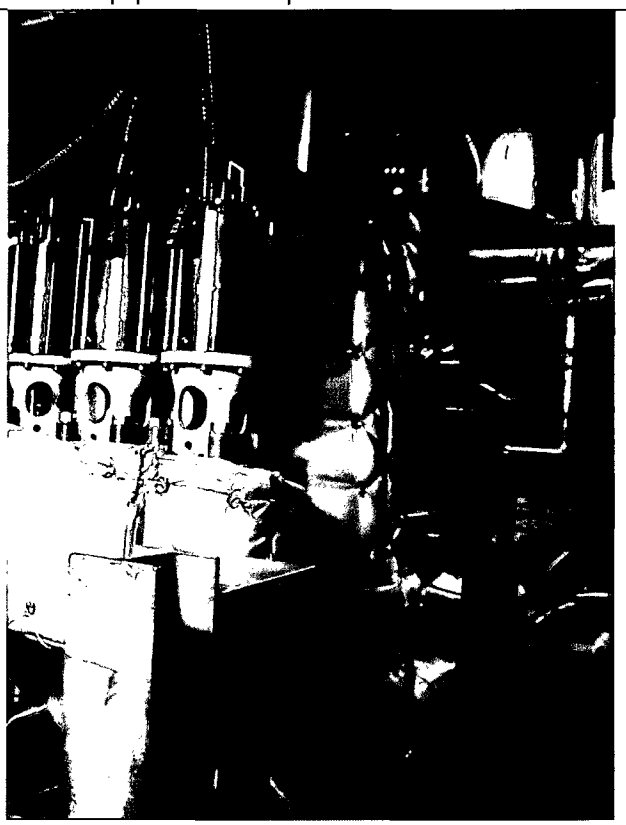
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: AEFV0039

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: EBB01A FEEDWATER ISOLATION VALVE



AEFV0039 9-20 058

AEFV0039 9-20 059

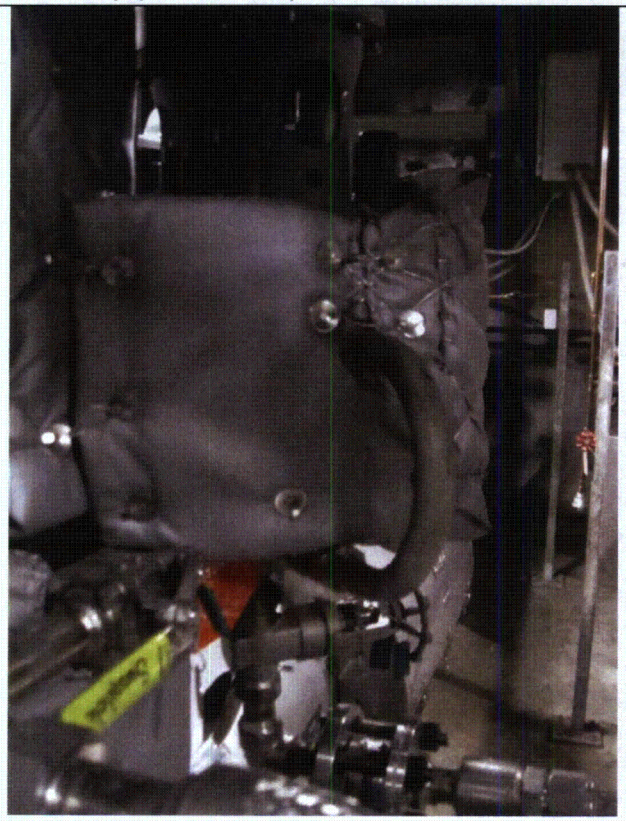
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

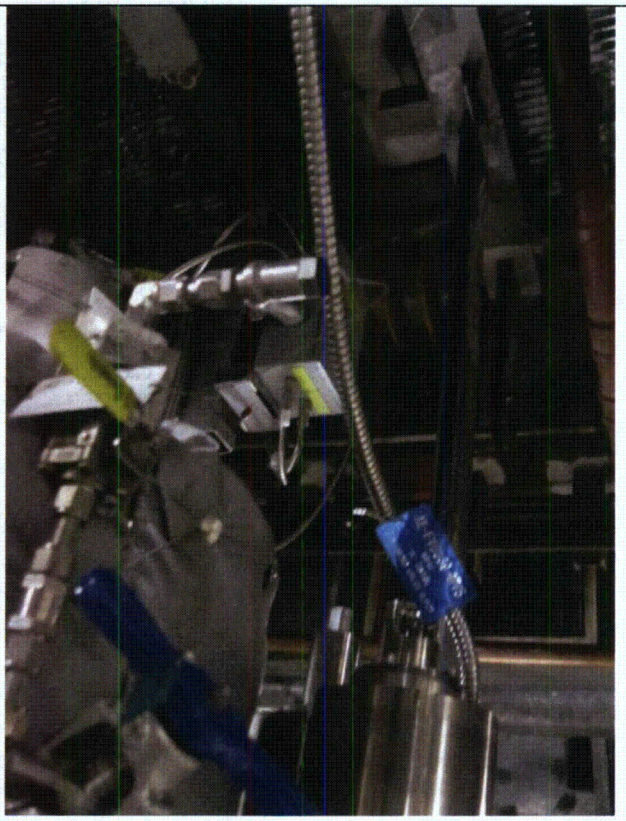
Equipment ID No.: AEFV0039

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: EBB01A FEEDWATER ISOLATION VALVE



AEFV0039 9-20 060



AEFV0039 9-20 061

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ALHV0030

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

Equipment Description: "ESW TO MDAFW PUMP B 6"" BTFL VLV W/LIMITQ"

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 1988.00 ft, 1206

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.: ALHV0030

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

Equipment Description: "ESW TO MDAFW PUMP B 6"" BTFL VLV W/LIMITQ"

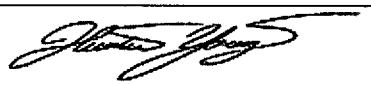
Interaction Effects

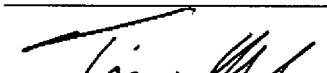
7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based 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? *SWT noted surface corrosion at pipe flange bolts. However no indication strength loss; therefore no adverse condition.*	Yes

Comments

Evaluated by:  Hunter Young Date: 11-15-12

 Timothy Nealon 11-15-12

Status: [Y] N U

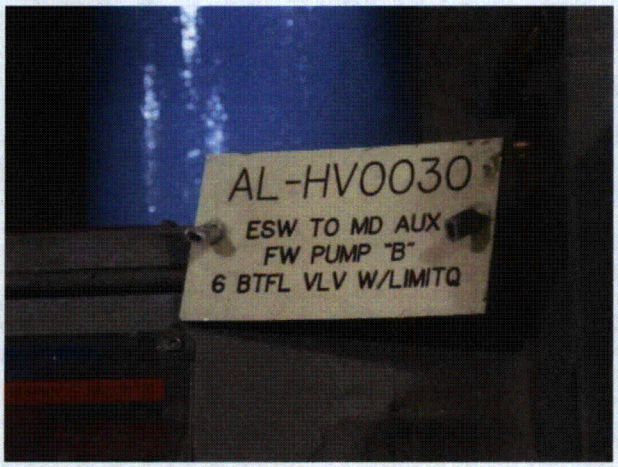
Seismic Walkdown Checklist (SWC)

Equipment ID No.: ALHV0030

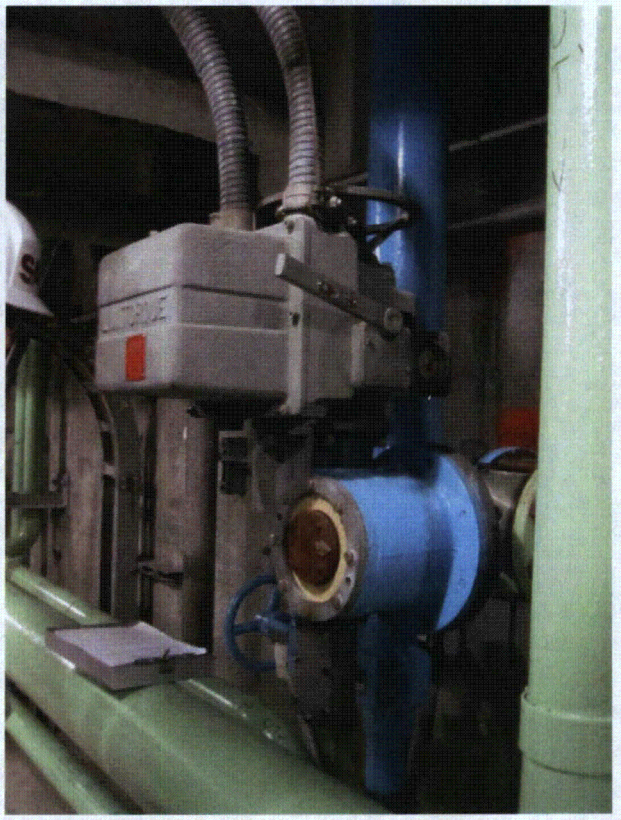
Equipment Class: (8) Motor-Operated and Solenoid-Operated Valves

Equipment Description: "ESW TO MDAFW PUMP B 6"" BTFL VLV W/LIMITQ"

Photos



ALHV0030 9-19 285



ALHV0030 9-19 286

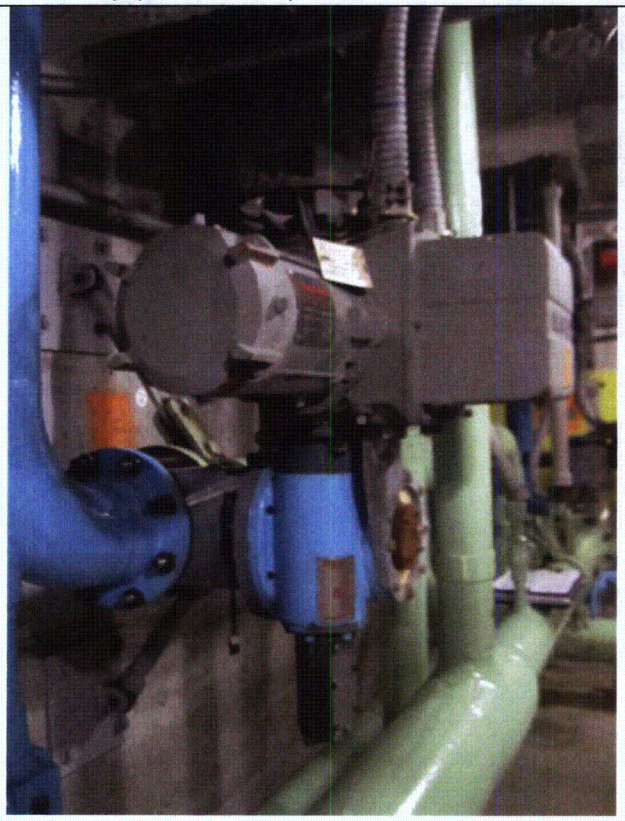
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

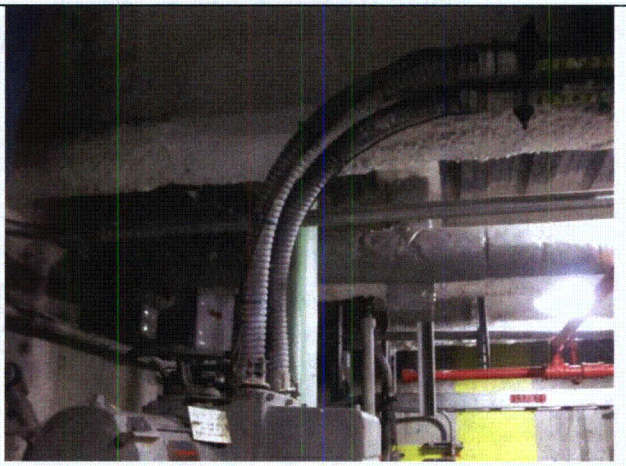
Equipment ID No.: ALHV0030

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

Equipment Description: "ESW TO MDAFW PUMP B 6"" BTFL VLV W/LIMITQ"



ALHV0030 9-19 287



ALHV0030 9-19 288

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BBLIS1321

Equipment Class: (18) Instruments on Racks

Equipment Description: RV SUBCOOLING MONITOR TRN B

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2000.00 ft, 1322

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? — Not Applicable

   Component is steel-mounted.

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.: BBLIS1321

Equipment Class: (18) Instruments on Racks

Equipment Description: RV SUBCOOLING MONITOR TRN B

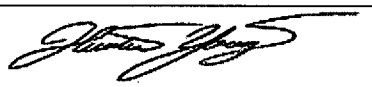
Interaction Effects

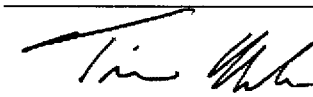
7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based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

Evaluated by:  Hunter Young Date: 11-15-12

 Timothy Nealon 11-15-12

Status: [Y] N U

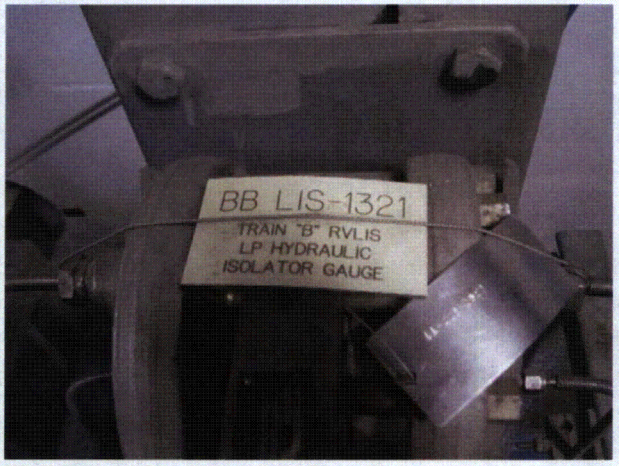
Seismic Walkdown Checklist (SWC)

Equipment ID No.: BBLIS1321

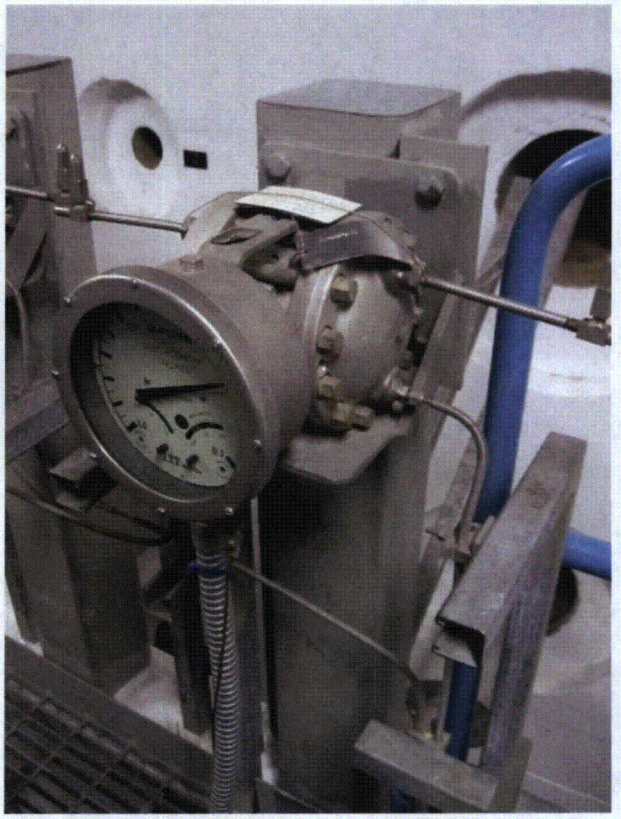
Equipment Class: (18) Instruments on Racks

Equipment Description: RV SUBCOOLING MONITOR TRN B

Photos



BBLIS1321 9-19 201

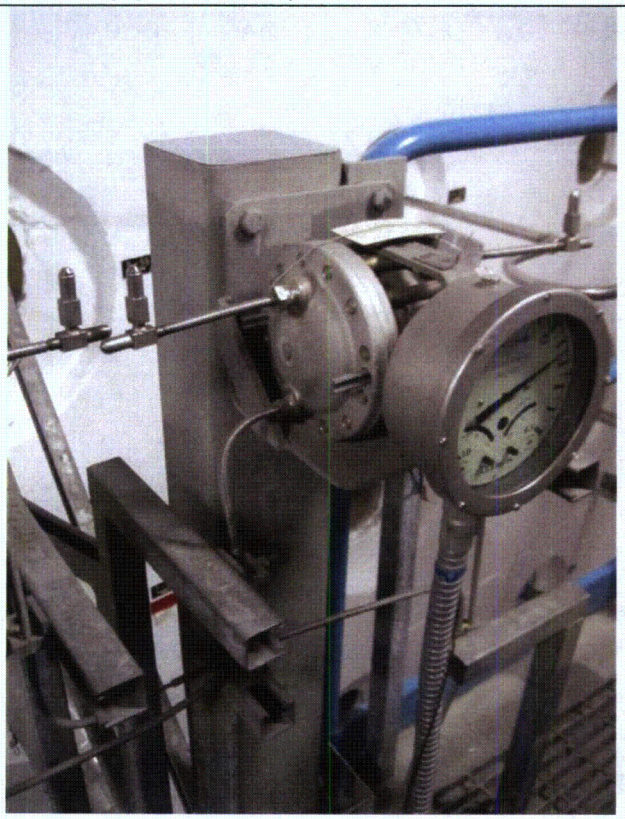


BBLIS1321 9-19 202

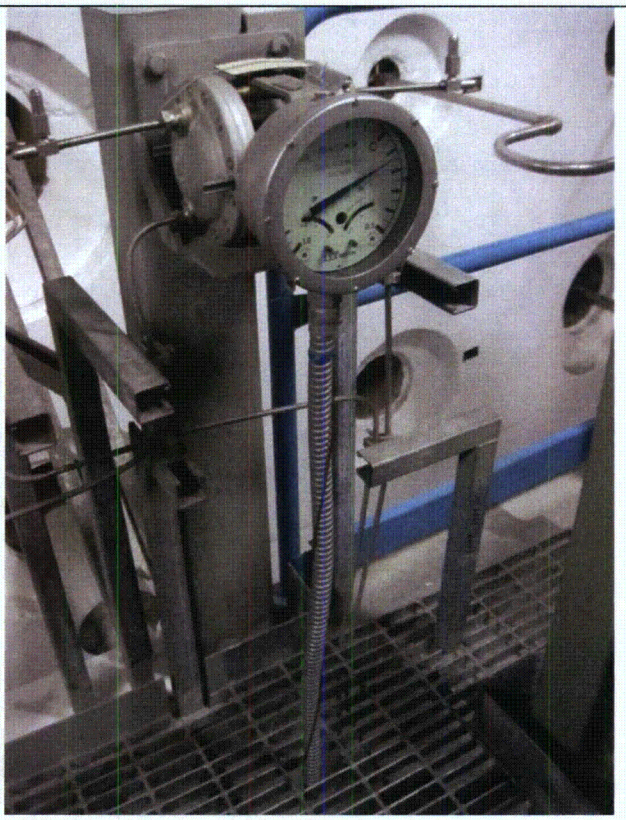
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	BBLIS1321
Equipment Class:	(18) Instruments on Racks
Equipment Description:	RV SUBCOOLING MONITOR TRN B



BBLIS1321 9-19 203



BBLIS1321 9-19 204

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BGFCV0121

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: CENTRIFUGAL CHG PMP FLOW CONTROL <CAT 2 AOV PROGRAM VALVE> <TIME CRITICAL ACTION EQUIPMENT>

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 1974.00 ft, 1115

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.:	BGFCV0121
Equipment Class:	(7) Fluid-Operated Valves
Equipment Description:	CENTRIFUGAL CHG PMP FLOW CONTROL <CAT 2 AOV PROGRAM VALVE> <TIME CRITICAL ACTION EQUIPMENT>

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

Evaluated by:	Hunter Young	Date:	11-15-12
	Timothy Nealon		11-15-12

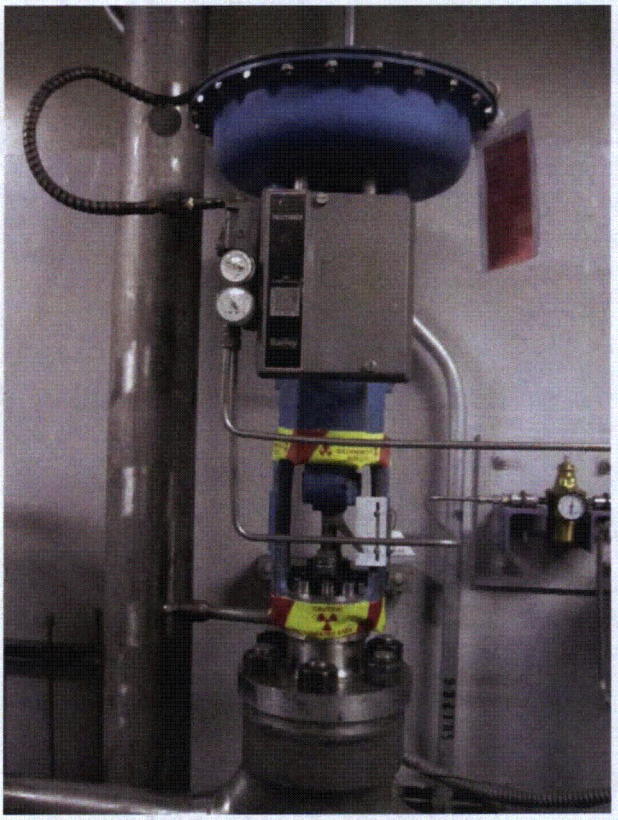
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	BGFCV0121
Equipment Class:	(7) Fluid-Operated Valves
Equipment Description:	CENTRIFUGAL CHG PMP FLOW CONTROL <CAT 2 AOV PROGRAM VALVE> <TIME CRITICAL ACTION EQUIPMENT>

Photos

BGFCV0121 9-19 080

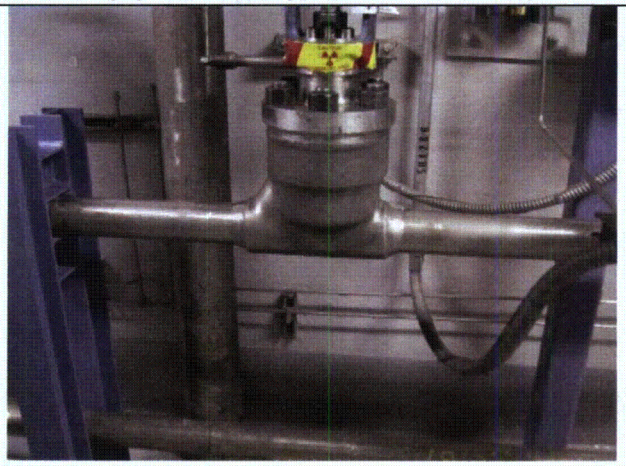


BGFCV0121 9-19 081

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	BGFCV0121
Equipment Class:	(7) Fluid-Operated Valves
Equipment Description:	CENTRIFUGAL CHG PMP FLOW CONTROL <CAT 2 AOV PROGRAM VALVE> <TIME CRITICAL ACTION EQUIPMENT>



BGFCV0121 9-19 082

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BGHV8105

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

Equipment Description: CHARGING PUMPS TO REGEN HX/CTMT ISO

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2000.00 ft, 1323

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.: BGHV8105

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

Equipment Description: CHARGING PUMPS TO REGEN HX/CTMT ISO

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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

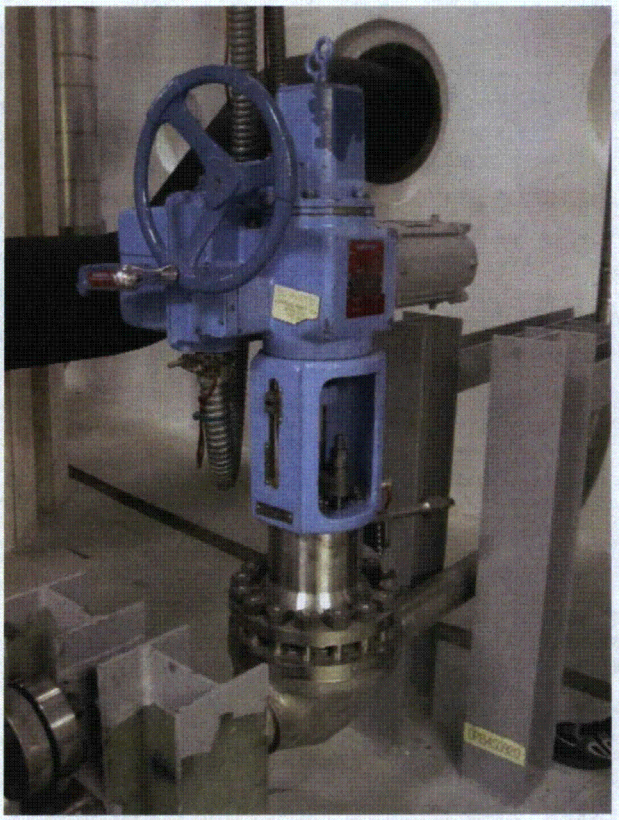
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	BGHV8105
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	CHARGING PUMPS TO REGEN HX/CTMT ISO

Photos

BGHV8105 9-19 379

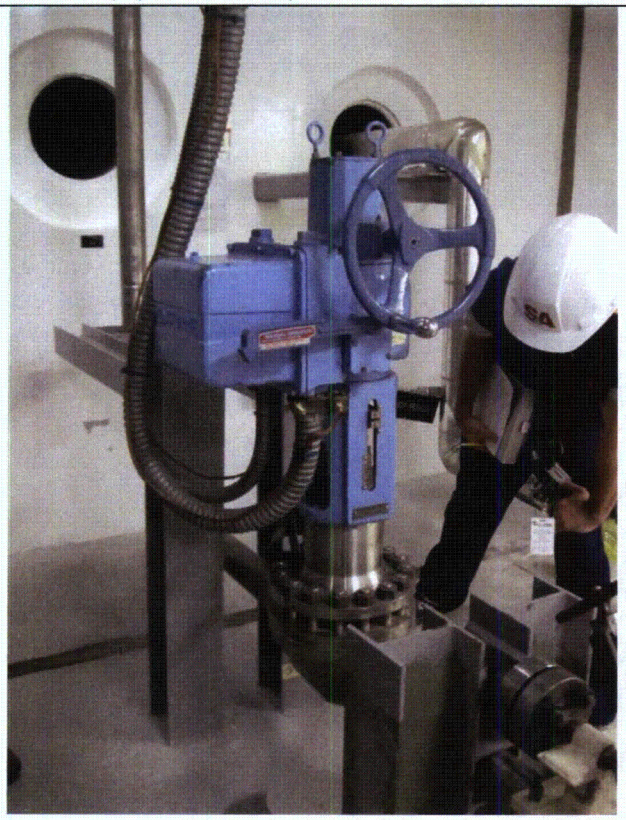


BGHV8105 9-19 380

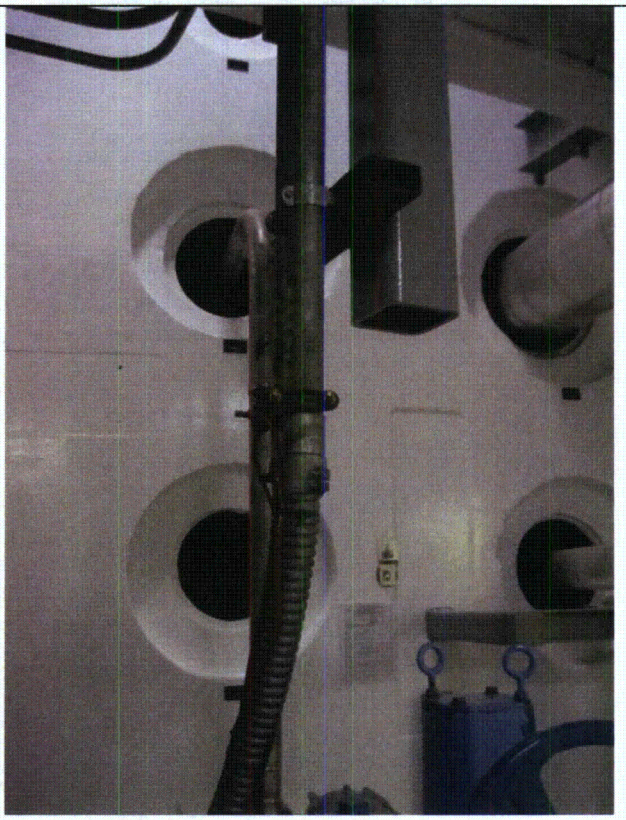
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	BGHV8105
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	CHARGING PUMPS TO REGEN HX/CTMT ISO



BGHV8105 9-19 381



BGHV8105 9-19 382

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BGHV8152

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LETDOWN SYSTEM CONTAINMENT ISO VLV

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2000.00 ft, 1322

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.: BGHV8152

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LETDOWN SYSTEM CONTAINMENT ISO VLV

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures? *SWT noted approximately ½" clearance to the adjacent valve's hand wheel to the east. Given that BGHV8152 is braced at this location in the direction of interest and the adjacent valve is also heavily braced, the gap is judged as adequate.*	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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

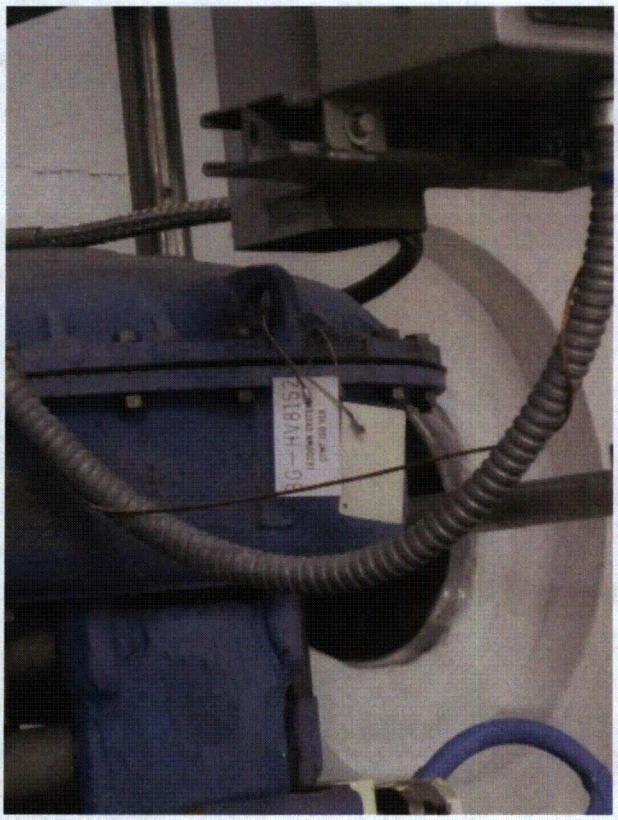
Seismic Walkdown Checklist (SWC)

Equipment ID No.: BGHV8152

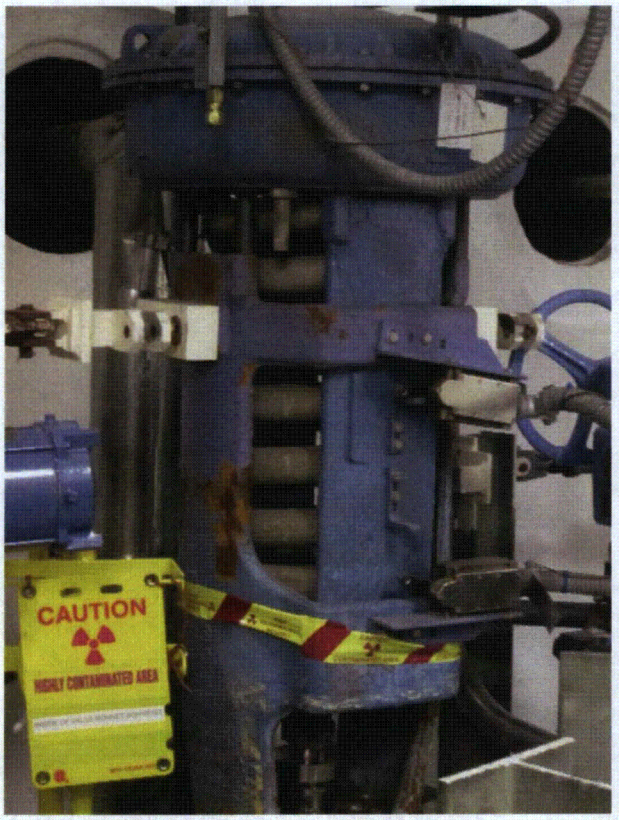
Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LETDOWN SYSTEM CONTAINMENT ISO VLV

Photos



BGHV8152 9-19 175



BGHV8152 9-19 176

Status: [Y] N U

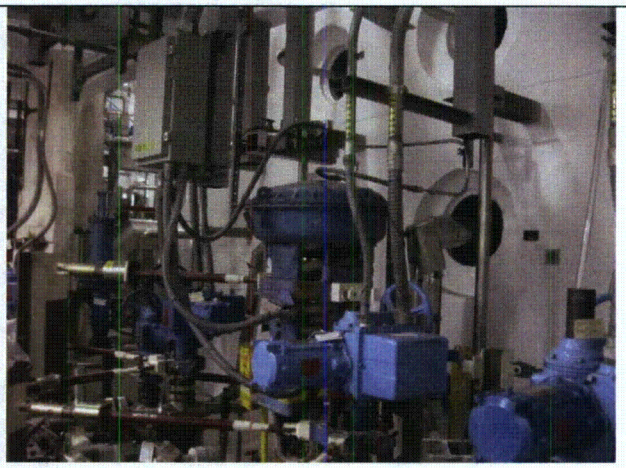
Seismic Walkdown Checklist (SWC)

Equipment ID No.: BGHV8152

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LETDOWN SYSTEM CONTAINMENT ISO VLV

BGHV8152 9-19 177



BGHV8152 9-19 178

Status: [Y] N U

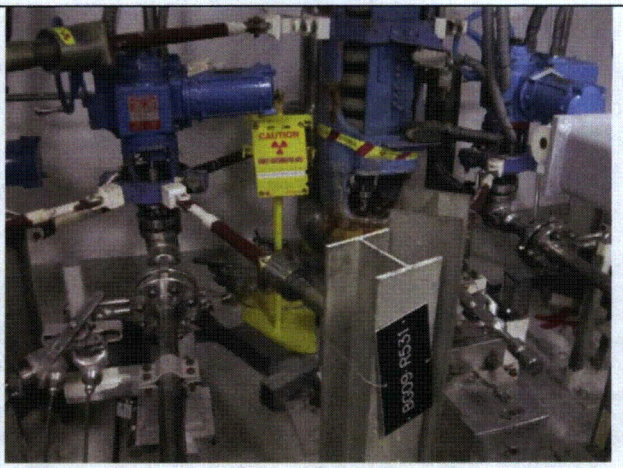
Seismic Walkdown Checklist (SWC)

Equipment ID No.: BGHV8152

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: LETDOWN SYSTEM CONTAINMENT ISO VLV

BGHV8152 9-19 179



BGHV8152 9-19 180

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BLHV8047

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: REACTOR M/U WATER CONTAINMENT ISO

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2000.00 ft, 1322

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.: BLHV8047

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: REACTOR M/U WATER CONTAINMENT ISO

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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

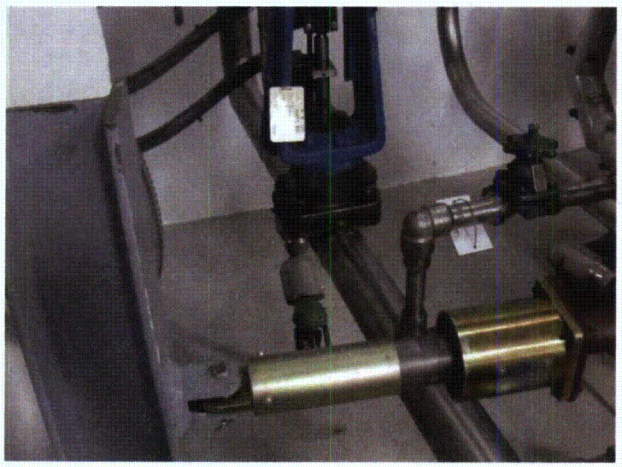
Seismic Walkdown Checklist (SWC)

Equipment ID No.:	BLHV8047
Equipment Class:	(7) Fluid-Operated Valves
Equipment Description:	REACTOR M/U WATER CONTAINMENT ISO

Photos

BLHV8047 9-19 181

BLHV8047 9-19 182



BLHV8047 9-19 183

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BMHV0002

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: SG B BLOWDOWN AFAS ISO

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2047.50 ft, UNK

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.: BMHV0002

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: SG B BLOWDOWN AFAS ISO

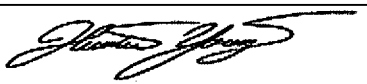
Interaction Effects

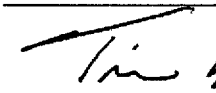
7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based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

Evaluated by:  Hunter Young Date: 11-15-12

 Timothy Nealon 11-15-12

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

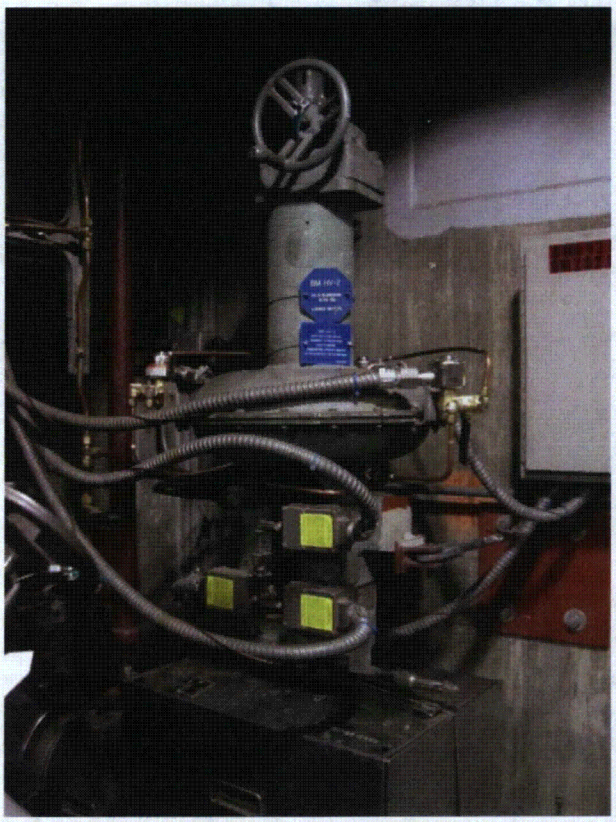
Equipment ID No.: BMHV0002

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: SG B BLOWDOWN AFAS ISO

Photos

BMHV0002 9-20 032



BMHV0002 9-20 033

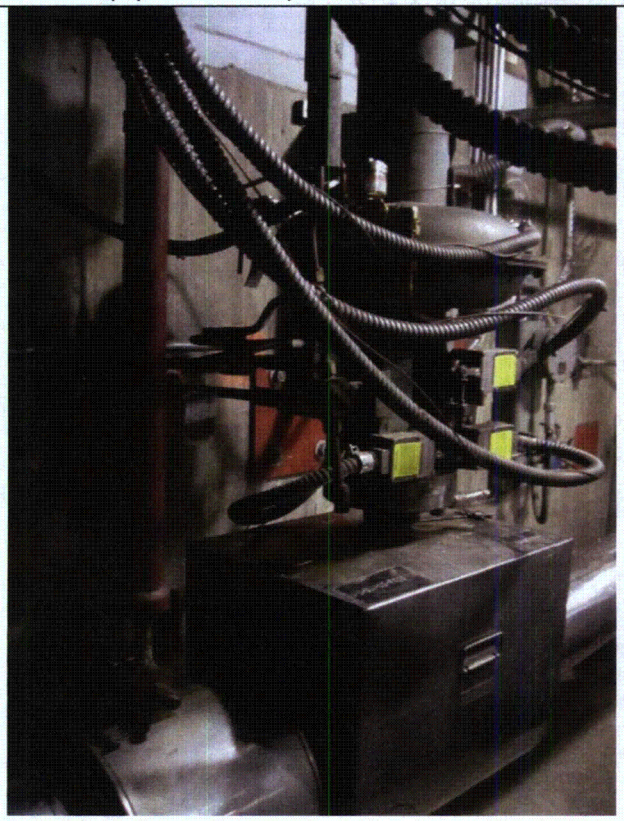
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BMHV0002

Equipment Class: (7) Fluid-Operated Valves

Equipment Description: SG B BLOWDOWN AFAS ISO



BMHV0002 9-20 034

BMHV0002 9-20 035

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BNHV0003

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

Equipment Description: RWST SUPPLY TO CTMT SPRAY PUMP B

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 1974.00 ft, 1110

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.: BNHV0003

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

Equipment Description: RWST SUPPLY TO CTMT SPRAY PUMP B

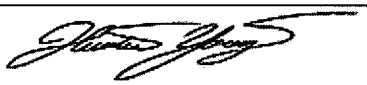
Interaction Effects

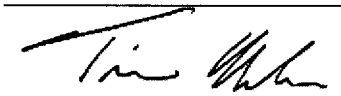
7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based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

Evaluated by:  Hunter Young Date: 11-15-12

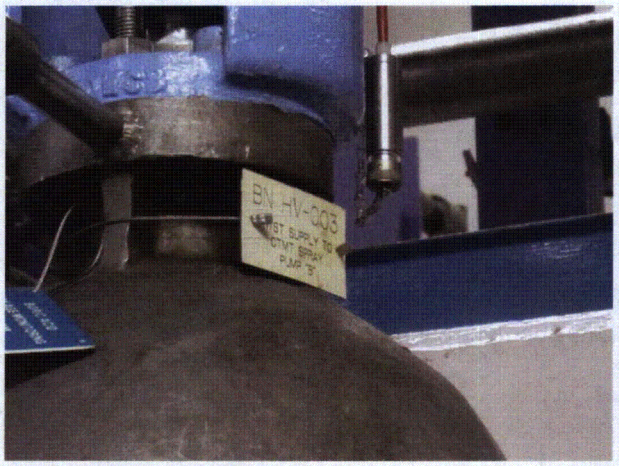
 Timothy Nealon 11-15-12

Status: [Y] N U

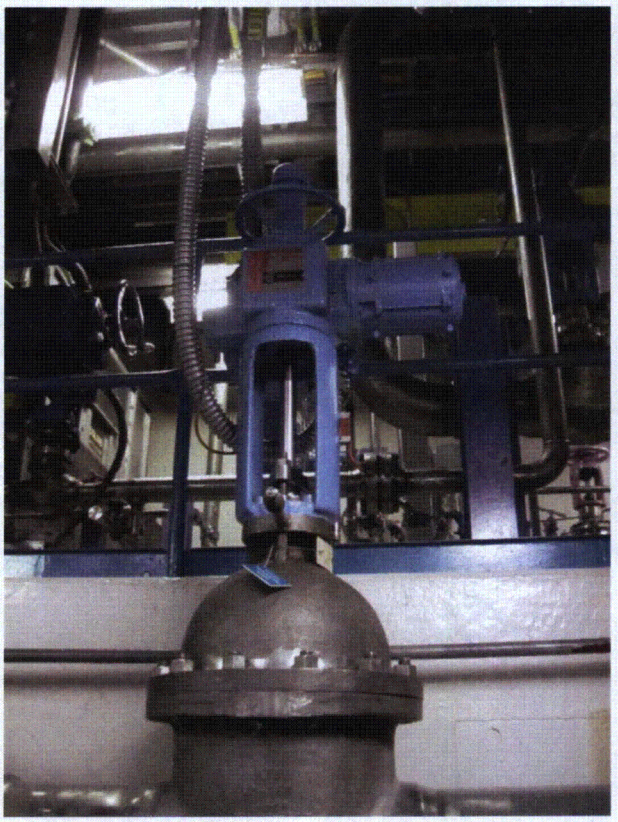
Seismic Walkdown Checklist (SWC)

Equipment ID No.:	BNHV0003
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	RWST SUPPLY TO CTMT SPRAY PUMP B

Photos



BNHV0003 9-19 140



BNHV0003 9-19 141

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BNHV0003

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

Equipment Description: RWST SUPPLY TO CTMT SPRAY PUMP B

BNHV0003 9-19 142

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BNLT0931

Equipment Class: (18) Instruments on Racks

Equipment Description: RWST LEVEL TRANSMITTER (2)

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): YRD, 2000.00 ft, UNK

Manufacturer/Model:

Instructions for Completing Checklist

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

Anchorage

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

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BNLT0931

Equipment Class: (18) Instruments on Racks

Equipment Description: RWST LEVEL TRANSMITTER (2)

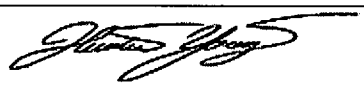
Interaction Effects

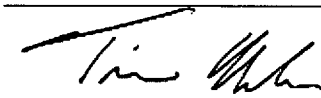
7.	Are soft targets free from impact by nearby equipment or structures?	Yes
8.	Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment?	Yes
9.	Do attached lines have adequate flexibility to avoid damage?	Yes
10.	Based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

Evaluated by:  Hunter Young Date: 11-15-12

 Timothy Nealon 11-15-12

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BNLT0931

Equipment Class: (18) Instruments on Racks

Equipment Description: RWST LEVEL TRANSMITTER (2)

Photos

BNLT0931 9-17 188

BNLT0931 9-17 189

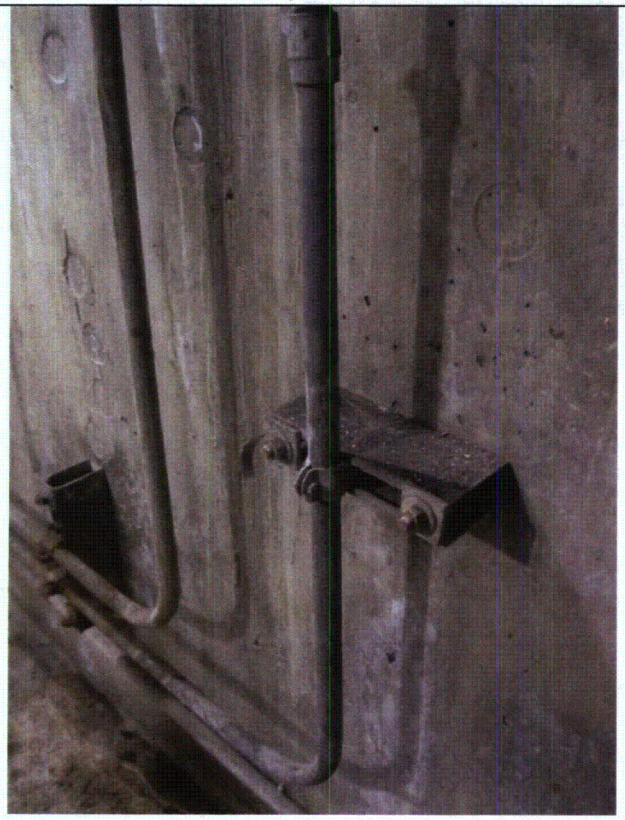
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BNLT0931

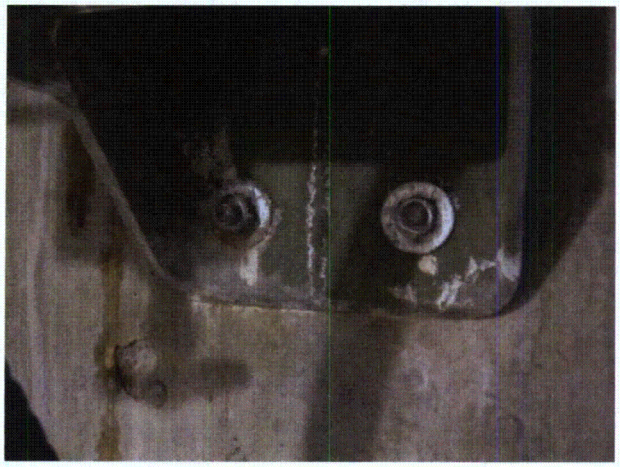
Equipment Class: (18) Instruments on Racks

Equipment Description: RWST LEVEL TRANSMITTER (2)



BNLT0931 9-17 190

BNLT0931 9-17 191



BNLT0931 9-17 192

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BNV0011

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

Equipment Description: RWST OUTLET ISO VALVE

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): YRD, 2000.00 ft, UNK

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.: BNV0011

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

Equipment Description: RWST OUTLET ISO VALVE

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures? *Good clearance and immediately supported.*	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

Evaluated by: Hunter Young Date: 11-15-12

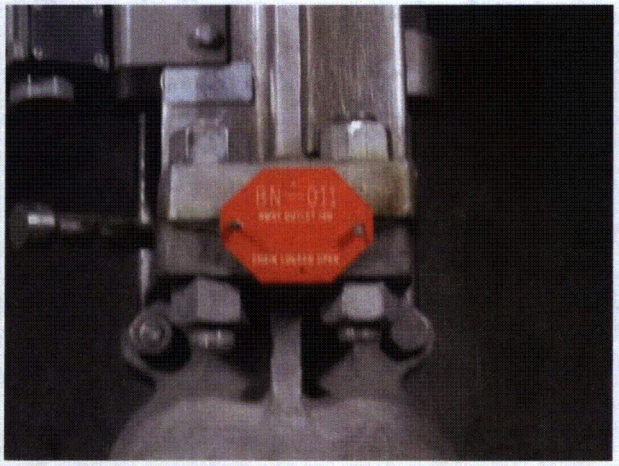
Timothy Nealon 11-15-12

Status: [Y] N U

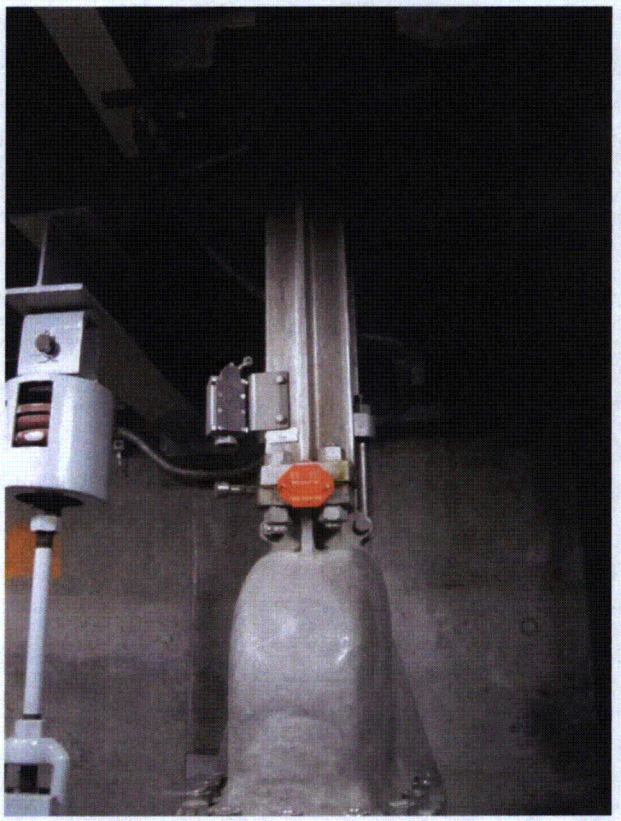
Seismic Walkdown Checklist (SWC)

Equipment ID No.:	BNV0011
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	RWST OUTLET ISO VALVE

Photos



BNV0011 9-17 182



BNV0011 9-17 183

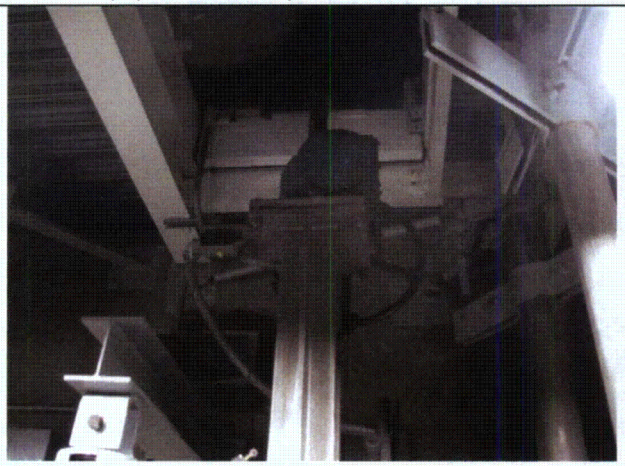
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

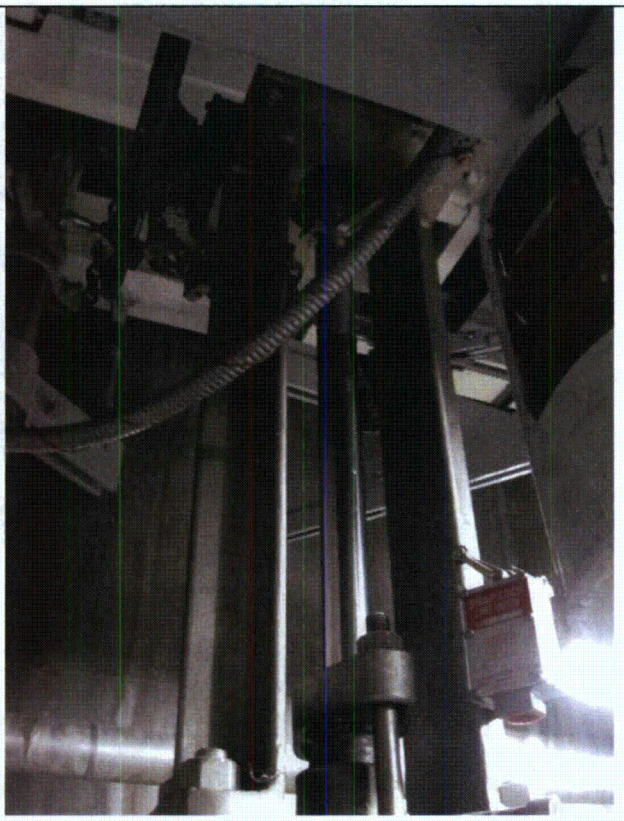
Equipment ID No.: BNV0011

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

Equipment Description: RWST OUTLET ISO VALVE



BNV0011 9-17 184



BNV0011 9-17 185

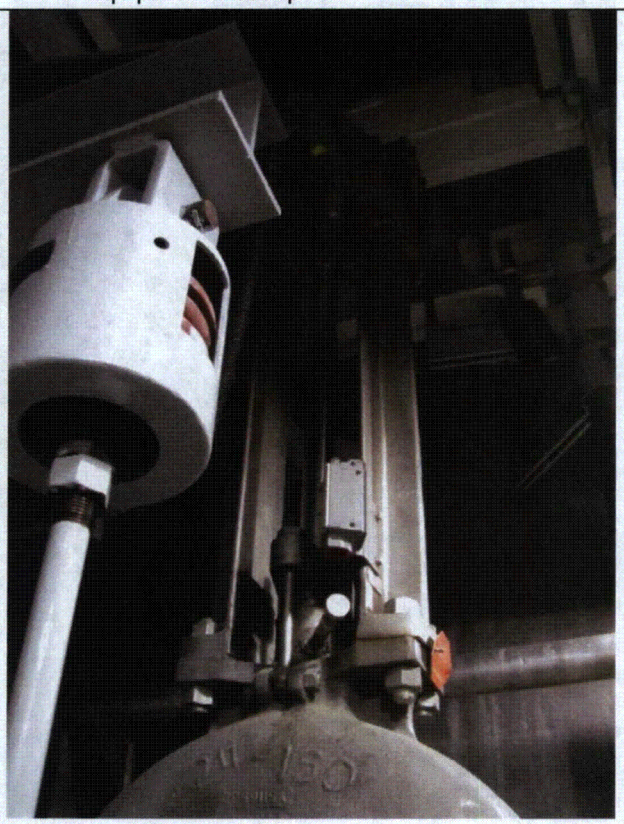
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: BNV0011

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

Equipment Description: RWST OUTLET ISO VALVE



BNV0011 9-17 186

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: CGM01B

Equipment Class: (9) Fans

Equipment Description: DIESEL GENERATOR BLDG SUPPLY FAN

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): DGB, -9999.00 ft, 5201

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.)	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.: CGM01B

Equipment Class: (9) Fans

Equipment Description: DIESEL GENERATOR BLDG SUPPLY FAN

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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

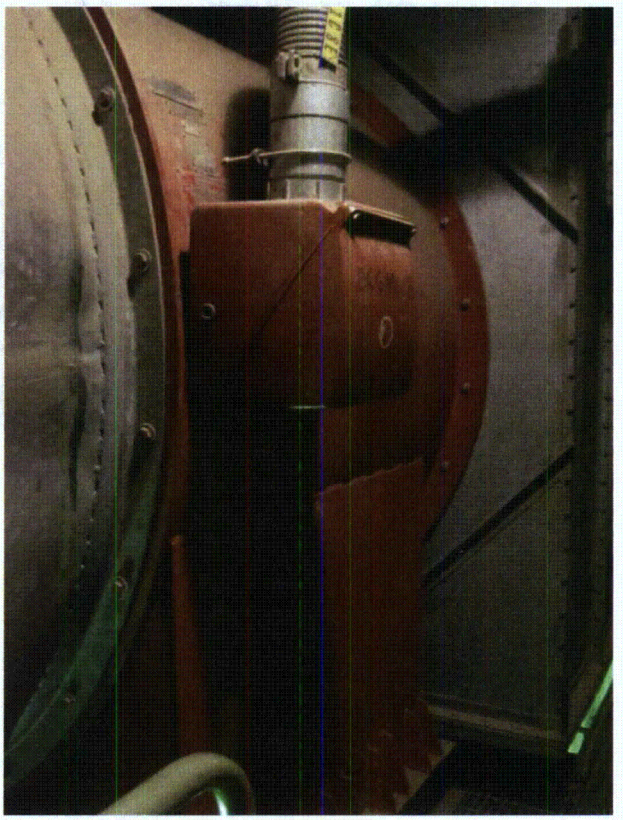
Equipment ID No.: CGM01B

Equipment Class: (9) Fans

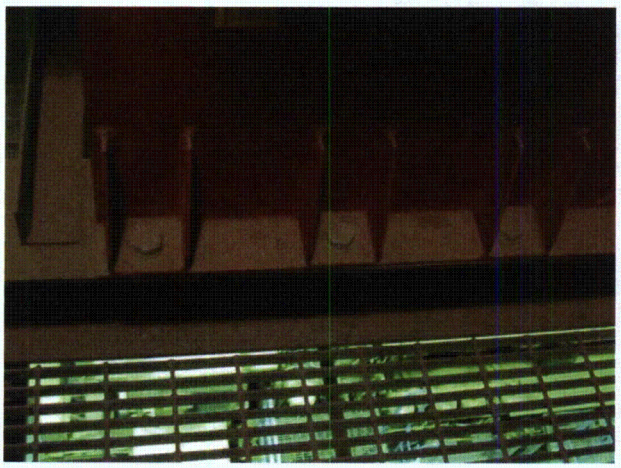
Equipment Description: DIESEL GENERATOR BLDG SUPPLY FAN

Photos

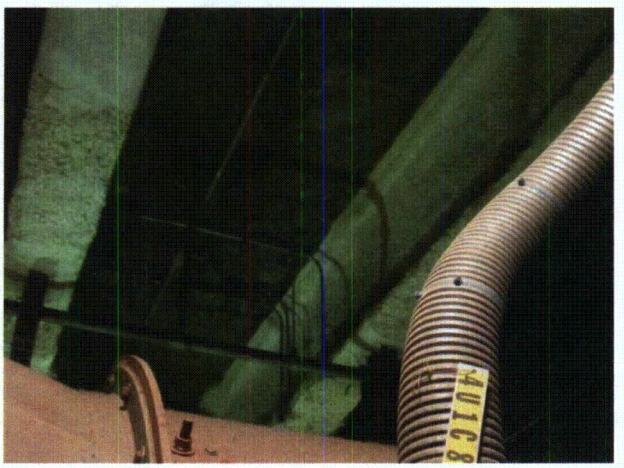
CGM01B 9-17 077



CGM01B 9-17 078



CGM01B 9-17 079



CGM01B 9-17 080

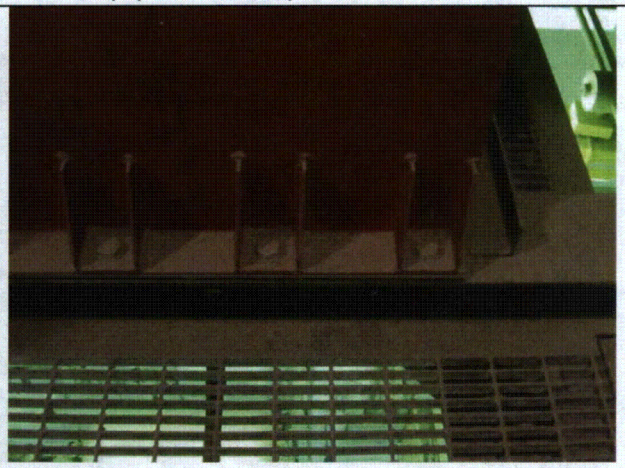
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: CGM01B

Equipment Class: (9) Fans

Equipment Description: DIESEL GENERATOR BLDG SUPPLY FAN



CGM01B 9-17 081

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ECFT0018

Equipment Class: (18) Instruments on Racks

Equipment Description: FUEL POOL COOLING PUMP DISCHARGE FLOW TRANSMITTER

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): FB, 2000.00 ft, 6104

Manufacturer/Model:

Instructions for Completing Checklist

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

Anchorage

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

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ECFT0018

Equipment Class: (18) Instruments on Racks

Equipment Description: FUEL POOL COOLING PUMP DISCHARGE FLOW TRANSMITTER

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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

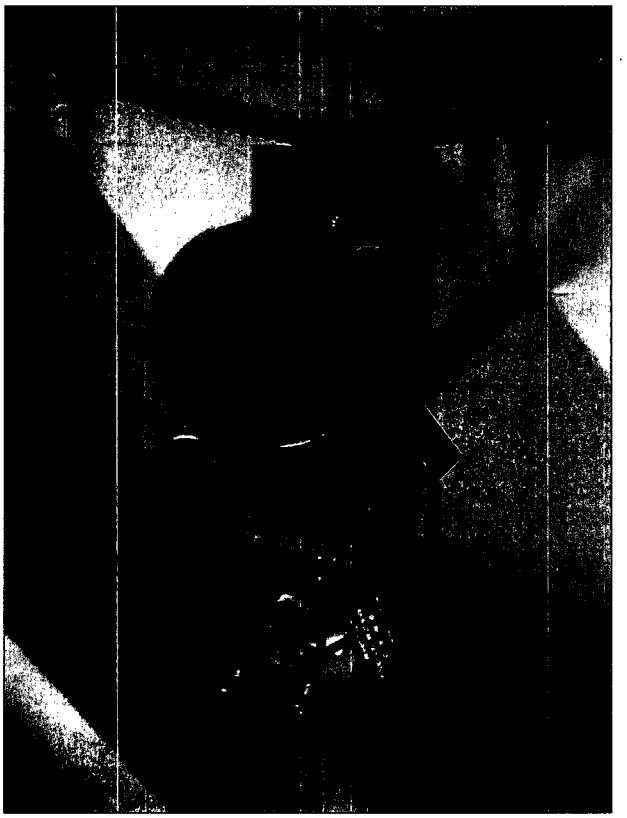
Equipment ID No.: ECFT0018

Equipment Class: (18) Instruments on Racks

Equipment Description: FUEL POOL COOLING PUMP DISCHARGE FLOW TRANSMITTER

Photos

ECFT0018 9-18 241



ECFT0018 9-18 242

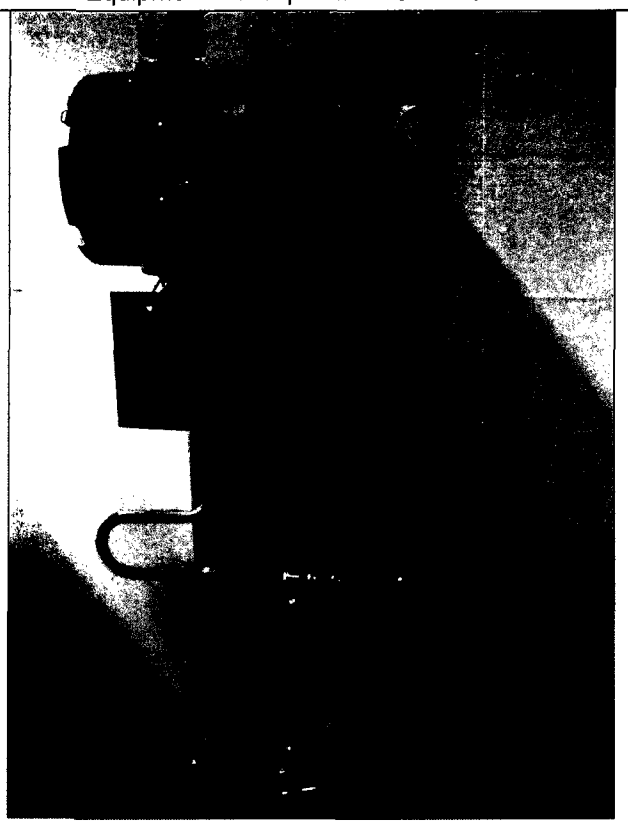
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

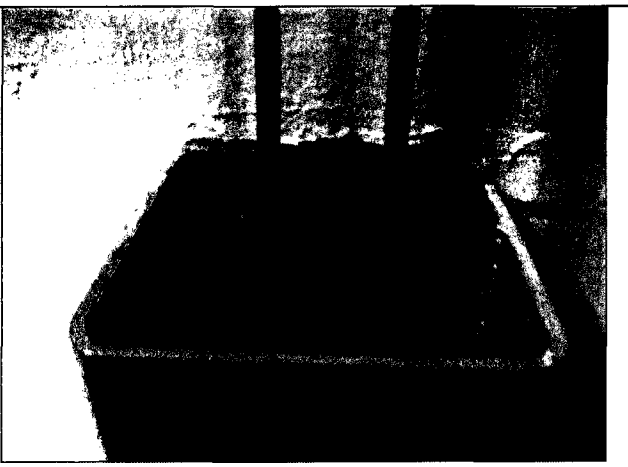
Equipment ID No.: ECFT0018

Equipment Class: (18) Instruments on Racks

Equipment Description: FUEL POOL COOLING PUMP DISCHARGE FLOW TRANSMITTER



ECFT0018 9-18 244



ECFT0018 9-18 245

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: ECHV012

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

Equipment Description: FUEL POOL HEAT EXCHANGER SHELL SIDE OUTLET ISO

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): FB, 2000.00 ft, 6104

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.: ECHV012

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

Equipment Description: FUEL POOL HEAT EXCHANGER SHELL SIDE OUTLET ISO

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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

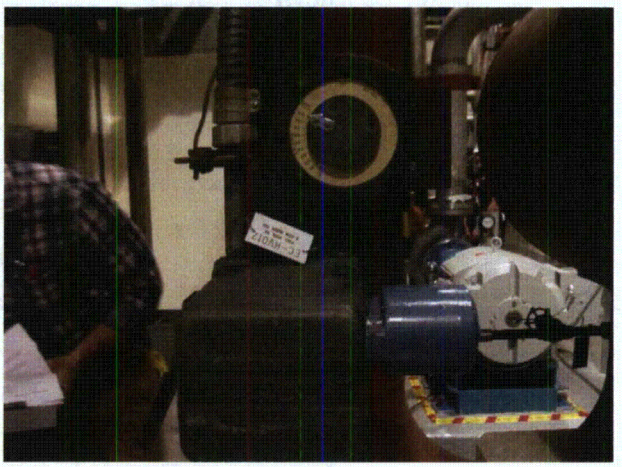
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

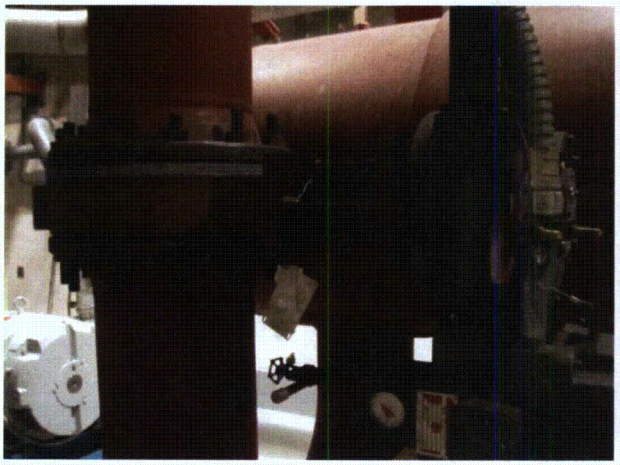
Equipment ID No.:	ECHV012
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	FUEL POOL HEAT EXCHANGER SHELL SIDE OUTLET ISO

Photos

ECHV012 9-18 235



ECHV012 9-18 236



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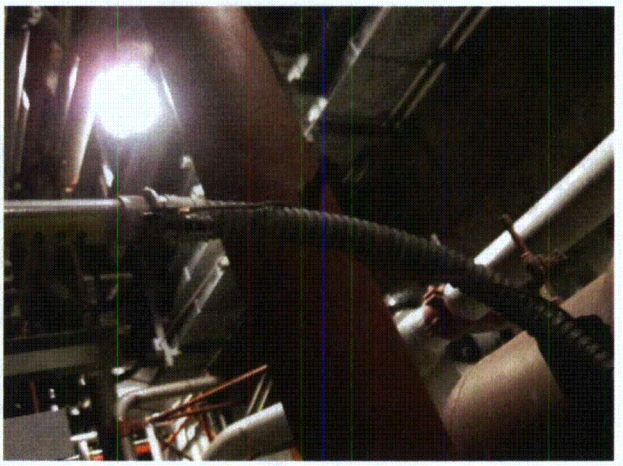


ECHV012 9-18 239

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EEC001B

Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: FUEL POOL COOLING HEAT EXCHANGER

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): FB, 2000.00 ft, 6104

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.)	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.: EEC001B

Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: FUEL POOL COOLING HEAT EXCHANGER

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? *Overhead hoist observed to be well-supported with chains tied off. No hazard.*	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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

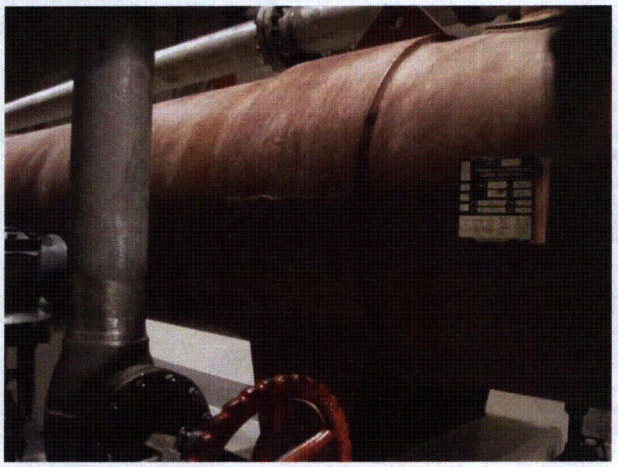
Seismic Walkdown Checklist (SWC)

Equipment ID No.: EEC001B

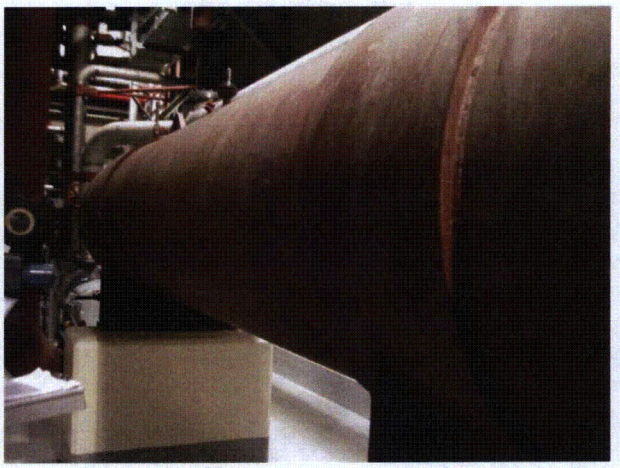
Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: FUEL POOL COOLING HEAT EXCHANGER

Photos



EEC001B 9-18 218



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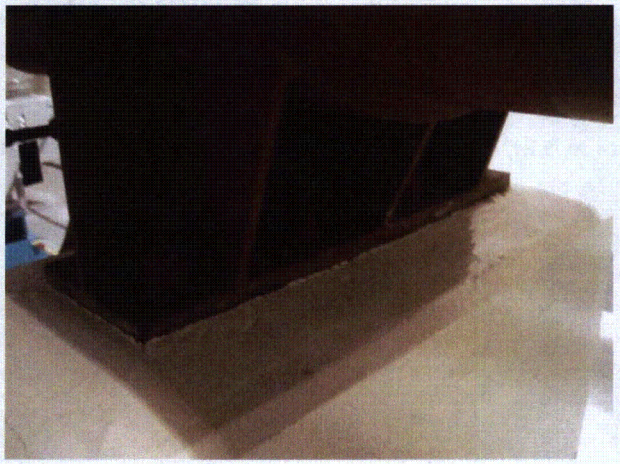


EEC001B 9-18 220

EEC001B 9-18 221

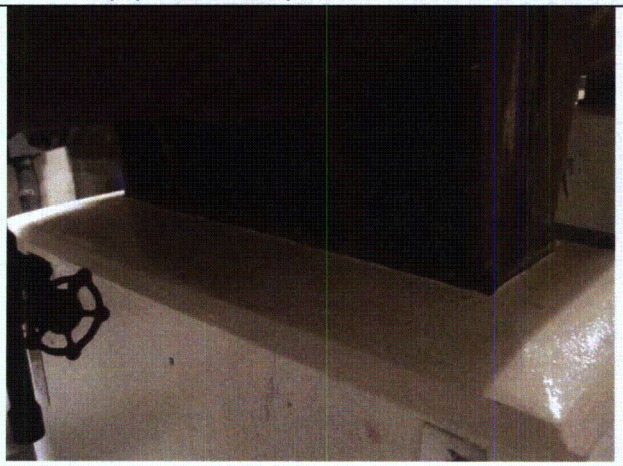
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

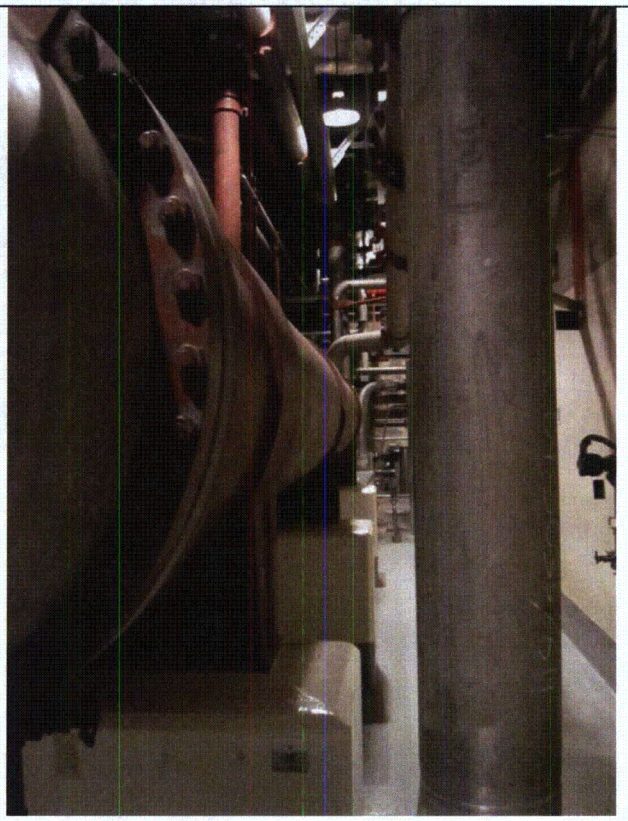
Equipment ID No.: EEC001B

Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: FUEL POOL COOLING HEAT EXCHANGER



EEC001B 9-18 222



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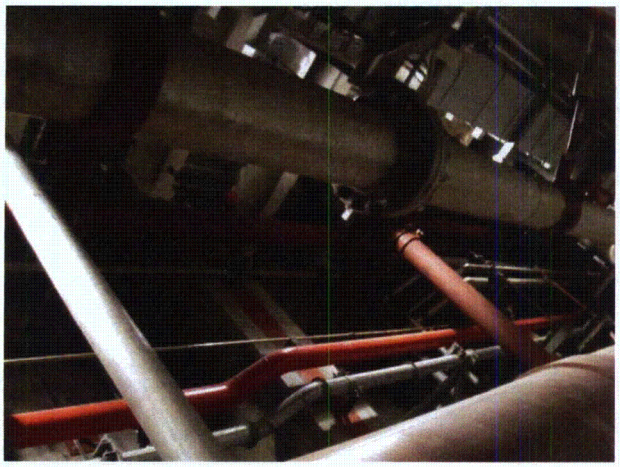


EEC001B 9-18 224

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EEG01B

Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: COMPONENT COOL WATER HEAT EXCHANGER

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2026.00 ft, 1401

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.)	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.: EEG01B

Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: COMPONENT COOL WATER HEAT EXCHANGER

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures? *Adjacent scaffolding noted to be well-braced and anchored with adequate clearance. No hazard.*	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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

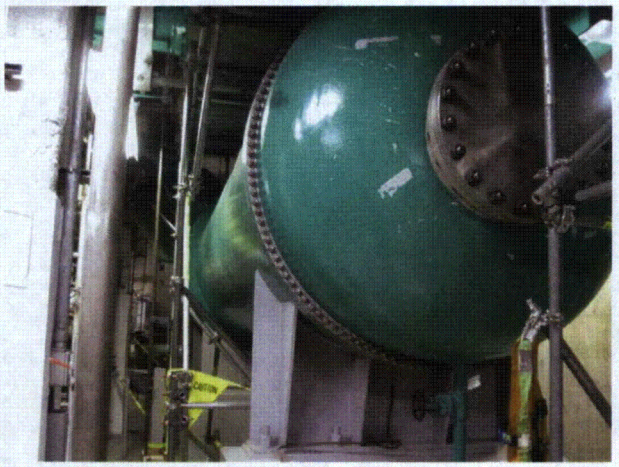
Seismic Walkdown Checklist (SWC)

Equipment ID No.: EEG01B

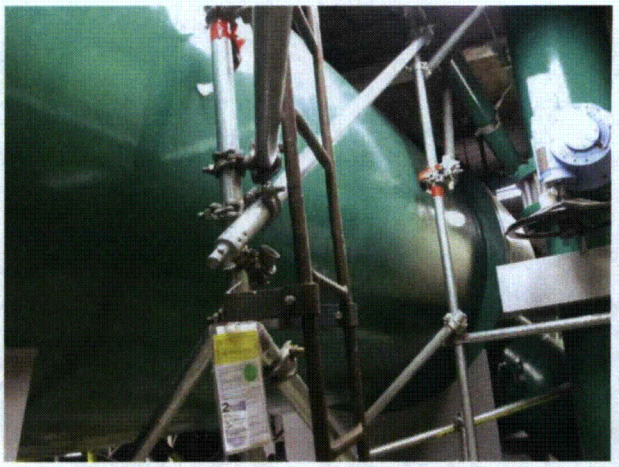
Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: COMPONENT COOL WATER HEAT EXCHANGER

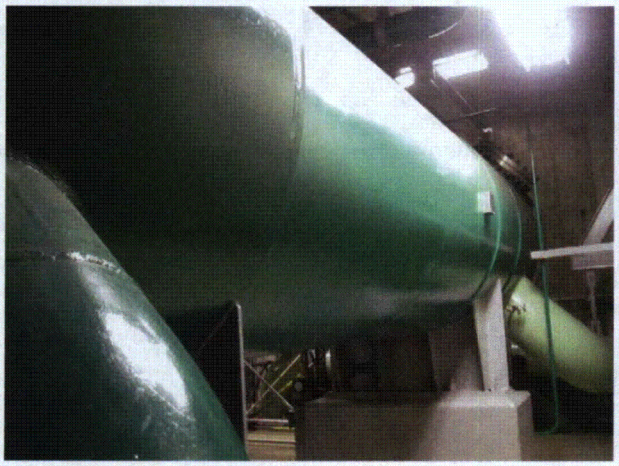
Photos



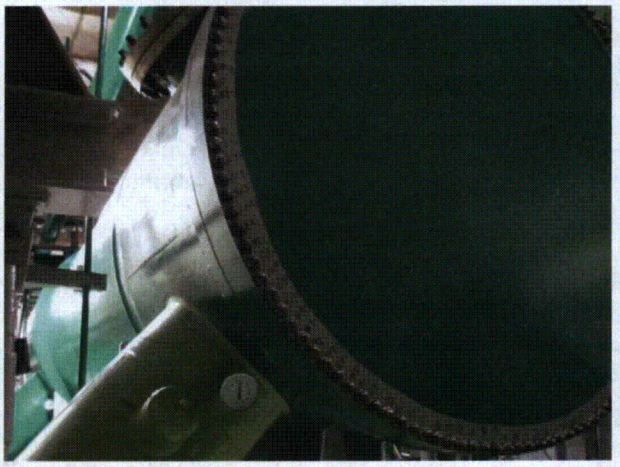
EEG01B 9-20 145



EEG01B 9-20 146



EEG01B 9-20 147



EEG01B 9-20 148

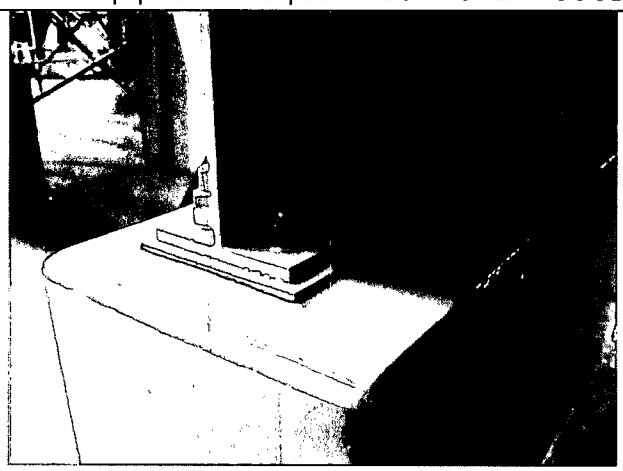
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

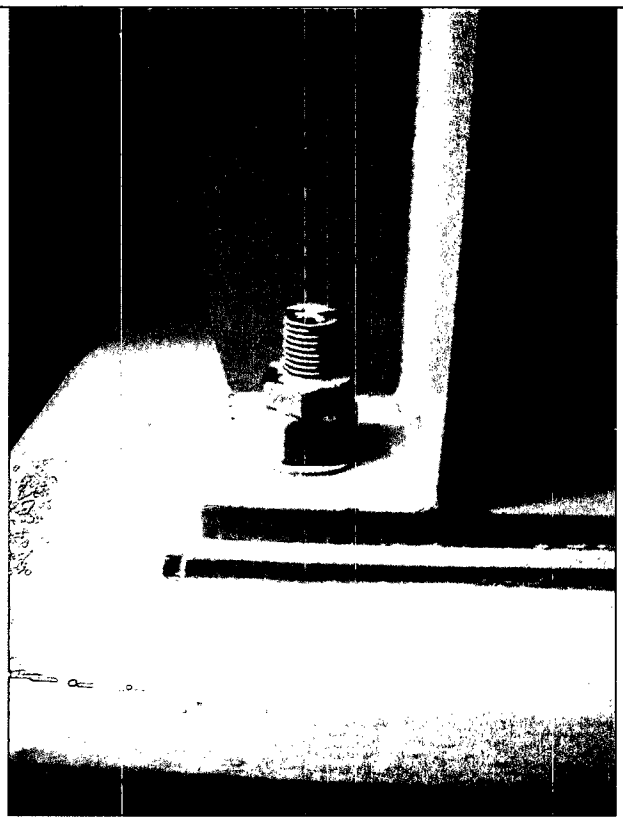
Equipment ID No.: EEG01B

Equipment Class: (21) Tanks and Heat Exchangers

Equipment Description: COMPONENT COOL WATER HEAT EXCHANGER



EEG01B 9-20 149



EEG01B 9-20 150

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EF156

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

Equipment Description: ESW CONTROL PANEL

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): ESW, 2000.00 ft, UNK

Manufacturer/Model:

Instructions for Completing Checklist

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

Anchorage

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

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EF156

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

Equipment Description: ESW CONTROL PANEL

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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

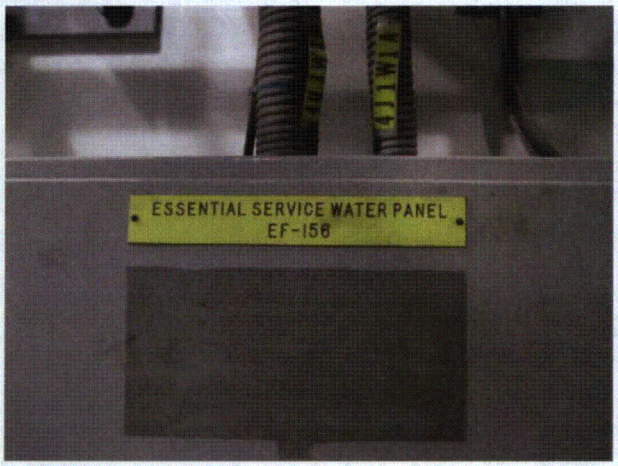
Seismic Walkdown Checklist (SWC)

Equipment ID No.: EF156

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

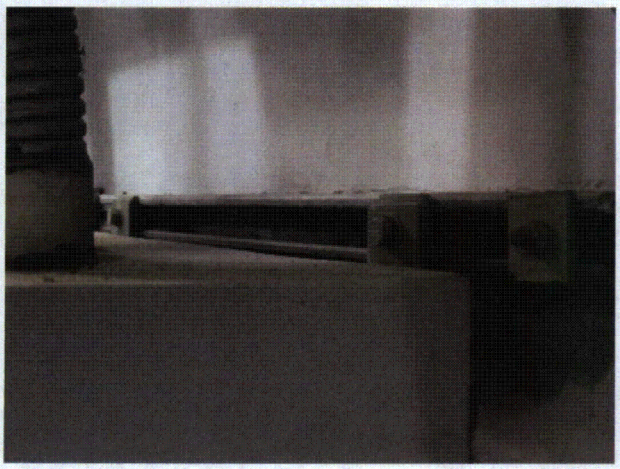
Equipment Description: ESW CONTROL PANEL

Photos



EF156 9-17 129

EF156 9-17 130



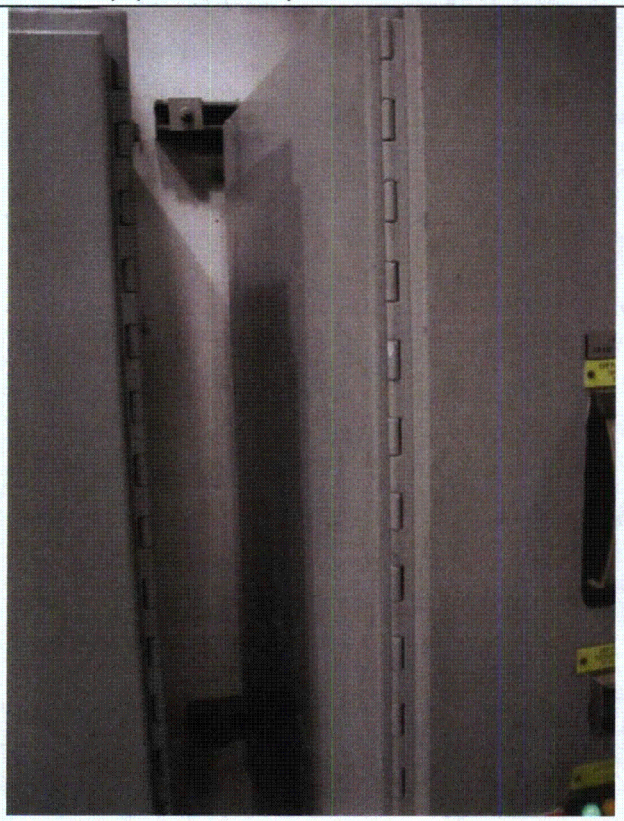
EF156 9-17 131

EF156 9-17 132

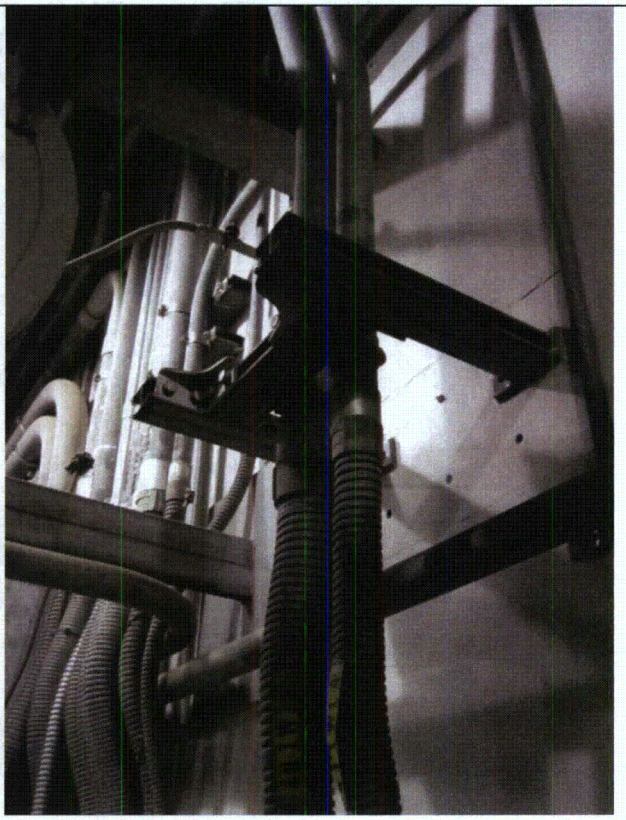
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	EF156
Equipment Class:	(20) Instrumentation and Control Panels and Cabinets
Equipment Description:	ESW CONTROL PANEL



EF156 9-17 133



EF156 9-17 134

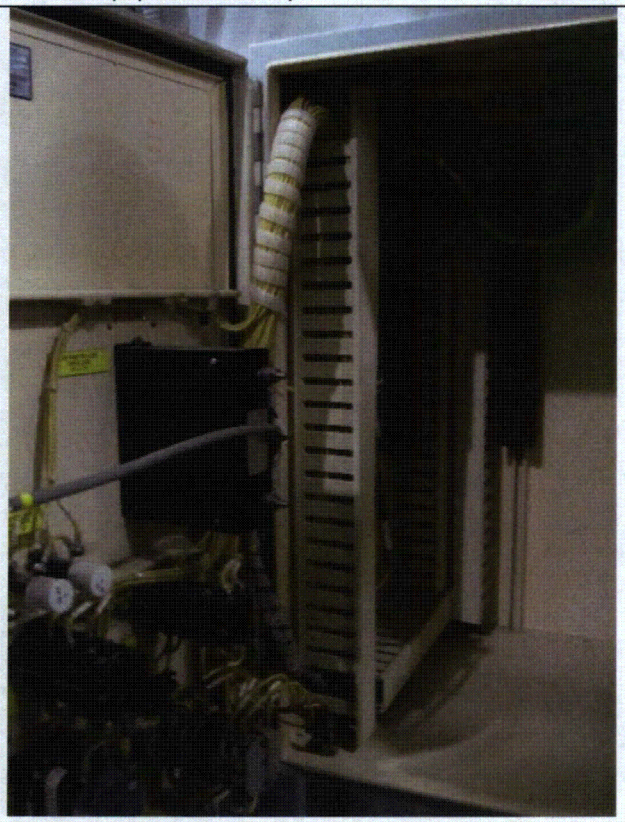
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EF156

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

Equipment Description: ESW CONTROL PANEL



EF156 9-17 135

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EFHV0024

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

Equipment Description: ESW B/SERVICE WATER CROSS CONNECT VALVE

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): CTRL, 1974.00 ft, 3101

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.: EFHV0024

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

Equipment Description: ESW B/SERVICE WATER CROSS CONNECT VALVE

Interaction Effects

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

Other Adverse Conditions

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

Comments

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	EFHV0024
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	ESW B/SERVICE WATER CROSS CONNECT VALVE

Photos

EFHV0024 9-18 001

EFHV0024 9-18 002

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EFHV0024

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

Equipment Description: ESW B/SERVICE WATER CROSS CONNECT VALVE

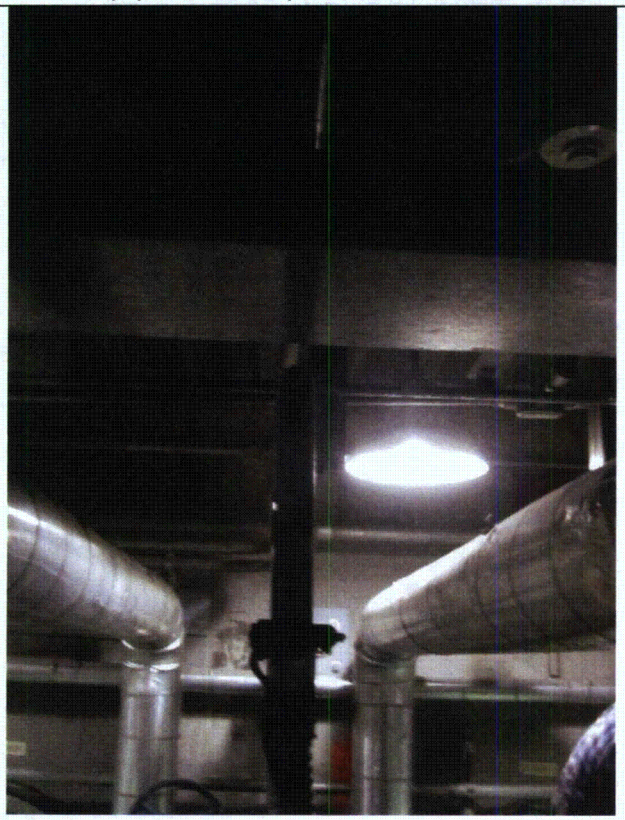
EFHV0024 9-18 003

EFHV0024 9-18 004

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	EFHV0024
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	ESW B/SERVICE WATER CROSS CONNECT VALVE



EFHV0024 9-18 005

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EFHV0040

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

Equipment Description: ESW TRAIN B TO SW CROSS CONNECT VALVE

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): CTRL, 1974.00 ft, 3101

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.: EFHV0040

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

Equipment Description: ESW TRAIN B TO SW CROSS CONNECT VALVE

Interaction Effects

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

Other Adverse Conditions

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

Comments

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

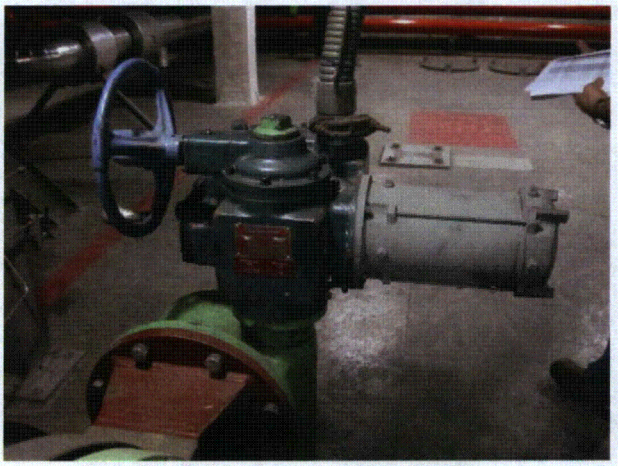
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	EFHV0040
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	ESW TRAIN B TO SW CROSS CONNECT VALVE

Photos

EFHV0040 9-18 006



EFHV0040 9-18 007

EFHV0040 9-18 008

EFHV0040 9-18 009

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EFHV0052

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

Equipment Description: ESW B TO CCW HX B

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2026.00 ft, 1401

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.: EFHV0052

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

Equipment Description: ESW B TO CCW HX B

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures? *Surrounding scaffolding noted to be well-braced and anchored with adequate clearance. No hazard.*	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

Evaluated by: Hunter Young Date: 11-15-12

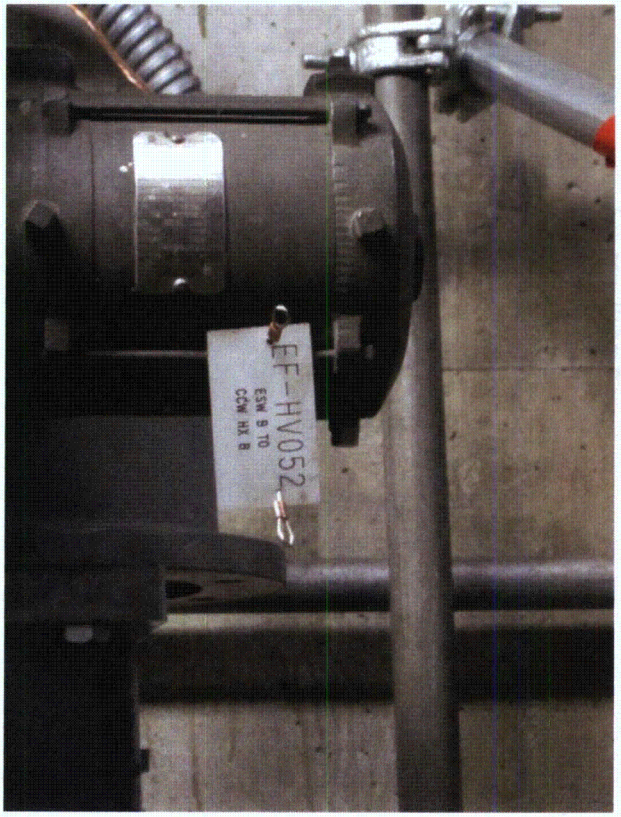
Timothy Nealon 11-15-12

Status: [Y] N U

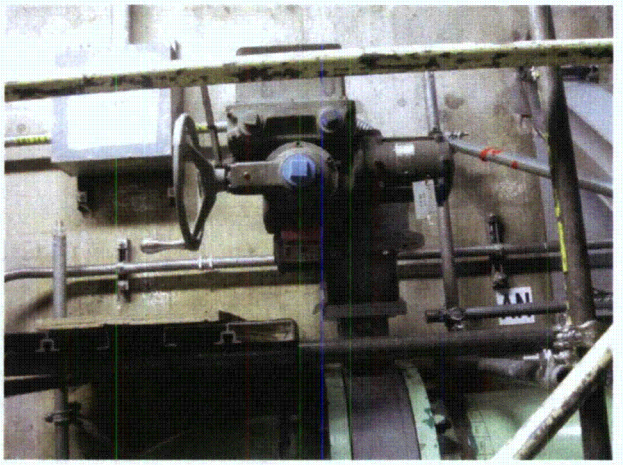
Seismic Walkdown Checklist (SWC)

Equipment ID No.:	EFHV0052
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	ESW B TO CCW HX B

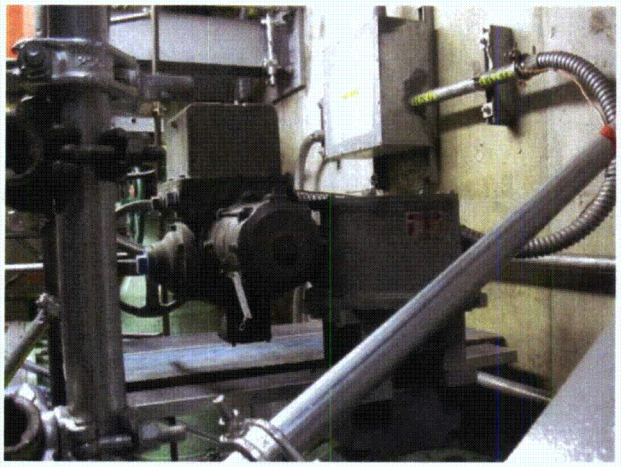
Photos



EFHV0052 9-20 158



EFHV0052 9-20 159



EFHV0052 9-20 160

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EFHV0098

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

Equipment Description: ESW PUMP B DISCHARGE RECIRC VALVE

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): ESW, -9999.00 ft, UNK

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.: EFHV0098

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

Equipment Description: ESW PUMP B DISCHARGE RECIRC VALVE

Interaction Effects

7.	Are soft targets free from impact by nearby equipment or structures? *Adjacent scaffolding noted to be well-braced and anchored with adequate clearance. No hazard.*	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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

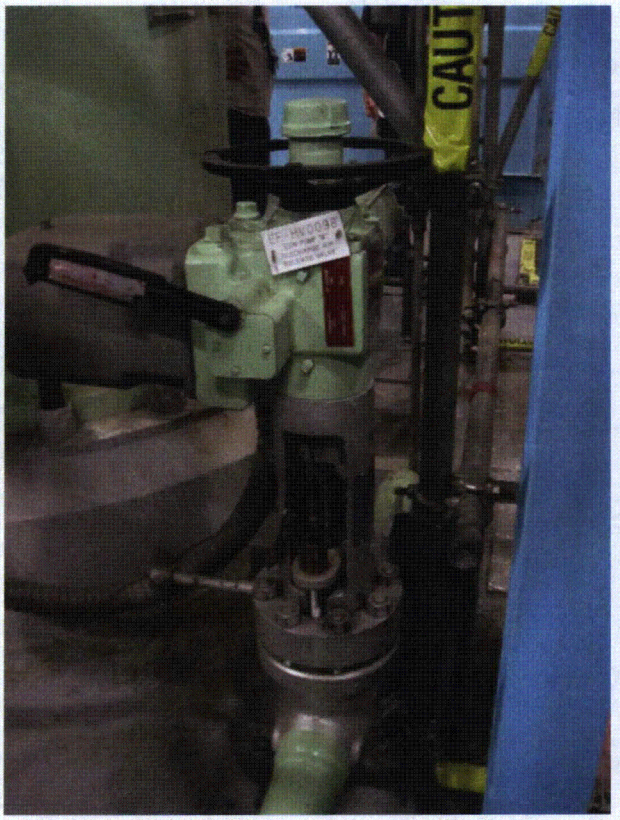
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	EFHV0098
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	ESW PUMP B DISCHARGE RECIRC VALVE

Photos

EFHV0098 9-17 136



EFHV0098 9-17 137

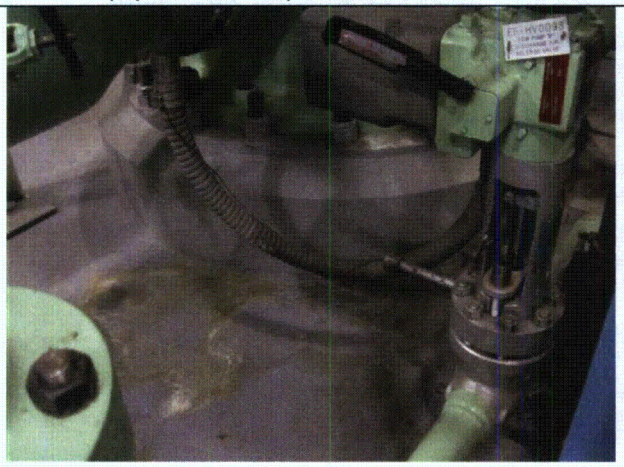
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

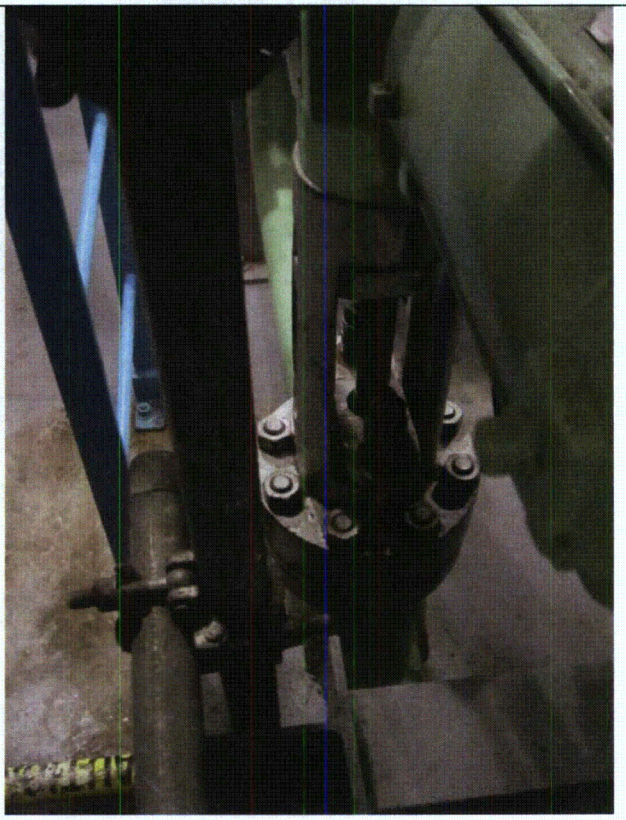
Equipment ID No.: EFHV0098

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

Equipment Description: ESW PUMP B DISCHARGE RECIRC VALVE



EFHV0098 9-17 138



EFHV0098 9-17 139

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EFHV0098

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

Equipment Description: ESW PUMP B DISCHARGE RECIRC VALVE

EFHV0098 9-17 140

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EFTE0062

Equipment Class: (19) Temperature Sensors

Equipment Description: ESW B TEMPT TO POWER BLOCK

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): CTRL, 1974.00 ft, 3101

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? *Component is integral with the parent component pipe from which it is mounted.*	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.: EFTE0062

Equipment Class: (19) Temperature Sensors

Equipment Description: ESW B TEMPT TO POWER BLOCK

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

Evaluated by: Hunter Young Date: 11-15-12

Timothy Nealon 11-15-12

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

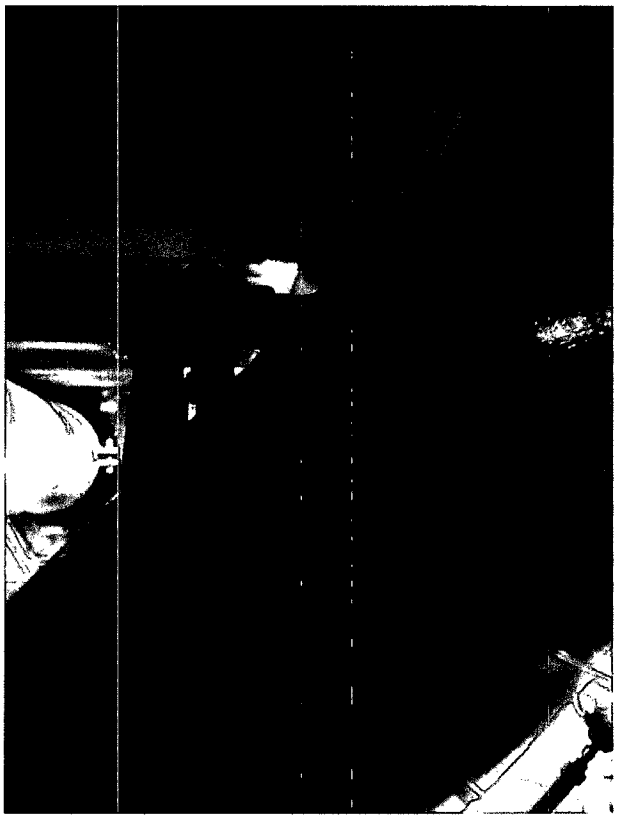
Equipment ID No.: EFTE0062

Equipment Class: (19) Temperature Sensors

Equipment Description: ESW B TEMPT TO POWER BLOCK

Photos

EFTE0062 9-18 010



EFTE0062 9-18 011

EFTE0062 9-18 012

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EGHV0016

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

Equipment Description: CCW TRAIN B RETURN ISO VALVE

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2026.00 ft, 1402

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.: EGHV0016

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

Equipment Description: CCW TRAIN B RETURN ISO VALVE

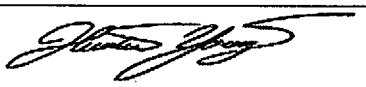
Interaction Effects

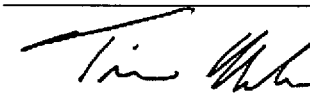
7.	Are soft targets free from impact by nearby equipment or structures? *Flexible supply conduit has approximately 1/16" clearance to pipe supports of valve. Pipe is supported in N-S direction close by and flex conduit has enough flexibility so that conduit will not be adversely affected during SSE. Therefore, there is no hazard.*	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

Evaluated by:  Hunter Young Date: 11-15-12

 Timothy Nealon 11-15-12

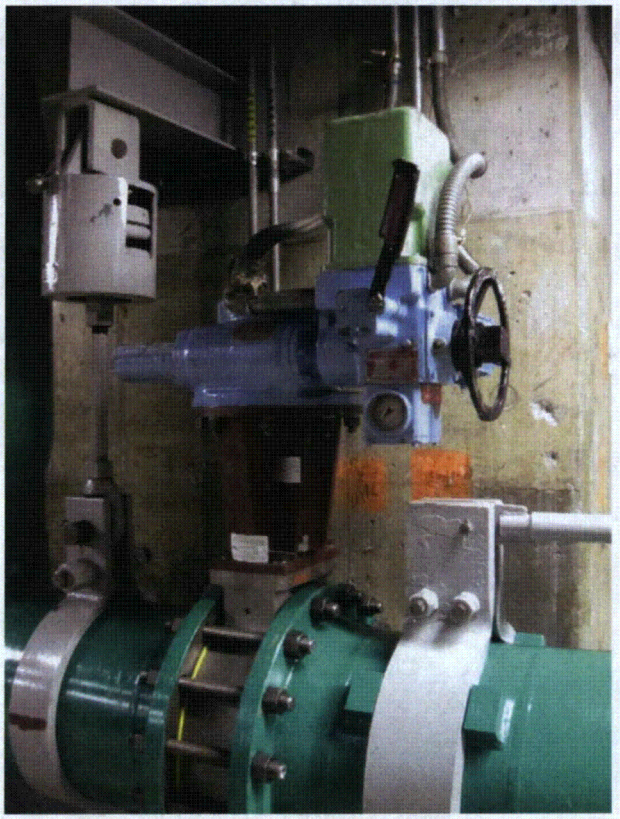
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	EGHV0016
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	CCW TRAIN B RETURN ISO VALVE

Photos

EGHV0016 9-20 116

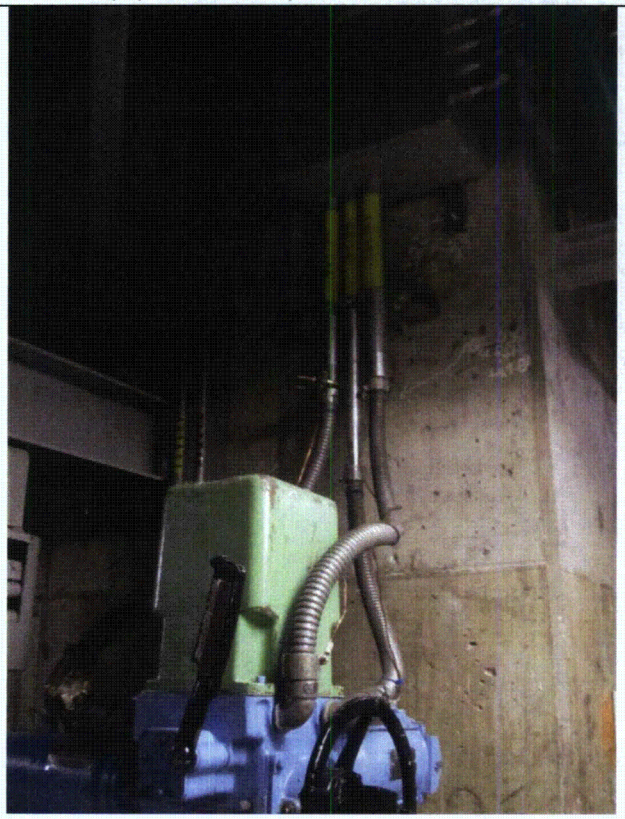


EGHV0016 9-20 117

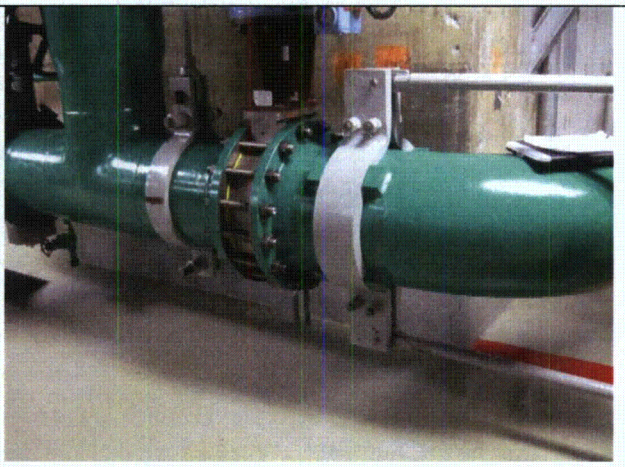
Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.:	EGHV0016
Equipment Class:	(8) Motor-Operated and Solenoid-Operated Valves
Equipment Description:	CCW TRAIN B RETURN ISO VALVE



EGHV0016 9-20 118



EGHV0016 9-20 119

Status: [Y] N U

Seismic Walkdown Checklist (SWC)

Equipment ID No.: EGHV0102

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

Equipment Description: CCW TO RHR HX B ISO

Project: WCNOC SWEL

Location (Bldg, Elev, Room/Area): AUX, 2026.00 ft, 1402

Manufacturer/Model:

Instructions for Completing Checklist

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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