Exelon Generation

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U.S. Nuclear Regulatory Commission
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Limerick Generating Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353

Subject: High Frequency Supplement to Seismic Hazard Screening Report, 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

References:

1. NRC Letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 12, 2012 (ML12053A340)
2. NRC Letter, Electric Power Research Institute Report 3002000704, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," As An Acceptable Alternative to the March 12, 2012, Information Request for Seismic Reevaluations, dated May 7, 2013 (ML13106A331)
3. NEI Letter, Final Draft of Industry Seismic Evaluation Guidance, Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic (EPRI 1025287), dated November 27, 2012 (ML12333A168 and ML12333A170)
4. NRC Letter, Endorsement of Electric Power Research Institute Final Draft Report 1025287, "Seismic Evaluation Guidance, Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," dated February 15, 2013 (ML12319A074)
5. Exelon Generation Company, LLC letter to NRC, Limerick Generating Station, Units 1 and 2 - Seismic Hazard and Screening Report (CEUS Sites), Response to NRC Request for Information Pursuant to 10CFR50.54(f) Regarding Recommendation 2.1 of Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident, dated March 31, 2014 (RS-14-069) (ML14090A236)

6. NRC Letter, Screening and Prioritization Results Regarding Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Seismic Hazard Re-evaluations for Recommendation 2.1 of the Near Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated May 9, 2014 (ML14111A147)
7. NRC Memorandum, Support Document for Screening and Prioritization Results Regarding Seismic Hazard Re-Evaluation for Operating Reactors in the Central and Eastern United States, dated May 21, 2014 (ML14136A126)
8. NEI Letter, Request for NRC Endorsement of High Frequency Program: Application Guidance for Functional Confirmation and Fragility Evaluation (EPRI 3002004396), dated July 30, 2015 (ML15223A100/ML15223A102)
9. NRC Letter to NEI: Endorsement of Electric Power Research Institute Final Draft Report 3002004396: "High Frequency Program: Application Guidance for Functional Confirmation and Fragility," dated September 17, 2015 (ML15218A569)
10. 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, dated October 27, 2015 (ML15194A015)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued a Request for Information per 10 CFR 50.54(f) (Reference 1) to all power reactor licensees. The required response section of Enclosure 1 of Reference 1 indicated that licensees should provide a Seismic Hazard Evaluation and Screening Report within 1.5 years from the date of the letter for Central and Eastern United States (CEUS) nuclear power plants. By NRC letter dated May 7, 2013 (Reference 2), the date to submit the report was extended to March 31, 2014.

By letter dated May 9, 2014 (Reference 6), the NRC transmitted the results of the screening and prioritization review of the seismic hazards reevaluation report for Limerick Generating Station, Units 1 and 2 submitted on March 31, 2014 (Reference 5). In accordance with the Screening, Prioritization, and Implementation Details report (SPID) (References 3 and 4), and Augmented Approach Guidance (Reference 2), the reevaluated seismic hazard is used to determine if additional seismic risk evaluations are warranted for a plant. Specifically, the reevaluated horizontal Ground Motion Response Spectrum (GMRS) at the control point elevation is compared to the existing Safe Shutdown Earthquake (SSE) or Individual Plant Examination for External Events (IPEEE) High Confidence of Low Probability of Failure (HCLPF) Spectrum (IHS) to determine if a plant is required to perform a high frequency confirmation evaluation. As noted in the May 9, 2014 letter from the NRC (Reference 6) on page 3 of Enclosure 2, Limerick Generating Station, Units 1 and 2 is to conduct a limited scope High Frequency Evaluation (Confirmation).

Within the May 9, 2014 letter (Reference 6), the NRC acknowledged that these limited scope evaluations will require additional development of the assessment process. By Reference 8, the Nuclear Energy Institute (NEI) submitted an Electric Power Research Institute (EPRI) report entitled, High Frequency Program: Application Guidance for Functional Confirmation and Fragility Evaluation (EPRI 3002004396) for NRC review and endorsement. NRC endorsement

was provided by Reference 9. Reference 10 provided the NRC final seismic hazard evaluation screening determination results and the associated schedules for submittal of the remaining seismic hazard evaluation activities.

The High Frequency Evaluation Confirmation Report for Limerick Generating Station, Units 1 and 2, provided in the enclosure to this letter, shows that all high frequency susceptible equipment evaluated within the scoping requirements and using evaluation criteria of Reference 8 for seismic demands and capacities, are acceptable. Therefore, no additional modifications or evaluations are necessary.

This transmittal completes the scope of work described in Section 4.2 of Reference 5 for Limerick Generating Station, Units 1 and 2.

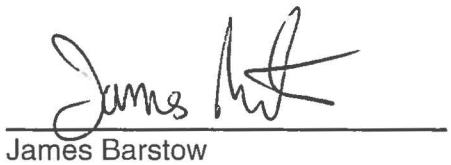
This letter closes the associated regulatory commitment contained in Enclosure 2 of Reference 5 for Limerick Generating Station, Units 1 and 2.

This letter contains no new regulatory commitments.

If you have any questions regarding this report, please contact Ronald Gaston at 630-657-3359.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 28th day of November 2016.

Respectfully submitted,



James Barstow
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Enclosure: Limerick Generating Station, Units 1 and 2 - Seismic High Frequency Evaluation Confirmation Report

cc: NRC Regional Administrator - Region I
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Enclosure

Limerick Generating Station, Units 1 and 2

Seismic High Frequency Evaluation Confirmation Report

(110 pages)

HIGH FREQUENCY CONFIRMATION REPORT

IN RESPONSE TO NEAR TERM TASK FORCE (NTTF) 2.1 RECOMMENDATION

for the

LIMERICK GENERATING STATION, UNITS 1 AND 2
3146 Sanatoga Rd, Pottstown, PA 19464
Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353
Correspondence No.: RS-16-177

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Document ID: 15C4345-RPT-002 Title: High Frequency Confirmation Report for Limerick Generating Station, Unit 1 and 2 in Response to Near Term Task Force (NTTF) 2.1 Recommendation

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Project Name: Limerick, Unit 1 and 2 High Frequency Confirmation
Job No.: 15C4345
Client: Exelon

This document has been prepared under the guidance of the S&A Quality Assurance Program Manual, Revision 18 and project requirements:

For Owner's Acceptance Review (Rev. 0)		
Originated by: F. Ganatra		Date: 10/27/2016
Checked by: M. Delaney		Date: 10/27/2016
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S&A Stevenson & Associates	DOCUMENT APPROVAL SHEET Figure 2.8			PROJECT NO. 15C4345

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 [15] 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 Limerick Generating Station, Unit 1 and 2 (LIM). 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 LIM 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 31, 2014, LIM 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 LIM 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 conclusions made as a result of the evaluations.

1.3 APPROACH

EPRI 3002004396 [8] is used for the LIM 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:

- LIM 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

LIM submitted reevaluated seismic hazard information including GMRS and seismic hazard information to the NRC on March 31, 2014 [4]. In a letter dated November 6, 2015, the NRC staff concluded that the submitted GMRS adequately characterizes the reevaluated seismic hazard for the LIM site for 2.1 Seismic [14].

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

1.5 REPORT DOCUMENTATION

Section 2 describes the selection of devices. The identified devices are evaluated in Reference [17] for the seismic demand specified in Section 3 using the evaluation criteria discussed in Section 4. The overall conclusion is discussed in Section 5.

Table B-1 lists the devices identified in Section 2 and provides the results of the evaluations performed in accordance with Section 3 and Section 4.

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.

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 misoperation of the active valve; therefore, SILO circuit reviews were not required for those active valves.

The process/criteria for assessing potential reactor coolant leak path valves is to review all P&ID's attached to the Reactor Coolant System (RCS) and include all active isolation valves and any active second valve upstream or downstream that is assumed to be required to be closed during normal operation or close upon an initiating event (Loss of Coolant Accident "LOCA" or Seismic). A table with the valves and associated P&ID is included in Table B-2 of this report.

Manual valves that are normally closed are assumed to remain closed and a second simple check valve is assumed to function and not be a Multiple Spurious Failure.

On BWR's the instrument lines that are 1" or less, in general, are assumed to have restricting orifices that are designed to mitigate any leakage due to make up.

Table B-2 contains a list of valves analyzed and based on the analysis detailed below, there are no moving contact control devices which could create a LOCA due to chatter-induced sustained valve misalignment, and thus no devices were selected for this category. For valves in Table B-2 that were identified as not requiring evaluation, the justification is provided in the Notes section of the table and is in accordance with guidance criteria.

Nuclear Steam Supply Shutoff Valves

Reactor Head Vent Valves HV-041-1F001, HV-041-1F002, HV-041-2F001, HV-041-2F002

These two Unit 1 valves [HV-041-1F001, HV-041-1F002] are normally closed and in series with one another [23]. Note 39 on the P&ID stipulates HV-041-1F002 is "disabled by locking open the circuit breaker and using administrative controls to assure that the valve is maintained in a closed positon when not in use" [24]. Because HV-041-1F002 is closed, depowered, and blocking flow through HV-041-1F001, contact chatter in the control circuits of either valve is irrelevant. Note 50 on the Unit 2 P&ID makes the same statement [25, 26], thus this reasoning applies to the Unit 2 valves HV-041-2F001, HV-041-2F002 as well.

Auto Depressurization Valves PSV-041-1F013E/H/K/M/S, PSV-041-2F013E/H/K/M/S

Electrical control for the solenoid-operated pilot valves is via relays B21C-K6A/C/E/G and B21C-K9A/C/E/G [27, 28, 29, 30]. These relays are controlled by the High Drywell Pressure / Reactor Pressure Vessel (RPV) Low Level Logic and the Residual Heat Removal (RHR) Pump Pressure relays B21C-K10A/C/E/G [31, 32]. The RHR Pump Pressure relays do not seal-in [33, 34] and, based on initial conditions at the time of the event, would block any inadvertent seal-in of the High Drywell Pressure / RPV Low Level Logic. Thus there is no SILO relays in this logic which could cause the Auto Depressurization Valves to remain open following a seismic event.

Safety Relief Valves PSV-041-1F013A/B/C/D/F/G/J/L/N, PSV-041-2F013A/B/C/D/F/G/J/L/N

Electrical control for the solenoid-operated pilot valves is via a rugged hand control switch. There are no chatter sensitive contact devices involved in the control of these valves [35, 36, 37, 38].

Main Steam Isolation Valves HV-041-1F022A/B/C/D, HV-041-1F028A/B/C/D, HV-041-2F022A/B/C/D, HV-041-2F028A/B/C/D

Electrical control for the solenoid-operated pilot valves is via relays B21H-K18A/B/C/D. These relays are slaves to B21H-K14A/B/C/D isolation logic relays [39, 40, 41, 42]. These relays are energized for at-power operation and de-energized to close the valves [43, 44, 45, 46]. In the energized state B21H-K14A/B/C/D are sealed in and any chatter in the control logic would break the seal-in and close the valves. This action is a desired response to the seismic event and for this reason chatter is acceptable and no contact devices in this circuit meet the selection criteria.

Main Steam Line Equalizer Valves HV-C-041-1F020, HV-C-041-2F020

These normally-open motor-operated valves are controlled by hand switches only [47, 48, 49]. 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. Thus these valves are not affected by SILO.

Main Steam Line Drain Valves HV-041-1F016, HV-041-1F019, HV-041-2F016, HV-041-2F019

The opening of normally-closed motor-operated valves HV-041-1F016/ HV-041-2F016 is commanded by a rugged hand switch with no seal-in contacts [50, 51]. This valve opening control is insensitive to contact chatter and thus the valve will remain closed after the seismic event. As stated in Table B-2, HV-041-1F019/HV-041-2F019 do not need to be analyzed provided HV-041-1F016/HV-041-2F016 remain closed.

Reactor Water Clean-Up Valves

Reactor Water Clean-Up Flow Control Valves HV-044-1F105, HV-044-2F105; Bottom Head Drain Flow Control Valves HV-044-1F100, HV-044-2F100

These normally-open motor-operated valves are controlled by hand switches only [52, 53]. 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. Thus these valves are not affected by SILO.

Reactor Water Clean-Up Isolation Valves HV-044-1F001, HV-044-1F004, HV-044-2F001, HV-044-2F004; Bottom Head Drain Flow Control Valves

These are normally-open motor-operated valves which close upon an isolation signal. 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 or isolation relay B21H-K24A/B [54, 55, 56, 57]. These relays are energized for at-power operation and de-energized to close the valves [58, 59, 60, 61]. In the energized state B21H-K24A/B are sealed in and any chatter in the control logic would break the seal-in and close the valves. This action is a desired response to the seismic event and for this reason chatter is acceptable and no contact devices in this circuit meet the selection criteria.

Reactor Core Isolation Cooling Valves

Reactor Core Isolation Cooling Steam Supply Line Isolation Valves HV-049-1F007, HV-049-1F008, HV-049-2F007, HV-049-2F008

These normally-open motor-operated valves are required to remain open to supply steam to the RCIC turbine. There is no seal-in in the opening circuit, and closure, if needed, is not blocked by SILO [62, 63, 64, 65]. Inadvertent closure of these valves is covered in the RCIC chatter analysis in Section 5.3.7 of Ref. [18].

Residual Heat Removal Valves

Testable Check Valves HV-051-1F041A/B/C/D, HV-051-1F050A/B, HV-051-2F041A/B/C/D, HV-051-2F050A/B

These solenoid-operated valves are controlled by a rugged, normally open push button [66, 67, 68, 69, 70, 71, 72, 73, 74, 75]. There are no SILO devices that would prevent the normal operation of these check valves.

RHR Injection Valves HV-051-1F017A/B/C/D, HV-051-2F017A/B/C/D; RHR Shutdown Cooling Injection Valves HV-051-1F015A/B, HV-051-2F015A/B

Since the testable check valves are not chatter sensitive and can be credited to remain closed, these downstream motor operated valves do not need to be analyzed per the notes in Table B-2.

RHR Shutdown Cooling Isolation Valves HV-051-1F008, HV-051-2F008; RHR Shutdown Cooling Suction Valves HV-051-1F009, HV-051-2F009

These normally-closed motor-operated valves are opened via a normally-open control switch and relay permissive. The valves can be closed manually via the control switch and automatically via an isolation signal. Sympathetic chatter on B21H-K29A/B and 42/O auxiliary contact could cause valve to open [76, 77, 78, 79], however the low reactor pressure permissive in control logic would prevent seal-in of B21H-K29A/B [58, 59, 60, 61]. After the period of strong shaking the normally-closed contact of B21H-K29A/B (isolation signal) would command these valves to reclose. Because there is no seal-in and the valves reclose without operator intervention, chatter is acceptable and no contact devices in this circuit meet the selection criteria.

Core Spray Valves

Testable Check Valves HV-052-1F006A/B, HV-052-2F006A/B

These solenoid-operated valves are controlled by a rugged, normally open push button [80, 81, 82, 83]. There are no SILO devices that would prevent the normal operation of these check valves.

Core Spray Outboard Check Valves HV-052-108, HV-052-208; Core Spray Inboard Motor Operated Valve HV-052-1F005, HV-052-2F005

Since the testable check valves are not chatter sensitive and can be credited to remain closed, these downstream motor operated valves do not need to be analyzed per the notes in Table B-2.

High Pressure Core Injection Valves

High Pressure Core Injection Steam Supply Line Isolation Valves HV-055-1F002, HV-055-1F003, HV-055-2F002, HV-055-2F003

These normally-open motor-operated valves supply steam to the HPCI turbine. The opening circuit is controlled by a rugged hand switch and permissive from E41A-K50B/D [84, 85, 86, 87]. There is no seal-in in the opening circuit. The closing circuit is controlled manually by a rugged hand switch or automatically via the isolation relay E41A-K50B/D [88, 89]. Any chatter in the isolation logic would seal-in E41A-K50B/D and close the valves. Since RCIC, not HPCI, is credited for core cooling this seal-in causing valve closure is not a selection criterion. There is no SILO which would prevent closure of these valves and thus no contact devices in this circuit 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. Limerick credits their steam turbine-driven Reactor Core Isolation Cooling (RCIC) Pump to provide core decay-heat cooling.

The selection of contact devices for the Safety Relief Valves (SRVs) overlaps with the RCS/Reactor Vessel Inventory Control Category. Refer to Section 2.2 for more information on the analysis of contact devices for these valves.

The selection of contact devices for RCIC was based on the premise that RCIC operation is desired, thus any SILO which would lead to RCIC operation is beneficial and thus does not meet the criteria for selection. Only contact devices which could render the RCIC system inoperable were considered.

The largest vulnerability to RCIC operation following a seismic event is contact chatter leading to a false RCIC Isolation Signal or false Turbine Trip. A false steam line break trip has the potential to delay RCIC operation while confirmatory inspections are being made. Chatter in the contacts of RCIC Isolation Signal Relay E51A-K31A or Steam Line High Differential Pressure Time Delay Relay E51A-K15A; or coincident chatter in the Turbine Exhaust Diaphragm High Pressure Relays E51A-K11A and E51A-K12A, or Reactor Pressure Relays E51A-K16A and E51A-K17A; may lead to a RCIC Isolation Signal and seal-in of E51A-K31A [19]. This would cause the RCIC Isolation Valves to close and the RCIC Trip and Throttle Valve to trip. Similar chatter in the contact devices that drive those relays could also lead to seal-in: PIS-050-1N655A, PIS-050-1N655E, PIS-049-1N658A, and PIS-049-1N658E [20]. (The three-second time delay associated with E51A-K15A will mask any chatter on PDIS-049-1N657A and PDS-049-1N660A, so they are excluded.) The same rationale applies to the identical Division 3 devices: E51A-K31C, E51A-K15C, E51A-K11C, E51A-K12C, E51A-K16C, E51A-K17C, PIS-050-1N655C, PIS-050-1N655G, PIS-049-1N658C, and PIS-049-1N658G [21, 22].

Any chatter that may lead to the energization of the Trip and Throttle Valve Remote Trip Circuit is considered as SILO as it will close the valve and require a manual reset prior to restoration of the RCIC system. Chatter in Turbine Trip Auxiliary Relay E51A-K28, or in the devices which control this relay; the Turbine Exhaust High Pressure Relays E51A-K13 and E51A-K14, the Pump Suction Low Pressure Relay E51A-K10, and the Isolation Signal Relays E51A-K30A, and E51A-K67C [19]. Similar chatter in the contact devices that drive those relays (and not already covered in the RCIC Isolation Signal analysis) could also lead to a turbine trip: E51A-K30C, PIS-050-1N653, PIS-050-1N656A, and PIS-050-1N656E [20, 21].

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,
- EDG Ancillary Systems, and
- 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 [8] 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 was spurious due to contact chatter or in response to an actual system fault. The actions taken to 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 Limerick's UFSAR [90]. Limerick has eight (8) EDGs which provide emergency power for their two units. Each unit has four (4) divisions of Class 1E loads with one EDG for each division [90, pp. 8.1-2]. The Class 1E AC distribution scheme is shown on one-line drawings E-15 [91] (Unit 1) and E-16 [92] (Unit 2). The Class 1E DC distribution scheme is described in the UFSAR [90, pp. 8.3-38] and shown on one-line drawings E-33 [93, 94] (Unit 1) and E-34 [95, 96] (Unit 2).

The analysis necessary to identify contact devices in this category relies on conservative worse-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 undervoltage 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 Unit 1 Division 1 device ID in this narrative, however the analysis applies to the identical components and devices in all divisions of both units. The selected contact devices for both units and all divisions appear in

Table 7-1 of Reference [18] where they are identified by device-specific ID, as indicated on the referenced control schematics.

Emergency Diesel Generators

The analysis of the Emergency Diesel Generators, D11, D12, D13, D14, D21, D22, D23, D24, is broken down into the generator protective relaying and diesel engine control. General descriptions of these systems and controls appear in the UFSAR [90, pp. 8.3-13].

Generator Protective Relaying

The control circuits for the 152-11507 EDG circuit breaker [97, 98, 99, 100] include 186-115A, 186-115B, 186-115C bus lockout, 186-AG501 differential lockout, 151-AG501 phase overcurrent, and 132-AG501 anti-motoring protective relays. As mentioned above, there is no presumption of LOCA and thus none of these trips would be bypassed by the LOCA auxiliary control circuit. Chatter in any of these relays may prevent closure of the EDG circuit breaker. The generator differential lockout relay 186-AG501 may be tripped by chatter in the 187G-AG501 differential and 151N-AG501 ground fault protective relays [101]. In addition, chatter in the 187-115 safeguards bus differential protective relays, or the 151-11509, 151-11502 overcurrent and 151N-11509, 151N-11502 ground fault relays associated with primary and alternate power feeds, could lead to the tripping of the bus lockout relay. When tripped, this bus lockout relay prevents closure of the EDG, ESW pump, and load center transformer circuit breakers [102].

The exciter [103] and governor control circuitry [104, 105, 106, 107, 108, 109, 110, 111] was analyzed and no devices within these circuits would cause a sustained change in control state such that the diesel generator would not operate after the period of strong shaking ends. The drawing note associated with an auxiliary contact of exciter contactor K1, "Trips Generator Circuit Breaker" [104, 105, 106, 107, 108, 109, 110, 111], is not accurate. The as-built condition of this auxiliary contact, connected to TBC terminals 6 and 10, was confirmed by walkdown to be not used. Refer to Attachment 9.4 of Reference [18] for more information regarding this walkdown.

Diesel Engine Control

Chatter analysis for the diesel engine control was performed on the start and shutdown circuits of each EDG [112, 113, 114] (D11), [115, 116, 117] (D12), [118, 119, 120] (D13), [121, 122, 123] (D14), [124, 125, 126] (D21), [127, 128, 129] (D22), [130, 131, 132] (D23), [133, 134, 135] (D24). The start circuit is blocked by seal-in of the SDR engine trouble shutdown or SFR start failure relays. Chatter of the seal-in contacts of these relays or of the contacts of relays within the coil circuits of these relays may prevent EDG start.

The SFR start failure relay is controlled by the two overcrank timing relays, T2A and T2B. Chatter in the contacts of either of these timing relays may energize the start failure relay and once energized it will seal in. The time delay function of these overcrank relays prevent momentary chatter in their coil circuits from energizing them.

The SDR engine trouble shutdown relay is controlled by the EOS engine overspeed switch and EOR engine overspeed relay, the 5E emergency stop relay, and a set of three switches and relays for each of the following engine faults: lube oil low pressure (OPL1, OPL2, OPL3, OP1, OP2, OP3), jacket coolant low pressure (CPL1, CPL2, CPL3, CP1, CP2, CP3), lube oil high temperature (OTH1, OTH2, OTH3, OT1, OT2, OT3), and jacket coolant high temperature (CTH1, CTH2, CTH3, CT1, CT2, CT3). Chatter of the contacts of the overspeed relay is blocked by the overspeed switch contacts. Chatter of the overspeed switch could energize the overspeed relay and lead to seal-in of the

shutdown relay. Chatter in the contacts of the emergency stop relay could lead to seal-in of the shutdown relay. Chatter in the emergency stop relay coil circuit is blocked from energizing the emergency stop relay by non-vulnerable control switches. Coincident chatter (occurring in two out of three of each group) on the relays or switches of the lube oil and jacket coolant temperature faults could lead to seal-in of the shutdown relay. Coincident chatter in the lube oil and jacket coolant pressure relay contacts (OP1/2/3, CP1/2/3) may seal-in the shutdown relay. Since the pressure switches (OPL1/2/3, CPL1/2/3) are closed when the engine is not running, chatter in the T3A engine high speed time delay relay may cause the lube oil low pressure and jacket coolant low pressure relays to energize, which could lead to seal-in of the shutdown relay. This means that chatter in T3A could prevent engine start regardless of chatter in the pressure switches. For this reason, this time delay relay will be selected and seismically analyzed while the pressure switches will not. If T3A is seismically screened (does not chatter), then chatter in the pressure switches are blocked. If T3A is not seismically screened (could potentially chatter), then the necessary mitigation actions for T3A would also address the potential for chatter in the pressure switches by default.

All other contact devices involved in engine start and engine shutdown circuits were analyzed and, other than the devices noted above, none would cause a sustained change in control state such that the diesel generator would not start after the period of strong shaking ends.

Battery Chargers

Chatter analysis on the battery chargers was performed using information from the UFSAR [90] as well as vendor schematic diagrams [136, 137, 138]. Each battery charger has a high voltage shutdown circuit [90, pp. 8.3-43] which is intended to protect the batteries and DC loads from output overvoltage due to charger failure. The high voltage shutdown circuit has a latching output relay K which disconnects the auxiliary voltage transformer, shutting the charger down [136, 137]. Chatter in the contacts of this output relay will only have a temporary effect on the charger during the period of strong shaking. The operate coil of this relay is controlled by a non-vulnerable solid-state circuit [138]. No other vulnerable contact device affects the availability of the battery chargers.

Inverters

Analysis of schematics for the 1A, 1B, 2A, and 2B RPS & UPS Static Inverters [139, 140], and the 1A, 1B, 2A, and 2B APRM UPS Inverters [141, 142] revealed no vulnerable contact devices and thus chatter analysis is unnecessary.

EDG Ancillary Systems

In order to start and operate the Emergency Diesel Generators, a number of components and systems are required. For the purpose of identifying electrical contact devices, only systems and components which are electrically controlled are analyzed. Information in the UFSAR [90] 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 and the only active components in this system required to operate are the air start solenoids [143, 144], which are covered under the EDG engine control analysis in Section above.

Combustion Air Intake and Exhaust

The combustion air intake and exhaust for the Diesel Generators are passive systems [145, 146] which do not rely on electrical control.

Lube Oil

The Diesel Generators utilize engine-driven mechanical lubrication oil pumps [147, 148] which do not rely on electrical control.

Fuel Oil

The Diesel Generator Fuel Oil System is described in the UFSAR [90, pp. 9.5-28]. The Diesel Generators utilize engine-driven mechanical pumps and DC-powered auxiliary pumps [149, 150] to supply fuel oil to the engines from the day tanks. The day tanks are re-supplied using AC-powered Diesel Oil Transfer Pumps. Chatter analysis of the control circuits for the electrically-powered auxiliary and transfer pumps [151, 152, 153, 154, 155, 156, 157, 158] concluded they do not include SILO devices. The mechanical pumps do not rely on electrical control.

Cooling Water

The Diesel Generator Cooling Water System is described in the UFSAR [90, pp. 9.5-37]. This system consists of two cooling loops, jacket water and air cooler, which are each cooled by Emergency Service Water (ESW) [159, 160, 161, 162]. Engine driven pumps operating in both cooling loops are credited when the engine is operating. These mechanical pumps do not rely on electrical control. The electric jacket water pump is only used during shutdown periods and is thus not included in this analysis.

Four ESW pumps, 0A, 0B, 0C, and 0D, provide cooling water to the heat exchangers associated with the eight EDGs [163]. In automatic mode these pumps are started via the EDG Start Signal. Chatter analysis of the EDG start signal is included in Section above. A chatter analysis of the 152-11508 ESW pump circuit breaker control circuits [164, 165, 166] indicates the 186-115 bus lockout, 150/151-11508 phase overcurrent, and 150G-11508 ground fault relays all could prevent automatic (sequential) breaker closure following the seismic event.

Ventilation

The Diesel Generator Enclosure Ventilation System is described in the UFSAR [90, pp. 9.4-46]. Ventilation for each Diesel Generator Enclosure is provided via two exhaust fans [167, 168]. In automatic mode these fans are started via the EDG Start Signal. Chatter analysis of the EDG start signal is included in Section above. Other than SILO devices identified for the EDG start signal, chatter analysis of the control circuits for these fans [169, 170] and their associated dampers concluded they do not include SILO devices.

Switchgear, Load Centers, and MCCs

Power distribution from the EDGs to the necessary electrical loads (Battery Chargers, Inverters, Fuel Oil Pumps, 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, which are covered in Section above, and the ESW Pump breakers which are covered in Section above, as well as component-specific contactors and their control devices, which are covered in the analysis of each component above.

The medium- and low-voltage circuit breakers in 4160V Busses and 440V Load Centers which are supplying power to loads identified in this section have been identified for evaluation. For Unit 1 Division 1 these breakers are 152-11507, 152-11505, 152-11508, 52-20133, and 52-20132. The 440V AC MCCs use Molded-Case Circuit Breakers [90, pp. 8.3-12] which are seismically rugged [8, pp. 2-11]; and DC power distribution is via non-vulnerable disconnect switches.

The only circuit breakers affected by protective relaying (not already covered) were those that distribute power via stepdown transformers from the 4KV Safeguards Busses to their associated 440V load centers. A chatter analysis of the control circuits for these circuit breakers [171, 172, 173] indicates the 186-115 bus lockout, 150/151-11505 transformer primary phase overcurrent, and 150G-11505 ground fault relays all could prevent automatic (sequential) breaker closure following the seismic event.

2.6 Summary of Selected Components

The investigation of high-frequency contact devices as described above was performed in Ref. [18]. A list of the contact devices requiring a high frequency confirmation is provided in Appendix B, Table B-1. The identified devices are evaluated in Ref. [17] per the methodology/description of Section 3 and 4. Results are presented in Section 5 and Table B-1.

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 LIM horizontal ground motion response spectrum (GMRS), which was generated as part of the LIM Seismic Hazard and Screening Report [4] submitted to the NRC on March 31, 2014, and accepted by the NRC on November 6, 2015 [14].

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."

The applicable buildings at LIM 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 3-2.

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 site's soil mean shear wave velocity vs. depth profile is provided in Reference. [4], Table 2.3.2-2 and reproduced below in Table 3-1.

Table 3-1: Soil Mean Shear Wave Velocity Vs. Depth Profile

Layer	Depth (m)	Depth (ft)	Thickness, d_i (ft)	Vs_i (ft/sec)	d_i / Vs_i	$\Sigma [d_i / Vs_i]$	Vs30 (ft/s)
1	3.048	10.0	10.0	3,452	2.90E-03	2.90E-03	3,418
2	6.096	20.0	10.0	3,457	2.89E-03	5.79E-03	
3	9.144	30.0	10.0	3,462	2.89E-03	8.68E-03	
4	12.192	40.0	10.0	3,467	2.88E-03	1.16E-02	
5	15.24	50.0	10.0	3,472	2.88E-03	1.44E-02	
6	18.288	60.0	10.0	3,477	2.88E-03	1.73E-02	
7	21.336	70.0	10.0	3,482	2.87E-03	2.02E-02	
8	24.384	80.0	10.0	3,487	2.87E-03	2.31E-02	
9	27.432	90.0	10.0	3,492	2.86E-03	2.59E-02	
10	30.48	100.0	10.0	3,497	2.86E-03	2.88E-02	

Using the shear wave velocity vs. depth profile, the velocity of a shear wave traveling from a depth of 30m (98.43ft) to the surface of the site (Vs30) is calculated per the methodology of Reference [8], Section 3.5.

- The time for a shear wave to travel through each soil layer is calculated by dividing the layer depth (d_i) by the shear wave velocity of the layer (Vs_i).
- The total time for a wave to travel from a depth of 30m to the surface is calculated by adding the travel time through each layer from depths of 0m to 30m ($\Sigma[d_i/Vs_i]$).
- The velocity of a shear wave traveling from a depth of 30m to the surface is therefore the total distance (30m) divided by the total time;
  i.e., $Vs30 = (30m)/\Sigma[d_i/Vs_i]$.
- Note: The shear wave velocity is calculated based on time it takes for the shear wave to travel 30.48m (100ft) instead of 30m (98.43ft). This small change in travel distance will have no impact on identifying soil class type.

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 0.193g and the shear wave velocity of 3418ft/s, the site soil class is B-Hard.

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 3-2 of this report.

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

Table 3-2: Horizontal and Vertical Ground Motions Response Spectra

Frequency (Hz)	HGMRS (g)	V/H Ratio	VGMRS (g)
100	0.193	0.8	0.154
90	0.195	0.82	0.160
80	0.198	0.87	0.172
70	0.202	0.91	0.184
60	0.210	0.92	0.193
50	0.228	0.9	0.205
45	0.243	0.89	0.216
40	0.258	0.86	0.222
35	0.279	0.81	0.226
30	0.306	0.75	0.230
25	0.339	0.7	0.237
20	0.363	0.68	0.247
15	0.381	0.68	0.259
12.5	0.386	0.68	0.262
10	0.385	0.68	0.262
9	0.381	0.68	0.259
8	0.374	0.68	0.254
7	0.361	0.68	0.245
6	0.340	0.68	0.231
5	0.315	0.68	0.214
4	0.264	0.68	0.180
3.5	0.235	0.68	0.160
3	0.203	0.68	0.138
2.5	0.169	0.68	0.115
2	0.149	0.68	0.101
1.5	0.125	0.68	0.085
1.25	0.106	0.68	0.072
1	0.090	0.68	0.061
0.9	0.082	0.68	0.056
0.8	0.073	0.68	0.049
0.7	0.065	0.68	0.044
0.6	0.056	0.68	0.038
0.5	0.046	0.68	0.031
0.4	0.036	0.68	0.025
0.35	0.032	0.68	0.022
0.3	0.027	0.68	0.019
0.25	0.023	0.68	0.016
0.2	0.018	0.68	0.012
0.15	0.014	0.68	0.009
0.125	0.011	0.68	0.008
0.1	0.009	0.68	0.006

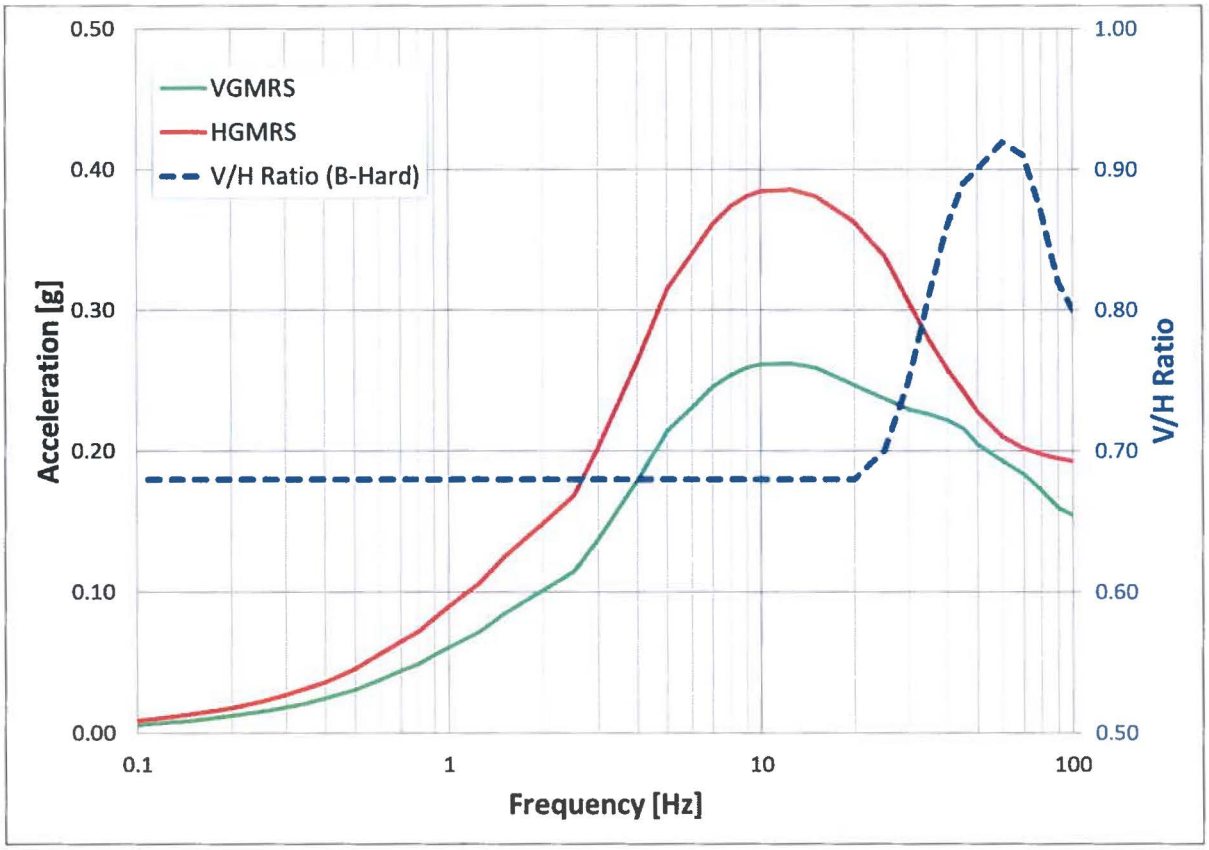

Figure 3-1 Plot of the Horizontal and Vertical Ground Motions Response Spectra and V/H Ratios

3.3 COMPONENT HORIZONTAL SEISMIC DEMAND

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

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

The in-structure amplification factor AF_{SH} is derived from Figure 4-3 in Reference [8]. The in-cabinet horizontal 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-SL [13] assuming 5% in-cabinet response spectrum damping. EPRI NP-7148-SL [13] 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 Appendix B) can be categorized into one of the in-cabinet amplification categories in Reference [8] as follows:

- Motor Control Centers are typical motor control center cabinets consisting of a lineup of several interconnected sections. Each section is a relatively narrow cabinet structure with height-to-depth ratios of about 4.5 that allow the cabinet framing to be efficiently used in flexure for the dynamic response loading, primarily in the front-to-back direction. This results in higher frame stresses and hence more damping which lowers the cabinet response. In addition, the subject components are not located on large unstiffened panels that could exhibit high local amplifications. These cabinets qualify as low amplification cabinets.
- Switchgear cabinets are large cabinets consisting of a lineup of several interconnected sections typical of the high amplification cabinet category. Each section is a wide box-type structure with height-to-depth ratios of about 1.5 and may include wide stiffened panels. This results in lower stresses and hence less damping which increases the enclosure response. Components can be mounted on the wide panels, which results in the higher in-cabinet amplification factors.
- Control cabinets are in a lineup of several interconnected sections with moderate width. Each section consists of structures with height-to-depth ratios of about 3 which results in moderate frame stresses and damping. The response levels are mid-range between MCCs and switchgear and therefore these cabinets can be considered in the medium amplification category.

3.4 COMPONENT VERTICAL SEISMIC DEMAND

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

- Vertical in-structure amplification factor AF_{SV} to account for seismic amplification at floor elevations above the host building's foundation

- Vertical in-cabinet amplification factor AF_c to account for seismic amplification within the host equipment (cabinet, switchgear, motor control center, etc.)

The in-structure amplification factor AF_{SV} is derived from Figure 4-4 in Reference [8]. The in-cabinet vertical 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], [10], [11], and [12].

   (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]

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

5 Conclusions

5.1 General Conclusions

LIM 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 528 components that required evaluation. As summarized in Table B-1 in Appendix B, all of the devices have adequate seismic capacity for the reevaluated seismic hazard [4].

5.2 Identification of Follow-up Actions

No follow-up actions were identified.

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 Seismic Hazard and Screening Report in Response to the 50.54(f) Information Request Regarding Fukushima Near-Term Task Force Recommendation 2.1: Seismic for Limerick Generating Station, Unit 1 and 2 dated March 31, 2014, ADAMS Accession Number ML14090A236

5 Not Used

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-SLV2, Addendum 1, "Seismic Ruggedness of Relays", September 1993

11 EPRI NP-7147-SLV2, Addendum 2, "Seismic Ruggedness of Relays", April 1995

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

13 EPRI NP-7148-SL, "Procedure for Evaluating Nuclear Power Plant Relay Seismic Functionality", 1990

14 NRC (F. Vega) Letter to Limerick Generating Station (B. Hanson), "Limerick Generating Station, Unit 1 and 2 – Staff Assessment of Information Provided Pursuant 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 NOS. MF3864 and MF3865)." November 6, 2015, ADAMS Accession Number ML15296A492

15 Recommendations For Enhancing Reactor Safety in the 21st Century, "The Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident" July 12, 2011, ADAMS Accession Number ML111861807

16 NEI 12-06, Rev. 2, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide"

17 15C4345-CAL-001, Rev. 2, "High Frequency Functional Confirmation and Fragility Evaluation of Relays"
18 15C4345-RPT-001, Rev. 3, "Selection of Relays and Switches for High Frequency Seismic Evaluation"
19 Limerick Drawing E51-1040-E-003 Rev. 32, Elementary Diagram Reactor Core Isolation
20 Limerick Drawing E51-1040-E-013 Rev. 16, Elementary Diagram RCIC System Sheet 3A
21 Limerick Drawing E51-1040-E-004 Rev. 30, Elementary Diagram Reactor Core Isolation
22 Limerick Drawing E51-1040-E-014 Rev. 16, Elementary Diagram RCIC System Sheet 4A
23 Limerick Drawing M-0041 Sheet 1 Rev. 47, Piping and Instrument Diagram Nuclear Boiler
24 Limerick Drawing M-0041 Sheet 3 Rev. 55, Piping and Instrument Diagram Nuclear Boiler
25 Limerick Drawing M-0041 Sheet 4 Rev. 43, Piping and Instrument Diagram Nuclear Boiler
26 Limerick Drawing M-0041 Sheet 6 Rev. 55, Piping and Instrument Diagram Nuclear Boiler
27 Limerick Drawing B21-1060-E-004 Rev. 14, Elementary Diagram Automatic Depressurization System Sheet 4
28 Limerick Drawing B21-1060-E-005 Rev. 13, Elementary Diagram Automatic Depressurization System Sheet 5
29 Limerick Drawing B21-1060-E-018 Rev. 7, Elementary Diagram Automatic Depressurization System
30 Limerick Drawing B21-1060-E-019 Rev. 6, Elementary Diagram Automatic Depressurization System
31 Limerick Drawing B21-1060-E-003 Rev. 16, Elementary Diagram Automatic Depressurization System
32 Limerick Drawing B21-1060-E-015 Rev. 5, Elementary Diagram Auto Depressurization System
33 Limerick Drawing B21-1060-E-008 Rev. 14, Elementary Diagram Auto Depressurization System Sheet 3A
34 Limerick Drawing B21-1060-E-016 Rev. 4, Elementary Diagram Auto Depressurization System Sheet 3A
35 Limerick Drawing B21-1060-E-006 Rev. 19, Elementary Diagram Auto Depressurization System Sheet 6
36 Limerick Drawing B21-1060-E-011 Rev. 12, Elementary Diagram Auto Depressurization System Sheet 6A
37 Limerick Drawing B21-1060-E-020 Rev. 7, Elementary Diagram Auto Depressurization System
38 Limerick Drawing B21-1060-E-021 Rev. 6, Elementary Diagram Auto Depressurization System
39 Limerick Drawing B21-1090-E-010 Rev. 23, Elementary Diagram Nuclear Steam Supply Shutoff System
40 Limerick Drawing B21-1090-E-011 Rev. 23, Elementary Diagram Nuclear Steam Supply Shutoff System
41 Limerick Drawing B21-1090-E-027 Sheet 10 Rev. 8, Elementary Diagram Reactor Core Isolation
42 Limerick Drawing B21-1090-E-027 Sheet 11 Rev. 9, Elementary Diagram Nuclear Steam Supply Shutoff System

43 Limerick Drawing B21-1090-E-006 Rev. 27, Elementary Diagram Nuclear Steam Supply Shutoff System Sheet 6
44 Limerick Drawing B21-1090-E-007 Rev. 25, Elementary Diagram Nuclear Steam Supply Shutoff System Sheet 7
45 Limerick Drawing B21-1090-E-027 Sheet 6 Rev. 7, Elementary Diagram Nuclear Steam Supply Shutoff System
46 Limerick Drawing B21-1090-E-027 Sheet 7 Rev. 8, Elementary Diagram Nuclear Steam Supply Shutoff System
47 Limerick Drawing B21-1040-E-004 Rev. 23, Elementary Diagram Nuclear Boiler Process
48 Limerick Drawing B21-1040-E-008 Rev. 8, Elementary Diagram Nuclear Boiler Process
49 Limerick Drawing B21-1040-E-009 Rev. 9, Elementary Diagram Nuclear Boiler Process
50 Limerick Drawing B21-1090-E-032 Sheet 1 Rev. 1, HV-041-1F016 Main Steam Drain Inboard PCIV Steam Drains Inboard
51 Limerick Drawing B21-1090-E-038 Sheet 1 Rev. 0, Elementary Diagram HV-051-2F016
52 Limerick Drawing G31-1040-E-001 Rev. 46, Elementary Diagram Reactor Water Cleanup System
53 Limerick Drawing G31-1040-E-005 Rev. 24, Elementary Diagram Reactor Water Cleanup System
54 Limerick Drawing B21-1090-E-012 Rev. 29, Elementary Diagram Nuclear Steam Supply Shutoff System
55 Limerick Drawing B21-1090-E-016 Sheet 2 Rev. 4, Elementary Diagram Nuclear Steam Supply Shutoff System
56 Limerick Drawing B21-1090-E-027 Sheet 12 Rev. 16, Elementary Diagram Nuclear Steam Supply Shutoff System
57 Limerick Drawing B21-1090-E-027 Sheet 2A Rev. 15, Elementary Diagram Nuclear Steam Supply Shutoff System
58 Limerick Drawing B21-1090-E-008 Rev. 32, Elementary Diagram Nuclear Steam Supply Sheet 8
59 Limerick Drawing B21-1090-E-017 Rev. 33, Elementary Diagram Nuclear Steam Supply Sheet 8A
60 Limerick Drawing B21-1090-E-027 Sheet 8 Rev. 16, Elementary Diagram Nuclear Steam Supply Shutoff System
61 Limerick Drawing B21-1090-E-027 Sheet 8A Rev. 14, Elementary Diagram Nuclear Steam Supply Shutoff System
62 Limerick Drawing E51-1040-E-052 Sheet 1 Rev. 1, Schematic HV-049-1F007 Main Steam Supply Inboard PCIV Inboard
63 Limerick Drawing E51-1040-E-053 Sheet 1 Rev. 2, Schematic HV-049-1F008 RCIC Steam Line Outboard PCIV Outboard
64 Limerick Drawing E51-1040-E-056 Sheet 1 Rev. 1, Elementary Diagram HV-049-2F007
65 Limerick Drawing E51-1040-E-057 Sheet 1 Rev. 1, Elementary Diagram HV-049-2F008
66 Limerick Drawing E11-1040-E-016 Rev. 35, Elementary Diagram Residual Heat Removal System
67 Limerick Drawing E11-1040-E-018 Rev. 35, Elementary Diagram Residual Heat Removal System

68 Limerick Drawing E11-1040-E-019 Rev. 32, Elementary Diagram Residual Heat Removal System
69 Limerick Drawing E11-1040-E-020 Rev. 23, Elementary Diagram Residual Heat Removal System
70 Limerick Drawing E11-1040-E-021 Rev. 21, Elementary Diagram Residual Heat Removal System
71 Limerick Drawing E11-1040-E-049 Rev. 17, Elementary Diagram Residual Heat Removal System
72 Limerick Drawing E11-1040-E-051 Rev. 16, Elementary Diagram Residual Heat Removal System
73 Limerick Drawing E11-1040-E-052 Rev. 15, Elementary Diagram Residual Heat Removal System
74 Limerick Drawing E11-1040-E-053 Rev. 10, Elementary Diagram Residual Heat Removal System
75 Limerick Drawing E11-1040-E-054 Rev. 11, Elementary Diagram Residual Heat Removal System
76 Limerick Drawing B21-1090-E-018 Sheet 2 Rev. 4, Elementary Diagram Nuclear Steam Supply Shutoff System
77 Limerick Drawing B21-1090-E-033 Sheet 1 Rev. 1, Schematic HV-051-1F009 RHR Shutdown Cooling Suction Inboard PCI Inboard
78 Limerick Drawing B21-1090-E-034 Sheet 1 Rev. 1, Elementary Diagram HV-051-2F008
79 Limerick Drawing B21-1090-E-035 Rev. 1, Elementary Diagram HV-051-2F009
80 Limerick Drawing E21-1040-E-009 Rev. 25, Elementary Diagram Core Spray System
81 Limerick Drawing E21-1040-E-010 Rev. 22, Elementary Diagram Core Spray System
82 Limerick Drawing E21-1040-E-030 Rev. 9, Elementary Diagram Core Spray System
83 Limerick Drawing E21-1040-E-031 Rev. 8, Elementary Diagram Core Spray System
84 Limerick Drawing E41-1040-E-014 Sheet 2 Rev. 1, Elementary Diagram HPCI System
85 Limerick Drawing E41-1040-E-013 Sheet 2 Rev. 0, Elementary Diagram HPCI System
86 Limerick Drawing E41-1040-E-027 Sheet 2 Rev. 0, Elementary Diagram HPCI System Sheet 11
87 Limerick Drawing E41-1040-E-027 Sheet 6 Rev. 0, Elementary Diagram HPCI System
88 Limerick Drawing E41-1040-E-006 Rev. 36, Elementary Diagram HPCI System
89 Limerick Drawing E41-1040-E-022 Rev. 8, Elementary Diagram HPCI System
90 Limerick Report, "Updated Final Safety Analysis Report (UFSAR)," Rev. 18, September 2016
91 Limerick Drawing E-0015 Sheet 1 Rev. 30, Single Line Meter and Relay Diagram 4KV Safeguard Power System Unit 1
92 Limerick Drawing E-0016 Sheet 1 Rev. 26, Single Line Meter and Relay Diagram 4KV Safeguard Power System Unit 2
93 Limerick Drawing E-0033 Sheet 1 Rev. 45, Single Line Meter and Relay Diagram 125, 250VDC System
94 Limerick Drawing E-0033 Sheet 2 Rev. 47, Single Line Meter and Relay Diagram 125, 250VDC System
95 Limerick Drawing E-0034 Sheet 1 Rev. 38, Single Line Meter and Relay Diagram 125, 250V DC System

96 Limerick Drawing E-0034 Sheet 2 Rev. 40, Single Line Diagram Instrumentation AC System
97 Limerick Drawing E-0164 Sheet 1 Rev. 19, Safeguard Busses D11 thru D14, D21 thru D24 Generator Breakers 4KV
98 Limerick Drawing E-0164 Sheet 3 Rev. 10, Safeguard Busses D11 thru D14 and D21 thru D24 Generator Breakers 4KV
99 Limerick Drawing E-0164 Sheet 5 Rev. 9, Safeguard Busses D11 thru D14 Generator Breakers 4KV
100 Limerick Drawing E-0164 Sheet 5A Rev. 1, Schematic Diagram Safeguard Busses D21, 22, 23, 24 Generator Breakers 4KV Unit 2
101 Limerick Drawing E-0169 Sheet 1 Rev. 11, Schematic Diagram - Diesel Generator Protective
102 Limerick Drawing E-0168 Sheet 1 Rev. 6, Schematic Diagram - Safeguard Buses, Protective Relaying
103 Limerick Drawing M-071-00147 Sheet 1 Rev. 21, Schematic Power Chassis Nuclear Exciter/Regulator
104 Limerick Drawing M-071-00065 Sheet 1A Rev. 19, Control Schematic D11 Diesel Generator
105 Limerick Drawing M-071-00065 Sheet 6 Rev. 2, Control Schematic D12 Diesel Generator
106 Limerick Drawing M-071-00065 Sheet 12 Rev. 3, Control Schematic D13 Diesel Generator
107 Limerick Drawing M-071-00065 Sheet 18 Rev. 3, Control Schematic D14 Diesel Generator
108 Limerick Drawing M-071-00065 Sheet 24 Rev. 3, Control Schematic D21 Diesel Generator
109 Limerick Drawing M-071-00065 Sheet 30 Rev. 3, Control Schematic D22 Diesel Generator
110 Limerick Drawing M-071-00065 Sheet 36 Rev. 2, Control Schematic D23 Diesel Generator
111 Limerick Drawing M-071-00065 Sheet 42 Rev. 3, Control Schematic D24 Diesel Generator
112 Limerick Drawing M-071-00048 Sheet 1 Rev. 30, Schematic Engine Control D11 Diesel Generator
113 Limerick Drawing M-071-00048 Sheet 2 Rev. 32, Schematic Engine Control D11 Diesel Generator
114 Limerick Drawing M-071-00048 Sheet 3 Rev. 33, Schematic Engine Control D11 Diesel Generator
115 Limerick Drawing M-071-00048 Sheet 6 Rev. 14, Schematic Engine Control D12 Diesel Generator
116 Limerick Drawing M-071-00048 Sheet 7 Rev. 3, Schematic Engine Control D12 Diesel Generator
117 Limerick Drawing M-071-00048 Sheet 8 Rev. 1, Schematic Engine Control D12 Diesel Generator
118 Limerick Drawing M-071-00048 Sheet 11 Rev. 0, Schematic Engine Control D13 Diesel Generator
119 Limerick Drawing M-071-00048 Sheet 12 Rev. 3, Schematic Engine Control D13 Diesel Generator
120 Limerick Drawing M-071-00048 Sheet 13 Rev. 1, Schematic Engine Control D13 Diesel Generator
121 Limerick Drawing M-071-00048 Sheet 16 Rev. 0, Schematic Engine Control D14 Diesel Generator
122 Limerick Drawing M-071-00048 Sheet 17 Rev. 3, Schematic Engine Control D14 Diesel Generator

123 Limerick Drawing M-071-00048 Sheet 18 Rev. 1, Schematic Engine Control D14 Diesel Generator
124 Limerick Drawing M-071-00048 Sheet 21 Rev. 0, Schematic Engine Control D21 Diesel Generator
125 Limerick Drawing M-071-00048 Sheet 22 Rev. 3, Schematic Engine Control D21 Diesel Generator
126 Limerick Drawing M-071-00048 Sheet 23 Rev. 1, Schematic Engine Control D21 Diesel Generator
127 Limerick Drawing M-071-00048 Sheet 26 Rev. 0, Schematic Engine Control D22 Diesel Generator
128 Limerick Drawing M-071-00048 Sheet 27 Rev. 3, Schematic Engine Control D22 Diesel Generator
129 Limerick Drawing M-071-00048 Sheet 28 Rev. 1, Schematic Engine Control D22 Diesel Generator
130 Limerick Drawing M-071-00048 Sheet 31 Rev. 0, Schematic Engine Control D23 Diesel Generator
131 Limerick Drawing M-071-00048 Sheet 32 Rev. 3, Schematic Engine Control D23 Diesel Generator
132 Limerick Drawing M-071-00048 Sheet 33 Rev. 1, Schematic Engine Control D23 Diesel Generator
133 Limerick Drawing M-071-00048 Sheet 36 Rev. 0, Schematic Engine Control D24 Diesel Generator
134 Limerick Drawing M-071-00048 Sheet 37 Rev. 3, Schematic Engine Control D24 Diesel Generator
135 Limerick Drawing M-071-00048 Sheet 38 Rev. 1, Schematic Engine Control D24 Diesel Generator
136 Limerick Drawing E-017-00012 Sheet 1 Rev. 11, Diagram - Schematic Arrangement 130 K300 and 400 Chargers
137 Limerick Drawing E-017-00014 Sheet 1 Rev. 9, Diagram - Schematic Arrangement 130 HK75/100F3 Chargers
138 Limerick Drawing E-017-00065 Sheet 1 Rev. 2, High Voltage Shutdown with Time Delay Universal PC Board
139 Limerick Drawing E-0032 Sheet 1 Rev. 64, Single Line Meter and Relay Diagram Uninterruptible AC, RPS, UPS, Computer
140 Limerick Drawing N-00E-72-00010 Sheet 1 Rev. 1, Power Stage Wiring 30KVA Inverter Solid State Switch 1AD160
141 Limerick Drawing E-0032 Sheet 2 Rev. 39, Single Line Meter and Relay Diagram Uninterruptible AC System
142 Limerick Drawing N-00E-72-00015 Sheet 1 Rev. 1, Power Stage Wiring 30KVA Inverter Solid State Switch 1BD160
143 Limerick Drawing M-0020 Sheet 6 Rev. 52, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Starting Air System Unit 1)
144 Limerick Drawing M-0020 Sheet 12 Rev. 16, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Starting Air System Unit 2)

145 Limerick Drawing M-0020 Sheet 8 Rev. 23, Piping and Instrument Diagram Fuel and Diesel Oil Storange and Transfer (Combustion Air Intake and Exhaust System Unit 1)
146 Limerick Drawing M-0020 Sheet 14 Rev. 15, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Combustion Air Intake and Exhaust System Unit 2)
147 Limerick Drawing M-0020 Sheet 7 Rev. 53, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Lube Oil System Unit 1)
148 Limerick Drawing M-0020 Sheet 13 Rev. 18, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Lube Oil System Unit 2)
149 Limerick Drawing M-0020 Sheet 3 Rev. 39, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Fuel Oil and Transfer System Unit 1)
150 Limerick Drawing M-0020 Sheet 9 Rev. 17, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Fuel Oil and Transfer System Unit 2)
151 Limerick Drawing M-071-00048 Sheet 5 Rev. 21, Schematic Engine Control D11 Diesel Generator
152 Limerick Drawing M-071-00048 Sheet 10 Rev. 1, Schematic Engine Control D12 Diesel Generator
153 Limerick Drawing M-071-00048 Sheet 15 Rev. 1, Schematic Engine Control D13 Diesel Generator
154 Limerick Drawing M-071-00048 Sheet 20 Rev. 1, Schematic Engine Control D14 Diesel Generator
155 Limerick Drawing M-071-00048 Sheet 25 Rev. 1, Schematic Engine Control D21 Diesel Generator
156 Limerick Drawing M-071-00048 Sheet 30 Rev. 1, Schematic Engine Control D22 Diesel Generator
157 Limerick Drawing M-071-00048 Sheet 35 Rev. 1, Schematic Engine Control D23 Diesel Generator
158 Limerick Drawing M-071-00048 Sheet 40 Rev. 1, Schematic Engine Control D24 Diesel Generator
159 Limerick Drawing M-0020 Sheet 4 Rev. 46, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Cooling Water System Unit 1)
160 Limerick Drawing M-0020 Sheet 5 Rev. 44, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Cooling Water System Unit 1)
161 Limerick Drawing M-0020 Sheet 10 Rev. 51, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Coling Water System Unit 2)
162 Limerick Drawing M-0020 Sheet 11 Rev. 8, Piping and Instrument Diagram Fuel and Diesel Oil Storage and Transfer (Cooling Water System Unit 2)
163 Limerick Drawing M-0011 Sheet 1 Rev. 86, Piping and Instrument Diagram Emergency Service Water (Unit 1, Unit 2, and Common)
164 Limerick Drawing E-0321 Sheet 2 Rev. 19, Schematic Diagram Emergency Service Water Pumps
165 Limerick Drawing E-0321 Sheet 3 Rev. 19, Schematic Diagram Emergency Service Water Pumps
166 Limerick Drawing E-0321 Sheet 5 Rev. 17, Schematic Diagram Emergency Service Water Pumps

167 Limerick Drawing M-0081 Sheet 1 Rev. 31, Piping and Instrument Diagram Miscellaneous Structures HVAC

168 Limerick Drawing M-0081 Sheet 3 Rev. 15, Piping and Instrument Diagram Miscellaneous Structures HVAC (Unit 2 and Common)

169 Limerick Drawing E-0490 Sheet 1 Rev. 16, Schematic Diagram Diesel Generator Ventilation Air Exhaust Fans and Auxiliary Control Units 1 and 2

170 Limerick Drawing E-0490 Sheet 2 Rev. 10, Schematic Diagram Diesel Generator Ventilation Air Exhaust Fans and Auxiliary Control Units 1 and 2

171 Limerick Drawing E-0163 Sheet 1 Rev. 18, Schematic Diagram - Safeguard Buses - Safeguard Load Center

172 Limerick Drawing E-0163 Sheet 2 Rev. 3, Schematic Diagram - Safeguard Buses - Safeguard Load Center

173 Limerick Drawing E-0162 Sheet 1 Rev. 13, Schematic Diagram-Safeguard Buses - D144 and D244

A Representative Sample Component Evaluations

The following sample calculation is extracted from Reference [17].

Notes:

1. Reference citations within the sample calculation are per the Ref. [17] reference section shown on the following page.

2. This sample calculation contains evaluations of sample high-frequency-sensitive components per the methodologies of both the EPRI high-frequency guidance [8] and the flexible coping strategies guidance document NEI 12-06 [16].

6 REFERENCES

1. Codes, Guidance, and Standards
   1.1. EPRI 3002004396. "High Frequency Program: Application Guidance for Functional Confirmation and Fragility Evaluation." July 2015.
   1.2. EPRI 3002002997. "High Frequency Program: High Frequency Testing Summary." September 2014.
   1.3. Not Used
   1.4. NEI 12-06, Appendix H, Rev. 2, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide."
   1.5. IEEE 344-1975 "IEEE Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations"
   1.6. SQUG GIP 3A, "Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Plant Equipment", December 2001
   1.7. EPRI NP-7147-SL, "Seismic Ruggedness of Relays", August 1991
   1.8. EPRI NP-7147-SL, SQUG Advisory 2004-02. "Relay GERS Corrections", September 10, 2004
   1.9. EPRI NP-7147-SLV2, Addendum 1, "Seismic Ruggedness of Relays", September 1993
   1.10. ANSI/IEEE C37.98-1987, "An American National Standard IEEE Standard Seismic Testing of Relays." January 15, 1988
   1.11. EPRI NP-6041-SL, Rev. 1, "A Methodology for Assessment of Nuclear Power Plant Seismic Margin", August 1991
   1.12. EPRI NP-7147-SLV2, Addendum 2, "Seismic Ruggedness of Relays", April 1995

2. Nuclear Regulatory Commission Documents
   2.1. Limerick Generating Station Units 1 & 2 Seismic Hazard and Screening Report, Rev. 0, NRC Docket No. STN 50-352 & STN 50-353, Correspondence No. RS-14-069

3. Station Documents
   3.1. Limerick Drawing C-0409, Rev. 33, "Control Room Area, Foundations, Wall Elevations Area 8"
   3.2. General Electric Report GE-101, Rev. 2, "GE Dynamic Qualification Report for Class 1E Control Room Panels"
   3.3. General Electric Report GE-201, Rev. 2, "GE Dynamic Qualification Report for Class 1E Control Room Panels"
   3.4. Limerick Drawing C-0682, Rev. 11, "Diesel Generator Building Unit 2 Wall Elevation & Sections"
   3.5. Limerick Report D-0014, Rev. 7, "Dynamic Qualification Book", Volumes 1-3.
   3.6. Limerick Report D-0007, Rev. 10, "Dynamic Qualification Book", Volumes 1-2.
   3.7. Not Used
   3.8. Limerick Report D-0015, Rev. 12, "Dynamic Qualification Book", Volumes 1-4.

4. S&A Documents
   4.1. 15C4345-RPT-001, Rev. 3, "Selection of Relays and Switches for High Frequency Seismic Evaluation."

5. Other Documents
   5.1. TE Connectivity, Qualification Test Report 501-529, "Nuclear Environmental Qualification Test Report on Agastat EGP, EML and ETR Control Relays by Control Products Division, Amerace Corporation"
   5.2. GE Multilin IAC Time-Overcurrent Brochure, "Time-overcurrent protection of AC circuits and apparatus." (See Attachment E)
   5.3. Agastat Nuclear Qualified Control Relays, dated 4/24/2002 "Series EGP/EML/ETR" (See Attachment F)

8 ANALYSIS (cont'd)

8.2 High-Frequency Seismic Demand

Calculate the high-frequency seismic demand on the components per the methodology from Ref. 1.1.

Sample calculations for the high-frequency seismic demand of components PIS-050-1N653 located in Unit 1 and E51A-K10 located in Unit 1 are presented below. A table that calculates the high-frequency seismic demand for all of the subject components listed in Attachment A, Table A-1 of this calculation is provided in Attachment A, Table A-2 of this calculation.

8.2.1 Horizontal Seismic Demand

The horizontal site-specific GMRS for Limerick is per Ref. 2.1. GMRS data can be found in Attachment B of this calculation.

Determine the peak acceleration of the horizontal GMRS between 15 Hz and 40 Hz.

Peak acceleration of horizontal GMRS between 15 Hz and 40 Hz (Ref. 2.1; see Attachment B of this calculation): $SA_{GMRS} := 0.381g$ (at 15 Hz)

Calculate the horizontal in-structure amplification factor based on the distance between the bottom of the foundation elevation and the subject floor elevation.

Bottom of Deepest Foundation Elevation: (Ref. 2.1, Table 2.3.1-1, Note C) $El_{found} := 174 \cdot ft$

Component Floor Elevation (See Table A-1): $EL_{comp} := 289 \cdot ft$

Components PIS-050-1N653 and E51A-K10 are both located in the Control Enclosure building at elevation 289'.

Distance Between Component Floor and Foundation Elevation: $h_{comp} := EL_{comp} - El_{found} = 115.00 \cdot ft$

8 ANALYSIS (cont'd)

8.2 High-Frequency Seismic Demand (cont'd)

8.2.1 Horizontal Seismic Demand (cont'd)

Work the distance between the component floor and foundation with Ref. 1.1, Fig. 4-3 to calculate the horizontal in-structure amplification factor.

Slope of Amplification Factor Line, $0ft < h_{comp} < 40ft$

$$m_h := \frac{2.1 - 1.2}{40ft - 0ft} = 0.0225 \cdot \frac{1}{ft}$$

Intercept of Amplification Factor Line, $0ft < h_{comp} < 40ft$

$$b_h := 1.2$$

Horizontal In-Structure Amplification Factor:

$$AF_{SH}(h_{comp}) := \begin{cases} (m_h \cdot h_{comp} + b_h) & \text{if } h_{comp} \le 40ft \\ 2.1 & \text{otherwise} \end{cases}$$

$$AF_{SH}(h_{comp}) = 2.10$$

Calculate the horizontal in-cabinet amplification factor based on the type of cabinet that contains the subject component.

Type of Cabinet (per Ref. 3.2 and 3.3) (enter "MCC", "Switchgear", "Control Cabinet", or "Rigid"):

$$cab := \text{"Control Cabinet"}$$

Horizontal In-Cabinet Amplification Factor (Ref. 1.1, p. 4-13):

$$AF_{c.h}(cab) := \begin{cases} 3.6 & \text{if } cab = \text{"MCC"} \\ 7.2 & \text{if } cab = \text{"Switchgear"} \\ 4.5 & \text{if } cab = \text{"Control Cabinet"} \\ 1.0 & \text{if } cab = \text{"Rigid"} \end{cases}$$

$$AF_{c.h}(cab) = 4.5$$

Multiply the peak horizontal GMRS acceleration between by the horizontal in-structure and in-cabinet amplification factors to determine the in-cabinet response spectrum demand on the components.

Horizontal In-Cabinet Response Spectrum (Ref. 1.1, p. 4-12, Eq. 4-1a):

$$ICRS_{c.h} := AF_{SH}(h_{comp}) \cdot AF_{c.h}(cab) \cdot SA_{GMRS} = 3.600 \cdot g$$

Note that the horizontal seismic demand is the same for both components PIS-050-1N653 and E51A-K10.

8 ANALYSIS (cont'd)

8.2 High-Frequency Seismic Demand (cont'd)

8.2.2 Vertical Seismic Demand

Determine the peak acceleration of the horizontal GMRS between 15 Hz and 40 Hz.

Peak Acceleration of Horizontal GMRS Between 15 Hz and 40 Hz (See Sect. 8.2.1 of this Calculation) $SA_{GMRS} = 0.381 \cdot g$ (at 15 Hz)

Obtain the peak ground acceleration (PGA) of the horizontal GMRS from Ref. 2.1 (See Attachment B of this calculation).

Peak Ground Acceleration (GMRS): $PGA_{GMRS} := 0.193g$

Calculate the shear wave velocity traveling from a depth of 30m to the surface of the site (V_{s30}) from Ref. 1.1 and Attachment C.

Shear Wave Velocity:

$$V_{s30} = \frac{(30m)}{\Sigma\left(\frac{d_i}{V_{si}}\right)}$$

where,
d_i: Thickness of the layer (ft)
V_{si}: Shear wave velocity of the layer (ft/s)

Per Attachment C, the sum of thickness of the layer over shear wave velocity of the layer is 0.0288 sec.

Shear Wave Velocity:

$$V_{s30} := \frac{30m}{0.0288sec} = 3418 \cdot \frac{ft}{sec}$$

8 ANALYSIS (cont'd)

8.2 High-Frequency Seismic Demand (cont'd)

8.2.2 Vertical Seismic Demand (cont'd)

Work the PGA and shear wave velocity with Ref. 1.1, Table 3-1 to determine the soil class of the site. Based on the PGA of 0.193g and shear wave velocity of 3418ft/sec at Limerick, the site soil class is B-Hard.

Work the site soil class with Ref. 1.1, Table 3-2 to determine the mean vertical vs. horizontal GMRS ratios (V/H) at each spectral frequency. Multiply the V/H ratio at each frequency between 15Hz and 40Hz by the corresponding horizontal GMRS acceleration at each frequency between 15Hz and 40Hz to calculate the vertical GMRS.

See Attachment B for a table that calculates the vertical GMRS (equal to (V/H) x horizontal GMRS) between 15Hz and 40Hz.

Determine the peak acceleration of the vertical GMRS (SA_{VGMRS}) between frequencies of 15Hz and 40Hz. (By inspection of Attachment B, the SA_{VGMRS} occurs at 15Hz.)

V/H Ratio at 15Hz (See Attachment B of this calculation): $VH := 0.68$

Horizontal GMRS at Frequency of Peak Vertical GMRS (at 15Hz) (See Attachment B of this calculation): $HGMRS := 0.381g$

Peak Acceleration of Vertical GMRS Between 15 Hz and 40 Hz: $SA_{VGMRS} := VH \cdot HGMRS = 0.259 \cdot g$ (at 15 Hz)

A plot of horizontal and vertical GMRS is provided in Attachment B of this calculation.

8 ANALYSIS (cont'd)

8.2 High-Frequency Seismic Demand (cont'd)

8.2.2 Vertical Seismic Demand (cont'd)

Calculate the vertical in-structure amplification factor based on the distance between the plant foundation elevation and the subject floor elevation.

Distance Between Component Floor and Foundation (See Sect. 8.2.1 of this Calculation): $h_{comp} = 115.00 \cdot ft$

Work the distance between the component floor and foundation with Ref. 1.1, Fig. 4-4 to calculate the vertical in-structure amplification factor.

Slope of Amplification Factor Line: $m_V := \frac{2.7 - 1.0}{100ft - 0ft} = 0.017 \cdot \frac{1}{ft}$

Intercept of Amplification Factor Line: $b_V := 1.0$

Vertical In-Structure Amplification Factor: $AF_{SV} := m_V \cdot h_{comp} + b_V = 2.96$

Per Ref. 1.1, the vertical in-cabinet amplification factor is 4.7 regardless of cabinet type.

Vertical In-Cabinet Amplification Factor: $AF_{c.v} := 4.7$

Multiply the peak vertical GMRS acceleration between by the vertical in-structure and in-cabinet amplification factors to determine the in-cabinet response spectrum demand on the component.

Vertical In-Cabinet Response Spectrum (Ref. 1.1, p. 4-12, Eq. 4-1b): $ICRS_{c.v} := AF_{SV} \cdot AF_{c.v} \cdot SA_{VGMRS} = 3.60 \cdot g$

Note that the vertical seismic demand is the same for both components PIS-050-1N653 and E51A-K10A.

8 ANALYSIS (cont'd)

8.3 High-Frequency Seismic Capacity

A sample calculation for the high-frequency seismic capacity of components PIS-050-1N653 and E51A-K10 located in Unit 1 is presented here. A table that calculates the high-frequency seismic capacities for all of the subject components listed in Attachment A, Table A-1 of this calculation is provided in Attachment A, Table A-2 of this calculation.

8.3.1 Seismic Test Capacity

The high frequency seismic capacity of a component can be determined from the EPRI High Frequency Testing Program (Ref. 1.2) or other broad banded low frequency capacity data such as the Generic Equipment Ruggedness Spectra (GERS) or other qualification reports.

The model for component PIS-050-1N653, a Rosemount 510DU2 trip unit per Table A-1, was not tested as part of the Ref. 1.2 high-frequency testing program. Attachment A (Group 1) provides a seismic capacity calculation for Rosemount 510DU2 trip unit based on Limerick Seismic Report GE-101 (Ref. 3.20). The seismic capacity was calculated in Attachment A to be 11.62g for component PIS-050-1N653.

The model for component E51A-K10 is an Agastat EGPB002 relay per Table A-1. Per Ref. 5.1, Page 2, Agastat EGP and GP series relays are the same relays and the "E" (nuclear safety related) designator was added to the front. Per Ref. 1.12, Page 2-4, the lowest capacity of Agastat Model GP relay 5.0g. Note that the capacity of Agastat GP relay provided in Ref. 1.12, Page 2-4 and 2-6 is based on additional verification test level only (this capacity is not the GERS capacity, but a qualification test capacity).

Seismic Test Capacity (SA*):

$$SA' := \begin{pmatrix} 11.62 \\ 5.00 \end{pmatrix} g \qquad \begin{pmatrix} \text{PIS-050-1N653} \\ \text{E51A-K10} \end{pmatrix}$$

8.3.2 Effective Spectral Test Capacity

Since a qualification report was used as the capacity source for both components, there are no spectral acceleration increases and the effective spectral test capacity is equal to the seismic test capacity.

Effective Spectral Test Capacity (Ref. 1.1, p. 4-16):

$$SA_T := \begin{pmatrix} SA'_1 \\ SA'_2 \end{pmatrix} = \begin{pmatrix} 11.62 \\ 5.00 \end{pmatrix} \cdot g \qquad \begin{pmatrix} \text{PIS-050-1N653} \\ \text{E51A-K10} \end{pmatrix}$$

8 ANALYSIS (cont'd)

8.3 High-Frequency Seismic Capacity (cont'd)

8.3.3 Seismic Capacity Knockdown Factor

Determine the seismic capacity knockdown factor for the subject component based on the type of testing used to determine the seismic capacity of the component.

Using Table 4-2 of Ref. 1.1 and the capacity sources from Section 8.3.1 above, the knockdown factors are chosen as:

Seismic Capacity Knockdown Factor: $F_k := \begin{pmatrix} 1.20 \\ 1.20 \end{pmatrix}$ $\begin{pmatrix} \text{PIS-050-1N653} \\ \text{E51A-K10} \end{pmatrix}$

8.3.4 Seismic Testing Single-Axis Correction Factor

Determine the seismic testing single-axis correction factor of the subject component, which is based on whether the equipment housing to which the component is mounted has well-separated horizontal and vertical motion or not.

Per Ref. 1.1, pp. 4-18, conservatively take the F_{MS} value as 1.0.

Single-Axis Correction Factor (Ref. 1.1, pp. 4-17 to 4-18): $F_{MS} := 1.0$

8 ANALYSIS (cont'd)

8.3 High-Frequency Seismic Capacity for Ref. 1.1 Components (cont'd)

8.3.5 Effective Wide-Band Component Capacity Acceleration

Calculate the effective wide-band component capacity acceleration per Ref. 1.1, Eq. 4-5.

Effective Wide-Band Component Capacity Acceleration (Ref. 1.1, Eq. 4-5):

$$TRS := \left(\frac{SA_T}{F_k}\right) \cdot F_{MS} = \begin{pmatrix} 9.683 \\ 4.167 \end{pmatrix} \cdot g \quad \begin{pmatrix} \text{PIS-050-1N653} \\ \text{E51A-K10} \end{pmatrix}$$

8.4 High-Frequency Seismic Capacity for Ref. 1.4, Appendix H Components

8.4.1 Effective Wide-Band Component Capacity Acceleration

Per a review of the capacity generation methodologies of Ref. 1.1 and Ref. 1.4, App. H, Section H.5, the capacity of a Ref. 1.4 component is equal to the Ref. 1.1 effective wide-band component capacity multiplied by a factor accounting for the difference between a 1% probability of failure ($C_{1\%}$, Ref. 1.1) and a 10% probability of failure ($C_{10\%}$, Ref. 1.4).

Per Ref. 1.4, App. H, Table H.1, use the $C_{10\%}$ vs. $C_{1\%}$ ratio from the Realistic Lower Bound Case for components.

$C_{10\%}$ vs. $C_{1\%}$ ratio

$$C_{10} := 1.36$$

Effective wide-band component capacity acceleration (Ref. 1.4, App. H, Sect. H.5)

$$TRS_{1.4} := TRS \cdot C_{10} = \begin{pmatrix} 13.169 \\ 5.667 \end{pmatrix} \cdot g \quad \begin{pmatrix} \text{PIS-050-1N653} \\ \text{E51A-K10} \end{pmatrix}$$

8 ANALYSIS (cont'd)

8.5 Component (Ref. 1.1) High-Frequency Margin

Calculate the high-frequency seismic margin for components per Ref. 1.1, Eq. 4-6.

A sample calculation for the high-frequency seismic demand of components PIS-050-1N653 and E51A-K10 is presented here. A table that calculates the high-frequency seismic margin for all of the subject components listed in Attachment A, Table A-1 of this calculation is provided in Attachment A, Table A-2 of this calculation.

Horizontal seismic margin (Ref. 1.1, Eq. 4-6): $\frac{TRS}{ICRS_{c.h}} = \begin{pmatrix} 2.689 \\ 1.157 \end{pmatrix}$ $\begin{matrix} > 1.0, \text{ O.K.} \\ > 1.0, \text{ O.K.} \end{matrix}$ $\begin{pmatrix} \text{PIS-050-1N653} \\ \text{E51A-K10} \end{pmatrix}$

Vertical seismic margin (Ref. 1.1, Eq. 4-6): $\frac{TRS}{ICRS_{c.v}} = \begin{pmatrix} 2.691 \\ 1.158 \end{pmatrix}$ $\begin{matrix} > 1.0, \text{ O.K.} \\ > 1.0, \text{ O.K.} \end{matrix}$ $\begin{pmatrix} \text{PIS-050-1N653} \\ \text{E51A-K10} \end{pmatrix}$

Both the horizontal and vertical seismic margins for PIS-050-1N653 and E51A-K10 are greater than 1.00; indicating that these components are adequate for high frequency seismic spectral ground motion for its Ref. 1.1 functions.

8.6 Component (Ref. 1.4) High-Frequency Margin

Calculate the high-frequency seismic margin for Ref. 1.4 components per Ref. 1.1, Eq. 4-6.

A sample calculation for the high-frequency seismic demand of component components PIS-050-1N653 and E51A-K10 is presented here. A table that calculates the high-frequency seismic margin for all of the subject components listed in Attachment A, Table A-1 of this calculation is provided in Attachment A, Table A-2 of this calculation.

Horizontal seismic margin (Ref. 1.1, Eq. 4-6): $\frac{TRS_{1.4}}{ICRS_{c.h}} = \begin{pmatrix} 3.658 \\ 1.574 \end{pmatrix}$ $\begin{matrix} > 1.0, \text{ O.K.} \\ > 1.0, \text{ O.K.} \end{matrix}$ $\begin{pmatrix} \text{PIS-050-1N653} \\ \text{E51A-K10} \end{pmatrix}$

Vertical seismic margin (Ref. 1.1, Eq. 4-6): $\frac{TRS_{1.4}}{ICRS_{c.v}} = \begin{pmatrix} 3.660 \\ 1.575 \end{pmatrix}$ $\begin{matrix} > 1.0, \text{ O.K.} \\ > 1.0, \text{ O.K.} \end{matrix}$ $\begin{pmatrix} \text{PIS-050-1N653} \\ \text{E51A-K10} \end{pmatrix}$

Both the horizontal and vertical seismic margins for PIS-050-1N653 and E51A-K10 are greater than 1.00; therefore, these components are adequate for high-frequency seismic spectral ground motion for its Ref. 1.4 functions.

B Components Identified for High Frequency Confirmation

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
1	1	PIS-049-1N658A	Control Relay	Core Cooling	RCIC Steam Pressure Indicating Switch	Rosemount	510DU1	10-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
2	1	PIS-049-1N658C	Control Relay	Core Cooling	RCIC Steam Pressure Indicating Switch	Rosemount	710DU0TT	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
3	1	PIS-049-1N658E	Control Relay	Core Cooling	RCIC Steam Pressure Indicating Switch	Rosemount	510DU1	10-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
4	1	PIS-049-1N658G	Control Relay	Core Cooling	RCIC Steam Pressure Indicating Switch	Rosemount	510DU1	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
5	1	PIS-050-1N653	Control Relay	Core Cooling	RCIC Pump Suction Header	Rosemount	510DU2	10-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
6	1	PIS-050-1N655A	Control Relay	Core Cooling	RCIC Turbine Exhaust Line Vent	Rosemount	510DU1	10-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
7	1	PIS-050-1N655C	Control Relay	Core Cooling	RCIC Turbine Exhaust Line Vent	Rosemount	510DU1	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
8	1	PIS-050-1N655E	Control Relay	Core Cooling	RCIC Turbine Exhaust Line Vent	Rosemount	510DU1	10-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
9	1	PIS-050-1N655G	Control Relay	Core Cooling	RCIC Turbine Exhaust Line Vent	Rosemount	510DU1	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
10	1	PIS-050-1N656A	Control Relay	Core Cooling	RCIC Pump Turbine Exhaust	Rosemount	510DU2	10-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
11	1	PIS-050-1N656E	Control Relay	Core Cooling	RCIC Pump Turbine Exhaust	Rosemount	510DU2	10-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
12	2	PIS-049-2N658A	Control Relay	Core Cooling	RCIC Steam Pressure Indicating Switch	Rosemount	510DU1	20-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
13	2	PIS-049-2N658C	Control Relay	Core Cooling	RCIC Steam Pressure Indicating Switch	Rosemount	710DU0TT	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
14	2	PIS-049-2N658E	Control Relay	Core Cooling	RCIC Steam Pressure Indicating Switch	Rosemount	510DU1	20-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
15	2	PIS-049-2N658G	Control Relay	Core Cooling	RCIC Steam Pressure Indicating Switch	Rosemount	710DU0TT	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
16	2	PIS-050-2N653	Control Relay	Core Cooling	RCIC Pump Suction Header	Rosemount	710DU0TT	20-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
17	2	PIS-050-2N655A	Control Relay	Core Cooling	RCIC Turbine Exhaust Line Vent	Rosemount	510DU1	20-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
18	2	PIS-050-2N655C	Control Relay	Core Cooling	RCIC Turbine Exhaust Line Vent	Rosemount	710DU0TT	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
19	2	PIS-050-2N655E	Control Relay	Core Cooling	RCIC Turbine Exhaust Line Vent	Rosemount	710DU0TT	20-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
20	2	PIS-050-2N655G	Control Relay	Core Cooling	RCIC Turbine Exhaust Line Vent	Rosemount	510DU2	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
21	2	PIS-050-2N656A	Control Relay	Core Cooling	RCIC Pump Turbine Exhaust	Rosemount	710DU0TT	20-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
22	2	PIS-050-2N656E	Control Relay	Core Cooling	RCIC Pump Turbine Exhaust	Rosemount	710DU0TT	20-C617	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
23	1	E51A-K10	Control Relay	Core Cooling	RCIC Pump Suction Pressure Relay Energize on Pressure On Vacuum Less than Set-point	Agastat	EGPB002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
24	1	E51A-K11A	Control Relay	Core Cooling	RCIC Relay – Energize on Turbine Diaphragm Exhaust Pressure Above Set-point	Agastat	EGPB002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
25	1	E51A-K11C	Control Relay	Core Cooling	RCIC Relay - Energize On Turbine Diaphragm Exhaust Pressure Above Set-Point	Agastat	EGPB002	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
26	1	E51A-K12A	Control Relay	Core Cooling	RCIC RELAY - Energize on Turbine Diaphragm Exhaust Pressure Above Set-point	Agastat	EGPB002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
27	1	E51A-K12C	Control Relay	Core Cooling	RCIC Relay – Energize on Turbine Diaphragm Exhaust Pressure Above Set-Point	Agastat	EGPB002	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
28	1	E51A-K13	Control Relay	Core Cooling	RCIC Relay - Energizes On Turbine Exhaust Pressure Above Set-point	Agastat	EGPB002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
29	1	E51A-K14	Control Relay	Core Cooling	RCIC Relay - Energizes On Turbine Exhaust Pressure Above Set-Point	Agastat	EGPB002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
30	1	E51A-K16A	Control Relay	Core Cooling	RCIC Relay - Energizes On Steam Line Pressure Below Set-point	Agastat	EGPB002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
31	1	E51A-K16C	Control Relay	Core Cooling	RCIC Relay - Energizes On Steam Line Pressure Below Set-Point	Agastat	EGPB002	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
32	1	E51A-K17A	Control Relay	Core Cooling	RCIC Relay - Energizes On Steam Line Pressure Below Set-point	Agastat	EGPB002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
33	1	E51A-K17C	Control Relay	Core Cooling	RCIC Relay - Energizes On Steam Line Pressure Below Set-Point	Agastat	EGPB002	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
34	1	E51A-K28	Control Relay	Core Cooling	RCIC Turbine Trip Auxiliary Relay	Agastat	EGPD002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
35	1	E51A-K30A	Control Relay	Core Cooling	Steam Leak Detection Relay (RCIC Isolation Signal Manual Isolation Relay - Valve E51-F008)	Agastat	EGPD002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
36	1	E51A-K30C	Control Relay	Core Cooling	RCIC DIV 3 Isolation Signal and Steam Line Detection Relay (E51-F007)	Agastat	EGPD002	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
37	1	E51A-K31A	Control Relay	Core Cooling	RCIC Isolation Signal Manual Isolation Relay - Valve E51-F008	Agastat	EGPD002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
38	1	E51A-K31C	Control Relay	Core Cooling	RCIC Isolation Signal Manual Isolation Relay - Valve E51-F008	Agastat	EGPD002	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
39	1	E51A-K67C	Control Relay	Core Cooling	RCIC DIV 3 Isolation Signal Relay	Agastat	EGPD002	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
40	2	E51A-K10	Control Relay	Core Cooling	RCIC Pump Suction Pressure Relay - Energize on Pressure on Vacuum Less than Set-point	Agastat	EGPB003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
41	2	E51A-K11A	Control Relay	Core Cooling	RCIC Relay - Energize on Turbine Diaphragm Exhaust Pressure Above Set-Point	Agastat	EGPB003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
42	2	E51A-K11C	Control Relay	Core Cooling	RCIC Relay - Energize on Turbine Diaphragm Exhaust Pressure Above Set-Point	Agastat	EGPB003	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
43	2	E51A-K12A	Control Relay	Core Cooling	RCIC Relay - Energize on turbine Diaphragm Exhaust Pressure Above Set-Point	Agastat	EGPB003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
44	2	E51A-K12C	Control Relay	Core Cooling	RCIC Relay - Energize on Turbine Diaphragm Exhaust Pressure Above Set-Point	Agastat	EGPB003	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
45	2	E51A-K13	Control Relay	Core Cooling	RCIC Relay - Energizes on Turbine Exhaust Pressure Above Set-Point	Agastat	EGPB003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
46	2	E51A-K14	Control Relay	Core Cooling	RCIC Relay - Energizes on Turbine Exhaust Pressure Above Set-Point	Agastat	EGPB003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
47	2	E51A-K16A	Control Relay	Core Cooling	RCIC RELAY - Energizes On Steam Line Pressure Below Set-Point	Agastat	EGPB003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
48	2	E51A-K16C	Control Relay	Core Cooling	RCIC Relay - Energizes on Steam Line Pressure Below Set-Point	Agastat	EGPB003	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
49	2	E51A-K17A	Control Relay	Core Cooling	RCIC RELAY - Energizes On Steam Line Pressure Below Set-Point	Agastat	EGPB003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
50	2	E51A-K17C	Control Relay	Core Cooling	RCIC Relay - Energizes on Steam Line Pressure Below Set-Point	Agastat	EGPB002	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
51	2	E51A-K28	Control Relay	Core Cooling	RCIC Turbine Trip Auxiliary Relay	Agastat	EGPD003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
52	2	E51A-K30A	Control Relay	Core Cooling	Steam Leak Detection Relay (RCIC Isolation Signal Manual Isolation Relay - Valve E51-F008)	Agastat	EGPD003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
53	2	E51A-K30C	Control Relay	Core Cooling	RCIC DIV 3 Isolation Signal and Steam Line Detection Relay (E51-F007)	Agastat	EGPD003	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
54	2	E51A-K31A	Control Relay	Core Cooling	RCIC Isolation Signal Manual Isolation Relay - Valve E51-F008	Agastat	EGPD003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
55	2	E51A-K31C	Control Relay	Core Cooling	RCIC Isolation Signal Manual Isolation Relay - Valve E51-F008	Agastat	EGPD003	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
56	2	E51A-K67C	Control Relay	Core Cooling	RCIC DIV 3 Isolation Signal Relay	Agastat	EGPD003	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
57	1	E51A-K15A	Control Relay	Core Cooling	RCIC System Steam Flow Above Set-point Time Delay Relay	Agastat	ETR14B3B C2004002	10-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
58	1	E51A-K15C	Control Relay	Core Cooling	RCIC System Steam Flow Above Set-Point Time Delay Relay	Agastat	ETR14B3B C2004002	10-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
59	2	E51A-K15A	Control Relay	Core Cooling	RCIC System Steam Flow Above Set-point Time Delay Relay	Agastat	ETR14B3C 003	20-C621	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
60	2	E51A-K15C	Control Relay	Core Cooling	RCIC System Steam Flow Above Set-Point Time Delay Relay	Agastat	ETR14B3C 003	20-C640	Control Cab.	Control Enclosure	289	Qualification Test	Cap > Dem
61	1	150/151-11508A	Protective Relay	AC/DC Power Support Systems	ESW Pump 0AP548 Overcurrent Phase A	GE	12IAC66K8A-S	D11-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
62	1	150/151-11508B	Protective Relay	AC/DC Power Support Systems	ESW Pump 0AP548 Overcurrent Phase B	GE	12IAC66K8A-S	D11-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
63	1	150/151-11508C	Protective Relay	AC/DC Power Support Systems	ESW Pump 0AP548 Overcurrent Phase C	GE	12IAC66K8A-S	D11-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
64	1	150/151-11608A	Protective Relay	AC/DC Power Support Systems	ESW Pump 0BP548 Overcurrent Phase A	GE	12IAC66K8A-S	D12-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
65	1	150/151-11608B	Protective Relay	AC/DC Power Support Systems	ESW Pump 0BP548 Overcurrent Phase B	GE	12IAC66K8A-S	D12-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
66	1	150/151-11608C	Protective Relay	AC/DC Power Support Systems	ESW Pump 0BP548 Overcurrent Phase C	GE	12IAC66K8A-S	D12-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
67	2	150/151-11605A	Protective Relay	AC/DC Power Support Systems	D224 Load Center Overcurrent Phase A	GE	12IAC77B812A-S	D22-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
68	2	150/151-11605B	Protective Relay	AC/DC Power Support Systems	D224 Load Center Overcurrent Phase B	GE	12IAC77B812A-S	D22-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
69	2	150/151-11605C	Protective Relay	AC/DC Power Support Systems	D224 Load Center Overcurrent Phase C	GE	12IAC77B812A-S	D22-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
70	2	150/151-11708A	Protective Relay	AC/DC Power Support Systems	ESW Pump 0CP548 Overcurrent Phase A	GE	12IAC66K8A-S	D23-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
71	2	150/151-11708B	Protective Relay	AC/DC Power Support Systems	ESW Pump 0CP548 Overcurrent Phase B	GE	12IAC66K8A-S	D23-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
72	2	150/151-11708C	Protective Relay	AC/DC Power Support Systems	ESW Pump 0CP548 Overcurrent Phase C	GE	12IAC66K8A-S	D23-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
73	1	132-AG501	Protective Relay	AC/DC Power Support Systems	Anti-Motoring Relay	GE	12ICW51A2A-S	D11-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
74	1	132-BG501	Protective Relay	AC/DC Power Support Systems	Anti-Motoring Relay	GE	12ICW51A2A-S	D12-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
75	1	132-CG501	Protective Relay	AC/DC Power Support Systems	Anti-Motoring Relay	GE	12ICW51A2A-S	D13-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
76	1	132-DG501	Protective Relay	AC/DC Power Support Systems	Anti-Motoring Relay	GE	12ICW51A2A-S	D14-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
77	1	187G-AG501A	Protective Relay	AC/DC Power Support Systems	D11 A Phase Differential Relay	GE	12IJD52A11A-S	D11-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
78	1	187G-AG501B	Protective Relay	AC/DC Power Support Systems	D11 B Phase Differential Relay	GE	12IJD52A11A-S	D11-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
79	1	187G-AG501C	Protective Relay	AC/DC Power Support Systems	D11 C Phase Differential Relay	GE	12IJD52A11A-S	D11-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
80	1	187G-BG501A	Protective Relay	AC/DC Power Support Systems	D12 A Phase Differential Relay	GE	12IJD52A11A-S	D12-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
81	1	187G-BG501B	Protective Relay	AC/DC Power Support Systems	D12 B Phase Differential Relay	GE	12IJD52A11A-S	D12-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
82	1	187G-BG501C	Protective Relay	AC/DC Power Support Systems	D12 C Phase Differential Relay	GE	12IJD52A1 1A-S	D12-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
83	1	187G-CG501A	Protective Relay	AC/DC Power Support Systems	D13 A Phase Differential Relay	GE	12IJD52A1 1A-S	D13-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
84	1	187G-CG501B	Protective Relay	AC/DC Power Support Systems	D13 B Phase Differential Relay	GE	12IJD52A1 1A-S	D13-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
85	1	187G-CG501C	Protective Relay	AC/DC Power Support Systems	D13 C Phase Differential Relay	GE	12IJD52A1 1A-S	D13-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
86	1	187G-DG501A	Protective Relay	AC/DC Power Support Systems	D14 A Phase Differential Relay	GE	12IJD52A1 1A-S	D14-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
87	1	187G-DG501B	Protective Relay	AC/DC Power Support Systems	D14 B Phase Differential Relay	GE	12IJD52A1 1A-S	D14-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
88	1	187G-DG501C	Protective Relay	AC/DC Power Support Systems	D14 C Phase Differential Relay	GE	12IJD52A1 1A-S	D14-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
89	2	132-AG501	Protective Relay	AC/DC Power Support Systems	Anti-Motoring Relay	GE	12ICW51A 2A-S	D21-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
90	2	132-BG501	Protective Relay	AC/DC Power Support Systems	Anti-Motoring Relay	GE	12ICW51A 2A-S	D22-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
91	2	132-CG501	Protective Relay	AC/DC Power Support Systems	Anti-Motoring Relay	GE	12ICW51A 2A-S	D23-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
92	2	132-DG501	Protective Relay	AC/DC Power Support Systems	Anti-Motoring Relay	GE	12ICW51A 2A-S	D24-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
93	2	187G-AG501A	Protective Relay	AC/DC Power Support Systems	D21 A Phase Differential Relay	GE	12IJD52A1 1A-S	D21-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
94	2	187G-AG501B	Protective Relay	AC/DC Power Support Systems	D21 B Phase Differential Relay	GE	12IJD52A1 1A-S	D21-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
95	2	187G-AG501C	Protective Relay	AC/DC Power Support Systems	D21 C Phase Differential Relay	GE	12IJD52A1 1A-S	D21-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
96	2	187G-BG501A	Protective Relay	AC/DC Power Support Systems	D22 A Phase Differential Relay	GE	12IJD52A1 1A-S	D22-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
97	2	187G-BG501B	Protective Relay	AC/DC Power Support Systems	D22 B Phase Differential Relay	GE	12IJD52A1 1A-S	D22-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
98	2	187G-BG501C	Protective Relay	AC/DC Power Support Systems	D22 C Phase Differential Relay	GE	12IJD52A1 1A-S	D22-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
99	2	187G-CG501A	Protective Relay	AC/DC Power Support Systems	D23 A Phase Differential Relay	GE	12IJD52A1 1A-S	D23-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
100	2	187G-CG501B	Protective Relay	AC/DC Power Support Systems	D23 B Phase Differential Relay	GE	12IJD52A1 1A-S	D23-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
101	2	187G-CG501C	Protective Relay	AC/DC Power Support Systems	D23 C Phase Differential Relay	GE	12IJD52A1 1A-S	D23-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
102	2	187G-DG501A	Protective Relay	AC/DC Power Support Systems	D24 A Phase Differential Relay	GE	12IJD52A11A-S	D24-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
103	2	187G-DG501B	Protective Relay	AC/DC Power Support Systems	D24 B Phase Differential Relay	GE	12IJD52A11A-S	D24-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
104	2	187G-DG501C	Protective Relay	AC/DC Power Support Systems	D24 C Phase Differential Relay	GE	12IJD52A11A-S	D24-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
105	1	150/151-11505A	Protective Relay	AC/DC Power Support Systems	D114 Load Center Overcurrent Phase A	GE	12IAC77B812A-S	D11-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
106	1	150/151-11505B	Protective Relay	AC/DC Power Support Systems	D114 Load Center Overcurrent Phase B	GE	12IAC77B812A-S	D11-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
107	1	150/151-11505C	Protective Relay	AC/DC Power Support Systems	D114 Load Center Overcurrent Phase C	GE	12IAC77B812A-S	D11-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
108	1	150/151-11605A	Protective Relay	AC/DC Power Support Systems	D124 Load Center Overcurrent Phase A	GE	12IAC77B812A-S	D12-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
109	1	150/151-11605B	Protective Relay	AC/DC Power Support Systems	D124 Load Center Overcurrent Phase B	GE	12IAC77B812A-S	D12-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
110	1	150/151-11605C	Protective Relay	AC/DC Power Support Systems	D124 Load Center Overcurrent Phase C	GE	12IAC77B812A-S	D12-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
111	1	150/151-11705A	Protective Relay	AC/DC Power Support Systems	D134 Load Center Overcurrent Phase A	GE	12IAC77B812A-S	D13-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
112	1	150/151-11705B	Protective Relay	AC/DC Power Support Systems	D134 Load Center Overcurrent Phase B	GE	12IAC77B 812A-S	D13-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
113	1	150/151-11705C	Protective Relay	AC/DC Power Support Systems	D134 Load Center Overcurrent Phase C	GE	12IAC77B 812A-S	D13-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
114	1	150/151-11805A	Protective Relay	AC/DC Power Support Systems	D144 Load Center Overcurrent Phase A	GE	12IAC77B 812A-S	D14-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
115	1	150/151-11805B	Protective Relay	AC/DC Power Support Systems	D144 Load Center Overcurrent Phase B	GE	12IAC77B 812A-S	D14-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
116	1	150/151-11805C	Protective Relay	AC/DC Power Support Systems	D144 Load Center Overcurrent Phase C	GE	12IAC77B 812A-S	D14-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
117	2	150/151-11505A	Protective Relay	AC/DC Power Support Systems	D214 Load Center Overcurrent Phase A	GE	12IAC77B 812A-S	D21-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
118	2	150/151-11505B	Protective Relay	AC/DC Power Support Systems	D214 Load Center Overcurrent Phase B	GE	12IAC77B 812A-S	D21-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
119	2	150/151-11505C	Protective Relay	AC/DC Power Support Systems	D214 Load Center Overcurrent Phase C	GE	12IAC77B 812A-S	D21-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
120	2	150/151-11705A	Protective Relay	AC/DC Power Support Systems	D234 Load Center Overcurrent Phase A	GE	12IAC77B 812A-S	D23-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
121	2	150/151-11705B	Protective Relay	AC/DC Power Support Systems	D234 Load Center Overcurrent Phase B	GE	12IAC77B 812A-S	D23-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
122	2	150/151-11705C	Protective Relay	AC/DC Power Support Systems	D234 Load Center Overcurrent Phase C	GE	12IAC77B 812A-S	D23-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
123	2	150/151-11805A	Protective Relay	AC/DC Power Support Systems	D244 Load Center Overcurrent Phase A	GE	12IAC77B 812A-S	D24-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
124	2	150/151-11805B	Protective Relay	AC/DC Power Support Systems	D244 Load Center Overcurrent Phase B	GE	12IAC77B 812A-S	D24-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
125	2	150/151-11805C	Protective Relay	AC/DC Power Support Systems	D244 Load Center Overcurrent Phase C	GE	12IAC77B 812A-S	D24-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
126	2	150/151-11808A	Protective Relay	AC/DC Power Support Systems	ESW Pump 0DP548 Overcurrent Phase A	GE	12IAC66K8 A-S	D24-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
127	2	150/151-11808B	Protective Relay	AC/DC Power Support Systems	ESW Pump 0DP548 Overcurrent Phase B	GE	12IAC66K8 A-S	D24-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
128	2	150/151-11808C	Protective Relay	AC/DC Power Support Systems	ESW Pump 0DP548 Overcurrent Phase C	GE	12IAC66K8 A-S	D24-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
129	1	151-11702A	Protective Relay	AC/DC Power Support Systems	A117 Breaker 702 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D13-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
130	1	151-11702B	Protective Relay	AC/DC Power Support Systems	A117 Breaker 702 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D13-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
131	1	151-11702C	Protective Relay	AC/DC Power Support Systems	A117 Breaker 702 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D13-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
132	1	151-11709A	Protective Relay	AC/DC Power Support Systems	A117 Breaker 709 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D13-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
133	1	151-11709B	Protective Relay	AC/DC Power Support Systems	A117 Breaker 709 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D13-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
134	1	151-11709C	Protective Relay	AC/DC Power Support Systems	A117 Breaker 709 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D13-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
135	1	151-AG501A	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase A	GE	12IAC53A 802A-S	D11-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
136	1	151-AG501B	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase B	GE	12IAC53A 802A-S	D11-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
137	1	151-AG501C	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase C	GE	12IAC53A 802A-S	D11-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
138	1	151-BG501A	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase A	GE	12IAC53A 802A-S	D12-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
139	1	151-BG501B	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase B	GE	12IAC53A 802A-S	D12-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
140	1	151-BG501C	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase C	GE	12IAC53A 802A-S	D12-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
141	1	151-CG501A	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase A	GE	12IAC53A 802A-S	D13-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
142	1	151-CG501B	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase B	GE	12IAC53A 802A-S	D13-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
143	1	151-CG501C	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase C	GE	12IAC53A 802A-S	D13-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
144	1	151-DG501A	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase A	GE	12IAC53A 802A-S	D14-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
145	1	151-DG501B	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase B	GE	12IAC53A 802A-S	D14-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
146	1	151-DG501C	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase C	GE	12IAC53A 802A-S	D14-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
147	1	151-11502A	Protective Relay	AC/DC Power Support Systems	A115 Breaker 502 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D11-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
148	1	151-11502B	Protective Relay	AC/DC Power Support Systems	A115 Breaker 502 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D11-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
149	1	151-11502C	Protective Relay	AC/DC Power Support Systems	A115 Breaker 502 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D11-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
150	1	151-11509A	Protective Relay	AC/DC Power Support Systems	A115 Breaker 509 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D11-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
151	1	151-11509B	Protective Relay	AC/DC Power Support Systems	A115 Breaker 509 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D11-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
152	1	151-11509C	Protective Relay	AC/DC Power Support Systems	A115 Breaker 509 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D11-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
153	1	151-11602A	Protective Relay	AC/DC Power Support Systems	A116 Breaker 602 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D12-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
154	1	151-11602B	Protective Relay	AC/DC Power Support Systems	A116 Breaker 602 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D12-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
155	1	151-11602C	Protective Relay	AC/DC Power Support Systems	A116 Breaker 602 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D12-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
156	1	151-11609A	Protective Relay	AC/DC Power Support Systems	A116 Breaker 609 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D12-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
157	1	151-11609B	Protective Relay	AC/DC Power Support Systems	A116 Breaker 609 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D12-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
158	1	151-11609C	Protective Relay	AC/DC Power Support Systems	A116 Breaker 609 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D12-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
159	1	151-11802A	Protective Relay	AC/DC Power Support Systems	A118 Breaker 802 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D14-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
160	1	151-11802B	Protective Relay	AC/DC Power Support Systems	A118 Breaker 802 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D14-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
161	1	151-11802C	Protective Relay	AC/DC Power Support Systems	A118 Breaker 802 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D14-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
162	1	151-11809A	Protective Relay	AC/DC Power Support Systems	A118 Breaker 809 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D14-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
163	1	151-11809B	Protective Relay	AC/DC Power Support Systems	A118 Breaker 809 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D14-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
164	1	151-11809C	Protective Relay	AC/DC Power Support Systems	A118 Breaker 809 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D14-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
165	2	151-11702A	Protective Relay	AC/DC Power Support Systems	A117 Breaker 702 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A	D23-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
166	2	151-11702B	Protective Relay	AC/DC Power Support Systems	A117 Breaker 702 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A	D23-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
167	2	151-11702C	Protective Relay	AC/DC Power Support Systems	A117 Breaker 702 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A	D23-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
168	2	151-11709A	Protective Relay	AC/DC Power Support Systems	A117 Breaker 709 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D23-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
169	2	151-11709B	Protective Relay	AC/DC Power Support Systems	A117 Breaker 709 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D23-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
170	2	151-11709C	Protective Relay	AC/DC Power Support Systems	A117 Breaker 709 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D23-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
171	2	151-AG501A	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase A	GE	12IAC53A 802A-S	D21-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
172	2	151-AG501B	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase B	GE	12IAC53A 802A-S	D21-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
173	2	151-AG501C	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase C	GE	12IAC53A 802A-S	D21-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
174	2	151-BG501A	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase A	GE	12IAC53A 802A-S	D22-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
175	2	151-BG501B	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase B	GE	12IAC53A 802A-S	D22-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
176	2	151-BG501C	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase C	GE	12IAC53A 802A-S	D22-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
177	2	151-CG501A	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase A	GE	12IAC53A 802A-S	D23-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
178	2	151-CG501B	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase B	GE	12IAC53A 802A-S	D23-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
179	2	151-CG501C	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase C	GE	12IAC53A 802A-S	D23-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
180	2	151-DG501A	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase A	GE	12IAC53A 802A-S	D24-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
181	2	151-DG501B	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase B	GE	12IAC53A 802A-S	D24-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
182	2	151-DG501C	Protective Relay	AC/DC Power Support Systems	Phase Overcurrent Relay Phase C	GE	12IAC53A 802A-S	D24-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
183	2	151-11502A	Protective Relay	AC/DC Power Support Systems	A115 Breaker 502 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D21-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
184	2	151-11502B	Protective Relay	AC/DC Power Support Systems	A115 Breaker 502 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D21-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
185	2	151-11502C	Protective Relay	AC/DC Power Support Systems	A115 Breaker 502 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D21-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
186	2	151-11509A	Protective Relay	AC/DC Power Support Systems	A115 Breaker 509 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D21-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
187	2	151-11509B	Protective Relay	AC/DC Power Support Systems	A115 Breaker 509 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D21-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
188	2	151-11509C	Protective Relay	AC/DC Power Support Systems	A115 Breaker 509 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D21-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
189	2	151-11602A	Protective Relay	AC/DC Power Support Systems	A116 Breaker 602 Bus A Phase Overcurrent Relay	GE	12IAC53A 803A	D22-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
190	2	151-11602B	Protective Relay	AC/DC Power Support Systems	A116 Breaker 602 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D22-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
191	2	151-11602C	Protective Relay	AC/DC Power Support Systems	A116 Breaker 602 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D22-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
192	2	151-11609A	Protective Relay	AC/DC Power Support Systems	A116 Breaker 609 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D22-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
193	2	151-11609B	Protective Relay	AC/DC Power Support Systems	A116 Breaker 609 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D22-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
194	2	151-11609C	Protective Relay	AC/DC Power Support Systems	A116 Breaker 609 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D22-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
195	2	151-11802A	Protective Relay	AC/DC Power Support Systems	A118 Breaker 802 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D24-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
196	2	151-11802B	Protective Relay	AC/DC Power Support Systems	A118 Breaker 802 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D24-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
197	2	151-11802C	Protective Relay	AC/DC Power Support Systems	A118 Breaker 802 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D24-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
198	2	151-11809A	Protective Relay	AC/DC Power Support Systems	A118 Breaker 809 Bus A Phase Overcurrent Relay	GE	12IAC53A 802A-S	D24-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
199	2	151-11809B	Protective Relay	AC/DC Power Support Systems	A118 Breaker 809 Bus B Phase Overcurrent Relay	GE	12IAC53A 802A-S	D24-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
200	2	151-11809C	Protective Relay	AC/DC Power Support Systems	A118 Breaker 809 Bus C Phase Overcurrent Relay	GE	12IAC53A 802A-S	D24-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
201	1	151N-11502	Protective Relay	AC/DC Power Support Systems	A115 Breaker 502 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D11-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
202	1	151N-11509	Protective Relay	AC/DC Power Support Systems	A115 Breaker 509 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D11-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
203	1	151N-11602	Protective Relay	AC/DC Power Support Systems	A116 Breaker 602 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D12-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
204	1	151N-11609	Protective Relay	AC/DC Power Support Systems	A116 Breaker 609 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D12-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
205	1	151N-11702	Protective Relay	AC/DC Power Support Systems	A117 Breaker 702 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D13-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
206	1	151N-11709	Protective Relay	AC/DC Power Support Systems	A117 Breaker 709 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D13-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
207	1	151N-11802	Protective Relay	AC/DC Power Support Systems	A118 Breaker 802 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D14-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
208	1	151N-11809	Protective Relay	AC/DC Power Support Systems	A118 Breaker 809 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D14-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
209	2	151N-11502	Protective Relay	AC/DC Power Support Systems	A115 Breaker 502 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D21-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
210	2	151N-11509	Protective Relay	AC/DC Power Support Systems	A115 Breaker 509 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D21-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
211	2	151N-11602	Protective Relay	AC/DC Power Support Systems	A116 Breaker 602 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D22-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
212	2	151N-11609	Protective Relay	AC/DC Power Support Systems	A116 Breaker 609 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D22-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
213	2	151N-11702	Protective Relay	AC/DC Power Support Systems	A117 Breaker 702 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D23-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
214	2	151N-11709	Protective Relay	AC/DC Power Support Systems	A117 Breaker 709 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D23-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
215	2	151N-11802	Protective Relay	AC/DC Power Support Systems	A118 Breaker 802 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D24-Bus-02	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
216	2	151N-11809	Protective Relay	AC/DC Power Support Systems	A118 Breaker 809 Neutral Overcurrent Relay	GE	12IAC51A 801A-S	D24-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
217	1	186-115A	Control Relay	AC/DC Power Support Systems	A115 Bus Lockout Relay	Electroswitch	Series 24	D11-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
218	1	186-115B	Control Relay	AC/DC Power Support Systems	A115 Bus Lockout Relay	Electroswitch	Series 24	D11-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
219	1	186-115C	Control Relay	AC/DC Power Support Systems	A115 Bus Lockout Relay	Electroswitch	Series 24	D11-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
220	1	186-116A	Control Relay	AC/DC Power Support Systems	A116 Bus Lockout Relay	Electroswitch	Series 24	D12-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
221	1	186-116B	Control Relay	AC/DC Power Support Systems	A116 Bus Lockout Relay	Electroswitch	Series 24	D12-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
222	1	186-116C	Control Relay	AC/DC Power Support Systems	A116 Bus Lockout Relay	Electroswitch	Series 24	D12-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
223	1	186-117A	Control Relay	AC/DC Power Support Systems	A117 Bus Lockout Relay	Electroswitch	Series 24	D13-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
224	1	186-117B	Control Relay	AC/DC Power Support Systems	A117 Bus Lockout Relay	Electroswitch	Series 24	D13-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
225	1	186-117C	Control Relay	AC/DC Power Support Systems	A117 Bus Lockout Relay	Electroswitch	Series 24	D13-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
226	1	186-118A	Control Relay	AC/DC Power Support Systems	A118 Bus Lockout Relay	Electroswitch	Series 24	D14-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
227	1	186-118B	Control Relay	AC/DC Power Support Systems	A118 Bus Lockout Relay	Electroswitch	Series 24	D14-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
228	1	186-118C	Control Relay	AC/DC Power Support Systems	A118 Bus Lockout Relay	Electroswitch	Series 24	D14-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
229	1	186-AG501	Control Relay	AC/DC Power Support Systems	D11 Lockout Relay	Electroswitch	Series 24	D11-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
230	1	186-BG501	Control Relay	AC/DC Power Support Systems	D12 Lockout Relay	Electroswitch	Series 24	D12-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
231	1	186-CG501	Control Relay	AC/DC Power Support Systems	D13 Lockout Relay	Electroswitch	Series 24	D13-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
232	1	186-DG501	Control Relay	AC/DC Power Support Systems	D14 Lockout Relay	Electroswitch	Series 24	D14-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
233	2	186-115A	Control Relay	AC/DC Power Support Systems	A115 Bus Lockout Relay	Electroswitch	Series 24	D21-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
234	2	186-115B	Control Relay	AC/DC Power Support Systems	A115 Bus Lockout Relay	Electroswitch	Series 24	D21-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
235	2	186-115C	Control Relay	AC/DC Power Support Systems	A115 Bus Lockout Relay	Electroswitch	Series 24	D21-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
236	2	186-116A	Control Relay	AC/DC Power Support Systems	A116 Bus Lockout Relay	Electroswitch	Series 24	D22-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
237	2	186-116B	Control Relay	AC/DC Power Support Systems	A116 Bus Lockout Relay	Electroswitch	Series 24	D22-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
238	2	186-116C	Control Relay	AC/DC Power Support Systems	A116 Bus Lockout Relay	Electroswitch	Series 24	D22-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
239	2	186-117A	Control Relay	AC/DC Power Support Systems	A117 Bus Lockout Relay	Electroswitch	Series 24	D23-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
240	2	186-117B	Control Relay	AC/DC Power Support Systems	A117 Bus Lockout Relay	Electroswitch	Series 24	D23-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
241	2	186-117C	Control Relay	AC/DC Power Support Systems	A117 Bus Lockout Relay	Electroswitch	Series 24	D23-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
242	2	186-118A	Control Relay	AC/DC Power Support Systems	A118 Bus Lockout Relay	Electroswitch	Series 24	D24-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
243	2	186-118B	Control Relay	AC/DC Power Support Systems	A118 Bus Lockout Relay	Electroswitch	Series 24	D24-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
244	2	186-118C	Control Relay	AC/DC Power Support Systems	A118 Bus Lockout Relay	Electroswitch	Series 24	D24-Bus-09	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
245	2	186-AG501	Control Relay	AC/DC Power Support Systems	D21 Lockout Relay	Electroswitch	Series 24	D21-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
246	2	186-BG501	Control Relay	AC/DC Power Support Systems	D22 Lockout Relay	Electroswitch	Series 24	D22-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
247	2	186-CG501	Control Relay	AC/DC Power Support Systems	D23 Lockout Relay	Electroswitch	Series 24	D23-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
248	2	186-DG501	Control Relay	AC/DC Power Support Systems	D24 Lockout Relay	Electroswitch	Series 24	D24-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
249	1	150G-11505	Protective Relay	AC/DC Power Support Systems	D114 Load Center Ground Fault	GE	12HFC11B 1A-S	D11-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
250	1	150G-11508	Protective Relay	AC/DC Power Support Systems	ESW Pump 0AP548 Ground Fault	GE	12HFC11B 1A-S	D11-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
251	1	150G-11605	Protective Relay	AC/DC Power Support Systems	D124 Load Center Ground Fault	GE	12HFC11B 1A-S	D12-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
252	1	150G-11608	Protective Relay	AC/DC Power Support Systems	ESW Pump 0BP548 Ground Fault	GE	12HFC11B 1A-S	D12-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
253	1	150G-11705	Protective Relay	AC/DC Power Support Systems	D134 Load Center Ground Fault	GE	12HFC11B 1A	D13-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
254	1	150G-11805	Protective Relay	AC/DC Power Support Systems	D144 Load Center Ground Fault	GE	12HFC11B 1A-S	D14-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
255	1	151N-AG501	Protective Relay	AC/DC Power Support Systems	D11 Neutral Overcurrent Relay	Westinghouse	264C899A01	D11-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
256	1	151N-BG501	Protective Relay	AC/DC Power Support Systems	D12 Neutral Overcurrent Relay	Westinghouse	264C899A01	D12-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
257	1	151N-CG501	Protective Relay	AC/DC Power Support Systems	D13 Neutral Overcurrent Relay	Westinghouse	264C899A01	D13-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
258	1	151N-DG501	Protective Relay	AC/DC Power Support Systems	D14 Neutral Overcurrent Relay	Westinghouse	264C899A01	D14-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
259	1	187-115A	Protective Relay	AC/DC Power Support Systems	A115 Bus A Phase Differential Relay	GE	12PVD21B 1A-S	D11-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
260	1	187-115B	Protective Relay	AC/DC Power Support Systems	A115 Bus B Phase Differential Relay	GE	12PVD21B 1A-S	D11-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
261	1	187-115C	Protective Relay	AC/DC Power Support Systems	A115 Bus C Phase Differential Relay	GE	12PVD21B 1A-S	D11-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
262	1	187-116A	Protective Relay	AC/DC Power Support Systems	A116 Bus A Phase Differential Relay	GE	12PVD21B 1A-S	D12-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
263	1	187-116B	Protective Relay	AC/DC Power Support Systems	A116 Bus B Phase Differential Relay	GE	12PVD21B 1A-S	D12-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
264	1	187-116C	Protective Relay	AC/DC Power Support Systems	A116 Bus C Phase Differential Relay	GE	12PVD21B 1A-S	D12-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
265	1	187-117A	Protective Relay	AC/DC Power Support Systems	A117 Bus A Phase Differential Relay	GE	12PVD21B 1A-S	D13-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
266	1	187-117B	Protective Relay	AC/DC Power Support Systems	A117 Bus B Phase Differential Relay	GE	12PVD21B 1A-S	D13-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
267	1	187-117C	Protective Relay	AC/DC Power Support Systems	A117 Bus C Phase Differential Relay	GE	12PVD21B 1A-S	D13-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
268	1	187-118A	Protective Relay	AC/DC Power Support Systems	A118 Bus A Phase Differential Relay	GE	12PVD21B 1A-S	D14-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
269	1	187-118B	Protective Relay	AC/DC Power Support Systems	A118 Bus B Phase Differential Relay	GE	12PVD21B 1A-S	D14-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
270	1	187-118C	Protective Relay	AC/DC Power Support Systems	A118 Bus C Phase Differential Relay	GE	12PVD21B 1A-S	D14-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
271	2	150G-11505	Protective Relay	AC/DC Power Support Systems	D214 Load Center Ground Fault	GE	12HFC11B 1A-S	D21-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
272	2	150G-11605	Protective Relay	AC/DC Power Support Systems	D224 Load Center Ground Fault	GE	12HFC11B 1A-S	D22-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
273	2	150G-11705	Protective Relay	AC/DC Power Support Systems	D234 Load Center Ground Fault	GE	12HFC11B 1A-S	D23-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
274	2	150G-11708	Protective Relay	AC/DC Power Support Systems	ESW Pump 0CP548 Ground Fault	GE	12HFC11B 1A-S	D23-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
275	2	150G-11805	Protective Relay	AC/DC Power Support Systems	D244 Load Center Ground Fault	GE	12HFC11B 1A-S	D24-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
276	2	150G-11808	Protective Relay	AC/DC Power Support Systems	ESW Pump 0DP548 Ground Fault	GE	12HFC11B 1A-S	D24-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
277	2	151N-AG501	Protective Relay	AC/DC Power Support Systems	D21 Neutral Overcurrent Relay	Westinghouse	264C899A01	D21-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
278	2	151N-BG501	Protective Relay	AC/DC Power Support Systems	D22 Neutral Overcurrent Relay	Westinghouse	264C899A01	D22-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
279	2	151N-CG501	Protective Relay	AC/DC Power Support Systems	D23 Neutral Overcurrent Relay	Westinghouse	264C899A01	D23-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
280	2	151N-DG501	Protective Relay	AC/DC Power Support Systems	D24 Neutral Overcurrent Relay	Westinghouse	264C899A01	D24-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
281	2	187-115A	Protective Relay	AC/DC Power Support Systems	A115 Bus A Phase Differential Relay	GE	12PVD21B 1A-S	D21-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
282	2	187-115B	Protective Relay	AC/DC Power Support Systems	A115 Bus B Phase Differential Relay	GE	12PVD21B 1A-S	D21-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
283	2	187-115C	Protective Relay	AC/DC Power Support Systems	A115 Bus C Phase Differential Relay	GE	12PVD21B 1A-S	D21-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
284	2	187-116A	Protective Relay	AC/DC Power Support Systems	A116 Bus A Phase Differential Relay	GE	12PVD21B 1A-S	D22-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
285	2	187-116B	Protective Relay	AC/DC Power Support Systems	A116 Bus B Phase Differential Relay	GE	12PVD21B 1A-S	D22-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
286	2	187-116C	Protective Relay	AC/DC Power Support Systems	A116 Bus C Phase Differential Relay	GE	12PVD21B 1A-S	D22-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
287	2	187-117A	Protective Relay	AC/DC Power Support Systems	A117 Bus A Phase Differential Relay	GE	12PVD21B 1A-S	D23-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
288	2	187-117B	Protective Relay	AC/DC Power Support Systems	A117 Bus B Phase Differential Relay	GE	12PVD21B 1A-S	D23-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
289	2	187-117C	Protective Relay	AC/DC Power Support Systems	A117 Bus C Phase Differential Relay	GE	12PVD21B 1A-S	D23-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
290	2	187-118A	Protective Relay	AC/DC Power Support Systems	A118 Bus A Phase Differential Relay	GE	12PVD21B 1A-S	D24-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
291	2	187-118B	Protective Relay	AC/DC Power Support Systems	A118 Bus B Phase Differential Relay	GE	12PVD21B 1A-S	D24-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
292	2	187-118C	Protective Relay	AC/DC Power Support Systems	A118 Bus C Phase Differential Relay	GE	12PVD21B 1A-S	D24-Bus-06	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
293	1	D11-Bus-07 (152-11507)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D11 Diesel Generator Circuit Breaker	ABB/ITE	5HK 350	D11-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
294	1	D11-Bus-05 (152-11505)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D114 LC Transformer Circuit Breaker	ABB/ITE	5HK 350	D11-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
295	1	D11-Bus-08 (152-11508)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	0A Essential Service Water Pump Circuit Breaker	ABB/ITE	5HK 350	D11-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
296	1	D12-Bus-07 (152-11607)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D12 Diesel Generator Circuit Breaker	ABB/ITE	5HK 350	D12-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
297	1	D12-Bus-05 (152-11605)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D124 LC Transformer Circuit Breaker	ABB/ITE	5HK 350	D12-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
298	1	D12-Bus-08 (152-11608)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	0B Essential Service Water Pump Circuit Breaker	ABB/ITE	5HK 350	D12-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
299	1	D13-Bus-07 (152-11707)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D13 Diesel Generator Circuit Breaker	ABB/ITE	5HK 350	D13-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
300	1	D13-Bus-05 (152-11705)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D134 LC Transformer Circuit Breaker	ABB/ITE	5HK 350	D13-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
301	1	D14-Bus-07 (152-11807)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D14 Diesel Generator Circuit Breaker	ABB/ITE	5HK 350	D14-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
302	1	D14-Bus-05 (152-11805)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D144 LC Transformer Circuit Breaker	ABB/ITE	5HK 350	D14-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
303	2	D21-Bus-07 (152-11507)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D21 Diesel Generator Circuit Breaker	ABB/ITE	5HK 350	D21-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
304	2	D21-Bus-05 (152-11505)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D214 LC Transformer Circuit Breaker	ABB/ITE	5HK 350	D21-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
305	2	D22-Bus-07 (152-11607)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D22 Diesel Generator Circuit Breaker	ABB/ITE	5HK 350	D22-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
306	2	D22-Bus-05 (152-11605)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D224 LC Transformer Circuit Breaker	ABB/ITE	5HK 350	D22-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
307	2	D23-Bus-07 (152-11707)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D23 Diesel Generator Circuit Breaker	ABB/ITE	5HK 350	D23-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
308	2	D23-Bus-05 (152-11705)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D234 LC Transformer Circuit Breaker	ABB/ITE	5HK 350	D23-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
309	2	D23-Bus-08 (152-11708)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	0C Essential Service Water Pump Circuit Breaker	ABB/ITE	5HK 350	D23-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
310	2	D24-Bus-07 (152-11807)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D24 Diesel Generator Circuit Breaker	ABB/ITE	5HK 350	D24-Bus-07	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
311	2	D24-Bus-05 (152-11805)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	D244 LC Transformer Circuit Breaker	ABB/ITE	5HK 350	D24-Bus-05	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
312	2	D24-Bus-08 (152-11808)	Medium Voltage Circuit Breaker	AC/DC Power Support Systems	0D Essential Service Water Pump Circuit Breaker	ABB/ITE	5HK 350	D24-Bus-08	Switch gear	Control Enclosure	239	Qualification Test	Cap > Dem
313	1	T2A (1ETB-AG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	1ETB-AG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
314	1	T2B (1ETB-AG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	1ETB-AG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
315	1	T2A (1ETB-BG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	1ETB-BG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
316	1	T2B (1ETB-BG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	1ETB-BG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
317	1	T2A (1ETB-CG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	1ETB-CG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
318	1	T2B (1ETB-CG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	1ETB-CG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
319	1	T2A (1ETB-DG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Amerace	ETR14D3B 002	1ETB-DG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
320	1	T2B (1ETB-DG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Amerace	ETR14D3B 002	1ETB-DG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
321	2	T2A (2ETB-AG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	2ETB-AG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
322	2	T2B (2ETB-AG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	2ETB-AG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
323	2	T2A (2ETB-BG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	2ETB-BG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
324	2	T2B (2ETB-BG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	2ETB-BG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
325	2	T2A (2ETB-CG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	2ETB-CG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
326	2	T2B (2ETB-CG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Tyco	ETR14D3B 004	2ETB-CG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
327	2	T2A (2ETB-DG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Amerace	ETR14D3B002	2ETB-DG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
328	2	T2B (2ETB-DG501)	Control Relays	AC/DC Power Support Systems	Overcrank Relay	Amerace	ETR14D3B002	2ETB-DG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
329	1	T3A (1ETB-AG501)	Control Relays	AC/DC Power Support Systems	High Speed Relay	Tyco	ETR14D3B004	1ETB-AG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
330	1	T3A (1ETB-BG501)	Control Relays	AC/DC Power Support Systems	High Speed Relay	Tyco	ETR14D3B004	1ETB-BG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
331	1	T3A (1ETB-CG501)	Control Relays	AC/DC Power Support Systems	High Speed Relay	Tyco	ETR14D3B004	1ETB-CG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
332	1	T3A (1ETB-DG501)	Control Relays	AC/DC Power Support Systems	High Speed Relay	Amerace	ETR14D3B002	1ETB-DG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
333	2	T3A (2ETB-AG501)	Control Relays	AC/DC Power Support Systems	High Speed Relay	Tyco	ETR14D3B004	2ETB-AG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
334	2	T3A (2ETB-BG501)	Control Relays	AC/DC Power Support Systems	High Speed Relay	Tyco	ETR14D3B004	2ETB-BG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
335	2	T3A (2ETB-CG501)	Control Relays	AC/DC Power Support Systems	High Speed Relay	Tyco	ETR14D3B004	2ETB-CG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem
336	2	T3A (2ETB-DG501)	Control Relays	AC/DC Power Support Systems	High Speed Relay	Amerace	ETR14D3B002	2ETB-DG501	Control Cab.	Diesel Generator	217	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
337	1	D11-5E	Control Relays	AC/DC Power Support Systems	Emergency Stop Relay	Amerace	7024PE	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
338	1	D12-5E	Control Relays	AC/DC Power Support Systems	Emergency Stop Relay	Amerace	7024PE	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
339	1	D13-5E	Control Relays	AC/DC Power Support Systems	Emergency Stop Relay	Amerace	7024PE	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
340	1	D14-5E	Control Relays	AC/DC Power Support Systems	Emergency Stop Relay	Amerace	7024PE	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
341	2	D21-5E	Control Relays	AC/DC Power Support Systems	Emergency Stop Relay	Amerace	7024PE	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
342	2	D22-5E	Control Relays	AC/DC Power Support Systems	Emergency Stop Relay	Amerace	7024PE	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
343	2	D23-5E	Control Relays	AC/DC Power Support Systems	Emergency Stop Relay	Amerace	7024PE	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
344	2	D24-5E	Control Relays	AC/DC Power Support Systems	Emergency Stop Relay	Amerace	7024PE	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
345	1	D11-CP1	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
346	1	D11-CP2	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
347	1	D11-CP3	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
348	1	D11-CT1	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
349	1	D11-CT2	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
350	1	D11-CT3	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
351	1	D11-OP1	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
352	1	D11-OP2	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
353	1	D11-OP3	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
354	1	D11-OT1	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
355	1	D11-OT2	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
356	1	D11-OT3	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
357	1	D11-SDR	Control Relays	AC/DC Power Support Systems	Shutdown Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
358	1	D11-SFR	Control Relays	AC/DC Power Support Systems	Start Failure Relay	ITE	J13P3012	1ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
359	1	D12-CP1	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
360	1	D12-CP2	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
361	1	D12-CP3	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
362	1	D12-CT1	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
363	1	D12-CT2	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
364	1	D12-CT3	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
365	1	D12-OP1	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
366	1	D12-OP2	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
367	1	D12-OP3	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
368	1	D12-OT1	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
369	1	D12-OT2	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
370	1	D12-OT3	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
371	1	D12-SDR	Control Relays	AC/DC Power Support Systems	Shutdown Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
372	1	D12-SFR	Control Relays	AC/DC Power Support Systems	Start Failure Relay	ITE	J13P3012	1ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
373	1	D13-CP1	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
374	1	D13-CP2	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
375	1	D13-CP3	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
376	1	D13-CT1	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
377	1	D13-CT2	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
378	1	D13-CT3	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
379	1	D13-OP1	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
380	1	D13-OP2	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
381	1	D13-OP3	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
382	1	D13-OT1	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
383	1	D13-OT2	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
384	1	D13-OT3	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
385	1	D13-SDR	Control Relays	AC/DC Power Support Systems	Shutdown Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
386	1	D13-SFR	Control Relays	AC/DC Power Support Systems	Start Failure Relay	ITE	J13P3012	1ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
387	1	D14-CP1	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
388	1	D14-CP2	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
389	1	D14-CP3	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
390	1	D14-CT1	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
391	1	D14-CT2	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
392	1	D14-CT3	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
393	1	D14-OP1	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
394	1	D14-OP2	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
395	1	D14-OP3	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
396	1	D14-OT1	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
397	1	D14-OT2	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
398	1	D14-OT3	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
399	1	D14-SDR	Control Relays	AC/DC Power Support Systems	Shutdown Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
400	1	D14-SFR	Control Relays	AC/DC Power Support Systems	Start Failure Relay	ITE	J13P3012	1ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
401	2	D21-CP1	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
402	2	D21-CP2	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
403	2	D21-CP3	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
404	2	D21-CT1	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
405	2	D21-CT2	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
406	2	D21-CT3	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
407	2	D21-OP1	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
408	2	D21-OP2	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
409	2	D21-OP3	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
410	2	D21-OT1	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
411	2	D21-OT2	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
412	2	D21-OT3	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
413	2	D21-SDR	Control Relays	AC/DC Power Support Systems	Shutdown Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
414	2	D21-SFR	Control Relays	AC/DC Power Support Systems	Start Failure Relay	ITE	J13P3012	2ETB-AG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
415	2	D22-CP1	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
416	2	D22-CP2	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
417	2	D22-CP3	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
418	2	D22-CT1	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
419	2	D22-CT2	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
420	2	D22-CT3	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
421	2	D22-OP1	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
422	2	D22-OP2	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
423	2	D22-OP3	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
424	2	D22-OT1	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
425	2	D22-OT2	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
426	2	D22-OT3	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
427	2	D22-SDR	Control Relays	AC/DC Power Support Systems	Shutdown Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
428	2	D22-SFR	Control Relays	AC/DC Power Support Systems	Start Failure Relay	ITE	J13P3012	2ETB-BG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
429	2	D23-CP1	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
430	2	D23-CP2	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
431	2	D23-CP3	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
432	2	D23-CT1	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
433	2	D23-CT2	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
434	2	D23-CT3	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
435	2	D23-OP1	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
436	2	D23-OP2	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
437	2	D23-OP3	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
438	2	D23-OT1	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
439	2	D23-OT2	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
440	2	D23-OT3	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
441	2	D23-SDR	Control Relays	AC/DC Power Support Systems	Shutdown Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
442	2	D23-SFR	Control Relays	AC/DC Power Support Systems	Start Failure Relay	ITE	J13P3012	2ETB-CG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
443	2	D24-CP1	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
444	2	D24-CP2	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
445	2	D24-CP3	Control Relays	AC/DC Power Support Systems	Jacket Cooling Pressure Low Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
446	2	D24-CT1	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
447	2	D24-CT2	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
448	2	D24-CT3	Control Relays	AC/DC Power Support Systems	Jacket Coolant Temperature Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
449	2	D24-OP1	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
450	2	D24-OP2	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
451	2	D24-OP3	Control Relays	AC/DC Power Support Systems	Lube Oil Pressure Low Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
452	2	D24-OT1	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
453	2	D24-OT2	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
454	2	D24-OT3	Control Relays	AC/DC Power Support Systems	Lube Oil High Temperature Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
455	2	D24-SDR	Control Relays	AC/DC Power Support Systems	Shutdown Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem
456	2	D24-SFR	Control Relays	AC/DC Power Support Systems	Start Failure Relay	ITE	J13P3012	2ETB-DG501	Control Cab.	Diesel Generator	217	GERS	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
457	1	D11-EOS	Process Switch	AC/DC Power Support Systems	Engine Overspeed Switch	Honeywell	BZE6-2RN7	1A-G501	Diesel Engine	Diesel Generator	217	EPRI HF Test	Cap > Dem
458	1	D12-EOS	Process Switch	AC/DC Power Support Systems	Engine Overspeed Switch	Honeywell	BZE6-2RN7	1B-G501	Diesel Engine	Diesel Generator	217	EPRI HF Test	Cap > Dem
459	1	D13-EOS	Process Switch	AC/DC Power Support Systems	Engine Overspeed Switch	Honeywell	BZE6-2RN7	1C-G501	Diesel Engine	Diesel Generator	217	EPRI HF Test	Cap > Dem
460	1	D14-EOS	Process Switch	AC/DC Power Support Systems	Engine Overspeed Switch	Honeywell	BZE6-2RN7	1D-G501	Diesel Engine	Diesel Generator	217	EPRI HF Test	Cap > Dem
461	2	D21-EOS	Process Switch	AC/DC Power Support Systems	Engine Overspeed Switch	Honeywell	BZE6-2RN7	2A-G501	Diesel Engine	Diesel Generator	217	EPRI HF Test	Cap > Dem
462	2	D22-EOS	Process Switch	AC/DC Power Support Systems	Engine Overspeed Switch	Honeywell	BZE6-2RN7	2B-G501	Diesel Engine	Diesel Generator	217	EPRI HF Test	Cap > Dem
463	2	D23-EOS	Process Switch	AC/DC Power Support Systems	Engine Overspeed Switch	Honeywell	BZE6-2RN7	2C-G501	Diesel Engine	Diesel Generator	217	EPRI HF Test	Cap > Dem
464	2	D24-EOS	Process Switch	AC/DC Power Support Systems	Engine Overspeed Switch	Honeywell	BZE6-2RN7	2D-G501	Diesel Engine	Diesel Generator	217	EPRI HF Test	Cap > Dem
465	1	TSH-GA-110A-1	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
466	1	TSH-GA-110A-2	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
467	1	TSH-GA-110A-3	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
468	1	TSH-GA-101A	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
469	1	TSH-GA-102A	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
470	1	TSH-GA-103A	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
471	1	TSH-GA-110B-1	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
472	1	TSH-GA-110B-2	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
473	1	TSH-GA-110B-3	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
474	1	TSH-GA-101B	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
475	1	TSH-GA-102B	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
476	1	TSH-GA-103B	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
477	1	TSH-GA-110C-1	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
478	1	TSH-GA-110C-2	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
479	1	TSH-GA-110C-3	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
480	1	TSH-GA-101C	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
481	1	TSH-GA-102C	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
482	1	TSH-GA-103C	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
483	1	TSH-GA-110D-1	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
484	1	TSH-GA-110D-2	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
485	1	TSH-GA-110D-3	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	1D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
486	1	TSH-GA-101D	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
487	1	TSH-GA-102D	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
488	1	TSH-GA-103D	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	1D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
489	2	TSH-GA-210A-1	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
490	2	TSH-GA-210A-2	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
491	2	TSH-GA-210A-3	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
492	2	TSH-GA-201A	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
493	2	TSH-GA-202A	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
494	2	TSH-GA-203A	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2A-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
495	2	TSH-GA-210B-1	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
496	2	TSH-GA-210B-2	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
497	2	TSH-GA-210B-3	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
498	2	TSH-GA-201B	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
499	2	TSH-GA-202B	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
500	2	TSH-GA-203B	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2B-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
501	2	TSH-GA-210C-1	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
502	2	TSH-GA-210C-2	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
503	2	TSH-GA-210C-3	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
504	2	TSH-GA-201C	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
505	2	TSH-GA-202C	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
506	2	TSH-GA-203C	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2C-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
507	2	TSH-GA-210D-1	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
508	2	TSH-GA-210D-2	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
509	2	TSH-GA-210D-3	Process Switch	AC/DC Power Support Systems	Jacket Coolant Temperature Switch	Allen Bradley	837-V3J	2D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
510	2	TSH-GA-201D	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
511	2	TSH-GA-202D	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
512	2	TSH-GA-203D	Process Switch	AC/DC Power Support Systems	Lube Oil High Temperature Switch	Allen Bradley	837-V3J	2D-G501	Diesel Engine	Diesel Generator	217	Qualification Test	Cap > Dem
513	1	D114-33 (52-20133)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D114-D-G Motor Control Center	ABB/ITE	K-600 Breaker	D114-33	Load Center / Switch gear	Reactor Enclosure	313	Qualification Test	Cap > Dem
514	1	D114-32 (52-20132)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D114-R-G Motor Control Center Circuit Breaker	ABB/ITE	K-600 Breaker	D114-32	Load Center / Switch gear	Reactor Enclosure	313	Qualification Test	Cap > Dem
515	1	D124-33 (52-20233)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D124-D-G Motor Control Center	ABB/ITE	K-600 Breaker	D124-33	Load Center / Switch gear	Reactor Enclosure	313	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
516	1	D124-32 (52-20232)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D124-R-G Motor Control Center Circuit Breaker	ABB/ITE	K-600 Breaker	D124-32	Load Center / Switch gear	Reactor Enclosure	313	Qualification Test	Cap > Dem
517	1	D134-33 (52-20333)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D134-D-G Motor Control Center	ABB/ITE	K-600 Breaker	D134-33	Load Center / Switch gear	Reactor Enclosure	253	Qualification Test	Cap > Dem
518	1	D134-24 (52-20324)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D134-R-E Motor Control Center Circuit Breaker	ABB/ITE	K-600 Breaker	D134-24	Load Center / Switch gear	Reactor Enclosure	253	Qualification Test	Cap > Dem
519	1	D144-33 (52-20433)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D144-D-G Motor Control Center	ABB/ITE	K-600 Breaker	D144-33	Load Center / Switch gear	Reactor Enclosure	283	Qualification Test	Cap > Dem
520	1	D144-24 (52-20424)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D144-R-E Motor Control Center Circuit Breaker	ABB/ITE	K-600 Breaker	D144-24	Load Center / Switch gear	Reactor Enclosure	283	Qualification Test	Cap > Dem
521	2	D214-33 (52-20133)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D214-D-G Motor Control Center	ABB/ITE	K-600 Breaker	D214-33	Load Center / Switch gear	Reactor Enclosure	313	Qualification Test	Cap > Dem
522	2	D214-32 (52-20132)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D214-R-G Motor Control Center Circuit Breaker	ABB/ITE	K-600 Breaker	D214-32	Load Center / Switch gear	Reactor Enclosure	313	Qualification Test	Cap > Dem
523	2	D224-33 (52-20233)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D224-D-G Motor Control Center	ABB/ITE	K-600 Breaker	D224-33	Load Center / Switch gear	Reactor Enclosure	313	Qualification Test	Cap > Dem

Table B-1: Components Identified for High Frequency Confirmation

No.	Unit	Component						Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		ID	Type	System	Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
524	2	D224-32 (52-20232)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D224-R-G Motor Control Center Circuit Breaker	ABB/ITE	K-600 Breaker	D224-32	Load Center / Switch gear	Reactor Enclosure	313	Qualification Test	Cap > Dem
525	2	D234-33 (52-20333)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D234-D-G Motor Control Center	ABB/ITE	K-600 Breaker	D234-33	Load Center / Switch gear	Reactor Enclosure	253	Qualification Test	Cap > Dem
526	2	D234-24 (52-20324)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D234-R-E Motor Control Center Circuit Breaker	ABB/ITE	K-600 Breaker	D234-24	Load Center / Switch gear	Reactor Enclosure	253	Qualification Test	Cap > Dem
527	2	D244-33 (52-20433)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D244-D-G Motor Control Center	ABB/ITE	K-600 Breaker	D244-33	Load Center / Switch gear	Reactor Enclosure	283	Qualification Test	Cap > Dem
528	2	D244-24 (52-20424)	Low Voltage Circuit Breaker	AC/DC Power Support Systems	D244-R-E Motor Control Center Circuit Breaker	ABB/ITE	K-600 Breaker	D244-24	Load Center / Switch gear	Reactor Enclosure	283	Qualification Test	Cap > Dem

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-1F001	HV-041-1F001	M-0041	1		Yes*
HV-1F002	HV-041-1F002	M-0041	1		Yes*
HV-1F005	HV-041-1F005	M-0041	1	NORMALLY OPEN TO MAIN STEAM LINE C. NOT A LEAK PATH (No Need to be included- Line C is isolated)	No
HV-1F011A	HV-041-1F011A	M-0041	1	DOWN STREAM CHECK VALVE HV-1F010A will provide Boundary (No Need to be included)	No
1F010A	041-1F010A	M-0041	1	SIMPLE CHECK VALVE (No Need to be included)	No
HV-1F074A	HV-041-1F074A	M-0041	1	DOWN STREAM OF CHECK VALVE (No Need to be included)	No
HV-1F011B	HV-041-1F011B	M-0041	1	DOWN STREAM CHECK VALVE HV-1F010B will provide Boundary (No Need to be included)	No
1F010B	041-1F010B	M-0041	1	SIMPLE CHECK VALVE (No Need to be included)	No
HV-1F074B	HV-041-1F074B	M-0041	1	DOWN STREAM OF CHECK VALVE (No Need to be included)	No
PSV-1F013A	PSV-041-1F013A	M-0041	2	SRV	Yes*

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
PSV-1F013B	PSV-041-1F013B	M-0041	2	SRV	Yes*
PSV-1F013C	PSV-041-1F013C	M-0041	2	SRV	Yes*
PSV-1F013D	PSV-041-1F013D	M-0041	2	SRV	Yes*
PSV-1F013E	PSV-041-1F013E	M-0041	2	SRV	Yes*
PSV-1F013F	PSV-041-1F013F	M-0041	2	SRV	Yes*
PSV-1F013G	PSV-041-1F013G	M-0041	2	SRV	Yes*
PSV-1F013H	PSV-041-1F013H	M-0041	2	SRV	Yes*
PSV-1F013J	PSV-041-1F013J	M-0041	2	SRV	Yes*
PSV-1F013K	PSV-041-1F013K	M-0041	2	SRV	Yes*
PSV-1F013L	PSV-041-1F013L	M-0041	2	SRV	Yes*
PSV-1F013M	PSV-041-1F013M	M-0041	2	SRV	Yes*
PSV-1F013S	PSV-041-1F013S	M-0041	2	SRV	Yes*
PSV-1F013N	PSV-041-1F013N	M-0041	2	SRV	Yes*
HV-F022A	HV-041-1F022A	M-0041	2		Yes*
HV-F028A	HV-041-1F028A	M-0041	2		Yes*
HV-F022B	HV-041-1F022B	M-0041	2		Yes*

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-F028B	HV-041-1F028B	M-0041	2		Yes*
HV-F022C	HV-041-1F022C	M-0041	2		Yes*
HV-F028C	HV-041-1F028C	M-0041	2		Yes*
HV-F022D	HV-041-1F022D	M-0041	2		Yes*
HV-F028D	HV-041-1F028D	M-0041	2		Yes*
HV-C-F020	HV-C-041-1F020	M-0041	2		Yes*
HV-1F016	HV-041-1F016	M-0041	2	Normally Closed Drain Line	Yes*
HV-1F019	HV-041-1F019	M-0041	2	Normally Closed Drain Line would only be a Leak Path if HV-1F016 Opens	No – See notes and discussion in Section 2.2 of this report.
HV-1F105	HV-044-1F105	M-0044	1	Normally Open- Need to check if there is a signal to close	Yes*
HV-1F001	HV-044-1F001	M-0044	1	Would only be a Leak Path if HV-1F105 fails to be closed	No – See notes and discussion in Section 2.2 of this report.
HV-1F004	HV-044-1F004	M-0044	1	Would only be a Leak Path if HV-1F105 fails to be closed	No – See notes and discussion in Section 2.2 of this report.
HV-1F100	HV-044-1F100	M-0044	1	Normally Open- Need to check if there is a signal to close	Yes*

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-1F007	HV-049-1F007	M-0049	1	Normally Open- Need to check if there is a signal to close	Yes*
HV-1F008	HV-049-1F008	M-0049	1	Would only be a Leak Path if HV-1F107 fails to be closed	No – See notes and discussion in Section 2.2 of this report.
HV-1F021A	HV-051-1F021A	M-0051	1	Per the Plant this is the Containment Spray Valves and does not communicate with the Reactor	No - See Note
HV-1F016A	HV-051-1F016A	M-0051	1	Per the Plant this is the Containment Spray Valves and does not communicate with the Reactor	No - See Note
HV-1F041C	HV-051-1F041C	M-0051	1	CHECK VALVE	Yes*
HV-1F017C	HV-051-1F017C	M-0051	1	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-1F041A	HV-051-1F041A	M-0051	1	CHECK VALVE	Yes*
HV-1F017A	HV-051-1F017A	M-0051	1	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-1F050A	HV-051-1F050A	M-0051	1	CHECK VALVE	Yes*
HV-1F015A	HV-051-1F015A	M-0051	1	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-1F008	HV-051-1F008	M-0051	1		Yes*
HV-1F021B	HV-M51-1F021B	M-0051	3	Per the Plant this is the Containment Spray Valves and does not communicate with the Reactor	No - See Note
HV-1F016B	HV-051-1F016B	M-0051	3	Per the Plant this is the Containment Spray Valves and does not communicate with the Reactor	No - See Note
HV-1F041D	HV-051-1F041D	M-0051	3	CHECK VALVE	Yes*
HV-1F017D	HV-051-1F017D	M-0051	3	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-1F041B	HV-051-1F041B	M-0051	3	CHECK VALVE	Yes
HV-1F017B	HV-051-1F017B	M-0051	3	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-1F050B	HV-051-1F050B	M-0051	3	CHECK VALVE	Yes*
HV-1F015B	HV-051-1F015B	M-0051	3	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-1F009	HV-051-1F009	M-0051	3		Yes*
HV-1F006B	HV-052-1F006B	M-0052	1	CHECK VALVE	Yes*

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-108	HV-052-108	M-0052	1	DOWN STREAM OF CHECK VALVE Only needed if HV-1F006B fails to be closed	No – See notes and discussion in Section 2.2 of this report.
HV-1F006A	HV-052-1F006A	M-0052	1	CHECK VALVE	Yes*
HV-1F005	HV-052-1F005	M-0052	1	DOWN STREAM OF CHECK VALVE Only needed if HV-1F006A fails to be closed	No – See notes and discussion in Section 2.2 of this report.
HV-1F002	HV-055-1F002	M-0055	1	Normally Open- Need to check if there is a signal to close	Yes*
HV-1F003	HV-055-1F003	M-0055	1	Would only be a potential Leak Path if HV-1F002 fails to be closed	No – See notes and discussion in Section 2.2 of this report.
HV-2F001	HV-041-2F001	M-0041	4		Yes*
HV-2F002	HV-041-2F002	M-0041	4		Yes*
HV-2F005	HV-041-2F005	M-0041	4	NORMALLY OPEN TO MAIN STEAM LINE C. NOT A LEAK PATH (No Need to be included- Line C is isolated)	No

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-2F011A	HV-041-2F011A	M-0041	4	DOWN STREAM CHECK VALVE HV-2F010A will provide Boundary (No Need to be included)	No
2F010A	041-2F010A	M-0041	4	SIMPLE CHECK VALVE (No Need to be included)	No
HV-2F074A	HV-041-2F074A	M-0041	4	DOWN STREAM OF CHECK VALVE (No Need to be included)	No
HV-2F011B	HV-041-2F011B	M-0041	4	DOWN STREAM CHECK VALVE HV-2F010B will provide Boundary (No Need to be included)	No
2F010B	041-2F010B	M-0041	4	SIMPLE CHECK VALVE (No Need to be included)	No
HV-2F074B	HV-041-2F074B	M-0041	4	DOWN STREAM OF CHECK VALVE (No Need to be included)	No
PSV-2F013A	PSV-041-2F013A	M-0041	5	SRV	Yes*
PSV-2F013B	PSV-041-2F013B	M-0041	5	SRV	Yes*
PSV-2F013C	PSV-041-2F013C	M-0041	5	SRV	Yes*

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
PSV-2F013D	PSV-041-2F013D	M-0041	5	SRV	Yes*
PSV-2F013E	PSV-041-2F013E	M-0041	5	SRV	Yes*
PSV-2F013F	PSV-041-2F013F	M-0041	5	SRV	Yes*
PSV-2F013G	PSV-041-2F013G	M-0041	5	SRV	Yes*
PSV-2F013H	PSV-041-2F013H	M-0041	5	SRV	Yes*
PSV-2F013J	PSV-041-2F013J	M-0041	5	SRV	Yes*
PSV-2F013K	PSV-041-2F013K	M-0041	5	SRV	Yes*
PSV-2F013L	PSV-041-2F013L	M-0041	5	SRV	Yes*
PSV-2F013M	PSV-041-2F013M	M-0041	5	SRV	Yes*
PSV-2F013S	PSV-041-2F013S	M-0041	5	SRV	Yes*
PSV-2F013N	PSV-041-2F013N	M-0041	5	SRV	Yes*
HV-F022A	HV-041-2F022A	M-0041	5		Yes*

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-F028A	HV-041-2F028A	M-0041	5		Yes*
HV-F022B	HV-041-2F022B	M-0041	5		Yes*
HV-F028B	HV-041-2F028B	M-0041	5		Yes*
HV-F022C	HV-041-2F022C	M-0041	5		Yes*
HV-F028C	HV-041-2F028C	M-0041	5		Yes*
HV-F022D	HV-041-2F022D	M-0041	5		Yes*
HV-F028D	HV-041-2F028D	M-0041	5		Yes*
HV-C-F020	HV-C-041-2F020	M-0041	5		Yes*
HV-2F016	HV-041-2F016	M-0041	5	Normally Closed Drain Line	Yes*
HV-2F019	HV-041-2F019	M-0041	5	Normally Closed Drain Line would only be a Leak Path if HV-2F016 Opens	No – See notes and discussion in Section 2.2 of this report.
HV-2F105	HV-044-2F105	M-0044	3	Normally Open- Need to check if there is a signal to close	Yes*

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-2F001	HV-044-2F001	M-0044	3	Would only be a Leak Path if HV-2F105 fails to be closed	No – See notes and discussion in Section 2.2 of this report.
HV-2F004	HV-044-2F004	M-0044	3	Would only be a Leak Path if HV-2F105 fails to be closed	No – See notes and discussion in Section 2.2 of this report.
HV-2F100	HV-044-2F100	M-0044	3	Normally Open- Need to check if there is a signal to close	Yes*
HV-2F007	HV-049-2F007	M-0049	2	Normally Open- Need to check if there is a signal to close	Yes*
HV-2F008	HV-049-2F008	M-0049	2	Would only be a Leak Path if HV-2F107 fails to be closed	No – See notes and discussion in Section 2.2 of this report.
HV-2F021A	HV-051-2F021A	M-0051	5	Per the Plant this is the Containment Spray Valves and does not communicate with the Reactor	No - See Note
HV-2F016A	HV-051-2F016A	M-0051	5	Per the Plant this is the Containment Spray Valves and does not communicate with the Reactor	No - See Note
HV-2F041C	HV-051-2F041C	M-0051	5	CHECK VALVE	Yes*

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-2F017C	HV-051-2F017C	M-0051	5	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-2F041A	HV-051-2F041A	M-0051	5	CHECK VALVE	Yes*
HV-2F017A	HV-051-2F017A	M-0051	5	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-2F050A	HV-051-2F050A	M-0051	5	CHECK VALVE	Yes*
HV-2F015A	HV-051-2F015A	M-0051	5	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-2F008	HV-051-2F008	M-0051	5		Yes*
HV-2F021B	HV-M51-2F021B	M-0051	7	Per the Plant this is the Containment Spray Valves and does not communicate with the Reactor	No - See Note
HV-2F016B	HV-051-2F016B	M-0051	7	Per the Plant this is the Containment Spray Valves and does not communicate with the Reactor	No - See Note
HV-2F041D	HV-051-2F041D	M-0051	7	CHECK VALVE	Yes*

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-2F017D	HV-051-2F017D	M-0051	7	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-2F041B	HV-051-2F041B	M-0051	7	CHECK VALVE	Yes*
HV-2F017B	HV-051-2F017B	M-0051	7	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-2F050B	HV-051-2F050B	M-0051	7	CHECK VALVE	Yes*
HV-2F015B	HV-051-2F015B	M-0051	7	DOWN STREAM OF CHECK VALVE	No – See notes and discussion in Section 2.2 of this report.
HV-2F009	HV-051-2F009	M-0051	7		Yes*
HV-2F006B	HV-052-2F006B	M-0052	3	CHECK VALVE	Yes*
HV-208	HV-052-208	M-0052	3	DOWN STREAM OF CHECK VALVE Only needed if HV-2F006B fails to be closed	No – See notes and discussion in Section 2.2 of this report.
HV-2F006A	HV-052-2F006A	M-0052	3	CHECK VALVE	Yes*
HV-2F005	HV-052-2F005	M-0052	3	DOWN STREAM OF CHECK VALVE Only needed if HV-2F006A fails to be closed	No – See notes and discussion in Section 2.2 of this report.

Table B-2: Reactor Coolant Leak Path Valve Identified for High Frequency Confirmation

VALVE ID on P&ID	PIMS ID	P&ID	SHEET	Notes	Evaluated in Ref. [18]
HV-2F002	HV-055-2F002	M-0055	2	Normally Open- Need to check if there is a signal to close	Yes*
HV-2F003	HV-055-2F003	M-0055	2	Would only be a potential Leak Path if HV-2F002 fails to be closed	No – See notes and discussion in Section 2.2 of this report.

* Note: the evaluation of this valve is discussed in Section 2.2 of this report as well as in report 15C4344-RPT-001 (Ref. 18).