

August 28, 2017 SBK-L-17136 Docket No. 50-443

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

#### Seabrook Station

#### <u>NextEra Energy Seabrook, LLC's Seismic High Frequency Confirmation Report</u> for the Reevaluated Seismic Hazard Information

#### References:

- 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
- 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."

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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 <u>28</u>, 2017.

Sincerely,

NextEra Energy Seabrook, LLC

En McCartney

Regional Vice President – Northern Region

Enclosure

cc: D. Dorman, NRC Region I Administrator
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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 A**PPROACH

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

- 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	•	4A
•	Dev-TR	٠	4B
•	5E	•	OP2
•	ASR	•	OP3
•	ASA	٠	OP4
•	ASB	٠	OTH
•	СТН	•	OTH-1
•	CTH-1	٠	SFR
•	EOR	•	SDR
•	EOS	•	T2A
•	ES1	٠	T3A
•	ES2	•	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 94-2
- 52Y

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.

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

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

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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<sub>SH</sub> to account for seismic amplification at floor elevations above the host building's foundation
- Horizontal in-cabinet amplification factor AF<sub>c</sub> 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 incabinet 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<sub>sv</sub> to account for seismic amplification at floor elevations above the host building's foundation
- Vertical in-cabinet amplification factor AF<sub>c</sub> 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* <sub>Horizontal</sub> (g)	22.6
Component Capacity, SA* <sub>Vertical</sub> (g)	22.6
Reference	EPRI 3002002997
Best Estimate of the Actual Malfunction Threshold, SA <sub>T-Horizontal</sub> (g)	23.225
Best Estimate of the Actual Malfunction Threshold, SA <sub>T-Vertical</sub> (g)	23.225
CDFM Knockdown Factor, F <sub>K</sub>	1.110
Multi-Axis to Single-Axis Correction Factor (CDFM), F <sub>MS</sub>	1.200
Effective Wide-Band Component Capacity, TRS <sub>Horizontal</sub> (g)	25.108
Effective Wide-Band Component Capacity, TRS <sub>Vertical</sub> (g)	25.108
Horizontal High Frequency Demand	
Spectral Acceleration - GMRS, SA <sub>GMRSH</sub> (g)	1.060
Structural Amplification Factor in the Horizontal Direction (CDFM), AF <sub>SH</sub>	1.200
Cabinet Amplification Factor in the Horizontal Direction (CDFM), AF <sub>cH</sub>	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 <sub>GMRSV</sub> (g)	0.966
Structural Amplification Factor in the Vertical Direction (CDFM), AF <sub>SV</sub>	1.000
Cabinet Amplification Factor in the Vertical Direction (CDFM), AF <sub>cV</sub>	4.700
In-Cabinet Response Spectra in the Vertical Direction (CDFM), ICRS <sub>cV</sub> (q)	4.540
Margin = Capacity / Demand	
EPRI High Frequency Horizontal Seismic Margin, TRS <sub>Horizontal</sub> / ICRS <sub>cH</sub>	2.742
EPRI High Frequency Vertical Seismic Margin, TRS <sub>Vertical</sub> / ICRS <sub>cV</sub>	5.530

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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* <sub>Horizontal</sub> (g)	14.200
Component Capacity, SA* <sub>Vertical</sub> (g)	14.200
Reference	SQUG Advisory 2004-02
Best Estimate of the Actual Malfunction Threshold, SA <sub>T-Horizontal</sub> (g)	14.200
Best Estimate of the Actual Malfunction Threshold, SA <sub>T-Vertical</sub> (g)	14.200
CDFM Knockdown Factor, F <sub>K</sub>	1.500
Multi-Axis to Single-Axis Correction Factor (CDFM), F <sub>MS</sub>	1.000
Effective Wide-Band Component Capacity, TRS <sub>Horizontal</sub> (g)	9.467
Effective Wide-Band Component Capacity, TRS <sub>Vertical</sub> (g)	9.467
Horizontal High Frequency Demand	
Spectral Acceleration - GMRS, SA <sub>GMRSH</sub> (g)	1.060
Structural Amplification Factor in the Horizontal Direction (CDFM), AF <sub>SH</sub>	1.200
Cabinet Amplification Factor in the Horizontal Direction (CDFM), AF <sub>cH</sub>	4.500
In-Cabinet Response Spectra in the Horizontal Direction (CDFM), ICRS $_{\rm cH}$ (g)	5.724
Vertical High Frequency Demand	
Vertical Spectral Acceleration - GMRS, SA <sub>GMRSV</sub> (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 <sub>Horizontal</sub> / ICRS <sub>cH</sub>	1.654
EPRI High Frequency Vertical Seismic Margin, TRS <sub>Vertical</sub> / ICRS <sub>cV</sub>	2.085

# Attachment B

**Components Identified for High Frequency Confirmation** 

## Table B-1: Components Identified for High Frequency Confirmation

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		Component							Enclosure			Floor		Component Evaluation	on
			Device			System						Elev.			1
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
		1-FW-								Motor					
		FV-			Motor	Core			1-EDE-MCC-	Control			1	Plant Seismic	Capacity>
1	1	4224-A	42/C	42/C	Starter	Cooling			515	Center	CB	21.5	34	Qualification Report	Demand
		1-FW-													
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
2	1	4224-A	4224 AX	A2Y, A2X	Relay	Cooling	AB	P400A1	914A	Panel	CB	50	1	Qualification Report	Demand
		1-FW-													
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
3	1	4224-A	4224 AX	A3Y, A3X	Relay	Cooling	AB	P400A1	914A	Panel	CB	50	1	Qualification Report	Demand
		1-FW-													
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
4	1	4224-A	MSO-2	A2Y, A2X	Relay	Cooling	AB	P400A1	914A	Panel	CB	50	1	Qualification Report	Demand
		1-FW-													
_		FV-			Auxiliary	Core	1.5	700-	1-MM-CP-	Control	GD	50		Plant Seismic	Capacity>
5	1	4224-A	R2A	A1X, A1Y	Relay	Cooling	AB	P400A1	914A	Panel	CB	50	1	Qualification Report	Demand
		1-FW-	4 500		A	6			1 MM CD	Cantral					Constitut
	1	FV-	1-FYY-	20.41	Auxiliary	Cooling	Westinghouse	NACI	1-MM-CP-	Control	CP	75	20	Plant Dogument	Capacity>
0	1	4224-A	4224-4	59,41	Relay	Cooling	westinghouse	INASI	297A	Matar		75	- 50		Demanu
		1-FVV-			Time Deley	Com			1 EDE MCC	Control	1				Conscitus
7	1	1224 A	62.2	1 5.2 6	Polov	Cooling	ACASTAT	E701244	515	Contor	CR	215	2	CEDS	Domand
	1	1 EW-	02-2	1, 3, 2, 0	Relay	coomig	AGASTAT	LIUIZAA	515	Motor	CD	41.5		0603	Demand
		EV-			Auviliary	Core			1-FDF-MCC-	Control				Plant Seismic	Canacitys
8	1	4224-Δ	R2	1T 1	Relay	Cooling	ITE	110	515	Center	CB	215	21	Qualification Report	Demand
		1_FW-	112	11,1	Relay	dooming		,10	515	Motor	00	<u> </u>		Quantication Report	Demana
		FV-			Motor	Core			1-FDE-MCC-	Control	1			Plant Seismic	Canacity>
9	1	4224-B	42/C	42/C	Starter	Cooling			615	Center	CB	21.5	34	Qualification Report	Demand
	-	1-FW-	12/3	12/3	Buildi	Gooling				Genter				Quantitation hopoire	
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Canacity>
10	1	4224-B	4224 BX	A2Y. A2X	Relay	Cooling	AB	P400A1	914B	Panel	СВ	50	1	Oualification Report	Demand
		1-FW-													
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
11	1	4224-B	4224 BX	A3Y, A3X	Relay	Cooling	AB	P400A1	914B	Panel	CB	50	1	Qualification Report	Demand
		1-FW-													
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
12	1	4224-B	MSO-2	A2Y, A2X	Relay	Cooling	AB	P400A1	914B	Panel	CB	50	1	Qualification Report	Demand
		1-FW-													
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
13	1	4224-B	R2B	A41, A1Y	Relay	Cooling	AB	P400A1	914B	Panel	CB	50	1	Qualification Report	Demand
		1-FW-								1					
		FV-	1-FYY-		Auxiliary	Core			1-MM-CP-	Control					Capacity>
14	1	4224-B	4224-2	39, 41	Relay	Cooling	Westinghouse	NAS1	297B	Panel	CB	75	30	Plant Document	Demand
		1-FW-								Motor					
		FV-			Time Delay	Core			1-EDE-MCC-	Control					Capacity>
15	1	4224-B	62-2	1, 5; 2, 6	Relay	Cooling	AGASTAT	E7012AA	615	Center	CB	21.5	3	GERS	Demand
		1-FW-								Motor				_	
		FV-		1	Auxiliary	Core			1-EDE-MCC-	Control				Plant Seismic	Capacity>
16	1	4224-B	RZ	TT, 1	Kelay	Cooling	ITE	J10	615	Center	CB	21.5	21	Qualification Report	Demand
		1-FW-							1 555 1462	Motor					
17	4	FV-	12/0	12/0	Motor	Cooling			I-EDE-MCC-	Control			24	Plant Seismic	Capacity>
	1	4214-A	42/6	42/0	Starter	Cooling			515	Center	L CR	21.5	34	Qualification Report	Demand
		1-FW-			A	Cana		700	1 MM CD	Control				Diant Colonsi-	Canadian
10	1	FV-   1014 A	4214 AV	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Auxiliary	Cooling	AD	700- D40041	1-MM-CP-	Lontrol	CD		-	Plant Seismic	Capacity>
10	1	4214-A	4214 AX	AZI, AZA	генау	Loonng	AD	r400A1	914A	ranei	LR	50	1	Quantication Report	Demanu

bo     Use     Device     Constant     Type     Parters     Manufacture     Hodel No.     Dp     Type     elds     (f)     Sol     Isast for Capacity     Result       1     14     414.4     AXA     AVXASX     Education     Core     14     Advast     Device     Core     14     Parts for Capacity     Device     Device <t< th=""><th></th><th colspan="7">Component</th><th></th><th colspan="2">Enclosure</th><th></th><th>Floor</th><th>1</th><th>Component Evaluati</th><th>on</th></t<>		Component								Enclosure			Floor	1	Component Evaluati	on
No.     Unit				Device			System	10				1	Elev.		anta salta Atta sata	
10     1     1.9%     Audiary     Core     AB     755     2.9M CP     Dand     G     1     Task Source     Company     Description       10     1     1.9%     Avelary     Geoling     AB     7400A1     974A     Description     Company     Compan	No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
D     PP Example     Auxiliary Example     Core Point     Path CP     Core of Core     Path CP     Core of Core     Path CP     P			1-FW-													
15     1     4/24 AS     AV     AV     Play     Costing     AB     PlayA     CB     30     1     Qualification Report     Demand       20     1     4/24 AS     AV     AV     Relay     Costing     AB     PlayA     Costing     CB     50     1     PlayA     PlayA </td <td></td> <td></td> <td>FV-</td> <td></td> <td></td> <td>Auxiliary</td> <td>Core</td> <td></td> <td>700-</td> <td>1-MM-CP-</td> <td>Control</td> <td></td> <td></td> <td></td> <td>Plant Seismic</td> <td>Capacity&gt;</td>			FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
L HP0- 20     L HV4- L HP4- L HV4- 21     L HV4- L HV4- L HV4- 22     L HV4- L HV4- L HV4- 23     L HV4- L HV4- L HV4- 24     L HV4	19	1	4214-A	4214 AX	A3Y, A3X	Relay	Cooling	AB	P400A1	914A	Panel	CB	50	1	Qualification Report	Demand
20     1     P21+A     MSD-1     APX_APX     Mailing     ABILING     PHODAL     PHODAL     PHODAL     PhoDAL     Cantrol     Cantro     Cantro			1-FW-							1 1 1 1 0 0 0						
240     1     24.1.4.     950.1     24.1.A.     Act Part of the part of th	20		FV-	NGO 1		Auxiliary	Core	4.0	700-	1-MM-CP-	Control	GD	50		Plant Seismic	Capacity>
1     1	20	1	4214-A	MSU-1	AZY, AZX	Relay	Cooling	AB	P400A1	914A	Panel	L CB	50	<u>1</u>	Qualification Report	Demand
21     1     1/214-0.     RZA     AK AAY     Bally     Coning     AB     P460A1     91A     Paulin     CB     50     1     Quilification Report     Demand       2     1     4214-4     4214-2     9.43     Relay     Cooling     Westinghouse     NAS     1.MM-CP-P     Control     CB     20     Paul Document     Demand       23     1     4214-4     4214-2     9.43     Relay     Cooling     AGSTAT     E7012AA     515     Control     Control     Control     Capacityp       23     1     4214-A     81     T.1     AGSTAT     E7012AA     515     Control     Capacityp       24     1     4214-A     81     T.1     AdsTat     E7012AA     515     Control     Paul Scientic     Capacityp       25     1     421-5     AdsTat     Cooling     FTB     100     515     Control     Paul Scientic     Capacityp       26     1     421-6     421-6     AdsTat     Advica			I-FVV-			Auviliany	Coro		700	1 MM CP	Control				Plant Soismic	Capacitus
1     1	21	1	4214-A	R2A	ΔΑΥ ΔΑΥ	Relay	Cooling	AR	P400A1	9144	Panel	CB	50	1	Qualification Report	Demand
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		1	1_FW_	124		Relay	Cooling	AD	ITTOORI	JITA	Tanci		50		Quanneación Report	Demand
1     1     4214-A     1     23-0     Fanel     CB     75     30     Plant Document     Dominal       2     1     4214-A     1-52-C     Time Delay     Core     AGASTAT     F7012AA     515-C     Control     Control     Control     CB     21.5     32     Plant Stimic     Capacity-       24     1     21.4     62-1     Audilary     Core     AGASTAT     F7012AA     515-C     Control     CB     21.5     2.1     Plant Stimic     Capacity-       24     1     21.4-A     62-1     Audilary     Core     Core     1-40-0-40-0     CB     21.5     2.1     Plant Stimic     Capacity-       25     1     421-8     42/C     42/C     Notor     Core     700-     1-40-0-40-0     Cancrol     CB     1     Qualification Report     Capacity-       26     1     421-8     421-4     A27,A2X     Relay     Core     700-     1-40-0-     Cancrol     CB     1     Qualification Report			EV-	1-FYV-		Auviliary	Core			1-MM-CP-	Control		}			Canacity
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	22	1	4214-A	4214-2	39.41	Relay	Cooling	Westinghouse	NAS1	297A	Panel	CB	75	30	Plant Document	Demand
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			1-FW-		0,,11	lionay	Gooling	in obtaining in o doo			Motor		/0			Demana
23     1     4214.4     62-1     1.5.2.6     Relay     Cooling     AGASTAT     P7012AA     515     Center     CB     21.5     3     CERS     Demand       24     1.27W.     PV.     Auxiliary     Core     1.12DE.MCC.     Control     Center     CB     2.1     21     Qualification Report     Capacity-       25     1.2W.     PV.     Auxiliary     Core     1.12DE.MCC.     Control     Center     CB     2.1     24     Qualification Report     Capacity-       26     1.42V.4     At     Auxiliary     Core     Cooling     AB     P400A1     914B     Pant. Sciencic     Capacity-     Demand       26     1.42V.4     421.6     421.4     Auxiliary     Core     700-     1.4MCCP.     Control     Control     Plant. Sciencic     Capacity-       27     1.421.48     421.44     Auxiliary     Core     700-     1.4MCCP.     Control     Core     Plant. Sciencic     Capacity-       28     1.7VV.     421.48 <td></td> <td></td> <td>FV-</td> <td></td> <td></td> <td>Time Delay</td> <td>Core</td> <td></td> <td></td> <td>1-EDE-MCC-</td> <td>Control</td> <td></td> <td></td> <td></td> <td></td> <td>Capacity&gt;</td>			FV-			Time Delay	Core			1-EDE-MCC-	Control					Capacity>
1.2%     1.2%     Auxiliary Relay     Core Cooling     ITE     1.10     515     Control Control     Plant Seisnic Control     Capacity- Control       2.1     4214.4     R1     TT.     Relay     Core Cooling     ITE     1.0     515     Control Control     2.1     Plant Seisnic     Capacity- Demand       2.1     4214.8     42/C     42/C     Ketor     Core Cooling     TTE     1.0     515     Center     CB     2.1.5     2.1     Qualification Report     Capacity- Demand       2.6     1.7W.     4214.8     4214.7     Auxiliary     Core Cooling     700-     1.3Mk CP- Panel     Control     CB     2.5     1     Plant Seismic     Capacity- Demand       2.7     1.4214.8     4214.4     X.3Y, A3X     Relay     Cooling     AB     P400A1     9148     Panel     CB     50     1     Plant Seismic     Capacity- Demand       2.7     1.4214.8     MSO-1     A2Y, A2X     Relay     Core Cooling     700-     1.3Mk CP- Panel     Control     1     Pla	23	1	4214-A	62-1	1, 5; 2, 6	Relay	Cooling	AGASTAT	E7012AA	515	Center	CB	21.5	3	GERS	Demand
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			1-FW-								Motor					
24     1     421-4.     R1     17.1     Relay     Cooling     ITE     10     515     Center     C8     21.5     21     Qualification Report     Opmand       25     1     421-8     421-6     24.7     Autor     Cooling     TEBE-MCC     Control     700-     1-RDE-MCC     Control     Plant Seismic     Capacity-       26     1     421-8     424.4     424.4     424.4     424.4     Cooling     AB     P400A1     91.4     Plant Seismic     Capacity-     Demand       26     1     421-8     421.4     421.4     421.4     421.4     Core     700-     1-MM-CP-     Control     Plant Seismic     Capacity-       27     1     421-8     421.4     A21.4     Astron     Auxiliary     Core     700-     1-MM-CP-     Control     CB     50     1     Qualification Report     Demand       28     1     421.4     MSO-1     A2Y, A2X     Relay     Cooling     AB     P400A1     91.4			FV-			Auxiliary	Core			1-EDE-MCC-	Control				Plant Seismic	Capacity>
1 1-FW- FV- 1 1-FW- 28 1-FW- 1-FW- 1-FW- PV- 1-FW- PV- 28 1-FW- 24 42/C 42/C Starter Auxiliary Cooling Core Core AB 700- 700- 700- 700- 700- 1-MH-CP 1-MH-CP- 20- 1-MH-CP Control CB CB 21.5 34 Plant Seismic Qualification Report Capacity- Demand   27 1 6214-B 4214-B A27, A2X Auxiliary Core Coling AB 700- P400A1 1-MH-CP- 914B Control Panel CB 50 1 Plant Seismic Qualification Report Capacity- Demand   27 1 6214-B 4214-B A3Y, A3X Auxiliary Cooling Core AB 700- P400A1 1-MH-CP- 914B Control Panel CB 50 1 Plant Seismic Qualification Report Capacity- Demand   28 1 4214-B M3X, A3X Auxiliary Relay Core Cooling AB 700- P400A1 1-MH-CP- 914B Control Panel CB 50 1 Plant Seismic Qualification Report Demand   29 1 4214-B M3X, A4X Auxiliary Relay Core Core 700- Core 1-MH-CP- Panel Control Panel CB 50 1 Plant Seismic Qualification Report Demand   31 1-FW- PV- 20 1-FW- PV- 20 4214-B 9,41 Rela	24	1	4214-A	R1	1T, 1	Relay	Cooling	ITE	J10	515	Center	CB	21.5	21	Qualification Report	Demand
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			1-FW-								Motor					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			FV-			Motor	Core			1-EDE-MCC-	Control				Plant Seismic	Capacity>
1.FW- PV.     FV. FV.     4214 BK     4214 BK     A2Y, A2X     Auxiliary Relay     Core Cooling AB     700- P400A1     1.MM-CP. 9148     Control Panel     CB     50     Plant Seismic Qualification Report     Capacitys- Demand       27     1 4214 BK     A2Y, A2X     Relay     Core Cooling AB     700- P400A1     1.MM-CP. 9148     Control Panel     CB     50     1     Qualification Report     Demand       27     1 4214-B     A214 BK     A3Y, A3X     Relay     Core Cooling AB     700- P400A1     1.MM-CP. 914B     Control Panel     CB     50     1     Qualification Report     Demand       28     1 4214-B     MSO-1     A2Y, A2X     Relay     Core Cooling     700- P400A1     1.MM-CP. 914B     Control     Plant Seismic     Capacitys- Penand       29     1 4214-B     R1B     A4X, A4Y     Relay     Core Cooling     700- Panel     1.MM-CP. Panel     Control     Plant Seismic     Capacitys- Panel       30     1 -FW- FV-     -     Auxiliary     Core Core     Core Core     1.MM-CP. Panel     Control     CB	25	1	4214-B	42/C	42/C	Starter	Cooling			615	Center	CB	21.5	34	Qualification Report	Demand
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			1-FW-													
26     1     4214 BX     A2Y, A2X     Relay     Cooling     AB     P400A1     914B     Panel     CB     50     1     Qualification Report     Demand       27     1     4214-BX     4214-BX     A3Y, A3X     Relay     Cooling     AB     P400A1     914B     Panel     CB     50     1     Qualification Report     Demand       27     1     4214-BX     A3Y, A3X     Relay     Cooling     AB     P400A1     914B     Panel     CB     50     1     Qualification Report     Demand       1     FW-     Auxiliary     Core     700-     1-MM-CP-     Control     Panel     CB     50     1     Qualification Report     Demand       1     FW-     Auxiliary     Core     700-     1-MM-CP-     Control     CB     50     1     Qualification Report     Demand       1     14214-B     R1B     A4X, A4X     Relay     Cooling     AB     P400A1     914B     Panel     CB     50     1<			FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	26	1	4214-B	4214 BX	A2Y, A2X	Relay	Cooling	AB	P400A1	914B	Panel	CB	50	1	Qualification Report	Demand
PV-     Auxiliary     Core     700-     1-MM-CP-     Control     Plant Seismic     Capacitys-       1     1-FW-     Auxiliary     Core     700-     1-MM-CP-     Control     1     Plant Seismic     Capacitys-       28     1     4214-8     MSO-1     A2Y, A2X     Relay     Core     700-     1-MM-CP-     Control     Control     Plant Seismic     Capacitys-       28     1     4214-8     MSO-1     A2Y, A2X     Relay     Core     700-     1-MM-CP-     Control     Plant Seismic     Capacitys-       29     1     4214-8     R1B     A4X, A4Y     Relay     Core     700-     1-MM-CP-     Control     Plant Seismic     Capacitys-       30     1     4214-8     4214-4     9.41     Relay     Cooling     AB     P400A1     914B     Panel     CB     50     1     Plant Seismic     Capacitys-       30     1     4214-8     4214-4     9.41     Relay     Cooling     AGASTAT     E7012A     615 </td <td></td> <td></td> <td>1-FW-</td> <td></td>			1-FW-													
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
28 1 4214-B MSO-1 A2Y, A2X Auxiliary Core 700- 1-MM-CP- 914B Control Panel CB 50 1 Plant Seismic Capacitys   29 1 4214-B R1B A4X, A4Y Relay Cooling AB P400A1 914B Panel CB 50 1 Plant Seismic Capacitys   29 1 4214-B R1B A4X, A4Y Relay Cooling AB P400A1 914B Panel CB 50 1 Qualification Report Capacitys   30 1 4214-B R1B A4X, A4Y Relay Cooling Westinghouse NAS1 297B Control Capacitys   30 1 4214-B 62-1 1.5; 2, 6 Relay Cooling AGSTAT F7012AA 615 Control Capacitys   31 1 4214-B 62-1 1.5; 2, 6 Relay Cooling AGSTAT F7012AA 615 Control Capacitys   2 1 FW- Auxiliary Core Core 1-EDE-MCC- Control Control Capacitys   2 1 4214-B R1 17.1 Relay<	27	1	4214-B	4214 BX	A3Y, A3X	Relay	Cooling	AB	P400A1	9148	Panel	CB	50	1	Qualification Report	Demand
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			1-FW-													
281421+3PISO-1A21, A2ARelayCoolingABP400A1914BPanelCB301Qualification ReportDemand2914214-BR1BA4X, A4YRelayCoolingABP400A1914BPanelCB501Qualification ReportDemand3014214-BR1BA4X, A4YRelayCoolingABP400A1914BPanelCB501Qualification ReportDemand3014214-B4214-439,41RelayCoolingABP400A1914BPanelCB501Qualification ReportDemand3014214-B4214-44214-439,41RelayCoolingAGASTATE7012AA615CenterCB7530Plant DocumentDemand41-FW-FV-Time DelayCoreCoreCoreControlControlControlControlCapacity>3114214-B62-11, 5; 2, 6RelayCoolingAGASTATE7012AA615CenterCB21.53GERSDemand3214214-B62-11, 5; 2, 6RelayCoolingITE10615CenterCB21.521Qualification ReportDemand331424-A42/4A42/4AAuxiliaryCoreTE1-EDE-MCCControlPlant SeismicCapacity>	20	1	FV-	MGO 1	ADV ADV	Auxiliary	Core		700-	1-MM-CP-	Control	CD	50		Plant Seismic	Capacity>
11-FW- FV-R1BA4X, A4YAuxiliary RelayCore Cooling700- AB1-MM-CP- 914BControl PanelCB501Plant Seismic Qualification ReportCapacity> Demand11-FW- FV-1	28	1	4214-B	MS0-1	AZY, AZX	кејау	Cooling	AB	P400A1	9148	Panei	CB	50	1	Qualification Report	Demand
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			1-F W-			Auviliary	Coro		700	1 MM CP	Control				Diant Solamia	Conscitus
1 <td>29</td> <td>1</td> <td>4214-R</td> <td>R1R</td> <td>ΔΑΧ ΔΑΥ</td> <td>Relay</td> <td>Cooling</td> <td>AB</td> <td>P40041</td> <td>914B</td> <td>Panel</td> <td>CB</td> <td>50</td> <td>1</td> <td>Plant Seisinic</td> <td>Domand</td>	29	1	4214-R	R1R	ΔΑΧ ΔΑΥ	Relay	Cooling	AB	P40041	914B	Panel	CB	50	1	Plant Seisinic	Domand
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		<b>1</b>	1-FW-		A4A, A41	Relay	Cooning	AD	1400A1	7140	Tallel			1	Quanneación Report	Demanu
30     1     4214-B     4214-4     39,41     Relay     Cooling     Westinghouse     NAS1     297B     Panel     CB     75     30     Plant Document     Demand       31     1     4214-B     62-1     1,5;2,6     Relay     Core			FV-	1-FYY-		Auxiliary	Core			1-MM-CP-	Control					Canacity>
1-FW- FV- 1-FW-	30	1	4214-B	4214-4	39.41	Relay	Cooling	Westinghouse	NAS1	297B	Panel	CB	75	30	Plant Document	Demand
31FV- 4214-B62-11,5;2,6Time Delay RelayCore CoolingAGASTATF7012AA615Control CenterCB21.53GERSCapacity> Demand321+FW- FV- 321+FW- FV- FV-Auxiliary RelayCore Core Core ColingITEJ10615Control CenterCB21.53GERSCapacity> Demand321+214-BR117.1RelayCoolingITEJ10615CenterCB21.521Qualification ReportDemand331+244-A42/C42/C5tarterCoolingTEJ10615Control Control CenterCB21.534Qualification ReportDemand341+244-A42/C42/C42/CStarterCoolingABP400A1914APanelCB501Qualification ReportDemand3514244-A4244 AXA3Y, A3XRelayCoolingABP400A1914APanelCB501Qualification ReportDemand361+244-A4244 AXA3Y, A3XRelayCoolingABP400A1914APanelCB501Qualification ReportDemand361+244-A424-AA24+AXA3Y, A3XRelayCoolingABP400A1914APanelCB501Qualification ReportDemand			1-FW-				0	0			Motor					
3114214-B62-11, 5; 2, 6RelayCoolingAGASTATE7012AA615CenterCB21.53GERSDemand1-FW- FV- 3214214-BR11T, 1RelayCore CoolingITEJ10615CenterCB21.53GERSCapacity> Demand3314214-BR11T, 1RelayCore CoolingITEJ10615CenterCB21.521Qualification ReportDemand3314244-A42/C42/CStarterCoolingITEJ10615CenterCB21.534Qualification ReportDemand3414244-A42/C42/CRelayCore Cooling700-1-MM-CP- 914AControl PanelPlant Seismic ControlPlant Seismic Capacity> Demand3411-FW- FV- FV-Auxiliary Core ColingCore Core Coling700-1-MM-CP- 914AControl PanelPlant Seismic ControlPlant Seismic PanelCapacity> Demand3514244-A424, AXA3Y, A3X RelayRelayCore Core Coling700- AB1-MM-CP- 914AControl PanelPlant Seismic ControlPlant Seismic PanelCapacity> Demand3611-FW- FV- FV- FV-Auxiliary RelayCore Core Coling700- AB1-MM-CP- 914AControl PanelPlant Seismic ControlP			FV-			Time Delay	Core			1-EDE-MCC-	Control					Capacity>
1-FW- FV- 1-FW- FV- Nation of the term of the term of term	31	1	4214-B	62-1	1, 5; 2, 6	Relay	Cooling	AGASTAT	E7012AA	615	Center	CB	21.5	3	GERS	Demand
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			1-FW-								Motor					
32   1   4214-B   R1   1T, 1   Relay   Cooling   ITE   J10   615   Center   CB   21.5   21   Qualification Report   Demand     3   1-FW- FV-   FV-   Motor   Core   1-EDE-MCC- Cooling   Control   Plant Seismic   Capacity>     34   1 4244-A   42/C   42/C   Starter   Cooling   Auxiliary   Core   700-   1-MM-CP-   Control   Plant Seismic   Capacity>     34   1 4244-A   4244 AX   A2Y, A2X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     35   1 4244-A   4244 AX   A3Y, A3X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     35   1 4244-A   4244 AX   A3Y, A3X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     36   1 4244-A   4244-A   A2Y, A2X <t< td=""><td></td><td></td><td>FV-</td><td></td><td>J</td><td>Auxiliary</td><td>Core</td><td></td><td></td><td>1-EDE-MCC-</td><td>Control</td><td></td><td></td><td></td><td>Plant Seismic</td><td>Capacity&gt;</td></t<>			FV-		J	Auxiliary	Core			1-EDE-MCC-	Control				Plant Seismic	Capacity>
1-FW- FV-   I-FW- FV-   Motor   Core Core   Core Cooling   Core Cooling   Motor   Starter   Core Cooling   I-EDE-MCC- 515   Motor   CB   Plant Seismic   Plant Seismic   Capacity> Demand     1   4244-A   42/C   42/C   42/C   Gree   700-   1-MM-CP-   Control   Plant Seismic   Capacity>     34   1   4244-A   4244 AX   A2Y, A2X   Relay   Core   700-   1-MM-CP-   Control   Plant Seismic   Capacity>     34   1   4244-A   4244 AX   A2Y, A2X   Relay   Core   700-   1-MM-CP-   Control   Plant Seismic   Capacity>     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Core   700-   1-MM-CP-   Control   Plant Seismic   Capacity>     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Core   700-   1-MM-CP-   Control   Plant Seismic   Capacity>     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Core   700-   1-MM-CP-   Control   Plan	32	1	4214-B	R1	1T, 1	Relay	Cooling	ITE	J10	615	Center	CB	21.5	21	Qualification Report	Demand
331 $FV-$ MotorCore StarterCore Coling1-EDE-MCC- StarterControl CenterPlant Seismic CBPlant Seismic Qualification ReportCapacity> Demand331 $4244-A$ $42/C$ $42/C$ $5tarter$ Coling $$			1-FW-								Motor					
33   1   4244-A   42/C   42/C   Starter   Cooling   515   Center   CB   21.5   34   Qualification Report   Demand     FV-   FV-   Auxiliary   Core   700-   1-MM-CP-   Control   FV-   Plant Seismic   Capacity>     34   1   4244-A   4244 AX   A2Y, A2X   Relay   Core   700-   1-MM-CP-   Control   FV-   Plant Seismic   Capacity>     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Core   700-   1-MM-CP-   Control   FV-   Plant Seismic   Capacity>     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Core   700-   1-MM-CP-   Control   FV-   Plant Seismic   Capacity>     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Cooling   AB   P400A1   9			FV-			Motor	Core			1-EDE-MCC-	Control				Plant Seismic	Capacity>
1   1-FW- FV-   FV- 34   1   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     34   1   4244-A   4244 AX   A2Y, A2X   Relay   Core Cooling   AB   P400A1   914A   Panel   CB   50   1   Plant Seismic Qualification Report   Capacity> Demand     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Core Cooling   700- Cooling   1-MM-CP- 914A   Control   Plant Seismic Qualification Report   Capacity> Demand     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Core Cooling   700- AB   1-MM-CP- 700-   Control Panel   Plant Seismic CB   Capacity> Plant Seismic   Capacity> Capacity> Demand     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Core Cooling   700- AB   700- 700-   1-MM-CP- Panel   CB   50   1   Qualification Report   Demand     1   1-FW- FV-   -   -   -   -	33	1	4244-A	42/C	42/C	Starter	Cooling			515	Center	CB	21.5	34	Qualification Report	Demand
34   1   4244-A   4244 AX   A2Y, A2X   Relay   Core   700-   1-MM-CP-   Control   CB   50   1   Plant Seismic   Capacity>     34   1   4244-A   4244 AX   A2Y, A2X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     1-FW-   FV-   Auxiliary   Core   700-   1-MM-CP-   Control   Plant Seismic   Capacity>     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Plant Seismic   Capacity>     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     FV-   Auxiliary   Core   700-   1-MM-CP-   Control   Plant Seismic   Capacity>     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Cooling   AB   P400A1			1-FW-													
34   1   4244-A   4244 AX   A2Y, A2X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     1   1-FW- FV-   -   Auxiliary   Core   700-   1-MM-CP-   Control   -   Plant Seismic   Capacity>     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Dema		,	FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
1   1-FW- FV-   FV- 4244-A   4244AX   A3Y, A3X   Auxiliary Relay   Core Cooling   700- AB   1-MM-CP- P400A1   Control Panel   CB   50   1   Plant Seismic Qualification Report   Capacity> Demand     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Core Cooling   AB   Pd00A1   914A   Panel   CB   50   1   Plant Seismic Qualification Report   Capacity> Demand     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Core Cooling   700- AB   1-MM-CP- P400A1   Control P14A   Panel   CB   50   1   Plant Seismic Qualification Report   Capacity> Demand     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Core Cooling   700- AB   1-MM-CP- P400A1   Control P14A   CB   50   1   Plant Seismic Qualification Report   Capacity> Demand     57   1   4244-A   R4A   A1X, A1Y   Relay   Core Cooling   700- Cooling   1-MM-CP- Panel   Control Plant Seismic   Plant Seismic   Capacity> Capacity> Demand     37   1   4244-A   R4A   A1X, A1Y <td>34</td> <td>11</td> <td>4244-A</td> <td>4244 AX</td> <td>AZY, AZX</td> <td>Relay</td> <td>Cooling</td> <td>AB</td> <td>P400A1</td> <td>914A</td> <td>Panel</td> <td>CB</td> <td>50</td> <td>1</td> <td>Qualification Report</td> <td>Demand</td>	34	11	4244-A	4244 AX	AZY, AZX	Relay	Cooling	AB	P400A1	914A	Panel	CB	50	1	Qualification Report	Demand
35   1   4244-A   4244 AX   A3Y, A3X   Relay   Core   /00-   1-MM-CP-   Control   Plant Seismic   Capacity>     35   1   4244-A   4244 AX   A3Y, A3X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     1   FW-   Auxiliary   Core   700-   1-MM-CP-   Control   Plant Seismic   Capacity>     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Plant Seismic   Capacity>     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Plant Seismic   Capacity>     37   1   4244-A   R4A   A1X, A1Y   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Plant Seismic   Capacity>     37   1   4244-A   R4A   A1X, A1Y			1-FW-			A			700	4.141.55						
35   1   4244-A   4244-A   A31, A3A   Kelay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     1   1-FW- FV-   FV-   Auxiliary   Core   700-   1-MM-CP-   Control   Plant Seismic   Capacity>     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand     -   FW- FV-   -   Auxiliary   Core   700-   1-MM-CP- FV-   Control   Plant Seismic   Capacity>     37   1   4244-A   R4A   A1X, A1Y   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand	25	1	FV-	4044 49		Auxiliary	Core	AD	/00-	1-MM-CP-	Control	CD	50		Plant Seismic	Capacity>
36   1   4244-A   MSO-4   A2Y, A2X   Auxiliary Relay   Core Cooling   700- AB   1-MM-CP- P400A1   Control Panel   CB   50   1   Plant Seismic Qualification Report   Capacity> Demand     36   1   4244-A   MSO-4   A2Y, A2X   Relay   Core   700- Cooling   1-MM-CP- P400A1   Control Panel   CB   50   1   Plant Seismic Qualification Report   Demand     37   1   4244-A   R4A   A1X, A1Y   Relay   Cooling   AB   P400A1   914A   Panel   CB   50   1   Qualification Report   Demand	35	1	4244-A	4244 AX	Α3Υ, Α3Χ	кејау	Looing	AB	P400A1	914A	Panel	CB	50	1	Qualification Report	Demand
36 1 4244-A MSO-4 A2Y, A2X Relay Core 700- 1-MM-CP- Control Control Plant Seismic Capacity>   36 1 4244-A MSO-4 A2Y, A2X Relay Cooling AB P400A1 914A Panel CB 50 1 Qualification Report Demand   1-FW- FW- Auxiliary Core 700- 1-MM-CP- Control Plant Seismic Capacity>   37 1 4244-A R4A A1X, A1Y Relay Cooling AB P400A1 914A Panel CB 50 1 Qualification Report Demand			1-F VV-			Auviliamy	Coro		700	1 MM CD	Control				Dlant Colon-in	Canacitan
30 1 1211 A BOO T A21, A2A Relay Cooling AB F40A1 914A Patel Cb 50 1 Qualification Report Demand   1 1-FW- FV- Auxiliary Core 700- 1-MM-CP- Control Plant Seismic Capacity>   37 1 4244-A R4A A1X, A1Y Relay Cooling AB P400A1 914A Panel CB 50 1 Qualification Report Demand	36	1	4244 A	MSO-4	42V 42V	Relay	Cooling	AB	P40041	1-MM-CP-	Panel	CP	EO	1	ridiit Seismic	Capacity>
FV- Auxiliary Core 700- 1-MM-CP- Control Plant Seismic Capacity>   37 1 4244-A R4A A1X.A1Y Relay Cooling AB P400A1 914A Panel CB 50 1 Qualification Penert Demand	- 30	1	1.FW-	M30-4	AL1, ALA	neiay	Cooning		THUUAL	214A	rallel		50	I	Quanneacion Report	Demanu
37 1 4244-A R4A A1X.A1Y Relay Cooling AB P400A1 914A Panel CR 50 1 (Dublication Pennet Damand			FV-			Auviliary	Core		700-	1-MM.CP	Control				Plant Seismic	Canacity
	37	1	4244-A	R4A	A1X. A1Y	Relay	Cooling	AB	P400A1	9144	Panel	CB	50	1	Qualification Report	Demand

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		Component							Enclosure			Floor		Component Evaluation	on
			Device			System		1				Elev.		a da ser a la facto de ser	
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
		1-FW-													
		FV-	1-FYY-		Auxiliary	Core			1-MM-CP-	Control					Capacity>
38	1	4244-A	4244-4	39, 41	Relay	Cooling	Westinghouse	NAS1	297A	Panel	CB	75	30	Plant Document	Demand
		1-FW-							1 EDE MOO	Motor		1			Constitut
20	1	FV-	(2.4	15.26	Time Delay	Core	ACACTAT	E701244	I-EDE-MCC-	Control	CP	21 5	2	CEDS	Capacity>
39	1	4244-A	62-4	1, 5; 2, 6	Relay	Cooling	AGASTAT	E/UIZAA	515	Motor	LB	21.5		GERS	Demand
		1-F W-			Auviliary	Core			1-EDE-MCC-	Control		1		Plant Seismic	Canacity
40	1	Δ244-A	R4	1T 1	Relay	Cooling	ITE	110	515	Center	CB	215	21	Qualification Report	Demand
		1-FW-		11,1	Relay	Cooling		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	515	Motor				Quanneación repore	Demana
		FV-			Motor	Core			1-EDE-MCC-	Control				Plant Seismic	Capacity>
41	1	4244-B	42/C	42/C	Starter	Cooling			615	Center	СВ	21.5	34	Oualification Report	Demand
		1-FW-													
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
42	1	4244-B	4244 BX	A2Y, A2X	Relay	Cooling	AB	P400A1	914B	Panel	CB	50	1	Qualification Report	Demand
		1-FW-										}			
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
43	1	4244-B	4244 BX	A3Y, A3X	Relay	Cooling	AB	P400A1	914B	Panel	CB	50	1	Qualification Report	Demand
		1-FW-													
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
44	11	4244-B	MSO-4	A2Y, A2X	Relay	Cooling	AB	P400A1	9148	Panel	CB	50	1	Qualification Report	Demand
		1-FW-			A	6		700	1 MM CD	Cantural				Diant Calencia	Consiltan
45	1	FV-	DAD		Auxiliary	Cooling	AD	700- P40041	1-MM-CP-	Banal	CP	FO	1	Plant Seismic	Domand
45	1	4244-D	K4D	AIA, AIT	Relay	Cooning	AD	F400A1	9140	Fallel	CD		<u>_</u>	Quanneación Report	Demanu
		EV-	1-EVV-		Auviliary	Core			1-MM-CP-	Control			1		Canacity
46	1	4244-B	4244-2	39 41	Relay	Cooling	Westinghouse	NAS1	297B	Panel	CB	75	30	Plant Document	Demand
		1-FW-		0,,12		Goome				Motor					
		FV-			Time Delay	Core			1-EDE-MCC-	Control					Capacity>
47	1	4244-B	62-4	1, 5; 2, 6	Relay	Cooling	AGASTAT	E7012AA	615	Center	CB	21.5	3	GERS	Demand
		1-FW-								Motor					
1.1		FV-			Auxiliary	Core			1-EDE-MCC-	Control				Plant Seismic	Capacity>
48	1	4244-B	R4	1T, 1	Relay	Cooling	ITE	J10	615	Center	CB	21.5	21	Qualification Report	Demand
		1-FW-								Motor					
		FV-			Motor	Core			1-EDE-MCC-	Control				Plant Seismic	Capacity>
49	1	4234-A	42/C	42/C	Starter	Cooling			515	Center	CB	21.5	34	Qualification Report	Demand
		1-FW-			A			700	1 100 00	Carta				Diant Calmaia	
FO	1	FV-	1224 AV	12V 12V	Rolay	Cooling	AP	700- P40041	1-MM-CP-	Control	CP	50	1	Plant Seismic	Capacity>
50	1	1_FM	4234 AA	AL1, ALA	петау	coomig	AD	I 400A1	214A	Fallel		50			Demanu
1		FV-			Auviliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Canacity
51	1	4234-A	4234 AX	A3Y, A3X	Relay	Cooling	AB	P400A1	914A	Panel	CB	50	1	Oualification Report	Demand
		1-FW-			1000					1			-		2 childing
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
52	1	4234-A	MSO-3	A2Y, A2X	Relay	Cooling	AB	P400A1	914A	Panel	CB	50	1	Qualification Report	Demand
		1-FW-			-									· · · · · · · · · · · · · · · · · · ·	
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control	]			Plant Seismic	Capacity>
53	1	4234-A	R3A	A4X, A4Y	Relay	Cooling	AB	P400A1	914A	Panel	CB	50	1	Qualification Report	Demand
		1-FW-													
		FV-	1-FYY-		Auxiliary	Core			1-MM-CP-	Control					Capacity>
54	1	4234-A	4234-2	39,41	Relay	Cooling	Westinghouse	NAS1	297A	Panel	CB	75	30	Plant Document	Demand
		1-FW-							4 555 1466	Motor					
		FV-	(2.2	15.26	Fime Delay	Core	ACACTAT	E701244	I-EDE-MCC-	Control	CD	21 5	2	CEDC	Capacity>
55	I	4254-A	02-3	1, 5; 2, 6	кејау	Looning	AGASTAT	E/UIZAA	312	Motor	L CB	41.5	3	UEKS	Demand
		1-FVV-			Auviliant	Coro			1 EDE MCC	Control				Plant Seismis	Capacitus
56	1	4234-4	R3	1 1 1 1	Relay	Cooling	ITE	110	515	Center	CB	215	21	Qualification Report	Demand
_ 50	1	-14JT-A	1.0		neiay	Goomig	1111	J 10	1 919	Gener	00	L.L.J	41	2 gaanneadon Report	Demanu

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		Component							Enclosure Floor Component Evaluation			on			
			Device		1	System	:				la se de de	Elev.	-	a standard and a standard and a standard a s	
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
		1-FW-								Motor					
		FV-			Motor	Core			1-EDE-MCC-	Control				Plant Seismic	Capacity>
57	1	4234-B	42/C	42/C	Starter	Cooling			615	Center	CB	21.5	34	Qualification Report	Demand
		1-FW-													
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
58	1	4234-B	4234 BX	A2Y, A2X	Relay	Cooling	AB	P400A1	914B	Panel	CB	50	1	Qualification Report	Demand
		1-FW-													
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
59	1	4234-B	4234 BX	A3Y. A3X	Relay	Cooling	AB	P400A1	914B	Panel	CB	50	1	Qualification Report	Demand
		1-FW-												I	
		FV-			Auxiliarv	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
60	1	4234-B	MSO-3	A2Y. A2X	Relay	Cooling	AB	P400A1	914B	Panel	CB	50	1	Oualification Report	Demand
		1-FW-	1100 0												
		FV-			Auxiliary	Core		700-	1-MM-CP-	Control				Plant Seismic	Capacity>
61	1	4234-B	R3B	Δ4Χ Δ4Υ	Relay	Cooling	AB	P400A1	914B	Panel	CB	50	1	Qualification Report	Demand
	-	1_5V-			iteray	doomig	110	1100111						Quantication Report	Domunu
		FV-	1-FYY-		Auxiliary	Core			1-MM-CP-	Control					Canacity>
62	1	4234-B	4234-4	39 41	Relay	Cooling	Westinghouse	NAS1	297B	Panel	CB	75	30	Plant Document	Demand
	<u>-</u>	1.FW-	1201 1							Motor	† <u> </u>			and boounione	2 chidne
		EV-			Time Delay	Core			1-FDF-MCC-	Control					Canacitys
63	1	4234-P	62-3	1 5.2 6	Relay	Cooling	ΔGASTAT	F701244	615	Center	CB	215	3	GERS	Demand
0.5	1	1 EW	02-3	1, 5, 2, 0	Relay	Coomig	AUASIAI	L/UIZAA	015	Motor		41.5	J	dERS	Demand
		1-F VV-			Anviliant	Com			1 EDE MCC	Control				Plant Colomia	Consisten
	1	FV-	D2	117 1	Auxiliary	Core	ITTE	110	I-EDE-MCC-	Control	CD	21 5	21	Plant Seismic	Capacity>
64	1	4234-B	K3	11,1	Relay	Looning		J10	015	Center	LB	21.5			Demand
						AC/DC									
					Inst. & Time	Power									
			50/51B		Overcurrent	Support	General	12IAC53B8	1-EDE-SWG-					Plant Seismic	Capacity>
65	1	A63	фА	50; 51; SI	Relay	Systems	Electric	11A	5	Switchgear	CB	21.5	10	Qualification Report	Demand
						AC/DC									
					Inst. & Time	Power								-	
			50/51B		Overcurrent	Support	General	12IAC53B8	1-EDE-SWG-					Plant Seismic	Capacity>
66	1	A63	фВ	50; 51; SI	Relay	Systems	Electric	11A	5	Switchgear	CB	21.5	10	Qualification Report	Demand
						AC/DC									
					Inst. & Time	Power									
			50/51B		Overcurrent	Support	General	12IAC53B8	1-EDE-SWG-					Plant Seismic	Capacity>
67	1	A63	фС	50; 51; SI	Relay	Systems	Electric	11A	5	Switchgear	CB	21.5	10	Qualification Report	Demand
			1			AC/DC				1	1				
					Time	Power					1				
					Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-		[			Plant Seismic	Capacity>
68	1	A54	51ВфА	51; SI	Relay	Systems	Electric	03A	5	Switchgear	CB	21.5	12	Qualification Report	Demand
						AC/DC					]				
					Time	Power									
					Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-					Plant Seismic	Capacity>
69	1	A54	51ВфВ	51; SI	Relay	Systems	Electric	03A	5	Switchgear	CB	21.5	12	Qualification Report	Demand
						AC/DC									
					Time	Power				1					
					Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-					Plant Seismic	Capacity>
70	1	A54	<u>51ВфС</u>	51; SI	Relay	Systems	Electric	03A	5	Switchgear	CB	21.5	12	Qualification Report	Demand
						AC/DC									
					Time	Power									
					Overcurrent	Support	General		1-EDE-SWG-					Plant Seismic	Capacity>
71	1	A54	51VфА	51; SI	Relay	Systems	Electric	IJCV	5	Switchgear	CB	21.5	16	Qualification Report	Demand
						AC/DC									
					Time	Power									
					Overcurrent	Support	General		1-EDE-SWG-					Plant Seismic	Capacity>
72	1	A54	51VфВ	51; SI	Relay	Systems	Electric	IJCV	5	Switchgear	CB	21.5	16	Qualification Report	Demand

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		Component							Enclosure			Floor		Component Evaluation	on
			Device			System						Elev.		national distribution of the	
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC									
					Time	Power			1 EDE CMC					Diant Calancia	Conseitan
70	1		FIVAC	E1. CI	Delev	Support	General	UCV	I-EDE-SWG-	Switchgeor	CR	215	16	Qualification Report	Demand
/3	1	A54	51700	51; 51	Relay			IJC V		Switcingear	CD		10		Demand
					Power	Power									
					Directional	Support	General		1-EDE-SWG-					Plant Seismic	Capacity>
74	1	A54	32	32; SI	Relay	Systems	Electric	ICW	5	Switchgear	CB	21.5	13	Qualification Report	Demand
						AC/DC									
				63,64 (A51)	Mech	Power									
			500	; 63, 64	Operated	Support	ITTE	NI/A	1-EDE-SWG-	Contrals goog		21 5		Plant Seismic	Capacity>
75	1	A54	525	(A52)	Switch	Systems	116	N/A	5	Switchgear	LB	21.5	9		Demanu
				69,70 (ASI),	Mach	Power									
				(A52):	Operated	Support			1-EDE-SWG-					Plant Seismic	Capacity>
76	1	A54	525	79,80	Switch	Systems	ITE	N/A	5	Switchgear	CB	21.5	9	Qualification Report	Demand
						AC/DC									
				71,72	Mech	Power									
				(A51);	Operated	Support			1-EDE-SWG-					Plant Seismic	Capacity>
77	1	A54	525	71,71 (A52)	Switch	Systems	ITE	_N/A	5	Switchgear	CB	21.5	9	Qualification Report	Demand
						AC/DC									
					Circuit	Support			1-EDE-SWG-					Plant Seismic	Canacity>
78	1	A54	52Y	52Y	Breaker	Systems	ITE	нкз50	5	Switchgear	CB	21.5	22	Qualification Report	Demand
						AC/DC				0					
						Power									
					Auxiliary	Support	General		1-DG-CP-	Control				GERS/Plant Seismic	Capacity>
79	1	A54	R43R4	3T,3	Relay	Systems	Electric	CR-120BD	75A	Panel	DGB	21.5	14	Qualification Report	Demand
						AC/DC									
					Auviliary	Support	General		1-DG-CP-	Control				GFRS /Plant Seismic	Canacity>
80	1	A54	R43R3	5T.5	Relay	Systems	Electric	CR-120BD	75A	Panel	DGB	21.5	14	Oualification Report	Demand
				//-		AC/DC									
						Power									
					Fast Closure	Support			1-EDE-SWG-					Plant Seismic	Capacity>
81	1	A54	RS	5,7	Relay	Systems	Westinghouse	AR	5	Switchgear	CB	21.5	32	Qualification Report	Demand
						AC/DC									
					Fast Closure	Support			1-FDF-SWC-					Plant Seismic	Canacity>
82	1	A54	RS	2.4	Relay	Systems	Westinghouse	AR	5	Switchgear	CB	21.5	32	Qualification Report	Demand
				,.	ling	AC/DC	Broade								
						Power									
					LOCA Seal	Support			1-EDE-SWG-	}				High Frequency Test	Capacity>
83	1	A54	RLA	14; 16	Relay	Systems	Electroswitch	LOR/ER	5	Switchgear	CB	21.5	8	Program	Demand
						AC/DC									
	[		DD1V		EDC A.	Power	Mantin -han			Cantral					Consister
01	1	AE 4	PRIX	2.2	EPS AUX Bolow	Support	westingnouse	AD	1 DC CP 70	Banol	CR	215	21	Plant Document	Demand
84	<u>_</u>	A34	(1.74)	2,3	SI Signal	AC/DC	ADD		1-00-01-19			41.3	51		Demanu
					Actuating	Power									
					Output	Support	Potter	MDR-4121-		Control					Capacity>
85	1	A54	K601A	15,16	Relay	Systems	Brumfield	1	1-MM-CP-12	Panel	CB	75	_24	Plant Document	Demand
						AC/DC									
						Power									
06		1.54	10	10.1	Loss of Field	Support	General	CEU	1-EDE-SWG-	Coultabara	CD	21 5	2	Plant Seismic	Capacity>
80		A54	40	40; A	кејау	Systems	Electric	LEH	5	Switchgear	CR	21.5	2	Qualification Report	Demand

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	2	Component							Enclosure			Floor	a	Component Evaluation	on
			Device			System						Elev.			
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC									
						Power									
					Aux Relay to	Support			1-EDE-SWG-					07770	Capacity>
87	1	A54	_40X	1T,1	Dev 40	Systems	ITE	J13	5	Switchgear	CB	21.5	20	GERS	Demand
						AC/DC Deruge									
	1				Shutdown	Support	Conoral			Control				Plant Solemic	Capacitus
88	1	454	54	54	Relay	Systems	Electric	CR-120BD	1-DG-CP-36	Panel	DGB	215	15	Qualification Report	Demand
	1		54	JA	Relay	AC/DC	Liccure	CR 12000	1 Dd di 50	Tanci	Dub			Quanneación Report	Demand
						Power					1				
					Time Delay	Support			1-EDE-SWG-					Plant Seismic	Capacity>
89	1	A54	81Y	9,10	Relay	Systems	ITE	62L	5	Switchgear	CB	21.5	23	Qualification Report	Demand
						AC/DC									
					Mech	Power									
		SW-V-			Operated	Support			1-EDE-SWG-					Plant Seismic	Capacity>
90	1	31	52S	61,62	Switch	Systems	ITE	N/A	6	Switchgear	CB	21.5	9	Qualification Report	Demand
						AC/DC									
		CWW			Mech	Power			1 EDE SWC					Plant Sajamia	Conscitus
01	1	20	525	61 62	Switch	Support	ITE	N/A	1-EDE-SWG-	Switchgear	CB	215	a	Qualification Report	Demand
- 71	1	29	525	01,02	Switch	AC/DC	115	N/A	0	Switcingean		21.5	,	Quanneación Report	Demand
					Mech	Power									
		SW-V-			Operated	Support			1-EDE-SWG-					Plant Seismic	Capacity>
92	1	22	525	61,62	Switch	Systems	ITE	N/A	5	Switchgear	СВ	21.5	9	Qualification Report	Demand
						AC/DC									
					Mech	Power									
					Operated	Support			1-EDE-SWG-					Plant Seismic	Capacity>
93	11	SW-V-2	525	61, 62	Switch	Systems	ITE	N/A	5	Switchgear	CB	21.5	9	Qualification Report	Demand
						AC/DC									
			50/511		Time	Power	Comonal	101400004	1 EDE CWC					Diant Calancia	Conseiber
04	1	A.D.4	50/51φ	E0. E1. SI	Relay	Support	Floctric	A 12IAC00B4	I-EDE-SWG-	Switchgoor	CP	215	11	Qualification Penort	Domand
	1	ЛКТ		50, 51, 51	Relay	AC/DC	Liectric		0	Switcingcar		41.5		Quanneación Report	Demand
					Time	Power									
			50/510		Overcurrent	Support	General	12IAC66B4	1-EDE-SWG-					Plant Seismic	Canacity>
95	1	AR4	C	50; 51; SI	Relay	Systems	Electric	A	6	Switchgear	CB	21.5	11	Qualification Report	Demand
						AC/DC									
						Power									
					Circuit	Support			1-EDE-SWG-					Plant Seismic	Capacity>
96	1	AR4	52Y	52Y	Breaker	Systems	ITE	HK350	6	Switchgear	CB	21.5	22	Qualification Report	Demand
						AC/DC									
					Tripping Delay Due	Power			1 EDE CHIC					Dlank Calan-1-	Cana-it-
07	1	101	94.2	24	Kelay Bus	Support	Westinghouse	AP	I-EDE-SWG-	Switchgoor	CR	21 5	22	Fiant Seismic	Capacity>
9/	1	АЛЧ	74-2	2,4	<u> </u>		westinghouse		0	switchgear		41.5	34	Quanneation Report	Demanu
						Power									
			HR8		EPS Starting	Support	Westinghouse			Control					Capacity>
98	1	AR4	(K83)	6,7	Relay	Systems	/ABB	AR	1-DG-CP-80	Panel	CB	21.5	31	Plant Document	Demand
						AC/DC									
						Power									
					Auxiliary	Support			1-EDE-SWG-					Plant Seismic	Capacity>
99	1	AR4	R1	5,7	Relay	Systems	Westinghouse	AR	6	Switchgear	CB	21.5	29	Qualification Report	Demand
						AC/DC									
			50/543		Time	Power		101405050	4 555 6142						
100	1	A	50/51φ	F0. F1. CI	Overcurrent	Support	General	12IAC53B8	I-EDE-SWG-	Curital	CD	21 5	10	Plant Seismic	Capacity>
100		A55	A	1 20; 21; 21	кегау	systems	LIECTFIC	11A	5	Switchgear	LR	21.5	10	Quanneation Report	Demand

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		Component							Enclosure		Floor	1.1.1.1.1.1	Component Evaluation	on	
			Device			System						Elev.		A na shaan ahay in	
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC					[				
			= = = = = = =		Time	Power		101405000	4 555 6146						
101	1	A.C.C.	50/51¢	F0. F1. CI	Overcurrent	Support	General	12IAC53B8	I-EDE-SWG-	Switchgoor	CP	21 5	10	Plant Seismic	Capacity>
101	11	ASS	В	50; 51; 51	Relay		Electric	11A	5	Switcilgear	CD	21.5	10	Quanneation Report	Demanu
					Time	Power									
1			50/51Φ		Overcurrent	Support	General	12IAC53B8	1-EDE-SWG-					Plant Seismic	Capacity>
102	1	A55	c	50; 51; SI	Relay	Systems	Electric	11A	5	Switchgear	CB	21.5	10	Qualification Report	Demand
						AC/DC									
					Time	Power									
			50/51¢		Overcurrent	Support	General	12IAC66B4	1-EDE-SWG-	0.11	0.0			Plant Seismic	Capacity>
103	11	AQ3	A	50; 51; SI	Relay	Systems	Electric	A	5	Switchgear	CB	21.5	11	Qualification Report	Demand
					Time	AC/DC									
			50/514		Overcurrent	Support	Caparal	121AC66B4	1-EDE-SWG-					Plant Seismic	Canacity
104	1	A03	ο 1 C	50: 51: SI	Relay	Systems	Electric	A	5	Switchgear	CB	21.5	11	Qualification Report	Demand
101		1140		00,01,01	licity	AC/DC	Bioturio			Difficingour					Domana
						Power									
					Circuit	Support			1-EDE-SWG-					Plant Seismic	Capacity>
105	1	AQ3	52Y	52Y	Breaker	Systems	ITE	HK350	5	Switchgear	CB	21.5	22	Qualification Report	Demand
						AC/DC									
					Tripping	Power									
100		1.00		10	Relay Bus	Support			1-EDE-SWG-		an	04.5		Plant Seismic	Capacity>
106	1	AQ3	94-2	1,3	00	Systems	westinghouse	AK	5	Switchgear	CB	21.5	32	Qualification Report	Demand
						AC/DC Bower									
			HRS		FPS Starting	Support	Westinghouse			Control					Canacity
107	1	A03	(K83)	4.5	Relay	Systems	/ABB	AR	1-DG-CP-79	Panel	CB	21.5	31	Plant Document	Demand
107			(	.,	itelay	AC/DC	/1.55		194 0. 17						Domana
						Power									
					Auxiliary	Support			1-EDE-SWG-					Plant Seismic	Capacity>
108	1	AQ3	R1	5,7	Relay	Systems	Westinghouse	AR	5	Switchgear	CB	21.5	29	Qualification Report	Demand
					-	AC/DC									
			50/541		Time	Power	C	101406604	1 EDE CHIC						
100	1	101	50/51¢	E0. E1. SI	Dvercurrent	Support	General	12IAC66B4	I-EDE-SWG-	Switchgoor	CP	21 5	11	Plant Seismic	Capacity>
109	1	AQ4	A	50; 51; 51	Relay		Liecuit	A	5	Switcilgear	CD	21.5	11		Demand
					Time	Power									
			50/51 <b>Φ</b>		Overcurrent	Support	General	12IAC66B4	1-EDE-SWG-					Plant Seismic	Capacity>
110	1	AQ4	C	50; 51; SI	Relay	Systems	Electric	А	5	Switchgear	CB	21.5	11	Qualification Report	Demand
						AC/DC									
						Power									
					Circuit	Support			1-EDE-SWG-					Plant Seismic	Capacity>
111	1	AQ4	52Y	52Y	Breaker	Systems	ITE	HK350	5	Switchgear	CB	21.5	22	Qualification Report	Demand
					Their and	AC/DC									
					i ripping	rower			1 EDE SWC					Plant Solomic	Capacitus
112	1	404	94-2	24	IV	Support	Westinghouse	AP		Switchgear	CB	215	30	Qualification Report	Demand
114	1	דעד	77-4	<u> </u>	5 v	AC/DC	westinghouse			Switcingear		41,3	34	Quanneauon Report	Demanu
						Power									
			HR8		EPS Starting	Support	Westinghouse			Control					Capacity>
113	1	AQ4	(K83)	7,6	Relay	Systems	/ABB	AR	1-DG-CP-79	Panel	CB	21.5	31	Plant Document	Demand
						AC/DC									
						Power									
					Auxiliary	Support			1-EDE-SWG-					Plant Seismic	Capacity>
114	1	AQ4	R1	5,7	Relay	Systems	Westinghouse	AR	5	Switchgear	CB	21.5	29	Qualification Report	Demand

	Component							Enclosure			Floor	1	Component Evaluation	on	
			Device			System					and a	Elev.	an	Antonio di Antonio di Attributetti di St	
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC									
					m	Power			4 555 6446						
115	1	DDC	CODIL	1.5	Timing	Support	ACACTAT	E70124E	1-EDE-SWG-	Curitabasan	CD	21 5		High Frequency Test	Capacity>
115	1	DPo	OZBLL	1,5		Systems	AGASTAT	E/UIZAE	110	Switchgear		21.5		Program	Demand
					Time	Power									
					Overcurrent	Support	General	1214C7748	1-EDE-SWG-					Plant Seismic	Canacity>
116	1	A74	51ВФА	51: SI	Relay	Systems	Electric	03A	6	Switchgear	CB	21.5	12	Qualification Report	Demand
						AC/DC									
					Time	Power									
					Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-					Plant Seismic	Capacity>
117	1	A74	51ВфВ	51; SI	Relay	Systems	Electric	03A	6	Switchgear	CB	21.5	12	Qualification Report	Demand
					-	AC/DC									
					Time	Power	Comment	101407740	1 EDE CMC					Dlaut Calancia	Constitute
110	1	174	51860	51.51	Relay	Support	Electric	12IAC//A8	1-EDE-SWG-	Switchgear	CB	215	12	Qualification Penort	Demand
110	1	A/4	51000	51, 51	Relay	AC/DC	Liecult	03A		Switcingear	CD	41.5			Demand
			1		Time	Power									
					Overcurrent	Support	General		1-EDE-SWG-					Plant Seismic	Capacity>
119	1	A74	51VфА	51; SI	Relay	Systems	Electric	IJCV	6	Switchgear	CB	21.5	16	Qualification Report	Demand
						AC/DC									
					Time	Power									
					Overcurrent	Support	General		1-EDE-SWG-					Plant Seismic	Capacity>
120	1	A74	<u>51VφB</u>	51; SI	Relay	Systems	Electric	IJCV	6	Switchgear	CB	21.5	16	Qualification Report	Demand
					Time	AC/DC									
					Overcurrent	Support	Conoral		1 EDE SWC					Plant Soismis	Capacitus
121	1	A74	51VdC	51.51	Relay	Systems	Electric	UCV	6	Switchgear	CB	215	16	Qualification Report	Demand
121				51, 51	itelay	AC/DC	Liceare	1)01		Dwittengeur		21.5	10	Quanneation Report	Demand
					Power	Power									
1					Directional	Support	General		1-EDE-SWG-					Plant Seismic	Capacity>
122	1	A74	32	32; SI	Relay	Systems	Electric	ICW	6	Switchgear	CB	21.5	13	Qualification Report	Demand
						AC/DC									
					<b>a</b>	Power									
122	1	174	FOV	FOV	Circuit	Support	ITTE	11/250	1-EDE-SWG-	Contrals an an	CD	21 5	22	Plant Seismic	Capacity>
123	1	A/4	521	521	вгеакег			пкзэо	0	Switchgear	CB	21.5	22	Quanneation Report	Demand
				63 64 (A71)	Mech	Power									
				: 63. 64	Operated	Support			1-EDE-SWG-					Plant Seismic	Capacity>
124	1	A74	52S	(A72)	Switch	Systems	ITE	N/A	6	Switchgear	CB	21.5	9	Qualification Report	Demand
						AC/DC									
				70,71	Mech	Power									
				(A71);	Operated	Support			1-EDE-SWG-					Plant Seismic	Capacity>
125	1	A74	525	70,71 (A72)	Switch	Systems	ITE	N/A	6	Switchgear	CB	21.5	9	Qualification Report	Demand
				69,70 (A71),		AC/DC									
				69,70	Mech	Power			1 EDE CWC					Dlank Colomia	Canaaitan
126	1	174	525	(A/2);	Switch	Support	ITE	N/A	1-EDE-5WG-	Switchgear	CB	215	0	Plant Seisinic	Domand
120	<u>1</u>	п/т	545	, ,,,00	Switch	AC/DC	11.5	17/4		Switcingeal		<u> </u>	7	Quanneation Report	Demanu
						Power									
					Auxiliary	Support	General		1-DG-CP-	Control				GERS/Plant Seismic	Capacity>
127	1	A74	R43R4	3T,3	Relay	Systems	Electric	CR-120BD	76A	Panel	DGB	21.5	14	Qualification Report	Demand
						AC/DC								· · · · · · · · · · · · · · · · · · ·	
						Power									
					Auxiliary	Support	General		1-DG-CP-	Control				GERS/Plant Seismic	Capacity>
128	1	A74	R43R3	5T,5	Relay	Systems	Electric	CR-120BD	76A	Panel	DGB	21.5	14	Qualification Report	Demand

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					Co	omponent			Enclo	sure	4	Floor	STR. A.	Component Evaluation	on
			Device			System					1	Elev.		the second second	10 C
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC									
						Power									
			PR1X		EPS Aux	Support	Westinghouse		1	Control					Capacity>
129	1	A74	(K74)	2,3	Relay	Systems	/ABB	AR	1-DG-CP-80	Panel	CB	21.5	31	Plant Document	Demand
						AC/DC Bouvon									
					Fact Clocure	Support			1-EDE-SWC-					Plant Seismic	Canacitys
130	1	A74	RS	57	Relay	Systems	Westinghouse	AR	6	Switchgear	CB	21.5	32	Qualification Report	Demand
150					licity	AC/DC	Westinghouse			Diritongour				Quantiousion response	
						Power									
					Fast Closure	Support			1-EDE-SWG-					Plant Seismic	Capacity>
131	1	A74	RS	2,4	Relay	Systems	Westinghouse	AR	6	Switchgear	CB	21.5	32	Qualification Report	Demand
						AC/DC									
			-			Power									
					LOCA Seal	Support		100 (70	1-EDE-SWG-			015		High Frequency Test	Capacity>
132	11	A74	RLA	14,16	Relay	Systems	Electroswitch	LOR/ER	6	Switchgear	CB	21.5	8	Program	Demand
					SI Signal	AC/DC Bower									
					Output	Support	Potter	MDR-4121-		Control	1				Canacitys
133	1	A74	K601B	15.16	Relay	Systems	Brumfield	1	1-MM-CP-13	Panel	CB	75	24	Plant Document	Demand
100		11/1	MOULD	10,10	licity	AC/DC	Diaminita		2 0. 20	- unor				Than Doorantono	
						Power									
				1	Shutdown	Support	General			Control				Plant Seismic	Capacity>
134	1	A74	5A	5A	Relay	Systems	Electric	CR-120BD	1-DG-CP-37	Panel	DGB	21.5	15	Qualification Report	Demand
						AC/DC									
						Power									
105		174	10	40.4	Loss of Field	Support	General	CEU	1-EDE-SWG-	Contrals an on		21 5	2	Plant Seismic	Capacity>
135	<u>1</u>	A/4	40	40; A	Relay	Systems	Electric	CEH	0	Switchgear	LB		2		Demand
						Power									
					Aux Relay to	Support			1-EDE-SWG-						Capacity>
136	1	A74	40X	1T,1	Dev 40	Systems	ITE	J13	6	Switchgear	CB	21.5	20	GERS	Demand
						AC/DC									
					Aux	Power									
					Frequency	Support			1-EDE-SWG-					Plant Seismic	Capacity>
137	1	A74	81Y	9,10	Relay	Systems	ITE	62L	6	Switchgear	CB	21.5	23	Qualification Report	Demand
					m.	AC/DC									
			EQ/E1A		Overgurrent	Power	Conoral	1214 052 00	1 EDE SWC					Diant Solomia	Conscitus
138	1	Δ75	Δ	50.51.51	Relay	Systems	Flectric	1114	1-EDE-3WG-	Switchgear	CB	215	10	Qualification Report	Demand
1.50	<sup>1</sup>	11/5		00,01,01	incluy	AC/DC	Licence		<u> </u>	owneengedi		£1.J	10	Quantication Report	Demand
					Time	Power									
			50/51 <b>φ</b>		Overcurrent	Support	General	12IAC53B8	1-EDE-SWG-					Plant Seismic	Capacity>
139	1	A75	В	50; 51; SI	Relay	Systems	Electric	11A	6	Switchgear	CB	21.5	10	Qualification Report	Demand
						AC/DC									
					Time	Power									
140		475	50/51¢	F0 F1 CI	Overcurrent	Support	General	12IAC53B8	1-EDE-SWG-	Constants and	CD	215	10	Plant Seismic	Capacity>
140	1	A/5	L	50; 51; 51	кејау	Systems	Electric	11A	0	Switchgear	L CR	21.5	10	Qualification Report	Demand
					Time	Power					1				
			50/510		Overcurrent	Support	General	12IAC66B4	1-EDE-SWG-					Plant Seismic	Canacity>
141	1	AR3	A A	50; 51: SI	Relay	Systems	Electric	A	6	Switchgear	СВ	21.5	11	Qualification Report	Demand
				., .,		AC/DC									
					Time	Power									
			50/51 <b>φ</b>		Overcurrent	Support	General	12IAC66B4	1-EDE-SWG-					Plant Seismic	Capacity>
142	1	AR3	C	50; 51; SI	Relay	Systems	Electric	A	6	Switchgear	CB	21.5	11	Qualification Report	Demand

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						omponent			Enclo	sure		Floor		Component Evaluati	on
1.			Device		·	System						Elev.	· .	and the state of the	
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC									
						Power									
1	[				Circuit	Support			1-EDE-SWG-					Plant Seismic	Capacity>
143	1	AR3	52Y	52Y	Breaker	Systems	ITE	HK350	6	Switchgear	CB	. 21.5	22	Qualification Report	Demand
						AC/DC									
					Tripping	Power									
					Relay Bus	Support			1-EDE-SWG-					Plant Seismic	Capacity>
144	1	AR3	94-2	1,3	UV	Systems	Westinghouse	AR	6	Switchgear	CB	21.5	32	Qualification Report	Demand
						AC/DC									
		{				Power									
			HR8		EPS Starting	Support	Westinghouse			Control					Capacity>
145	1	AR3	(K83)	4,5	Relay	Systems	/ABB	AR	1-DG-CP-80	Panel	CB	21.5	31	Plant Document	Demand
						AC/DC									
	1	[				Power					1		1		
					Auxiliary	Support			1-EDE-SWG-					Plant Seismic	Capacity>
146	1	AR3	R1	5,7	Relay	Systems	Westinghouse	AR	6	Switchgear	CB	21.5	29	Qualification Report	Demand
						AC/DC									
					Time	Power									
			50/51φ		Overcurrent	Support	General	12IAC53B8	1-EDE-SWG-					Plant Seismic	Capacity>
147	1	A83	A	50; 51; SI	Relay	Systems	Electric	11A	6	Switchgear	CB	21.5	10	Qualification Report	Demand
					1	AC/DC									
					Time	Power									
			50/51¢		Overcurrent	Support	General	12IAC53B8	1-EDE-SWG-					Plant Seismic	Capacity>
148	1	A83	B	50; 51; SI	Relay	Systems	Electric	11A	6	Switchgear	CB	21.5	10	Qualification Report	Demand
1				1		AC/DC									
					Time	Power							]		
			50/51φ		Overcurrent	Support	General	12IAC53B8	1-EDE-SWG-					Plant Seismic	Capacity>
149	1	A83	C	50; 51; SI	Relay	Systems	Electric	11A	6	Switchgear	CB	21.5	10	Qualification Report	Demand
						AC/DC									
						Power									
1			(0.0.1		Timing	Support			1-EDE-SWG-					High Frequency Test	Capacity>
150	<u> </u>	DQ8	62BLL	1,5	Relay	Systems	AGASTAT	E/012AE	110	Switchgear	CB	21.5	4	Program	Demand
						AC/DC									
						Power									
1 1 5 1	1	DNA	CODIL	15	Timing	Support	A.G.A.GTTAT	<b>D</b> 70404D	I-EDE-SWG-		an	04 5		High Frequency Test	Capacity>
151	<u>1</u>	DN4	62BLL	1,5	кејау	Systems	AGASTAT	E/012AE	TIR	Switchgear	CB	21.5	4	Program	Demand
						AC/DC									
					Normal Chai	rower				Cantural				Iliah Engar	Competition
150	1	EDC 1A	-	25	Normai Stop	Support	ACASTAT	ETODODE	1 DC CD 26	Control	DCD	21 5	-	nign Frequency Test	Capacity>
152	1	EDG-1A	3	3,5	пенау	Systems	AGASIAI	E/UZZPE	1-DG-CF-36	ranei		21.5	· · ·	rrogram	Demand
1						AL/DL			1						
					Tachomator	Fower				Control				Diant Colon-1-	Canadita
152	1	EDC 14	Dou TP	Dou TP	Relay	Support			1 DC CD 26	Banal	DCP	21 5	25	Priant Seismic	Capacity>
155	I	EDG-1A	Dev-IR	Dev-IR	кејау	Systems			1-DG-CP-30	Panei	DGB	21.5	35		Demand
1				1		AC/DC									
						Support				Control					Capacitus
154	1	FDG-1A	44	44	Start Palay	Svetame	ITE	113	1-DC-CP 26	Panel	DCP	21 5	10	CEPS	Demand
134		PD0-14		-1/1	Start Kelay		1115	113	1-00-01-30			41.3	17	0000	Demanu
						Power									
						Support				Control					Canacity
155	1	EDG-14	4B	4B	Start Relay	Systeme	ITE	113	1-DG-CP-36	Panel	DCR	215	10	GERS	Demand
100	<b>1</b>	JPG IN		- 15	Start Iteray	AC/DC		J15	1.00-01-30	ranci		<u> </u>	19	0110	Demanu
					Emergency	Power									
					Device	Sunnort	General			Control				Plant Seismic	Canacitus
156	1	EDG-1A	SE	SF	Relay	Systems	Flectric	CR-120BD	1-DG-CP-36	Panel	DGB	215	15	Qualification Report	Demand
	, <u> </u>	LUDU IN	1 00		iciuy	Systems	Siccure	J SIC LLODD	1 1 0 0 - 50	runci	, Dub	21.0	10	2 aumeauon neport	Demanu

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					Co	omponent			Enclo	sure	8	Floor		Component Evaluation	on
			Device		and the second second	System			a share a state of the			Elev.	900-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	mana dipetracher and	
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC				1					
					Starting Air	Power									
155				100	Shutoff	Support	General	GD 400DD	1 00 00 00	Control	Dan	0.1 5	45	Plant Seismic	Capacity>
157	1	EDG-1A	ASR	ASR	Relay	Systems	Electric	CR-120BD	1-DG-CP-36	Panel	DGB	21.5	15	Qualification Report	Demand
					Chauting Air	AC/DC									
					Value Belay	Support				Control					Capacity
158	1	FDG-14	454	454	FV_AS1	Systems	ITE	113	1-DG-CP-36	Panel	DGB	215	19	GFRS	Demand
150	<u>1</u>	LDU-IA	AJA	AJA	I I AJI	AC/DC		J15	1-Du-Ci-50	Tanci		21.5		dENS	Demand
					Starting Air	Power									
					Valve Relav	Support				Control					Capacity>
159	1	EDG-1A	ASB	ASB	FY-AS2	Systems	ITE	113	1-DG-CP-36	Panel	DGB	21.5	19	GERS	Demand
					Jacket	AC/DC									
					Coolant	Power									
					Hight Temp	Support				Control					Capacity>
160	1	EDG-1A	СТН	СТН	Aux Relay	Systems	ITE	J13	1-DG-CP-36	Panel	DGB	21.5	19	GERS	Demand
					Jacket	AC/DC									
					Coolant	Power									
					Hight Temp	Support	General			Control				Plant Seismic	Capacity>
161	1	EDG-1A	CTH-1	1T,1	Aux Relay	Systems	Electric	CR-120BD	1-DG-CP-36	Panel	DGB	21.5	15	Qualification Report	Demand
						AC/DC									
			DCA DC		Coolant	Power				Contral				Direct Calanda	Guiden
162	1	EDC 14	DGA-PS-	DCA DC CDC	Pressure	Support			1 DC CD 26	Control	DCD	21 5	10	Plant Seismic	Capacity>
102	1	EDG-1A	LPS	DGA-PS-GPS	Switch	Systems			1-DG-CP-30	Panel	DGB	21.5	18	Quanneation Report	Demand
					Engine	AC/DC Power			-						
					Overspeed	Support	General			Control				Plant Seismic	Canacity
163	1	EDG-1A	EOR	EOR	Relay	Systems	Electric	CR-120BD	1-DG-CP-36	Panel	DGB	215	15	Qualification Report	Demand
			2011	2011	nong	AC/DC	Litterite	011 22000	1000.00					Quantion in the point	2 Children
					Engine	Power									
					Overspeed	Support				Control				Plant Seismic	Capacity>
164	1	EDG-1A	EOS	EOS	Relay	Systems			1-DG-CP-36	Panel	DGB	21.5	27	Qualification Report	Demand
						AC/DC									
						Power									
					Emergency	Support				Control					Capacity>
165	1	EDG-1A	ES1	ES1	Start Relay	Systems	ITE	J13	1-DG-CP-36	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
						Power									
100		EDC 14	ECO	ESO	Emergency	Support	ITE	112	1 DC CD 36	Lontrol	DCD	24 5	10	CEDC	Capacity>
100	1	EDG-1A	E97	E52	start Kelay	Systems	11E	)13	1-DG-CP-36	Panel	DGB	21.5	19	UEKS	Demand
					Emorgoner	AC/DC									
					Start Aux	Support	General			Control				Plant Seismic	Canacity
167	1	EDG-1A	ESX	3T3.4T4	Relay	Systems	Electric	CR-120BD	1-DG-CP-36	Panel	DGB	215	15	Qualification Report	Demand
		100 III		510, 11,1		AC/DC		511 10000	1 20 01 00	1 41101	200	L 1.5		zaumention report	Demanu
						Power							1		
					Oil Pressure	Support				Control					Capacity>
168	1	EDG-1A	OP2	OP2	Relay	Systems	ITE	]13	1-DG-CP-36	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
						Power									
					Oil Pressure	Support				Control					Capacity>
169	1	EDG-1A	OP3	OP3	Relay	Systems	ITE	J13	1-DG-CP-36	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
						Power									
1.55					Oil Pressure	Support				Control					Capacity>
170	1	EDG-1A	OP4	OP4	Relay	Systems	ITE	J13	1-DG-CP-36	Panel	DGB	21.5	19	GERS	Demand

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					Co	omponent			Enclo	sure		Floor		Component Evaluati	on
			Device		1	System				1	7	Elev.	and the second		
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC									
					011	Power				Cambral					Consoltan
171	1	EDC 14	OTU	OTU	Oil Temp	Support	ITE	112	1 DC CD 26	Control	DCP	21 5	10	CEDS	Lapacity>
1/1	1	EDG-1A		UIN	Relay			J15	1-D0-C1-30	Tallei	Dub		19	dens	Demand
						Power									
					Oil Temp	Support	General			Control				Plant Seismic	Capacity>
172	1	EDG-1A	OTH-1	1T,1	Relay	Systems	Electric	CR-120BD	1-DG-CP-36	Panel	DGB	21.5	15	Qualification Report	Demand
						AC/DC			-						
					Starting	Power				Cantral					Constitute
173	1	FDC-1A	SER	SER	Relay	Support	ITE	113	1-DC-CP-36	Panel	DGB	215	19	GERS	Demand
1/5		LDU-IA	JIK	STR	Relay	AC/DC			I Du ci Su	I difei		21.5	17		Demand
1						Power									
					Shutdown	Support				Control					Capacity>
174	11	EDG-1A	SDR	SDR	Relay	Systems	ITE	J13	1-DG-CP-36	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
1					Storting	Power				Control					Capacitys
175	1	EDG-1A	T2A	1.5	Time Relay	Systems	AGASTAT	E7012PC	1-DG-CP-36	Panel	DGB	21.5	5	GERS	Demand
1/5		bbd m	1211	1,5	Thile Relay	AC/DC	Inditio IIII	Biothig	1 Du di Du	T union	- Dub			GLIKE	Demana
						Power									
					Starting	Support				Control					Capacity>
176	1	EDG-1A	T2B	1,5	Time Relay	Systems	AGASTAT	E7012PC	1-DG-CP-36	Panel	DGB	21.5	5	GERS	Demand
						AC/DC									
					Alarm Set	Power				Control					Canacitys
177	1	EDG-1A	T3A	1.5	Relay	Svstems	AGASTAT	E7014PC	1-DG-CP-36	Panel	DGB	21.5	6	GERS	Demand
						AC/DC					1				
						Power									
					TR Control	Support				Control					Capacity>
178	1	EDG-1A	TRP	TRP	Power Relay	Systems		J13	1-DG-CP-36	Panel	DGB	21.5	19	GERS	Demand
						AC/DC Bower									
					Normal Stop	Support				Control				High Frequency Test	Canacity>
179	1	EDG-1B	5	3,5	Relay	Systems	AGASTAT	E7022PE	1-DG-CP-37	Panel	DGB	21.5	7	Program	Demand
						AC/DC									
						Power									
100	1	EDC 1D	DTD	D TD	Tachometer	Support			1 DC CD 27	Control		21 5	25	Plant Seismic	Capacity>
180	1	EDG-18	Dev-1K	Dev-1K	кејау	Systems			1-DG-CP-3/	ranei		21.5	55	Qualification Report	Demand
1						Power									
						Support				Control					Capacity>
181	1	EDG-1B	4A	4A	Start Relay	Systems	ITE	J13	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
						Power									
102	1	EDC 1D	4.0	4.0	Chant Dalary	Support	ITE	110	1 DC CD 27	Control	DCD	21 5	10	CEDC	Capacity>
182	1	EDG-18	40	40	Start Kelay		11E		1-DA-CK-3/	Panel	DGR		19	UEKS	Demand
					Emergency	Power									
					Device	Support	General			Control				Plant Seismic	Capacity>
183	1	EDG-1B	5E	5E	Relay	Systems	Electric	CR-120BD	1-DG-CP-37	Panel	DGB	21.5	15	Qualification Report	Demand
						AC/DC									
					Starting Air	Power	Comonal			Cantural				Dlank Colon-1-	Canadita
1.84	1	FDG-1R	ASR	ASR	Snutoff	Systems	General	CR-120RD	1-DG-CP-27	Lontrol Panel	DCR	21 5	15	Plant Seismic	Capacity>
L 107				1.51	inclay	Systems	ыссин		1 1-00-01-07	ranci		61.0	10	Quanneacion Report	Demanu

				· · · · · · · · · · · · · · · · · · ·	Co	omponent			Enclo	osure		Floor		Component Evaluation	on
			Device			System						Elev.			
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC									
					Starting Air	Power									
					Valve Relay	Support				Control					Capacity>
185	1	EDG-1B	ASA	ASA	FY-AS1	Systems	ITE	J13	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
					Starting Air	Power									C
100		EDG 4D	100	4.610	Valve Relay	Support	ITT	110	1 DC CD 27	Control	DCD	21 5	10	CEDC	Capacity>
186	I	EDG-1B	АЗВ	ASB	FT-ASZ	Systems	IIE	J15	1-DG-CF-37	Panel	DGB		19	GERS	Demanu
					Jacket Coolant	AC/DC Power									
	1				Hight Temn	Support				Control					Canacity>
187	1	EDG-1B	СТН	СТН	Aux Relay	Systems	ITE	113	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
		DDG 1D			lacket	AC/DC		1							
					Coolant	Power									
					Hight Temp	Support	General			Control				Plant Seismic	Capacity>
188	1	EDG-1B	CTH-1	1T,1	Aux Relay	Systems	Electric	CR-120BD	1-DG-CP-37	Panel	DGB	21.5	15	Qualification Report	Demand
						AC/DC									
					Coolant	Power									
			DGB-PS-		Pressure	Support				Control					Capacity>
189	1	EDG-1B	CPS	DGA-PS-CPS	Switch	Systems	ITE	J13	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
					Engine	Power				Contral				Discrite Calanata	Generality
100	1	EDC 1D	FOR	FOR	Overspeed	Support	Electric	CD 120PD	1 DC CD 27	Control	DCP	21 5	15	Plant Seismic	Capacity>
190	1	EDG-ID	EUR	EUK	Relay		Electric	CK-120BD	1-Du-Cr-57	Fallel	DGB	21.5	15	Quanneation Report	Demanu
1	1				Engine	Power									
					Overspeed	Support				Control				Plant Seismic	Canacity>
191	1	EDG-1B	EOS	EOS	Relay	Svstems			1-DG-CP-37	Panel	DGB	21.5	27	Qualification Report	Demand
						AC/DC									
						Power									
					Emergency	Support				Control					Capacity>
192	1	EDG-1B	ES1	ES1	Start Relay	Systems	ITE	J13	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
					_	Power									
100		DDG 4D		504	Emergency	Support		14.0	4 DG GD 07	Control	DOD	04 5	10	GEDG	Capacity>
193	1	EDG-18	ESZ	ESI	Start Relay	Systems	IIE	<u></u>	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
					Emorgoncy	AC/DC Bower									
					Start Time	Support	General			Control				Plant Seismic	Canacitys
194	1	EDG-1B	ESX	3T3 4T 4	Relay	Systems	Electric	CR-120BD	1-DG-CP-37	Panel	DGB	21.5	15	Qualification Report	Demand
		223 10		,		AC/DC						_ 1.0	10		
						Power									
					Oil Pressure	Support				Control					Capacity>
195	1	EDG-1B	OP2	OP1	Relay	Systems	ITE	J13	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
						Power									
					Oil Pressure	Support				Control	1				Capacity>
196	1	EDG-1B	OP3	OP2	Relay	Systems	ITE	J13	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
					O'l Durrant	Power				Contral					Compatibut
107	1	FDC 1P	OPA	OP2	Oil Pressure	Support	ITE	112	1 DC CP 27	Ranol	DCP	21 5	10	CEPS	Lapacity>
19/	<sup>1</sup>	EDG-1B	014	013	менау		116	515	1-Du-CP-3/	Fallel		41.5	19	<u>чыкэ</u>	Demanu
						Power									
1					Oil Temn	Sunnort				Control	1				Canacity>
198	1	EDG-1B	отн	OP4	Relav	Systems	ITE	113	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
L					· · · · · · · · · · · · · · · · · · ·			l							1

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			- Desta			omponent			Enclo	sure	1	Floor		Component Evaluation	on
			Device			System				1		Elev.			
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC									
					0.1 m	Power									
100	1	EDC 1D		OTU	Dil Temp	Support	General	CD 120DD	1 DC CD 27	Control	DCD	21 5	15	Plant Seismic	Capacity>
199	1	EDG-1B	UIH-1	UIH	Relay		Electric	CR-120BD	1-DU-CP-37	Panel	DGB	21.5	15		Demand
					Starting	Power									
					Failure	Support				Control					Capacity>
200	1	EDG-1B	SFR	1T,1	Relay	Systems	ITE	J13	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
						Power									
					Shutdown	Support				Control					Capacity>
201	1	EDG-1B	SDR	SFR	Relay	Systems	ITE	J13	1-DG-CP-37	Panel	DGB	21.5	19	GERS	Demand
						AC/DC									
					Starting	Support				Control					Capacitys
202	1	EDG-1B	T2A	SDR	Time Relay	Systems	AGASTAT	E7012PC	1-DG-CP-37	Panel	DGB	215	5	GERS	Demand
101		BDG ID		BBR	Thile itelay	AC/DC	Inditio IIII	Broillig		Tuner	Dub	<u> </u>			Demana
						Power									
					Starting	Support				Control					Capacity>
203	1	EDG-1B	T2B	1,5	Time Relay	Systems	AGASTAT	E7012PC	1-DG-CP-37	Panel	DGB	21.5	5	GERS	Demand
						AC/DC									
						Power									
					Alarm Set	Support				Control					Capacity>
204	1	EDG-1B	T3A	1,5	Relay	Systems	AGASTAT	E7014PC	1-DG-CP-37	Panel	DGB	21.5	6	GERS	Demand
						AC/DC									
					TD Control	Power				Control					Consoltan
205	1	FDG-1B	TRP	15	Power Relay	Support	ITE	113	1-DC-CP-37	Panel	DGB	215	19	GERS	Demand
205	1	LDG ID		1,5	1 ower neury	AC/DC			1 Du di 5/	Tanci	Dub	21.5	1)	dino	Demand
						Power									
					Timing	Support			1-EDE-SWG-					High Frequency Test	Capacity>
206	1	DM2	62BLL	1,5	Relay	Systems	AGASTAT	E7012AE	11A	Switchgear	CB	21.5	4	Program	Demand
						AC/DC									
					Time	Power									
0.07		454	5434	<b>F4 01</b>	Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-		an	01 5	10	Plant Seismic	Capacity>
207	1	A51	51¢A	51; 51	Relay	Systems	Electric	03A	5	Switchgear	CB	21.5	12	Qualification Report	Demand
					Time	AC/DC Bower									
					Overcurrent	Support	Ceneral	121407748	1-FDF-SWG-					Plant Seismic	Canacitys
208	1	A51	51dB	51: SI	Relay	Systems	Electric	03A	5	Switchgear	CB	21.5	12	Qualification Report	Demand
						AC/DC						21.5	10		2 chiana
					Time	Power									
					Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-					Plant Seismic	Capacity>
209	1	A51	51фC	51; SI	Relay	Systems	Electric	03A	5	Switchgear	CB	21.5	12	Qualification Report	Demand
						AC/DC									
				1	Time	Power									
					Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-					Plant Seismic	Capacity>
210	11	A52	51¢A	51; SI	Relay	Systems	Electric	03A	5	Switchgear	CB	21.5	12	Qualification Report	Demand
					Time	AC/DC									
					Overcurrent	Fower	Conoral	121407740	1 EDE SWC	]				Plant Saismis	Canacitus
211	1	A52	51dB	51.51	Relay	Systems	Flectric	034	5	Switchgear	CB	215	12	Qualification Report	Demand
		1101	0140	51,01	icity	AC/DC			<u> </u>	Switcingcal	- 30		14	2. aumention report	Demanu
					Time	Power									
					Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-					Plant Seismic	Capacity>
212	1	A52	51¢C	51; SI	Relay	Systems	Electric	03A	5	Switchgear	CB	21.5	12	Qualification Report	Demand

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1.1					C	omponent			Enclo	osure	n - C An an An An An An	Floor		Component Evaluati	on
	5		Device			System		1				Elev.	19	et di karalar da pasisira da	
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
						AC/DC									
					Time	Power	Cananal	121407740	1 EDE SWC		}			Dlant Colomia	Canacitan
213	1	Δ71	51.64	51.51	Relay	Systems	Flectric	034	6	Switchgear	CB	215	12	Qualification Report	Demand
215				51,51	Relay	AC/DC	Licetre	0.011	+- <sup>0</sup>	Bwittengeur		21.0		Quanneación Report	Demund
					Time	Power									
					Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-					Plant Seismic	Capacity>
214	1	A71	51фB	51; SI	Relay	Systems	Electric	03A	6	Switchgear	CB	21.5	12	Qualification Report	Demand
						AC/DC									
1					Time	Power		401407740							
215	1	171	F14C	F1. CI	Dvercurrent	Support	General	12IAC//A8	I-EDE-SWG-	Curitah gaan	CD	21 5	12	Plant Seismic	Capacity>
215	1	A/1	5100	51; 51	кејау	Systems	Elecuric	USA	0	Switchgear		21.5	12	Quantication Report	Demand
					Time	Power									
					Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-					Plant Seismic	Capacity>
216	1	A72	51фА	51; SI	Relay	Systems	Electric	03A	6	Switchgear	CB	21.5	12	Qualification Report	Demand
						AC/DC									
					Time	Power									
					Overcurrent	Support	General	12IAC77A8	1-EDE-SWG-					Plant Seismic	Capacity>
217	1	A72	<u>51φB</u>	51; SI	Relay	Systems	Electric	03A	6	Switchgear	CB	21.5	12	Qualification Report	Demand
					Time	AC/DC Rower									
					Overcurrent	Support	General	121407748	1-EDE-SWG-					Plant Seismic	Canacity>
218	1	A72	51¢C	51: SI	Relay	Systems	Electric	03A	6	Switchgear	СВ	21.5	12	Qualification Report	Demand
			1		Spray	AC/DC									
					Actuation	Power									
					Output	Support	Potter	MDR-4121-		Control					Capacity>
219	1	A81	K644B	13,14; 15,16	Relay	Systems	Brumfield	1	1-MM-CP-13	Panel	CB	75	24	Plant Document	Demand
					Emergency	AC/DC									
			100		Sequencer	Support	Westinghouse			Control					Capacitus
220	1	A81	(K84)	45	Relay	Systems	/ABB	AR	1-DG-CP-80	Panel	CB	215	31	Plant Document	Demand
				1,0	Spray	AC/DC	71100		I Du ur ou	Tuner	GD			Thine Document	Demand
					Actuation	Power									
					Output	Support	Potter	MDR-4121-		Control					Capacity>
221	1	A61	K644A	13,14; 15,16	Relay	Systems	Brumfield	1	1-MM-CP-12	Panel	CB	75	24	Plant Document	Demand
					Emergency	AC/DC									
			LDO		Power	Power				Cantral					Gundita
222	1	461	(K84)	45	Relay	Support	/ABB	AR	1-DC-CP-79	Panel	CR	215	21	Plant Document	Demand
		101		1,5	Emergency	AC/DC	1100		1.00-01-79			41.5		i mit Document	Demanu
			PR1		Power	Power									
			(K7,K10		Sequencer	Support				Control					Capacity>
223	1	A79		5,6; 11,12	Relay	Systems	ITE	J13	1-DG-CP-80	Panel	CB	21.5	19	GERS	Demand
					Emergency	AC/DC									
			PR1		Power	Power									
224	1	478	(K8,K10   )	910.1516	Relay	Support	ITE	113	1-DG-CP-80	Control	CB	215	10	CERS	Capacity>
- 227	<u>1</u>	A/U		7,10, 13,10	Emergency	AC/DC	115		1-Du-Cr-60	i allei	CD	41.3	19	UERO	Demanu
			PR1		Power	Power									
			(K8,K10		Sequencer	Support				Control					Capacity>
225	1	A59	)	5,6; 11,12	Relay	Systems	ITE	J13	1-DG-CP-79	Panel	CB	21.5	19	GERS	Demand
					Emergency	AC/DC									
			PR1		Power	Power									
220	4	450	(K7,K10	0.10.15.16	Sequencer	Support	ITTE	112	1 DC CD 70	Control	CR	04 F	10	CEDC	Capacity>
226	1	A28		9,10;15,16	кејау	Systems	1 11 15	]13	I-DG-CP-79	Panel	CB	21.5	19	GERS	Demand

1.00			·····		C	omponent			Enclo	osure		Floor	Sec	Component Evaluati	on
			Device			System				· · · · · · · · · · · · · · · · · · ·		Elev.	2-2-2-2		
No	Unit	ID	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
					SI Signal	AC/DC									
					Actuating	Power	<b>_</b>								
227	1	457	NC01A	10 17 10	Output	Support	Potter	MDR-4121-	1 MM CD 12	Control		75	0.4		Capacity>
	1	A57	KOUIA	1,2; 17,18	Emorgoney	Systems	Brunnieu	1	1-MM-GP-12	Panel		/5		Plant Document	Demand
					Power	Power									
			PR1		Sequencer	Support				Control					Capacity>
228	1	A57	(K7)	11,12	Relay	Systems	ITE	113	1-DG-CP-79	Panel	CB	21.5	19	GERS	Demand
					SI Signal	AC/DC									
					Actuating	Power									
					Output	Support	Potter	MDR-4121-		Control					Capacity>
229	1	A62	K616A	7,8	Relay	Systems	Brumfield	1	1-MM-CP-12	Panel	CB	75	24	Plant Document	Demand
					Emergency	AC/DC									
			DOV		Power	Power	We obly also up a			Control					Consider
220	1	162	(V72)	22	Polov	Support	/APP	AP	1 DC CP 70	Panal	CP	21 5	21	Plant Document	Capacity>
230	<b>1</b>	A02	(K/3)	2,5	SI Signal	AC/DC	TADD		1-Du-ci-77	1 alle1				T lance Document	Demand
					Actuating	Power									
					Output	Support	Potter	MDR-4121-		Control					Capacity>
231	1	A76	K610B	1,2; 11, 12	Relay	Systems	Brumfield	1	1-MM-CP-13	Panel	CB	75	24	Plant Document	Demand
					SI Signal	AC/DC									
					Actuating	Power									
					Output	Support	Potter	MDR-4121-		Control					Capacity>
232	1	A56	K610A	1,2; 11, 12	Relay	Systems	Brumfield	1	1-MM-CP-12	Panel	CB	75	24	Plant Document	Demand
					Si Signal	AC/DC									
					Output	Support	Potter	MDR-4121-		Control					Capacitys
233	1	A77	K601B	1.2: 17.18	Relay	Systems	Brumfield	1	1-MM-CP-13	Panel	CB	75	2.4	Plant Document	Demand
					Emergency	AC/DC									
					Power	Power									
			PR1		Sequencer	Support				Control					Capacity>
234	1	A77	(K7)	11,12	Relay	Systems	ITE	J13	1-DG-CP-80	Panel	CB	21.5	19	GERS	Demand
						AC/DC									
					Auvilian	Power	Cananal		1 EDE SWC					Diant Colomia	Conseitra
235	1	493	PS5X	28	Relay	Support	Flectric	НСА	1-EDE-SWG-	Switchgear	CB	215	17	Qualification Report	Demand
200		1175	135/	2,0	Relay	AC/DC	Liccure	nun	5	Switcingcai				Quanneación Report	Demand
					Mech	Power									
					Operated	Support			1-EDE-SWG-					Plant Seismic	Capacity>
236	1	A93	52S	59,60	Switch	Systems	ITE	N/A	5	Switchgear	CB	21.5	9	Qualification Report	Demand
					Reactor	AC/DC									
					Protector	Power	_								
007		100	LIC AOD	07.010	System Aux.	Support	Potter	MDR-4103-	4 101 00 40	Control	0.0				Capacity>
	1	A80	K640B	8,7; 9,10	Relay	Systems	Brumfield	1	1-MM-CP-13	Panei	CB	/5	25	Plant Document	Demand
					Protector	Power									
					System Aux.	Support	Potter	MDR-4121-		Control					Capacity>
238	1	A80	K615B	7,8; 11,12	Relay	Systems	Brumfield	1	1-MM-CP-13	Panel	СВ	75	24	Plant Document	Demand
				· · · · · · · · · · · · · · · · · · ·		AC/DC									
						Power									
					Isolation	Support	Struthers-		1-MM-CP-	Control					Capacity>
239	1	A80	KA24	10,11	Relay	Systems	Dunn	219XBX234	470	Panel	CB	75	28	Plant Document	Demand
					Emergency	AC/DC									
			FPS-DD1		Sequencer	Support				Control					Canacitus
240	1	A80	(K7)	13.14	Relav	Systems	ITE	113	1-DG-CP-80	Panel	CB	21.5	19	GERS	Demand
1	-		1 (11)					, ,==							, womana

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					C	omponent	· · ·		Enclo	sure		Floor		Component Evaluati	on
			Device			System	1					Elev.	dia second	tala béhéheré Alat zan arts	
No	Unit	ID .	ID	Contacts	Туре	Function	Manufacturer	Model No.	ID	Туре	Bldg.	(ft)	Gr.	Basis for Capacity	Result
2					Tower	AC/DC									
					Actuation	Power									
		[			Signal Aux	Support			1-EDE-CP-	Control					Capacity>
241	1	AU6	RTB	8T,8	Relay	Systems	ITE	J13	249	Panel	CB	21.5	19	GERS	Demand
					Emergency	AC/DC									
					Power	Power									
			HR8		Sequencer	Support	Westinghouse			Control					Capacity>
242	1	AU6	(K83)	1,10	Relay	Systems	/ABB	AR	1-DG-CP-80	Panel	CB	21.5	31	Plant Document	Demand
						AC/DC									
					High Speed	Power									
					Auxiliary	Support	Westinghouse		1-EDE-SWG-					Plant Seismic	Capacity>
243	1	AU6	R4	5,7	Relay	Systems	/ABB	AR	6	Switchgear	CB	21.5	33	Qualification Report	Demand
					Tower	AC/DC									
					Actuation	Power									
					Signal Aux	Support			1-EDE-CP-	Control					Capacity>
244	1	AU2	RTA	4T,4	Relay	Systems	ITE	J13	248	Panel	CB	21.5	19	GERS	Demand
					Emergency	AC/DC									
					Power	Power									
			HR8		Sequencer	Support	Westinghouse			Control					Capacity>
245	1	AU2	(K83)	1,10	Relay	Systems		AR	1-DG-CP-79	Panel	CB	21.5	31	Plant Document	Demand
						AC/DC									
					High Speed	Power									
0.16					Auxiliary	Support	Westinghouse	4.0	1-EDE-SWG-		GD	04 5		Plant Seismic	Capacity>
246	1	AUZ	R4	5,7	Relay	Systems	/АВВ	AR	5	Switchgear	CR	21.5	33	Qualification Report	Demand
					SI Signal	AC/DC									
					Actuating	Power	Detter	MDD 4101		Cantral					Conseibus
247	1	402	V(1CD	7.0	Dutput	Support	Potter	MDR-4121-	1 MM CD 12	Control	CD	75	24	Blant Dammant	Capacity>
24/		A82	KOTOR	7,8	кејау	Systems	Бгашиена	L	1-MM-UP-13	ranei	CB	/5		Fiant Document	Demand
					Emergency	AC/DC									
			DOV		Sequencer	Support	Westinghouse			Control					Capacitus
24.9	1	102	(172)	22	Polay	Support	/ARR	AD	1-DC-CP-90	Panel	CR	215	21	Plant Document	Domand
440	1 1	102	[[[[, ]]]]	4,5	neiay	Jystems	///////////////////////////////////////	AIL	1-DU-CF-00	Tanci		41.5	51	rianc Document	Demanu

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	АВ	700-P400A1	1.429	2.086
2	Control Building	21.5	Switchgear	GE	СЕН	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

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.	I	L		L		
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