UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 26, 2018

Mr. Bryan C. Hanson
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2; CALVERT CLIFFS INDEPENDENT SPENT FUEL STORAGE INSTALLATION; NINE MILE POINT NUCLEAR STATION, UNITS 1 AND 2; AND R. E. GINNA NUCLEAR POWER PLANT – ISSUANCE OF AMENDMENTS REVISING EMERGENCY ACTION LEVEL SCHEMES (CAC NOS. MF9836–MF9840, EPID L-2017-LLA-0237)

Dear Mr. Hanson:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 324 to Renewed Facility Operating License No. DPR-53 and Amendment No. 302 to Renewed Facility Operating License No. DPR-69 for the Calvert Cliffs Nuclear Power Plant, Units 1 and 2, respectively; Amendment No. 230 to Renewed Facility Operating License No. DPR-63 and Amendment No. 171 to Renewed Facility Operating License No. NPF-69 for the Nine Mile Point Nuclear Station, Units 1 and 2, respectively; and Amendment No. 128 to Renewed Facility Operating License No. DPR-18 for the R. E. Ginna Nuclear Power Plant.

The amendments are in response to the application by Exelon Generation Company, LLC (Exelon, the licensee) dated May 31, 2017 (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML17164A149), as supplemented by letters dated January 31 and May 10, 2018 (ADAMS Accession Nos. ML18037A653 (package) and ML18131A007, respectively).

In its May 31, 2017, application, Exelon requested to revise the emergency plans for Calvert Cliffs Nuclear Power Plant, Units 1 and 2, Calvert Cliffs Independent Spent Fuel Storage Installation (ISFSI), Nine Mile Point Nuclear Station, Units 1 and 2, and R. E. Ginna Nuclear Power Plant. The Calvert Cliffs ISFSI has a site-specific license, but it is included in the emergency plan for the Calvert Cliffs Nuclear Power Plant. Accordingly, changes to the emergency plan are properly addressed by amendments to the power plant licenses, and a separate amendment to the Calvert Cliffs ISFSI materials license is not required. The ISFSIs at R. E. Ginna Nuclear Power Plant and Nine Mile Point Nuclear Station, Units 1 and 2, are covered under a general license.

A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

Blake A. Purnell, Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-317, 50-318, 50-220, 50-410,
50-244, 72-8, 72-1036, and 72-67

Enclosures:
1. Amendment No. 324 to DPR-53
2. Amendment No. 302 to DPR-69
3. Amendment No. 230 to DPR-63
4. Amendment No. 171 to NPF-69
5. Amendment No. 128 to DPR-18
6. Safety Evaluation

cc: Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-317

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 324
Renewed License No. DPR-53

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated May 31, 2017, as supplemented by letters dated January 31 and May 10, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 324, Renewed Facility Operating License No. DPR-53 is hereby amended to authorize revision to the Emergency Plan as set forth in the licensee's application dated May 31, 2017, as supplemented by letters dated January 31 and May 10, 2018, and evaluated in the NRC staff's safety evaluation for this amendment.

3. This license amendment is effective as of the date of its issuance and shall be implemented on or before June 28, 2019.

FOR THE NUCLEAR REGULATORY COMMISSION

Michele G Evans for

Brian E. Holian, Acting Director
Office of Nuclear Reactor Regulation

Date of Issuance: June 26, 2018

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-318

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 302
Renewed License No. DPR-69

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated May 31, 2017, as supplemented by letters dated January 31 and May 10, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 302, Renewed Facility Operating License No. DPR-69 is hereby amended to authorize revision to the Emergency Plan as set forth in the licensee's application dated May 31, 2017, as supplemented by letters dated January 31 and May 10, 2018, and evaluated in the NRC staff's safety evaluation for this amendment.

3. This license amendment is effective as of the date of its issuance and shall be implemented on or before June 28, 2019.

FOR THE NUCLEAR REGULATORY COMMISSION

Michele G Evans for

Brian E. Holian, Acting Director
Office of Nuclear Reactor Regulation

Date of Issuance: June 26, 2018

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-220

NINE MILE POINT NUCLEAR STATION UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 230
Renewed License No. DPR-63

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated May 31, 2017, as supplemented by letters dated January 31 and May 10, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 230, Renewed Facility Operating License No. DPR-63 is hereby amended to authorize revision to the Emergency Plan as set forth in the licensee's application May 31, 2017, as supplemented by letters dated January 31 and May 10, 2018, and evaluated in the NRC staff's safety evaluation for this amendment.

3. This license amendment is effective as of the date of its issuance and shall be implemented on or before June 28, 2019.

FOR THE NUCLEAR REGULATORY COMMISSION

Michele G. Evans for

Brian E. Holian, Acting Director
Office of Nuclear Reactor Regulation

Date of Issuance: June 26, 2018

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-410

NINE MILE POINT NUCLEAR STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 171
Renewed License No. NPF-69

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated May 31, 2017, as supplemented by letters dated January 31 and May 10, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 171, Renewed Facility Operating License No. NPF-69 is hereby amended to authorize revision to the Emergency Plan as set forth in the licensee's application dated May 31, 2017, as supplemented by letters dated January 31 and May 10, 2018, and evaluated in the NRC staff's safety evaluation for this amendment.

3. This license amendment is effective as of the date of its issuance and shall be implemented on or before June 28, 2019.

FOR THE NUCLEAR REGULATORY COMMISSION

Michele G. Evans for

Brian E. Holian, Acting Director
Office of Nuclear Reactor Regulation

Date of Issuance: JUne 26, 2018

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-244

R. E. GINNA NUCLEAR POWER PLANT

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 128
Renewed License No. DPR-18

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated May 31, 2017, as supplemented by letters dated January 31 and May 10, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 128, Renewed Facility Operating License No. DPR-18 is hereby amended to authorize revision to the Emergency Plan as set forth in the licensee's application dated May 31, 2017, as supplemented by letters dated January 31 and May 10, 2018, and evaluated in the NRC staff's safety evaluation for this amendment.

3. This license amendment is effective as of the date of its issuance and shall be implemented on or before June 28, 2019.

FOR THE NUCLEAR REGULATORY COMMISSION

Michele G. Evans for

Brian E. Holian, Acting Director
Office of Nuclear Reactor Regulation

Date of Issuance: June 26, 2018

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 324 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-53

AMENDMENT NO. 302 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-69

AMENDMENT NO. 230 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-63

AMENDMENT NO. 171 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-69

AMENDMENT NO. 128 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-18

EXELON GENERATION COMPANY, LLC

CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2

NINE MILE POINT NUCLEAR STATION, UNITS 1 AND 2

R. E. GINNA NUCLEAR POWER PLANT

DOCKET NOS. 50-317, 50-318, 50-220, 50-410, 50-244, 72-8, 72-1036, AND 72-67

1.0 INTRODUCTION

By application dated May 31, 2017 (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML17164A149), as supplemented by letters dated January 31 and May 10, 2018 (ADAMS Accession No. ML18037A653 (package) and ML18131A007, respectively), Exelon Generation Company, LLC (Exelon, the licensee) submitted a license amendment request for Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2; Nine Mile Point Nuclear Station, Units 1 and 2 (NMP-1 and NMP-2, respectively); and R. E. Ginna Nuclear Power Plant (Ginna). The amendments would revise the emergency plans by changing the emergency action level (EAL) schemes for these facilities. The proposed changes are based on the Nuclear Energy Institute's (NEI's) guidance in NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," which was endorsed by the U.S. Nuclear Regulatory Commission (NRC or Commission) by letter dated March 28, 2013 (ADAMS Package Accession No. ML13091A209).

The supplemental letters dated January 31 and May 10, 2018, provided additional information that clarified the application but did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* (FR) on August 1, 2017 (82 FR 35838).

The Calvert Cliffs Independent Spent Fuel Storage Installation (ISFSI) is included in the emergency plan for the Calvert Cliffs Nuclear Power Plant. Accordingly, changes to the emergency plan are properly addressed by an amendment request for the CCNPP licenses, and a separate amendment to the Calvert Cliffs ISFSI materials license is not required.

2.0 REGULATORY EVALUATION

The applicable regulations and guidance for the emergency plans are as follows:

2.1 Regulations

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.47, "Emergency plans," sets forth emergency plan requirements for nuclear power reactors. The regulations in 10 CFR 50.47(a)(1)(i) state, in part, that:

> . . . no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

Section 50.47(b) establishes the planning standards that the onsite and offsite emergency response plans must meet for NRC staff to make a finding that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. Planning Standard (4) of this section requires that onsite and offsite emergency response plans meet the following standard:

> A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

Section 50.47(b)(4) requires the use of a standard emergency classification and action level scheme, ensuring that implementation methods are relatively consistent throughout the industry for a given reactor and containment design, but permits site-specific design considerations and preferences.

Section IV.B.1 of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, states, in part:

> The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant.

Section IV.B.2 of Appendix E to 10 CFR Part 50 states, in part:

> A licensee desiring to change its entire emergency action level scheme shall submit an application for an amendment to its license and receive NRC approval before implementing the change.

2.2 Guidance

The EAL development guidance was initially established in Generic Letter (GL) 79-50,[1] dated October 10, 1979 (ADAMS Accession No. ML031320278). This guidance was subsequently revised in the joint NRC and Federal Emergency Management Agency (FEMA) document NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," dated November 1980 (ADAMS Accession No. ML040420012), which was endorsed by NRC Regulatory Guide 1.101, Revision 2, "Emergency Planning and Preparedness for Nuclear Power Reactors," October 1981 (ADAMS Accession No. ML090440294),[2] as an approach acceptable to the NRC for the development of an EAL scheme.

As industry and regulatory experience was gained with the implementation and use of EAL schemes, the industry issued revised EAL scheme development guidance to reflect lessons learned, numerous of which have been provided to the NRC for review and endorsement as generic (i.e., not site-specific) EAL development guidance. Most recently, the industry provided NEI 99-01, Revision 6, to the NRC which the NRC staff endorsed by letter dated March 28, 2013, as acceptable generic EAL scheme development guidance.

Although the EAL development guidance contained in NEI 99-01, Revision 6, is generic and may not be entirely applicable for some non-passive, large light-water reactor (LWR) designs, it bounds the most typical accident and event scenarios for which emergency response is necessary, in a format that allows for industry standardization and consistent regulatory oversight. Licensees may choose to develop plant-specific EAL schemes using NEI 99-01, Revision 6, with appropriate plant-specific alterations, as applicable.

NRC Regulatory Issue Summary (RIS) 2003-18, "Use of NEI 99-01, 'Methodology for Development of Emergency Action Levels,' Revision 4, Dated January 2003," dated October 8, 2003 (ADAMS Accession No. ML032580518), with supplements dated July 13, 2004, and December 12, 2005 (ADAMS Accession Nos. ML041550395 and ML051450482, respectively), also provided guidance for developing or changing a standard EAL scheme. In addition, this RIS and its supplements provide recommendations to assist licensees, consistent with Section IV.B of Appendix E to 10 CFR Part 50, in determining whether to seek prior NRC approval when considering changes to its EAL scheme.

In summary, the NRC staff considers NEI 99-01, Revision 6, to be an acceptable method to develop site-specific EALs that meet the requirements of Section IV.B of Appendix E to 10 CFR Part 50 and planning standard 10 CFR 50.47(b)(4), with the understanding that licensees may want to develop EALs that differ from the guidance document.

---

[1] Untitled letter transmitting basis for emergency action levels.

[2] Also see Revision 3, dated August 1992, and Revision 4, dated July 2003 (ADAMS Accession Nos. ML003740302 and ML032020276, respectively).

2.3 NRC Staff Review

In its application, as supplemented, the licensee proposed to revise the current EAL schemes for CCNPP, Ginna, NMP-1, and NMP-2 to EAL schemes based on NEI 99-01, Revision 6. For each facility, the licensee provided the proposed EAL scheme, the technical basis containing an evaluation and rationale for each proposed EAL change, and a matrix comparing the proposed initiating conditions, mode applicability, and EAL wording to that found in NEI 99-01, Revision 6. The comparison matrix for each facility also included a description of global changes applicable to the EAL scheme and a justification for any differences or deviations from NEI 99-01, Revision 6. The application stated that the licensee used the terms "difference" and "deviation" as defined in RIS 2003-18, as supplemented, when comparing its proposed site-specific EALs to the generic EALs in NEI 99-01, Revision 6.

The NRC staff reviewed the application, as supplemented, and verified that the proposed EAL scheme is consistent with the guidance provided in NEI 99-01, Revision 6, to ensure that the proposed EAL scheme meets planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV of Appendix E to 10 CFR Part 50. The NRC staff found that both the current and proposed EALs have modifications from the NEI 99-01, Revision 6, guidance due to specific plant designs and licensee preferences.

The NRC staff reviewed the application, as supplemented, and verified that the instrumentation and setpoints derived for this proposed EAL scheme are consistent with the overall EAL scheme development guidance, address the site-specific implementation strategies provided, and are consistent with a standard EAL scheme.

Although the EALs must be site-specific, the NRC staff reviewed the proposed EALs for the following key characteristics of an effective EAL scheme to ensure consistency and regulatory stability:

- Consistency, including standardization of intent, if not in actual wording (i.e., the EALs would lead to similar decisions under similar circumstances at different plants);
- Human factors engineering and user friendliness;
- Potential for emergency classification level upgrade only when there is an increasing threat to public health and safety;
- Ease of upgrading and downgrading the emergency classification level;
- Thoroughness in addressing issues regarding the completeness and accuracy of Appendix 1 to NUREG-0654 (i.e., the EALs are unambiguous and are based on site-specific indicators);
- Technical completeness for each classification level;
- Logical progression in classification for multiple events; and
- The use of objective and observable values.

The NRC staff verified that risk assessments were appropriately used to set the boundaries of the emergency classification levels and ensure that all EALs that trigger the declaration of an emergency classification are in the same range of relative risk. In addition, the NRC staff verified that the proposed EAL scheme is technically complete for each classification level, accurate, and consistent with EAL schemes implemented at similarly designed plants.

To aid in understanding the nomenclature used in this safety evaluation, the following conventions are used: the first letter signifies the EAL recognition category; the second letter

signifies the emergency classification level; and the number is the applicable number from the plant-specific EAL scheme.

- The scheme's generic information is organized by recognition category in the following order:

  - A or R – Abnormal Radiation Levels/Radiological Effluent,
  - C – Cold Shutdown/Refueling System Malfunction,
  - E – Independent Spent Fuel Storage Installation,
  - F – Fission Product Barrier,
  - H – Hazards and Other Conditions Affecting Plant Safety, and
  - S or M – System Malfunction.

- The emergency classification levels are:

  - U = Notification of Unusual Event (UE),
  - A = Alert,
  - S = Site Area Emergency (SAE), and
  - G = General Emergency (GE).

An EAL set refers to EALs within an EAL recognition category and subcategory that includes an escalation path for one or more classification levels. Not all EAL recognition categories require an EAL set.

This safety evaluation (SE) uses the numbering system from the licensee's proposed EAL scheme, which was consistent across all of its facilities. The numbering system from the generic EAL scheme development guidance contained in NEI 99-01, Revision 6, is annotated in [brackets] in the subsection headings of this SE to aid in cross-referencing the licensee's EAL numbering convention with that of the guidance.

3.0 TECHNICAL EVALUATION

3.1 Recognition Category 'R' – Abnormal Radiological Release/Radiological Effluent

3.1.1 EAL Set RU1/RA1/RS1/RG1 [AU1/AA1/AS1/AG1]

The intent of this EAL set is to ensure that an emergency classification is declared upon site-specific indications of a release of radioactivity (gaseous or liquid). In recognition of the lower possible radioactivity concentrations, the assessment of liquid releases is limited to the UE and Alert classification levels. This set provides for accident assessments using pre-calculated values based on assumed conditions, real-time parameters, and field monitoring results.

The NRC staff verified that the progression from a UE to a GE classification level is appropriate and consistent with EAL scheme development guidance.

- RU1 – This EAL addresses a potential decrease in the level of safety of the plant as indicated by a low-level radiological release that exceeds regulatory commitments for an extended period of time (e.g., an uncontrolled release).

- RA1 – This EAL addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than 1 percent of the U.S. Environmental Protection Agency (EPA) early phase protective action guides (PAGs).[3]
- RS1 – This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than 10 percent of the EPA early phase PAGs.
- RG1 – This EAL addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the EPA early phase PAGs.

In its January 31, 2018, letter, the licensee stated that for NMP-1 the main stack high range and low range monitors are the only effluent monitors used in dose assessment, and these monitors do not provide enough range to display the SAE or GE threshold values. As such, the licensee did not develop thresholds that use instrument radiation monitor readings for NMP-1 EALs RS1 and RG1. NMP-1 does have a main stack teletector, with a local read-out, that could be used to perform offsite dose assessment.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, ease of upgrading/downgrading, instrumentation, and setpoints for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.1.2 EAL Set RU2/RA2/RS2/RG2 [AU2/AA2/AS2/AG2]

The intent of this EAL set is to ensure that an emergency classification is declared upon site-specific indications of potential or actual damage to irradiated fuel assemblies. It addresses a lowering of the water level over irradiated fuel in the spent fuel pool or refueling pathway, irradiated fuel uncovering (i.e., water level below the top of the fuel), and fuel handling accidents that result in mechanical damage to irradiated fuel (e.g., a dropped fuel assembly). Some of these EALs rely on the spent fuel pool water level instrumentation required by NRC Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012 (ADAMS Accession No. ML12054A679).

The NRC staff has verified that the progression from a UE to a GE classification level is appropriate and consistent with EAL scheme development guidance.

- RU2 – This EAL addresses a decrease in water level above irradiated fuel sufficient to cause elevated radiation levels.

---

[3] EPA PAG Manual, "Protective Action Guides and Planning Guidance for Radiological Incidents," dated January 2017 (ADAMS Accession No. ML17044A073).

- RA2 – This EAL addresses events that have caused imminent or actual damage to an irradiated fuel assembly, including a significant lowering of water level within the spent fuel pool.
- RS2 – This EAL addresses a significant loss of spent fuel pool inventory control and makeup capability leading to imminent fuel damage.
- RG2 – This EAL addresses a significant loss of spent fuel pool inventory control and makeup capability leading to a prolonged uncovering of spent fuel.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, ease of upgrading/downgrading, instrumentation, and setpoints for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.1.3 EAL RA3 [AA3]

The intent of this EAL is to ensure that an emergency classification is declared when elevated radiation levels in certain plant rooms and areas preclude or impede personnel from performing actions necessary for normal plant operations, cooldown, or shutdown. This includes the control room and the central alarm station. The Alert classification level is primarily intended to ensure that the plant emergency response organization (ERO) is activated to support the control room in removing the impediment to normal access, as well as assisting in quantifying potential damage to the fuel. Indications of increasing radiation levels in the plant are bounded by Recognition Category 'F', as well as RS1 and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, instrumentation, and setpoints for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in

Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2 Recognition Category 'C' – Cold Shutdown/Refueling System Malfunction

3.2.1 EAL Set CU6/CA6/CS6/CG6 [CU1/CA1/CS1/CG1]

The intent of this EAL set is to ensure an emergency classification is declared upon a loss of reactor pressure vessel (RPV) inventory or reactor coolant system (RCS) inventory, as applicable, during cold shutdown or refueling.

The NRC staff verified that the progression from a UE to a GE classification level is appropriate and consistent with EAL scheme development guidance.

- CU6 – This EAL addresses the inability to restore and maintain water level to a required minimum level (or the lower limit of a level band), or a loss of the ability to monitor RPV/RCS water level concurrent with indications of coolant leakage.
- CA6 – This EAL addresses conditions that are precursors to a loss of the ability to adequately cool irradiated fuel (i.e., a precursor to a challenge to the fuel clad barrier).
- CS6 – This EAL addresses a significant and prolonged loss of RPV/RCS inventory control and makeup capability leading to imminent fuel damage.
- CG6 – This EAL addresses the inability to restore and maintain RPV/RCS water level above the top of active fuel with containment challenged.

In its January 31, 2018, letter, the licensee stated that the reactor vessel level indication system for Ginna is removed from service upon entry into Mode 4 (hot standby) during plant shutdown from hot shutdown to cold conditions. As such, the licensee did not propose EAL thresholds that use RCS water level instrumentation for Ginna EALs CS6 and CG6. This is consistent with the developer notes in NEI 99-01, Revision 6, for EALs CS1 and CG1, which states that if the design and operation of water level instrumentation is such that this level value cannot be determined at any time during cold shutdown or refueling, then an EAL threshold that uses RCS water level instrumentation should not be developed.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, ease of upgrading/downgrading, instrumentation, and setpoints for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.2.2 EAL Set CU1/CA1 [CU2/CA2]

The intent of this EAL set is to ensure that an emergency classification is declared upon a loss of alternating current (ac) power to emergency electrical buses during cold shutdown, refueling, or defueled conditions.

The NRC staff verified that the progression from a UE to an Alert classification level is appropriate and consistent with EAL scheme development guidance. The SAE and GE classification levels for this specific accident progression are bounded by EALs RS1 and RG1.

- CU1 – This EAL describes a significant degradation of offsite and onsite ac power sources to emergency buses such that any additional single failure would result in a loss of all ac power to safety systems.
- CA1 – This EAL addresses a total loss of ac power to emergency buses that compromises the performance of all safety systems requiring electric power including those necessary for emergency core cooling, containment heat removal/pressure control, spent fuel heat removal, and the ultimate heat sink.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression and ease of upgrading/downgrading for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.2.3 EAL Set CU5/CA5 [CU3/CA3]

The intent of this EAL set is to ensure that an emergency classification is declared based on the inability to maintain control of decay heat removal during cold shutdown or refueling.

The NRC staff verified that the progression from a UE to an Alert classification level is appropriate and consistent with EAL scheme development guidance. The SAE and GE classification levels for this specific accident progression are bounded by EALs RS1 and RG1.

- CU5 – This EAL addresses an unplanned increase in RCS temperature above the technical specification cold shutdown temperature limit, or the inability to determine RCS temperature and level.
- CA5 – This EAL addresses conditions involving a loss of decay heat removal capability or an addition of heat to the RCS in excess of that which can currently be removed.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, and ease of upgrading/downgrading for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.2.4 EAL CU3 [CU4]

The intent of this EAL is to ensure that an emergency classification is declared upon a loss of vital direct current (dc) power which compromises the ability to monitor and control operable safety systems during cold shutdown or refueling. This EAL is primarily intended to ensure that key ERO members and offsite response organizations (OROs) are aware of the event, resources necessary to respond to the event are mobilized, and any necessary compensatory measures are promptly implemented. The Alert, SAE, and GE classification levels for a protracted loss of vital dc power are bounded by EALs CA6, CA5, CS6, CG6, RA1, RS1, and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, formatting, logical progression, instrumentation, and setpoints for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.5 EAL CU4 [CU5]

The intent of this EAL is to address a significant loss of onsite or offsite communications capability during cold shutdown, refueling, or defueled conditions. This EAL is primarily intended to ensure that key ERO members, OROs, and the NRC are aware of the loss of communications capabilities, the resources necessary to restore communications are mobilized, and compensatory measures are promptly implemented. Considering that a loss of emergency

communications capability would not involve an actual or potential substantial degradation to the level of safety of the plant, no escalation path is necessary for this EAL.

The communication methods derived for this EAL are consistent with the overall EAL scheme development guidance. The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, and logical progression for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.6 EAL CA2 [CA6]

The intent of this EAL is to ensure that an emergency classification is declared when hazardous events lead to potential damage to safety systems during cold shutdown or refueling. The hazardous events include earthquake, flooding, high winds, tornado strike, explosion, fire, or other event with similar hazard characteristics as determined by the shift manager. This EAL is primarily intended to ensure that the plant ERO is activated to support the control room in understanding the event impacts and restoring affected safety system equipment to service. Indications of hazard induced damage to components containing radioactive materials are bounded by EALs CS6, CG6, RS1, and RG1.

The NRC-endorsed guidance in NEI 99-01, Revision 6, states that an Alert applies when:

> Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety.... Any releases are expected to be limited to small fractions of the EPA PAG exposure levels.

EAL CA6 in NEI 99-01, Revision 6, is intended to ensure that an Alert is declared only when an actual or potential substantial degradation of the level of safety of the plant has occurred as a result of a hazardous event. However, there may be cases where a hazardous event only causes damage to a single safety system component or train. Additionally, an Alert classification should not be made if the damage from the hazardous event is limited to a safety system component or a safety system train that was inoperable or out of service prior to the event occurring.

In its May 10, 2018, letter, the licensee's proposed EAL CA2 would require an Alert classification for a hazardous event that results in indications of degraded performance in one train of a multi-train safety system with either indications of degraded performance or visible damage to a second train of the safety system. These indications should be significant enough that the operability or reliability of the second safety system train is a concern. Although

different from EAL CA6 in NEI 99-01, Revision 6, the licensee's proposed EAL CA2 is acceptable because it ensures that an Alert would be declared only when an actual or potential substantial degradation of the level of safety of the plant has occurred as a result of a hazardous event.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, and logical progression for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.3 Recognition Category 'E' – Independent Spent Fuel Storage Installation

3.3.1 EAL E-HU1 [E-HU1]

This EAL applies to an event that results in damage to the confinement boundary of a storage cask containing spent fuel. This EAL is primarily intended to ensure that key ERO members and OROs are aware of the cask damage, resources necessary to respond to the event are mobilized, and protective measures, if warranted, are promptly implemented.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, and logical progression for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.4 Recognition Category 'F' – Fission Product Barrier Matrix

3.4.1 EAL Set FA1/FS1/FG1 [FA1/FS1/FG1]

The intent of this EAL set is to ensure that an emergency classification is declared upon a loss or potential loss of one or more fission product barriers during power operations, startup, hot standby, or hot shutdown, as applicable. This EAL set uses plant condition-based thresholds as triggers within a particular logic configuration needed to reflect a loss or potential loss of a fission product barrier. Non-passive, large LWRs in the United States have three fission product barriers: fuel cladding, the RCS, and primary containment. Licensees are to develop thresholds that provide EAL decision-makers input into making an event declaration based upon degradation of one or more of these fission product barriers.

There are numerous triggers used as logic inputs to decide on the appropriate classification based upon the number of loss and/or potential loss indicators that are triggered for each barrier. These indicators are redundant with other similar indicators in Recognition Categories 'R' and 'S.'

The NRC staff verified that the logic used to determine the appropriate emergency classification is consistent with the generic EAL scheme development guidance in NEI 99-01, Revision 6. The progression from an Alert to a GE classification level is appropriate and consistent with EAL scheme development guidance.

- FA1 – Any loss or any potential loss of either the fuel clad or RCS barrier.
- FS1 – Loss or potential loss of any two fission product barriers.
- FG1 – Loss of any two fission product barriers and loss or potential loss of the third fission product barrier.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, ease of upgrading/downgrading, instrumentation, and setpoints for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.5 Recognition Category 'H' – Hazards

3.5.1 EAL Set HU1/HA1/HS1 [HU1/HA1/HS1/HG1]

The intent of this EAL set is to ensure that an emergency classification is declared based upon a security-related event. The generic EAL set was developed using the guidance from NRC

Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," dated July 18, 2005, and RIS 2006-12, "Endorsement of Nuclear Energy Institute Guidance 'Enhancements to Emergency Preparedness Programs for Hostile Action'," dated July 19, 2006 (ADAMS Accession Nos. ML051740058 and ML072670421, respectively). Based upon lessons learned from the implementation and use of this EAL set, particularly the insights gained from combined security and emergency preparedness drills, the licensee's proposed EAL set does not include EAL HG1.

EAL HG1 of NEI 99-01, Revision 6, addresses a hostile action that results in the loss of physical control of the facility. Such an action can reasonably be expected to exceed EPA early phase PAG exposure levels offsite for more than the immediate site area, which is the criteria for EAL HG7 in NEI 99-01, Revision 6. Therefore, in NEI 99-01, Revision 6, EAL HG1 is bounded by the EAL HG7. Additionally, any event that could result in a radiological release in excess of EPA early phase PAGs would be bounded by EALs AG1 or AG2 in NEI 99-01, Revision 6. The NRC staff verified that the licensee's EALs RG1, RG2, and HG7 bound the events addressed by EAL HG1 in NEI 99-01, Revision 6.

The NRC staff also verified that the progression from a UE to an SE classification level is appropriate and consistent with EAL scheme development guidance.

- HU1 – This EAL addresses events that pose a threat to plant personnel or safety systems, including notification of an aircraft threat.
- HA1 – This EAL addresses the occurrence of a hostile action within the owner controlled area or notification of an aircraft attack threat within 30 minutes of the site.
- HS1 – This EAL addresses the occurrence of a hostile action within the protected area.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, and ease of upgrading/downgrading for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.5.2 EAL HU4 [HU2]

The intent of this EAL is to ensure that an emergency classification is declared based upon a seismic event that results in accelerations at the plant site greater than those specified for an operating basis earthquake. This EAL is primarily intended to ensure that key ERO members and OROs are aware of the earthquake magnitude at the plant site and that post-event damage assessments are promptly implemented. This EAL is considered part of an EAL set containing the licensee's EALs CA2 and MA5, depending on the operating mode applicable at the time of

the event. Indications of earthquake induced damage to components containing radioactive materials are bounded by Recognition Category 'F', as well as EALs RA1, RS1, or RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, instrumentation, and setpoints for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.5.3 EAL HU6 [HU3]

The intent of this EAL is to ensure that an emergency classification is declared based upon the effects that hazardous events may have on the facility that are considered to be precursors to a more significant event or condition or have potential impacts that warrant emergency notification to local, State, and Federal authorities. Hazards addressed include:

- Tornado strike within the protected area;
- Internal room or area flooding requiring electrical isolation of a safety system component;
- Movement of personnel within the protected area is impeded due to an offsite event involving hazardous materials;
- A hazardous event that results in onsite conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles; and
- Other site-specific events.

This EAL is primarily intended to ensure that key ERO members and OROs are aware of the hazardous event affecting the plant site, and post-event damage assessments are promptly implemented. In addition, other site-specific events that may impact the effective implementation of the site emergency plan are considered.

This EAL is considered part of an EAL set containing the licensee's EALs CA2 and MA5, depending on the operating mode applicable at the time of the event. Indications of hazard-induced damage to components containing radioactive materials are bounded by Recognition Category 'F', as well as EALs RA1, RS1, or RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, and logical progression for this EAL are consistent with the overall EAL scheme development guidance and

address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.5.4 EAL HU3 [HU4]

The intent of this EAL is to ensure that an emergency classification is declared based upon the effect that a fire may have on the facility, which would be indicative of a potential degradation of the level of safety of the plant. This EAL is primarily intended to ensure that key ERO members and OROs are aware of the fire, and post-event damage assessments are promptly implemented. This EAL is considered part of an EAL set containing the licensee's EALs CA2 and MA5, depending on the operating mode applicable at the time of the event. Indications of a protracted fire involving radioactive materials are bounded by Recognition Category 'F', as well as EALs RS1 and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, and logical progression for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.5.5 EAL HA5 [HA5]

The intent of this EAL is to ensure that an emergency classification is declared based upon the effect that toxic, corrosive, asphyxiating, or flammable gases may have on the facility, which precludes or impedes access to equipment necessary for normal plant operations, cooldown, or shutdown. This EAL is primarily intended to ensure that the plant ERO is activated to support the control room in removing the impediment to normal access to the affected area or room. Indications of a protracted loss of access to equipment necessary for normal plant operations, cooldown, or shutdown are bounded by Recognition Category 'F', as well as EALs RS1 and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, and logical progression for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.5.6 EAL Set HA2/HS2 [HA6/HS6]

The intent of this EAL set is to ensure that an emergency classification is declared based upon a control room evacuation with a transfer of control to an alternate location.

The NRC staff verified that the progression from an Alert to an SAE classification level is appropriate and consistent with EAL scheme development guidance. The GE classification level for this specific accident progression is bounded by Recognition Category 'F', as well as EAL RG1.

- HA2 – This EAL addresses an evacuation of the control room that results in transfer of plant control to alternate locations.
- HS2 – This EAL addresses an evacuation of the control room that results in transfer of plant control to alternate locations, and the control of a key safety function cannot be reestablished in a timely manner.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, and ease of upgrading/downgrading for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.5.7 EAL Set HU7/HA7/HS7/HG7 [HU7/HA7/HS7/HG7]

The intent of this EAL set is to provide decision-makers with an escalating emergency classification to consider when, in their judgment, entry into the site's emergency plan and mobilization of the licensee's ERO and OROs is warranted.

The NRC staff verified that the progression from a UE to a GE classification level is appropriate and consistent with EAL scheme development guidance.

- HU7 – This EAL addresses unanticipated conditions, not explicitly addressed elsewhere, that warrant declaration of an emergency because conditions exist that are believed by the Emergency Director to fall under the emergency classification level description for a UE.
- HA7 – This EAL addresses unanticipated conditions, not explicitly addressed elsewhere, that warrant declaration of an emergency because conditions exist that are believed by the Emergency Director to fall under the emergency classification level description for an Alert.
- HS7 – This EAL addresses unanticipated conditions, not explicitly addressed elsewhere, that warrant declaration of an emergency because conditions exist that are believed by the Emergency Director to fall under the emergency classification level description for an SAE.
- HG7 – This EAL addresses unanticipated conditions, not explicitly addressed elsewhere, that warrant declaration of an emergency because conditions exist that are believed by the Emergency Director to fall under the emergency classification level description for a GE.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, and ease of upgrading/downgrading for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.6 Recognition Category 'M' – System Malfunction

3.6.1 EAL Set MU1/MA1/MS1/MG1 [SU1/SA1/SS1/SG1]

The intent of this EAL set is to ensure that an emergency classification is declared based upon a loss of ac power sources to the emergency electrical buses during power operations, startup, hot standby, or hot shutdown, as applicable.

The NRC staff reviewed the licensee's evaluation and justification for site-specific changes associated with this EAL set and verified that the progression from a UE to a GE classification level is appropriate and consistent with EAL scheme development guidance.

- MU1 – This EAL addresses a loss of all offsite ac power sources to emergency buses for 15 minutes or longer.
- MA1 – This EAL addresses a significant degradation of ac power sources such that any additional single failure would result in a loss of all ac power to safety systems.
- MS1 – This EAL addresses a loss of all ac power source to emergency buses for 15 minutes or longer. Such a loss would compromise the performance of all safety systems requiring electric power including those necessary for emergency core cooling, containment heat removal/pressure control, spent fuel heat removal and the ultimate heat sink.
- MG1 – This EAL addresses a prolonged loss of all ac power sources to emergency buses.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, ease of upgrading/downgrading, instrumentation, and setpoints for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.6.2 EAL Set MU4/MA4 [SU2/SA2]

The intent of this EAL set is to ensure that an emergency classification is declared based upon the unplanned loss of available indicators in the control room during power operations, startup, hot standby, or hot shutdown, as applicable.

The NRC staff verified that the progression from a UE to an Alert classification level is appropriate and consistent with EAL scheme development guidance. The SAE and GE classification levels for this specific accident progression are bounded by Recognition Category 'F', as well as EALs RS1 and RG1.

- MU4 – This EAL addresses the difficulty associated with monitoring normal plant conditions without the ability to obtain safety system parameters from within the control room.
- MA4 – This EAL addresses the difficulty associated with monitoring rapidly changing plant conditions during a transient without the ability to obtain safety system parameters from within the control room.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, and ease of upgrading/downgrading for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.6.3 EAL RU3 [SU3]

The intent of this EAL is to ensure that an emergency classification is declared when reactor coolant activity is greater than allowable limits in the plant technical specifications during power operations, startup, hot standby, or hot shutdown, as applicable. This EAL is primarily intended to ensure that key ERO members are aware of the elevated reactor coolant activity and support the control room in implementation of appropriate response measures. Escalation of the emergency classification is bounded by Recognition Category 'F', as well as EALs RA1, RS1, and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, and instrumentation and setpoints for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.6.4 EAL MU6 [SU4]

The intent of this EAL is to ensure that an emergency classification is declared when the plant has indications of RCS leakage during power operations, startup, hot standby, or hot shutdown, as applicable. The indications for this EAL are redundant to corresponding indicators for a loss or potential loss of fission product barriers, as well as radiation monitoring, to ensure reactor and/or fission product barrier events are recognized. This EAL is primarily intended to ensure

that key ERO members are aware of the RCS leakage and support the control room in implementation of appropriate response measures. Escalation of the emergency classification is bounded by Recognition Category 'F,' as well as EALs RA1, RS1, and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, instrumentation, and setpoints for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.6.5 EAL Set MU3/MA3/MS3 [SU5/SA5/SS5]

The intent of this EAL set is to ensure that an emergency classification is declared based upon the effect that a failure of the reactor protection system (RPS) may have on the plant during power operations or startup, as applicable.

The NRC staff verified that the progression from a UE to an SAE classification level is appropriate and consistent with EAL scheme development guidance. The GE classification level for this event is bounded by Recognition Category 'F', as well as EAL RG1.

- MU3 – This EAL addresses a failure of the RPS to initiate or complete an automatic or manual reactor trip that results in a reactor shutdown, and either a subsequent operator manual action taken at the reactor control consoles or an automatic trip is successful in shutting down the reactor.
- MA3 – This EAL addresses a failure of the RPS to initiate or complete an automatic or manual reactor trip that results in a reactor shutdown, and subsequent operator manual actions taken at the reactor control consoles to shut down the reactor are also unsuccessful.
- MS3 – This EAL addresses a failure of the RPS to initiate or complete an automatic or manual reactor trip that results in a reactor shutdown, all subsequent operator actions to manually shutdown the reactor are unsuccessful, and continued power generation is challenging the capability to adequately remove heat from the core and/or the RCS.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, ease of upgrading/downgrading, instrumentation, and setpoints for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the

EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.6.6 EAL MU7 [SU6]

The intent of this EAL is to address a significant loss of onsite or offsite communications capability during power operation, startup, hot standby, or hot shutdown, as applicable. This EAL is primarily intended to ensure that key ERO members, OROs, and the NRC are aware of the loss of communications capabilities, the resources necessary to restore communications are mobilized, and compensatory measures are promptly implemented. Considering that a loss of emergency communications capability would not involve an actual or potential substantial degradation to the level of safety of the plant, no escalation path is necessary for this EAL.

The communication methods derived for this EAL are consistent with the overall EAL scheme development guidance. The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, and logical progression for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.6.7 EAL Set MU8 [SU7]

The intent of this EAL is to ensure that an emergency classification is declared when there is a failure of one or more containment penetrations to automatically isolate (close) when required during power operations, startup, hot standby, or hot shutdown, as applicable. It also addresses an event that results in high containment pressure with a concurrent failure of containment pressure control systems. The indications for this EAL are redundant to corresponding indicators from a loss or potential loss of fission product barriers, as well as radiation monitoring, to ensure reactor and/or fission product barrier events are recognized. This EAL is only applicable to pressurized-water reactor designs. Therefore, this EAL applies to CCNPP and Ginna, but it is not applicable to NMP-1 and NMP-2 since they are boiling-water reactors.

This EAL is primarily intended to ensure that key ERO members and OROs are aware of significant challenges to containment integrity, and compensatory measures are promptly implemented. The escalation of the emergency classification level is bounded by Recognition Category 'F', as well as EALs RA1, RS1, and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, instrumentation, and setpoints for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.6.8 EAL Set MS2/MG2 [SS8/SG8]

The intent of this EAL set is to ensure that an emergency classification is declared when a loss of vital dc power occurs for 15 minutes or longer during power operations, startup, hot standby, or hot shutdown, as applicable, as this condition compromises the ability of the licensee to monitor and control safety systems.

The NRC staff verified that the progression from an SAE to a GE classification level is appropriate and consistent with EAL scheme development guidance.

- MS2 – This EAL addresses a loss of vital dc power, which compromises the ability to monitor and control safety systems.
- MG2 – This EAL addresses the loss of all ac and vital dc power sources for 15 minutes or longer.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression, ease of upgrading/downgrading, instrumentation, and setpoints for this EAL set are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL set is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL set is consistent with the key characteristics of an effective EAL scheme (identified in

Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL set acceptable.

3.6.9 EAL MA5 [SA9]

The intent of this EAL is to ensure that an emergency classification is declared when a hazardous event leads to potential damage to safety systems needed for the current operating mode. The hazardous events include an earthquake, flooding, high winds, tornado strike, explosion, fire, or other events with similar hazard characteristics as determined by the shift manager. This EAL is primarily intended to ensure that the plant ERO is activated to support the control room in understanding the event impacts and restoring affected safety system equipment to service. Indications of hazard induced damage to components containing radioactive materials are bounded by Recognition Category 'F', as well as EALs RS1 and RG1.

The NRC-endorsed guidance in NEI 99-01, Revision 6, states that an Alert applies when:

> Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety.... Any releases are expected to be limited to small fractions of the EPA PAG exposure levels.

EAL SA9 in NEI 99-01, Revision 6, is intended to ensure that an Alert is declared only when an actual or potential substantial degradation of the level of safety of the plant has occurred as a result of a hazardous event. However, there may be cases where a hazardous event only causes damage to a single safety system component or train. Additionally, an Alert classification should not be made if the damage from the hazardous event is limited to a safety system component or a safety system train that was inoperable or out of service prior to the event occurring.

In its May 10, 2018, letter, the licensee's proposed EAL MA5 would require an Alert classification for a hazardous event that results in indications of degraded performance in one train of a multi-train safety system with either indications of degraded performance or visible damage to a second train of the safety system. These indications should be significant enough that the operability or reliability of the second safety system train is a concern. Although different from EAL SA9 in NEI 99-01, Revision 6, the licensee's proposed EAL MA5 is acceptable because it ensures that an Alert would be declared only when an actual or potential substantial degradation of the level of safety of the plant has occurred as a result of a hazardous event.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff verified that the numbering, sequencing, formatting, and logical progression for this EAL are consistent with the overall EAL scheme development guidance and address the site-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4). The NRC staff also verified that the EAL is worded in an unambiguous manner that addresses human factors engineering and user-friendliness concerns, is technically complete for each classification level, addresses issues regarding completeness and accuracy of Appendix 1 to NUREG-0654, and uses objective and observable values based on site-specific indications.

Based on the above, the NRC staff concludes that the site-specific implementation method for this EAL is consistent with the key characteristics of an effective EAL scheme (identified in

Section 2.3 above), and meets the requirements of 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.7 Review Summary

The NRC staff has reviewed the technical bases for the proposed EAL scheme, the modifications from NEI 99-01, Revision 6, and the licensee's evaluation of the proposed changes. The licensee chose to modify its proposed EAL scheme from the generic EAL scheme development guidance provided in NEI 99-01, Revision 6, in order to adopt a format that is better aligned with how it currently implements its EALs, as well as with site-specific writer's guides and preferences. The staff verified that these modifications do not alter the intent of any specific EAL within a set, recognition category, or within the entire EAL scheme as described in NEI 99-01, Revision 6. Thus, the proposed changes meet the requirements in Appendix E to 10 CFR Part 50 and the planning standards of 10 CFR 50.47(b).

The NRC staff determined that the proposed EAL scheme uses objective and observable values, is worded in a manner that addresses human factors engineering and user friendliness concerns, follows logical progressions for escalating events, and allows for event downgrading and upgrading based upon the potential risk to the public health and safety. Risk assessments were appropriately used to set the boundaries of the emergency classification levels and ensure that all EALs that trigger an emergency classification are in the same range of relative risk. In addition, the staff determined that the proposed EAL scheme is technically complete and consistent with EAL schemes implemented at similarly designed plants.

The NRC staff verified that the instrumentation and setpoints derived for this proposed EAL scheme are consistent with the overall EAL scheme development guidance, address the site-specific implementation strategies provided, and are consistent with a standard EAL scheme.

Based on its review, the NRC staff finds that the licensee's proposed EAL scheme is acceptable and provides reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency. Specifically, the staff concludes that the licensee's EAL basis document for CCNPP, Ginna, NMP-1, and NMP-2, which were provided with the May 31, 2017, application, as supplemented by letters dated January 31 and May 10, 2018, are acceptable for implementation.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Maryland and New York State officials were notified of the proposed issuance of the amendment on May 16, 2018. The State officials had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted areas, as defined in 10 CFR Part 20, and changes an inspection or surveillance requirement. The NRC staff has determined that the amendments involve no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding, which was published in the FR on August 1, 2017 (82 FR 35838), that the

amendments involve no significant hazards consideration, and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Raymond Hoffman, NSIR/DPR

Date of issuance: June 26, 2018

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2; CALVERT CLIFFS INDEPENDENT SPENT FUEL STORAGE INSTALLATION; NINE MILE POINT NUCLEAR STATION, UNITS 1 AND 2; AND R. E. GINNA NUCLEAR POWER PLANT – ISSUANCE OF AMENDMENTS REVISING EMERGENCY ACTION LEVEL SCHEMES (CAC NOS. MF9836–MF9840, EPID L-2017-LLA-0237) DATED JUNE 26, 2018

DISTRIBUTION:

PUBLIC
RidsNrrPMExelon Resource
RidsNrrDorlLpl1 Resource
RidsNrrDorlLpl3 Resource
RidsNrrLAIBetts Resource
RidsNrrLASRohrer Resource
RidsAcrs_MailCTR Resource
RidsRgn1MailCenter Resource
RidsNrrPMCalvertCliffs Resource
RidsNrrPMNineMilePoint Resource
RidsNrrPMREGinna Resource
RidsNsirDpr Resource
RidsNrrDorl Resource
RidsNrrOd Resource
RidsNmssDsfmSflb Resource
RHoffman, NSIR
MNorris, NSIR

ADAMS Accession No.: ML18137A614 *by e-mail

OFFICE	DORL/LPL3/PM	DORL/LPL3/LA	NSIR/DPR/RLB/BC
NAME	BPurnell	SRohrer	JAnderson (MNorris for)*
DATE	5/21/18	5/21/18	4/17/18
OFFICE	OGC NLO*	NMSS/DSFM/SFLB/BC*	DORL/LPL3/BC
NAME	JGillespie	JMcKirgan	DWrona
DATE	6/1/18	6/13/18	5/25/18
OFFICE	DORL/DD	NRR/OD(A)	DORL/LPL3/PM
NAME	GSuber	BHolian (MEvans for)	BPurnell
DATE	6/12/18	6/25/18	6/26/18

OFFICIAL RECORD COPY