Exelon Generation.

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U.S. Nuclear Regulatory Commission
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Nine Mile Point Nuclear Station, Unit 1
Renewed Facility Operating License No. DPR-63
NRC Docket No. 50-220

Subject: Mitigating Strategies Assessment (MSA) Report for the Reevaluated Seismic Hazard Information – NEI 12-06, Appendix H, Revision 2, H.4.2 Path 2: GMRS < SSE with High Frequency Exceedances

References:

1. NEI 12-06, Revision 2, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, December 2015 (ML16005A625)
2. JLD-ISG-2012-01, Revision 1, Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, January 22, 2016 (ML15357A163)
3. Constellation Energy, LLC Letter to USNRC, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding the Seismic Aspects of Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident – 1.5 Year Response for CEUS Sites, dated September 12, 2013 (ML13259A044)
4. Constellation Energy, LLC Letter to USNRC, Nine Mile Point Nuclear Station, Units 1 and 2 - Seismic Hazard and Screening Report (Central and Eastern United States (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 March 31, 2014 (ML14099A196)
5. NRC Letter to Exelon Generation Company, LLC, Nine Mile Point Nuclear Station, Units 1 and 2 – Staff Assessment of Information Provided Pursuant to Title 10 of the Code of Federal Regulations Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident (TAC Nos. MF3973 and MF3974), dated June 16, 2015 (ML15153A660)

6. Exelon Generation Company, LLC Letter to USNRC, Report of Full 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), dated June 8, 2015 (RS-15-117) (ML15163A097)

The purpose of this letter is to provide the results of the assessment for Nine Mile Point Nuclear Station, Unit 1 to demonstrate that the FLEX Mitigating Strategies developed, implemented and maintained in accordance with NRC Order EA-12-049, can be implemented considering the impacts of the reevaluated seismic hazard. The assessment was performed in accordance with the guidance provided in Appendix H of NEI 12-06, Revision 2 (Reference 1) which was endorsed by the NRC (Reference 2). The Nine Mile Point Nuclear Station, Unit 1 FLEX Mitigating Strategies are described in Reference 6.

The Mitigating Strategies Seismic Hazard Information (MSSHI) is the licensee's reevaluated seismic hazard information at Nine Mile Point Nuclear Station, Unit 1, developed using a 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 site control point elevation. Nine Mile Point Nuclear Station, Unit 1 submitted the reevaluated seismic hazard information including the UHRS, GMRS and the hazard curves to the NRC in References 3 and 4. The NRC staff concluded that the GMRS that was submitted adequately characterizes the reevaluated seismic hazard for the site (Reference 5).

Consistent with Section H.4.2 of Reference 1, the Nine Mile Point Nuclear Station, Unit 1 GMRS is bounded by the Safe Shutdown Earthquake (SSE) except at frequencies greater than 10Hz. Therefore, an evaluation was performed for equipment required to implement the Mitigation Strategies that may be sensitive to high frequency ground motions.

Based upon the Mitigating Strategies Assessment provided in the enclosure to this letter, the Mitigating Strategies for Nine Mile Point Nuclear Station, Unit 1 can be implemented as designed when considering the impacts of the reevaluated seismic hazard.

This letter contains no new regulatory commitments and no revision to existing regulatory commitments.

If you have any questions regarding this submittal, please contact Ron Gaston at (630) 657-3359.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 2nd day of November 2016.

Respectfully submitted,

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

Enclosure: Seismic Mitigating Strategies Assessment for Nine Mile Point Nuclear Station, Unit 1

cc: NRC Regional Administrator - Region I
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Enclosure

Seismic Mitigating Strategies Assessment for Nine Mile Point Nuclear Station, Unit 1

(17 pages)

SEISMIC MITIGATING STRATEGIES ASSESSMENT REPORT

IN RESPONSE TO REGULATORY GUIDE JLD-ISG-2012-01

for the

NINE MILE POINT NUCLEAR STATION, UNIT 1

348 Lake Rd, Oswego, NY 13126

Facility Operating License No. DPR-63

NRC Docket No. 50-220

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S&A Stevenson & Associates	DOCUMENT APPROVAL SHEET Figure 2.8	PROJECT NO. 15C4344

ATTACHMENT

Exelon Corporation

Nine Mile Point Nuclear Station, Unit 1

Docket Number: 50-220

License Number: DPR-63

Seismic Mitigating Strategies Assessment for NMP1

1 INTRODUCTION

1.1 BACKGROUND

Nine Mile Point Nuclear Station, Unit 1 (Nine Mile Point, Unit 1 or NMP1) has completed a Mitigating Strategies Assessment (MSA) of 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 can be implemented considering the impacts of the reevaluated seismic hazard. The MSA was performed in accordance with the guidance provided in Appendix H of NEI 12-06 Revision 2 [1] which was endorsed by the NRC [2]. The NMP1 FLEX Mitigating Strategies are described in Reference [5a], Reference [5b], and Reference [6].

NMP1 submitted a reevaluated seismic hazard to the NRC [5]. By letter dated October 27, 2015 [6], the NRC transmitted the results of the screening and prioritization review of the seismic hazards reevaluation. Per the results of Reference [5] and Reference [6], the NMP1 GMRS exceeds the SSE only at frequencies greater than 10 Hz; therefore, the site falls under the guidance of Reference [1], Appendix H, Section H.4.2 (i.e., Path 2), which requires that high frequency sensitive plant equipment associated with the NMP1 mitigating strategies; namely, electrical contact devices, be evaluated for effects of the MSSHI.

This report describes the Mitigation Strategies Assessment undertaken for NMP1, implemented using the methodologies in NEI 12-06 [1], Appendix H, which in turn specifies the methodologies from EPRI 3002004396, "High Frequency Program, Application Guidance for Functional Confirmation and Fragility Evaluation." [7]

The objective of this report is to provide summary information describing the assessment for NMP1 to demonstrate that the FLEX strategies developed, implemented and maintained in accordance with NRC Order EA-12-049 [8] can be implemented considering the impacts of the reevaluated seismic hazard. As described in the Overall Integrated Plan (OIP) [3,4], six-month status updates [3.1 through 3.5], and the Final Integrated Plan (FIP) [3.6], the plant equipment relied on for FLEX strategies have previously been evaluated as seismically robust to the SSE levels. The level of detail provided in the report is intended to enable NRC to understand the inputs used, the basis for the scope selection, the evaluations performed, and the decisions made because of the evaluations.

1.2 Approach

NEI 12-06 [1], Appendix H Section H.4.2 refers to EPRI 3002004396 [7] for the high-frequency contact device analysis approach. Reference [7] is the primary guidance document used for the NMP1 engineering evaluations described in this report. Acceptance criteria for the evaluations are found in Reference [1], Appendix H, Section H.5. In accordance with References [7] and [1], the following topics are addressed in the subsequent sections of this report:

- NMP1 SSE and GMRS/MMSHI Information
- Selection of components and a list of specific components for high-frequency confirmation
- Estimation of seismic demand for subject components
- Estimation of seismic capacity for subject components
- Summary of subject components' high-frequency evaluations
- Summary of Results

1.3 Plant Screening

The Mitigating Strategies Seismic Hazard Information (MSSHI) is the licensee's reevaluated seismic hazard information at NMP1, developed using 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 NMP1 control point elevation. NMP1 submitted the reevaluated seismic hazard information including the UHRS, GMRS and the hazard curves to the NRC on March 31, 2014. [5]. The NMP1 Seismic Hazard and Screening NRC Staff Assessment Report confirmed Nine Mile Point, Unit 1's Seismic Hazard Reevaluation on June 16, 2015 [20]. The NRC summarized their screening evaluations in Reference [6].

1.4 Report Documentation

Section 2 of this report describes the selection of devices. The identified devices are evaluated for the seismic demand specified in Section 3 of this report (see [21] for the evaluation) using the evaluation criteria discussed in Section 4 of this report. The overall conclusions are discussed in Section 5 of this report.

Table A-1 in Appendix A of this report lists the devices identified in Section 2 of this report and provides the results of the evaluations performed in accordance with Sections 3 and 4 of this report.

2 SELECTION OF COMPONENTS

The fundamental objective of the MSA evaluation is to determine whether the FLEX/mitigating strategies developed, implemented and maintained in accordance with NRC Order EA-12-049 [8] can be implemented considering the impacts of the reevaluated seismic hazard. Within the applicable functions identified in Section H.4.2 (Path 2) [1], the components that require 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 evaluated to ensure their functions perform as necessary for the FLEX/mitigating strategies. The equipment selection process for each of those categories is described below.

2.1 REACTOR TRIP/SCRAM

Section H.4.2 of NEI 12-06 Appendix H [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 [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.

2.2 REACTOR VESSEL INVENTORY CONTROL

This category of components is shared between NEI 12-06 Appendix H [1] and EPRI 3002004396 [7]. The concern for both these 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 Electromatic Relief Valves (ERV) as well as other Reactor Coolant System (RCS) valves listed in Attachment 9.2 of Reference [15] were analyzed. In this case, the "undesirable state" criterion for selection of devices was any device that could lead to a listed valve opening and remaining open after the period of strong shaking. Loss of AC power is a basic premise of NEI 12-06, thus control devices for AC-powered valves are not included in the NEI 12-06 Appendix H selection. No devices in this category met all criteria for selection.

2.3 FLEX PHASE 1

NEI 12-06 Appendix H [1] requires the analysis of relays and contactors that may lead to circuit seal-ins or lockouts 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 [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.

In order to select the Phase 1 SILO devices, an Expedited Seismic Equipment List (ESEL) specific to FLEX Phase 1 was derived from installed permanent plant equipment identified in the plant-specific Overall Integrated Plan (OIP) [3], periodic updates [3.1 through 3.5], and the plant-specific Final Integrated Plan (FIP) [3.6], using the EPRI Seismic Evaluation

Guidance [16]. 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 [1], omitting response strategies only valid in an outage.

The ESEL 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 [3 and 3.1 through 3.6] 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. Following section 3.2 of the evaluation guidance [16, pp. 3-3] the following equipment categories were excluded from consideration:

- Structures
- Distributed systems (piping, cabling, conduit, cable trays, HVAC)
- Nuclear Steam Supply System components

The following key functions were reviewed.

- Piping Flow Paths
- Equipment/Room Cooling
- Key Parameter Instrumentation
- Diesel Fuel Oil Supply
- 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 [16] 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 [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 [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, Nine Mile Point, Unit 1, credits their Emergency Condensers to provide core decay-heat cooling. For this effort, the flow paths credited include: (1) Steam from the Reactor Pressure Vessel to the Emergency Condensers; (2) Condensate from the Emergency Condensers back to the Reactor Pressure Vessel; (3) Make up coolant from the Emergency Condenser Make-Up Water Tanks to the Emergency Condensers; and (4) Steam from the Emergency Condensers vented to atmosphere.

Equipment/Room Cooling

Cooling for rooms is normally provided by AC power, and thus components associated with fans, dampers, compressors or other systems relied upon to provide ventilation or cooling to these rooms were not considered as these would not be Phase 1 systems.

Key Parameter Instrumentation

Instruments identified to monitor parameters critical to control of elements of the Phase 1 FLEX Strategy [3 and 3.1 through 3.6] are included in the ESEL. 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 (per rule-of-the-box (ROB)) was included in the ESEL.

Diesel Fuel Oil Supply

Diesel Fuel Oil is not necessary for Nine Mile Point'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 [3 and 3.1 through 3.6] 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. In general, normal instrument air (IA) is non-safety related. Any valves credited to establish Nine Mile Point'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, thus no instrument air components are necessary on the Phase 1 ESEL.

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 ESEL requiring control, the associated control diagrams were reviewed and the control cabinets or panels critical to the item's control were included on the ESEL. 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 ESEL. The criteria for inclusion specific to the ESEL is as follows:

(Criterion 1)

The Phase 1 FLEX Strategy for Nine Mile Point, Unit 1, as described in the Overall Integrated Plan [3] its updates [3.1 through 3.5], and the Final Integrated Plan [3.6], relies on permanent plant equipment in the Emergency Condenser and Electromatic Relief Valve 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 (in this case) experience a beyond design-basis seismic event coupled with an extended loss of AC power (ELAP) and loss of ultimate heat sink (LUHS). 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 three 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 Emergency Condenser was based on the premise that condenser operation is desired, thus any SILO which would lead to condenser operation is beneficial and thus does not meet the criteria for selection. Only contact devices which could render the Emergency Condenser inoperable were considered.

The emergency condenser is placed into operation by opening the condensate outlet isolation valves [17, pp. V-18] via by initiation relays 11K61A, 11K61X, 11K62A, and 11K62X [18] in Channel 11 and 12K61A, 12K61X, 12K62A, and 12K62X in Channel 12 [19]. These relays are normally energized and must de-energize to initiate the condenser. Chatter in the initiation circuit would tend to open these valves and this beneficial effect eliminates these relays and their input devices from consideration.

Chatter in the Auto Close circuit could lead to an undesired isolation of the Emergency Condenser, which would place it out of operation. Chatter in the normally de-energized isolation signal output relays 4-11A/B or 4-12A/B; or their input devices K17A/B/C/D and 36-06A-M/B-M/C-M/D-M could tend to seal-in the isolation relays [18 and 19]. Chatter in normally-energized confirmatory logic relays 36A/B/C/D could break their seal-in. The potential effect of chatter in these devices meets the selection criteria and thus they must be considered for this program. Chatter in the remote isolation bypass circuit (R38A/B/C/D or their input devices) would have no effect on the condenser control when it is available or operating. The remaining devices are slave relays to those listed and do not lead to SILO on their own.

2.4 FLEX Phase 2 Automatic Operation

NEI 12-06 Appendix H [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. Nine Mile Point, Unit 1 Station 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.

2.5 Summary of Selected Components

The investigation of high-frequency contact devices as described above was performed in Ref. [15]. A list of the contact devices requiring a high frequency evaluation is provided in Appendix A, Table A-1 of this report. The identified devices are evaluated in Ref. 21 per the methodology and description of Sections 3 and 4 of this report. Results are presented in Section 5 and Table A-1 of this report.

3 SEISMIC EVALUATION

3.1 HORIZONTAL SEISMIC DEMAND

NMP1 performed a High Frequency Confirmation using the criteria in Reference [7], which is the same criteria specified for the MSA Path 2 evaluation [1]. The horizontal ground motion applicable to the MSA Path 2 evaluation is the same horizontal ground motion identified in the NMP1 high-frequency submittal [9].

3.2 VERTICAL SEISMIC DEMAND

NMP1 performed a High Frequency Confirmation using the criteria in Reference [7], which is the same criteria specified for the MSA Path 2 evaluation [1]. The vertical ground motion applicable to the MSA Path 2 evaluation is the same vertical ground motion identified in the NMP1 high-frequency submittal [9].

3.3 COMPONENT HORIZONTAL SEISMIC DEMAND

The components identified in Section 2 are the same components previously evaluated in the NMP1 High Frequency Confirmation [9]. Therefore, the component horizontal seismic demands for the MSA are the same as the demands applied in the High Frequency Confirmation.

3.4 COMPONENT VERTICAL SEISMIC DEMAND

The components identified in Section 2 are the same components previously evaluated in the NMP1 High Frequency Confirmation [9]. Therefore, the component vertical seismic demands for the MSA are the same as the demands applied in the High Frequency Confirmation.

4 CONTACT DEVICES EVALUATION

Per Reference [7], seismic capacities (the highest seismic test level reached by the contact device without chatter or other malfunction) of each subject contact device are determined by the following procedures:

(1) If a contact device was tested as part of the EPRI High Frequency Testing program [10], then the component seismic capacity from this program is used.

(2) If a contact device was not tested as part of Reference 10, then one or more of the following means to determine the component capacity were used:

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

  (b) Generic Equipment Ruggedness Spectra (GERS) capacities per References [11, 12, 13, 14].

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

The high-frequency capacity of each device was evaluated with the component mounting point demand from Section 3 using the criteria in Section 4.5 of Reference [7] and the acceptance criteria in Section H.5 of [1].

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

5 CONCLUSIONS

5.1 General Conclusions

NMP1 completed the evaluation of potentially sensitive contact devices in accordance with NEI 12-06 [1], Appendix H Section H.4.2 and EPRI 3002004396 [7]. The results of the evaluation confirm that the FLEX strategies for NMP1 can be implemented as designed and no further seismic evaluations are necessary.

5.2 Identification of Follow-up Actions

No follow-up actions were identified.

6 REFERENCES

1. NEI 12-06, Revision 2, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, December 2015, ADAMS Accession Number ML16005A625

2. JLD-ISG-2012-01, Revision 1, Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, February 2016, ADAMS Accession Number ML15357A163

3. Calvert Cliffs Nuclear Power Plant, Units 1 and 2; R.E. Ginna Nuclear Power Plant; and Nine Mile Point Nuclear Station, Units 1 and 2. "Overall Integrated Plan for Mitigation Strategies for Beyond-Design-Basis External Events." February 28, 2013. ADAMS Accession Number ML13066A171

   3.1. Calvert Cliffs Nuclear Power Plant, Units 1 and 2; R.E. Ginna Nuclear Power Plant; and Nine Mile Point Nuclear Station, Units 1 and 2. "Supplement to Overall Integrated Plan for Mitigation Strategies for Beyond-Design-Basis External Events." March 8, 2013. ADAMS Accession Number ML13074A056

   3.2. Calvert Cliffs Nuclear Power Plant, Units 1 and 2; R.E. Ginna Nuclear Power Plant; and Nine Mile Point Nuclear Station, Units 1 and 2. "Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)." August 27, 2013. ADAMS Accession Number ML13254A278

   3.3. Calvert Cliffs Nuclear Power Plant, Units 1 and 2; R.E. Ginna Nuclear Power Plant; and Nine Mile Point Nuclear Station, Units 1 and 2. "February 2014 Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)." February 27, 2014. ADAMS Accession Number ML14069A318

   3.4. Nine Mile Point Nuclear Station, Units 1 and 2. "August 2014 Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)." August 26, 2014. ADAMS Accession Number ML14241A380

   3.5. Nine Mile Point Nuclear Station, Units 1 and 2. "February 2015 Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)." February 19, 2015. ADAMS Accession Number ML15062A036

   3.6. Nine Mile Point Nuclear Station, Unit 1. "Report of Full 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)." Dated June 8, 2015. ADAMS Accession Number ML15163A097

4. NRC (J. Bowen) Letter to CENG (J. Spina). "Nine Mile Point Nuclear Station, Units 1 and 2 - Interim Staff Evaluations Relating to Overall Integrated Plans in Response to Order EA-12-049 (Mitigation Strategies) (TAC Nos. MF1129 and MF1130)." Dated December 19, 2013. ADAMS Accession Number ML13225A584

5. Calvert Cliffs Nuclear Power Plant, Units 1 and 2; R.E. Ginna Nuclear Power Plant; and Nine Mile Point Nuclear Station, Units 1 and 2. "Seismic Hazard and Screening Report (CEUS Sites), Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident." March 31, 2014. ADAMS Accession Number ML14099A196-1

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

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

8. NRC (E. Leeds) Letter to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status. EA-12-049. "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events." March 12, 2012. ADAMS Accession Number ML12054A735

9. 15C4344-RPT-002, Rev. 1, "High Frequency Confirmation Report for Nine Mile Point Nuclear Station, Unit 1 in Response to Near Term Task Force (NTTF) 2.1 Recommendation"

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

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

12. EPRI NP-7147-SLV2, Addendum 1, "Seismic Ruggedness of Relays", September 1993

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

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

15. Stevenson & Associates Report 15C4344-RPT-001, Rev. 2. "Selection of Relays and Switches for High Frequency Seismic Evaluation"

16. EPRI Report 3002000704, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," Final Report, May 2013

17. NMP Report, "Final Safety Analysis Report (Updated)," Rev. 24, October 2015

18. NMP Drawing C19859C-008 Rev. 51, "Elementary Wiring Diagram Reactor Protection System (Emergency Cooling Channel #11)"

19. NMP Drawing C19859C-008A Rev. 24, "Elementary Wiring Diagram Reactor Protection System (Emergency Cooling Channel #12)"

20. NRC (F. Vega) Letter to Nine Mile Point Nuclear Station (P. Orphanos). "Nine Mile Point Nuclear Station, Units 1 and 2 - Staff Assessment of Information Provided Pursuant to Title 10 of the Code of Federal Regulations Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident (TAC NOS. MF3973 and MF3974)." June 16, 2015, ADAMS Accession Number ML15153A660

21. 15C4344-CAL-001, Rev. 2. "High Frequency Functional Confirmation and Fragility Evaluation of Relays"

A Components Identified for High Frequency Evaluation

Table A-1: Components Identified for High Frequency Evaluation

No.	Unit	Component				Enclosure Type	Building	Component Evaluation Result
		ID	Type	System	Function			
1	1	36-06A-M	Trip Unit	FLEX Phase 1	EMERGENCY CONDENSER STEAM FLOW TRIP UNIT	Switchgear	Reactor	Cap > Dem
2	1	36-06B-M	Trip Unit	FLEX Phase 1	EMERGENCY CONDENSER STEAM FLOW TRIP UNIT	Switchgear	Reactor	Cap > Dem
3	1	36-06C-M	Trip Unit	FLEX Phase 1	EMERGENCY CONDENSER STEAM FLOW TRIP UNIT	Switchgear	Reactor	Cap > Dem
4	1	36-06D-M	Trip Unit	FLEX Phase 1	EMERGENCY CONDENSER STEAM FLOW TRIP UNIT	Switchgear	Reactor	Cap > Dem
5	1	4-11A	Auxiliary Relay	FLEX Phase 1	EMERGENCY CONDENSER RELAY	Switchgear	Turbine	Cap > Dem
6	1	4-11B	Auxiliary Relay	FLEX Phase 1	EMERGENCY CONDENSER RELAY	Switchgear	Turbine	Cap > Dem
7	1	4-12A	Auxiliary Relay	FLEX Phase 1	EMERGENCY CONDENSER RELAY	Switchgear	Turbine	Cap > Dem
8	1	4-12B	Auxiliary Relay	FLEX Phase 1	EMERGENCY CONDENSER RELAY	Switchgear	Turbine	Cap > Dem
9	1	K17A	Control Relay	FLEX Phase 1	EMERGENCY CONDENSER STEAM FLOW RELAY	Switchgear	Reactor	Cap > Dem
10	1	K17B	Control Relay	FLEX Phase 1	EMERGENCY CONDENSER STEAM FLOW RELAY	Switchgear	Reactor	Cap > Dem
11	1	K17C	Control Relay	FLEX Phase 1	EMERGENCY CONDENSER STEAM FLOW RELAY	Switchgear	Reactor	Cap > Dem
12	1	K17D	Control Relay	FLEX Phase 1	EMERGENCY CONDENSER STEAM FLOW RELAY	Switchgear	Reactor	Cap > Dem
13	1	R36A	Output Relay	FLEX Phase 1	EMERGENCY CONDENSER AUTO CLOSE RELAY	Switchgear	Reactor	Cap > Dem
14	1	R36B	Output Relay	FLEX Phase 1	EMERGENCY CONDENSER AUTO CLOSE RELAY	Switchgear	Reactor	Cap > Dem
15	1	R36C	Output Relay	FLEX Phase 1	EMERGENCY CONDENSER AUTO CLOSE RELAY	Switchgear	Reactor	Cap > Dem
16	1	R36D	Output Relay	FLEX Phase 1	EMERGENCY CONDENSER AUTO CLOSE RELAY	Switchgear	Reactor	Cap > Dem