Keith J. Polson
Site Vice President

DTE Energy Company
6400 N. Dixie Highway, Newport, MI 48166
Tel: 734.586.6515 Fax: 734.586.4172
Email: keith.polson@dteenergy.com

DTE Energy

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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

References:
1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) NEI 12-06, Revision 4, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, December 2016, ADAMS Accession Number ML16354B421

3) JLD-ISG-2012-01, Revision 2, Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, February 2017, ADAMS Accession Number ML17005A188

4) DTE Energy Company (DTE), Letter NRC-16-0005, Fermi 2 Compliance with 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), Enclosure 3 Final Integration Plan, date January 20, 2016, ADAMS Accession Number ML16022A118

5) NRC Letter, Fermi Unit 2 Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation to Orders EA-12-049 and EA-12-051 (TAC Nos. MF0770 and MF0771), dated September 29, 2016, ADAMS Accession Number ML16258A040

Subject: Fermi 2 Seismic Mitigating Strategies Assessment (MSA) Report for the Reevaluated Seismic Hazard Information – NEI 12-06, Appendix H, Revision 4, H.4.4 Path 4: GMRS < 2xSSE

The purpose of this letter is to provide the results of the mitigating strategies assessment for Fermi Unit 2 (Fermi 2) to demonstrate that the FLEX strategies developed, implemented, and maintained in accordance with NRC Order EA-12-049 remain acceptable considering the impacts of the reevaluated seismic hazard. The assessment was performed in accordance with the guidance provided in Appendix H Section H.4.4 of NEI 12-06 Revision 4 (Reference 2) which was endorsed by the NRC (Reference 3).

Based upon the mitigating strategies assessment in the enclosure, the mitigating strategies for Fermi 2, considering the impacts of the reevaluated seismic hazard, are acceptable as described in the Final Integration Plan (Reference 4) which was endorsed by the NRC (Reference 5).

This letter contains no new Regulatory Commitments and no revision to existing Regulatory Commitments.

Should you have any questions or require additional information, please contact Mr. Scott A. Maglio, Manager – Nuclear Licensing, at (734) 586-5076.

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

Executed on August 31, 2017

Keith J. Polson
Site Vice President

Enclosure: Mitigating Strategies Assessment for Fermi 2

cc:
NRC Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 5, Region III
Regional Administrator, Region III
Michigan Public Service Commission
  Regulated Energy Division (kindschl@michigan.gov)

Enclosure to
NRC-17-0053

Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43

Mitigating Strategies Assessment for Fermi 2
NEI 12-06 Appendix H – Seismic "Path 4"

1. BACKGROUND

Fermi 2 has completed a mitigating strategies assessment (MSA) for the impacts of the reevaluated seismic hazard to determine if the mitigating (FLEX) strategies developed, implemented, and maintained in accordance with NRC Order EA-12-049 remain acceptable at the reevaluated seismic hazard levels. The MSA was performed in accordance with the guidance provided in Appendix H of NEI 12-06 Revision 4 [Reference 1] which was endorsed by the NRC [Reference 2].

The Mitigating Strategies Seismic Hazard Information (MSSHI) is the reevaluated seismic hazard information at Fermi 2, developed using the Probabilistic Seismic Hazard Analysis (PSHA). The MSSHI includes a performance-based Ground Motion Response Spectrum (GMRS), Uniform Hazard Response Spectra (UHRS) at various annual probabilities of exceedance, and a family of seismic hazard curves at various frequencies and fractiles developed at the Fermi 2 control point elevation. Fermi 2 submitted the reevaluated seismic hazard information including the UHRS, GMRS and the hazard curves to the NRC on March 31, 2014 [Reference 3]. The NRC staff concluded that the GMRS that was submitted adequately characterizes the reevaluated seismic hazard for the Fermi 2 site [Reference 4]. Section 6.1.1 of Reference [2] identifies the method described in Section H.4.4 of Reference [1] as applicable to Fermi 2.

After the development of the GMRS presented in Reference [3], the Fermi 2 site elected to develop an additional GMRS using more recent site specific data. This GMRS is used in the Expedited Seismic Evaluation Process (ESEP) [Reference 10] and accepted by the NRC [Reference 13]. This GMRS is also used in the site’s Seismic Probabilistic Risk Assessment (SPRA). This GMRS is more conservative than the one used in Reference [3], particularly in the higher frequency range, and is used in this evaluation as well. Additionally, building in-structure response spectra (ISRS) are used from Reference [10].

2. ASSESSMENT TO MSSHI

Consistent with Section H.4.4 (Path 4) of Reference [1], the Fermi 2 GMRS has spectral accelerations greater than the safe shutdown earthquake (SSE) but no more than 2 times the SSE anywhere in the 1 to 10 Hz frequency range. As described in the Final Implementation Plan (FIP) [References 14, 15], the plant equipment relied on for FLEX strategies have previously been evaluated as seismically robust to the SSE levels. The basic elements within the MSA of Path 4 Structures, Systems, and Components (SSCs) are described in Reference [1]. Implementation of each of these basic Path 4 elements for the Fermi 2 site is summarized below.

2.1 Step 1 – Scope of MSA Plant Equipment

The scope of SSCs considered for the Path 4 MSA was determined following the guidance used for the expedited seismic evaluation process (ESEP) defined in EPRI 3002000704 [Reference 9]. FLEX SSCs excluded from consideration in the ESEP were added to the MSA equipment scope. In addition, SSC failure modes not addressed in the ESEP that could potentially affect the FLEX strategies were added and evaluated.

SSCs associated with the FLEX strategy that are inherently rugged or sufficiently rugged are discussed in Section 2.3 below and identified in Section H.4.4 (Path 4) of Reference [1]. These SSCs were not explicitly added to the scope of MSA plant equipment.

2.2 Step 2 – ESEP Review

Equipment used in support of the FLEX strategies has been evaluated to demonstrate seismic adequacy following the guidance in Section 5 of NEI 12-06. As stated in Appendix H of NEI 12-06, previous seismic evaluations should be credited to the extent that they apply for the assessment of the MSSHI. This includes the ESEP evaluations [Reference 10] for the FLEX strategies which were performed in accordance with EPRI 3002000704 [Reference 9]. The ESEP evaluations remain applicable for this MSA since these evaluations directly addressed the most critical 1 Hz to 10 Hz part of the new seismic hazard using seismic responses from the scaling of the design basis analyses. In addition, separate evaluations are performed to address high frequency exceedances under the high frequency (HF) sensitive equipment assessment process, as required, and are documented in Section 4 of this attachment.

The Fermi 2 site has recently performed an SPRA. A detailed building model analysis was performed for all Category I structures. Development of in-structure response spectra (ISRS) was part of this analysis. This analysis used a site response GMRS that incorporates more recent site specific data, including information from the planned Fermi Unit 3 subsurface investigation that is adjacent to the existing Fermi 2 site. This GMRS was used to complete the ESEP analysis submitted to the NRC in Reference [10] and accepted by the NRC in Reference [13]. Since all equipment in the Expedited Seismic Equipment List (ESEL) satisfies the ESEP requirements, they also meet the requirements for this MSA. Therefore, any component on the ESEL requires no further evaluation to show the $C_{10\%}$ capacity is acceptable.

2.3 Step 3 – Inherently/Sufficiently Rugged Equipment

The qualitative assessment of certain SSCs not included in the ESEP was accomplished using (1) a qualitative screening of “inherently rugged” SSCs and (2) evaluation of SSCs to determine if they are “sufficiently rugged.” Reference [1] documents the process and the justification for this ruggedness assessment. SSCs that are either inherently rugged or sufficiently rugged are described in Reference [1] and no further evaluations for these rugged SSCs are required under the MSA.

2.4 Step 4 – Evaluations Using Section H.5 of Reference [1]

Step four for Path 4 plants includes the evaluations of:

1. FLEX equipment storage buildings and Non-Seismic Category 1 Structures that could impact FLEX implementation
2. Operator Pathways
3. Tie-down of FLEX portable equipment
4. Seismic Interactions not included in ESEP that could affect FLEX strategies
5. Haul Paths

The results of the reviews of each of these five areas are described in the sections below.

2.4.1 FLEX Equipment Storage Buildings

There are two FLEX Storage Facility (FSF) Structures on site. FSF-1 is installed inside the Protected Area (PA) approximately 160 ft directly north of the Reactor Building (RB), and FSF-2 is installed outside the PA approximately 215 ft southeast of the South Cooling Tower in between the Circulating Water Pumphouse and the Cooling Tower. Each of these structures is identical. They are rectangular, mat founded, reinforced concrete (RC) structures elevated above plant grade by a four-foot berm. The concrete roof slab is supported by a robust hollow steel section (HSS) welded truss structure. Two large tornado proof doors are installed at either end of the structure to provide egress for large equipment.

Using scaling factors provided in ASCE 7-10, the design spectrum for the FSF structures is calculated using the generic design response spectra shape provided in Figure 11.4-1 of ASCE 7-10. The Maximum Considered Earthquake (MCE) used in the analysis of the structure had a Peak Spectral Acceleration (PSA) of 0.132g and a Peak Ground Acceleration (PGA) of 0.063g. The plant site specific earthquake (SSE) at ground surface is also considered for the structure, which is more limiting than the design basis earthquake (DBE). This has a PSA of 0.45g and 0.29g in the horizontal and vertical directions, respectively; and a PGA of 0.15g and 0.10g in the horizontal and vertical directions, respectively (Reference [17]). While both the ASCE 7-10 design spectrum and SSE were considered in the design, the SSE is ultimately used for design as it is more limiting.

Per Section 2.7 of Reference [14], the structures have been evaluated equivalent to that of a Seismic Category I Structure. According to Section H.4.4 Step 3 of Reference [1], Category I structures require no additional evaluation to demonstrate their robustness for sites following Path 4. Thus, the FSF structures are screened as sufficiently rugged. The Updated Final Safety Analysis Report (UFSAR) dismisses liquefaction as not credible for the foundation of all Category I structures. This is in agreement with Reference [18] which calculates an upper bound maximum liquefaction displacement for the site at the surface level of 0.25 in. Therefore, it is concluded that both FSF structures have adequate seismic capacity to withstand the GMRS earthquake.

Non-Seismic Category 1 Structures

Turbine Building

The Turbine Building (TB) is required for the success of the FLEX strategy. However, the MSA does not credit the FLEX primary strategy for containment heat removal (bleed portion). Instead, the secondary strategy of using the HCVS for bleed is credited. It is within the TB that FLEX air compressor hoses are attached to replenish air for air-operated valves (AOV). It is also the primary operator pathway for any operator leaving the Main Control Room to perform actions outside of the nuclear island.

This Category II structure is made of RC shear walls and diaphragms for the first three floors of the structure. Above the third floor deck, a steel frame is erected to support the roof system. The building was originally designed as a Category I structure before being reclassified during the construction process. This is seen in both Reference [19] and [20]. For the same reasoning as the FSF structures, the TB can be screened as sufficiently rugged based on Reference [1]. It is therefore concluded that under a GMRS level seismic event, the TB structure will not collapse and will be available for operator access and actions.

Drywell Entry/Exit Building and Operations Service Building

The Drywell Entry/Exit Building (DWEEB) and Operations Service Building (OSB) are small lightweight surface founded structures directly adjacent to the nuclear island. These non-category I structures are not essential to the success of FLEX, but can serve as alternate pathways for operators leaving/returning to the Main Control Room. Through the OSB is the entry point to the radiologically-controlled area (RCA) during normal operations, and the DWEEB is another RCA entry point typically brought into service during refueling outages. Both these structures are accessible during all operating modes. While the TB is the credited pathway for the purposes of this submittal, the DWEEB and OSB serve as alternate pathways available to the operators performing actions.

2.4.2 Operator Pathways

Fermi 2 has reviewed the operator pathways and verified that the operator pathways are not impacted by the MSSHI. Considerations for this review included:

- Multiple available pathways or multiple FLEX components
- Debris removal capabilities for moderate to smaller seismic interactions
- Available time for operator actions
- Operator pathways were reviewed during a walkdown to assess seismic interactions associated with a GMRS level seismic event

Based on the above bullets, operator access will be available for all actions required for the FLEX strategy. A more detailed description of specific pathways is provided below.

The operator pathways are broken into general paths below. According to the minimum staffing requirements in Reference [14], a total of nine operators will always be available. Four are expected to be in the Main Control Room (MCR) at all times, while the remaining five could be in the MCR, Tagging Center, performing plant rounds, or somewhere else within the plant. It is the expectation that operators not in the MCR at the onset of a FLEX scenario will return to the MCR as soon as they are able. However, for this assessment, it is assumed that all operator actions will initiate from the MCR itself per the plants minimum staffing requirements.

According to Reference [14] security can be made available to open any typically locked or operated door needed to complete a FLEX action. In the event security is not available, the operators have keys available to them to perform this action themselves.

Around the RB and Auxiliary Building

All of the RB and Auxiliary Building (AB) are seismic Category I. Plant housekeeping procedures prevent any equipment or material from blocking essential pathways. Walkdowns from the ESEP effort, and follow on walkdowns for this submittal confirm this. All block walls either in the vicinity of equipment or capable of blocking a pathway are Category I and have been analyzed in Reference [22] against the GMRS. These all have an elastic capacity that shows a $C_{10\%}$ capacity that exceeds the site GMRS, therefore satisfying the requirements of the MSA.

Areas in the RB and AB needed for success of FLEX are adjacent to the MCR. It is concluded that the following areas will be accessible after a GMRS earthquake.

- The MCR
- Battery Charger Area
- Division I Switchgear Room
- Division II Switchgear Room
- Relay Room
- RB1
- RB2
- RBB

Getting to the Yard

From the MCR, the main egress to the yard passes through the TB. From the RB and AB there is at least one point on Floors 2, and 3 to enter the TB. From the TB, the regular egress to the yard is through the non-Category I OSB. However, there are multiple alternate points of egress that lead directly to the yard in the event that the OSB is not available. The DWEEB can also serve as an alternate egress point, though this structure is also non-Category I. The credited egress would be any of the three doors that lead from the TB directly to the yard. For simplicity, the fastest way out would be to exit the MCR and take the staircase on the north east of the MCR on the TB side down to the first floor of the TB. A roll up door is at the bottom of this stair and leads directly into the yard.

No block walls in the TB are analyzed as the RB and AB walls are. However, there are no block walls in the vicinity of any of the primary points of egress for the TB. Additionally, there are multiple staircases for operators to get down from the third floor where the MCR is in the AB down to the first floor of the TB where the egress is. It is therefore concluded that there is no credible block wall interaction that will prevent operator egress to the yard from the TB.

Access Around the Yard

Once in the Yard, there are many clear paths from any egress in the nuclear island to all points relevant for the FLEX strategy. This includes the RHR Complex, FSF-1, Dominator Connection Points on the west of the RB, FLEX Air connection on the north of the TB, and FSF-2.

Power lines connecting the Switchyard and the TB may fall during a GMRS earthquake. These are near the egress of the DWEEB, but will not affect that egress. It is concluded that these lines falling will have no effect on the success of the FLEX strategy.

The main security fence impedes access to the FSF-2 from the PA. Security is to open the gate needed for access, or operators are instructed to cut the gate lock in the event security is not available. It is concluded that this fence will not affect access to FSF-2.

Power lines that connect the Switchyard and the Circulating Water Pumphouse (CWP) may fall during a GMRS earthquake. These lines go in between the PA and FSF-2. There is adequate space to walk around any fallen lines. Any fallen line will not impact operator access to FSF-2. These lines are discussed further in Section 2.4.4 for Haul Path's.

2.4.3 Tie Down of FLEX Portable Equipment

All portable equipment staged for use in the FLEX strategy is stored in either FSF-1 or FSF-2. The two structures are identical as described in Section 2.4.1. An equipment list for both the essential and non-essential equipment is included in Table 3 of Reference [14]. Stored equipment was evaluated (for stability and restraint as required/necessary) and protected from seismic interactions to the SSE level as part of the FLEX design process to ensure that unsecured and/or non-seismic components do not damage the FLEX equipment. In addition, large FLEX equipment such as pumps and power supplies were secured as necessary to protect them during a SSE seismic event.

Prior to staging of the portable equipment, Reference [23] evaluated the tie downs of all equipment to be staged to the SSE level as required for design. After final delivery and staging, it was seen that the as staged condition was somewhat different than the as designed condition, so Reference [24] was developed to demonstrate that the as staged condition is adequate for all components analyzed in Reference [23]. This demonstrated that not all equipment required tie downs and showed that there is adequate resistance from sliding and overturning based on self-resistance alone for some of them. This confirmed that all portable equipment meets the required SSE level for design. Additional walkdowns were conducted for this mitigating strategy effort to demonstrate the as installed conditions compare with the calculations in References [23] and [24].

For the purposes of satisfying this MSA, all essential equipment is reevaluated to the GMRS level earthquake in accordance with Section H.5 of NEI 12-06. Some pieces of equipment have very low aspect ratios and are not prone to overturning. There are several inches available on all sides of each of these to accommodate any potential sliding as well. For the rest of the equipment, it is conservatively assumed that no tie downs are installed and that all equipment relies solely on self-resistance. It has been demonstrated that all essential equipment staged in the FSF structures has no adverse interactions or significant damage that could impair the ability of the equipment to perform its mitigating strategy function during or following the GMRS level seismic event using the methods described in Section H.5 of NEI 12-06.

Having satisfied all requirements described in Section H.5 of NEI 12-06 for a GMRS level seismic event, there are no plans to modify any tie downs or plant procedures regarding the staging of the portable equipment in the FSF structures.

2.4.4 Additional Seismic Interactions

Seismic interactions that could potentially affect the FLEX strategies and were not previously reviewed as part of the ESEP program (e.g., flooding from non-seismically robust tanks, interactions to distributed systems associated with the ESEP equipment list, etc.) were reviewed for Fermi 2.

A detailed walkdown was performed for this MSA by seismically qualified engineers to identify any potential interactions that were not previously captured by the ESEP program. This walkdown included all new construction in the FSF structures, all new equipment staged/installed within the FSF structures, operator and haul pathways, newly constructed FLEX connection points, and newly installed FLEX equipment in the electrical rooms. It was seen on this walkdown that the strategy does not involve buried tanks and therefore no buried tanks are reviewed. Discussion on potential interactions found during the walkdown is discussed in detail below.

South Cooling Tower

The South Cooling Tower is adjacent to the FSF-2 structure, it is not seismically designed and cannot be screened as sufficiently rugged for the purposes of this MSA. However, this cooling tower is not expected to impact the MSA for the following reasons:

- Section 2.2.3.6 of the UFSAR concludes that, due to its shape, any postulated collapse of the tower would cause it to fall inward as opposed to outward towards the FSF-2.
- The distance from the cooling tower to the FSF-2 structure is greater than 50% of the tower's height. At this distance, it is not expected that a falling tower will have a significant impact on the structural integrity, or accessibility of the FSF-2 structure.
- If rubble does contact the FSF-2, the structure itself is designed to withstand similar missiles as part of its tornado design. Debris removing tools are staged in FSF-1 to move any rubble that might affect deployment of FLEX equipment.
- The initial point of collapse is likely the bottom of the hyperbolic tower, not the edge of the basin. This puts the likely collapse distance an additional 60ft from FSF-2.

CWP Power Lines

Power lines come from the main 345KV Switchyard and go across the site to power the CWP. These lines are powered only by offsite sources. If these lines fall, there is the potential for them to lie in the haul path between FSF-1 and FSF-2

Assuming the EDG's are not available, AND the electrical distribution system between the switchyard and the plant experiences a failure, then the plant will have entered into station blackout. However, since offsite power could still be intact, it is possible for the plant to be in a FLEX scenario, and the lines feeding the CWP to still be energized.

This postulated event, while technically possible, is highly unlikely. It is expected that these lines will not affect implementation of the FLEX strategy for the following reasons:

- Any seismic event strong enough to put the plant in station blackout is also likely strong enough to fail offsite power. It is not likely that these failures would be un-correlated.
- Any failure of an offsite line will cause failure to both the plant and the CWP. This is the most likely scenario.
- An electrical fault felt by the 345KV Switchyard will automatically trip all breakers that receive power from the grid. This will automatically de-energize the CWP lines.

In addition to the above reasoning, a corrective action document was initiated after the MSA walkdowns to further address and formalize assessment and damage mitigation of these CWP lines in the FLEX procedure. As a result, FLEX procedure 29.400.01 was enhanced to specifically instruct operators to assess if a line has fallen in the haul path and open the breaker supplying that line if it has.

Inside FSF-2

Behind one of the Neptune Pumps inside FSF-2 is a staged hose reel. This hose reel is top heavy, and is easily displaceable by hand. If it tips over during a GMRS earthquake, it may cause superficial damage to the exterior of the Neptune pump trailer. However, the reel is sufficiently far away that it will not cause damage to the pump itself. The reel tipping over will not impede any pathways. The hose itself is a spare and is not essential for success of the FLEX strategy. The primary hose is anchored to a truck bed in FSF-2 and will not tip over. It is concluded that this interaction is credible, but will not impact implementation of FLEX.

Inside each of the Neptune pump trailers, all ancillary equipment and tools needed to bring the pump into operation is either very stout or tied to the inside of the trailer. However, during the MSA walkdowns it was noticed that the source pump in each trailer is not stout and was tied off only at the base. This left the potential for the source pump to tip in the event of a GMRS earthquake. This might have interfered with the plants ability to deploy the pump. Therefore, a corrective action document was issued and the two source pumps were subsequently tied off such that they will not tip in a GMRS earthquake. These source pumps are no longer a credible interaction concern for the FLEX strategy.

Fermi 2 has reviewed the additional seismic interactions and verified that the Mitigation Strategy is not adversely impacted by the GMRS.

2.4.5 Haul Path

Primary haul paths for deployment of FLEX equipment are considered in the FIP, these can be seen in Figure 3 of Reference [14]. The essential paths needed for success of the FLEX strategy are:

- Fuel delivery from the RHR Complex to the FSF-1
- Neptune Hose/Fuel line from FSF-2 to FSF-1
- Dominator Hose from FSF-1 to FLEX connection on the RB
- Delivery of FLEX air compressor to connection point on northwest corner of the TB

By procedure, all haul paths are kept clear during all operation modes. That is, no laydown areas for refueling outages are permitted in areas that would impede implementation of the FLEX strategy.

The site has no slopes, so slope stability is not an issue for any path. It is not expected that an earthquake can generate a tsunami in Lake Erie large enough to impact the plant, so external flooding is not expected to be initiated by a seismic event, this is consistent with Section 3.4.2 of the UFSAR. Assumed failure of several various onsite tanks will not impact FLEX implementation. Liquefaction is dismissed as not credible for the rock founded structures in Section 2.5.4.8 of the UFSAR. Additionally, Reference [18] concludes that the maximum potential liquefaction settlement at the SSE level at the surface elevation is negligible for the site. Settlements several times higher than reported for the SSE would be needed to impede implementation of the FLEX procedure. It is not expected that liquefaction at the GMRS level will be significantly greater than the SSE level. Based on the above, it is concluded that there is not potential for geotechnical or flooding failures to impede implementation of the FLEX strategy.

As discussed in Section 2.4.4, power lines can impede the deployment path of equipment between FSF-2 and the site. This resulted in a procedure change to mitigate any potential impact from fallen lines. This change has been implemented as described in Section 2.4.4. These lines are no longer an issue for any haul path of equipment.

Fermi 2 has reviewed the haul paths from a procedure standpoint, and through walkdowns, and verified that the haul paths are not adversely impacted by the MSSHI.

3. SPENT FUEL POOL COOLING EVALUATION

The evaluation of spent fuel pool (SFP) cooling for Fermi 2 was performed based on the initial conditions established in NEI 12-06 [Reference 1] for spent fuel cooling coping in the event of an Extended Loss of AC Power (ELAP)/Loss of Ultimate Heat Sink (LUHS). The evaluation also used the results of pool heatup analyses from the ELAP evaluation as input.

The FLEX strategy for SFP cooling utilizes SFP level monitoring and make-up capability as described in the Fermi 2 FIP [Reference 14]. SFP make-up capability is provided using the portable FLEX Dominator pump taking suction though a portable flexible hose. From the FLEX permanent connection point on the exterior of the RB, water is then discharged into the RHR system from permanently installed FLEX piping on RB1. The RHR system is then realigned through valve manipulation to discharge into the SFP via the normal installed discharge lines. The source of make-up water is the Circulating Water Pond in the Yard adjacent to the FSF-2 structure.

The permanently installed plant equipment relied on for the implementation of the SFP Cooling FLEX strategy has been designed and installed, or evaluated to remain functional, in accordance with the plant design basis to the SSE loading conditions. The SFP integrity evaluations demonstrated inherent margins of the SFP structure and interfacing plant equipment above the SSE to a PSA of 0.8g [Reference 16]. The portable FLEX equipment availability, including its storage and deployment pathways, and the permanently installed plant equipment needed to accomplish SFP cooling have subsequently been evaluated considering the GMRS loading conditions.

Any permanently installed valve needed for success of this RHR system realignment is evaluated in accordance with NEI 12-06, Appendix H, Section H4.4 to the GMRS level earthquake. It is therefore concluded that the FLEX Strategy for supplemental SFP cooling will be available after a GMRS earthquake.

4 HIGH FREQUENCY REVIEW

Under the guidance of Reference [1], Appendix H, Section H.4.4 (i.e., Path 4), requires that high frequency sensitive plant equipment; namely, electrical contact devices, be evaluated for effects of the MSSHI. Reference [1] refers to the methodology prescribed in Section H.4.2 (i.e., Path 2) to satisfy the requirements for the Fermi site.

This section describes the Mitigation Strategies Assessment undertaken for Fermi, implemented using the methodologies in NEI 12-06 [Reference 1], Appendix H, which in turn specifies the methodologies from EPRI 3002004396, “High Frequency Program, Application Guidance for Functional Confirmation and Fragility Evaluation.” [Reference 7]

4.1 Selection of Components

The fundamental objective of the MSA evaluation is to determine whether the FLEX strategies developed, implemented and maintained in accordance with NRC Order EA-12-049 can be implemented considering the impacts of the reevaluated seismic hazard. Within the applicable functions identified in Section H.4.2 (Path 2) [Reference 1], the components that would need a high frequency evaluation are contact control devices subject to intermittent states in seal-in or lockout (SILO) circuits. Plants in Path 2 are required to evaluate SILO devices in the control systems of four specific categories: (1) Reactor Trip/Scram, (2) Reactor Vessel Coolant Inventory leakage pathways, (3) FLEX Phase 1 Components, and (4) Automatically Operated FLEX Phase 2 Components to ensure those functions perform as necessary in the FLEX strategies. The equipment selection process for each of those categories is described below.

4.1.1 Reactor Trip/SCRAM

Section H.4.2 of NEI 12-06 Appendix H [Reference 1] identifies the Reactor Trip/SCRAM function as a function to be considered in the high frequency evaluation. The EPRI guidance for High Frequency Confirmation [Reference 7] notes that “the design requirements preclude the application of seal-in or lockout circuits that prevent reactor trip/SCRAM functions” and that “No high-frequency review of the reactor trip/SCRAM systems is necessary.” Therefore, no additional evaluations are necessary for the reactor trip/SCRAM function.

4.1.2 Reactor Vessel Inventory Control

The equipment in the Reactor Vessel Inventory Control function are the same equipment evaluated in the Fermi 2 NTTF 2.1 High Frequency Confirmation. The primary concern for both the NTTF 2.1 and MSA programs is the actuation of valves that have the potential to cause a loss-of-coolant accident (LOCA). A LOCA following a seismic event could provide a challenge to the mitigation strategies and lead to core damage. Control circuits for the Safety Relief Valves (SRV) as well as other Reactor Coolant System (RCS) valves were analyzed as part of the Fermi 2 submittal to address NTTF 2.1 recommendations [Reference 5]. The components covered in this category are a subset of those covered in the RCS/Reactor Vessel Inventory Control category of EPRI 3002004396 Fermi 2 submittal [Reference 5]. The Mitigation Strategy related components associated with Reactor Vessel Inventory Control are noted in Attachment 1 for completeness, although no additional seismic evaluations were required for these components.

4.1.3 FLEX Phase 1

Section H.4.2 of NEI 12-06 Appendix H [Reference 1] requires the analysis of relays and contactors that may lead to circuit seal-in or lockout that could impede the Phase 1 FLEX capabilities, including vital buses fed by station batteries through inverters. Phase 1 of the FLEX Strategy is defined in NEI 12-06 [Reference 1] as the initial response period where a plant is relying solely on installed plant equipment. During this phase the plant has no AC power and is relying on batteries, steam, and air accumulators to provide the motive force necessary to operate the critical pumps, valves, instrumentation, and control circuits.

FLEX Strategies specific to a seismic event response or common to all external event responses were examined to identify flow paths, electrical distribution and instrumentation relied upon to accomplish the reactor and containment safety functions identified in NEI 12-06 [Reference 1], omitting response strategies only valid in an outage. The selected equipment is a subset of equipment relied upon to establish the credited flow paths, electrical distribution, and instrumentation identified in the FLEX responses examined. Permanent plant equipment required for implementation of Phase 1 of the FLEX Strategy was identified by reviewing the FLEX Strategy, FLEX support documents, and associated flow path Piping and Instrumentation Diagrams (P&IDs), instrument elementary diagrams, and electrical distribution one-line diagrams.

The following key functions were reviewed.

- Piping Flow Paths
- Key Parameter Instrumentation
- Instrument Air Distribution
- Electrical Power Distribution
- Control Systems

Piping Flow Paths

Once the FLEX Strategy and FLEX support documents (flow diagrams) were reviewed, P&IDs were examined to identify the primary Phase 1 flow paths credited for seismic response and pressure boundaries necessary to establish those flow paths. In accordance with NEI 12-06, not all success paths need to be evaluated for all hazards; therefore, only a single success path needs to be reviewed for cooling or make-up functions. All components within these identified flow paths and pressure boundaries were screened utilizing the evaluation guidance [Reference 7] to exclude components having the following criteria:

- Non-power operated valves (manual valves, check valves, rupture disks) excluding pressure relief valves and manual valves with reach-rods
- Power operated valves, pressure relief valves, and manual valves with reach rods not required to change state to establish identified flow paths
- Sub-components mounted within equipment already included on the list
- In-line pipe-supported components
- Pumps and small heat exchangers within piping pressure boundaries but not in the flow path
- Instrumentation not relied upon for the FLEX response
- Components expected to operate during the initial reactor transient (as described in NEI 12-06 section 3.2.1.4 [Reference 1])
- Containment isolation valves not required to change state following the initial containment isolation action (as described in NEI 12-06 section 3.2.1.11 [Reference 1])

The remaining components not screened out are included in the equipment list. Of these components, pumps needed to operate, power-operated valves needed to change state to establish the identified flow paths and pressure boundaries, as well as instruments that are essential to FLEX Strategy within these paths were singled out for identification of necessary motive and control sources. For the Phase 1 FLEX response, Fermi 2 credits their steam turbine-driven Reactor Core Isolation Cooling (RCIC) Pump to provide core decay-heat cooling. For this effort, the flow paths credited include: (1) Steam from the reactor pressure vessel to the RCIC turbine and exhausted to the suppression pool; (2) Coolant from the suppression pool to the reactor via the RCIC pump; and (3) Steam from the reactor pressure vessel vented to the suppression pool via the Safety Relief Valves (SRVs).

Key Parameter Instrumentation

Instruments identified to monitor parameters critical to control of elements of the Phase 1 FLEX Strategy are included in the equipment list. For each of the included instruments, flow diagrams were reviewed as applicable to confirm the transmitter is within an established FLEX flow path.

Elementary diagrams were reviewed to establish the signal path between the instrument transmitter and the credited indicator. The transmitter, indicator and any signal conditioning components, as well as power supplies used to power all the components necessary to the signal path were identified. For each of these items either the component itself or the instrumentation cabinet containing it was included in the equipment list.

Diesel Fuel Oil Supply

Diesel Fuel Oil is not necessary to support the station Diesel/Generator or for diesel driven pumps for Fermi 2's Phase 1 response and is thus not considered for the Phase 1 ESEL.

Instrument Air Distribution

Instrument Air P&IDs were reviewed along with the OIP and FLEX Support Guides to determine if any tanks, accumulators, pressure regulating valves, or any power operated valves are required to provide Instrument Air (IA) to air-operated valves necessary to establish FLEX Phase 1 flow paths. Any valves credited to establish Fermi 2's FLEX Phase 1 flow paths which use normal Instrument Air as a motive source either fail to their required state or will be manually overridden. Air-operated valves which rely on pneumatic pressure for motive force and are required to operate to support the FLEX mitigation strategy have backup accumulators and associated control valves which are on the Phase 1 equipment list. At Fermi 2 these instrument gas control valves are mechanically operated from air pressure and thus no electrical relays or switches are needed to provide the air supply required for any valve.

Electrical Power Distribution

The Phase 1 response relies on station batteries for electrical power (motive force). One-line drawings were reviewed and the batteries, inverters, and electrical distribution between the batteries and the required DC MCCs and vital instrumentation power supplies were included on the equipment list.

Control Systems

For every FLEX Phase 1 item on the equipment list requiring control, the associated control diagrams were reviewed and the control cabinets or panels critical to the item's control were included on the equipment list. Power sources for the required control circuits were traced and any power distribution component necessary for the control circuits (and not already identified) was added as well. Relay control logic was analyzed and relays or switches that could cause seal-in or lockout and leave the circuit in a state other than what would be desired for FLEX response were identified and added to the equipment list. The criteria for determining if a component needed to be evaluated are provided below. A component must meet all three of the following criteria to be selected.

(Criterion 1)

The Phase 1 FLEX Strategy for Fermi 2, as described in the Final Integrated Plan [Reference 14], relies on permanent plant equipment in the steam turbine-driven RCIC and SRV systems. Control elementary diagrams, piping and instrumentation diagrams, and system technical manuals were reviewed as necessary to determine which relays and switches have an impact on the operation of these systems. Any impact to AC powered valves in these systems was ignored as loss of AC power is a requirement for entry into FLEX.

(Criterion 2)

Before entry into FLEX a site must first (for this evaluation) experience a beyond design-basis seismic event coupled with an ELAP and loss of normal access to the Ultimate Heat Sink (UHS). In this event scenario, the site would need time to assess plant conditions before it would declare itself in an ELAP/LUHS condition. By the time this condition is declared it is expected the period of strong shaking would be over and thus any temporary effect of relay chatter would be cleared before entry into FLEX. In some control circuits, however, contacts are fed back into the control to electrically seal-in and cause a sustained change of state in the control circuit. This circuit seal-in may cause valves to change position, pumps to change state, or controls to lock-out operation of systems or components. Control elementary diagrams, piping and instrumentation diagrams, and system technical manuals were reviewed as necessary to determine the potential of chatter (in the relays and switches identified by Criterion 1) to cause a seal-in or lock-out. Only those relays and switches with the potential to cause seal-in or lock-out were screened-in for evaluation, relays and switches with only the potential to cause temporary conditions that clear on their own before entry into FLEX were screened out.

(Criterion 3)

In some cases, spurious chatter leads to a circuit seal-in or lock-out that either has no effect on the FLEX Response, or has a beneficial effect on the FLEX Response (for example the unintentional change of state in a valve that aids in aligning a credited flow path). Contact chatter having no system effect or beneficial system effects allow a relay or switch to be functionally screened out of consideration for this category. Control elementary diagrams, piping and instrumentation diagrams, and system technical manuals were reviewed as necessary to determine the potential impact of chatter (in the relays and switches identified by Criterion 2) on the operation of the Phase 1 systems. Only those relays and switches which could cause an undesirable effect on these systems were screened-in. The selection of contact devices for the Safety Relief Valves (SRVs) overlaps with the RCS/Reactor Vessel Inventory Control Category Fermi 2 submittal. The selection of contact devices for RCIC was based on the premise that RCIC operation is desired, thus any SILO device which would lead to RCIC operation is beneficial and thus does not meet the criteria for selection. Only contact devices which could render the RCIC system inoperable were considered. The largest vulnerability to RCIC operation following a seismic event is contact chatter leading to a false RCIC Isolation Signal or false Turbine Trip. A false steam line break trip has the potential to delay RCIC operation while confirmatory inspections are being made. Chatter in the contacts of RCIC Isolation Signal Relay or Steam Line High Differential Pressure Time Delay Relay; or coincident chatter in the Turbine Exhaust Diaphragm High Pressure Relays, or Reactor Pressure Relays; may lead to a RCIC Isolation Signal and seal-in. This would cause the RCIC Isolation Valves to close and the RCIC Trip and Throttle Valve to trip. Similar chatter in the contact devices that drive those relays could also lead to seal-in. (The three-second time delay associated with some applicable relays will mask any chatter on other system relays, so they are excluded.)

Any chatter that may lead to the energization of the Trip and Throttle Valve Remote Trip Circuit is considered as SILO as it will close the valve and require a manual reset prior to restoration of the RCIC system including chatter in the Turbine Trip Auxiliary Relay, or in the devices which control this relay; the Turbine Exhaust High Pressure Relays, the Pump Suction Low Pressure Relay, and the Isolation Signal Relays. The Overspeed Mechanism was also reviewed, but it had no such seal-in and thus cannot cause a SILO event. Similar chatter in the contact devices that drive those relays (and not already covered in the RCIC Isolation Signal analysis) could also lead to a turbine trip are included.

4.1.4 FLEX Phase 2 Automatic Operation

NEI 12-06 Appendix H [Reference 1] requires the inclusion of SILO relays and contactors that could impede FLEX capabilities for mitigation of seismic events in permanently installed Phase 2 SSCs that have the capability to begin operation without operator manual actions.

With the loss of AC power, Phase 2 SSCs are limited to any permanently installed FLEX generator and, if allowed to automatically start, any electrical components powered by the FLEX generator and relied upon for Phase 2 of the FLEX Strategy. Fermi 2 credits a portable FLEX generator for Phase 2 response, and the operator actions necessary to install and connect the generator excludes any devices from being identified in this category.

4.1.5 Summary of Selected Components

A list of the contact devices requiring a high frequency evaluation is provided in Attachment 1.

4.2 Seismic Evaluation

4.2.1 Horizontal and Vertical Seismic Demand

Fermi performed a High Frequency Confirmation using the criteria in Reference [7] for the NTTF effort, which is the same criterion specified for the MSA Path 4 evaluation [Reference 1]. The horizontal and vertical ground motion used for the MSA Path 4 evaluation is the same as the horizontal and vertical ground motion in Fermi submittal dated August 30, 2017 [Reference 5].

4.2.2 Component Horizontal and Vertical Seismic Demand

The components identified in Section 4.1 are the same components previously evaluated in the Fermi High Frequency Confirmation [Reference 5]. Therefore, the component horizontal and vertical seismic demands for the MSA are the same as the demands applied in the High Frequency Confirmation.

4.2.3 Contact Devices Evaluation

The high-frequency capacity of each device identified in Section 4.1 was evaluated in Reference [5] with the component mounting point demand from Section 4.2.2 using the criteria in Section 4.5 of Reference [7]. This evaluation exceeds the acceptance criteria in Section H.5 of [Reference 1].

A summary of the high-frequency evaluation results is provided in Attachment 1.

4.3 High Frequency Review Results

Fermi completed the evaluation of potentially sensitive contact devices in accordance with NEI 12-06 [Reference 1], Appendix H Section H.4.4 and EPRI 3002004396 [Reference 7] within the evaluation for NTTF HF Confirmation in Reference [5]. The results of the evaluation confirm that the FLEX strategies for Fermi can be implemented as designed and no further seismic evaluations are necessary.

No follow-up-actions or evaluations are required for the HF portion of the MSA Path 4 submittal for Fermi.

5 CONCLUSION

Therefore, the FLEX strategies for Fermi 2 as described in the FIP [14] are acceptable as specified and no further seismic evaluations are necessary.

6 REFERENCES

1. NEI 12-06, Revision 4, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, December 2016, ADAMS Accession Number ML16354B421
2. JLD-ISG-2012-01, Revision 2, Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, February 2017, ADAMS Accession Number ML17005A188
3. DTE Energy Company (DTE) Letter NRC-14-0017, DTE Electric Company's Seismic Hazard and Screening Report Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, March 31, 2014, ADAMS Accession Number ML14090A326
4. NRC Letter, Fermi, Unit 2 - Staff Assessment of Information provided Pursuant to Title 10 of the Code of Federal Regulations Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima DAI-ICHI Accident (TAC No. MF3861), dated October 5, 2015, ADAMS Accession Number ML15077A028
5. DTE Energy Company (DTE) Letter NRC-17-0052, High Frequency Seismic Confirmation Report, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, August 30, 2017, ADAMS Accession Number ML17242A213
6. Not used
7. EPRI 3002004396, Final Report, July 2015, High Frequency Program Application Guidance for Functional Confirmation and Fragility Evaluation, ADAMS Accession Number ML15223A102
8. NRC Letter, Endorsement of Electric Power Research Institute Final Draft Report 3002004396, "High Frequency Program: Application Guidance for Functional Confirmation and Fragility", dated September 17, 2015, ADAMS Accession Number ML15218A569

9. EPRI, “Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic”, Report Number 3002000704, Palo Alto, CA, April, 2013.
10. DTE Energy Company (DTE) Letter NRC-14-0074, Fermi 2 Expedited Seismic Evaluation Process Report (CEUS Sites), Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated December 9, 2014, ADAMS Accession Number ML14345A469.
11. Not used
12. Not used
13. NRC Letter, Fermi Unit 2 Staff Review of Interim Evaluation Associated with Reevaluated Seismic Hazard Implementing Near-Term Task Force Recommendation 2.1 (TAC NO. MF5241), dated November 6, 2015, ADAMS Accession Number ML15310A197
14. DTE Energy Company (DTE), Letter NRC-16-0005, Fermi 2 Compliance with 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), Enclosure 3 Final Integration Plan, date January 20, 2016, ADAMS Accession Number ML16022A118
15. NRC Letter, Fermi Unit 2 Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation to Orders EA-12-049 and EA-12-051 (TAC Nos. MF0770 and MF0771), dated September 29, 2016, ADAMS Accession Number ML16258A040
16. DTE Energy Company (DTE), Letter NRC-16-0067, Fermi 2 Spent Fuel Pool Evaluation Supplemental Report, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, date December 9, 2016, ADAMS Accession Number ML16344A257.
17. DTE Electric Company (DTE), Building Seismic Criteria and SSI Analysis, Revision 2, DSN 183141 51 1004, dated December 8, 2014.
18. DTE Electric Company (DTE), Evaluation of Liquefaction of Soil in the FLEX Deployment Path, Revision 0, Calculation DC-6603, dated January 16, 2015.
19. DTE Electric Company (DTE), Turbine House/Radwaste Building Seismic Analysis, Revision 0, DC-612, dated February 7, 1978.
20. DTE Electric Company (DTE), Evaluation of Seismic Adequacy of the Turbine House and Radwaste Buildings, Revision 0, Technical Evaluation TE-U22-13-051, dated February 20, 2014.
21. Not used
22. RIZZO Associates, Fragility Analysis Fermi 2 Nuclear Power Plant, Revision 3, dated May 26, 2017.
23. DTE Electric Company (DTE), Design of FLEX Equipment Seismic Restraints and Anchorage, Revision 0, Calculation DC-6571, dated November 19, 2014.
24. DTE Electric Company (DTE), Engineering Evaluation of FLEX Equipment Stability, Seismic Restraints and Anchorage, Revision 0, Technical Evaluation TE-K11-15-071, dated October 27, 2015.

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
1	R30P311	CC1	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
2	R30P311	CC2	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
3	R30P311	CC3	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
4	R30P311	OP1	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
5	R30P311	OP2	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
6	R30P311	OP3	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
7	R30P311	EOR	Control Relay	ENGINE OVERSPEED	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
8	R3001S001	EOS	Limit Switch	ENGINE OVERSPEED	MICR	BZE6-2RN	R3001S001	EDG	RHR	595	EPRI HF Test	Capacity > Demand
9	R30P311	SDR	Control Relay	ENGINE TROUBLE SHUTDOWN	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
10	R30P311	SFR	Control Relay	START FAILURE	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
11	R30P311	T2A	Time Delay Relay	CRANKING TIME CONTROL	AGAS	E7012PC004	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
12	R30P311	T2B	Time Delay Relay	CRANKING TIME CONTROL	AGAS	E7012PC004	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
13	R14P001A	X-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 A-EA3	BUS	RHR	617	SSE Spectra	Capacity > Demand
14	R14P001A	Y-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 A-EA3	BUS	RHR	617	SSE Spectra	Capacity > Demand
15	R14P001A	Z-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 A-EA3	BUS	RHR	617	SSE Spectra	Capacity > Demand

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No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
16	R3000S005	1KU94	Relay	EDG DIFFERENTIAL TRIP STRING	WEST	12HFA151A7H	R3000S005	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
17	R3000S005	2KU94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S005	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
18	R3000S005	3KU94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S005	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
19	R30P311	NCX	Control Relay	ENGINE TROUBLE SHUTDOWN	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
20	R30P311	CLL	Control Relay	JACKET COOLANT LEVEL-LOW	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
21	R30P311	FPL2	Control Relay	FUEL OIL PRESSURE-LOW	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
22	R30P311	CPL	Control Relay	JACKET COOLANT PRESSURE-LOW	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
23	R30P311	CTH	Time Delay Relay	JACKET COOLANT TEMP-HIGH	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
24	R30P311	OTH	Time Delay Relay	LUBE OIL TEMPERATURE-HIGH	AGAS	E7022PD004	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
25	R30N558A	R30N558A	Level Switch	JACKET COOLANT LEVEL-LOW	MCDO	E-8	R3000A005	EDG Tank	RHR	603	SSE Spectra	Capacity > Demand
26	R30NA37A	FPLS	Pressure Switch	FUEL OIL PRESSURE-LOW	ALLB	836-C3	R30P310	EDG Engine Gauge PNL	RHR	590	GERS	Capacity > Demand
27	R30NA02A	CPLA	Pressure Switch	JACKET COOLANT PRESSURE-LOW	ALLB	836-C3	R30P310	EDG Engine Gauge PNL	RHR	590	GERS	Capacity > Demand
28	R30NA01A	CTHA	Temperature Switch	JACKET COOLANT TEMP-HIGH	ALLB	837-A6JX715	R3001S001	EDG	RHR	595	EPRI HF Test	Capacity > Demand

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No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
29	R30NA15A	OTHA	Temperature Switch	LUBE OIL TEMPERATURE-HIGH	ALLB	837-A6JX712	R3001S001	EDG	RHR	595	EPRI HF Test	Capacity > Demand
30	R30P311	T3	Control Relay	ENGINE AT LOW SPD & ALM	ITEG	J13P3012	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
31	R30P311	T3A	Time Delay Relay	DELAY TDPU	AGAS	E7012PC004	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
32	R30NA16A	CPS	Pressure Switch	JACKET COOLANT PRESSURE	ALLB	836-C3	R3001S001	EDG	RHR	595	GERS	Capacity > Demand
33	R30P321	CC1	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
34	R30P321	CC2	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
35	R30P321	CC3	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
36	R30P321	OP1	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
37	R30P321	OP2	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
38	R30P321	OP3	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
39	R30P321	EOR	Control Relay	ENGINE OVERSPEED	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
40	R3001S002	EOS	Limit Switch	ENGINE OVERSPEED	MICR	BZE6-2RN	R3001S002	EDG	RHR	595	EPRI HF Test	Capacity > Demand
41	R30P321	SDR	Control Relay	ENGINE TROUBLE SHUTDOWN	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
42	R30P321	SFR	Control Relay	START FAILURE	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
43	R30P321	T2A	Time Delay Relay	CRANKING TIME CONTROL	AGAS	E7012PC004	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
44	R30P321	T2B	Time Delay Relay	CRANKING TIME CONTROL	AGAS	E7012PC004	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

		Component					Enclosure				Component Evaluation	
No.	ID	Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type	Building	Floor Elev. (ft)	Basis for Capacity	Evaluation Result
45	R14P001B	X-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 B-EB3	BUS	RHR	617	SSE Spectra	Capacity > Demand
46	R14P001B	Y-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 B-EB3	BUS	RHR	617	SSE Spectra	Capacity > Demand
47	R14P001B	Z-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 B-EB3	BUS	RHR	617	SSE Spectra	Capacity > Demand
48	R3000S006	1KV94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S006	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
49	R3000S006	2KV94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S006	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
50	R3000S006	3KV94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S006	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
51	R30P321	NCX	Control Relay	ENGINE TROUBLE SHUTDOWN	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
52	R30P321	CLL	Control Relay	JACKET COOLANT LEVEL-LOW	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
53	R30P321	FPL2	Control Relay	FUEL OIL PRESSURE-LOW	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
54	R30P321	CPL	Control Relay	JACKET COOLANT PRESSURE-LOW	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
55	R30P321	CTH	Time Delay Relay	JACKET COOLANT TEMP-HIGH	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
56	R30P321	OTH	Time Delay Relay	LUBE OIL TEMPERATURE-HIGH	AGAS	E7022PD004	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
57	R30N558B	R30N558B	Level Switch	JACKET COOLANT LEVEL-LOW	MCDO	E-8	R3000A006	EDG Tank	RHR	603	SSE Spectra	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
58	R30NA37B	FPLS	Pressure Switch	FUEL OIL PRESSURE-LOW	ALLB	836-C3	R30P330	EDG Engine Gauge PNL	RHR	590	GERS	Capacity > Demand
59	R30NA02B	CPLA	Pressure Switch	JACKET COOLANT PRESSURE-LOW	ALLB	836-C3	R30P330	EDG Engine Gauge PNL	RHR	590	GERS	Capacity > Demand
60	R30NA01B	CTHA	Temperature Switch	JACKET COOLANT TEMP-HIGH	ALLB	837-A6JX715	R3001S003	EDG	RHR	595	EPRI HF Test	Capacity > Demand
61	R30NA15B	OTHA	Temperature Switch	LUBE OIL TEMPERATURE-HIGH	ALLB	837-A6JX712	R3001S003	EDG	RHR	595	EPRI HF Test	Capacity > Demand
62	R30P321	T3	Control Relay	ENGINE AT LOW SPD & ALM	ITEG	J13P3012	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
63	R30P321	T3A	Time Delay Relay	DELAY TDPU	AGAS	E7012PC004	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
64	R30NA16B	CPL	Pressure Switch	JACKET COOLANT PRESSURE	ALLB	836-C3	R3001S003	EDG	RHR	595	GERS	Capacity > Demand
65	R30P331	CC1	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
66	R30P331	CC2	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
67	R30P331	CC3	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
68	R30P331	OP1	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
69	R30P331	OP2	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
70	R30P331	OP3	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
71	R30P331	EOR	Control Relay	ENGINE OVERSPEED	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
72	R3001S003	EOS	Limit Switch	ENGINE OVERSPEED	MICR	BZE6-2RN	R3001S003	EDG	RHR	595	EPRI HF Test	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
73	R30P331	SDR	Control Relay	ENGINE TROUBLE SHUTDOWN	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
74	R30P331	SFR	Control Relay	START FAILURE	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
75	R30P331	T2A	Time Delay Relay	CRANKING TIME CONTROL	AGAS	E7012PC004	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
76	R30P331	T2B	Time Delay Relay	CRANKING TIME CONTROL	AGAS	E7012PC004	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
77	R14P001C	X-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 C-EC3	BUS	RHR	617	SSE Spectra	Capacity > Demand
78	R14P001C	Y-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 C-EC3	BUS	RHR	617	SSE Spectra	Capacity > Demand
79	R14P001C	Z-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 C-EC3	BUS	RHR	617	SSE Spectra	Capacity > Demand
80	R3000S007	1KW94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S007	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
81	R3000S007	2KW94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S007	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
82	R3000S007	3KW94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S007	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
83	R30P331	NCX	Control Relay	ENGINE TROUBLE SHUTDOWN	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
84	R30P331	CLL	Control Relay	JACKET COOLANT LEVEL-LOW	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
85	R30P331	FPL2	Control Relay	FUEL OIL PRESSURE-LOW	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
86	R30P331	CPL	Control Relay	JACKET COOLANT PRESSURE-LOW	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
87	R30P331	CTH	Time Delay Relay	JACKET COOLANT TEMP-HIGH	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
88	R30P331	OTH	Time Delay Relay	LUBE OIL TEMPERATURE-HIGH	AGAS	E7022PD004	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
89	R30N558C	R30N558C	Level Switch	JACKET COOLANT LEVEL-LOW	MCDO	E-8	R3000A007	EDG Tank	RHR	603	SSE Spectra	Capacity > Demand
90	R30NA37C	FPLS	Pressure Switch	FUEL OIL PRESSURE-LOW	ALLB	836-C3	R30P320	EDG Engine Gauge PNL	RHR	590	GERS	Capacity > Demand
91	R30NA02C	CPLA	Pressure Switch	JACKET COOLANT PRESSURE-LOW	ALLB	836-C3	R30P320	EDG Engine Gauge PNL	RHR	590	GERS	Capacity > Demand
92	R30NA01C	CTHA	Temperature Switch	JACKET COOLANT TEMP-HIGH	ALLB	837-A6JX715	R3001S002	EDG	RHR	595	EPRI HF Test	Capacity > Demand
93	R30NA15C	OTHA	Temperature Switch	LUBE OIL TEMPERATURE-HIGH	ALLB	837-A6JX712	R3001S002	EDG	RHR	595	EPRI HF Test	Capacity > Demand
94	R30P331	T3	Control Relay	ENGINE AT LOW SPD & ALM	ITEG	J13P3012	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
95	R30P331	T3A	Time Delay Relay	DELAY TDPU	AGAS	E7012PC004	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
96	R30NA16C	CPL	Pressure Switch	JACKET COOLANT PRESSURE	ALLB	836-C3	R3001S002	EDG	RHR	595	GERS	Capacity > Demand
97	R30P341	CC1	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
98	R30P341	CC2	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
99	R30P341	CC3	Control Relay	CRANCASE PRESSURE HIGH	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
100	R30P341	OP1	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
101	R30P341	OP2	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
102	R30P341	OP3	Control Relay	LUBE OIL PRESSURE LOW	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
103	R30P341	EOR	Control Relay	ENGINE OVERSPEED	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
104	R3001S004	EOS	Limit Switch	ENGINE OVERSPEED	MICR	BZE6-2RN	R3001S004	EDG	RHR	595	EPRI HF Test	Capacity > Demand
105	R30P341	SDR	Control Relay	ENGINE TROUBLE SHUTDOWN	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
106	R30P341	SFR	Control Relay	START FAILURE	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
107	R30P341	T2A	Time Delay Relay	CRANKING TIME CONTROL	AGAS	E7012PC004	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
108	R30P341	T2B	Time Delay Relay	CRANKING TIME CONTROL	AGAS	E7012PC004	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
109	R14P001D	X-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 D-ED3	BUS	RHR	617	SSE Spectra	Capacity > Demand
110	R14P001D	Y-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 D-ED3	BUS	RHR	617	SSE Spectra	Capacity > Demand
111	R14P001D	Z-87G	Differential Relay	EDG DIFFERENTIAL TRIP STRING	WEST	CA	R1400S002 D-ED3	BUS	RHR	617	SSE Spectra	Capacity > Demand
112	R3000S008	1KX94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S008	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
113	R3000S008	2KX94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S008	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
114	R3000S008	3KX94	Relay	EDG DIFFERENTIAL TRIP STRING	GE	12HFA151A7H	R3000S008	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
115	H11P628	B21CK27A	Control Relay	AGASTAT TYPE EGPD CONTROL RELAY	AGAS	FGPDC750	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
116	H11P628	B21CK27B	Auxiliary Relay	G.E. TYPE 'HGA' RELAY	GE	12HGA11A52F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
117	B2104M084	B21CK427C	Control Relay	AGASTAT TYPE EGPD CONTROL RELAY	AGAS	EGPD004	B21P401	Relay Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand
118	B2104M085	B21CK427D	Control Relay	AGASTAT TYPE EGPD CONTROL RELAY	AGAS	EGPD004	B21P401	Relay Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand
119	H11P628	B21CK27E	Auxiliary Relay	G.E. TYPE 'HGA' RELAY	GE	12HGA11A52F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
120	B2104M086	B21CK427F	Control Relay	AGASTAT TYPE EGPD CONTROL RELAY	AGAS	EGPD004	B21P401	Relay Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand
121	B2104M087	B21CK427G	Control Relay	AGASTAT TYPE EGPD CONTROL RELAY	AGAS	EGPD004	B21P401	Relay Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand
122	H11P628	B21CK27H	Auxiliary Relay	G.E. TYPE 'HGA' RELAY	GE	12HGA11A52F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
123	H11P628	B21CK27J	Auxiliary Relay	G.E. TYPE 'HGA' RELAY	GE	12HGA11A52F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
124	B2104M088	B21CK427K	Control Relay	AGASTAT TYPE EGPD CONTROL RELAY	AGAS	EGPD004	B21P401	Relay Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand
125	B2104M097	B21CK427L	Control Relay	AGASTAT TYPE EGPD CONTROL RELAY	AGAS	EGPD004	B21P401	Relay Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand
126	B2104M098	B21CK427M	Control Relay	AGASTAT TYPE EGPD CONTROL RELAY	AGAS	EGPD004	B21P401	Relay Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand
127	B2104M099	B21CK427N	Control Relay	AGASTAT TYPE EGPD CONTROL RELAY	AGAS	EGPD004	B21P401	Relay Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand
128	H11P628	B21CK27P	Auxiliary Relay	G.E. TYPE 'HGA' RELAY	GE	12HGA11A52F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
129	H11P628	B21CK27R	Auxiliary Relay	G.E. TYPE 'HGA' RELAY	GE	12HGA11A52F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
130	H21P082	B21-K253A	Control Relay	LLS LOW PRESSURE AND SCRAM SEALED IN	AGAS	EGPBC2004002	H21P082	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
131	H21P083	B21-K253B	Control Relay	LLS LOW PRESSURE AND SRV OPEN PERMISSIVE	AGAS	EGPBC2004002	H21P083	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
132	H21P082	B21-K253E	Control Relay	LLS HIGH PRESSURE AND SCRAM SEALED IN	AGAS	EGPBC2004002	H21P082	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
133	H21P083	B21-K253F	Control Relay	LLS HIGH PRESSURE AND SRV OPEN PERMISSIVE	AGAS	EGPBC2004002	H21P083	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
134	H11P628	K6A	Auxiliary Relay	HIGH DRYWELL PRESSURE	GE	12HFA151A2F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
135	H11P628	K7A	Auxiliary Relay	RPV LOW LEVEL	GE	12HFA151A2F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
136	H11P628	K8A	Auxiliary Relay	RPV LOW LEVEL	GE	12HGA11A52F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
137	H11P628	K6B	Auxiliary Relay	HIGH DRYWELL PRESSURE	GE	12HFA151A2F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
138	H11P628	K7B	Auxiliary Relay	RPV LOW LEVEL	GE	12HFA151A2F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
139	H11P628	K8B	Auxiliary Relay	RPV LOW LEVEL	GE	12HGA11A52F	H11P628	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
140	R30P341	NCX	Control Relay	ENGINE TROUBLE SHUTDOWN	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
141	R30P341	CLL	Control Relay	JACKET COOLANT LEVEL-LOW	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
142	R30P341	FPL2	Control Relay	FUEL OIL PRESSURE-LOW	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
143	R30P341	CPL	Control Relay	JACKET COOLANT PRESSURE-LOW	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
144	R30P341	CTH	Time Delay Relay	JACKET COOLANT TEMP-HIGH	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
145	R30P341	OTH	Time Delay Relay	LUBE OIL TEMPERATURE-HIGH	AGAS	E7022PD004	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
146	R30N558D	R30N558D	Level Switch	JACKET COOLANT LEVEL-LOW	MCDO	E-8	R3000A008	EDG Tank	RHR	603	SSE Spectra	Capacity > Demand
147	R30NA37D	FPLS	Pressure Switch	FUEL OIL PRESSURE-LOW	ALLB	836-C3	R30P340	EDG Engine Gauge PNL	RHR	590	GERS	Capacity > Demand
148	R30NA02D	CPLA	Pressure Switch	JACKET COOLANT PRESSURE-LOW	ALLB	836-C3	R30P340	EDG Engine Gauge PNL	RHR	590	GERS	Capacity > Demand
149	R30NA01D	CTHA	Temperature Switch	JACKET COOLANT TEMP-HIGH	ALLB	837-A6JX715	R3001S004	EDG	RHR	595	EPRI HF Test	Capacity > Demand
150	R30NA15D	OTHA	Temperature Switch	LUBE OIL TEMPERATURE-HIGH	ALLB	837-A6JX712	R3001S004	EDG	RHR	595	EPRI HF Test	Capacity > Demand
151	R30P341	T3	Control Relay	ENGINE AT LOW SPD & ALM	ITEG	J13P3012	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
152	R30P341	T3A	Time Delay Relay	DELAY TDPU	AGAS	E7012PC004	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
153	R30NA16D	CPL	Pressure Switch	JACKET COOLANT PRESSURE	ALLB	836-C3	R30NA16D	EDG	RHR	593	GERS	Capacity > Demand
154	R3200S020A-3D	CRI	Relay	R3200S020A Battery Charger High Voltage Lockout Relay			R3200S020A-3D	BUS	AB	643.5	Fermi 2 Plant Specific Report	Capacity > Demand
155	R3200S020A-10E	CRI	Relay	R3200S020B Battery Charger High Voltage Lockout Relay			R3200S020A-10E	BUS	AB	643.5	Fermi 2 Plant Specific Report	Capacity > Demand
156	R3200S021A-5B	CRI	Relay	R3200S021A Battery Charger High Voltage Lockout Relay			R3200S021A-5B	BUS	AB	643.5	Fermi 2 Plant Specific Report	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
157	R3200S021A-3D	CRI	Relay	R3200S021B Battery Charger High Voltage Lockout Relay			R3200S021 A-3D	BUS	AB	643.5	Fermi 2 Plant Specific Report	Capacity > Demand
158	E5100M033	K33	Auxiliary Relay	RCIC ISOLATION SIGNAL	GE	12HFA151A2F	H11P618	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
159	E5100M039	K39	Auxiliary Relay	TURBINE EXHAUST DIAPHRAGM HIGH PRESSURE	GE	12HGA11A52F	H11P618	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
160	E5100M032	K32	Control Relay	STEAM LINE DIFFERENTIAL PRESSURE	AGAS	ETR14D3BC200 4002	H11P618	Relay Cabinet	AB	613.5	GERS	Capacity > Demand
161	E5100M060	K60	Control Relay	REACTOR PRESSURE LOW	GE	12HMA24A2F	H11P618	Relay Cabinet	AB	613.5	GERS	Capacity > Demand
162	E5100M061	K61	Control Relay	REACTOR PRESSURE LOW	GE	12HMA24A2F	H11P618	Relay Cabinet	AB	613.5	GERS	Capacity > Demand
163	H21P081	E51K20 1B	Control Relay	TURBINE EXHAUST DIAPHRAGM HIGH PRESSURE	AGAS	FGPBC750	H21P081	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
164	H21P081	E51K20 1D	Control Relay	TURBINE EXHAUST DIAPHRAGM HIGH PRESSURE	AGAS	FGPBC750	H21P081	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
165	H21P081	E51K20 4B	Control Relay	REACTOR PRESSURE LOW	AGAS	FGPBC750	H21P081	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
166	H21P081	E51K20 4D	Control Relay	REACTOR PRESSURE LOW	AGAS	FGPBC750	H21P081	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
167	E5150F007	16	Limit Switch	NON-RECYCLE (F007 ONLY)			E5150F007	MOV	DW	586'10"	Fermi 2 Plant Specific Report	Capacity > Demand
168	E5150F007	CLOSE	Contactor	E5150F007 Close Contactor			E5150F007	MOV	DW	586'10"	Fermi 2 Plant Specific Report	Capacity > Demand
169	E5100M015	K15	Auxiliary Relay	RCIC ISOLATION SIGNAL	GE	12HFA151A2F	H11P621	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
170	E5100M029	K29	Auxiliary Relay	TURBINE EXHAUST DIAPHRAGM HIGH PRESSURE	GE	12HGA11A52F	H11P621	Relay Cabinet	AB	613.5	EPRI HF Test	Capacity > Demand
171	E5100M012	K12	Control Relay	STEAM LINE DIFFERENTIAL PRESSURE	AGAS	ETR14D3BC2004	H11P621	Relay Cabinet	AB	613.5	GERS	Capacity > Demand
172	E5100M058	K58	Control Relay	REACTOR PRESSURE LOW	GE	12HMA24A2	H11P621	Relay Cabinet	AB	613.5	GERS	Capacity > Demand
173	E5100M059	K59	Control Relay	REACTOR PRESSURE LOW	GE	12HMA24A2	H11P621	Relay Cabinet	AB	613.5	GERS	Capacity > Demand
174	H21P080	E51K201A	Control Relay	TURBINE EXHAUST DIAPHRAGM HIGH PRESSURE	AGAS	FGPBC750	H21P080	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
175	H21P080	E51K201C	Control Relay	TURBINE EXHAUST DIAPHRAGM HIGH PRESSURE	AGAS	FGPBC750	H21P080	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
176	H21P080	E51K204A	Control Relay	REACTOR PRESSURE LOW	AGAS	FGPBC750	H21P080	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
177	H21P080	E51K204C	Control Relay	REACTOR PRESSURE LOW	AGAS	FGPBC750	H21P080	Instrument Rack	AB	659.5	SSE Spectra	Capacity > Demand
178	E5150F007	8	Limit Switch	NON-RECYCLE (F007 ONLY)			E5150F007	MOV	DW	586'10"	Fermi 2 Plant Specific Report	Capacity > Demand
179	E5150F008	CLOSE	Contactor	E5150F008 Close Contactor			E5150F008	MOV	RB	586'10"	Fermi 2 Plant Specific Report	Capacity > Demand
180	E5150F012	CLOSE	Contactor	E5150F012 Close Contactor			E5150F012	MOV	RB	578.5	Fermi 2 Plant Specific Report	Capacity > Demand
181	R1400S002A	3KP94	Control Relay	BUS 11EA OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002A	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
182	R1400S002A	4KU94	Control Relay	GENERATOR DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002A	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	**Type**	**System Function**	**Manufacturer**	**Model No.**	**ID**	**Type**			**Basis for Capacity**	**Evaluation Result**
183	R3000S005	59SX	Control Relay	OVERVOLTAGE	ITEE	J13P30	R3000S005	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
184	R30P311	T3A1	Time Delay Relay	SPEED PERMISSIVE	AGAS	E7012PB004	R30P311	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
185	R1400S002A -EA4	X-87B	Differential Relay	BUS 11EA OVERALL DIFFERENTIAL STRING			R1400S002 A-EA4	BUS	RHR	617	SSE Spectra	Capacity > Demand
186	R1400S002A -EA4	Y-87B	Differential Relay	BUS 11EA OVERALL DIFFERENTIAL STRING			R1400S002 A-EA4	BUS	RHR	617	SSE Spectra	Capacity > Demand
187	R1400S002A -EA4	Z-87B	Differential Relay	BUS 11EA OVERALL DIFFERENTIAL STRING			R1400S002 A-EA4	BUS	RHR	617	SSE Spectra	Capacity > Demand
188	R1400S002A	2KP94	Control Relay	BUS 11EA OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002 A	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
189	R1400S002A	4KP94	Control Relay	BUS 11EA OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002 A	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
190	R3000S005	59S	Relay	OVERVOLTAGE	ABBP	1338D83A01 TYPE SSV-T	R3000S005	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
191	R1400S002B	3KR94	Control Relay	BUS 12EB OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002 B	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
192	R1400S002B	4KU94	Control Relay	GENERATOR DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002 B	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
193	R3000S006	59SX	Control Relay	OVERVOLTAGE	ITEE	J13P30	R3000S006	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
194	R30P321	T3A1	Time Delay Relay	SPEED PERMISSIVE	AGAS	E7012PB004	R30P321	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
195	R1400S002B-EB4	X-87B	Differential Relay	BUS 12EB OVERALL DIFFERENTIAL STRING			R1400S002B-EB4	BUS	RHR	617	SSE Spectra	Capacity > Demand
196	R1400S002B-EB4	Y-87B	Differential Relay	BUS 12EB OVERALL DIFFERENTIAL STRING			R1400S002B-EB4	BUS	RHR	617	SSE Spectra	Capacity > Demand
197	R1400S002B-EB4	Z-87B	Differential Relay	BUS 12EB OVERALL DIFFERENTIAL STRING			R1400S002B-EB4	BUS	RHR	617	SSE Spectra	Capacity > Demand
198	R1400S002B	2KR94	Control Relay	BUS 12EB OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002B	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
199	R1400S002B	4KR94	Control Relay	BUS 12EB OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002B	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
200	R3000S006	59S	Relay	OVERVOLTAGE	ABBP	1338D83A01 TYPE SSV-T	R3000S006	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
201	R1400S002C	3KS94	Control Relay	BUS 13EC OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002C	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
202	R1400S002C	4KU94	Control Relay	GENERATOR DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002C	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
203	R3000S007	59SX	Control Relay	OVERVOLTAGE	ITEE	J13P30	R3000S007	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
204	R30P331	T3A1	Time Delay Relay	SPEED PERMISSIVE	AGAS	E7012PB004	R30P331	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
205	R1400S002C-EC4	X-87B	Differential Relay	BUS 13EC OVERALL DIFFERENTIAL STRING			R1400S002C-EC4	BUS	RHR	617	SSE Spectra	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
206	R1400S002C -EC4	Y-87B	Differential Relay	BUS 13EC OVERALL DIFFERENTIAL STRING			R1400S002 C-EC4	BUS	RHR	617	SSE Spectra	Capacity > Demand
207	R1400S002C -EC4	Z-87B	Differential Relay	BUS 13EC OVERALL DIFFERENTIAL STRING			R1400S002 C-EC4	BUS	RHR	617	SSE Spectra	Capacity > Demand
208	R1400S002C	2KS94	Control Relay	BUS 13EC OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002 C	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
209	R1400S002C	4KS94	Control Relay	BUS 13EC OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002 C	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
210	R3000S007	59S	Relay	OVERVOLTAGE	ABBP	1338D83A01 TYPE SSV-T	R3000S007	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
211	R1400S002D	3KT94	Control Relay	BUS 14ED OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002 D	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
212	R1400S002D	4KU94	Control Relay	GENERATOR DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002 D	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
213	R3000S008	59SX	Control Relay	OVERVOLTAGE	ITEE	J13P3012	R3000S008	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
214	R30P341	T3A1	Time Delay Relay	SPEED PERMISSIVE	AGAS	E7012PB004	R30P341	Relay Cabinet	RHR	617	SSE Spectra	Capacity > Demand
215	R1400S002D -ED4	X-87B	Differential Relay	BUS 14ED OVERALL DIFFERENTIAL STRING			R1400S002 D-ED4	BUS	RHR	617	SSE Spectra	Capacity > Demand
216	R1400S002D -ED4	Y-87B	Differential Relay	BUS 14ED OVERALL DIFFERENTIAL STRING			R1400S002 D-ED4	BUS	RHR	617	SSE Spectra	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
217	R1400S002D-ED4	Z-87B	Differential Relay	BUS 14ED OVERALL DIFFERENTIAL STRING			R1400S002D-ED4	BUS	RHR	617	SSE Spectra	Capacity > Demand
218	R1400S002D	2KT94	Control Relay	BUS 14ED OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002D	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
219	R1400S002D	4KT94	Control Relay	BUS 14ED OVERALL DIFFERENTIAL STRING	GE	12HMA24A4F	R1400S002D	4160V BUS	RHR	617	SSE Spectra	Capacity > Demand
220	R3000S008	59S	Relay	OVERVOLTAGE	ABBP	1338D83A01 TYPE SSV-T	R3000S008	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
221	R3200S020A	DCB	Circuit Breaker	BATTERY CHARGER	SE&A	QJ22B225	R3200S020A-3D	Battery Charger	AB	643.5	Fermi 2 Plant Specific Report	Capacity > Demand
222	R3200S020B	DCB	Circuit Breaker	BATTERY CHARGER	SE&A	QJ22B225	R3200S020B-10E	Battery Charger	AB	643.5	Fermi 2 Plant Specific Report	Capacity > Demand
223	R3200S021A	DCB	Circuit Breaker	BATTERY CHARGER	SE&A	QJ22B225	R3200S021A-5B	Battery Charger	AB	643.5	Fermi 2 Plant Specific Report	Capacity > Demand
224	R3200S021B	DCB	Circuit Breaker	BATTERY CHARGER	SE&A	QJ22B225	R3200S021B-3D	Battery Charger	AB	643.5	Fermi 2 Plant Specific Report	Capacity > Demand
225	B2104M082	K2SRV	Control Relay	AGASTAT TYPE EGPD CONTROL RELAY	AGAS	EGPD004	B21P401	Relay Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand
226	B2100M312A	K33A	Control Relay	NB DIV1 SRV LO-LO SET LOGIC HI PRESS SCRAM	AGAS	FGPDC750	H11P628	Assembly Panel	AB	613.5	EPRI HF Test	Capacity > Demand
227	B2100M312B	K33B	Control Relay	NB DIV2 SRV LO-LO SET LOGIC HI PRESS SCRAM	AGAS	EGPD002	B21P401	Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand
228	B2100M312C	K33C	Control Relay	NB DIV2 SRV LO-LO SET LOGIC SRV OPEN	AGAS	FGPDC750	H11P628	Assembly Panel	AB	613.5	EPRI HF Test	Capacity > Demand
229	B2100M312D	K33D	Control Relay	NB DIV2 SRV LO-LO SET LOGIC SRV OPEN	AGAS	EGPD002	B21P401	Cabinet	AB	643.5	EPRI HF Test	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
230	R3000S005	CV8/64	Ground Detector Relay	EDG 11 GROUND TRIP			R3000S005	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
231	R3000S005	1ND94	Relay	EDG 11 GROUND TRIP	GE	12HFA151A7H	R3000S005	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
232	R1400S002A	2ND94	Control Relay	EDG 11 GROUND TRIP	GE	12HMA24A4	BUS 11EA-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
233	R3000S006	CV8/64	Ground Detector Relay	EDG 12 GROUND TRIP			R3000S006	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
234	R3000S006	1NE94	Relay	EDG 12 GROUND TRIP	GE	12HFA151A7H	R3000S006	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
235	R1400S002B	2NE94	Control Relay	EDG 12 GROUND TRIP	GE	12HMA24A4F	BUS 12EB-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
236	R3000S007	CV8/64	Ground Detector Relay	EDG 13 GROUND TRIP			R3000S007	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
237	R3000S007	1NF94	Relay	EDG 13 GROUND TRIP	GE	12HFA151A7H	R3000S007	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
238	R1400S002A	2NF94	Control Relay	EDG 13 GROUND TRIP	GE	12HMA24A4F	BUS 13EC-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
239	R3000S008	CV8/64	Ground Detector Relay	EDG 14 GROUND TRIP			R3000S008	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
240	R3000S008	1NG94	Relay	EDG 14 GROUND TRIP	GE	12HFA151A7H	R3000S008	Control Panel	RHR	617	SSE Spectra	Capacity > Demand
241	R1400S002A	2NG94	Control Relay	EDG 14 GROUND TRIP	GE	12HMA24A4	BUS 14ED-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
242	R1400S002A	1NL94	Control Relay	EDG 11 OFFSITE UNDERFREQUENCY	GE	12HMA24A2F	BUS 11EA-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
243	R1400S002A	1PA69	Control Relay	EDG 11 OFFSITE UNDERFREQUENCY	GE	12HMA24A2	BUS 11EA-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
244	R1400S001B	Pos. B6	Circuit Breaker	4160V BUS 64B	ITEG	HK	R1400S001B	Switchgear	AB	613.5	Fermi 2 Plant Specific Report	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

		Component					Enclosure				Component Evaluation	
No.	**ID**	**Alt ID**	**Type**	**System Function**	**Manufacturer**	**Model No.**	**ID**	**Type**	**Building**	**Floor Elev. (ft)**	**Basis for Capacity**	**Evaluation Result**
245	R1400S002B	1NM94	Control Relay	EDG 12 OFFSITE UNDERFREQUENCY	GE	12HMA24A2F	BUS 12EB-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
246	R1400S002B	1PB69	Control Relay	EDG 12OFFSITE UNDERFREQUENCY	GE	12HMA24A2F	BUS 12EB-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
247	R1400S001C	Pos. C6	Circuit Breaker	4160V BUS 64C	ITEG	HK	R1400S001C	Switchgear	AB	613.5	Fermi 2 Plant Specific Report	Capacity > Demand
248	R1400S002C	1NN94	Control Relay	EDG 13 OFFSITE UNDERFREQUENCY	GE	12HMA24A2F	BUS 13EC-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
249	R1400S002C	1PC69	Control Relay	EDG 13 OFFSITE UNDERFREQUENCY	GE	12HMA24A2	BUS 13EC-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
250	R1400S001E	Pos. E6	Circuit Breaker	4160V BUS 65E	ITEG	HK	R1400S001E	Switchgear	AB	643.5	Fermi 2 Plant Specific Report	Capacity > Demand
251	R1400S002D	1N094	Control Relay	EDG 14 OFFSITE UNDERFREQUENCY	GE	12HMA24A2F	BUS 14ED-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
252	R1400S002D	1PD69	Control Relay	EDG 14 OFFSITE UNDERFREQUENCY	GE	12HMA24A2F	BUS 14ED-3	Switchgear	RHR	617	SSE Spectra	Capacity > Demand
253	R1400S001F	Pos. F6	Circuit Breaker	4160V BUS 65F	ITEG	HK	R1400S001F	Switchgear	AB	643.5	Fermi 2 Plant Specific Report	Capacity > Demand
254	R1400S001B	IAC53A-X51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53A2A	BUS 64B POS B9	Switchgear	AB	613.5	GERS	Capacity > Demand
255	R1400S001B	IAC53A-Y51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53A2A	BUS 64B POS B9	Switchgear	AB	613.5	GERS	Capacity > Demand
256	R1400S001B	IAC53A-Z51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53101A	BUS 64B POS B9	Switchgear	AB	613.5	GERS	Capacity > Demand
257	R1400S001B	IAC66B-X50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC66B6A	BUS 64B POS B6	Switchgear	AB	613.5	GERS	Capacity > Demand
258	R1400S001B	IAC66B-Y50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC66B1A	BUS 64B POS B6	Switchgear	AB	613.5	GERS	Capacity > Demand
259	R1400S001B	IAC53A-Z50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53B104A	BUS 64B POS B6	Switchgear	AB	613.5	GERS	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

		Component					Enclosure				Component Evaluation	
No.	**ID**	**Alt ID**	**Type**	**System Function**	**Manufacturer**	**Model No.**	**ID**	**Type**	**Building**	**Floor Elev. (ft)**	**Basis for Capacity**	**Evaluation Result**
260	R1400S001C	IAC53A -X51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53A2A	BUS 64C POS C9	Switchgear	AB	613.5	GERS	Capacity > Demand
261	R1400S001C	IAC53A -Y51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53A3A	BUS 64C POS C9	Switchgear	AB	613.5	GERS	Capacity > Demand
262	R1400S001C	IAC53A -Z51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53101A	BUS 64C POS C9	Switchgear	AB	613.5	GERS	Capacity > Demand
263	R1400S001C	IAC66B -X50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC66B6A	BUS 64C POS C6	Switchgear	AB	613.5	GERS	Capacity > Demand
264	R1400S001C	IAC66B -Y50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC66B1A	BUS 64C POS C6	Switchgear	AB	613.5	GERS	Capacity > Demand
265	R1400S001C	IAC53A -Z50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53B104A	BUS 64C POS C6	Switchgear	AB	613.5	GERS	Capacity > Demand
266	R1400S001E	IAC53A -X51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53A2A	BUS 65E POS E9	Switchgear	AB	643.5	GERS	Capacity > Demand
267	R1400S001E	IAC53A -Y51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53A2A	BUS 65E POS E9	Switchgear	AB	643.5	GERS	Capacity > Demand
268	R1400S001E	IAC53A -Z51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53A2A	BUS 65E POS E9	Switchgear	AB	643.5	GERS	Capacity > Demand
269	R1400S001E	IAC66B -X50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC66B6A	BUS 65E POS E6	Switchgear	AB	643.5	GERS	Capacity > Demand
270	R1400S001E	IAC66B -Y50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC66B1A	BUS 65E POS E6	Switchgear	AB	643.5	GERS	Capacity > Demand
271	R1400S001E	IAC53A -Z50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53B104A	BUS 65E POS E6	Switchgear	AB	643.5	GERS	Capacity > Demand
272	R1400S001F	IAC53A -X51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53A2A	BUS 65F POS E9	Switchgear	AB	643.5	GERS	Capacity > Demand
273	R1400S001F	IAC53A -Y51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53A2A	BUS 65F POS E9	Switchgear	AB	643.5	GERS	Capacity > Demand
274	R1400S001F	IAC53A -Z51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53A2A	BUS 65F POS E9	Switchgear	AB	643.5	GERS	Capacity > Demand
275	R1400S001F	IAC66B -X50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC66B6A	BUS 65F POS E6	Switchgear	AB	643.5	GERS	Capacity > Demand

Attachment 1 – Components Identified for High Frequency Evaluation in the MSA SEL

No.	ID	Component					Enclosure		Building	Floor Elev. (ft)	Component Evaluation	
		Alt ID	Type	System Function	Manufacturer	Model No.	ID	Type			Basis for Capacity	Evaluation Result
276	R1400S001F	IAC66B -Y50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC66B1A	BUS 65F POS E6	Switchgear	AB	643.5	GERS	Capacity > Demand
277	R1400S001F	IAC53A -Z50/51	Overcurrent Relay	BREAKER PROTECTION	GE	12IAC53B104A	BUS 65F POS E6	Switchgear	AB	643.5	GERS	Capacity > Demand