NEXTera® ENERGY SEABROOK

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SBK-L-17136
Docket No. 50-443

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Seabrook Station

NextEra Energy Seabrook, LLC's Seismic High Frequency Confirmation Report for the Reevaluated Seismic Hazard Information

References:

1. NRC Letter, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," March 12, 2012, ADAMS Accession Number ML12053A340

2. EPRI 3002004396, "High Frequency Program, Application Guidance for Functional Confirmation and Fragility Evaluation," July 2015

3. NRC Letter , "Endorsement of Electric Power Research Institute Final Draft Report 3002004396, 'High Frequency Program: Application Guidance for Functional Confirmation and Fragility.'" September 17, 2015, ADAMS Accession Number ML15218A569

4. NRC Letter, "Final Determination of Licensee Seismic Probabilistic Risk Assessments Under the Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendation 2.1 "Seismic" of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident." October 27, 2015, ADAMS Accession Number ML15194A015

The NRC issued a 50.54(f) letter on March 12, 2012 [1], requesting information to assure that recommendations from the Fukushima Near-Term Task Force (NTTF) are addressed by all U.S. nuclear power plants. The 50.54(f) letter requests that licensees and holders of construction permits under 10 CFR Part 50 reevaluate the seismic hazards at their sites against present-day NRC requirements and guidance. Included in the 50.54(f) letter was a request that licensees perform a "confirmation, if necessary, that SSCs, which may be affected by high-frequency ground motion, will maintain their functions important to safety."

Subsequent guidance for performing a High Frequency Confirmation was provided by EPRI in Reference 2, and was endorsed by the NRC in Reference 3. Final screening identifying plants needing to perform a High Frequency Confirmation, including Seabrook Station, was provided by the NRC in Reference 4.

The enclosure to this letter describes the High Frequency Confirmation evaluation undertaken for Seabrook Station. The objective of this report is to provide summary information describing the High Frequency Confirmation evaluations and results. The level of detail provided in the report is intended to enable the NRC to understand the inputs used, the evaluations performed, and the decisions made as a result of the evaluations.

This letter contains no new regulatory commitments.

Should you have any questions concerning this submittal, please contact Mr. Kenneth Browne, Licensing Manager, at (603) 773-7932.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 28, 2017.

Sincerely,

NextEra Energy Seabrook, LLC

Eric McCartney
Regional Vice President – Northern Region

Enclosure

cc: D. Dorman, NRC Region I Administrator
J. Poole, NRC Project Manager, Project Directorate 1-2
P. Cataldo, NRC Senior Resident Inspector
Director, Office of Nuclear Reactor Regulation
Mr. Eric E. Bowman, NRR/JLD/PPSD/HMB

Mr. Perry Plummer
Director Homeland Security and Emergency Management
New Hampshire Department of Safety
Division of Homeland Security and Emergency Management
Bureau of Emergency Management

33 Hazen Drive
Concord, NH 03305
perry.plummer@dos.nh.gov

Mr. John Giarrusso, Jr., Nuclear Preparedness Manager
The Commonwealth of Massachusetts
Emergency Management Agency
400 Worcester Road
Framingham, MA 01702-5399
John.Giarrusso@massmail.state.ma.us

Enclosure to Letter SBK-L-17136

NextEra Energy Seabrook, LLC

Seabrook Station

Seismic High Frequency Confirmation

Executive Summary

The purpose of this report is to provide information as requested by the Nuclear Regulatory Commission (NRC) in its March 12, 2012 letter issued to all power reactor licensees and holders of construction permits in active or deferred status [1]. In particular, this report provides information requested to address the High Frequency Confirmation requirements of Item (4), Enclosure 1, Recommendation 2.1: Seismic, of the March 12, 2012 letter [1].

Following the accident at the Fukushima Dai-ichi nuclear power plant resulting from the March 11, 2011, Great Tohoku Earthquake and subsequent tsunami, the Nuclear Regulatory Commission (NRC) established a Near Term Task Force (NTTF) to conduct a systematic review of NRC processes and regulations and to determine if the agency should make additional improvements to its regulatory system. The NTTF developed a set of recommendations intended to clarify and strengthen the regulatory framework for protection against natural phenomena. Subsequently, the NRC issued a 50.54(f) letter on March 12, 2012 [1], requesting information to assure that these recommendations are addressed by all U.S. nuclear power plants. The 50.54(f) letter requests that licensees and holders of construction permits under 10 CFR Part 50 reevaluate the seismic hazards at their sites against present-day NRC requirements and guidance. Included in the 50.54(f) letter was a request that licensees perform a "confirmation, if necessary, that SSCs, which may be affected by high-frequency ground motion, will maintain their functions important to safety."

EPRI 1025287, "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic" [6] provided screening, prioritization, and implementation details to the U.S. nuclear utility industry for responding to the NRC 50.54(f) letter. This report was developed with NRC participation and was subsequently endorsed by the NRC. The SPID included guidance for determining which plants should perform a High Frequency Confirmation and identified the types of components that should be evaluated in the evaluation.

Subsequent guidance for performing a High Frequency Confirmation was provided in EPRI 3002004396, "High Frequency Program, Application Guidance for Functional Confirmation and Fragility Evaluation," [8] and was endorsed by the NRC in a letter dated September 17, 2015 [3]. Final screening identifying plants needing to perform a High Frequency Confirmation was provided by NRC in a letter dated October 27, 2015 [2].

This report describes the High Frequency Confirmation evaluation undertaken for Seabrook Station. The objective of this report is to provide summary information describing the High Frequency Confirmation evaluations and results. The level of detail provided in the report is intended to enable NRC to understand the inputs used, the evaluations performed, and the decisions made as a result of the evaluations.

EPRI 3002004396 [8] is used for the Seabrook Station engineering evaluations described in this report. In accordance with Reference [8], the following topics are addressed in the subsequent sections of this report:

- Process of selecting components and a list of specific components for high-frequency confirmation
- Estimation of a vertical ground motion response spectrum (GMRS)
- Estimation of in-cabinet seismic demand for subject components
- Estimation of in-cabinet seismic capacity for subject components
- Summary of subject components' high-frequency evaluations

1 Introduction

1.1 PURPOSE

The purpose of this report is to provide information as requested by the NRC in its March 12, 2012 50.54(f) letter issued to all power reactor licensees and holders of construction permits in active or deferred status [1]. In particular, this report provides requested information to address the High Frequency Confirmation requirements of Item (4), Enclosure 1, Recommendation 2.1: Seismic, of the March 12, 2012 letter [1].

1.2 BACKGROUND

Following the accident at the Fukushima Dai-ichi nuclear power plant resulting from the March 11, 2011, Great Tohoku Earthquake and subsequent tsunami, the Nuclear Regulatory Commission (NRC) established a Near Term Task Force (NTTF) to conduct a systematic review of NRC processes and regulations and to determine if the agency should make additional improvements to its regulatory system. The NTTF developed a set of recommendations intended to clarify and strengthen the regulatory framework for protection against natural phenomena. Subsequently, the NRC issued a 50.54(f) letter on March 12, 2012 [1], requesting information to assure that these recommendations are addressed by all U.S. nuclear power plants. The 50.54(f) letter requests that licensees and holders of construction permits under 10 CFR Part 50 reevaluate the seismic hazards at their sites against present-day NRC requirements and guidance. Included in the 50.54(f) letter was a request that licensees perform a "confirmation, if necessary, that SSCs, which may be affected by high-frequency ground motion, will maintain their functions important to safety."

EPRI 1025287, "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic" [6] provided screening, prioritization, and implementation details to the U.S. nuclear utility industry for responding to the NRC 50.54(f) letter. This report was developed with NRC participation and is endorsed by the NRC. The SPID included guidance for determining which plants should perform a High Frequency Confirmation and identified the types of components that should be evaluated in the evaluation.

Subsequent guidance for performing a High Frequency Confirmation was provided in EPRI 3002004396, "High Frequency Program, Application Guidance for Functional Confirmation and Fragility Evaluation," [8] and was endorsed by the NRC in a letter dated September 17, 2015 [3]. Final screening identifying plants needing to perform a High Frequency Confirmation was provided by NRC in a letter dated October 27, 2015 [2].

On March 27, 2014, Seabrook Station submitted a reevaluated seismic hazard to the NRC as a part of the Seismic Hazard and Screening Report [4]. By letter dated October 27, 2015 [2], the NRC transmitted the results of the screening and prioritization review of the seismic hazards reevaluation.

This report describes the High Frequency Confirmation evaluation undertaken for Seabrook Station using the methodologies in EPRI 3002004396, "High Frequency Program, Application Guidance for Functional Confirmation and Fragility Evaluation," as endorsed by the NRC in a letter dated September 17, 2015 [3].

The objective of this report is to provide summary information describing the High Frequency Confirmation evaluations and results. The level of detail provided in the report is intended to enable NRC to understand the inputs used, the evaluations performed, and the decisions made as a

result of the evaluations.

1.3 APPROACH

EPRI 3002004396 [8] is used for the Seabrook Station engineering evaluations described in this report. Section 4.1 of Reference [8] provided general steps to follow for the high frequency confirmation component evaluation. Accordingly, the following topics are addressed in the subsequent sections of this report:

- Seabrook Station's SSE and GMRS Information
- Selection of components and a list of specific components for high-frequency confirmation
- Estimation of seismic demand for subject components
- Estimation of seismic capacity for subject components
- Summary of subject components' high-frequency evaluations
- Summary of Results

1.4 PLANT SCREENING

Seabrook Station submitted reevaluated seismic hazard information including GMRS and seismic hazard information to the NRC on March 27, 2014 [4]. In a letter dated August 12, 2015, the NRC staff concluded that the submitted GMRS adequately characterizes the reevaluated seismic hazard for the Seabrook Station site [12].

The NRC final screening determination letter concluded [2] that the Seabrook Station GMRS to SSE comparison resulted in a need to perform a High Frequency Confirmation in accordance with the screening criteria in the SPID [6].

2 Selection of Components for High-Frequency Screening

The fundamental objective of the high frequency confirmation review is to determine whether the occurrence of a seismic event could cause credited equipment to fail to perform as necessary. An optimized evaluation process is applied that focuses on achieving a safe and stable plant state following a seismic event. As described in Reference [8], this state is achieved by confirming that key plant safety functions critical to immediate plant safety are preserved (reactor trip, reactor vessel inventory and pressure control, and core cooling) and that the plant operators have the necessary power available to achieve and maintain this state immediately following the seismic event (AC/DC power support systems).

Within the applicable functions, the components that would need a high frequency confirmation are contact control devices subject to intermittent states in seal-in or lockout circuits. Accordingly, the objective of the review as stated in Section 4.2.1 of Reference [8] is to determine if seismic induced high frequency relay chatter would prevent the completion of the following key functions.

The information presented in this Section along with the extensive list of references used in the selection process is provided by Reference [13].

2.1 Reactor Trip/SCRAM

The reactor trip/SCRAM function is identified as a key function in Reference [8] to be considered in the High Frequency Confirmation. The same report also states that "the design requirements preclude the application of seal-in or lockout circuits that prevent reactor trip/SCRAM functions" and that "No high-frequency review of the reactor trip/SCRAM systems is necessary."

2.2 Reactor Vessel Inventory Control

The reactor coolant system/reactor vessel inventory control systems were reviewed for contact control devices in seal-in and lockout (SILO) circuits that would create a Loss of Coolant Accident (LOCA). The focus of the review was contact control devices that could lead to a significant leak path. Check valves in series with active valves would prevent significant leaks due to mis-operation of the active valve; therefore, SILO circuit reviews were not required for those active valves.

After review of the piping systems attached to the Reactor Coolant System (RCS), all active isolation valves and any upstream or downstream active valves required to be closed are included. The following components were selected as part of the inventory selection:

Letdown Isolation Valve 1-RC-LCV-460, 1-RC-V-81
Normally-open motor-operated valve 1-RC-V-81 is controlled by hand switches only. Open limit switches in the opening circuit prevent seal-in of the opening contactor auxiliary contact and no contacts prevent valve closure via the control switch. However, this requires operator actions and meets the selections criteria. Valve 1-RC-LCV-460 will be evaluated for potentially not meeting the selection criteria.

Electrical control for the normally-open solenoid-operated pilot valves is through the pressurizer level relay LY-460-DX1 and rugged control and limit switches. No device would prevent valve closure either via the hand switch or pressurizer level relay signal. Thus, no devices meet the selection criteria.

Excess Letdown Isolation Valves 1-CS-V-175, 1-CS-V-176
Electrical control for the solenoid-operated pilot valves is via a rugged hand control switch only. There are no chatter sensitive contact devices involved in the control of these valves. Valve 1-CS-V-176 was screened out based on the results of the evaluation of 1-CS-V-175.

Reactor Head Vent Isolation Valve 1-RC-FV-2881, 1-RC-V-323
Electrical control for the solenoid-operated pilot valve, 1-RC-FV-2881, is via a rugged hand control switch only. There are no chatter sensitive contact devices involved in the control of these valves. Based on the results of the evaluation of 1-RC-FV-2881, Valve 1-RC-V-323 does not meet the selection criteria.

Reactor Cooling Pressure Operated Relief Valves 1-RC-PCV-456A, 1-RC-PCV-456B
Valve 1-RC-PCV-456A and 1-RC-PCV-456B are normally-closed solenoid operated valves and controlled by relays TY-413KX, PY-405CX, PY-455EX, PY-458BX, KA7. Chatter to these devices could spuriously energize the 42 relay and result in energizing the solenoid that would open the valve. However, because there are no SILO devices the valve will return to its original position the valves and thus do not meet the selection criteria.

2.3 Reactor Vessel Pressure Control

The reactor vessel pressure control function is identified as a key function in Reference [8] to be considered in the High Frequency Confirmation. The same report also states that "*required post event pressure control is typically provided by passive devices*" and that "no specific high frequency component chatter review is required for this function."

2.4 Core Cooling

The core cooling systems were reviewed for contact control devices in seal-in and lockout circuits that would prevent at least a single train of non-AC power driven decay heat removal from functioning.

The steam Turbine-Driven Auxiliary Feedwater (TDAFW) pump was the train chosen for this analysis. The selection of contact devices for TDAFW was based on the premise that pump operation is desired, thus any SILO which would lead to pump operation is desirable and for this reason does not meet the selection criteria. Only Contact devices which could render the TDAFW system inoperative were considered.

The piping systems attached to the Feed Water (FW) is reviewed. The throttle and isolation valves and any active second valve upstream or downstream required to maintain the flow to the steam generators are included. The following components were selected as part of the inventory selection:

Emergency Feedwater Pump Steam Supply Valves 1-MS-V-393, 1-MS-V-394, 1-MS-V-395
Initiation of the TDAFW is via the opening of main steam valves 1-MS-V-393, 1-MS-V-394, and 1-MS-V-395. These normally-closed solenoid-operated pilot valves open on the following signals; 2 out of 4 low-low indication in any steam generator, safety injection signal, loss of offsite power, or AMS (ATWS Mitigation System). Chatter in the control would only open the valve, which is desired. No vulnerable device has the potential to prevent valve opening and thus none of these valves meet the selection criteria.

Emergency Feedwater Valve 1-FW-FV-4214A/B, 1-FW-FV-4224A/B, 1-FW-FV-4234A/B, 1-FWFV-4244A/B To ensure proper flow of Auxiliary Feedwater, normally-open motor-operated discharge valves 1-FW-FV-4214A/B, 1-FW-FV-4224A/B, 1-FW-FV-4234A/B, 1-FW-FV-4244A/B were analyzed. Chatter in the opening circuit is blocked by open rugged limit and control switches. Chatter in the closing circuit could spuriously energize the motor starter to the closing position. This spurious energization could be achieved via two separate paths. The first path requires 42/C and 4214-AX contacts to chatter in unison and the second path requires only R1 contacts to chatter. Relays and contacts that could spuriously energize R1 Relay have also been evaluated. If path one or two were to energize the 42#4-AX relay this would lead to MS0-1 spuriously energizing and providing a path to energize the 42/C relay. Energizing 42/C would result in a SILO of these valves in the undesired position. These relays meet the selection criteria for the high frequency program.

Emergency Feedwater Recirc Valve 1-FW-V-346
To maintain min flow requirements to the Auxiliary Feedwater, normally-closed motor-operated valve 1-FW-V-346 was analyzed. Valve position is controlled by rugged hand and limit switches. Thus, this device does not meet the selection criteria.

2.5 AC/DC Power Support Systems

The AC and DC power support systems were reviewed for contact control devices in seal-in and lockout circuits that prevent the availability of DC and AC power sources. The following AC and DC power support systems were reviewed:

- Emergency Diesel Generators,
- Battery Chargers,
- Inverters – UPS,
- EDG Ancillary systems
- Switchgear, load centers, and MCCs

Electrical power, especially DC, is necessary to support achieving and maintaining a stable plant condition following a seismic event. DC power relies on the availability of AC power to recharge the batteries. The availability of AC power is dependent upon the Emergency Diesel Generators and their ancillary support systems. EPRI 3002004396 requires confirmation that the supply of emergency power is not challenged by a SILO device. The tripping of lockout devices or circuit breakers is expected to require some level of diagnosis to determine if the trip diagnose the fault condition could substantially delay the restoration of emergency power.

In order to ensure contact chatter cannot compromise the emergency power system, control circuits were analyzed for the Emergency Diesel Generators (EDG), Battery Chargers, Vital AC Inverters, and Switchgear/Load Centers/MCCs as necessary to distribute power from the EDGs to the Battery Chargers and EDG Ancillary Systems. General information on the arrangement of safety-related AC and DC systems, as well as operation of the EDGs, was obtained from Seabrook Station UFSAR. Seabrook Station EDGs provide emergency power for the units. Seabrook Station is a single unit plant and it has two (2) divisions of Class 1E loads with one EDG for each division.

The analysis necessary to identify contact devices in this category relies on conservative worst-case initial conditions and presumptions regarding event progression. The analysis considers the reactor is operating at power with no equipment failures or LOCA prior to the seismic event. The

Emergency Diesel Generators are not operating but are available. The seismic event is presumed to cause a Loss of Offsite Power (LOOP) and a normal reactor SCRAM.

In response to bus under-voltage relaying detecting the LOOP, the Class 1E control systems must automatically shed loads, start the EDGs, and sequentially load the diesel generators as designed. Ancillary systems required for EDG operation as well as Class 1E battery chargers and inverters must function as necessary. The goal of this analysis is to identify any vulnerable *contact devices* which could chatter during the seismic event, seal-in or lock-out, and prevent these systems from performing their intended safety-related function of supplying electrical power during the LOOP.

The following sections contain a description of the analysis for each element of the AC/DC Support Systems. Contact devices are identified by description and device ID. The selected contact devices for both divisions are presented in Attachment B.

Emergency Diesel Generators

The analysis of the Emergency Diesel Generators is broken down into the generator protective relaying and diesel engine control. General descriptions of these systems and controls appear in the UFSAR. The control and protective circuits for the diesel generator function differently depending on whether the diesel is stopped (immediately prior to starting), starting automatically in response to a loss of bus voltage (emergency start), or manually started (with offsite power available). Only two of these states are considered possible during the period of strong shaking, stopped prior to starting and automatically started. It is expected that under degraded voltage conditions the normal power feeder breakers would be tripped manually or automatically via the degraded voltage relaying (analyzed herein), and the diesel generator would start automatically on the loss of voltage on the bus. Manual starting during strong shaking (as only a precaution in cases where offsite power has not been effected) is not considered in this analysis.

Generator Protective Relaying

The control circuits for the A54 (EDG-1A) and A74 (EDG-1B) diesel generator circuit breakers include circuit breaker lockout relays. The circuit breaker lockout relays are LOR lockout relays manufactured by Electro Switch. EPRI tested LOR/ER type lockout relays and determined that these type of lockout relays are rugged with no ability to chatter. Thus, based on the tested document under EPRI 3002002997 the Electro Switch LOR lockout relays are considered rugged. However, in the event a relay becomes energized it would trip and lock out the breaker until operator actions are taken. Chatter to the below devices could energize the breaker lockout relays and meet the criteria for selection.

- 51V/A/B/C (A54)
- 51B/A/B/C (A54)
- 52S
- 51V/A/B/C (A74)
- 51B/A/B/C (A74)
- 32
- 40
- 51A/B/C (A51)
- 51A/B/C (A52)
- 51A/B/C (A71)
- 51A/B/C (A72)
- 40X

Due to anti-pump function of the breaker, the 52Y relay could prevent automatic reclosure, and for this reason, devices that could energize the 52Y device due to chatter meet the criteria for selection. Such said devices are listed below. Also, devices that could energize the trip coil while

52Y is simultaneous energized were considered to meet the criteria for selection and are listed below.

- 81Y
- 52Y
- R43R3
- RS
- 52S
- RLA
- PR1X
- K601A
- 5A

In addition, the medium voltage circuit breakers associated with the generators are vulnerable and could trip during a seismic event.

Diesel Engine Control

Chatter analysis for the diesel engine control was performed on the start and shutdown circuits of each EDG. For EDG-1A/B, chatter that could prevent the auto start or cause the EDG to shut down were determined to be meet the selection criteria and are listed below.

- 5
- Dev-TR
- 5E
- ASR
- ASA
- ASB
- CTH
- CTH-1
- EOR
- EOS
- ES1
- ES2
- 4A
- 4B
- OP2
- OP3
- OP4
- OTH
- OTH-1
- SFR
- SDR
- T2A
- T3A
- TRP

Load Shed and Sequencer

Chatter after load shedding and during normal sequencing could lead to tripping of the nuclear EDG circuit breakers. This section evaluates loads off the 4160 Bus 5E/6E that if spurious breaker closure occurred could lead to overcurrent of the EDG. Load breakers that were evaluated for this section only reviewed spurious closure of the breaker. Required loads that were evaluated for spurious breaker opening are documented in their respective sections below, cooling water and section 6.5.6 of Reference [13]. Load breakers that were evaluated in section 6.5.2 of Reference [13] include required loads A55, A63, A75, A83, AR3, AR4, AQ3, AQ4 and unrequired loads A56, A57, A58, A59, A5A, A60, A61, A62, A76, A77, A78, A79, A7A, A80, A81, A82, A90, A93, AU2, AU6, AU7, and AV4. The following devices could lead to spurious breaker closure and overloading of the EDGs and therefore meet the selection criteria for inclusion in the high frequency program.

- K644A
- LR8 (K84)
- PR1 (K7, K10)
- PR1 (K8, K10)
- K601A
- PR1 (K7)
- K616A
- 52S
- K640B
- K615B
- KA24
- EPS-PR1 (K7)
- RTB
- HR8 (K83)

- R2X (K73)
- K610B
- K610A
- K601B
- PS5X
- R4
- RTA
- K616B
- R1

EDG Ancillary Systems

In order to start and operate the Emergency Diesel Generators require a number of components and systems. For the purpose of identifying electrical contact devices, only systems and components which are electrically controlled are analyzed. Information in the UFSAR was used as appropriate for this analysis.

Starting Air

Based on Diesel Generator availability as an initial condition, the passive air reservoirs are presumed pressurized with sufficient volume to provide five successful engine starts. The only active components in this system required to operate are the air start solenoids. Seal in of devices 4A and 4B, captured in section 6.5.1 of Reference [13], could energize the solenoid operated air start valve, FY-AS1 and FY-AS2, and maintain them open. Chatter to the FY-SDS valve circuit would only have a temporary effect and does not meet the selection criteria.

Combustion Air Intake and Exhaust

The combustion air intake and exhaust for the Diesel Generators are passive systems which do not rely on electrical control.

Lube Oil

The Diesel Generators utilize engine-driven mechanical pumps and electrically controlled auxiliary pumps to supply lube oil to the engines. The engine-driven mechanical lubrication oil pumps, 1-DG-P-115A/B do not rely on electrically-powered control. Analysis of the control circuit for the prelube and auxiliary lube oil pumps, 1-DG-P-116A/B and 1-DG-P-117A/B, concluded they do not include SILO devices.

Fuel Oil

The Diesel Generator Fuel Oil System is described in the Diesel Generator DBD. The Diesel Generators utilize engine-driven mechanical pumps and electrically-powered auxiliary pumps to supply fuel oil to the engines from the day tanks. The day tanks are re-supplied using Diesel Oil Transfer Pumps 1-DG-P-38A/B from the fuel storage tanks. The fuel oil header pressure is maintained by the Auxiliary Fuel Oil Pumps 1-DG-P-118A/B. Chatter analysis of the control circuits for the electrically-powered auxiliary and transfer pumps concluded they do not include SILO devices. The Fuel Oil Pumps, 1-DG-P-119A/B, are mechanical pumps which do not rely on electrical control.

Cooling Water

The cooling water system consists of Jacket Water Cooler 1-DG-P-121A/B, the Air Coolant Pump 1-DG-P-231A/B, and Service Water (SW) 1-SW-P41A/B/C/D. Jacket water cools the engine cylinders, governor lube oil cooler, and turbochargers, while air coolant is used for the intercooler, outboard bearing, and lube oil cooler. Engine driven pumps operating in the jacket water and air coolant pump loop are credited when the engine is operating. These mechanical pumps do not rely on

electrical control. The solenoid operated flow control valves, 1-DG-V-9A/B, 1-DG-V-11A/B, 1-DG-V12-A/B, and 1-DG-V13-A/B, were analyzed in section 6.5.1 of Reference [13] along with the EDG control logics. It was concluded that the flow control valves do not have any SILO devices.

Four SW pumps, 1-SW-P41A/B/C/D, provide cooling water to the heat exchangers associated with EDG-1A/B. Following load shed, these pumps are started on generator breaker closure or a safety injection signal. Chatter analysis of the generator breaker controls is included in Section 6.5.1 of Reference [13]. The low voltage circuit breakers, AR3, AR4, AQ3, and AQ4, associated with the pumps, are vulnerable and could trip during a seismic event. Chatter in the 50/51A/C overcurrent protective relays circuit could energize the 86 circuit breaker lock out relay and prevent circuit breaker closure. Overcurrent protective relay devices meet the selection criteria. Due to anti-pump function of the SW breakers, the 52Y relay could prevent automatic reclosure and for this reason, devices that could energize the 52Y device due to chatter meet the criteria for selection. Such said devices are listed below. Moreover, devices that could energize the trip coil while 52Y is simultaneously energized were considered to meet the criteria for selection and are listed below.

- R1
- 52Y
- 94-2

To ensure proper flow supply from the Intake Structure to the DG heat exchangers, motor-operated discharge and supply valves 1-SW-V-2, 1-SW-V-16, 1-SW-V-18, 1-SW-V-22, 1-SW-V-29, 1-SW-V31, 1-SW-V44, 1-SW-V-46, 1-SW-V-63, and 1-SW-V-64, were analyzed. Chatter in the circuit is blocked by rugged limit, control, and torque switches and does not include SILO devices.

Ventilation
Ventilation for each Diesel Generator Enclosure is provided via two supply and exhaust fans, one pair for each EDG room. In automatic mode, these fans are controlled by room temperature. Chatter analysis of the control circuits for these fans and their associated dampers concluded they do not include SILO devices.

Battery Chargers

The control circuit for the battery chargers, BC-1A/B/C/D, indicates that chatter would result in closure of the breaker. Analysis of the battery charger input power control circuit DB1, DA1, D88, and DB2 determined there are no SILO devices. Circuit analysis of the battery charger output power control circuit, DM2, DN4, DP6, DQ8, reveals that chatter to 62BLL contacts would energize the Stunt Trip Coil, 72STC, and trip the breaker. There is no auto closure function built into these breakers and reclosure after tripping would require operator actions. Thus, these devices meet the selection criteria for being included in the high frequency program.

Inverters-UPS

Analysis of schematics for the UPS1-A/B/C/D breakers DR1, DN8, DP9, and DM6 revealed no vulnerable contact devices and thus chatter analysis is unnecessary.

Switchgear, Load Centers, and MCCs

Power distribution from the EDGs to the necessary electrical loads (Battery Chargers, Batteries, Inverters, Fuel Oil Pumps, Service Water Pumps, Radiator Fans, and EDG Ventilation Fans) was traced to identify any SILO devices which could lead to a circuit breaker trip and interruption in power. This effort excluded the EDG circuit breakers and the Service Water Pump circuit breakers, which are covered in separate sections, as well as component-specific contactors and their control devices, which are covered in analysis of the components.

Due to their high frequency sensitivity, the medium- and low-voltage circuit breakers in 4160V Busses and 480V Switchgear, which are supplying power to loads identified in this section, have been identified for evaluation: A55, A63, AB2, AC2, AB6, AC8, AB6, D27, D30, A75, A83, AD2, AE2, AE8, D26, D23, DN8, DD3, DP2, AB5, A94, AD5, AX8, AX9, DM0, DB7.

The only circuit breakers affected by protective relaying (not already covered) were those that distribute power from 4160 Busses to their associated 480V stepdown transformers A55, A63, A75, A83. A chatter analysis of the control circuits for these circuit breakers indicates the 86 lockout and 50/51 phase overcurrent relays could trip the circuit breaker following the seismic event.

2.6 SUMMARY OF SELECTED COMPONENTS

A list of the contact devices requiring a high frequency confirmation is provided in Attachment B.

3 Seismic Evaluation

3.1 Horizontal Seismic Demand

Per Reference [8], Sect. 4.3, the basis for calculating high-frequency seismic demand on the subject components in the horizontal direction is the Seabrook Station horizontal ground motion response spectrum (GMRS), which was generated as part of the Seabrook Station Seismic Hazard and Screening Report [4] submitted to the NRC on March 27, 2014 and accepted by the NRC on August 12, 2015 [12].

It is noted in Reference [8] that a Foundation Input Response Spectrum (FIRS) may be necessary to evaluate buildings whose foundations are supported at elevations different than the Control Point elevation. However, for sites founded on rock, per Ref. [8], "The Control Point GMRS developed for these rock sites are typically appropriate for all rock-founded structures and additional FIRS estimates are not deemed necessary for the high frequency confirmation effort." For sites founded on soil, the soil layers will shift the frequency range of seismic input towards the lower frequency range of the response spectrum by engineering judgment. Therefore, for purposes of high-frequency evaluations in this report, the GMRS is an adequate substitute for the FIRS for sites founded on soil.

The applicable buildings at Seabrook Station are founded on rock; therefore, the Control Point GMRS is representative of the input at the building foundation.

The horizontal GMRS values are provided in Table 3-1.

3.2 Vertical Seismic Demand

As described in Section 3.2 of Reference. [8], the horizontal GMRS and site soil conditions are used to calculate the vertical GMRS (VGMRS), which is the basis for calculating high-frequency seismic demand on the subject components in the vertical direction.

The Seabrook Station soil profile is defined as a rock site. The shear wave velocity is provided in Section 2.1 of Reference [4], it is estimated between 8,000 and 10,000ft/sec.

The site's soil class is determined by using the site's shear wave velocity (Vs30) and the peak ground acceleration (PGA) of the GMRS and comparing them to the values within Reference [8], Table 3-1. Based on the PGA of 0.499g and the shear wave velocity greater than 3280ft/s, the site soil class is D-Hard class.

Once a site soil class is determined, the mean vertical vs. horizontal GMRS ratios (V/H) at each frequency are determined by using the site soil class and its associated V/H values in Reference [8], Table 3-2.

The vertical GMRS is then calculated by multiplying the mean V/H ratio at each frequency by the horizontal GMRS acceleration at the corresponding frequency. It is noted that Reference [8], Table 3-2 values are constant between 0.1Hz and 15Hz.

The V/H ratios and VGMRS values are provided in Table 3-1 of this report.

Figure 3-1 below provides a plot of the horizontal GMRS, V/H ratios, and vertical GMRS for Seabrook Station.

Table 3-1: Horizontal and Vertical Ground Motions Response Spectra

Frequency (Hz)	HGMRS (g)	V/H Ratio	VGMRS (g)
0.1	0.009	0.74	0.007
0.125	0.011	0.74	0.008
0.167	0.015	0.74	0.011
0.2	0.018	0.74	0.013
0.3	0.027	0.74	0.020
0.4	0.036	0.74	0.026
0.5	0.044	0.74	0.033
0.6	0.054	0.74	0.040
0.7	0.063	0.74	0.047
0.8	0.072	0.74	0.053
0.9	0.081	0.74	0.060
1	0.089	0.74	0.066
1.25	0.118	0.74	0.087
1.5	0.147	0.74	0.109
2	0.198	0.74	0.147
2.5	0.240	0.74	0.178
3	0.291	0.74	0.215
4	0.384	0.74	0.284
5	0.469	0.74	0.347
6	0.542	0.74	0.401
7	0.609	0.74	0.451
8	0.672	0.74	0.497
9	0.730	0.74	0.540
10	0.783	0.74	0.579
12.5	0.866	0.74	0.641
15	0.927	0.74	0.686
20	1.000	0.74	0.740
25	1.040	0.74	0.770
31	1.060	0.81	0.864
35	1.060	0.87	0.922
40	1.050	0.92	0.966
45	1.020	0.97	0.989
50	0.976	0.98	0.956
60	0.853	0.99	0.844
70	0.719	0.98	0.705
80	0.611	0.93	0.568
90	0.540	0.88	0.475
100	0.499	0.85	0.424

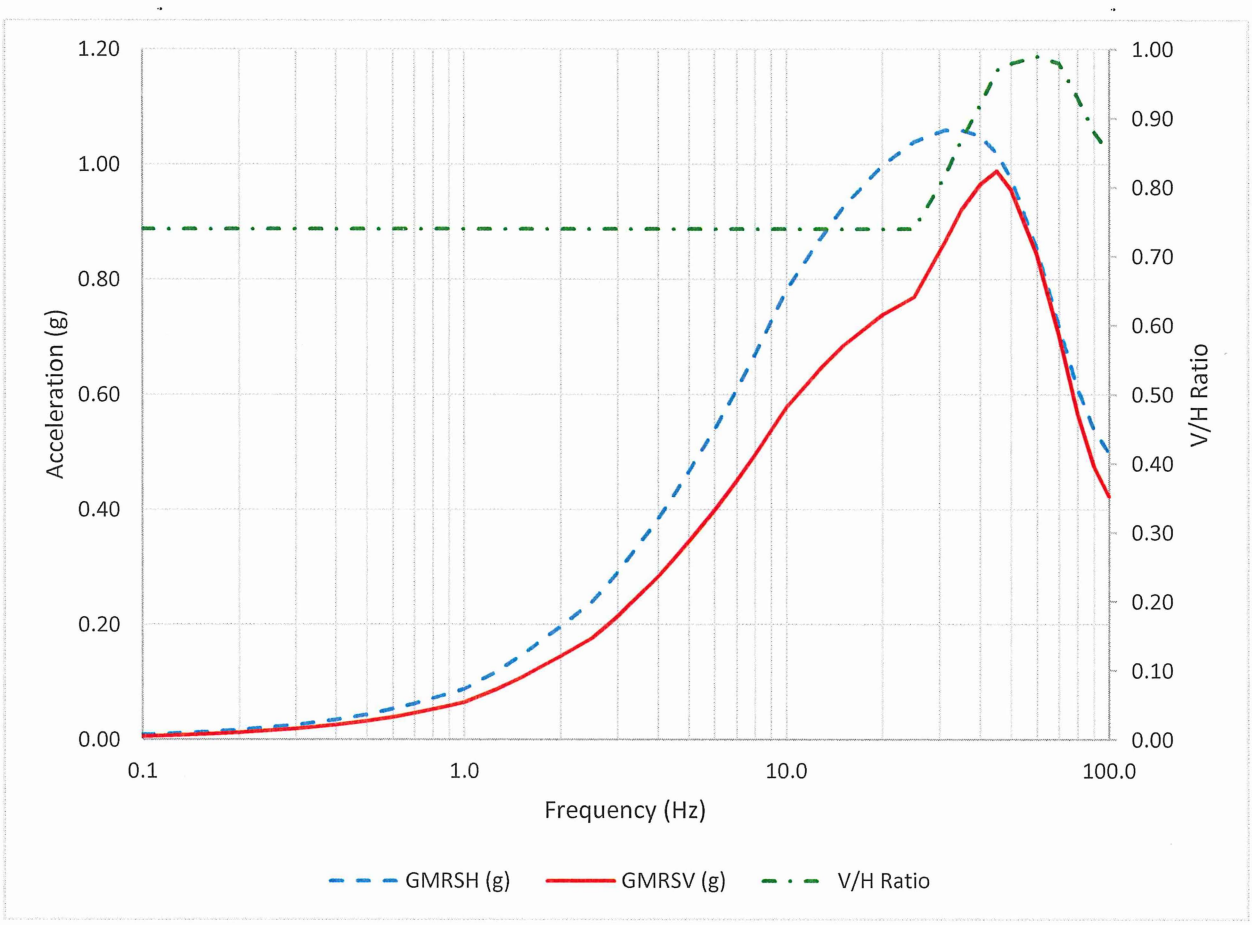

Figure 3-1 Plot of the Horizontal and Vertical Ground Motions Response Spectra and V/H Ratios

3.3 COMPONENT HORIZONTAL SEISMIC DEMAND

Per Reference [8] the peak horizontal acceleration is amplified using the following two factors to determine the horizontal in-cabinet response spectrum:

- Horizontal in-structure amplification factor AF_{SH} to account for seismic amplification at floor elevations above the host building's foundation
- Horizontal in-cabinet amplification factor AF_c to account for seismic amplification within the host equipment (cabinet, switchgear, motor control center, etc.)

The in-structure amplification factor AF_{SH} is derived from Figure 4-3 in Reference [8]. The in-cabinet amplification factor, AF_c is associated with a given type of cabinet construction. The three general cabinet types are identified in Reference [8] and Appendix I of EPRI NP-7148 [11] assuming 5% in-cabinet response spectrum damping. EPRI NP-7148 [11] classified the cabinet types as high amplification structures such as switchgear panels and other similar large flexible panels, medium amplification structures such as control panels and control room benchboard panels and low amplification structures such as motor control centers.

All of the electrical cabinets containing the components subject to high frequency confirmation (see Table B-1 in Attachment B) can be categorized into one of the in-cabinet amplification categories in Reference [8] as follows:

- Motor Control Centers are typical motor control center cabinets consisting of a lineup of several interconnected sections. Each section is a relatively narrow cabinet structure with

height-to-depth ratios of about 4.5 that allow the cabinet framing to be efficiently used in flexure for the dynamic response loading, primarily in the front-to-back direction. This results in higher frame stresses and hence more damping which lowers the cabinet response. In addition, the subject components are not located on large unstiffened panels that could exhibit high local amplifications. These cabinets qualify as low amplification cabinets.

- Switchgear cabinets are large cabinets consisting of a lineup of several interconnected sections typical of the high amplification cabinet category. Each section is a wide box-type structure with height-to-depth ratios of about 1.5 and may include wide stiffened panels. This results in lower stresses and hence less damping which increases the enclosure response. Components can be mounted on the wide panels, which results in the higher in-cabinet amplification factors.
- Control cabinets are in a lineup of several interconnected sections with moderate width. Each section consists of structures with height-to-depth ratios of about 3 which results in moderate frame stresses and damping. The response levels are mid-range between MCCs and switchgear and therefore these cabinets can be considered in the medium amplification category.

3.4 Component Vertical Seismic Demand

The component vertical demand is determined using the peak acceleration of the VGMRS between 15 Hz and 40 Hz and amplifying it using the following two factors:

- Vertical in-structure amplification factor AF_{SV} to account for seismic amplification at floor elevations above the host building's foundation
- Vertical in-cabinet amplification factor AF_c to account for seismic amplification within the host equipment (cabinet, switchgear, motor control center, etc.)

The in-structure amplification factor AF_{SV} is derived from Figure 4-4 in Reference [8]. The in-cabinet amplification factor, AF_c is derived in Reference [8] and is 4.7 for all cabinet types.

4 Contact Device Evaluations

Per Reference [8], seismic capacities (the highest seismic test level reached by the contact device without chatter or other malfunction) for each subject contact device are determined by the following procedures:

(1) If a contact device was tested as part of the EPRI High Frequency Testing program [7], then the component seismic capacity from this program is used.

(2) If a contact device was not tested as part of [7], then one or more of the following means to determine the component capacity were used:

  (a) Device-specific seismic test reports (either from the station or from the SQURTS testing program.

  (b) Generic Equipment Ruggedness Spectra (GERS) capacities per [9] and [10].

  (c) Assembly (e.g. electrical cabinet) tests where the component functional performance was monitored.

The high-frequency capacity of each device was evaluated with the component mounting point demand from Section 3 using the criteria in Section 4.5 of Reference [8]

The selected components were divided into thirty-five (35) groups as part of the high-frequency evaluation. The definitions of these groups are based on the device type and location, enclosure type, and available documentation.

- Group 1: Comprised of devices/components hosted in Wall Mounted Panel enclosures 1-MM-CP-914-A, 1-MM-CP-914-B. They are located in the Control Building at elevation 50 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Fragility level in horizontal direction.
- Group 2: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 3: Comprised of devices/components hosted in Motor Control Center enclosures 1-EDE-MCC-515, 1-EDE-MCC-615. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the GERS and the test criterion is defined as the Lowest level without chatter.
- Group 4: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-11-A, 1-EDE-SWG-11-B, 1-EDE-SWG-11-C, 1-EDE-SWG-11-D. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the High Frequency Test Program and the test criterion is defined as the Test Table Capacity.
- Group 5: Comprised of devices/components hosted in Control Panel enclosures 1-DG-CP-36, 1-DG-CP-37. They are located in the Diesel Generator Building at elevation 21.5 ft. The source for the component capacity is the GERS and the test criterion is defined as the Lowest level without chatter.
- Group 6: Comprised of devices/components hosted in Control Panel enclosures 1-DG-CP-36, 1-DG-CP-37. They are located in the Diesel Generator Building at elevation 21.5 ft. The

source for the component capacity is the GERS and the test criterion is defined as the Lowest level without chatter.

- Group 7: Comprised of devices/components hosted in Control Panel enclosures 1-DG-CP-36, 1-DG-CP-37. They are located in the Diesel Generator Building at elevation 21.5 ft. The source for the component capacity is the High Frequency Test Program and the test criterion is defined as the Fragility Threshold.
- Group 8: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the High Frequency Test Program and the test criterion is defined as the Test Table Capacity.
- Group 9: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 10: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 11: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 12: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 13: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 14: Comprised of devices/components hosted in Control Panel enclosures 1-DG-CP-75-A, 1-DG-CP-76-A. They are located in the Diesel Generator Building at elevation 21.5 ft. The source for the component vertical capacity is the GERS and the test criterion is defined as the Lowest level without chatter and the source for the horizontal capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 15: Comprised of devices/components hosted in Control Panel enclosures 1-DG-CP-36, 1-DG-CP-37. They are located in the Diesel Generator Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 16: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 17: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for

the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).

- Group 18: Comprised of devices/components hosted in Control Panel enclosure 1-DG-CP-36. They are located in the Diesel Generator Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 19: Comprised of devices/components hosted in Control Panel enclosures 1-DG-CP-36, 1-DG-CP-37, 1-DG-CP-79, 1-DG-CP-80, 1-EDE-CP-248, 1-EDE-CP-249. They are located in the Diesel Generator Building at elevation 21.5 ft. The source for the component capacity is the GERS and the test criterion is defined as the Lowest level without chatter.
- Group 20: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the GERS and the test criterion is defined as the Lowest level without chatter.
- Group 21: Comprised of devices/components hosted in Motor Control Center enclosures 1-EDE-MCC-515, 1-EDE-MCC-615. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 22: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 23: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 24: Comprised of devices/components hosted in Control Panel enclosures 1-MM-CP-12, 1-MM-CP-13. They are located in the Control Building at elevation 75 ft. The source for the component capacity is the Plant Document and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 25: Comprised of devices/components hosted in Control Panel enclosure 1-MM-CP-13. It is located in the Control Building at elevation 75 ft. The source for the component capacity is the Plant Document and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 26: Not used.
- Group 27: Comprised of devices/components hosted in Control Panel enclosures 1-DG-CP-36, 1-DG-CP-37. They are located in the Diesel Generator Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 28: Comprised of devices/components hosted in Control Panel enclosure 1-MM-CP-470. They are located in the Control Building at elevation 75 ft. The source for the component capacity is the Plant Document and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 29: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).

- Group 30: Comprised of devices/components hosted in Control Panel enclosures 1-MM-CP-297A, 1-MM-CP-297B. They are located in the Control Building at elevation 75 ft. The source for the component capacity is the Plant Document and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 31: Comprised of devices/components hosted in Control Panel enclosures 1-DG-CP-79, 1-DG-CP-80. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Document and the test criterion is defined as the Lowest level without chatter.
- Group 32: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 33: Comprised of devices/components hosted in Switchgear enclosures 1-EDE-SWG-5, 1-EDE-SWG-6. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 34: Comprised of devices/components hosted in Motor Control Center enclosures 1-EDE-MCC-515, 1-EDE-MCC-615. They are located in the Control Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).
- Group 35: Comprised of devices/components hosted in Control Panel enclosures 1-DG-CP-36, 1-DG-CP-37. They are located in the Diesel Generator Building at elevation 21.5 ft. The source for the component capacity is the Plant Seismic Qualification Report and the test criterion is defined as the Envelop of the Required Response Spectra (RRS).

A summary of the high-frequency evaluation conclusions is provided in Table B-1 in Attachment B.

5 Conclusions

5.1 General Conclusions

Seabrook Station has performed a High Frequency Confirmation evaluation in response to the NRC's 50.54(f) letter [1] using the methods in EPRI report 3002004396 [8].

The evaluation identified a total of 248 components that required evaluation. As summarized in Table B-2 in Attachment B, all of the devices have adequate seismic capacity following the criteria in Section 4.6 of Reference [8].

5.2 Identification of Follow-up Actions

As described per Section 5.1, no device requires follow up actions.

6 References

1 NRC (E. Leeds and M. Johnson) Letter to All Power Reactor Licensees et al., "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," March 12, 2012, ADAMS Accession Number ML12053A340

2 NRC (W. Dean) Letter to the Power Reactor Licensees on the Enclosed List. "Final Determination of Licensee Seismic Probabilistic Risk Assessments Under the Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendation 2.1 "Seismic" of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident." October 27, 2015, ADAMS Accession Number ML15194A015

3 NRC (J. Davis) Letter to Nuclear Energy Institute (A. Mauer). "Endorsement of Electric Power Research Institute Final Draft Report 3002004396, 'High Frequency Program: Application Guidance for Functional Confirmation and Fragility.'" September 17, 2015, ADAMS Accession Number ML15218A569

4 Seabrook Letter SBK-L-14052, "NextEra Energy Seabrook, LLC Seismic Hazard and Screening Report (CEUS Sites) Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights From the Fukushima Dai-ichi Accident", March 27, 2014, ADAMS Accession Number ML14092A413

5 EPRI 1015109. "Program on Technology Innovation: Seismic Screening of Components Sensitive to High-Frequency Vibratory Motions." October 2007

6 EPRI 1025287. "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic." February 2013

7 EPRI 3002002997. "High Frequency Program: High Frequency Testing Summary." September 2014

8 EPRI 3002004396. "High Frequency Program: Application Guidance for Functional Confirmation and Fragility Evaluation." July 2015

9 EPRI NP-7147-SL. "Seismic Ruggedness of Relays." August 1991

10 EPRI NP-7147 SQUG Advisory 2004-02. "Relay GERS Corrections." September 10, 2004

11 Procedure for Evaluating Nuclear Power Plant Relay Seismic Functionality EPRI, Palo Alto, CA:1990. NP-7148

12 NRC (F. Vega) Letter to NextEra Energy Seabrook (D. Curtland), "Seabrook Station, Unit 1 – Staff Assessment of Information Provided to Title 10 of the Code of Federal Regulations Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident (TAC NO. MF3921)", August 12, 2015, ADAMS Accession Number ML15208A049

13 Seabrook Document FP101174 (JENSEN HUGHES Report 1TCR27123-SQ-RPT-002 Revision 0), "Selection of Relays and Switches for High Frequency Seismic Evaluation and Seabrook Nuclear Station", Revision 0

14 Seabrook Document FP101172 (JENSEN HUGHES Report 1TCR27123-SQ-CAL-006 Revision 0), "NTTF Recommendation 2.1 High Frequency Confirmation", Revision 0

Attachment A

Representative Sample Component Evaluations

For additional details regarding used references and detailed methodology, please see Reference 14.

General Information	
Group Number	8
Manufacturer	ELECTROSWITCH
Model Number	LOR/ER
Enclosure ID	1-EDE-SWG-5, 1-EDE-SWG-6
Enclosure Type	Switchgear
Building	Control Building
Floor Elevation (ft)	21.5
Building Foundation Elevation (ft)	21.5
Capacity	
Test Source	High Frequency Test Program
Test Result	Test Table Capacity
Multi-Axis motion?	No
Component Capacity, $SA^*_{Horizontal}$ (g)	22.6
Component Capacity, $SA^*_{Vertical}$ (g)	22.6
Reference	EPRI 3002002997
Best Estimate of the Actual Malfunction Threshold, $SA_{T\text{-}Horizontal}$ (g)	23.225
Best Estimate of the Actual Malfunction Threshold, $SA_{T\text{-}Vertical}$ (g)	23.225
CDFM Knockdown Factor, F_K	1.110
Multi-Axis to Single-Axis Correction Factor (CDFM), F_{MS}	1.200
Effective Wide-Band Component Capacity, $TRS_{Horizontal}$ (g)	25.108
Effective Wide-Band Component Capacity, $TRS_{Vertical}$ (g)	25.108
Horizontal High Frequency Demand	
Spectral Acceleration - GMRS, SA_{GMRSH} (g)	1.060
Structural Amplification Factor in the Horizontal Direction (CDFM), AF_{SH}	1.200
Cabinet Amplification Factor in the Horizontal Direction (CDFM), AF_{cH}	7.200
In-Cabinet Response Spectra in the Horizontal Direction (CDFM), $ICRS_{cH}$ (g)	9.158
Vertical High Frequency Demand	
Vertical Spectral Acceleration - GMRS, SA_{GMRSV} (g)	0.966
Structural Amplification Factor in the Vertical Direction (CDFM), AF_{SV}	1.000
Cabinet Amplification Factor in the Vertical Direction (CDFM), AF_{cV}	4.700
In-Cabinet Response Spectra in the Vertical Direction (CDFM), $ICRS_{cV}$ (g)	4.540
Margin = Capacity / Demand	
EPRI High Frequency Horizontal Seismic Margin, $TRS_{Horizontal}$ / $ICRS_{cH}$	2.742
EPRI High Frequency Vertical Seismic Margin, $TRS_{Vertical}$ / $ICRS_{cV}$	5.530

Seabrook Station Seismic High Frequency Confirmation

General Information	
Group Number	19
Manufacturer	ITE
Model Number	J13
Enclosure ID	1-DG-CP-36, 1-DG-CP-37, 1-DG-CP-79, 1-DG-CP-80, 1-EDE-CP-248, 1-EDE-CP-249
Enclosure Type	Control Panel
Building	Diesel Generator Building
Floor Elevation (ft)	21.5
Building Foundation Elevation (ft)	21.5
Capacity	
Test Source	GERS
Test Result	Lowest level without chatter
Multi-Axis motion?	Yes
Component Capacity, $SA^*_{Horizontal}$ (g)	14.200
Component Capacity, $SA^*_{Vertical}$ (g)	14.200
Reference	SQUG Advisory 2004-02
Best Estimate of the Actual Malfunction Threshold, $SA_{T\text{-}Horizontal}$ (g)	14.200
Best Estimate of the Actual Malfunction Threshold, $SA_{T\text{-}Vertical}$ (g)	14.200
CDFM Knockdown Factor, F_K	1.500
Multi-Axis to Single-Axis Correction Factor (CDFM), F_{MS}	1.000
Effective Wide-Band Component Capacity, $TRS_{Horizontal}$ (g)	9.467
Effective Wide-Band Component Capacity, $TRS_{Vertical}$ (g)	9.467
Horizontal High Frequency Demand	
Spectral Acceleration - GMRS, SA_{GMRSH} (g)	1.060
Structural Amplification Factor in the Horizontal Direction (CDFM), AF_{SH}	1.200
Cabinet Amplification Factor in the Horizontal Direction (CDFM), AF_{cH}	4.500
In-Cabinet Response Spectra in the Horizontal Direction (CDFM), $ICRS_{cH}$ (g)	5.724
Vertical High Frequency Demand	
Vertical Spectral Acceleration - GMRS, SA_{GMRSV} (g)	0.966
Structural Amplification Factor in the Vertical Direction (CDFM), AF_{SV}	1.000
Cabinet Amplification Factor in the Vertical Direction (CDFM), AF_{cV}	4.700
In-Cabinet Response Spectra in the Vertical Direction (CDFM), $ICRS_{cV}$ (g)	4.540
Margin = Capacity / Demand	
EPRI High Frequency Horizontal Seismic Margin, $TRS_{Horizontal}$ / $ICRS_{cH}$	1.654
EPRI High Frequency Vertical Seismic Margin, $TRS_{Vertical}$ / $ICRS_{cV}$	2.085

Attachment B

Components Identified for High Frequency Confirmation

Seabrook Station Seismic High Frequency Confirmation

Table B-1: Components Identified for High Frequency Confirmation

		Component							Enclosure			Floor	Component Evaluation		
No	Unit	ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type	Bldg.	Elev. (ft)	Gr.	Basis for Capacity	Result
1	1	1-FW-FV-4224-A	42/C	42/C	Motor Starter	Core Cooling			1-EDE-MCC-515	Motor Control Center	CB	21.5	34	Plant Seismic Qualification Report	Capacity> Demand
2	1	1-FW-FV-4224-A	4224 AX	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
3	1	1-FW-FV-4224-A	4224 AX	A3Y, A3X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
4	1	1-FW-FV-4224-A	MSO-2	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
5	1	1-FW-FV-4224-A	R2A	A1X, A1Y	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
6	1	1-FW-FV-4224-A	1-FYY-4224-4	39, 41	Auxiliary Relay	Core Cooling	Westinghouse	NAS1	1-MM-CP-297A	Control Panel	CB	75	30	Plant Document	Capacity> Demand
7	1	1-FW-FV-4224-A	62-2	1, 5; 2, 6	Time Delay Relay	Core Cooling	AGASTAT	E7012AA	1-EDE-MCC-515	Motor Control Center	CB	21.5	3	GERS	Capacity> Demand
8	1	1-FW-FV-4224-A	R2	1T, 1	Auxiliary Relay	Core Cooling	ITE	J10	1-EDE-MCC-515	Motor Control Center	CB	21.5	21	Plant Seismic Qualification Report	Capacity> Demand
9	1	1-FW-FV-4224-B	42/C	42/C	Motor Starter	Core Cooling			1-EDE-MCC-615	Motor Control Center	CB	21.5	34	Plant Seismic Qualification Report	Capacity> Demand
10	1	1-FW-FV-4224-B	4224 BX	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
11	1	1-FW-FV-4224-B	4224 BX	A3Y, A3X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
12	1	1-FW-FV-4224-B	MSO-2	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
13	1	1-FW-FV-4224-B	R2B	A41, A1Y	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
14	1	1-FW-FV-4224-B	1-FYY-4224-2	39, 41	Auxiliary Relay	Core Cooling	Westinghouse	NAS1	1-MM-CP-297B	Control Panel	CB	75	30	Plant Document	Capacity> Demand
15	1	1-FW-FV-4224-B	62-2	1, 5; 2, 6	Time Delay Relay	Core Cooling	AGASTAT	E7012AA	1-EDE-MCC-615	Motor Control Center	CB	21.5	3	GERS	Capacity> Demand
16	1	1-FW-FV-4224-B	R2	1T, 1	Auxiliary Relay	Core Cooling	ITE	J10	1-EDE-MCC-615	Motor Control Center	CB	21.5	21	Plant Seismic Qualification Report	Capacity> Demand
17	1	1-FW-FV-4214-A	42/C	42/C	Motor Starter	Core Cooling			1-EDE-MCC-515	Motor Control Center	CB	21.5	34	Plant Seismic Qualification Report	Capacity> Demand
18	1	1-FW-FV-4214-A	4214 AX	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand

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No	Unit	Component							Enclosure		Bldg.	Floor Elev. (ft)	Component Evaluation		
		ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type			Gr.	Basis for Capacity	Result
19	1	1-FW-FV-4214-A	4214 AX	A3Y, A3X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
20	1	1-FW-FV-4214-A	MSO-1	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
21	1	1-FW-FV-4214-A	R2A	A4X, A4Y	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
22	1	1-FW-FV-4214-A	1-FYY-4214-2	39, 41	Auxiliary Relay	Core Cooling	Westinghouse	NAS1	1-MM-CP-297A	Control Panel	CB	75	30	Plant Document	Capacity> Demand
23	1	1-FW-FV-4214-A	62-1	1, 5; 2, 6	Time Delay Relay	Core Cooling	AGASTAT	E7012AA	1-EDE-MCC-515	Motor Control Center	CB	21.5	3	GERS	Capacity> Demand
24	1	1-FW-FV-4214-A	R1	1T, 1	Auxiliary Relay	Core Cooling	ITE	J10	1-EDE-MCC-515	Motor Control Center	CB	21.5	21	Plant Seismic Qualification Report	Capacity> Demand
25	1	1-FW-FV-4214-B	42/C	42/C	Motor Starter	Core Cooling			1-EDE-MCC-615	Motor Control Center	CB	21.5	34	Plant Seismic Qualification Report	Capacity> Demand
26	1	1-FW-FV-4214-B	4214 BX	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
27	1	1-FW-FV-4214-B	4214 BX	A3Y, A3X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
28	1	1-FW-FV-4214-B	MSO-1	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
29	1	1-FW-FV-4214-B	R1B	A4X, A4Y	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
30	1	1-FW-FV-4214-B	1-FYY-4214-4	39, 41	Auxiliary Relay	Core Cooling	Westinghouse	NAS1	1-MM-CP-297B	Control Panel	CB	75	30	Plant Document	Capacity> Demand
31	1	1-FW-FV-4214-B	62-1	1, 5; 2, 6	Time Delay Relay	Core Cooling	AGASTAT	E7012AA	1-EDE-MCC-615	Motor Control Center	CB	21.5	3	GERS	Capacity> Demand
32	1	1-FW-FV-4214-B	R1	1T, 1	Auxiliary Relay	Core Cooling	ITE	J10	1-EDE-MCC-615	Motor Control Center	CB	21.5	21	Plant Seismic Qualification Report	Capacity> Demand
33	1	1-FW-FV-4244-A	42/C	42/C	Motor Starter	Core Cooling			1-EDE-MCC-515	Motor Control Center	CB	21.5	34	Plant Seismic Qualification Report	Capacity> Demand
34	1	1-FW-FV-4244-A	4244 AX	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
35	1	1-FW-FV-4244-A	4244 AX	A3Y, A3X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
36	1	1-FW-FV-4244-A	MSO-4	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
37	1	1-FW-FV-4244-A	R4A	A1X, A1Y	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand

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No	Unit	Component							Enclosure		Bldg.	Floor Elev. (ft)	Component Evaluation		
		ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type			Gr.	Basis for Capacity	Result
38	1	1-FW-FV-4244-A	1-FYY-4244-4	39, 41	Auxiliary Relay	Core Cooling	Westinghouse	NAS1	1-MM-CP-297A	Control Panel	CB	75	30	Plant Document	Capacity> Demand
39	1	1-FW-FV-4244-A	62-4	1, 5; 2, 6	Time Delay Relay	Core Cooling	AGASTAT	E7012AA	1-EDE-MCC-515	Motor Control Center	CB	21.5	3	GERS	Capacity> Demand
40	1	1-FW-FV-4244-A	R4	1T, 1	Auxiliary Relay	Core Cooling	ITE	J10	1-EDE-MCC-515	Motor Control Center	CB	21.5	21	Plant Seismic Qualification Report	Capacity> Demand
41	1	1-FW-FV-4244-B	42/C	42/C	Motor Starter	Core Cooling			1-EDE-MCC-615	Motor Control Center	CB	21.5	34	Plant Seismic Qualification Report	Capacity> Demand
42	1	1-FW-FV-4244-B	4244 BX	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
43	1	1-FW-FV-4244-B	4244 BX	A3Y, A3X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
44	1	1-FW-FV-4244-B	MSO-4	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
45	1	1-FW-FV-4244-B	R4B	A1X, A1Y	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
46	1	1-FW-FV-4244-B	1-FYY-4244-2	39, 41	Auxiliary Relay	Core Cooling	Westinghouse	NAS1	1-MM-CP-297B	Control Panel	CB	75	30	Plant Document	Capacity> Demand
47	1	1-FW-FV-4244-B	62-4	1, 5; 2, 6	Time Delay Relay	Core Cooling	AGASTAT	E7012AA	1-EDE-MCC-615	Motor Control Center	CB	21.5	3	GERS	Capacity> Demand
48	1	1-FW-FV-4244-B	R4	1T, 1	Auxiliary Relay	Core Cooling	ITE	J10	1-EDE-MCC-615	Motor Control Center	CB	21.5	21	Plant Seismic Qualification Report	Capacity> Demand
49	1	1-FW-FV-4234-A	42/C	42/C	Motor Starter	Core Cooling			1-EDE-MCC-515	Motor Control Center	CB	21.5	34	Plant Seismic Qualification Report	Capacity> Demand
50	1	1-FW-FV-4234-A	4234 AX	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
51	1	1-FW-FV-4234-A	4234 AX	A3Y, A3X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
52	1	1-FW-FV-4234-A	MSO-3	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
53	1	1-FW-FV-4234-A	R3A	A4X, A4Y	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914A	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
54	1	1-FW-FV-4234-A	1-FYY-4234-2	39, 41	Auxiliary Relay	Core Cooling	Westinghouse	NAS1	1-MM-CP-297A	Control Panel	CB	75	30	Plant Document	Capacity> Demand
55	1	1-FW-FV-4234-A	62-3	1, 5; 2, 6	Time Delay Relay	Core Cooling	AGASTAT	E7012AA	1-EDE-MCC-515	Motor Control Center	CB	21.5	3	GERS	Capacity> Demand
56	1	1-FW-FV-4234-A	R3	1T, 1	Auxiliary Relay	Core Cooling	ITE	J10	1-EDE-MCC-515	Motor Control Center	CB	21.5	21	Plant Seismic Qualification Report	Capacity> Demand

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No	Unit	Component							Enclosure		Bldg.	Floor Elev. (ft)	Component Evaluation		
		ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type			Gr.	Basis for Capacity	Result
57	1	1-FW-FV-4234-B	42/C	42/C	Motor Starter	Core Cooling			1-EDE-MCC-615	Motor Control Center	CB	21.5	34	Plant Seismic Qualification Report	Capacity> Demand
58	1	1-FW-FV-4234-B	4234 BX	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
59	1	1-FW-FV-4234-B	4234 BX	A3Y, A3X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
60	1	1-FW-FV-4234-B	MSO-3	A2Y, A2X	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
61	1	1-FW-FV-4234-B	R3B	A4X, A4Y	Auxiliary Relay	Core Cooling	AB	700-P400A1	1-MM-CP-914B	Control Panel	CB	50	1	Plant Seismic Qualification Report	Capacity> Demand
62	1	1-FW-FV-4234-B	1-FYY-4234-4	39, 41	Auxiliary Relay	Core Cooling	Westinghouse	NAS1	1-MM-CP-297B	Control Panel	CB	75	30	Plant Document	Capacity> Demand
63	1	1-FW-FV-4234-B	62-3	1, 5; 2, 6	Time Delay Relay	Core Cooling	AGASTAT	E7012AA	1-EDE-MCC-615	Motor Control Center	CB	21.5	3	GERS	Capacity> Demand
64	1	1-FW-FV-4234-B	R3	1T, 1	Auxiliary Relay	Core Cooling	ITE	J10	1-EDE-MCC-615	Motor Control Center	CB	21.5	21	Plant Seismic Qualification Report	Capacity> Demand
65	1	A63	50/51B ϕA	50; 51; SI	Inst. & Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B811A	1-EDE-SWG-5	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
66	1	A63	50/51B ϕB	50; 51; SI	Inst. & Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B811A	1-EDE-SWG-5	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
67	1	A63	50/51B ϕC	50; 51; SI	Inst. & Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B811A	1-EDE-SWG-5	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
68	1	A54	51BϕA	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-5	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
69	1	A54	51BϕB	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-5	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
70	1	A54	51BϕC	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-5	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
71	1	A54	51VϕA	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	IJCV	1-EDE-SWG-5	Switchgear	CB	21.5	16	Plant Seismic Qualification Report	Capacity> Demand
72	1	A54	51VϕB	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	IJCV	1-EDE-SWG-5	Switchgear	CB	21.5	16	Plant Seismic Qualification Report	Capacity> Demand

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No	Unit	Component							Enclosure		Bldg.	Floor Elev. (ft)	Component Evaluation		
		ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type			Gr.	Basis for Capacity	Result
73	1	A54	51VϕC	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	IJCV	1-EDE-SWG-5	Switchgear	CB	21.5	16	Plant Seismic Qualification Report	Capacity> Demand
74	1	A54	32	32; SI	Power Directional Relay	AC/DC Power Support Systems	General Electric	ICW	1-EDE-SWG-5	Switchgear	CB	21.5	13	Plant Seismic Qualification Report	Capacity> Demand
75	1	A54	52S	63,64 (A51) ; 63, 64 (A52)	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-5	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
76	1	A54	52S	69,70 (A51), 69, 70 (A52); 79,80	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-5	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
77	1	A54	52S	71,72 (A51); 71,71 (A52)	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-5	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
78	1	A54	52Y	52Y	Circuit Breaker	AC/DC Power Support Systems	ITE	HK350	1-EDE-SWG-5	Switchgear	CB	21.5	22	Plant Seismic Qualification Report	Capacity> Demand
79	1	A54	R43R4	3T,3	Auxiliary Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-75A	Control Panel	DGB	21.5	14	GERS/Plant Seismic Qualification Report	Capacity> Demand
80	1	A54	R43R3	5T,5	Auxiliary Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-75A	Control Panel	DGB	21.5	14	GERS/Plant Seismic Qualification Report	Capacity> Demand
81	1	A54	RS	5,7	Fast Closure Relay	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-5	Switchgear	CB	21.5	32	Plant Seismic Qualification Report	Capacity> Demand
82	1	A54	RS	2,4	Fast Closure Relay	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-5	Switchgear	CB	21.5	32	Plant Seismic Qualification Report	Capacity> Demand
83	1	A54	RLA	14; 16	LOCA Seal Relay	AC/DC Power Support Systems	Electroswitch	LOR/ER	1-EDE-SWG-5	Switchgear	CB	21.5	8	High Frequency Test Program	Capacity> Demand
84	1	A54	PR1X (K74)	2,3	EPS Aux Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-79	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
85	1	A54	K601A	15,16	SI Signal Actuating Output Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-12	Control Panel	CB	75	24	Plant Document	Capacity> Demand
86	1	A54	40	40; A	Loss of Field Relay	AC/DC Power Support Systems	General Electric	CEH	1-EDE-SWG-5	Switchgear	CB	21.5	2	Plant Seismic Qualification Report	Capacity> Demand

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		Component							Enclosure			Floor	Component Evaluation		
No	Unit	ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type	Bldg.	Elev. (ft)	Gr.	Basis for Capacity	Result
87	1	A54	40X	1T,1	Aux Relay to Dev 40	AC/DC Power Support Systems	ITE	J13	1-EDE-SWG-5	Switchgear	CB	21.5	20	GERS	Capacity> Demand
88	1	A54	5A	5A	Shutdown Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-36	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
89	1	A54	81Y	9,10	Time Delay Relay	AC/DC Power Support Systems	ITE	62L	1-EDE-SWG-5	Switchgear	CB	21.5	23	Plant Seismic Qualification Report	Capacity> Demand
90	1	SW-V-31	52S	61,62	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-6	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
91	1	SW-V-29	52S	61, 62	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-6	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
92	1	SW-V-22	52S	61, 62	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-5	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
93	1	SW-V-2	52S	61, 62	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-5	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
94	1	AR4	50/51ϕA	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC66B4A	1-EDE-SWG-6	Switchgear	CB	21.5	11	Plant Seismic Qualification Report	Capacity> Demand
95	1	AR4	50/51ϕC	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC66B4A	1-EDE-SWG-6	Switchgear	CB	21.5	11	Plant Seismic Qualification Report	Capacity> Demand
96	1	AR4	52Y	52Y	Circuit Breaker	AC/DC Power Support Systems	ITE	HK350	1-EDE-SWG-6	Switchgear	CB	21.5	22	Plant Seismic Qualification Report	Capacity> Demand
97	1	AR4	94-2	2,4	Tripping Relay Bus UV	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-6	Switchgear	CB	21.5	32	Plant Seismic Qualification Report	Capacity> Demand
98	1	AR4	HR8 (K83)	6,7	EPS Starting Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-80	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
99	1	AR4	R1	5,7	Auxiliary Relay	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-6	Switchgear	CB	21.5	29	Plant Seismic Qualification Report	Capacity> Demand
100	1	A55	50/51ϕA	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B811A	1-EDE-SWG-5	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand

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		Component							Enclosure			Floor	Component Evaluation		
No	Unit	ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type	Bldg.	Elev. (ft)	Gr.	Basis for Capacity	Result
101	1	A55	50/51ϕ B	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B8 11A	1-EDE-SWG-5	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
102	1	A55	50/51ϕ C	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B8 11A	1-EDE-SWG-5	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
103	1	AQ3	50/51ϕ A	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC66B4 A	1-EDE-SWG-5	Switchgear	CB	21.5	11	Plant Seismic Qualification Report	Capacity> Demand
104	1	AQ3	50/51ϕ C	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC66B4 A	1-EDE-SWG-5	Switchgear	CB	21.5	11	Plant Seismic Qualification Report	Capacity> Demand
105	1	AQ3	52Y	52Y	Circuit Breaker	AC/DC Power Support Systems	ITE	HK350	1-EDE-SWG-5	Switchgear	CB	21.5	22	Plant Seismic Qualification Report	Capacity> Demand
106	1	AQ3	94-2	1,3	Tripping Relay Bus UV	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-5	Switchgear	CB	21.5	32	Plant Seismic Qualification Report	Capacity> Demand
107	1	AQ3	HR8 (K83)	4,5	EPS Starting Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-79	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
108	1	AQ3	R1	5,7	Auxiliary Relay	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-5	Switchgear	CB	21.5	29	Plant Seismic Qualification Report	Capacity> Demand
109	1	AQ4	50/51ϕ A	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC66B4 A	1-EDE-SWG-5	Switchgear	CB	21.5	11	Plant Seismic Qualification Report	Capacity> Demand
110	1	AQ4	50/51ϕ C	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC66B4 A	1-EDE-SWG-5	Switchgear	CB	21.5	11	Plant Seismic Qualification Report	Capacity> Demand
111	1	AQ4	52Y	52Y	Circuit Breaker	AC/DC Power Support Systems	ITE	HK350	1-EDE-SWG-5	Switchgear	CB	21.5	22	Plant Seismic Qualification Report	Capacity> Demand
112	1	AQ4	94-2	2,4	Tripping Relay Bus UV	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-5	Switchgear	CB	21.5	32	Plant Seismic Qualification Report	Capacity> Demand
113	1	AQ4	HR8 (K83)	7,6	EPS Starting Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-79	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
114	1	AQ4	R1	5,7	Auxiliary Relay	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-5	Switchgear	CB	21.5	29	Plant Seismic Qualification Report	Capacity> Demand

Seabrook Station Seismic High Frequency Confirmation

		Component							Enclosure			Floor	Component Evaluation		
No	Unit	ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type	Bldg.	Elev. (ft)	Gr.	Basis for Capacity	Result
115	1	DP6	62BLL	1,5	Timing Relay	AC/DC Power Support Systems	AGASTAT	E7012AE	1-EDE-SWG-11C	Switchgear	CB	21.5	4	High Frequency Test Program	Capacity> Demand
116	1	A74	51BϕA	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-6	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
117	1	A74	51BϕB	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-6	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
118	1	A74	51BϕC	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-6	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
119	1	A74	51VϕA	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	IJCV	1-EDE-SWG-6	Switchgear	CB	21.5	16	Plant Seismic Qualification Report	Capacity> Demand
120	1	A74	51VϕB	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	IJCV	1-EDE-SWG-6	Switchgear	CB	21.5	16	Plant Seismic Qualification Report	Capacity> Demand
121	1	A74	51VϕC	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	IJCV	1-EDE-SWG-6	Switchgear	CB	21.5	16	Plant Seismic Qualification Report	Capacity> Demand
122	1	A74	32	32; SI	Power Directional Relay	AC/DC Power Support Systems	General Electric	ICW	1-EDE-SWG-6	Switchgear	CB	21.5	13	Plant Seismic Qualification Report	Capacity> Demand
123	1	A74	52Y	52Y	Circuit Breaker	AC/DC Power Support Systems	ITE	HK350	1-EDE-SWG-6	Switchgear	CB	21.5	22	Plant Seismic Qualification Report	Capacity> Demand
124	1	A74	52S	63,64 (A71) ; 63, 64 (A72)	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-6	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
125	1	A74	52S	70,71 (A71); 70,71 (A72)	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-6	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
126	1	A74	52S	69,70 (A71), 69, 70 (A72); 79,80	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-6	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
127	1	A74	R43R4	3T,3	Auxiliary Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-76A	Control Panel	DGB	21.5	14	GERS/Plant Seismic Qualification Report	Capacity> Demand
128	1	A74	R43R3	5T,5	Auxiliary Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-76A	Control Panel	DGB	21.5	14	GERS/Plant Seismic Qualification Report	Capacity> Demand

Seabrook Station Seismic High Frequency Confirmation

No	Unit	Component							Enclosure		Bldg.	Floor Elev. (ft)	Component Evaluation		
		ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type			Gr.	Basis for Capacity	Result
129	1	A74	PR1X (K74)	2,3	EPS Aux Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-80	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
130	1	A74	RS	5,7	Fast Closure Relay	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-6	Switchgear	CB	21.5	32	Plant Seismic Qualification Report	Capacity> Demand
131	1	A74	RS	2,4	Fast Closure Relay	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-6	Switchgear	CB	21.5	32	Plant Seismic Qualification Report	Capacity> Demand
132	1	A74	RLA	14,16	LOCA Seal Relay	AC/DC Power Support Systems	Electroswitch	LOR/ER	1-EDE-SWG-6	Switchgear	CB	21.5	8	High Frequency Test Program	Capacity> Demand
133	1	A74	K601B	15,16	SI Signal Actuating Output Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-13	Control Panel	CB	75	24	Plant Document	Capacity> Demand
134	1	A74	5A	5A	Shutdown Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-37	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
135	1	A74	40	40; A	Loss of Field Relay	AC/DC Power Support Systems	General Electric	CEH	1-EDE-SWG-6	Switchgear	CB	21.5	2	Plant Seismic Qualification Report	Capacity> Demand
136	1	A74	40X	1T,1	Aux Relay to Dev 40	AC/DC Power Support Systems	ITE	J13	1-EDE-SWG-6	Switchgear	CB	21.5	20	GERS	Capacity> Demand
137	1	A74	81Y	9,10	Aux Frequency Relay	AC/DC Power Support Systems	ITE	62L	1-EDE-SWG-6	Switchgear	CB	21.5	23	Plant Seismic Qualification Report	Capacity> Demand
138	1	A75	50/51ϕ A	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B8 11A	1-EDE-SWG-6	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
139	1	A75	50/51ϕ B	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B8 11A	1-EDE-SWG-6	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
140	1	A75	50/51ϕ C	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B8 11A	1-EDE-SWG-6	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
141	1	AR3	50/51ϕ A	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC66B4 A	1-EDE-SWG-6	Switchgear	CB	21.5	11	Plant Seismic Qualification Report	Capacity> Demand
142	1	AR3	50/51ϕ C	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC66B4 A	1-EDE-SWG-6	Switchgear	CB	21.5	11	Plant Seismic Qualification Report	Capacity> Demand

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		Component							Enclosure			Floor	Component Evaluation		
No	Unit	ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type	Bldg.	Elev. (ft)	Gr.	Basis for Capacity	Result
143	1	AR3	52Y	52Y	Circuit Breaker	AC/DC Power Support Systems	ITE	HK350	1-EDE-SWG-6	Switchgear	CB	21.5	22	Plant Seismic Qualification Report	Capacity> Demand
144	1	AR3	94-2	1,3	Tripping Relay Bus UV	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-6	Switchgear	CB	21.5	32	Plant Seismic Qualification Report	Capacity> Demand
145	1	AR3	HR8 (K83)	4,5	EPS Starting Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-80	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
146	1	AR3	R1	5,7	Auxiliary Relay	AC/DC Power Support Systems	Westinghouse	AR	1-EDE-SWG-6	Switchgear	CB	21.5	29	Plant Seismic Qualification Report	Capacity> Demand
147	1	A83	50/51ϕ A	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B8 11A	1-EDE-SWG-6	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
148	1	A83	50/51ϕ B	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B8 11A	1-EDE-SWG-6	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
149	1	A83	50/51ϕ C	50; 51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC53B8 11A	1-EDE-SWG-6	Switchgear	CB	21.5	10	Plant Seismic Qualification Report	Capacity> Demand
150	1	DQ8	62BLL	1,5	Timing Relay	AC/DC Power Support Systems	AGASTAT	E7012AE	1-EDE-SWG-11D	Switchgear	CB	21.5	4	High Frequency Test Program	Capacity> Demand
151	1	DN4	62BLL	1,5	Timing Relay	AC/DC Power Support Systems	AGASTAT	E7012AE	1-EDE-SWG-11B	Switchgear	CB	21.5	4	High Frequency Test Program	Capacity> Demand
152	1	EDG-1A	5	3,5	Normal Stop Relay	AC/DC Power Support Systems	AGASTAT	E7022PE	1-DG-CP-36	Control Panel	DGB	21.5	7	High Frequency Test Program	Capacity> Demand
153	1	EDG-1A	Dev-TR	Dev-TR	Tachometer Relay	AC/DC Power Support Systems			1-DG-CP-36	Control Panel	DGB	21.5	35	Plant Seismic Qualification Report	Capacity> Demand
154	1	EDG-1A	4A	4A	Start Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
155	1	EDG-1A	4B	4B	Start Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
156	1	EDG-1A	5E	5E	Emergency Device Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-36	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand

Seabrook Station Seismic High Frequency Confirmation

		Component							Enclosure			Floor	Component Evaluation		
No	Unit	ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type	Bldg.	Elev. (ft)	Gr.	Basis for Capacity	Result
157	1	EDG-1A	ASR	ASR	Starting Air Shutoff Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-36	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
158	1	EDG-1A	ASA	ASA	Starting Air Valve Relay FY-AS1	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
159	1	EDG-1A	ASB	ASB	Starting Air Valve Relay FY-AS2	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
160	1	EDG-1A	CTH	CTH	Jacket Coolant Hight Temp Aux Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
161	1	EDG-1A	CTH-1	1T,1	Jacket Coolant Hight Temp Aux Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-36	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
162	1	EDG-1A	DGA-PS-CPS	DGA-PS-CPS	Coolant Pressure Switch	AC/DC Power Support Systems			1-DG-CP-36	Control Panel	DGB	21.5	18	Plant Seismic Qualification Report	Capacity> Demand
163	1	EDG-1A	EOR	EOR	Engine Overspeed Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-36	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
164	1	EDG-1A	EOS	EOS	Engine Overspeed Relay	AC/DC Power Support Systems			1-DG-CP-36	Control Panel	DGB	21.5	27	Plant Seismic Qualification Report	Capacity> Demand
165	1	EDG-1A	ES1	ES1	Emergency Start Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
166	1	EDG-1A	ES2	ES2	Emergency Start Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
167	1	EDG-1A	ESX	3T3; 4T,4	Emergency Start Aux Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-36	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
168	1	EDG-1A	OP2	OP2	Oil Pressure Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
169	1	EDG-1A	OP3	OP3	Oil Pressure Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
170	1	EDG-1A	OP4	OP4	Oil Pressure Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand

Seabrook Station Seismic High Frequency Confirmation

No	Unit	Component							Enclosure		Bldg.	Floor Elev. (ft)	Component Evaluation		
		ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type			Gr.	Basis for Capacity	Result
171	1	EDG-1A	OTH	OTH	Oil Temp Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
172	1	EDG-1A	OTH-1	1T,1	Oil Temp Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-36	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
173	1	EDG-1A	SFR	SFR	Starting Failure Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
174	1	EDG-1A	SDR	SDR	Shutdown Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
175	1	EDG-1A	T2A	1,5	Starting Time Relay	AC/DC Power Support Systems	AGASTAT	E7012PC	1-DG-CP-36	Control Panel	DGB	21.5	5	GERS	Capacity> Demand
176	1	EDG-1A	T2B	1,5	Starting Time Relay	AC/DC Power Support Systems	AGASTAT	E7012PC	1-DG-CP-36	Control Panel	DGB	21.5	5	GERS	Capacity> Demand
177	1	EDG-1A	T3A	1,5	Alarm Set Relay	AC/DC Power Support Systems	AGASTAT	E7014PC	1-DG-CP-36	Control Panel	DGB	21.5	6	GERS	Capacity> Demand
178	1	EDG-1A	TRP	TRP	TR Control Power Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-36	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
179	1	EDG-1B	5	3,5	Normal Stop Relay	AC/DC Power Support Systems	AGASTAT	E7022PE	1-DG-CP-37	Control Panel	DGB	21.5	7	High Frequency Test Program	Capacity> Demand
180	1	EDG-1B	Dev-TR	Dev-TR	Tachometer Relay	AC/DC Power Support Systems			1-DG-CP-37	Control Panel	DGB	21.5	35	Plant Seismic Qualification Report	Capacity> Demand
181	1	EDG-1B	4A	4A	Start Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
182	1	EDG-1B	4B	4B	Start Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
183	1	EDG-1B	5E	5E	Emergency Device Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-37	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
184	1	EDG-1B	ASR	ASR	Starting Air Shutoff Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-37	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand

Seabrook Station Seismic High Frequency Confirmation

No	Unit	Component							Enclosure		Bldg.	Floor Elev. (ft)	Component Evaluation		
		ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type			Gr.	Basis for Capacity	Result
185	1	EDG-1B	ASA	ASA	Starting Air Valve Relay FY-AS1	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
186	1	EDG-1B	ASB	ASB	Starting Air Valve Relay FY-AS2	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
187	1	EDG-1B	CTH	CTH	Jacket Coolant Hight Temp Aux Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
188	1	EDG-1B	CTH-1	1T,1	Jacket Coolant Hight Temp Aux Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-37	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
189	1	EDG-1B	DGB-PS-CPS	DGA-PS-CPS	Coolant Pressure Switch	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
190	1	EDG-1B	EOR	EOR	Engine Overspeed Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-37	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
191	1	EDG-1B	EOS	EOS	Engine Overspeed Relay	AC/DC Power Support Systems			1-DG-CP-37	Control Panel	DGB	21.5	27	Plant Seismic Qualification Report	Capacity> Demand
192	1	EDG-1B	ES1	ES1	Emergency Start Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
193	1	EDG-1B	ES2	ES1	Emergency Start Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
194	1	EDG-1B	ESX	3T3; 4T,4	Emergency Start Time Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-37	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
195	1	EDG-1B	OP2	OP1	Oil Pressure Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
196	1	EDG-1B	OP3	OP2	Oil Pressure Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
197	1	EDG-1B	OP4	OP3	Oil Pressure Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
198	1	EDG-1B	OTH	OP4	Oil Temp Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand

Seabrook Station Seismic High Frequency Confirmation

No	Unit	Component							Enclosure		Bldg.	Floor Elev. (ft)	Component Evaluation		
		ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type			Gr.	Basis for Capacity	Result
199	1	EDG-1B	OTH-1	OTH	Oil Temp Relay	AC/DC Power Support Systems	General Electric	CR-120BD	1-DG-CP-37	Control Panel	DGB	21.5	15	Plant Seismic Qualification Report	Capacity> Demand
200	1	EDG-1B	SFR	1T,1	Starting Failure Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
201	1	EDG-1B	SDR	SFR	Shutdown Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
202	1	EDG-1B	T2A	SDR	Starting Time Relay	AC/DC Power Support Systems	AGASTAT	E7012PC	1-DG-CP-37	Control Panel	DGB	21.5	5	GERS	Capacity> Demand
203	1	EDG-1B	T2B	1,5	Starting Time Relay	AC/DC Power Support Systems	AGASTAT	E7012PC	1-DG-CP-37	Control Panel	DGB	21.5	5	GERS	Capacity> Demand
204	1	EDG-1B	T3A	1,5	Alarm Set Relay	AC/DC Power Support Systems	AGASTAT	E7014PC	1-DG-CP-37	Control Panel	DGB	21.5	6	GERS	Capacity> Demand
205	1	EDG-1B	TRP	1,5	TR Control Power Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-37	Control Panel	DGB	21.5	19	GERS	Capacity> Demand
206	1	DM2	62BLL	1,5	Timing Relay	AC/DC Power Support Systems	AGASTAT	E7012AE	1-EDE-SWG-11A	Switchgear	CB	21.5	4	High Frequency Test Program	Capacity> Demand
207	1	A51	51ϕA	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-5	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
208	1	A51	51ϕB	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-5	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
209	1	A51	51ϕC	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-5	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
210	1	A52	51ϕA	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-5	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
211	1	A52	51ϕB	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-5	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
212	1	A52	51ϕC	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-5	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand

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		Component							Enclosure			Floor	Component Evaluation		
No	Unit	ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type	Bldg.	Elev. (ft)	Gr.	Basis for Capacity	Result
213	1	A71	51ϕA	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-6	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
214	1	A71	51ϕB	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-6	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
215	1	A71	51ϕC	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-6	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
216	1	A72	51ϕA	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-6	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
217	1	A72	51ϕB	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-6	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
218	1	A72	51ϕC	51; SI	Time Overcurrent Relay	AC/DC Power Support Systems	General Electric	12IAC77A803A	1-EDE-SWG-6	Switchgear	CB	21.5	12	Plant Seismic Qualification Report	Capacity> Demand
219	1	A81	K644B	13,14; 15,16	Spray Actuation Output Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-13	Control Panel	CB	75	24	Plant Document	Capacity> Demand
220	1	A81	LR8 (K84)	4,5	Emergency Power Sequencer Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-80	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
221	1	A61	K644A	13,14; 15,16	Spray Actuation Output Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-12	Control Panel	CB	75	24	Plant Document	Capacity> Demand
222	1	A61	LR8 (K84)	4,5	Emergency Power Sequencer Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-79	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
223	1	A79	PR1 (K7,K10)	5,6; 11,12	Emergency Power Sequencer Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-80	Control Panel	CB	21.5	19	GERS	Capacity> Demand
224	1	A78	PR1 (K8,K10)	9,10; 15,16	Emergency Power Sequencer Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-80	Control Panel	CB	21.5	19	GERS	Capacity> Demand
225	1	A59	PR1 (K8,K10)	5,6; 11,12	Emergency Power Sequencer Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-79	Control Panel	CB	21.5	19	GERS	Capacity> Demand
226	1	A58	PR1 (K7,K10)	9,10; 15,16	Emergency Power Sequencer Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-79	Control Panel	CB	21.5	19	GERS	Capacity> Demand

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		Component							Enclosure			Floor	Component Evaluation		
No	Unit	ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type	Bldg.	Elev. (ft)	Gr.	Basis for Capacity	Result
227	1	A57	K601A	1,2; 17,18	SI Signal Actuating Output Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-12	Control Panel	CB	75	24	Plant Document	Capacity> Demand
228	1	A57	PR1 (K7)	11,12	Emergency Power Sequencer Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-79	Control Panel	CB	21.5	19	GERS	Capacity> Demand
229	1	A62	K616A	7,8	SI Signal Actuating Output Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-12	Control Panel	CB	75	24	Plant Document	Capacity> Demand
230	1	A62	R2X (K73)	2,3	Emergency Power Sequencer Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-79	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
231	1	A76	K610B	1,2; 11, 12	SI Signal Actuating Output Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-13	Control Panel	CB	75	24	Plant Document	Capacity> Demand
232	1	A56	K610A	1,2; 11, 12	SI Signal Actuating Output Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-12	Control Panel	CB	75	24	Plant Document	Capacity> Demand
233	1	A77	K601B	1,2; 17,18	SI Signal Actuating Output Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-13	Control Panel	CB	75	24	Plant Document	Capacity> Demand
234	1	A77	PR1 (K7)	11,12	Emergency Power Sequencer Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-80	Control Panel	CB	21.5	19	GERS	Capacity> Demand
235	1	A93	PS5X	2,8	Auxiliary Relay	AC/DC Power Support Systems	General Electric	HGA	1-EDE-SWG-5	Switchgear	CB	21.5	17	Plant Seismic Qualification Report	Capacity> Demand
236	1	A93	52S	59,60	Mech Operated Switch	AC/DC Power Support Systems	ITE	N/A	1-EDE-SWG-5	Switchgear	CB	21.5	9	Plant Seismic Qualification Report	Capacity> Demand
237	1	A80	K640B	8,7; 9,10	Reactor Protector System Aux. Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4103-1	1-MM-CP-13	Control Panel	CB	75	25	Plant Document	Capacity> Demand
238	1	A80	K615B	7,8; 11,12	Reactor Protector System Aux. Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-13	Control Panel	CB	75	24	Plant Document	Capacity> Demand
239	1	A80	KA24	10,11	Isolation Relay	AC/DC Power Support Systems	Struthers-Dunn	219XBX234	1-MM-CP-470	Control Panel	CB	75	28	Plant Document	Capacity> Demand
240	1	A80	EPS-PR1 (K7)	13,14	Emergency Power Sequencer Relay	AC/DC Power Support Systems	ITE	J13	1-DG-CP-80	Control Panel	CB	21.5	19	GERS	Capacity> Demand

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		Component							Enclosure			Floor	Component Evaluation		
No	Unit	ID	Device ID	Contacts	Type	System Function	Manufacturer	Model No.	ID	Type	Bldg.	Elev. (ft)	Gr.	Basis for Capacity	Result
241	1	AU6	RTB	8T,8	Tower Actuation Signal Aux Relay	AC/DC Power Support Systems	ITE	J13	1-EDE-CP-249	Control Panel	CB	21.5	19	GERS	Capacity> Demand
242	1	AU6	HR8 (K83)	1,10	Emergency Power Sequencer Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-80	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
243	1	AU6	R4	5,7	High Speed Auxiliary Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-EDE-SWG-6	Switchgear	CB	21.5	33	Plant Seismic Qualification Report	Capacity> Demand
244	1	AU2	RTA	4T,4	Tower Actuation Signal Aux Relay	AC/DC Power Support Systems	ITE	J13	1-EDE-CP-248	Control Panel	CB	21.5	19	GERS	Capacity> Demand
245	1	AU2	HR8 (K83)	1,10	Emergency Power Sequencer Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-79	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand
246	1	AU2	R4	5,7	High Speed Auxiliary Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-EDE-SWG-5	Switchgear	CB	21.5	33	Plant Seismic Qualification Report	Capacity> Demand
247	1	A82	K616B	7,8	SI Signal Actuating Output Relay	AC/DC Power Support Systems	Potter Brumfield	MDR-4121-1	1-MM-CP-13	Control Panel	CB	75	24	Plant Document	Capacity> Demand
248	1	A82	R2X (K73)	2,3	Emergency Power Sequencer Relay	AC/DC Power Support Systems	Westinghouse /ABB	AR	1-DG-CP-80	Control Panel	CB	21.5	31	Plant Document	Capacity> Demand

Note: Bldg. = Building, Gr. = Analysis Group Number

Table B-2: Results of the analysis

Group	Building	Elev.	Enclosure Type	Manufacturer	Type/Model Number	Horizontal Seismic Margin	Vertical Seismic Margin
1	Control Building	50	Wall Mounted Panel	AB	700-P400A1	1.429	2.086
2	Control Building	21.5	Switchgear	GE	CEH	1.160	1.058
3	Control Building	21.5	Motor Control Center	AGASTAT	E7012AA	2.184	2.203
4	Control Building	21.5	Switchgear	AGASTAT	E7012AE	2.383	4.807
5	Diesel Generator Building	21.5	Control Panel	AGASTAT	E7012PC	1.456	1.835
6	Diesel Generator Building	21.5	Control Panel	AGASTAT	E7014PC	1.165	1.468
7	Diesel Generator Building	21.5	Control Panel	AGASTAT	E7022PE	1.683	2.121
8	Control Building	21.5	Switchgear	ELECTROSWITCH	LOR/ER	2.742	5.530
9	Control Building	21.5	Switchgear	ITE	Unknown	1.160	1.058
10	Control Building	21.5	Switchgear	GE	12IAC53B811A	1.160	1.058
11	Control Building	21.5	Switchgear	GE	12IAC66B4A	1.160	1.058
12	Control Building	21.5	Switchgear	GE	12IAC77A803A	1.160	1.058
13	Control Building	21.5	Switchgear	GE	ICW	1.160	1.058
14	Diesel Generator Building	21.5	Control Panel	GE	CR-120BD	1.191	1.233
15	Diesel Generator Building	21.5	Control Panel	GE	CR-120BD	2.309	2.248
16	Control Building	21.5	Switchgear	GE	IJCV	1.160	1.058
17	Control Building	21.5	Switchgear	GE	HGA	1.160	1.058
18	Diesel Generator Building	21.5	Control Panel	Unknown	Unknown	2.309	2.248
19	Diesel Generator Building	21.5	Control Panel	ITE	J13	1.654	2.085
20	Control Building	21.5	Switchgear	ITE	J13	1.240	2.502

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Group	Building	Elev.	Enclosure Type	Manufacturer	Type/Model Number	Horizontal Seismic Margin	Vertical Seismic Margin
21	Control Building	21.5	Motor Control Center	ITE	J10	3.191	2.347
22	Control Building	21.5	Switchgear	ITE	HK350	1.160	1.058
23	Control Building	21.5	Switchgear	ITE	62L	1.160	1.058
24	Control Building	75	Control Panel	POTTER BRUMFIELD	MDR-4121-1	1.235	2.169
25	Control Building	75	Control Panel	POTTER BRUMFIELD	MDR-4103-1	1.235	2.169
26	Not used.						
27	Diesel Generator Building	21.5	Control Panel	Unknown	Unknown	2.309	2.248
28	Control Building	75	Control Panel	STRUTHERS-DUNN	219XBX234	1.191	2.550
29	Control Building	21.5	Switchgear	W	AR	1.160	1.058
30	Control Building	75	Control Panel	W	NAS1	1.227	3.244
31	Control Building	21.5	Control Panel	W/ABB	AR	2.329	2.937
32	Control Building	21.5	Switchgear	WE	AR	1.160	1.058
33	Control Building	21.5	Switchgear	WEST.	AR	1.160	1.058
34	Control Building	21.5	Motor Control Center	Unknown	Unknown	3.191	2.347
35	Diesel Generator Building	21.5	Control Panel	Unknown	Unknown	2.309	2.248