# AMEREN MISSOURI
# CALLAWAY ENERGY CENTER
# EXPEDITED SEISMIC EVALUATION PROCESS (ESEP) REPORT

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**EXPEDITED SEISMIC EVALUATION PROCESS REPORT**

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## 1.0 Purpose and Objective

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. Depending on the comparison between the reevaluated seismic hazard and the current design basis, further risk assessment may be required. Assessment approaches acceptable to the staff include a seismic probabilistic risk assessment (SPRA), or a seismic margin assessment (SMA). Based upon the assessment results, the NRC staff will determine whether additional regulatory actions are necessary.

This report describes the Expedited Seismic Evaluation Process (ESEP) undertaken for the Callaway Energy Center (CEC). The intent of the ESEP is to perform an interim action in response to the NRC's 50.54(f) letter [1] and to demonstrate seismic margin through a review of a subset of the plant equipment that can be relied upon to protect the reactor core following beyond design basis seismic events.

The ESEP is implemented using the methodologies in the NRC endorsed guidance in EPRI 3002000704, *Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic* [2]. The guidance discusses the use of the ongoing FLEX process [3] as a starting point for consideration. This report examines the FLEX equipment and strategy [3] (Section 2.0) to develop the initial Expedited Seismic Equipment List (ESEL) and uses an iterative process to develop the final ESEL [4] (Section 3.0).

The ESEL is used to evaluate the listed equipment against the review level ground motion (RLGM) data (Section 5) with respect to the equipment's seismic capacity based on characterization of the high confidence of a low probability of failure (HCLPF). Equipment which has seismic capacity larger than the RLGM data can be screened from further evaluation. For equipment that has a seismic capacity below the RLGM, modifications need to be performed following the NRC endorsed guidance in EPRI 3002000704.

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

## 2.0 Brief Summary of the FLEX Seismic Implementation Strategies

The Callaway FLEX strategies for Reactor Core Cooling and Heat Removal, Reactor Inventory Control/Long-term Subcriticality, and Containment Function are summarized below. This summary is derived from the Callaway Overall Integrated Plan (OIP) in Response to the March 12, 2012, Commission Order EA-12-049 [3].

Reactor core cooling and heat removal is achieved via steam release from the Steam Generators (SGs) with SG makeup from the Turbine Driven Auxiliary Feedwater Pump (TDAFP) during FLEX Phase 1 with suction from the Condensate Storage Tank (CST).

Ameren Missouri has elected to construct a new Hardened Condensate Storage Tank (HCST) [3]. The larger HCST volume would be capable of feeding the steam generators for at least 72 hours. This extended coping duration will not require HCST make-up from the UHS before the Phase 3 off-site equipment is deployed. The TDAFP flow control valves and Main Steam Atmospheric Relief Valves (ARVs) are also required to provide reactor core heat-removal capability. Phase 2 reactor core heat removal is achieved via the new FLEX mechanical connections. The only permanent plant equipment manipulated for the Phase 2 is manual valves.

Reactor Inventory Control/Long-term Subcriticality strategy consists of reactor coolant system borated make-up via the FLEX primary make-up connections.

Reactor coolant system (RCS) inventory reduction is a result of water volume reduction due to cooldown, reactor coolant pump seal leakage, and letdown via head-vents and/or pressurizer PORVs. The reactor coolant pump seal leak-off containment isolation valve is manually isolated to conserve inventory and keep leak-off flow within the Reactor Building. To avoid adverse effects on the RCS natural circulation flow, the accumulator isolation valves are electrically closed during the cooldown to prevent nitrogen injection into the reactor coolant system.

There are no Phase 1 or Phase 2 FLEX actions required to maintain containment integrity. In fact, containment function is not expected to be challenged during all three phases.

Necessary electrical components are outlined in the Callaway FLEX OIP submittal [3], and primarily entail the installation of a 480V generator (FLEX) to provide power to vital batteries, equipment installed to support FLEX electrical connections, and monitoring instrumentation required for core cooling, reactor coolant inventory, and containment integrity.

## 3.0 Equipment Selection Process and ESEL

The selection of equipment for the Expedited Seismic Equipment List (ESEL) followed the guidelines of EPRI 3002000704 [2]. The ESEL for Callaway is presented in Attachment A.

### 3.1 Equipment Selection Process and ESEL

The selection of equipment to be included on the ESEL was based on installed plant equipment credited in the FLEX strategies during Phases 1, 2 and 3 mitigation of a Beyond Design Basis External Event (BDBEE), as outlined in the Callaway Overall Integrated Plan (OIP) in Response to the March 12, 2012, Commission Order EA-12-049 [3]. The OIP provides the Callaway FLEX mitigation strategy and serves as the basis for equipment selected for the ESEP.

The scope of "installed plant equipment" includes equipment relied upon for the FLEX strategies to sustain the critical functions of core cooling and containment integrity consistent with the Callaway OIP [3]. FLEX recovery actions are excluded from the ESEP scope per EPRI 3002000704 [2]. The overall list of planned FLEX modifications and the scope for consideration herein is limited to those required to support core cooling, reactor coolant inventory and subcriticality, and containment integrity functions. Portable and pre-staged FLEX equipment (not permanently installed) are excluded from the ESEL per EPRI 3002000704 [2].

The ESEL component selection followed the EPRI guidance outlined in Section 3.2 of EPRI 3002000704.

1. The scope of components is limited to that required to accomplish the core cooling and containment safety functions identified in Table 3-2 of EPRI 3002000704. The instrumentation monitoring requirements for core cooling/containment safety functions are limited to those outlined in the EPRI 3002000704 guidance, and are a subset of those outlined in the Callaway OIP [3].
2. The scope of components is limited to installed plant equipment and the FLEX connections necessary to implement the Callaway OIP [3] as described in Section 2.
3. The scope of components assumes the credited FLEX connection modifications are implemented, and are limited to those required to support a single FLEX success path (i.e., either "Primary" or "Back-up/Alternate").
4. The "Primary" FLEX success path is to be specified. Selection of the "Back-up/Alternate" FLEX success path must be justified.
5. Phase 3 coping strategies are included in the ESEP scope, whereas recovery strategies are excluded.

6. Structures, systems, and components excluded per the EPRI 3002000704 [2] guidance are:
    - Structures (e.g., containment, reactor building, control building, auxiliary building, etc.)
    - Piping, cabling, conduit, HVAC, and their supports.
    - Manual valves and rupture disks.
    - Power-operated valves not required to change state as part of the FLEX mitigation strategies.
    - Nuclear steam supply system components (e.g., reactor pressure vessel and internals, reactor coolant pumps and seals, etc.)
7. For cases in which neither train was specified as a primary or back-up strategy, then only one train component (generally 'A' train) is included in the ESEL.

### 3.1.1 ESEL Development

The ESEL was developed by reviewing the Callaway OIP [3] to determine the major equipment involved in the FLEX strategies. Further reviews of plant drawings (e.g., Process and Instrumentation Diagrams (P&IDs) and Electrical One Line Diagrams) were performed to identify the boundaries of the flowpaths to be used in the FLEX strategies and to identify specific components in the flowpaths needed to support implementation of the FLEX strategies.

Boundaries were established at an electrical or mechanical isolation device (e.g., isolation amplifier, valve, etc.) in branch circuits / branch lines off the defined strategy electrical or fluid flowpath. P&IDs were the primary reference documents used to identify mechanical components and instrumentation. The flow paths used for FLEX strategies were selected and specific components were identified using detailed equipment and instrument drawings, piping isometrics, electrical schematics and one-line drawings, system descriptions, design basis documents, etc., as necessary. The P&IDs are also used to determine the normal position of system valves and the valve positioning required in order to align the system in support of the FLEX functions.

The electrical equipment required to support the mechanical components used in the FLEX strategies evaluated for the ESEL was also evaluated for its inclusion on the ESEL using electrical drawings and guidance [2].

### 3.1.2 Power Operated Valves

Page 3-3 of EPRI 3002000704 [2] notes that power operated valves not required to change state are excluded from the ESEL. Page 3-2 also notes that “functional failure modes of electrical and mechanical portions of the installed Phase 1 equipment should be considered (e.g., RCIC/AFW trips).” To address this

concern, the following guidance is applied in the Callaway ESEL for functional failure modes associated with power operated valves:

- Power operated valves that remain energized during the Extended Loss of all AC Power (ELAP) events (such as DC powered valves), were included on the ESEL.
- Power operated valves not required to change state as part of the FLEX mitigation strategies were not included on the ESEL. The seismic event also causes the ELAP event; therefore, the valves are incapable of spurious operation as they would be de-energized.
- Power operated valves not required to change state as part of the FLEX mitigation strategies during Phase 1, and are re-energized and operated during subsequent Phase 2 and 3 strategies, were not evaluated for spurious valve operation as the seismic event that caused the ELAP has passed before the valves are re-powered.

### 3.1.3 Pull Boxes

Pull boxes were deemed unnecessary to add to the ESELs as these components provide completely passive locations for pulling or installing cables. No breaks or connections in the cabling are included in pull boxes. Pull boxes were considered part of conduit and cabling, which are excluded in accordance with EPRI 3002000704 [2].

### 3.1.4 Termination Cabinets

Termination cabinets, including cabinets necessary for FLEX Phase 2 and Phase 3 connections, provide consolidated locations for permanently connecting multiple cables. The termination cabinets and the internal connections provide a completely passive function; however, the cabinets are included in the ESEL to ensure industry knowledge on panel/anchorage failure vulnerabilities is addressed.

### 3.1.5 Critical Instrumentation Indicators

Critical indicators and recorders are typically physically located on panels/cabinets and are included as separate components; however, seismic evaluation of the instrument indication may be included in the panel/cabinet seismic evaluation (rule-of-the-box).

### 3.1.6 Phase 2 and Phase 3 Piping Connections

Item 2 in Section 3.1 above notes that the scope of equipment in the ESEL includes "… FLEX connections necessary to implement the Callaway OIP [3] as described in Section 2." Item 3 in Section 3.1 also notes that "The scope of components assumes the credited FLEX connection modifications are implemented, and are limited to those required to support a single FLEX success path (i.e., either "Primary" or "Back-up/Alternate")."

Item 6 in Section 3.1 above goes on to explain that "Piping, cabling, conduit, HVAC, and their supports" are excluded from the ESEL scope in accordance with EPRI 3002000704 [2].

Therefore, piping and pipe supports associated with FLEX Phase 2 and Phase 3 connections are excluded from the scope of the ESEP evaluation. However, any active valves in FLEX Phase 2 and Phase 3 connection flow path are included in the ESEL.

#### 3.1.7 Relays

Relays essential to the FLEX strategy were explicitly addressed [5]. Relays were screened and where relay chatter was found to result in an undesirable alignment the relay, and its parent cabinet, were added to the analysis. Parent cabinets were walked down and, if needed, HCLPF estimates were performed.

### 3.2 Justification for Use of Equipment That Is Not the Primary Means for FLEX Implementation

No equipment outside of the primary FLEX strategy is credited in the Callaway ESEP [4].

The complete ESEL for Callaway [4] is presented in Attachment A.

## 4.0 Ground Motion Response Spectrum (GMRS)

### 4.1 Plot of GMRS Submitted by the Licensee

The CEC design response spectra are stated to be applied in the free field at finished grade [6].

The 1E-4 and 1E-5 Uniform Hazard Response Spectra (UHRS), along with a design factor (DF), are used to compute the GMRS at the control point as shown in the seismic hazard and GMRS submittal to the NRC [7].

Table 4-1 shows the UHRS and GMRS spectral accelerations.

**Table 4-1: UHRS for 10-4 and 10-5 and GMRS at the control point for Callaway**

| Freq. (Hz) | $10^{-4}$ UHRS (g) | $10^{-5}$ UHRS (g) | GMRS (g) |
|---|---|---|---|
| 100 | 4.20E-01 | 9.88E-01 | 5.00E-01 |
| 90 | 4.24E-01 | 1.00E+00 | 5.06E-01 |
| 80 | 4.30E-01 | 1.02E+00 | 5.15E-01 |
| 70 | 4.40E-01 | 1.05E+00 | 5.30E-01 |
| 60 | 4.61E-01 | 1.11E+00 | 5.57E-01 |
| 50 | 5.12E-01 | 1.23E+00 | 6.17E-01 |
| 40 | 6.17E-01 | 1.45E+00 | 7.34E-01 |
| 35 | 6.83E-01 | 1.60E+00 | 8.12E-01 |
| 30 | 7.68E-01 | 1.82E+00 | 9.20E-01 |
| 25 | 8.70E-01 | 2.10E+00 | 1.06E+00 |
| 20 | 9.16E-01 | 2.21E+00 | 1.11E+00 |
| 15 | 9.02E-01 | 2.18E+00 | 1.10E+00 |
| 12.5 | 9.10E-01 | 2.16E+00 | 1.09E+00 |
| 10 | 9.54E-01 | 2.17E+00 | 1.11E+00 |
| 9 | 9.90E-01 | 2.21E+00 | 1.13E+00 |
| 8 | 1.02E+00 | 2.24E+00 | 1.15E+00 |
| 7 | 1.03E+00 | 2.24E+00 | 1.15E+00 |
| 6 | 1.01E+00 | 2.19E+00 | 1.12E+00 |
| 5 | 9.14E-01 | 2.00E+00 | 1.02E+00 |
| 4 | 6.74E-01 | 1.55E+00 | 7.85E-01 |
| 3.5 | 5.29E-01 | 1.25E+00 | 6.32E-01 |
| 3 | 4.00E-01 | 9.59E-01 | 4.83E-01 |
| 2.5 | 2.87E-01 | 6.81E-01 | 3.44E-01 |
| 2 | 2.31E-01 | 5.32E-01 | 2.70E-01 |
| 1.5 | 1.70E-01 | 3.75E-01 | 1.92E-01 |

| Freq. (Hz) | $10^{-4}$ UHRS (g) | $10^{-5}$ UHRS (g) | GMRS (g) |
|---|---|---|---|
| 1.25 | 1.58E-01 | 3.39E-01 | 1.75E-01 |
| 1 | 1.36E-01 | 2.86E-01 | 1.48E-01 |
| 0.9 | 1.24E-01 | 2.61E-01 | 1.35E-01 |
| 0.8 | 1.12E-01 | 2.38E-01 | 1.23E-01 |
| 0.7 | 1.02E-01 | 2.19E-01 | 1.13E-01 |
| 0.6 | 9.47E-02 | 2.04E-01 | 1.05E-01 |
| 0.5 | 8.64E-02 | 1.89E-01 | 9.68E-02 |
| 0.4 | 6.91E-02 | 1.51E-01 | 7.75E-02 |
| 0.35 | 6.05E-02 | 1.32E-01 | 6.78E-02 |
| 0.3 | 5.18E-02 | 1.13E-01 | 5.81E-02 |
| 0.25 | 4.32E-02 | 9.44E-02 | 4.84E-02 |
| 0.2 | 3.45E-02 | 7.55E-02 | 3.87E-02 |
| 0.15 | 2.59E-02 | 5.66E-02 | 2.91E-02 |
| 0.125 | 2.16E-02 | 4.72E-02 | 2.42E-02 |
| 0.1 | 1.73E-02 | 3.77E-02 | 1.94E-02 |

Figure 4-1 shows the control point UHRS and GMRS.

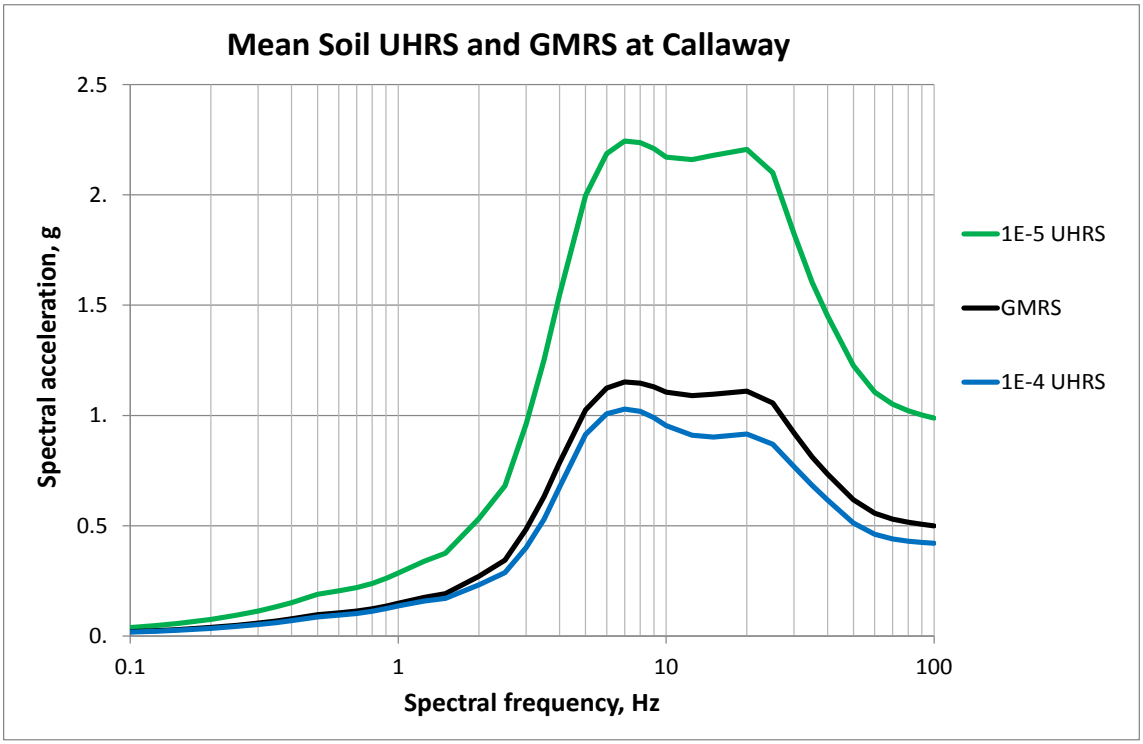


**Figure 4-1: Plots of 1E-4 and 1E-5 UHRS and GMRS at control point for Callaway (5%-damped response spectra)**

## 4.2 Comparison to SSE

The definition of the SSE for Callaway is discussed in Section 2.5, 3.7 and 3.7(B) of the FSAR [6]. The SSE is anchored to a 0.20g Peak Ground Acceleration (PGA) and is presented in Table 4-2.

**Table 4-2: SSE for Callaway**

| Freq (Hz) | SA (g) |
|---|---|
| 0.25 | 0.09 |
| 2.50 | 0.63 |
| 9.00 | 0.52 |
| 33.00 | 0.20 |
| 100.00 | 0.20 |

As shown in Figure 4-2, the GMRS begins to exceed the SSE at around 3.5 Hz.

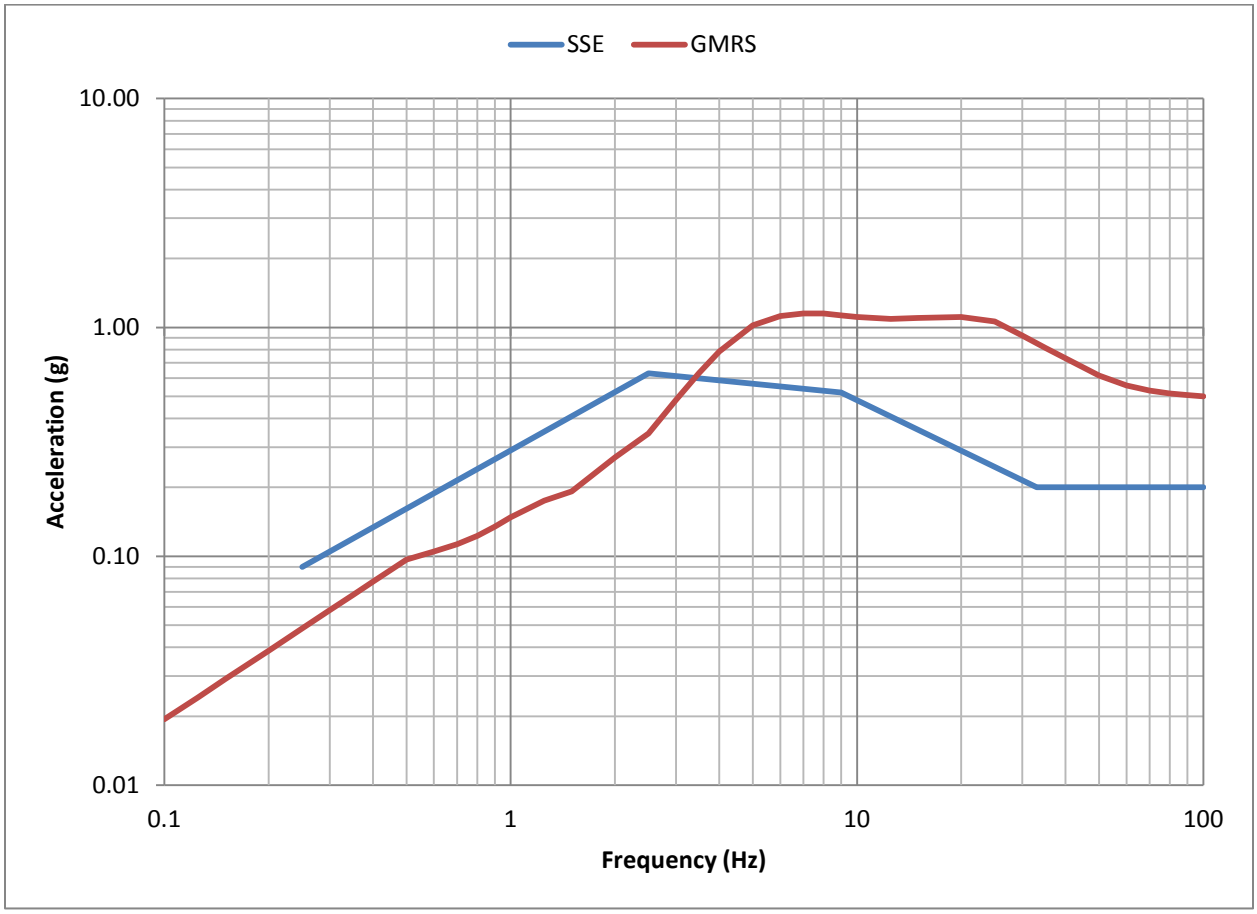


**Figure 4-2: Callaway SSE – GMRS Comparison**

## 5.0 Review Level Ground Motion (RLGM)

### 5.1 Description of RLGM Selected

The Review Level Ground Motion is derived by linearly scaling the current design basis SSE by the maximum ratio of the GMRS to the SSE between the 1 and 10 Hz range (not to exceed two times the SSE) [2]. The maximum GMRS/SSE ratio occurs at 10 Hz as seen in Figure 4-2. The In-Structure Response Spectra document provides logarithmic interpolation at 10 Hz to determine that the SSE spectral acceleration is 0.48 g [8]. Examination of Table 4-1 shows that the GMRS spectral acceleration is 1.11 g. The result is a maximum GMRS/SSE ratio between 1 – 10 Hz of 2.31 (witness 1.11 g / 0.48 g = 2.31). Since the GMRS/SSE ratio cannot exceed 2 the RGLM is scaled at 2 X SSE. The resulting RLGM is shown in Table 5-1 and Figure 5-1.

It is noted that for surface-mounted structures, systems, and components (SSC) (TAP01, TBN01, and the CST pipe house) directly applying the GMRS for HCLPF

determination is acceptable. Results based upon the GMRS as the seismic margins earthquake are noted where applicable herein.

**Table 5-1: RLGM for Callaway**

| Freq. (Hz) | 100 | 33 | 9 | 2.5 | 0.25 |
|---|---|---|---|---|---|
| RLGM (g) | 0.4 | 0.4 | 1.04 | 1.26 | 0.18 |

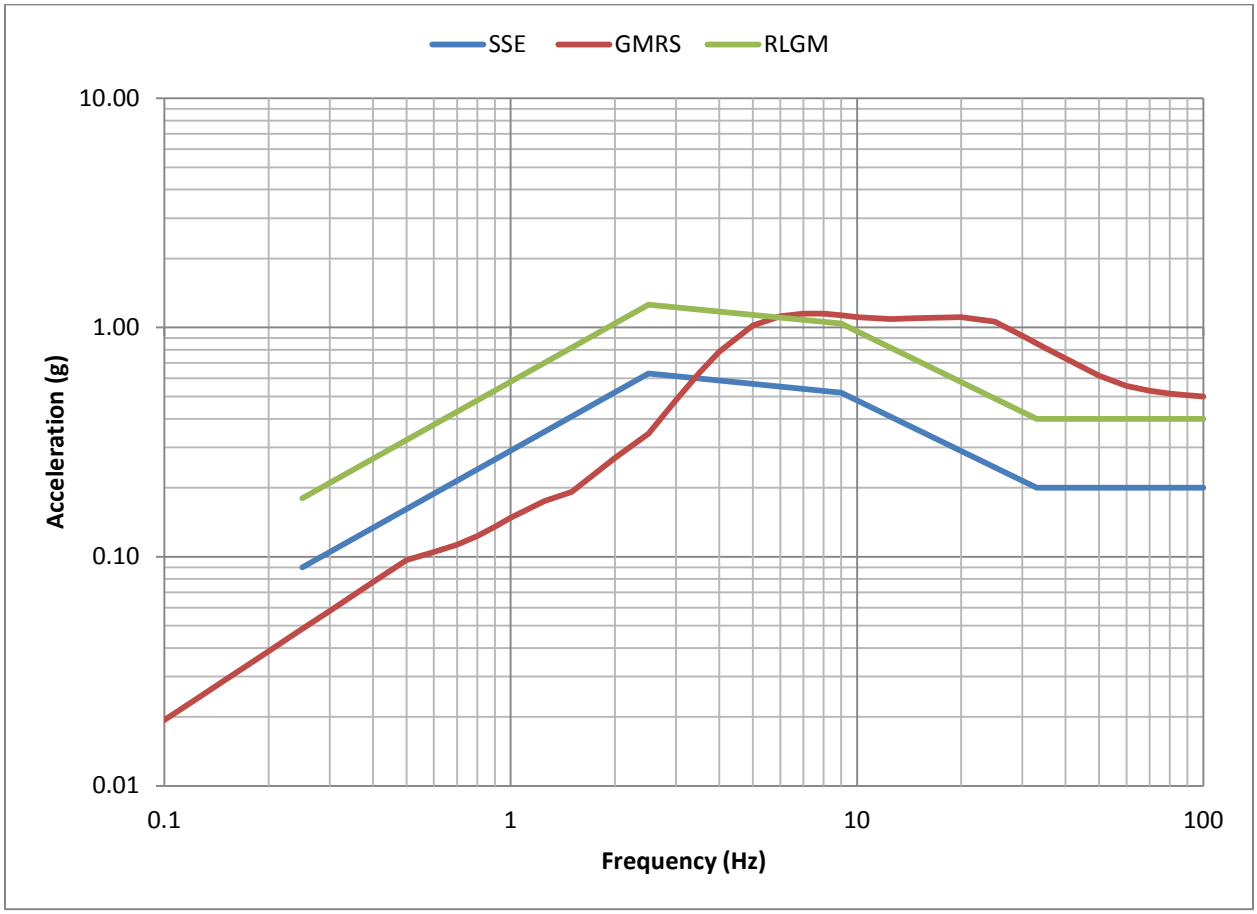


**Figure 5-1: Callaway RLGM vs GMRS**

## 5.2 Method to Estimate In-Structure Response Spectra (ISRS)

The ISRS for Callaway [10a] uses the scaled approach to estimate the ISRS. As mentioned in Section 5.1, the RLGM is scaled by a factor of 2 which is also applied to the existing ISRS curves.

# 6.0 Seismic Margin Evaluation Approach

It is necessary to demonstrate that the ESEL items have sufficient seismic capacity to meet or exceed the demand characterized by the RLGM. The seismic capacity is characterized as the peak ground acceleration (PGA) for which there is a high confidence of a low probability of failure (HCLPF). The PGA is associated with a specific spectral shape, in this case the 5%-damped RLGM spectral shape. The HCLPF capacity must be equal to or greater than the RLGM PGA. The criteria for seismic capacity determination are given in Section 5 of EPRI 3002000704 [2].

There are two basic approaches for developing HCLPF capacities:

1. Deterministic approach using the conservative deterministic failure margin (CDFM) methodology of EPRI NP-6041, A Methodology for Assessment of Nuclear Power Plant Seismic Margin (Revision 1) [8].
2. Probabilistic approach using the fragility analysis methodology of EPRI TR-103959, Methodology for Developing Seismic Fragilities [9].

Callaway has elected to use the deterministic approach by applying the EPRI NP-6041 screening process [8].

## 6.1 Summary of Methodologies Used

The seismic margins methodology of EPRI report NP-6041-SL [8] was applied for this effort. Use of this methodology conforms to Section 5 of EPRI 3002000704. The primary tasks performed were:

- Generic seismic screening per NP-6041, Table 2-4.
- Performance of seismic walkdowns.
- Item-specific screening via walkdown, review of design data, and performance of screening calculations.
- Performance of HCLPF calculations for screened-in equipment

## 6.2 HCLPF Screening Process

### 6.2.1 Overview

The seismic margins screening methodology of NP-6041-SL was applied. The primary steps for this screening process are:

1. Apply NP-6041-SL, Table 2-4 to determine which equipment items and failure modes may be screened-out on a generic basis.
2. For each equipment item, perform a seismic walkdown to verify generic screening may be applied and to verify the item does not have any specific seismic vulnerabilities.
3. Verify anchorage capacity.

The generic screening criteria of Table 2-4 are dependent on the applied screening level and are applicable to equipment located within 40 feet of plant grade. For the Callaway ESEP project:

- The peak 5% spectral acceleration of the RLGM is 1.26g and occurs at 2.5 Hz. At 3.5 Hz, the RLGM decreases to 1.2g[1]. From FSAR SP Table 3.7(B)-4 and SA Tables 3.7-3 and 3.7-4, all Category I structures have fundamental frequencies exceeding 3.5 Hz and can reasonably be considered to respond in the frequency range corresponding to accelerations less than 1.2g. Accordingly, the 2nd screening column (0.8 – 1.2g) screening criteria of NP-6041-SL, Table 2-4, were applied with special consideration for components with low frequencies.
- A number of components in the Auxiliary/Control Building and the Reactor Building were located above 40' from grade; all other equipment was located within 40' of plant grade. Per Appendix A of NP-6041-SL, components that are above 40' from grade *and* have corresponding ISRS at the base of component in exceedance of 1.5 times the bounding spectrum (equivalent to a 1.8g peak spectral acceleration) may not be screened to the 2nd screening column and require HCLPF analysis.

Table 6-1 below summarizes the application of Table 2-4 screening for the ESEP.

Applied plant grade was Elevation 2000'. Per the FSAR this grade elevation is constant through-out the power block area.

After completion of the screening process, an item is either screened-out or screened-in. The presumptive seismic capacity of a screened-out item exceeds the applied screening level and no further evaluation is needed. An item that is screened-in requires a HCLPF analysis to address the failure mode cited by the seismic review team (SRT). The HCLPF capacity may or may not be above the screening level.

### 6.2.2 Generic Screening Results

Table 6-1 summarizes the generic screening results for the ESEL. Only the relevant equipment types are listed. Based on the generic screening:

- HCLPF analyses are required for atmospheric storage tanks
- Relay chatter requires evaluation

[1] The frequency where the RLGM spectra equals 1.2g is determined by logarithmic interpolation based on the control point accelerations and frequencies in Reference 8 as follows:

$$1.2g = 10^{\left( (\log(X\,Hz)-\log(2.5\,Hz)\cdot\frac{\log(1.04\,g)-\log(1.26\,g)}{\log(9\,Hz)-\log(2.5\,Hz)}+\log(1.26\,g)\right)} \Rightarrow X = 3.46Hz$$

Other generic screening requirements were addressed by walkdown, design review and anchorage verification. These assessments are documented in the screening evaluation work sheets (SEWS) [10f].

**Table 6-1: Summary of generic screening per NP-6041-SL Table 2-4, 1.2g Screening Level**

| Equipment Type | Generic Screening Criteria | Screening Result |
|---|---|---|
| Active valves | Note (f) applies. | There are no extremely large extended motor operators on 2-inch or smaller piping. |
| Passive valves | No evaluation required. | N/A |
| Atmospheric storage tanks | Evaluation required. | HCLPF analyses required for the atmospheric storage tanks. |
| Pressure vessels | Notes (h), (i) apply | For the pressurized tanks on the ESEL, anchorage and load path were verified by bounding calculations using qualification reports during screening. Potential failure modes of the vessel bodies were addressed by walkdown and design review. |
| Batteries and racks | Note (k) applies. | Batteries are braced racks and are designed for seismic loads. HCLPF analyses are required for the battery rack anchorage. |
| Horizontal pumps | No evaluation required. | Although no evaluation is required for the component per se, a HCLPF evaluation for the auxiliary feedwater turbine-driven pump is required. |
| Active electrical power distribution panels | Notes (s) and (t) apply. | Note (s) was addressed by walkdown and design review. Where bounding analysis of anchorage configurations for the RLGM could not be provided, HCLPF analyses are required.<br><br>Relays are evaluated separately per Reference 5. |
| Passive electrical power distribution panels | Note (s) applies. | Note (s) was addressed by walkdown and design review. Where bounding analysis of anchorage configurations for the RLGM could not be provided, HCLPF analyses are required. |
| Transformers | Notes (u) and (v) apply. | The ESEL includes dry-type transformers. A design review verified coil restraint. HCLPF analysis of anchorage is required. |

| Equipment Type | Generic Screening Criteria | Screening Result |
|---|---|---|
| Battery chargers & inverters | Note (w) applies. | Per walkdown and design review, the items on the ESEL are solid state units. Where bounding analysis of anchorage configurations for the RLGM could not be provided, HCLPF analyses are required. |
| Instrumentation and control panels and racks | Notes (s) and (t) apply. | Note (s) was addressed by walkdown and design review. Where bounding analysis of anchorage configurations for the RLGM could not be provided, HCLPF analyses are required.<br><br>Relays are evaluated separately per Reference 5. |
| Temperature sensors; pressure and level sensors. | Note (x) applies. | Note (x) was addressed by walkdown and design review. Sensors in the scope were typically mounted in-line on piping. |

**Relevant notes from NP-6041-SL Table 2-4**

f. Evaluation recommended for MOVs in piping lines of 2 inches diameter or less.

h. Margin evaluation only needs to consider anchorage and supports.

i. For vessels designed by dynamic analysis or equivalent static analysis enveloping vessel inertial and piping loading, only the anchorage and supports require evaluation. For vessel not meeting these criteria, all potential failure modes require evaluation.

k. Batteries mounted in braced racks designed for seismic loads or qualified by dynamic testing do not require evaluation. Rigid spacers between batteries and end restraints are required. Batteries should be tightly supported by side rails.

s. Walkdown should be conducted to verify that the instruments are properly attached to the cabinets.

t. Relays, contactors, switches, and breakers must be evaluated for chatter and trip if functionality during strong shaking is required.

u. Anchorage evaluation required.

v. Liquid-filled transformers require evaluation of overpressure safety switches. The transformer coils should be restrained within the cabinet for dry transformers.

w. Solid state units require anchorage checks. Others require evaluation.

x. Insufficient data are available for screening guidelines. Emphasis should be on attachments.

## 6.3 Seismic Walkdown Approach

### 6.3.1 Walkdown Approach

Walkdowns were performed by two-person seismic review teams (SRTs) consisting of engineers with seismic experience. Walkdowns followed the guidance of Section 5 of EPRI 3002000704 [2] and Section 2 of NP-6041-SL [8]. The SRT used NP-6041-SL, Appendix F, to evaluate item-specific equipment caveats. The SRT also recorded notes and took photographs of the items under review.

Two walkdown sessions have been performed as indicated below.

| Walkdown Date | SRT | Plant Support |
|---|---|---|
| Week of July 14, 2014 | Hunter Young (S&A)<br>Samer El-Bahey (S&A) | Jim Cunningham (Callaway)<br>Steve Sampson (Callaway)<br>George Belchik (Callaway) |
| Week of November 3, 2014 | Hunter Young (S&A)<br>Apostolos Karavoussianis (S&A) | David Hollabaugh (Callaway) |

The walkdown findings for each item are documented in screening evaluation work sheets (SEWS). The SEWS notes also identify evaluations and reviews performed to support screening. The SEWS are included in Appendix C of Reference 10f. Also, Appendix A [10f] provides a concise summary of screening results in tabular format.

### 6.3.2 Application of Previous Walkdown Information

New seismic walkdowns were performed for ESEL equipment. The results of the previous seismic margin evaluation, performed for the Seismic IPEEE program [11], were reviewed and used for background purposes only.

### 6.3.3 Significant Walkdown Findings

The walkdown and screening results are summarized in Table 6-2.

## Table 6-2: Items Selected for HCLPF Analysis

| No. | ID | Description | Bldg | Elev | Basis for Selection |
|---|---|---|---|---|---|
| 1. | NB001 | 4.16KV SWGR NB001 (Class 1E, Train A) | CB | 2000-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage. |
| 2. | NG001 | 480 V LOAD CENTER NG01 | CB/CC | 2000-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage.<br><br>Apply results to similar items NG002 and NG003. |
| 3. | NK011 | 125 V BATTERY NK011 | CB/CC | 2016-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage.<br><br>Apply results to similar items NK013 and NK014. |
| 4. | NK021 | 125 V BATTERY CHARGER NK021 | CB/CC | 2016-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage.<br><br>Apply results to similar items NK023 and NK024. |
| 5. | NK025 | 125 V BATTERY CHARGER NK025 (Swing Battery Charger) | CB | 2000-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage. |
| 6. | NN001 | Class 1E AC DIST SWBD NN01 (SEP GRP 1) | CB/CC | 2016-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage.<br><br>Apply results to similar items NK043, NN003, NK051, NK041, NK001, NK003, NK004, and NN004. |
| 7. | NN011 | 7.5KVA INVERTER (FED FROM BATT CHARGER NK021) | CB/CC | 2016-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage.<br><br>Apply results to similar item NN013. |

| No. | ID | Description | Bldg | Elev | Basis for Selection |
|---|---|---|---|---|---|
| 8. | PA003 | CUBICLE PT FOR RCP MOTOR DPBB01A | AUX | 2026-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage.<br><br>Apply results to similar item PA004. |
| 9. | PAL02 | TDAFW Pump | AUX | 2000-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage. |
| 10. | RL001 | REACTOR COOLANT AND SUPT SYS CONSOLE | CB | 2047-06 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage.<br><br>Apply results to similar items RL002, RL005, RL006, and RL017 thru RL026. |
| 11. | SB102A | W CABINET FOR REACTOR TRIP SWG TRAIN-A | AUX | 2026-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage. |
| 12. | TAP01 | Condensate Storage Tank | YARD | 2000-00 | Perform HCLPF analysis per Appendix H of NP-6041. In addition, evaluate block wall doghouse that is adjacent for interaction hazard. |
| 13. | TBN01 | RWST | YRD | 2000-00 | Perform HCLPF analysis per Appendix H of NP-6041. |
| 14. | XNG01 | 4.16-KV/480 V LOAD CENTER TRANSFORMER XNG01 FOR LC NG001 | CB/CC | 2000-00 | Anchorage could not be readily screened. Perform HCLPF analysis of anchorage. |

| No. | ID | Description | Bldg | Elev | Basis for Selection |
|---|---|---|---|---|---|
| 15. | Generic | Equipment 40’ above grade | AB/CB | 2047-06 | Equipment on the Aux/Ctrl 2047.5' elevation are 40' above grade and have ISRS spectral accelerations in both horizontal directions exceeding 1.8g (with clipping) and therefore do not screen to the 2nd screening lane. HCLPF analysis for component functionality and structure (including anchorage) are required for the associated components.<br><br>Affected components include NF039A, NF039B, NF039C, NG003C, NG004C, RP053AC, RP053BC, RP053DB, RP068, RP081A, RP081B, RP289, SA036A, SA036C, SA066A, SA066B, SA075A, SB029A, SB029D, SB030A, SB032A, SB032D, SB033A, SB037, SB038, SB041, SB078, SB079, SE054A, SE054C, and SE054D. |
| 16. | Generic | BLOCK WALLS | AB/ CB | Var. | Per NP-6041-SL Table 2-4 seismic capacity cannot be screened and HCLPF analysis is required for block wall seismic capacity.<br><br>Affected components include NB001, NK025, NG003, TAP01, NK043, NN003, NN013, NK041, NN001, NK021, NN011, NK051, NK001, NK023, NK071, NK073, NK011, NK013, AB007, NK003, RP209, NG002, NK024, NK074, NK004, NK014, NN014, NN004, RP140, and RP334. |

## 6.4 HCLPF Calculation Process

All HCLPF values were calculated using the conservative, deterministic failure margin (CDFM) criteria of NP-6041-SL [8]. CDFM analysis criteria are summarized in NP-6041-SL, Table 2-5.

For structural failure modes, the HCLPF capacity is equal to the earthquake magnitude at which the strength limit is reached. For equipment functionality, experience data or available test response spectra (TRS) are typically used to define the HCLPF capacity. The methods of NP-6041-SL, Appendix Q were applied for functionality evaluations.

## 6.5 Functional Evaluations of Relays

Verification of the functional capacity for equipment mounted within 40' of grade was addressed by application NP-6041-SL, Table 2-4 generic screening criteria as described above. For equipment mounted higher than 40' above grade and for in-scope relays, the methods of NP-6041-SL, Appendix Q were applied for functionality evaluations. In those cases the seismic capacity was based upon one of the following:

- Test response spectra (TRS) from plant-specific seismic qualification reports.
- Generic equipment ruggedness spectra (GERS) from EPRI report NP-5223-SL [12].
- Experience based seismic capacity per the guidelines of EPRI TR-1019200 [13].

Screening of relays within the scope of the ESEP (in accordance with EPRI 3002000704) is conducted within 14C4258-RPT-003 [5]. Cabinets requiring HCLPF evaluation for relay functionality are noted in Table 7-2 [5] under Item 17.

## 6.6 Tabulated ESEL HCLPF Values (Including Key Failure Modes)

Table 6-3 lists HCLPF analysis results. The failure modes analyzed are identified. Supporting calculation documents [10.d &e] containing the detailed HCLPF calculations are also identified.

For the following discussion, an "ESEP outlier" is defined as an item whose HCLPF capacity is less than the RLGM. There are currently four ESEP outliers:

- NG003C (Relay Capacity)
- NG004C (Relay Capacity)
- TAP01 (Anchorage Capacity)
- TBN01 (Anchorage Capacity)

Note that for the CST (TAP01) and RWST (TBN01), the applied ground motion and HCLPF are based on the GMRS of Reference 7. The GMRS is acceptable as an alternative RLGM per EPRI 3002000704, Section 4, Option 2. The CST and RWST are founded on a slab-on-grade in the yard. The GMRS has a horizontal PGA of 0.50g.

Relay Chatter Failure Modes

NG003C and NG004C are ESEP-outliers with respect to relay chatter. Refer to 14C4258-RPT-003 [5] for specific relays. Credit for operator action may resolve the relay chatter failure modes.

Tabulated HCLPF Values

In general, the HCLPF values for screened-out items equals or exceeds the RLGM.

HCLPF ≥ 0.40g The HCLPF for screened-out items and failure modes

Unless justified by calculations, the above HCLPF is applicable for all screened-out items and covers the relevant failure modes.

The HCLPF values for all ESEL items are tabulated in Appendix B.

**Table 6-3: HCLPF Analysis Results**

| No. | ID | Description | Bldg | Elev | HCLPF[2] (g, PGA) | Failure Mode Analyzed | Basis | Related Components |
|---|---|---|---|---|---|---|---|---|
| 1. | NB001 | 4.16KV SWGR NB001 (Class 1E, Train A) | CB | 2000-00 | 0.41 | Equipment capacity and anchorage | 14C4258-CAL-005 | n/a |
| 2. | NG001 | 480 V LOAD CENTER NG01 | CB/CC | 2000-00 | 0.41 | Equipment capacity and anchorage | 14C4258-CAL-005 | NG002, NG003 |
| 3. | NK011 | 125 V BATTERY NK011 | CB/CC | 2016-00 | 2.36 | Anchorage | 14C4258-CAL-004 | NK013, NK014 |
| 4. | NK021 | 125 V BATTERY CHARGER NK021 | CB/CC | 2016-00 | 1.33 | Anchorage | 14C4258-CAL-004 | NK023, NK024 |
| 5. | NK025 | 125 V BATTERY CHARGER NK025 (Swing Battery Charger) | CB | 2000-00 | 0.85 | Anchorage | 14C4258-CAL-004 | n/a |
| 6. | NN001 | Class 1E AC DIST SWBD NN01 (SEP GRP 1) | CB/CC | 2016-00 | 0.71 | Anchorage | 14C4258-CAL-004 | NK043, NN003, NK051, NK041, NK001, NK003, NK004, NN004 |
| 7. | NN011 | 7.5KVA INVERTER (FED FROM BATT CHARGER NK021) | CB/CC | 2016-00 | 0.75 | Anchorage | 14C4258-CAL-004 | NN013 |
| 8. | PA003 | CUBICLE PT FOR RCP MOTOR DPBB01A | AUX | 2026-00 | 0.62 | Anchorage | 14C4258-CAL-004 | PA004 |

[2] HCLPFs based upon RLGM (PGA=0.40g) as the seismic margins earthquake with the exception of TAP01, TBN01, and the CST pipe house block walls, which are based upon the GMRS (PGA=0.50g).

| No. | ID | Description | Bldg | Elev | HCLPF2 (g, PGA) | Failure Mode Analyzed | Basis | Related Components |
|---|---|---|---|---|---|---|---|---|
| 9. | PAL02 | TDAFW Pump | AUX | 2000-00 | 1.75 | Anchorage | 14C4258-CAL-004 | n/a |
| 10. | RL001 | REACTOR AUX CNTRL PANEL | CB | 2047-06 | 0.71 | Anchorage | 14C4258-CAL-004 | RL002, RL005, RL006, RL017 thru RL026 |
| 11. | SB102A | W CABINET FOR REACTOR TRIP SWG TRAIN-A | AUX | 2026-00 | 0.58 | Anchorage | 14C4258-CAL-004 | n/a |
| 12. | TAP01 | Condensate Storage Tank | YARD | 2000-00 | 0.30 | Equipment capacity and anchorage | 14C4258-CAL-002 | n/a |
| 13. | TBN01 | RWST | YRD | 2000-00 | 0.33 | Equipment capacity and anchorage | 14C4258-CAL-002 | n/a |
| 14. | XNG01 | 4.16-KV/480 V LOAD CENTER TRANSFORMER XNG01 FOR LC NG001 | CB/CC | 2000-00 | 0.45 | Anchorage | 14C4258-CAL-004 | |
| 15. | Generic | Equipment >40’ | | | | | | |
| | SE054A | NIS Cabinet | CB | 2047-06 | 0.41 | Equipment capacity and anchorage | 14C4258-CAL-005 | SE054C, SE054D |
| | SB037 | 7300 Series Three Bay Cabinets | CB | 2047-06 | 0.41 | Equipment capacity and anchorage | 14C4258-CAL-005 | SB038, SB041, SB078, SB079 |
| | SA066A | STATUS INDICATING SYS | CB | 2047-06 | 0.41 | Equipment capacity and anchorage | 14C4258-CAL-005 | SA066B |
| | RP068 | BOP Instrumentation Panel | CB | 2047-06 | 0.41 | Equipment capacity and anchorage | 14C4258-CAL-005 | n/a |
| | RP053AC | BOP Instrumentation Rack | CB | 2047-06 | 0.41 | Equipment capacity and anchorage | 14C4258-CAL-005 | RP053BC, RP053DB |
| | RP081A | T/C SUBCOOLING MONITOR CABINET | CB | 2047-06 | 0.41 | Equipment capacity and anchorage | 14C4258-CAL-005 | RP081B |
| 16. | Generic | Block Wall Seismic Interaction | | | | | | |
| | CTRL 2000’ | All block walls on CTRL 2000’ elev | CB | 2000-00 | 1.17 | Seismic interaction | 14C4258-CAL-003 | NB001, NK025, NG003, RP140, and RP334. |

| No. | ID | Description | Bldg | Elev | HCLPF2 (g, PGA) | Failure Mode Analyzed | Basis | Related Components |
|---|---|---|---|---|---|---|---|---|
| | CTRL 2016' | All block walls on CTRL 2016' elev | CB | 2016-00 | 0.87 | Seismic interaction | 14C4258-CAL-003 | NK043, NN003, NN004, NN013, NN014, NK041, NN001, NK021, NN011, NK051, NK001, NK023, NK071, NK073, NK074 NK011, NK013, NK014, AB007, NK003, NK004, NK024 |
| | AUX 2000' | 2000' elev wall on column line AF north of Stair A-2 | AUX | 2000-00 | 0.67 | Seismic interaction | 14C4258-CAL-003 | RP209 |
| | CST House | CST Pipe house masonry walls | YARD | 2000-00 | 0.40 | Seismic interaction | 14C4258-CAL-003 | TAP01 |
| 17. | Generic | Cabinets containing essential relays | | | | | | |
| | NG003C | MCC NG03C BUS | CB | 2047-06 | 0.32 | Functional capacity and host component capacity | 14C4258-CAL-005 | NG004C |
| | NG002B | MCC NG02B BUS | CB | 2026-00 | 0.40 | Functional capacity and host component capacity | 14C4258-CAL-005 | NG001A |
| | FC0219 | LOCAL CONTROL PANEL FOR TD AFW PUMP | AB | 2000-00 | 0.41 | Functional capacity and host component capacity | 14C4258-CAL-005 | n/a |

## 7.0 Inaccessible Items

### 7.1 Identification of ESEL items inaccessible for walkdowns

Sufficient access was provided for all ESEL items and no additional walkdowns are planned.

## 8.0 ESEP Conclusions and Results

### 8.1 Supporting Information

Callaway has performed the ESEP as an interim action in response to the NRC's 50.54(f) letter [1]. It was performed using the methodologies in the NRC endorsed guidance in EPRI 3002000704 [2].

The ESEP provides an important demonstration of seismic margin and expedites plant safety enhancements through evaluations and potential near-term

modifications of plant equipment that can be relied upon to protect the reactor core following beyond design basis seismic events.

The ESEP is part of the overall Callaway response to the NRC's 50.54(f) letter [1]. On March 12, 2014, NEI submitted to the NRC results of a study [14] of seismic core damage risk estimates based on updated seismic hazard information as it applies to operating nuclear reactors in the Central and Eastern United States (CEUS). The study concluded that "site-specific seismic hazards show that there [...] has not been an overall increase in seismic risk for the fleet of U.S. plants" based on the re-evaluated seismic hazards. As such, the "current seismic design of operating reactors continues to provide a safety margin to withstand potential earthquakes exceeding the seismic design basis."

The NRC's May 9, 2014 NTTF 2.1 Screening and Prioritization letter [15] concluded that the "fleetwide seismic risk estimates are consistent with the approach and results used in the GI-199 safety/risk assessment." The letter also stated that, "As a result, the staff has confirmed that the conclusions reached in GI-199 safety/risk assessment remain valid and that the plants can continue to operate while additional evaluations are conducted."

An assessment of the change in seismic risk for Callaway was included in the fleet risk evaluation submitted in the March 12, 2014 NEI letter [14] therefore, the conclusions in the NRC's May 9 letter [15] also apply to Callaway.

In addition, the March 12, 2014 NEI letter [14] provided an attached "Perspectives on the Seismic Capacity of Operating Plants," which: (1) assessed a number of qualitative reasons why the design of SSCs inherently contain margin beyond their design level, (2) discussed industrial seismic experience databases of performance of industry facility components similar to nuclear SSCs, and (3) discussed earthquake experience at operating plants.

The fleet of currently operating nuclear power plants was designed using conservative practices, such that the plants have significant margin to withstand large ground motions safely. This has been borne out for those plants that have actually experienced significant earthquakes. The seismic design process has inherent (and intentional) conservatisms which result in significant seismic margins within SSCs. These conservatisms are reflected in several key aspects of the seismic design process, including:

- Safety factors applied in design calculations
- Damping values used in dynamic analysis of SSCs
- Bounding synthetic time histories for in-structure response spectra calculations
- Broadening criteria for in-structure response spectra
- Response spectra enveloping criteria typically used in SSC analysis and testing applications

- Response spectra based frequency domain analysis rather than explicit time history based time domain analysis
- Bounding requirements in codes and standards
- Use of minimum strength requirements of structural components (concrete and steel)
- Bounding testing requirements, and
- Ductile behavior of the primary materials (that is, not crediting the additional capacity of materials such as steel and reinforced concrete beyond the essentially elastic range, etc.).

These design practices combine to result in margins such that the SSCs will continue to fulfill their functions at ground motions well above the SSE.

The intent of the ESEP is to perform an interim action in response to the NRC's 50.54(f) letter [1] to demonstrate seismic margin through a review of a subset of the plant equipment that can be relied upon to protect the reactor core following beyond design basis seismic events. In order to complete the ESEP in an expedited amount of time, the RLGM used for the ESEP evaluation is a scaled version of the plant's SSE rather than the actual GMRS. To more fully characterize the risk impacts of the seismic ground motion represented by the GMRS on a plant specific basis, a more detailed seismic risk assessment (SPRA or risk-based SMA) is to be performed in accordance with EPRI 1025287 [16]. As identified in the Callaway Seismic Hazard and GMRS submittal [7], Callaway screens in for a risk evaluation. The complete risk evaluation will more completely characterize the probabilistic seismic ground motion input into the plant, the plant response to that probabilistic seismic ground motion input, and the resulting plant risk characterization. Callaway will complete that evaluation in accordance with the schedule identified in NEI's letter dated April 9, 2013 [17] and endorsed by the NRC in their May 7, 2013 letter [2].

## 8.2 Indication of Planned Modifications

This report presents the seismic evaluation results for the ESEP as applied to Callaway Energy Center. A primary goal of the ESEP is to demonstrate that HCLPF seismic capacities of ESEL items exceed the RLGM seismic demand. For Callaway, the RLGM is equal to the SSE scaled-up by a 2.0 factor. The RLGM has a PGA of 0.40g at grade. Exceptions to this include the CST (TAP01) and RWST (TBN01), which apply the GMRS (PGA of 0.50g) for HCLPF evaluation [10b].

Insights from the ESEP identified the following items (Table 8-1) where the HCLPF is below the RLGM and plant modifications will be made in accordance with EPRI 3002000704 [2] to enhance the seismic capacity of the plant.

**Table 8-1: Equipment with HCLPF Capacities below the RLGM Requiring Modification**

| ID | Description | HCLPF Capacity[3] (g, PGA) | Failure Mode |
|---|---|---|---|
| NG003C | MCC NG03C BUS | 0.32 | Relay functionality |
| NG004C | MCC NG04C BUS | 0.32 | Relay functionality |
| TAP01 | Condensate Storage Tank | 0.30 | Anchorage |
| TBN01 | RWST | 0.33 | Anchorage |

## 8.3 Modification Implementation Schedule

Plant modifications will be performed in accordance with the schedule identified in NEI letter dated April 9, 2013 [15], which states that plant modifications not requiring a planned refueling outage will be completed by December 2016 and modifications requiring a refueling outage will be completed within two planned refueling outages after December 31, 2014.

Section 8.4 contains the regulatory commitment dates to complete planned plant modifications as a result of ESEP. Referencing Section 8.4, Actions 1 and 2 do not require a refueling outage and will be completed by December 31, 2016. Action 3 requires a refueling outage and will be completed by the end of RF21, Spring 2016, as required to support FLEX implementation. Action 4 requires a refueling outage and will be completed no later than the end of the second refueling outage after 12/31/14, currently RF22 scheduled for Fall 2017.

## 8.4 Summary of Regulatory Commitments

The following actions will be performed as a result of the ESEP.

| Action # | Equipment ID | Equipment Description | Action Description | Completion Date |
|---|---|---|---|---|
| 1 | NG003C | MCC NG03C BUS | Modify FLEX Support Guidelines to include operator actions to reset relays with HCLPF values less than the RLGM. | December 31, 2016 |
| 2 | NG004C | MCC NG04C BUS | Modify FLEX Support Guidelines to include operator actions to reset relays with HCLPF values less than the RLGM. | December 31, 2016 |
| 3 | TAP01 | Condensate Storage Tank | Install a new “hardened” Condensate Storage Tank. | End of RF21, Spring 2016 |

[3] All HCLPFs based upon RLGM (PGA=0.40g) as the seismic margins earthquake with the exception of TAP01, TBN01, and the CST pipe house block walls, which are based upon the GMRS (PGA=0.50g).

| Action # | Equipment ID | Equipment Description | Action Description | Completion Date |
|---|---|---|---|---|
| 4 | TBN01 | RWST | Three step response in order of priority: 1) Re-evaluate FLEX response strategies to eliminate the need for the tank. 2) Re-analyze the tank with the more realistic median-centered structural response based on the new GMRS which will be generated once the Seismic PRA starts, 3) Upgrade/replace the tank. | No later than the end of the second refueling outage after 12/31/14, currently RF22 scheduled for Fall 2017 |

## 9.0 References

1. Letter from E. J. Leeds and M. R. Johnson, USNRC, to M. W. Sunseri, WCNOC, "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 No. ML12053A340.
2. Letter from E. J. Leeds, USNRC, to J. E. Pollock, NEI, "Electric Power Research Institute Final Draft Report XXXXXX, "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," May 7, 2013. 3002000704; ADAMS Accession No. ML13106A331.
3. Callaway Overall Integrated Plan (OIP) in Response to the March 12, 2012, Commission Order EA-12-049.
    a. Callaway Letter ULNRC-05962, "Docket No. 50-483: Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," February 18, 2013, (ADAMS Accession Number ML13063A459).
    b. Callaway Letter ULNRC-06024, "Docket No. 50-483: Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 First Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," August 29, 2013, (ADAMS Accession Number ML 13242A239).
    c. Callaway Letter ULNRC-06087, "Docket No. 50-483: Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," February 26, 2014, (ADAMS Accession Number ML 14057A770).
    d. Callaway Letter ULNRC-06135, "Docket No. 50-483: Callaway Plant Unit 1 Union Electric Co. Facility Operating License NPF-30 Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-

Design-Basis External Events (Order Number EA-12-049)," August 28, 2014, (ADAMS Accession Number ML13063A459).

4. SCP-14-82, "Transmittal of Updated Callaway ESEL for ESEP Report", December 2014.
5. S&A report 14C4258-RPT-003 Rev. 0, "Callaway ESEL Relay Assessment," December 2014.
6. CEC FSAR, Rev. OL-20, "Callaway Energy Center Final Safety Analysis Report (FSAR)." December 2013.
7. Callaway Seismic Hazard and GMRS submittal, dated March 31, 2014.
8. Electric Power Research Institute Report, NP-6041-SLR1, Revision 1, "A Methodology for Assessment of Nuclear Power Plant Seismic Margin," 1991.
9. Electric Power Research Institute Report, TR-103959, "Methodology for Developing Seismic Fragilities," 1994.
10. S&A Calculations:
    a) 14C4258-CAL-001 Rev. 0, "Generation of Scaled In-Structure Response Spectra for Callaway," December 2014.
    b) 14C4258-CAL-002 Rev. 0, "Seismic Capacity of CST (TAP01) and RWST (TBN01)," December 2014.
    c) 14C4258-CAL-003 Rev. 0, "HCLPF Analyses for Block Walls," December 2014.
    d) 14C4258-CAL-004 Rev. 0, "HCLPF Seismic Capacity Evaluations for Selected Equipment," December 2014.
    e) 14C4258-CAL-005 Rev. 0, "HCLPF Analysis of Components Based on Seismic Test Data," December 2014.
    f) 14C4258-RPT-002, Revision 1, "Seismic Evaluation of Equipment at CEC for the Expedited Seismic Evaluation Process," December 2014.
11. ULNRC-3232, "Callaway Plant Individual Plant Examination of External Events (IPEEE)," June 1995.
12. Electric Power Research Institute Report, NP-5223-SL, Revision 1, "Generic Seismic Ruggedness of Power Plant Equipment," 1991.
13. Electric Power Research Institute Technical Report, TR-1019200, "Seismic Fragility Applications Guide Update," 2009.
14. Letter from A. R. Pietrangelo, NEI, to D. L Skeen, USNRC, "Seismic Risk Estimates for Plants in the Central and Eastern United States," March 12, 2014. ADAMS Accession No. ML14083A584.
15. NRC (E Leeds) Letter to All Power Reactor Licensees et al., "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," May 9, 2014.

16. Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic. EPRI, Palo Alto, CA: February 2013. 1025287.
17. Letter from A. R. Pietrangelo, NEI, to D. L. Skeen, USNRC, "Proposed Path Forward for NTTF Recommendation 2.1: Seismic Reevaluations," April 9, 2013. ADAMS Accession No. ML13107B386.

**Attachment A Callaway ESEL**

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| **Mechanical ESEL Items** | | | | | |
| 1 | TAP01 | Condensate Storage Tank | Operable | Operable | CST provides AFW suction for the first 17 hours |
| 2 | PAL02 | TDAFW Pump | Not Operating | Operating | TDAFW provides pump power to move AFW to SG |
| 3 | ALHV0034 | MOV | Open | Closed | MOV required to isolate flow path |
| 4 | ALHV0035 | MOV | Open | Closed | MOV required to isolate flow path |
| 5 | ALPI0029 | Suction Pressure Indicator | | | |
| 6 | ALFE0049 | TDAFWP Miniflow Flow Element | | | |
| 7 | ALFI0049 | TDAFWP Miniflow Flow Indicator | | | |
| 8 | APLV0002 | Level Control Valve | Open | Closed | Fail closed valve |
| 9 | ALPI0020 | TDAFW Pump Discharge Pressure Indicator | | | |
| 10 | ALHV0012 | Air Operated Valve | Open | Open | Valve may be operated to throttle AFW flow to SG |
| 11 | ALFE0004 | Flow Element | | | AFW flow related hardware |
| 12 | ALFT0004 | Flow Transmitter | | | AFW flow related hardware |
| 13 | ALFT0011 | Flow Transmitter | | | AFW flow related hardware |
| 14 | AEFV0041 | Feedwater Isolation Valve | Open | Closed | Fail closed valve |
| 15 | ALHV0010 | Air Operated Valve | Open | Open | Valve may be operated to throttle AFW flow to SG |
| 16 | ALFE0003 | Flow Element | | | |
| 17 | ALFT0003 | Flow Transmitter | | | AFW flow related hardware |
| 18 | ALFT0009 | Flow Transmitter | | | AFW flow related hardware |
| 19 | AEFV0040 | Feedwater Isolation Valve | Open | Closed | Fail closed valve |
| 20 | ALHV0008 | Air Operated Valve | Open | Open | Valve may be operated to throttle AFW flow to SG |
| 21 | ALFE0002 | Flow Element | | | AFW flow related hardware |
| 22 | ALFT0002 | Flow Transmitter | | | AFW flow related hardware |
| 23 | ALFT0007 | Flow Transmitter | | | AFW flow related hardware |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 24 | AEFV0039 | Feedwater Isolation Valve | Open | Closed | Fail closed valve |
| 25 | ALHV0006 | Air Operated Valve | Open | Open | Valve may be operated to throttle AFW flow to SG |
| 26 | ALFE0001 | Flow Element | | | AFW flow related hardware |
| 27 | ALFT0001 | Flow Transmitter | | | AFW flow related hardware |
| 28 | AEFV0042 | Feedwater Isolation Valve | Open | Closed | Fail closed valve |
| 29 | ABHV0005 | Air Operated Valve | Closed | Fail Open | TDAFW controls and steam flow controls. Fails open. |
| 30 | ABHV0048 | Air Operated Valve | Open | Fail Closed | TDAFW controls and steam flow controls. Fails closed. |
| 31 | ABHV0006 | Air Operated Valve | Closed | Fail Open | TDAFW controls and steam flow controls. Fails open. |
| 32 | ABHV0049 | Air Operated Valve | Open | Fail Closed | TDAFW controls and steam flow controls. Fails closed. |
| 33 | FCPI0311 | Pressure Indicator | | | |
| 34 | FCLT0010 | Level Indicator | | | Needed to prevent water intrusion in TDAFWP |
| 35 | FCFV0310 | Level Control Valve | Open | Fail Closed | Needed to prevent water intrusion in TDAFWP. Valve fails closed. |
| 36 | FCHV0312 | Trip and Throttle Valve | Closed | Operating | TDAFW controls and steam flow controls. Operation of this manual valve should be accounted for in operating procedures. |
| 37 | Speed Governor | Speed Governor | Standby | Operating | TDAFW controls and steam flow controls. |
| 38 | FCFV0313 | Speed Governor Valve | Open | Operating | TDAFW controls and steam flow controls. |
| 39 | KFC02 | AFW Pump Turbine | Not Operating | Operating | TDAFW controls and steam flow controls. |
| 40 | BBPV8702A | RHR TO RCS | Closed | Open | |
| 41 | EMHV8803B | MOTOR-OPERATED VALVE EMHV8803B | Closed | Open | Primary flow path, can be operated manually |
| 42 | EMHV8801B | MOTOR-OPERATED VALVE EMHV8801B | Closed | Open | Primary flow path, can be operated manually |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 43 | EMFE0924 | ECCS FLOW TO RCS COLD-LEG 1 | | | |
| 44 | EMFE0925 | ECCS FLOW TO RCS COLD-LEG 2 | | | |
| 45 | EMFE0926 | ECCS FLOW TO RCS COLD-LEG 3 | | | |
| 46 | EMFE0927 | ECCS FLOW TO RCS COLD-LEG 4 | | | |
| 47 | TBN01 | RWST | | | Secondary source for core makeup after BAT exhausted |
| 48 | BNLT0930 | RWST Level Transmitter | | | Monitor RWST level |
| 49 | EJHCV0606 | RHR Heat Exchanger A Outlet Isolation Valve | Fail Open | Closed | Can be operated manually |
| 50 | TBG03A | Boric Acid Tank | | | |
| 51 | BGLT0102 | BORIC ACID TANK A LEV | | | Monitor BAT level |
| 52 | BGLI0102 | BORIC ACID TANK A LEV | | | Local level indicator |
| 53 | EJFCV0610 | RHR Pump A miniflow Valve | Open | Closed | |
| 54 | EJFCV0610 | RHR Pump A miniflow Valve | Open | Closed | |
| 55 | EJFCV0610 | RHR Pump A miniflow Valve | Open | Closed | |
| **Electrical ESEL Items** | | | | | |
| 56 | NB001 | 4.16KV SWGR NB001 (Class 1E, Train A) | N/A | N/A | This component is powered by the FLEX DG in Phase 3 as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 57 | NB00101 | 4.16 kV FDR BKR FOR RHRP-A DPEJ01A (Residual Heat Removal Pump A) | N/A | N/A | This component is powered by the FLEX DG in Phase 3 as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 58 | NB00107 | 4.16 kV FDR BKR FOR CCWP-A DPEG01A (Component Cooling Water Pump A) | N/A | N/A | This component is powered by the FLEX DG in Phase 3 as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 59 | NB00109 | 4.16 kV FLEX GEN (Phase 3) TIE-IN POINT (BKR) FOR TRAIN A | N/A | N/A | This breaker position is the tie-in point for the Phase 3 FLEX diesel generator |
| 60 | NB00113 | 4.16 kV FDR BKR FOR XFMR XNG01 (4160 V to 480 V for LC NG001) | N/A | N/A | This component is powered by the FLEX DG in Phase 3 as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 61 | XNG01 | 4.16-KV/480 V LOAD CENTER TRANSFORMER XNG01 FOR LC NG001 | N/A | N/A | This component is powered by the FLEX DG in Phase 3 as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 62 | NG001 | 480 V LOAD CENTER NG01 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 63 | NG00101 | MAIN BKR FOR LC NG01 | N/A | N/A | This component is powered by the FLEX DG in Phase 3 as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 64 | NG00103 | FDR BKR FOR 125 V VITAL BATTERY CHARGER NK021 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 65 | NG00112 | FLEX 500 kW TIE IN BRK (Phase 2 connection point) | N/A | N/A | This component is powered by the FLEX DG in Phase 2 as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 66 | NG00116 | TIE BKR (CONNECTS NG01 AND NG03) | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 67 | NG003 | 480 V LOAD CENTER NG03 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 68 | NG00303 | FDR BKR FOR 125 V VITAL BATTERY CHARGER NK023 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 69 | NK021 | 125 V BATTERY CHARGER NK021 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 70 | NK071 | TRANSFER SWITCH BUS NK01 BATTERY CHARGER NK21/NK25 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 71 | NK001 | 125 VDC BUS SWITCHBOARD NK001 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 72 | NK00102 | FDR BKR FROM BATT CHGR NK021 TO NK001 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 73 | NK00104 | MAIN BREAKER FOR CNTRL AND DIST PNL NK041 (PART OF SWBD NK001) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 74 | NK00105 | MAIN BREAKER FOR CNTRL AND DIST PNL NK051 (PART OF SWBD NK001) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 75 | NK011 | 125 V BATTERY NK011 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 76 | NK00101 | ISOLATION BKR FOR BATTERY NK011 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 77 | NK00111 | FDR BKR FOR INVERTER NN011 (PART OF SWBD NK001) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 78 | NN011 | 7.5KVA INVERTER (FED FROM BATT CHARGER NK021) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 79 | NN001 | Class 1E AC DIST SWBD NN01 (SEP GRP 1) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 80 | SA066A | STATUS INDICATING SYS | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 81 | SENY0060A | NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 60A | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 82 | SENY0060B | NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 60B | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 83 | SB038 | W PROCESS ANALOG PROTECTION SET CAB-01 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 84 | SE054A | W NUC INSTM NIS 1 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 85 | RP053AC | BOP INSTRUMENTATION RACK (TERMINATION AREA) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 86 | SB078 | RPV LEVEL INSTR SYS (RVLIS) PROC PROT SYS CABINET | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 87 | RP081A | T/C SUBCOOLING MONITOR CABINET | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 88 | NK041 | CNTRL & INSTR DIST SWBD NK041 (CLASS 1E 125 VDC) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 89 | NE107 | DIESEL GEN PNL NE107 & FIELD FLASHING | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 90 | RL005 | TURBINE GENERATOR AND FW CONSOLE | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 91 | RL006 | TURBINE GENERATOR AND FW CONSOLE | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 92 | RP315 | DC DIST PNL RP315 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 93 | RL023 | TURBINE GENERATOR AND FW MCB | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 94 | RL024 | TURBINE GENERATOR AND FW MCB | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 95 | RL017 | ESF MCB | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 96 | RL018 | ESF MCB | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 97 | RL019 | ESF MCB | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 98 | RL020 | ESF MCB | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 99 | RL001 | REACTOR COOLANT AND SUPT SYS CONSOLE | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 100 | RL002 | REACTOR COOLANT AND SUPT SYS CONSOLE | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 101 | RL025 | TURBINE GENERATOR AND FW MCB | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 102 | RL026 | TURBINE GENERATOR AND FW MCB | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 103 | RP317 | FUSED 125 VDC DIST PNL RP317 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 104 | NK051 | CNTRL & INSTR DIST SWBD NK051 (CLASS 1E 125 VDC) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 105 | BBPCV0455A | BBPCV0455A PORV SOLENOID FAILS TO OPEN ON DEMAND | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 106 | RL021 | REACTOR AUX CNTRL PANEL | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 107 | RL022 | REACTOR AUX CNTRL PANEL | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 108 | KJ0121 | DIESEL GAUGE AND CONTROL PANEL | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 109 | RP209 | B AUXILIARY RELAY RACK | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 110 | RP289 | DC DIST PNL RP289 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 111 | RP068 | MISC BOP INSTRUMENT RACK | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 112 | RP330 | AUX RELAY RACK RP330 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 113 | RP332 | B AUXILIARY RELAY RACK | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 114 | NK051A | EM'CY LIGHTING DIST SWBD NK051A (SUBPNL OF NK051) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 115 | NK023 | 125 V BATTERY CHARGER NK023 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 116 | NK073 | TRANSFER SWITCH BUS NK03 BATTERY CHARGER NK23/NK25 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 117 | NK003 | 125 VDC BUS SWITCHBOARD NK003 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 118 | NK00302 | FDR BKR FROM BATT CHGR NK023 TO NK003 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 119 | NK00304 | MAIN BREAKER FOR CNTRL AND DIST PNL NK043 (PART OF SWBD NK003) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 120 | NK013 | 125 V BATTERY NK013 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 121 | NK00301 | ISOLATION BKR FOR BATTERY NK013 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 122 | NK00311 | FDR BKR FOR INVERTER NN013 (PART OF SWBD NK003) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 123 | NN013 | 7.5KVA INVERTER (FED FROM BATT CHARGER NK023) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 124 | NN003 | Class 1E AC DIST SWBD NN03 (SEP GRP 3) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 125 | RP053DB | BOP INSTR RACK RP053DB | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 126 | SB037 | W PROCESS ANALOG PROTECTION SET CAB-03 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 127 | SE054C | W NUC INSTM NIS 3 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 128 | NK043 | CNTRL & INSTR DIST SWBD NK043 (CLASS 1E 125 VDC) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 129 | AB007 | Aux Relay Rack | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Plant FLEX Integrated Plan |
| 130 | NG00109 | FDR BKR FOR 125 V SWING BATTERY CHARGER NK025 | N/A | N/A | This component provides power to NK025 and, in turn, Separation Group 1. |
| 131 | NK025 | 125 V BATTERY CHARGER NK025 (Swing Battery Charger) | N/A | N/A | The A-Train swing charger will be used to power Separation Group 1. |
| 132 | NG002 | 480 V LOAD CENTER NG02 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Integrated FLEX Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 133 | NG00212 | FLEX 500 kW TIE IN BKR from FD201 (Phase 2 connection point) | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 134 | NG00203 | FDR BKR FOR 125 V VITAL BATTERY CHARGER NK024 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 135 | NK024 | 125 V BATTERY CHARGER NK024 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 136 | NK074 | TRANSFER SWITCH BUS NK04 BATTERY CHARGER NK24/NK26 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 137 | NK004 | 125 VDC BUS SWITCHBOARD NK004 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 138 | NK00402 | FDR BKR FROM BATT CHGR NK024 TO NK004 | N/A | N/A | This component is powered by the FLEX DG, first Phase 2, then in Phase 3, as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 139 | NK014 | 125 V BATTERY NK014 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 140 | NK00401 | ISOLATION BKR FOR BATTERY NK014 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 141 | NK00411 | FDR BKR FOR INVERTER NN011 (PART OF SWBD NK004) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 142 | NN014 | 7.5KVA INVERTER (FED FROM BATT CHARGER NK024) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 143 | NN004 | Class 1E AC DIST SWBD NN04 (SEP GRP 4) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 144 | RP147B | BOP Instrumentation Rack RP147B | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 145 | SENY0061A | NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 61A | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 146 | SENY0061B | NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 61B | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 147 | SE054D | W NUC INSTM NIS 4 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 148 | SB041 | W PROCESS ANALOG PROTECTION SET CAB-04 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |

| ESEL Item Num | Equipment | | Operating State | | Notes/Comments[1] |
|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | |
| 149 | RP053BC | BOP Instrumentation Rack RP053BC | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 150 | SB079 | RVLIS Process Cabinet SB079 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 151 | RP081B | Subcooling Monitor Cabinet | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 152 | SB148B | W PROCESS PROTECTION (Fire Isolation) | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 153 | SA066B | STATUS INDICATING SYS | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |
| 154 | RP140 | PANEL RP140 | N/A | N/A | This component is powered during ALL phases of the FLEX strategy as stated in Sec. 8 of the Callaway Integrated FLEX Plan |

**Attachment B ESEP HCLPF Values and Failure Modes Tabulation**

HCLPF values are listed in Table B-1. These notes are applicable:

1. The listed HCLPF value is for comparison to the horizontal PGA at the bedrock surface.
2. Items covered by the NP-6041-SL "rule of the box" (ROB) are identified in Table A-2 [9]. In each case, the HCLPF value for the parent item applies.
3. For the CST and RWST only (TAP01 and TBN01, respectively), the applied ground motion was based on the GMRS (PGA = 0.50g).
4. Where an anchorage HCLPF is performed but the component per se is screened, the equipment capacity is assigned based upon the 1.2g peak spectral acceleration coinciding with the 2$^{nd}$ screening lane of NP-6041-SL. Since the Callaway RLGM has a peak spectral acceleration of 1.2g in the building frequency range of interest (see Section 6.2.1) and PGA of 0.40g [Ref. 7], the equipment capacity is assigned as 0.40g PGA.
5. As a result of the relay chatter evaluation, additional items were added to the ESEL list for evaluation.

## Table B-1: ESEL HCLPF Values

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| 1 | TAP01 | Condensate Storage Tank | YARD | 2000-00 | 0.3 | Anchorage | Tank capacity evaluated in 14C4258-CAL-002. Block wall evaluated per 14C4258-CAL-003. |
| 2 | PAL02 | TDAFW Pump | AUX | 2000-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 3 | ALHV0034 | MOV | AUX | 1988-00 | >RLGM | Screened | SRT disposition |
| 4 | ALHV0035 | MOV | AUX | 1988-00 | >RLGM | Screened | SRT disposition |
| 5 | ALPI0029 | Suction Pressure Indicator | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 6 | ALFE0049 | TDAFWP Miniflow Flow Element | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 7 | ALFI0049 | TDAFWP Miniflow Flow Indicator | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 8 | APLV0002 | Level Control Valve | YARD | 2000-00 | >RLGM | Screened | SRT disposition |
| 9 | ALPI0020 | TDAFW Pump Discharge Pressure Indicator | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 10 | ALHV0012 | Air Operated Valve | AUX | 2004-07 | >RLGM | Screened | SRT disposition |
| 11 | ALFE0004 | Flow Element | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 12 | ALFT0004 | Flow Transmitter | AUX | 2016-01 | >RLGM | Screened | SRT disposition |
| 13 | ALFT0011 | Flow Transmitter | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 14 | AEFV0041 | Feedwater Isolation Valve | AUX | 2028-00 | >RLGM | Screened | SRT disposition |
| 15 | ALHV0010 | Air Operated Valve | AUX | 2002-09 | >RLGM | Screened | SRT disposition |
| 16 | ALFE0003 | Flow Element | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 17 | ALFT0003 | Flow Transmitter | AUX | 2016-00 | >RLGM | Screened | SRT disposition |
| 18 | ALFT0009 | Flow Transmitter | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 19 | AEFV0040 | Feedwater Isolation Valve | AUX | 2027-10 | >RLGM | Screened | SRT disposition |
| 20 | ALHV0008 | Air Operated Valve | AUX | 2004-00 | >RLGM | Screened | SRT disposition |

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| 21 | ALFE0002 | Flow Element | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 22 | ALFT0002 | Flow Transmitter | AUX | 2016-00 | >RLGM | Screened | SRT disposition |
| 23 | ALFT0007 | Flow Transmitter | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 24 | AEFV0039 | Feedwater Isolation Valve | AUX | 2028-00 | >RLGM | Screened | SRT disposition |
| 25 | ALHV0006 | Air Operated Valve | AUX | 2001-06 | >RLGM | Screened | SRT disposition |
| 26 | ALFE0001 | Flow Element | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 27 | ALFT0001 | Flow Transmitter | AUX | 2015-00 | >RLGM | Screened | SRT disposition |
| 28 | AEFV0042 | Feedwater Isolation Valve | AUX | 2027-10 | >RLGM | Screened | SRT disposition |
| 29 | ABHV0005 | Air Operated Valve | AUX | 2027-10 | >RLGM | Screened | SRT disposition |
| 30 | ABHV0048 | Air Operated Valve | AUX | 2027-10 | >RLGM | Screened | SRT disposition |
| 31 | ABHV0006 | Air Operated Valve | AUX | 2027-10 | >RLGM | Screened | SRT disposition |
| 32 | ABHV0049 | Air Operated Valve | AUX | 2027-10 | >RLGM | Screened | SRT disposition |
| 33 | FCPI0311 | Pressure Indicator | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 34 | FCLT0010 | Level Indicator | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 35 | FCFV0310 | Level Control Valve | AUX | 1988-00 | >RLGM | Screened | SRT disposition |
| 36 | FCHV0312 | Trip and Throttle Valve | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 37 | Speed Governor | Speed Governor | AUX | 2000-00 | 0.4 | Equipment Capacity | Item is ROB to PAL02. Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 38 | FCFV0313 | Speed Governor Valve | AUX | 2000-00 | 0.4 | Equipment Capacity | Item is ROB to PAL02. Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 39 | KFC02 | AFW Pump Turbine | AUX | 2000-00 | 0.4 | Equipment Capacity | Item is ROB to PAL02. Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 40 | BBPV8702A | RHR TO RCS | RB | 2007-09 | >RLGM | Screened | SRT disposition |
| 41 | EMHV8803B | MOTOR-OPERATED VALVE EMHV8803B | AUX | 1975-08 | >RLGM | Screened | SRT disposition |
| 42 | EMHV8801B | MOTOR-OPERATED VALVE EMHV8801B | AUX | 2002-00 | >RLGM | Screened | SRT disposition |

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| 43 | EMFE0924 | ECCS FLOW TO RCS COLD-LEG 1 | RB | 1998-06 | >RLGM | Screened | SRT disposition |
| 44 | EMFE0925 | ECCS FLOW TO RCS COLD-LEG 2 | RB | 1998-06 | >RLGM | Screened | SRT disposition |
| 45 | EMFE0926 | ECCS FLOW TO RCS COLD-LEG 3 | RB | 1998-06 | >RLGM | Screened | SRT disposition |
| 46 | EMFE0927 | ECCS FLOW TO RCS COLD-LEG 4 | RB | 1998-06 | >RLGM | Screened | SRT disposition |
| 47 | TBN01 | RWST | YRD | 2000-00 | 0.33 | Anchorage | Tank capacity evaluated in 14C4258-CAL-002. |
| 48 | BNLT0930 | RWST Level Transmitter | YRD | 1993-00 | >RLGM | Screened | SRT disposition |
| 49 | EJHCV0606 | RHR Heat Exchanger A Outlet Isolation Valve | AUX | 2001-06 | >RLGM | Screened | SRT disposition |
| 50 | TBG03A | Boric Acid Tank | AUX | 1974-00 | >RLGM | Screened | SRT disposition |
| 51 | BGLT0102 | BORIC ACID TANK A LEV | AUX | 1968-01 | >RLGM | Screened | SRT disposition |
| 52 | BGLI0102 | BORIC ACID TANK A LEV | CB | 2047-06 | 0.4 | Equipment Capacity | Item is ROB to RL001. Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 53 | EJFCV0610 | RHR Pump A miniflow Valve | AUX | 1968-01 | >RLGM | Screened | SRT disposition |
| 56 | NB001 | 4.16KV SWGR NB001 (Class 1E, Train A) | CB | 2000-00 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005 Block wall evaluated per 14C4258-CAL-003. |
| 57 | NB00101 | 4.16 kV FDR BKR FOR RHRP-A DPEJ01A (Residual Heat Removal Pump A) | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NB001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. Block wall evaluated per 14C4258-CAL-003. |
| 58 | NB00107 | 4.16 kV FDR BKR FOR CCWP-A DPEG01A (Component Cooling Water Pump A) | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NB001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 59 | NB00109 | 4.16 kV FLEX GEN (Phase 3) TIE-IN POINT (BKR) FOR TRAIN A | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NB001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 60 | NB00113 | 4.16 kV FDR BKR FOR XFMR XNG01 (4160 V to 480 V for LC NG001) | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NB001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| 61 | XNG01 | 4.16-KV/480 V LOAD CENTER TRANSFORMER XNG01 FOR LC NG001 | CB/CC | 2000-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 62 | NG001 | 480 V LOAD CENTER NG01 | CB/CC | 2000-00 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 63 | NG00101 | MAIN BKR FOR LC NG01 | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NG001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. |
| 64 | NG00103 | FDR BKR FOR 125 V VITAL BATTERY CHARGER NK021 | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NG001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. |
| 65 | NG00112 | FLEX 350 kW TIE IN BRK (Alternate Phase 2 connection point) | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NG001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. |
| 66 | NG00116 | TIE BKR (CONNECTS NG01 AND NG03) | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NG001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 67 | NG003 | 480 V LOAD CENTER NG03 | CB/CC | 2000-00 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. Block wall evaluated per 14C4258-CAL-003. |
| 68 | NG00303 | FDR BKR FOR 125 V VITAL BATTERY CHARGER NK023 | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NG003. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. Block wall evaluated per 14C4258-CAL-003. |
| 69 | NK021 | 125 V BATTERY CHARGER NK021 | CB/CC | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 70 | NK071 | TRANSFER SWITCH BUS NK01 BATTERY CHARGER NK21/NK25 | CB | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Block wall evaluated per 14C4258-CAL-003. |
| 71 | NK001 | 125 VDC BUS SWITCHBOARD NK001 | CB/CC | 2016-00 | 0.71 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 72 | NK00102 | FDR BKR FROM BATT CHGR NK021 TO NK001 | CB | 2016-00 | 0.71 | Anchorage | Item is ROB to NK001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 73 | NK00104 | MAIN BREAKER FOR CNTRL AND DIST PNL NK041 (PART OF SWBD NK001) | CB | 2016-00 | 0.71 | Anchorage | Item is ROB to NK001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| 74 | NK00105 | MAIN BREAKER FOR CNTRL AND DIST PNL NK051 (PART OF SWBD NK001) | CB | 2016-00 | 0.71 | Anchorage | Item is ROB to NK001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 75 | NK011 | 125 V BATTERY NK011 | CB/CC | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 76 | NK00101 | ISOLATION BKR FOR BATTERY NK011 | CB | 2016-00 | 0.71 | Anchorage | Item is ROB to NK001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 77 | NK00111 | FDR BKR FOR INVERTER NN011 (PART OF SWBD NK001) | CB | 2016-00 | 0.71 | Anchorage | Item is ROB to NK001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 78 | NN011 | 7.5KVA INVERTER (FED FROM BATT CHARGER NK021) | CB/CC | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 79 | NN001 | Class 1E AC DIST SWBD NN01 (SEP GRP 1) | CB/CC | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 80 | SA066A | STATUS INDICATING SYS | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 81 | SENY0060A | NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 60A | AUX | 2026-00 | >RLGM | Screened | SRT disposition |
| 82 | SENY0060B | NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 60B | AUX | 2026-00 | >RLGM | Screened | SRT disposition |
| 83 | SB038 | W PROCESS ANALOG PROTECTION SET CAB-01 | CB/CC | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 84 | SE054A | W NUC INSTM NIS 1 | CB/CC | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 85 | RP053AC | BOP INSTRUMENTATION RACK (TERMINATION AREA) | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 86 | SB078 | RPV LEVEL INSTR SYS (RVLIS) PROC PROT SYS CABINET | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| 87 | RP081A | T/C SUBCOOLING MONITOR CABINET | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 88 | NK041 | CNTRL & INSTR DIST SWBD NK041 (CLASS 1E 125 VDC) | CB/CC | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 89 | NE107 | DIESEL GEN PNL NE107 & FIELD FLASHING | DGB | 2000-00 | >RLGM | Screened | SRT disposition |
| 90 | RL005 | TURBINE GENERATOR AND FW CONSOLE | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 91 | RL006 | TURBINE GENERATOR AND FW CONSOLE | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 92 | RP315 | DC DIST PNL RP315 | ESW Pumphouse | 2000-00 | >RLGM | Screened | SRT disposition |
| 93 | RL023 | TURBINE GENERATOR AND FW MCB | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 94 | RL024 | TURBINE GENERATOR AND FW MCB | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 95 | RL017 | ESF MCB | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 96 | RL018 | ESF MCB | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 97 | RL019 | ESF MCB | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 98 | RL020 | ESF MCB | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 99 | RL001 | REACTOR COOLANT AND SUPT SYS CONSOLE | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 100 | RL002 | REACTOR COOLANT AND SUPT SYS CONSOLE | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 101 | RL025 | TURBINE GENERATOR AND FW MCB | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 102 | RL026 | TURBINE GENERATOR AND FW MCB | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 103 | RP317 | FUSED 125 VDC DIST PNL RP317 | UHS | 2000-00 | >RLGM | Screened | SRT disposition |

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| 104 | NK051 | CNTRL & INSTR DIST SWBD NK051 (CLASS 1E 125 VDC) | CB/CC | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 105 | BBPCV0455A | BBPCV0455A PORV SOLENOID FAILS TO OPEN ON DEMAND | RB | 2070-00 | >RLGM | Screened | SRT disposition |
| 106 | RL021 | REACTOR AUX CNTRL PANEL | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 107 | RL022 | REACTOR AUX CNTRL PANEL | CB | 2047-06 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 108 | KJ0121 | DIESEL GAUGE AND CONTROL PANEL | DGB | 2000-00 | >RLGM | Screened | SRT disposition |
| 109 | RP209 | B AUXILIARY RELAY RACK | AUX | 2000-00 | 0.4 | Equipment Capacity | Component per se screened. Block wall evaluated per 14C4258-CAL-003. |
| 110 | RP289 | DC DIST PNL RP289 | AUX | 2047-06 | >RLGM | Screened | SRT disposition |
| 111 | RP068 | MISC BOP INSTRUMENT RACK | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 112 | RP330 | AUX RELAY RACK RP330 | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 113 | RP332 | B AUXILIARY RELAY RACK | AUX | 2000-00 | >RLGM | Screened | SRT disposition |
| 114 | NK051A | EM'CY LIGHTING DIST SWBD NK051A (SUBPNL OF NK051) | CB | 2016-00 | 0.4 | Equipment Capacity | Item is ROB to NK051. Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 115 | NK023 | 125 V BATTERY CHARGER NK023 | CB/CC | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 116 | NK073 | TRANSFER SWITCH BUS NK03 BATTERY CHARGER NK23/NK25 | CB | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Block wall evaluated per 14C4258-CAL-003. |
| 117 | NK003 | 125 VDC BUS SWITCHBOARD NK003 | CB/CC | 2016-00 | 0.71 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 118 | NK00302 | FDR BKR FROM BATT CHGR NK023 TO NK003 | CB | 2016-00 | 0.71 | Anchorage | Item is ROB to NK003. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| 119 | NK00304 | MAIN BREAKER FOR CNTRL AND DIST PNL NK043 (PART OF SWBD NK003) | CB | 2016-00 | 0.71 | Anchorage | Item is ROB to NK003. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 120 | NK013 | 125 V BATTERY NK013 | CB/CC | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 121 | NK00301 | ISOLATION BKR FOR BATTERY NK013 | CB | 2016-00 | 0.71 | Anchorage | Item is ROB to NK003. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 122 | NK00311 | FDR BKR FOR INVERTER NN013 (PART OF SWBD NK003) | CB | 2016-00 | 0.71 | Anchorage | Item is ROB to NK003. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 123 | NN013 | 7.5KVA INVERTER (FED FROM BATT CHARGER NK023) | CB/CC | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 124 | NN003 | Class 1E AC DIST SWBD NN03 (SEP GRP 3) | CB/CC | 2016-00 | 0.71 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 125 | RP053DB | BOP INSTR RACK RP053DB | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 126 | SB037 | W PROCESS ANALOG PROTECTION SET CAB-03 | CB/CC | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 127 | SE054C | W NUC INSTM NIS 3 | CB/CC | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 128 | NK043 | CNTRL & INSTR DIST SWBD NK043 (CLASS 1E 125 VDC) | CB/CC | 2016-00 | 0.71 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 129 | AB007 | Aux Relay Rack | CB | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Block wall evaluated per 14C4258-CAL-003. |
| 130 | NG00109 | FDR BKR FOR 125 V SWING BATTERY CHARGER NK025 | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NG001. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. |
| 131 | NK025 | 125 V BATTERY CHARGER NK025 (Swing Battery Charger) | CB | 2000-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| 132 | NG002 | 480 V LOAD CENTER NG02 | CB | 2000-00 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005 Block wall evaluated per 14C4258-CAL-003. |
| 133 | NG00212 | FLEX 500 kW TIE IN BKR from FD201 (Phase 2 connection point) | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NG002. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 134 | NG00203 | FDR BKR FOR 125 V VITAL BATTERY CHARGER NK024 | CB | 2000-00 | 0.41 | Anchorage | Item is ROB to NG002. Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 135 | NK024 | 125 V BATTERY CHARGER NK024 | CB | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 136 | NK074 | TRANSFER SWITCH BUS NK04 BATTERY CHARGER NK24/NK26 | CB | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Block wall evaluated per 14C4258-CAL-003. |
| 137 | NK004 | 125 VDC BUS SWITCHBOARD NK004 | CB | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 138 | NK00402 | FDR BKR FROM BATT CHGR NK024 TO NK004 | CB | 2016-00 | 0.4 | Equipment Capacity | Item is ROB to NK004. Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 139 | NK014 | 125 V BATTERY NK014 | CB | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 140 | NK00401 | ISOLATION BKR FOR BATTERY NK014 | CB | 2016-00 | 0.4 | Equipment Capacity | Item is ROB to NK004. Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 141 | NK00411 | FDR BKR FOR INVERTER NN011 (PART OF SWBD NK004) | CB | 2016-00 | 0.4 | Equipment Capacity | Item is ROB to NK004. Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| 142 | NN014 | 7.5KVA INVERTER (FED FROM BATT CHARGER NK024) | CB | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Block wall evaluated per 14C4258-CAL-003. |
| 143 | NN004 | Class 1E AC DIST SWBD NN04 (SEP GRP 4) | CB | 2016-00 | 0.4 | Equipment Capacity | Component per se screened. Anchorage evaluated per 14C4258-CAL-004. Block wall evaluated per 14C4258-CAL-003. |
| 144 | RP147B | BOP Instrumentation Rack RP147B | CB | 2000-00 | >RLGM | Screened | SRT disposition |
| 145 | SENY0061A | NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 61A | AUX | 2047-00 | >RLGM | Screened | SRT disposition |

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| 146 | SENY0061B | NEUTRON FLUX MONITORING SYSTEM DETECTOR AMPLIFIER SENY 61B | AUX | 2047-00 | >RLGM | Screened | SRT disposition |
| 147 | SE054D | W NUC INSTM NIS 4 | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 148 | SB041 | W PROCESS ANALOG PROTECTION SET CAB-04 | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 149 | RP053BC | BOP Instrumentation Rack RP053BC | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 150 | SB079 | RVLIS Process Cabinet SB079 | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 151 | RP081B | Subcooling Monitor Cabinet | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 152 | SB148B | W PROCESS PROTECTION (Fire Isolation) | CB | 2000-00 | >RLGM | Screened | SRT disposition |
| 153 | SA066B | STATUS INDICATING SYS | CB | 2047-06 | 0.41 | Anchorage | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. |
| 154 | RP140 | PANEL RP140 | CB | 2000-00 | 0.4 | Equipment Capacity | Component per se screened. Block wall evaluated per 14C4258-CAL-003. |
| Note 5 | BGLI0104 | BORIC ACID TANK A LEV | CB | 2047-06 | 0.4 | Equipment Capacity | Item is ROB to RL002. Component per se screened. Anchorage evaluated per 14C4258-CAL-004. |
| Note 5 | BGLT0104 | BORIC ACID TANK A LEV | AUX | 1974-00 | >RLGM | Screened | SRT disposition |
| Note 5 | BNHV0003 | RWST SUPPLY TO CTMT SPRAY PUMP B | AUX | 1974-00 | >RLGM | Screened | SRT disposition |
| Note 5 | BNHV0004 | RWST SUPPLY TO CTMT SPRAY PUMP A | AUX | 1974-00 | >RLGM | Screened | SRT disposition |
| Note 5 | BNHV8806A | RWST TO SAFETY INJ PUMP A SUCTION | AUX | 1976-10 | >RLGM | Screened | SRT disposition |
| Note 5 | BNHV8806B | RWST TO SAFETY INJ PUMP B SUCTION | AUX | 1976-10 | >RLGM | Screened | SRT disposition |
| Note 5 | BNHV8812B | RWST TO RHR PUMP B SUCTION | AUX | 1968-01 | >RLGM | Screened | SRT disposition |
| Note 5 | BNLT0933 | RWST Level Transmitter | YRD | 1993-00 | >RLGM | Screened | SRT disposition |

| ESEL Item Number | ID | Description | Bldg | Elev | HCLPF | Failure Mode | Basis |
|---|---|---|---|---|---|---|---|
| Note 5 | FC0219 | LOCAL CONTROL PANEL FOR TD AFW PUMP | AUX | 2002-00 | 0.41 | Equipment Capacity | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. Relay functionality evaluated per 14C4258-CAL-005. |
| Note 5 | NG002B | MCC NG02B BUS | AUX | 2026-00 | 0.4 | Relay functionality | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-004. Relay functionality evaluated per 14C4258-CAL-005. |
| Note 5 | NG003C | MCC NG03C BUS | AUX | 2047-00 | 0.32 | Relay functionality | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. Relay functionality evaluated per 14C4258-CAL-005. |
| Note 5 | NG004C | MCC NG04C BUS | AUX | 2047-00 | 0.32 | Relay functionality | Equipment capacity evaluated in 14C4258-CAL-005. Anchorage evaluated per 14C4258-CAL-005. Relay functionality evaluated per 14C4258-CAL-005. |
| Note 5 | RP334 | LOCKOUT RELAY RACK | CB | 2000-00 | 0.4 | Equipment Capacity | Component per se screened. Block wall evaluated per 14C4258-CAL-003. |