



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

December 12, 2017

Ms. Mary J. Fisher
Senior Director Fort Calhoun
Station Decommissioning
Omaha Public Power District
Fort Calhoun Station
9610 Power Lane, Mail Stop FC-2-4
Blair, NE 68008

SUBJECT: FORT CALHOUN STATION, UNIT 1 - ISSUANCE OF AMENDMENT
RE: REVISE EMERGENCY PLAN TO THE PERMANENTLY DEFUELED
EMERGENCY PLAN AND PERMANENTLY DEFUELED EMERGENCY ACTION
LEVEL SCHEME (CAC NO. MF8951; EPID L-2016-LLA-0036)

Dear Ms. Fisher:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 295 to Renewed Facility Operating License No. DPR-40 for the Fort Calhoun Station, Unit 1 (FCS), in response to your application dated December 16, 2016, as supplemented by letter dated May 15, 2017.

The amendment revises the Emergency Plan and Emergency Action Level (EAL) scheme for the permanently defueled condition. The proposed permanently defueled Emergency Plan and EAL scheme are commensurate with the significantly reduced spectrum of credible accidents that can occur in the permanently defueled condition and are necessary to properly reflect the conditions of the facility while continuing to preserve the effectiveness of the emergency plan.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in cursive script that reads "James Kim".

James Kim, Project Manager
Special Projects and Process Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosures:

1. Amendment No. 295 to DPR-40
2. Safety Evaluation

cc: Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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OMAHA PUBLIC POWER DISTRICT

DOCKET NO. 50-285

FORT CALHOUN STATION, UNIT 1

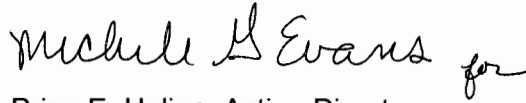
AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 295
Renewed License No. DPR-40

1. The Nuclear Regulatory Commission (NRC, the Commission) has found that:
 - A. The application for amendment by the Omaha Public Power District (the licensee), dated December 16, 2016, as supplemented by letter dated May 15, 2017, 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 license 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. 295, Renewed Facility Operating License No. DPR-40 is hereby amended to authorize the revision to the Fort Calhoun Station, Unit 1 Emergency Plan and Emergency Action Level Scheme as set forth in the Omaha Public Power District application dated December 16, 2016, as supplemented by letter dated May 15, 2017, and as evaluated in the NRC staff's safety evaluation issued with this amendment.
3. The license amendment is effective April 7, 2018, and shall be implemented within 90 days of the effective date.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script that reads "Michael H. Evans" followed by a small flourish.

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

Date of Issuance: December 12, 2017



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 295 TO RENEWED FACILITY

OPERATING LICENSE NO. DPR-40

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT 1

DOCKET NO. 50-285

1.0 INTRODUCTION

Fort Calhoun Station, Unit 1 (FCS), is a decommissioning power reactor located on approximately 660 acres midway between Fort Calhoun and Blair, Nebraska, on the west bank of the Missouri River, with an additional exclusion area of 582 acres on the northeast bank of the river, directly opposite the plant buildings. Omaha Public Power District (OPPD, the licensee) is the holder of the Renewed Facility Operating License No. DPR-40, issued pursuant to the Atomic Energy Act of 1954, as amended, and Part 50, "Domestic Licensing of Production and Utilization Facilities," of Title 10 of the *Code of Federal Regulations* (10 CFR), authorizing the licensee to possess and store spent nuclear fuel and greater-than-Class C radioactive waste at the permanently shutdown and defueled FCS facility.

By letter dated June 24, 2016 (Reference 1), pursuant to 10 CFR 50.82(a)(1)(i), OPPD certified to the U.S. Nuclear Regulatory Commission (NRC) that it planned to cease power operations at FCS by December 31, 2016. By letter dated August 25, 2016 (Reference 2), OPPD supplemented its June 24, 2016, letter updating its prior certification to the NRC, pursuant to 10 CFR 50.82(a)(1)(i), of its intention to permanently cease power operations at the FCS facility on October 24, 2016.

By letter dated November 13, 2016 (Reference 3), OPPD submitted a certification to the NRC, pursuant to 10 CFR 50.82(a)(1)(ii), that all spent fuel had been permanently removed from the FCS reactor vessel and placed in the FCS spent fuel pool (SFP). Upon the docketing of the certifications, the 10 CFR Part 50 license for FCS no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). Spent fuel is currently stored on-site in the FCS SFP and a dry cask independent spent fuel storage installation (ISFSI) at the FCS facility.

By letter dated December 16, 2016 (Reference 4), and as supplemented by letters dated February 10, April 14, and April 20, 2017 (References 5, 6, and 7, respectively), OPPD requested a license exemption from specific emergency planning (EP) requirements contained in 10 CFR 50.47, "Emergency plans," and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, based on the permanently

shutdown and defueled condition of the FCS reactor. The requested exemptions will be implemented no earlier than 530 days after the reactor was permanently shut down (estimated as April 7, 2018).

By letter dated December 16, 2016 (Reference 8), and as supplemented by letter dated May 15, 2017 (Reference 9), OPPD submitted a license amendment request to revise the FCS Emergency Plan, referred to hereafter as the Permanently Defueled Emergency Plan (PDEP), and the FCS Emergency Action Level (EAL) scheme, based on the NRC staff's approval of the proposed exemptions. The licensee's letter dated December 16, 2016, contained a copy of the proposed PDEP and EAL scheme, including a description and evaluation of the proposed changes and a comparison to the EAL scheme provided in Nuclear Energy Institute (NEI) document NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," November 2012 (Reference 10). The licensee submitted the FCS PDEP and the FCS EAL scheme to the NRC for approval in accordance with 10 CFR 50.54(q)(4) and Section IV.B.2 to Appendix E of 10 CFR Part 50.

A supplemental letter dated May 15, 2017, provided additional information that clarified the application, 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* on March 28, 2017 (82 FR 15383).

1.1 Discussion

The licensee submitted the proposed FCS PDEP to the NRC in accordance with 10 CFR 50.54(q)(4), contingent on the NRC's prior approval of certain exemptions from specific requirements of 10 CFR 50.47 and Appendix E to 10 CFR Part 50. By letter dated December 11, 2017 (Reference 11), the NRC staff granted OPPD exemptions from certain EP requirements in 10 CFR 50.47 and Appendix E to 10 CFR Part 50, in accordance with 10 CFR 50.12, "Specific exemptions," and based, in part, on the low risks associated with the permanently shutdown and defueled condition of the FCS reactor.

In granting the requested exemptions, the NRC primarily relied on the FCS site-specific analyses, which provided reasonable assurance that: (1) an offsite radiological release would not exceed the U.S. Environmental Protection Agency (EPA) early phase protective action guide (PAG), contained in the "PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017 (Reference 12), at the site's exclusion area boundary for the remaining design-basis accidents applicable to the FCS facility in its permanently shutdown and defueled condition, and (2) in the unlikely event of a severe beyond-design-basis accident resulting in a loss of all cooling to the spent fuel stored in the FCS SFP, there would be a significant amount of time between the initiating event and the possible onset of conditions that could result in a zirconium cladding fire. This time provides a substantial opportunity for event mitigation. The FCS is required to maintain effective strategies, sufficient resources and adequately trained personnel to mitigate such an event. If State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for the offsite response organizations (OROs) to implement these measures using a comprehensive, or "all-hazards," emergency management plan (CEMP) approach.¹

¹ A CEMP in this context, also referred to as an emergency operations plan, is addressed in the Federal Emergency Management Agency's (FEMA's) Comprehensive Preparedness Guide 101, "Developing and Maintaining Emergency Operations Plans," Version 2.0, November 2010 (Reference 13).

The Commission's approval of the requested exemptions is documented in a Staff Requirements Memorandum (SRM) dated October 25, 2017 (Reference 14), responding to SECY-17-0080, "Request by Omaha Public Power District for Exemptions from Certain Emergency Planning Requirements," dated August 10, 2017 (Reference 15). With the NRC's approval of the requested EP exemptions, OPPD states that the proposed FCS PDEP will continue to meet the planning standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted.

In addition to the proposed changes in the PDEP, OPPD is proposing to change the entire EAL scheme to reflect the permanently shutdown and defueled condition of the FCS reactor. In accordance with Section IV.B.2 of Appendix E to 10 CFR Part 50, the licensee must receive NRC approval before implementing a change to the entire EAL scheme. The licensee states that the changes to the EAL scheme are consistent with the methodology recommended for permanently shutdown and defueled reactors, as provided in NEI 99-01, Revision 6.

2.0 REGULATORY EVALUATION

2.1 Emergency Plan

Section 50.47 of 10 CFR Part 50 sets forth the emergency plan requirements for nuclear power plant facilities. 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) of the Commission's regulations establishes the standards that the onsite and offsite emergency response plans must meet for NRC staff to make a positive finding that there is reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency.

Appendix E, Section IV, "Content of Emergency Plans," to 10 CFR Part 50 provides the requirements for the content of the emergency plans.

The current EP regulations contained in 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50, apply to both operating power reactors, and permanently shutdown and defueled power reactors. However, the EP regulations are silent with regard to the fact that once a power reactor permanently ceases operation and permanently removes fuel from the reactor vessel, the risks of credible emergency accident scenarios at the facility are greatly reduced.

Therefore, the consistent practice for permanently shutdown and defueled power reactors has been for the licensees to request exemptions, under 10 CFR 50.12, which allow changes to the facility's emergency plan, commensurate with the credible site-specific risks that are present during decommissioning. Such EP exemptions generally recognize the reduction in radiological risk as spent fuel ages and the preclusion of accidents that are strictly applicable to an operating power reactor.

The consistent practice of granting exemptions from the Commission's EP regulations for permanently shutdown and defueled power reactor licensees is a well-established part of the NRC regulatory process. This process allows licensees to address site-specific situations or to

implement alternative approaches in response to circumstances that are not necessarily contemplated in regulations that are generally intended for operating power reactors. The exemption process, which allows the NRC to provide relief in appropriate circumstances where safety and security continue to be assured, is not unique to the decommissioning of power reactors or to the specific technical areas of EP. The Commission makes decisions on exemption requests on a site-specific, case-by-case basis, following an established process that includes the NRC staff's detailed technical assessment of individual exemption requests. According to 10 CFR 50.12, the Commission may grant exemptions from the requirements of its regulations, which are authorized by law, will not present an undue risk to the public health and safety, are consistent with the common defense and security, and present special circumstances.

The guidance in Revision 1 to NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980 (Reference 16), provides an acceptable method for power reactor licensees to develop radiological emergency response plans. Revision 1 to NUREG-0654/FEMA-REP-1 provides guidance for the format and content of an emergency plan, which can be applied to the planning standards in 10 CFR 50.47(b), as exempted for FCS. Attachment 1, "Staff Guidance for Evaluation of Permanently Defueled Emergency Plans," to Interim Staff Guidance (ISG) document NSIR/DPR-ISG-02, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," dated May 11, 2015 (Reference 17), provides an acceptable method for the staff's review of PDEPs for sites undergoing decommissioning and was developed from the remaining applicable evaluation criteria in Section II to NUREG-0654/FEMA-REP-1.

2.2 Emergency Action Level Scheme

Paragraph 50.47(b)(4) of 10 CFR, as exempted for FCS, requires that a licensee's emergency response plan contain:

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.~~

This requirement emphasizes a standard emergency classification and action level scheme, assuring that implementation methods are relatively consistent throughout the industry for a given reactor and containment design, while simultaneously providing an opportunity for a licensee to modify its EAL scheme as necessary to address plant-specific design considerations or preferences.

Section IV.B of Appendix E to 10 CFR Part 50, as exempted for FCS, states:

1. 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.~~ The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and state and local governmental authorities, and approved by the NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis.

2. 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. Licensees shall follow the change process in § 50.54(q) for all other emergency action level changes.

This review is based upon a revision to the FCS EAL scheme provided in the licensee's letter dated December 16, 2016 (Reference 8), which was reviewed by the NRC for acceptability. As part of this review, the NRC staff assessed the site-specific modifications made by OPPD to the guidance provided by NEI 99-01, Revision 6. The purpose of NEI 99-01, Revision 6, is to provide guidance to nuclear power plant operators on the development of a site-specific emergency classification scheme. This methodology has been endorsed by the NRC, by letter dated March 28, 2013 (Reference 18), as an acceptable method for developing EALs required by 10 CFR 50.47(b)(4), Section IV.B.1 of Appendix E to 10 CFR Part 50, and the associated planning standard evaluation criteria in Section II.D of NUREG-0654/FEMA-REP-1, Revision 1. In addition, the methodology also provides guidance for permanently shutdown and defueled power reactors for the development of a site-specific emergency classification scheme.

3.0 TECHNICAL EVALUATION

3.1 Emergency Plan

Pursuant to OPPD's certifications of permanent cessation of operations and permanent removal of fuel under 10 CFR 50.82, "Termination of license," no reactor operations can take place, and FCS is prohibited from moving the fuel from the SFP to the reactor vessel. Consequently, the FCS PDEP describes the licensee's response to emergencies that may arise at FCS while it is in a permanently shutdown and defueled configuration. Recognizing that there are no longer any credible design-basis accidents that would result in offsite dose consequences large enough to require offsite radiological emergency preparedness (REP) plans, the PDEP no longer specifies the requirements for formal offsite REP planning. Additionally, the onsite EP activities contained in the FCS PDEP are reduced in scope. The PDEP specifically implements the planning standards of 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted by the NRC's letter to OPPD dated December 11, 2017 (Reference 11).

This safety evaluation summarizes the NRC staff's technical evaluation of the FCS PDEP based on the planning standards of 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted for FCS, and using the remaining applicable evaluation criteria

provided in NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-ISG-02. The proposed changes, as exempted for FCS, are shown with a strikethrough of the current wording associated with the regulations.

3.1.1 Assignment of Responsibility (Organizational Control)

Paragraph 50.47(b)(1) of 10 CFR, as exempted for FCS, requires in a licensee's emergency plan that:

Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations ~~within the Emergency Planning Zones~~ have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

The Shift Manager position is staffed 24 hours a day, 7 days a week. This position is the senior management position at the facility during off-hours, and this position is responsible for monitoring facility conditions and approving onsite activities. The position has the authority, management ability, and technical knowledge to classify and declare an emergency event, and shall assume the position of Emergency Director once the emergency classification has been declared. This position is responsible for monitoring conditions, approving all onsite activities, and has the requisite authority, management ability, technical knowledge, and staff to manage the site emergency and recovery organization.

In addition to the Shift Manager, designated on-shift staff positions include a Non-Certified Operator and Radiation Protection (RP) Technician, along with security personnel. The FCS Emergency Response Organization (ERO) is activated at the Alert classification, and will augment the on-shift staff within approximately 2 hours of an Alert declaration. However, the ERO may be activated, in part or in whole, at any time at the discretion of the Shift Manager/Emergency Director. The on-shift staff can perform all required response actions, including initiation of SFP mitigation measures, until the ERO arrives.

The OROs may respond to a declared emergency at FCS. Each of these OROs listed below are capable of 24-hour response and operation.

Firefighting support:

- Blair Volunteer Fire Department – primary
- Fort Calhoun Volunteer Fire Department – backup

Transportation of injured and contaminated injured personnel:

- Blair Volunteer Fire Department – primary
- Fort Calhoun Volunteer Fire Department – backup

Offsite medical treatment:

- Blair Hospital – medical support for work related injuries
- University of Nebraska Medical Center, in Omaha, a regional Radiation Health Center which provides services for the treatment of radiologically contaminated injuries and radiation exposure evaluation

Local law enforcement:

- Nebraska State Patrol
- Washington County Sheriff's Department

The details of their responsibilities are described in Section 3.0, "Emergency Response Support and Resources," of the FCS PDEP and are described in their respective letter of agreement between each organization and OPPD. These letters are maintained on file in the Emergency Planning Department at FCS, as noted in the letter dated December 16, 2016.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately describes the concept of operations for individuals and organizations responsible for responding to emergencies at the site; identifies the position of Emergency Director as the individual in charge of the emergency response, and identifies the minimum staff on duty at the plant during all shifts to provide emergency response. Additional personnel are available on an on-call basis to respond to plant emergencies. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(1), and the requirements of Sections IV.A.1, A.2, A.4, and A.7 of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to assignment of responsibility (organization control), are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.2 Onsite Emergency Organization

Paragraph 50.47(b)(2) of 10 CFR requires that a licensee's emergency response plan states:

On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified.

The FCS facility has designated personnel on-shift at all times, including a designated Shift Manager, Non-Certified Operator, and RP Technician, who would provide the initial response to an event. The Shift Manager is the on-shift individual who declares the initial emergency classification and assumes the role of Emergency Director. The Shift Manager has the authority to immediately and unilaterally initiate any emergency actions. The PDEP also specifies the non-delegable and delegable responsibilities of the Emergency Director.

Members of the on-shift organization are trained on their responsibilities and duties in the event of an emergency and are capable of performing necessary response actions until the ERO arrives to augment on-shift staffing or the event is terminated. The on-shift staffing assignments include the roles and responsibilities for their emergency response functions. The relationship between normal and emergency response positions for the shift personnel is unchanged when an event occurs.

The FCS ERO augments the on-shift station organization's ability to respond to declared emergencies. Personnel are trained and assigned to the ERO based on either their normal job qualifications or by being specifically trained to fill a position. The ERO is activated when an Alert is declared, or at the discretion of the Shift Manager for an Unusual Event, and at such time, the Shift Manager assumes the responsibilities of the Emergency Director. The

Emergency Director is responsible for ensuring that an ERO callout method is initiated to augment the on-shift staff. The minimum augmented staff is an RP Coordinator and a Technical Coordinator. The on-shift positions, and the augmented positions that fulfill emergency staffing capabilities, are depicted in Table 2.1, "On-Shift and Emergency Response Organization Staffing Requirements," of the FCS PDEP. This table, along with Figure 2.1, "On-Shift and Emergency Response Organization," provides a graphical representation of the functional responsibilities for designated on-shift positions and the augmented positions that fulfill emergency staffing capabilities.

The FCS PDEP further provides that in the event of an emergency at FCS requiring additional personnel and other support resources, the FCS ERO can be augmented with manpower and equipment support from offsite organizations, as previously discussed in Section 3.1.1 of this safety evaluation. Arrangements are in place through letters of agreement for ambulance services, treatment of contaminated and injured patients, fire support services, and law enforcement response, as requested by FCS.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP identifies: (1) the onsite ERO and its relationship to the normal shift complement; (2) the on-shift individual responsible for emergency response is the Shift Manager, who has the authority and responsibility to initiate the functional responsibilities for emergency response; (3) adequate staffing to provide initial facility accident response in key functional areas; (4) timely augmentation of response capabilities is available; (5) local services are identified with letters of agreement in place; and (6) arrangements for the treatment and transportation of contaminated injured personnel. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(2), and the requirements of Sections IV.A.1, A.2, A.4, A.9, and C.1 of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to the onsite emergency organization, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.3 Emergency Response Support and Resources

Paragraph 50.47(b)(3) of 10 CFR, as exempted for FCS, requires that a licensee's emergency response plan states:

Arrangements for requesting and effectively using assistance resources have been made, ~~arrangements to accommodate State and local staff at the licensee's Emergency Operations Facility have been made~~, and other organizations capable of augmenting the planned response have been identified.

The Emergency Director is authorized to request assistance as needed, including fire, ambulance and local law enforcement response. Letters of agreement are in place for those local agencies that will respond to the site and for the local hospital that may be required to treat a contaminated injured individual from the site, as designated in the FCS PDEP. These letters of agreement are discussed in Section 3.1.1 of this safety evaluation.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately describes the arrangements for requesting assistance from other organizations or individuals in an emergency,

and that this assistance is supported by letters of agreement. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(3), and the requirements of Sections IV.A.6 and A.7 of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to emergency response support and resources, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.4 Emergency Classification System

Paragraph 50.47(b)(4) of 10 CFR, as exempted for FCS, requires that a licensee's emergency response plan states:

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.~~

The FCS PDEP identifies that the emergency classification system covers a spectrum of possible radiological and non-radiological emergencies at FCS, considering the permanently shutdown and defueled status of the facility. A graded scale of response for distinct classifications of emergency conditions, actions appropriate for those classifications, and criteria for escalation to a more severe classification are provided. The revised emergency classification scheme categorizes accidents and/or emergency situations into one of two emergency classification levels depending on emergency conditions at the time of the incident. The emergency classification levels applicable at FCS, considering the permanently shutdown and defueled status of the facility, in order of increasing severity, are a Notification of Unusual Event (Unusual Event) and Alert. Each of these emergency classification levels requires notification to the States of Nebraska and Iowa, as well as the NRC, as designated in the FCS PDEP. The classification of emergencies up to an Alert is consistent with the regulations for an ISFSI in 10 CFR 72.32(a)(3) and the exemptions granted, as described in the NRC's letter dated December 11, 2017 (Reference 11).

The FCS EAL scheme is based on NEI 99-01, Revision 6, as applied to a permanently shutdown and defueled power reactor with fuel stored in an onsite SFP and ISFSI, which specifies emergency classification levels of an Unusual Event and Alert. When indications are available to on-shift personnel that an EAL has been met, the event is assessed and the corresponding emergency classification level is declared. The FCS maintains the capability to assess, classify, and declare an emergency condition within 30 minutes after the availability of indications that an EAL threshold has been reached. The expectation is that emergency classifications are to be made as soon as conditions are present and recognizable for the classification, but within 30 minutes or less in all cases of conditions being present. The initiating conditions, their corresponding emergency classification levels, and the technical bases for each classifiable EAL threshold are contained in the FCS EAL Technical Bases Document (Enclosure 2 to the licensee's letter dated December 16, 2016; Reference 8).

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately identifies: (1) that the emergency classification system covers a spectrum of possible radiological and non-radiological emergencies at FCS; (2) a graded scale of response for distinct classifications of emergency conditions; (3) actions appropriate for those classifications, and (4) criteria for

escalation to a more severe classification. The specific instruments, parameters, or equipment status are described for each emergency classification level in the EAL scheme. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(4), and the requirements of Sections IV.B.1, C.1, and C.2 of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to the emergency classification system, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.5 Notification Methods and Procedures

Paragraph 50.47(b)(5) of 10 CFR, as exempted for FCS, requires that a licensee's emergency response plan states:

Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow-up messages to response organizations ~~and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.~~

The FCS PDEP identifies the Emergency Director position, which is assumed by the Shift Manager, as having the authority and responsibility for initiating notifications to Federal and State officials following the declaration of an Unusual Event or Alert. On-site staff is informed of an emergency condition through the use of the facility public address system, office telephone, and/or wireless devices capable of receiving telephone calls and text messages. In the event that personnel required to staff ERO positions are not on-site at the time an emergency is declared, they may be contacted by commercial telephone including land lines and/or wireless devices capable of receiving telephone calls and text messages. Mobilization of the ERO will be conducted under the direction of the Emergency Director, according to personnel assignments and telephone numbers maintained in various telephone directories.

Notification to the responsible authorities in the States of Nebraska and Iowa is required within 60 minutes of the declaration of an emergency classification. The respective States will then have responsibility to notify their respective counties, as deemed appropriate. The commercial telephone network serves as the primary means to provide emergency notification to the designated State points of contact, and is used to provide initial and updated notifications and for general information flow with these agencies. In the event the commercial telephone system is unavailable, wireless communications can be used to make emergency notifications. In addition, electronic means may be used to transmit the notification message.

The licensee, in coordination with the States of Nebraska and Iowa, have established the contents of the initial emergency messages to be sent from FCS in the event an emergency classification is declared. These messages contain the following information if it is known and appropriate:

- Location of the incident,
- Name and telephone number (or communications channel identification) of caller,
- Date and time of the incident,
- Class of emergency,
- Licensee emergency response actions underway,

- Request for any needed onsite support by offsite organizations, and
- Prognosis for worsening or termination of event based on facility information.

The NRC Emergency Notification System (ENS) is a dedicated telephone system used to notify the NRC Operations Center of an emergency declaration. The NRC will be notified as soon as possible after State notifications and within 60 minutes of the declaration of an event classification or change in classification. In the event that the NRC ENS fails, commercial phone lines will be used to notify the NRC Operations Center. Notification to the NRC is the responsibility of the Emergency Director.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately describes the process for initiating notifications to the NRC and State officials, and the contents of the emergency messages to be sent. The licensee, in cooperation with the States of Nebraska and Iowa, has established mutually agreeable methods and procedures for notification of OROs (as discussed above), consistent with the approved emergency classification level scheme and the contents of the initial notification form. Follow-up calls will also be made to each of the lead agencies notified initially and will utilize a follow-up notification form with information similar to the initial notification form. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(5), and the requirements of Sections IV.A.6, A.7, C.1, C.2, D1, and D.3 of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to notification methods and procedures, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.6 Emergency Communications

Paragraph 50.47(b)(6) of 10 CFR, as exempted for FCS, requires that a licensee's emergency response plan states:

Provisions exist for prompt communications among principal response organizations to emergency personnel ~~and to the public~~.

A number of communications systems are available for use among the principal response organizations. Provisions for 24-hour per day notification to State authorities are discussed in Section 5.0, "Notification Methods and Procedures," of the FCS PDEP, as are provisions for activating licensee ERO personnel. Periodic testing of the emergency communications systems are described in Section 14.0, "Exercises and Drills," of the FCS PDEP.

The FCS Protected Area Paging System provides a means of intra-plant communications. Stations on this system provide access to the paging system and to intercom lines. These stations and speakers are placed throughout the facility, including the FCS Control Room. Buildings outside of the FCS Protected Area also have public address announcing capabilities. Access to the public address system in both locations can be accomplished via the site's telephone system. This system can be used to notify personnel of an emergency.

The commercial telephone system, as discussed previously in Section 3.1.5 of this safety evaluation, is the primary emergency notification system between FCS and State agencies, and is used to provide initial and follow-up notifications and for general information flow with these agencies.

Additional methods of communication are available to FCS staff to transmit information onsite and offsite during normal and emergency situations. Portable radios may be utilized by station personnel and ERO personnel during an emergency. The telephone system can be used for in-facility as well as outside communications. The telephone system is the primary means to activate the ERO upon declaration of an emergency, as directed by the Emergency Director. In the event that personnel required to staff emergency positions are not on-site at the time an emergency is declared, they may be contacted by commercial telephone, including land lines and/or wireless devices capable of receiving telephone calls and text messages. Telephone numbers are maintained in various telephone directories. The phone system includes many automated or programmable features that improve notification and allow flexibility. Wireless communications serve as the backup means of communication. In addition, electronic means may be used to transmit the notification message.

The NRC ENS utilizes the Federal Telecommunications System (FTS) telephone network for emergency communications. The FTS line exists between the NRC Operations Center and the FCS Control Room. Emergency notification, facility status information, and radiological information are communicated via the NRC ENS.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately identifies that provisions exist for prompt communications among principal response organizations to emergency personnel. The communication methods provide a reliable primary and backup means of communication; a 24-hour capability internal to the plant; and for plant-to-offsite communications with Federal, State, and local agencies. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(6) and the requirements of Sections IV.C.1, D1, and D.3 of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to emergency communications, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.7 Public Education and Information

Paragraph 50.47(b)(7) of 10 CFR, as exempted, requires that a licensee's emergency response plan states:

~~Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors);~~ [T]he principal points of contact with the news media for dissemination of information during an emergency **~~(including the physical location or locations)~~** are established in advance, and procedures for coordinated dissemination of information to the public are established.

As part of its normal corporate structure, OPPD maintains a Corporate Communications Division that can be called upon to provide resources as necessary. The Corporate Crisis Communication Plan provides guidance for the dissemination of information during emergencies. The spokesperson function would typically be performed by OPPD Corporate Communications Division personnel. However, the function could be performed by FCS or other corporate personnel. The spokesperson function participates in news conferences, as appropriate, with Federal, State, and local response organizations. Principal points of contact with news media are also determined by the Corporate Crisis Communication Plan.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP organization includes a communications position that would serve as the licensee's designated spokesperson should an emergency be declared at FCS. The spokesperson is available for media inquiries, and the positional duties include maintaining liaison with local media and coordinating with Federal, State, and local response organizations to disseminate appropriate information regarding an emergency at FCS. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(7), and the requirements of Sections IV.A.7 and D.2 of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to public education and information, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.8 Emergency Facilities and Equipment

Paragraph 50.47(b)(8) of 10 CFR requires that a licensee's emergency response plan states:

Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

The FCS PDEP identifies that, following the declaration of an emergency, the activities of the ERO are coordinated from the Control Room, where command and control is maintained. Facility personnel assess conditions; evaluate the magnitude and potential consequences of abnormal conditions; initiate preventative, mitigating and corrective actions, and perform onsite and offsite notifications. When activated, the ERO reports to the Control Room.

The licensee maintains and operates on-site monitoring systems needed to provide data that is essential for initiating emergency measures and performing accident assessment, including dose assessment and assessing the magnitude of a release. This includes monitoring systems for facility processes, radiological conditions, meteorological conditions, and fire hazards. Annunciator and computer alarms are provided for a variety of parameters, including SFP level and temperature. The manner in which process monitors are used for accident recognition and classification is detailed in FCS's Permanently Defueled EALs.

Radiation monitors provide continuous radiological surveillance. These monitors, which include Control Room readout and alarm functions, perform the following basic functions:

- Warn personnel of potential radiological health hazards,
- Give early warning of certain equipment malfunctions that might lead to a radiological hazard or facility damage, and
- Prevent or minimize the effects of inadvertent releases of radioactivity.

Plant instrumentation provides Control Room personnel with the following parameters necessary to perform dose assessment and determine the magnitude of a potential release:

- Gaseous and liquid effluent monitor readings, and
- Area radiation levels.

Meteorological data is available in the Control Room. The data is used to determine the projected radiological consequences in the event of an accidental release of radioactivity to the environment. In addition, the National Weather Service operates on a 24-hour per day basis. Upon request, this organization can provide FCS with meteorological conditions including predicted temperature inversions, precipitation, wind patterns, and velocity.

In addition to installed monitoring systems, onsite portable radiation and contamination monitoring equipment is available. Radiological emergency kits include protective equipment, radiological monitoring equipment and emergency supplies. Kits are located in the Control Room. The methods and frequencies for instrument calibration, repair, and replacement are maintained in accordance with facility procedures. Dosimetry kits include dosimetry, dosimeter chargers, and appropriate paperwork. Kits are located in the Control Room.

First aid equipment and supplies are located in the First Aid Room. Trauma and primary response kits are available throughout the facility. These kits are inspected and maintained in accordance with approved facility procedures. Contaminated/injured person kits are located near the Radiation Protection Count Room and are maintained in accordance with facility procedures.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately identifies that during a declared emergency, command and control is maintained in the Control Room. Facility personnel assess conditions; evaluate the magnitude and potential consequences of abnormal conditions; initiate preventative, mitigating and corrective actions; and perform onsite and offsite notifications. When activated, the ERO reports to the Control Room. Section 8.0, "Emergency Facilities and Equipment," of the FCS PDEP identifies the general category of equipment and supplies that make up equipment available to assist with emergency response. Section 16.2, "Inventory and Maintenance of Emergency Equipment," of the FCS PDEP discusses the inventory and maintenance of equipment. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(8), and the requirements of Sections IV.A and G of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to emergency facilities and equipment, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.9 Accident Assessment

Paragraph 50.47(b)(9) of 10 CFR, as exempted, requires that a licensee's emergency response plan states:

Adequate methods, systems, and equipment for assessing and monitoring actual or potential **offsite** consequences of a radiological emergency condition are in use.

Station procedures provide preventative and/or corrective actions that mitigate the consequences of events. Instrumentation, control systems, and radiation monitoring systems provide indications related to the safe and orderly implementation of corrective actions. These systems provide indication of SFP storage inventory, temperature, cooling, and supporting systems, and are discussed further in Section 3.1.8 of this safety evaluation.

The licensee maintains procedures and strategies for the movement of any necessary portable equipment that will be relied upon for mitigating the loss of SFP water. These mitigative strategies are maintained in accordance with License Condition 3.G of the FCS Renewed Facility Operating License and Technical Specifications. These diverse strategies provide defense-in-depth and ample time to provide makeup water or spray to the SFP prior to the onset of zirconium cladding ignition when considering very low probability beyond-design-basis events affecting the SFP.

Emergency plan implementing procedures (EPIPs) utilize radiological instrumentation readings and meteorological data to provide a rapid method of determining the magnitude of a radioactive release during an emergency. The licensee is capable of performing dose assessment 24 hours a day. Initial dose assessment is performed by qualified on-shift personnel, under the direction of the Emergency Director. When the ERO is augmented, the RP Coordinator assumes subsequent dose assessment responsibilities.

Meteorological data is available in the Control Room. The data is used to determine the projected radiological consequences in the event of an accidental release of radioactivity to the environment. In addition, the National Weather Service operates on a 24-hour per day basis. Upon request, this organization can provide FCS with meteorological conditions including predicted temperature inversions, precipitation, wind patterns, and velocity.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because Section 9, "Accident Assessment," of the FCS PDEP adequately identifies the onsite capabilities and resources available to provide initial and continuing information for accident assessment throughout the course of an event. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(9), and the requirements of Sections IV.A.4, B.1, C.2, and E of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to accident assessment, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.10 Protective Response

Paragraph 50.47(b)(10) of 10 CFR, as exempted, requires that a licensee's emergency response plan states:

A range of protective actions has been developed for the plume exposure pathway-EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway-EPZ appropriate to the locale have been developed.

The FCS PDEP identifies the protective actions for onsite personnel, including station personnel, contractors, and visitors (members of the public) located onsite, and will include:

- Site personnel accountability,
- Site egress control methods,
- Exposure and personnel contamination control,
- Use of protective equipment and supplies, and
- Medical and health support.

Accountability is considered and used as a protective action whenever a site-wide risk to health and safety exists and prudence dictates. If personnel accountability is required, at the direction of the Emergency Director, all individuals at the site (including non-essential employees, visitors, and contractor personnel) shall be notified by sounding the facility alarm and making announcements over the Public Address System. Following announcement of an emergency declaration, and when accountability has been requested, facility personnel are responsible for reporting to designated areas and aiding Security in the accountability process. Station procedures also provide actions to protect personnel during hostile actions.

Accountability of all personnel on the site should be accomplished within 60 minutes of the accountability announcement. If personnel are unaccounted for, teams shall be dispatched to locate the missing personnel. Accountability may be modified or suspended if the safety of personnel may be jeopardized by a security event or other event hazardous to personnel.

All visitors and unnecessary contractors are evacuated from the facility at the discretion of the Emergency Director. In the event of a suspected radiological release, personnel are monitored for radioactive contamination prior to leaving the FCS Protected Area. Portable radiation survey meters are available to monitor for potential contamination.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because Section 10, "Protective Actions," of the FCS PDEP adequately identifies the protective actions for onsite personnel, including station personnel, contractors, and visitors (members of the public), and provides that protective equipment and supplies are maintained to support an emergency response. The FCS PDEP also describes that plant evacuees are monitored for radioactive contamination prior to leaving the Protected Area. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(10), and the requirements of Sections IV.C.1, E, and I of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to protective response, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.11 Radiological Exposure Control

Paragraph 50.47(b)(11) of 10 CFR requires that a licensee's emergency response plan states:

Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

The FCS PDEP identifies all reasonable measures shall be taken to control the radiation exposure to emergency response personnel providing rescue, first aid, decontamination, emergency transportation, medical treatment services, or corrective or assessment actions within applicable limits specified in 10 CFR Part 20. The RP Coordinator will ensure radiological control areas are established in response to the event. The RP Coordinator directs control of access to radiological control areas, unless immediate access control is authorized by the Emergency Director to protect personnel or facilitate emergency repairs.

Individuals authorized to enter radiological control areas are required to have dosimetry capable of measuring a dose received from external sources of ionizing radiation. Emergency workers are issued permanent reading dosimeters (e.g., dosimeter of legal record) as a means of recording radiation exposure for permanent records prior to entering a radiological control area. Additionally, personnel are issued electronic alarming dosimetry capable of measuring dose and dose rate on a real time basis. Dose records are maintained in accordance with facility procedures.

The Emergency Director is responsible for authorizing personnel to receive doses in excess of 10 CFR Part 20 limits, if necessary, and is coordinated with the RP Coordinator when available. Table 11.1, "Emergency Exposure Criteria," of the FCS PDEP contains the guidelines for emergency exposure criteria, which is consistent with Table 2-2, "Response Worker Guidelines," provided in the EPA PAG Manual (Reference 12). Dosimeters are typically located in each of the emergency lockers in the Control Room.

During emergency conditions, normal facility decontamination and contamination control measures are maintained as closely as possible. However, these measures may be modified, by the Emergency Director, should conditions warrant. Contamination control measures are maintained to address access control, drinking water and food supplies, and the return of areas and items to normal use, in accordance with proper radiation and contamination control techniques. Documentation surveys and decontamination activities shall be maintained in accordance with facility procedures. Protective clothing is maintained in the Control Room, and additional sets are available. Monitoring and issuance of respiratory protection equipment will be conducted in accordance with station procedures.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately identifies the means for controlling radiological exposures for emergency workers. Emergency worker dose limits are established for designated activities and under specific conditions. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(11), and the requirements of Section IV.E of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to radiological exposure control, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.12 Medical and First Aid Support

Paragraph 50.47(b)(12) of 10 CFR requires that a licensee's emergency response plan states:

Arrangements are made for medical services for contaminated injured individuals.

The FCS PDEP identifies that FCS maintains on-shift personnel and equipment to provide first aid for personnel working at the site. Medical supplies for emergency first aid treatment are provided on the site at various locations. The FCS PDEP further provides that if immediate professional medical help is needed, local ambulance services are available to transport seriously ill, injured, or radioactively contaminated injured personnel to a designated medical facility. The licensee is capable of maintaining communications with the ambulance while transporting a patient. Patients can also be transported to a designated medical facility via medical ambulance helicopters.

Agreements are in place with Blair Hospital for medical support for work related injuries and the University of Nebraska Medical Center in Omaha, which has trained personnel and detailed procedures for handling radioactively contaminated patients from FCS. Refer to Section 3.1.1 of this safety evaluation for a description of agreements made with respective OROs responding to the FCS site in the event of an emergency.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately identifies that arrangements are maintained for primary and backup hospitals or medical facilities located in the vicinity of the station, and for prompt ambulance transport of persons with injuries involving radiological contamination to designated hospitals. The licensee also maintains onsite first aid supplies and equipment necessary for the treatment of contaminated or injured persons. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(12), and the requirements of Sections IV.A.6, A.7, and E of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to medical and first aid support, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.13 Recovery and Reentry

Paragraph 50.47(b)(13) of 10 CFR requires that a licensee's emergency response plan states:

General plans for recovery and reentry are developed.

The FCS PDEP identifies that planning for the recovery involves the development of general principles and an organizational capability that can be adapted to any emergency situation. Upon termination of an emergency and transition to recovery phase, the Emergency Director assembles the recovery organization to address the specific emergency circumstances of the terminated event.

The Emergency Director directs the recovery organization and is responsible for:

- Ensuring the facility is maintained in a safe condition,
- Managing onsite recovery activities, and
- Keeping corporate support apprised of recovery activities and requirements.

The remainder of the recovery is accomplished using the normal facility organization and ERO, as necessary to provide radiological and technical expertise to the Emergency Director in order to restore the facility to normal conditions. The recovery organization's responsibilities include:

- Maintaining comprehensive radiological surveillance of the facility to assure continuous control and recognition of problems;
- Controlling access to the area and exposure to workers;
- Decontaminating affected areas and/or equipment;
- Conducting clean-up and restoration activities;
- Isolating and repairing damaged systems; and
- Documenting all proceedings of the event and reviewing the effectiveness of the emergency organization in reducing public hazard and plant damage.

When plant conditions allow a transition from the emergency phase to the recovery phase, the Emergency Director conducts a plant emergency management meeting to discuss the recovery organization. The actions taken by this organization concerning termination of the emergency proceeds in accordance with a recovery plan developed specifically for the accident conditions.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately identifies the general goals for plant recovery, and the licensee's recovery organization will be based on a normal FCS organization and function with a FCS executive management position responsible for directing all site activities. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(13), and the requirements of Section IV.H. of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to recovery and reentry, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.14 Exercises and Drills

Paragraph 50.47(b)(14) of 10 CFR requires that a licensee's emergency response plan states:

Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.

The FCS PDEP identifies that periodic exercises are conducted to evaluate major portions of emergency response capabilities. Biennial exercises shall be conducted to test the timing and content of implementing procedures and methods, and to ensure that emergency personnel are familiar with their duties. The OROs are offered the opportunity to participate to the extent assistance would be expected during an emergency declaration.

An Exercise/Drill Coordinator is responsible for the overall development of the scenario package. A scenario development team is assembled (if needed) by the Exercise/Drill Coordinator to create the various segments of the scenario which include, but are not limited to, the following:

- Objective(s),
- Date, time period, place and participating organizations,
- Simulation lists,
- Timeline of real and simulated events,
- A narrative summary, and
- List of controllers and participants.

The final scenario shall be approved by a designated member of senior facility management. Drill/Exercise confidentiality must always be maintained.

Periodic drills are conducted to develop and maintain key emergency response skills. Deficiencies as a result of exercises or drills are identified and corrected. A medical emergency drill shall be conducted annually and involves a simulated contaminated injury. The University of Nebraska Medical Center Radiation Health Center is invited to participate in an annual exercise and/or scheduled drill(s) to demonstrate and practice the receipt and treatment of contaminated patients. Involvement by hospital and medical transport services may be included as part of any drill or exercise.

Health Physics drills are conducted semi-annually involving response to, and the analysis of, simulated, elevated in-facility airborne and liquid samples and direct radiation measurements in the environment. This drill can be performed as part of any drill or exercise.

Off-hours, unannounced augmentation drills shall be conducted semiannually to estimate emergency response personnel response times. No actual travel is required. Participants provide an estimated time of arrival to their designated ERO position.

Fire Drills are conducted in accordance with the respective FCS Fire Protection Plan and procedures. Medical drills are conducted annually, involving a simulated contaminated injury.

The NRC ENS used to communicate with the NRC is tested monthly. Other communication systems, as detailed in Section 6.2, are used on a frequent basis. Therefore, periodic testing of these systems is not necessary.

Critiques will evaluate the participant's performance during a drill or exercise. Exercise and drill performance objectives are evaluated against measurable demonstration criteria. As soon as possible following the conclusion of each drill/exercise, a critique, including participants, controllers, and evaluators, is conducted to evaluate the ability of the participants to meet the performance objectives. Deficiencies are identified and entered into the corrective action system. A written report is prepared, including the evaluation of designated objectives, and references corrective actions and recommendations resulting from the drill/exercise.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately identifies the general goals for exercises and drills, the intent of exercise scenarios, and that exercise and drill

performance objectives are evaluated against measurable demonstration criteria. As soon as possible following the conclusion of each exercise or drill, a critique will be conducted. The Emergency Planning Manager is responsible for ensuring that items identified in the critique are correctly dispositioned and for ensuring resolution of each item under the site's corrective actions program. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(14), and the requirements of Sections IV.E.9 and F of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to exercises and drills, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.15 Radiological Emergency Response Training

Paragraph 50.47(b)(15) of 10 CFR requires that a licensee's emergency response plan states:

Radiological emergency response training is provided to those who may be called on to assist in an emergency.

Radiological emergency response training is provided to those who may be called on to assist in an emergency. The FCS management is responsible to ensure all members of the ERO receive the required initial training and continuing training. The training program for ERO personnel is based on applicable requirements of Appendix E to 10 CFR Part 50 and position-specific responsibilities as defined in the PDEP. The ERO personnel in the following categories receive initial training and annual retraining.

Shift Managers/Emergency Directors, Technical Coordinators, and RP Coordinators shall have training conducted such that proficiency is maintained on topics listed below. These topics should be covered as a minimum on an annual basis:

- EAL classification,
- Dose assessment,
- Federal, State and local notification procedures,
- ERO augmentation,
- Emergency exposure control,
- Mitigating strategies for a catastrophic loss of SFP inventory, and
- Recovery.

The FCS personnel are available during emergencies to perform emergency response activities as an extension of their normal duties, and receive duty specific training. This includes facility on-shift personnel, maintenance, radiation protection, and security personnel. Personnel assigned to liaison with offsite fire departments are trained in accordance with the Fire Protection Program. Personnel assigned the responsibility of on-shift first aid shall attend first aid training.

An overview of the FCS PDEP will be given to all personnel allowed unescorted access into the Protected Area at FCS. Personnel will receive this information during initial training and will be requalified on an annual basis. This training will include identification of the emergency alarm, the fire alarm, and the steps to follow for a plant and site evacuation.

Training is offered annually to OROs which may provide specialized services during an emergency responding to the FCS onsite (fire-fighting, medical services, transport of

contaminated and/or injured personnel, etc.). The training shall be structured to meet the needs of that organization with respect to the nature of their support. Topics of event notification, site access, basic radiation protection and interface activities are included in the training.

The FCS procedures outline the process to document training of the FCS ERO and to verify training provided to OROs.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately identifies the level and depth of the emergency preparedness training program to which individuals are to be trained, and the training for ERO personnel is developed from position-specific responsibilities defined in the PDEP. Training is provided or formally offered annually to OROs. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(15), and the requirements of Section IV.F of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to radiological emergency response training, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.1.16 Emergency Plan Development and Review

Paragraph 50.47(b)(16) of 10 CFR requires that a licensee's emergency response plan states:

Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.

Senior plant leadership is responsible for the implementation of actions required to periodically exercise the FCS PDEP and the EIPs and for maintaining an effective ERO staff. Senior plant leadership is responsible for the final approval of the FCS PDEP and the EIPs used for emergency classification and maintaining an effective emergency response capability at FCS. The Emergency Planning Manager is responsible for the development, administration, and maintenance of the PDEP, EIPs, review and approval of all EIP changes (with the exception of the EIP used for emergency classification), planner training, the overall development and implementation of the FCS ERO Training and Qualification Program, and coordination of offsite emergency organization activities.

The FCS PDEP, Permanently Defueled EAL Technical Bases Document, and the EIPs included in Appendix A of the PDEP, are reviewed annually and updated as needed. All proposed changes will be reviewed in accordance with 10 CFR 50.54(q) to ensure that the change would not compromise the effectiveness of any other EIPs or degrade the effectiveness of the PDEP.

Letters of Agreement with support agencies shall be reviewed annually. Agreements will be revised or recertified. Recertification may include a recertification letter/memorandum, purchase order, e-mail, documented telephone conversation, or other correspondence. Designated FCS management has the authority to enter into these agreements with outside organizations.

The EAL scheme is reviewed with the States of Nebraska and Iowa, Washington County (Nebraska), and Harrison County (Iowa) on an annual basis.

The FCS Emergency Telephone Directory will be maintained in specified locations and updated quarterly.

Periodic inventory, testing, and calibration of emergency equipment and supplies are conducted in accordance with approved facility procedures. This equipment includes, but is not limited to:

- Portable radiation monitoring equipment,
- Emergency medical response equipment,
- Dosimeters, and
- Portable radios.

Emergency equipment and instrumentation shall be inventoried, inspected, and operationally checked periodically as indicated by the procedure and after each use. Sufficient reserves of equipment and instrumentation are stocked to replace emergency equipment and instrumentation removed from service for calibration and/or repair.

Based on the NRC staff's review of the FCS PDEP as described above, the NRC staff finds that the proposed FCS PDEP meets the applicable evaluation criteria of NUREG-0654/FEMA-REP-1, as outlined in Attachment 1 to NSIR/DPR-02, because the FCS PDEP adequately identifies responsibility for the issuance, control, and revision/updating of the PDEP, EIPs and support documents, including required changes identified during audits, assessments, training, drills, and exercises. Based on this review, the NRC staff concludes that planning standard 10 CFR 50.47(b)(16), and the requirements of Section IV.G of Appendix E to 10 CFR Part 50, as exempted for FCS, pertaining to emergency plan development and review, are addressed in an acceptable manner in the FCS PDEP, considering the permanently shutdown and defueled status of the facility.

3.2 Emergency Action Level Scheme

The licensee currently utilizes an EAL scheme based on NEI 99-01, Revision 6, as applied to an operating power reactor, with site-specific modifications due to design issues and/or licensee preference. The licensee is converting to an EAL scheme using the guidance in Section 8, "Independent Spent Fuel Storage Installation (ISFSI) ICs [Initiating Conditions] and EALs," and Appendix C, "Permanently Defueled Station ICs/EALs," of NEI 99-01, Revision 6, as applied to a permanently shutdown and defueled power reactor with fuel stored in an onsite SFP and ISFSI, with site-specific modifications due to design issues and/or licensee preference.

As discussed in the NRC's safety evaluation associated with the exemptions granted to FCS from certain planning standards of 10 CFR 50.47 and requirements of Appendix E to 10 CFR Part 50 (Reference 11), there are no longer any design-basis accidents at FCS that can result in a radiological release exceeding the EPA PAGs at the exclusion area boundary. Therefore, the NRC staff's assessment of the risks and consequences of a radiological release at FCS, based on its permanently shutdown and defueled condition, concluded that the risks and consequences are insufficient to warrant emergency classification levels for a Site Area Emergency or General Emergency. As a result, the only emergency classification levels applicable to FCS are an Unusual Event or an Alert.

In its letter dated December 16, 2016 (Reference 8), OPPD submitted its proposed EAL scheme for FCS, along with its technical basis and the EAL numbering scheme. The proposed EAL scheme is unique to FCS, as it contains site-specific designations and descriptions.

The NRC staff verified that the proposed EAL scheme is consistent with the guidance provided in Section 8 and Appendix C to NEI 99-01, Revision 6, to assure that the proposed EAL scheme meets the standards of 10 CFR 50.47(b)(4) and requirements of Section IV.B of Appendix E to 10 CFR Part 50, as exempted for a permanently shutdown and defueled power reactor with spent fuel stored onsite in the SFP and ISFSI. The NRC staff reviewed the proposed site-specific EAL scheme, technical basis, comparison matrix, and all additional information provided and found that both the proposed EAL scheme has site-specific modifications from the NEI 99-01, Revision 6, guidance due to specific plant designs and licensee preference.

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 plant-specific implementation strategies provided, and are consistent with a standard EAL scheme.

Although the EALs must be plant-specific, to ensure consistency and regulatory stability, the NRC staff reviewed the proposed EAL scheme with respect to the following key characteristics of an effective EAL scheme found in the NRC-endorsed guidance of NEI 99-01, Revision 6:

- 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 and disposing of the issues of completeness and accuracy raised in Appendix 1 to NUREG-0654/FEMA-REP-1 (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 FCS EAL technical basis document is an integral part of the emergency classification scheme. The material in this document supports proper emergency classification decision-making by providing informed background and development information in a readily accessible format. It can be referred to in training situations and when making an actual emergency classification, if necessary. The document is also useful for establishing configuration management controls for emergency preparedness-related equipment and explaining an emergency classification to offsite authorities.

To aid in understanding the nomenclature used in this safety evaluation, the proposed EAL scheme for FCS includes two emergency classification levels: (1) Unusual Event (U), and (2) Alert (A). Initiating conditions (ICs) for entry into each of the two emergency classification levels are specified for conditions relating to:

- Abnormal Radiological Levels/Radiological Effluent (PD-R),
- Hazards and Other Conditions Affecting Plant Safety (PD-H),
- System Malfunction (PD-S), based on the permanently shutdown and defueled status of the facility with spent fuel stored onsite in an SFP, and
- Hazards and Other Conditions Affecting ISFSI (E-H).

This safety evaluation uses the numbering system from the proposed plant-specific EAL scheme; however, the numbering system from the generic EAL scheme development guidance contained in NEI 99-01, Revision 6, is annotated in [brackets] to aid in cross-referencing the site-specific EAL numbering convention with that of the guidance. The NRC staff verified that the numbering, sequencing, formatting, logical progression and ease of upgrading/downgrading for this EAL are consistent with the overall EAL scheme development guidance and address the plant-specific implementation strategies provided, and are, therefore, consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

For each IC, specific EAL threshold values are identified that would require the declaration of an emergency classification level. The EAL scheme is intended to provide multiple and diverse threshold values for an Unusual Event and Alert to ensure accurate EAL classification and timely declaration.

The FCS site made the following changes to the generic EAL scheme, throughout the proposed EAL scheme, as follows:

- Used the term "Unusual Event (UE)" instead of "Notification of Unusual Event (NOUE)," as FCS determined that its use was consistent with the current EAL matrix and agreed in meaning and intent with NEI 99-01, Revision 6;
- Removed the emergency classification level as it is identified in the IC;
- Added the recognition category for each EAL;
- Removed reference to "Operating Mode," as it did not apply in a permanently defueled condition;
- Removed the "Example Emergency Action Levels";
- Changed the numbering of the EALs; and
- Added site-specific basis information.

The NRC staff determined that these changes are administrative in nature, and as such, acceptable, since they do not impact the overall EAL scheme.

An evaluation of the acceptability of the proposed EAL scheme is provided in the sections below.

3.2.1 Category "PD-R" [PD-A]: Abnormal Radiation Levels/Radiological Effluent

3.2.1.1 EAL PD-RU1, "Release of gaseous or liquid radioactivity greater than 2 times the radiological effluent Offsite Dose Calculation Manual (ODCM) for 60 minutes or longer"

This EAL addresses a potential or actual 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). It includes any gaseous or liquid radiological release, monitored or unmonitored, including those for which a radioactivity discharge permit is normally prepared.

The NRC staff verified that the FCS implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme, as follows:

- IC:
 - Inserted "ODCM" for the site-specific effluent release controlling document.
- EAL:
 - Removed "radiation" from monitor notation and pluralized monitor;
 - Included Table R-1, Effluent Monitor Thresholds, to provide effluent monitor description and threshold values, and
 - Replaced "2 times the alarm setpoint established by a current radioactivity discharge permit" with "2 X High Alarm."

For the site-specific change to reference the ODCM, the NRC staff verified that FCS implemented the developer notes for identifying the site-specific effluent release controlling document identified in NEI 99-01, Revision 6, as the basis for this specific EAL. Because FCS has implemented NRC Generic Letter 89-01, "Implementation of Programmatic Controls for Radiological Effluent Technical Specifications [(RETS)] in the Administrative Controls Section of the Technical Specifications and the Relocation of Procedural Details of RETS to the Offsite Dose Calculation Manual or to the Process Control Program," dated January 31, 1989 (Reference 19), pursuant to the guidance, the ODCM is FCS's site-specific effluent release controlling document. The site-specific changes to the generic EAL scheme are administrative and do not affect the applicability of the EAL.

The NRC staff verified that the FCS Permanently Defueled EAL Technical Bases Document (Enclosure 2 of Reference 8) provides the specific ODCM references that the high alarm setpoint for the Stack Gas Monitor RM-17-156/157 is established to ensure the ODCM release

limits are not exceeded and that the high alarm setpoint for Service Water Discharge Header Discharge Monitor (RM-17-351) is also established to ensure the ODCM release limits are not exceeded.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 3.2 of this safety evaluation), and meets the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.1.2 EAL PD-RA1 [PD-AA1], "Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mRem [millirem] TEDE [total effective dose equivalent] or 50 mRem thyroid CDE [committed dose equivalent]"

This EAL addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1 percent of the EPA PAGs. It includes both monitored and unmonitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant, uncontrolled release). The NRC staff verified that the FCS implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- PD-RA 1.1: Added "valid" to better enhance the identified information and a site-specific monitor list and threshold values (calculation FC08515 was developed to determine the RM-052 and RM-062 monitor threshold values and FC08516 was developed for the RM-055 monitor threshold values);
- EAL PD-RA 1.2: Identified the site boundary as the site-specific dose receptor point;
- EAL PD-RA 1.3: Identified the site boundary as the site-specific dose receptor point; and
- EAL PD-RA 1.4: Identified the site boundary as the site-specific dose receptor point.

The licensee provides that:

1. The TEDE dose is set at 1 percent of the EPA PAG of 1000 mRem while the 50 mRem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.
2. The threshold value for RM-052 was determined via Calculation FC08515. The RM-052 reading that corresponds to the 10 mRem TEDE (1.1×10^8 cpm [counts per minute]) threshold exceeds the maximum count rate for the monitor (1×10^7 cpm). Based on the guidance presented in

NEI 99-01, Revision 6, the EAL threshold value is set at 90 percent of the maximum monitor reading, corresponding to 9×10^6 cpm.

3. The threshold value for RM-062 was determined via Calculation FC08515. The RM-062 reading that corresponds to the 10 mRem TEDE (9.3×10^7 cpm) threshold exceeds the maximum count rate for the monitor (1×10^7 cpm). Based on the guidance presented in NEI 99-01, Revision 6, the EAL threshold value is set at 90 percent of the maximum monitor reading, corresponding to 9×10^6 cpm.
4. The threshold value for RM-055 was determined via Calculation FC08516. The RM-055 reading that corresponds to the 10 mRem TEDE threshold exceeds the maximum count rate for the monitor (1×10^7 cpm). Based on the guidance presented in NEI 99-01, Revision 6, the EAL threshold value is set at 90 percent of the maximum monitor reading, corresponding to 9×10^6 cpm.

The NRC staff finds this site-specific change acceptable, as the instrumentation values are within the range of the instrumentation to allow for accurate and timely classification of the EAL, as described in the NRC-accepted developer notes in NEI 99-01, Revision 6.

The distance from the reactor containment to the nearest site boundary is approximately 910 meters. For the purposes of these EALs, the FCS site boundary is an acceptable site-specific substitute for the generic "site-specific dose receptor point."

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 3.2 of this safety evaluation), and meets the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.1.3 EAL PD-RU2 [PD-AU2], "UNPLANNED rise in plant radiation levels"

This EAL is based upon site-specific indications of increased plant radiation levels caused by a decrease in water level above irradiated (spent) fuel. The increased radiation levels are indicative of a minor loss in the ability to control radiation levels within the plant. This condition is a potential degradation in the level of safety of the plant.

The NRC staff verified that the FCS implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Added "to below the normal range" to EAL 2.1.a. as it relates to the appropriate level indication, as per the following site-specific monitors: LT2846 (Spent Fuel Pool Level) and LI2846 (Local Indication);

- Added “a valid reading on” to EAL 2.1.b. for the following site-specific radiation monitors: RM-80, 85, and 87 (spent fuel storage area radiation monitor) and portable area radiation monitor (auxiliary building near fuel handling areas); and
- Also added definitions for UNPLANNED and NORMAL LEVELS to the FCS Basis.

The site-specific changes to EAL PD-RU2 are in accordance with the guidance provided in NEI 99-01, Revision 6, for this specific EAL. The developer notes in NEI 99-01, Revision 6, provide that the site-specific indications may include instrumentation values, such as water level, area radiation monitoring readings, and personnel reports. These site-specific indications are installed plant equipment with indications in the Control Room that provide timely indication for classifying this EAL. Therefore, the SFP low level alarm monitors are acceptable site-specific indications of increased plant radiation levels caused by a decrease in water level above irradiated (spent) fuel. The licensee provides that besides a water level decrease being primarily determined by indications from available level instrumentation, other sources of level indications may include reports from plant personnel or video camera observations (if available). A significant drop in the water level may also cause an increase in the radiation levels of adjacent areas that can be detected by monitors in those locations.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 3.2 of this safety evaluation), and meets the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.1.4 EAL PD-RA2 [PD-AU2], “UNPLANNED rise in plant radiation levels that impedes plant access required to maintain spent fuel integrity”

This EAL addresses increased radiation levels that impede necessary access to areas containing equipment that must be operated manually or that require local monitoring in order to maintain systems needed to maintain spent fuel integrity. As used here, “impede” includes hindering or interfering, provided that the interference or delay is sufficient to significantly threaten necessary plant access. As such, it represents an actual or potential substantial degradation of the level of safety of the plant.

The Alert classification for this EAL is primarily intended to ensure that the ERO is activated to support the on-shift personnel in removing the impediment to normal access to maintaining spent fuel integrity.

The NRC staff verified that the FCS implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Reworded EAL 2.2 to provide better guidance concerning access to areas and added site-specific areas, and
- Also added definitions for UNPLANNED and NORMAL LEVELS to the FCS Basis.

For the site-specific changes to EAL PD-RA2.2, the developer notes in NEI 99-01, Revision 6, provide that the list should include all areas requiring continuous occupancy to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity. The list that FCS provided includes six rooms, any of which are needed to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity.

The revisions to the wording of EAL PD-RA2.2 are administrative and do not affect the applicability of the EAL.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 3.2 of this safety evaluation), and meets the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.2 Category "PD-H": Hazards and Other Conditions Affecting Plant Safety

3.2.2.1 EAL PD-HU1 [PD-HU1], "Confirmed SECURITY CONDITION or threat"

This EAL is based upon any security-related event listed in the approved FCS Physical Security Plan that constitutes a threat/risk to site personnel or a potential degradation to the level of safety of the plant.

The NRC staff verified that the FCS implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Defined the site-specific security shift supervision title, "Security Shift Supervisor, and"
- Added definitions for HOSTAGE; HOSTILE ACTION; PROJECTILE, and SECURITY CONDITION.

The developer notes in NEI 99-01, Revision 6, provide that the "site specific security shift supervision" is the title of the on-shift individual responsible for supervision of the on-shift security force. For FCS, the Security Shift Supervisor is the title of the on-shift individual responsible for supervision of the on-shift security force. The definition of terms were consistent with the NEI 99-01, Revision 6, emergency classification scheme.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 3.2 of this safety evaluation), and meets the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.2.2 EAL PD-HA1 [PD-HA1], "HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes"

This EAL addresses the occurrence of a hostile action within the Owner Controlled Area or notification of an aircraft attack threat. This event will require rapid response and assistance due to the possibility of the attack progressing to the protected area, or the need to prepare the plant and staff for a potential aircraft impact.

The NRC staff verified that the FCS implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Defined the site-specific security shift supervision title, "Security Shift Supervisor."

The developer notes in NEI 99-01, Revision 6, provide that the "site specific security shift supervision" is the title of the on-shift individual responsible for supervision of the on-shift security force. For FCS, the Security Shift Supervisor is the title of the on-shift individual responsible for supervision of the on-shift security force.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 3.2 of this safety evaluation), and meets the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.2.3 EAL PD-HU2 [PD-HU2], "Hazardous event affecting equipment necessary for spent fuel cooling"

This EAL is based upon the effect that natural and destructive hazards may have on at least one train of a safety system needed for spent fuel cooling. The damage must be of sufficient magnitude that the system(s) train cannot, or potentially cannot, perform its design function. This condition reduces the margin to a loss or potential loss of the fuel clad barrier, and therefore, represents a potential degradation of the level of safety.

The NRC staff verified that the FCS implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- For 1.a., added low river level as indicated by less than 976 feet, 9 inches MSL [mean sea level] elevation, and
- For 1.b., replaced "SAFETY SYSTEM" with "system."

The licensee provided that this EAL addresses a hazardous event that causes damage to at least one train of equipment needed for spent fuel cooling. All systems required to support SFP cooling will be considered to be within the scope of this EAL. Following permanent cessation of operations, SFP cooling will be accomplished using the standby fuel pool cooling subsystem. The standby fuel pool cooling subsystem is a two-train system designed to prevent a single active failure from disabling both trains. The system consists of two pumps and two heat exchangers that are normally lined up as two parallel trains. Each train of the standby fuel pool cooling subsystem can be placed in service remotely. Term "SAFETY SYSTEM" was replaced with "system," as the term is not applicable in the permanently shutdown and defueled condition. The IC language continues to focus on a hazardous event affecting equipment necessary for spent fuel cooling.

The licensee added "low river level" indication as a site-specific hazard, which is consistent with the developer notes in NEI 99-01, Revision 6, that the EAL developers should consider other significant site-specific hazards (e.g., a seiche).

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 3.2 of this safety evaluation), and meets the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.2.4 EAL PD-HU3 [PD-HU3], "Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Unusual Event (UE)"

This EAL is based upon providing EALs to consider when the decision-maker's judgment deems an emergency classification is warranted, based on the definition and intent of the emergency classification level.

The NRC staff verified that the FCS implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Replaced "...unless further degradation of safety systems occurs" with "...further degradation of systems needed to maintain spent fuel cooling occurs."

The licensee replaced the statement "...unless further degradation of safety systems occurs" with "... further degradation of systems needed to maintain spent fuel cooling occurs," as the phrase is not applicable in the permanently shutdown and defueled condition. The IC language continues to focus on a hazardous event affecting systems needed to maintain spent fuel cooling.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 3.2 of this safety evaluation), and meets the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.2.5 EAL PD-HA3 [PD-HA3], "Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert"

This EAL is based upon providing EALs to consider when the decision-maker's judgment deems an emergency classification is warranted, based on the definition and intent of the emergency classification level.

The licensee made no site-specific changes to the generic EAL scheme.

Based on the NRC staff's review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme. There are no site-specific differences to what is provided in the generic EAL development guidance, and thus this EAL continues to meet the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50 and therefore, is acceptable for implementation.

3.2.3 Category "PD-S": System Malfunction

3.2.3.1 EAL PD-SU1 [PD-SU1], "UNPLANNED spent fuel pool temperature rise"

This EAL is based upon a loss of the ability to maintain SFP cooling. If uncorrected, boiling could occur and result in a loss of water inventory and increased radiation levels.

The NRC staff verified that the FCS implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Appendix C to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Referenced the unplanned spent fuel temperature level (150 °F), "as indicated on T408A/B/C or locally by handheld instrument."

The FCS Updated Safety Analysis Report Chapter 9.6, "Auxiliary Systems – Spent Fuel Pool Cooling System" (Reference 20), states spent fuel pool cooling system was designed to remove decay heat from spent fuel assemblies stored in the pool and to control and maintain the chemistry and clarity of the pool water. It can remove decay heat from a full core discharged from the reactor 72 hours after shutdown at a rate of 3 assemblies/hour from a power level of 1500 megawatts thermal, while maintaining the pool water temperature below 140 degrees Fahrenheit (°F) (a heat load of 20.7 x 10⁶ British Thermal Units per hour). The NRC staff finds that this site-specific change to EAL PD-SU1.1 to reference the site-specific value of 150 °F is acceptable as it addresses a condition that is a precursor to a more serious event and represents a potential degradation to the safety to the plant. If uncorrected, boiling in the SFP will occur, and result in a loss of pool level and increased radiation levels.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 3.2 of this safety evaluation), and meets the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.2.4 Category "E": ISFSI Malfunction

3.2.4.1 E-HU1 [E-HU1], "Damage to a loaded cask CONFINEMENT BOUNDARY"

This EAL addresses an event that results in damage to the confinement boundary of a storage cask containing spent fuel. It applies to irradiated fuel that is licensed for dry storage beginning at the point that the loaded storage cask is sealed. The issues of concern are the creation of a potential or actual release path to the environment; degradation of one or more fuel assemblies due to environmental factors; and configuration changes, which could cause challenges in removing the cask or fuel from storage.

A spent fuel storage license contains technical requirements and operating conditions (fuel specifications, cask leak testing, surveillance, and other requirements) for the ISFSI and specifies what the licensee is authorized to store at the site.

The NRC staff verified that the FCS implementation of this EAL, except for the site-specific changes identified below, is consistent with the guidance provided in Section 8 to NEI 99-01, Revision 6.

The licensee made the following site-specific changes to the generic EAL scheme:

- Included the site-specific technical specification values of:
 - ≥ 1600 mRem/hr (gamma + neutron) on the Horizontal Storage Module (HSM) front surface, OR
 - ≥ 400 mRem/hr (gamma + neutron) on the HSM door centerline, OR
 - ≥ 16 mRem/hr (gamma + neutron) on the end shield wall exterior.

The licensee provided the values that are two times the site-specific cask-specific technical specification allowable radiation level. The developer notes in NEI 99-01, Revision 6, provide that the allowable radiation level for a spent fuel cask is a radiation reading two times the cask's technical specification level located in the Certificate of Compliance.

Based on the above, the NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme (identified in Section 3.2 of this safety evaluation), and meets the planning standard 10 CFR 50.47(b)(4) and the requirements of Section IV.B of Appendix E to 10 CFR Part 50. Therefore, the NRC staff finds this EAL acceptable.

3.3 Conclusions

3.3.1 Emergency Plan Conclusions

Based on the NRC staff's review of the proposed FCS PDEP as described in Section 3.1 of this safety evaluation, the staff finds that the proposed PDEP meets the planning standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted, and provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the facility. Therefore, the staff concludes that the licensee's proposed FCS PDEP, in its application dated December 16, 2016 (Reference 8), as supplemented by the licensee's letter dated May 15, 2017 (Reference 9), is acceptable.

3.3.2 Emergency Action Level Scheme Conclusions

The NRC staff has reviewed the technical basis for the proposed EAL scheme, the modifications from NEI 99-01, Revision 6, and the licensee's evaluation of the proposed changes. The OPPD chose, in part, to modify its EAL scheme from the generic EAL scheme development guidance provided in NEI 99-01, Revision 6, in order to adopt a format more in alignment with its currently approved EAL scheme, as well as alignment with licensee-specific writer's guides and preferences. The staff determined that these modifications are administrative in nature and do not alter the intent of any specific EAL within an EAL, EAL category, or within the entire EAL scheme as stated in NEI 99-01, Revision 6.

The NRC staff determined that the proposed EAL scheme uses objective and observable values, is worded in a manner that addresses human engineering and user friendliness concerns, follows logical progression 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 emergency classification are in the same range of relative risk.

Based on the above, and the NRC staff's review as described in Section 3.2 of this safety evaluation, the staff has determined that the proposed changes meet the guidance in NEI 99-01, Revision 6; the planning standard of 10 CFR 50.47(b)(4); and the requirements in Section IV.B to Appendix E of 10 CFR Part 50, as exempted for FCS. Therefore, the staff concludes that the proposed EAL scheme, as stated in Enclosures 2 and 3 of the licensee's letter dated December 16, 2016, is acceptable, and provides reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Nebraska State official was notified of the proposed issuance of the amendment on November 1, 2017. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves 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 that the amendment involves no significant hazards consideration and there has been no public comment on such finding published in the *Federal Register* on March 28, 2017 (82 FR 15383). Accordingly, the amendment meets 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 amendment.

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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

1. Burke, T. J., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "Certification of Permanent Cessation of Power Operations," dated June 24, 2016 (ADAMS Accession No. ML16176A213).
2. Burke, T. J., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "Certification of Permanent Cessation of Power Operations," dated August 25, 2016 (ADAMS Accession No. ML16242A127).
3. Burke, T. J., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "Certification of Permanent Removal of Fuel from the Reactor Vessel," dated November 13, 2016 (ADAMS Accession No. ML16319A254).
4. Marik, S. M., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR Part 50, Appendix E," dated December 16, 2016 (ADAMS Accession No. ML16356A578).
5. Fisher, M. J., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "Supplemental Information Needed For Acceptance of Requested Licensing Action RE: Fort Calhoun Station Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR Part 50, Appendix E (CAC NO. MF9067)," dated February 10, 2017 (ADAMS Accession No. ML17041A443).
6. Fisher, M. J., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information, Fort Calhoun Station, Unit No. 1 - Final Request for Additional Information Concerning Exemption from the Requirements of 10 CFR 50.47 and Appendix E (CAC MF9067)," dated April 14, 2017 (ADAMS Accession No. ML17104A191).

7. Fisher, M. J., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information, Fort Calhoun Station, Unit No. 1 - Request for Additional Information RE: Defueled Emergency Plan Exemption Request (CAC No. MF9067)," dated April 20, 2017 (ADAMS Accession No. ML17111A857).
8. Marik, S. M., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "License Amendment Request 16-07; Revise the Fort Calhoun Station Emergency Plan to the Permanently Defueled Emergency Plan and Permanently Defueled Emergency Action Level Scheme," dated December 16, 2016 (ADAMS Accession No. ML16351A464).
9. Fisher, M. J., Omaha Public Power District, letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information, Fort Calhoun Station, Unit No. 1 – Final Request for Additional Information Concerning License Amendment Request 16-07: Revise the Fort Calhoun Station Emergency Plan to the Permanently Defueled Emergency Plan and Permanently Defueled Emergency Action Level Scheme," dated May 15, 2017 (ADAMS Accession No. ML17135A390).
10. Nuclear Energy Institute (NEI) 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6, dated November 2012 (ADAMS Accession No. ML12326A805).
11. Kim, J., U.S. Nuclear Regulatory Commission, letter to Mary J. Fisher, Omaha Public Power District, "Fort Calhoun Station, Unit No. 1 – Exemptions from Certain Emergency Planning Requirements and Related Safety Evaluation (CAC No. MF9067; EPID L-2016-LLE-0003," dated December 11, 2017 (ADAMS Accession No. ML17263B198).
12. U.S. Environmental Protection Agency, EPA 400/R 17/001, "PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents," January 2017 (ADAMS Accession No. ML17044A073).
13. Federal Emergency Management Agency's Comprehensive Preparedness Guide 101, "Developing and Maintaining Emergency Operations Plans," Version 2.0, November 2010 (http://www.fema.gov/pdf/about/divisions/npd/CPG_101_V2.pdf).
14. [U.S. Nuclear Regulatory Commission, "Staff Requirements – SECY-17-0080 – Request by Omaha Public Power District for Exemptions from Certain Emergency Planning Requirements," dated October 25, 2017 (ADAMS Accession No. ML17298A976).
15. U.S. Nuclear Regulatory Commission, SECY-17-0080, "Request by Omaha Public Power District for Exemptions from Certain Emergency Planning Requirements for the Fort Calhoun Station, Unit 1," dated August 10, 2017 (ADAMS Accession No. ML17116A430).
16. U.S. Nuclear Regulatory Commission and Federal Emergency Management Agency, NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980 (ADAMS Accession No. ML040420012).

17. U.S. Nuclear Regulatory Commission, "NSIR/DPR-ISG-02, Interim Staff Guidance, Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," dated May 11, 2015 (ADAMS Accession No. ML14106A057).
18. Thaggard, M., U.S. Nuclear Regulatory Commission, letter to Ms. Susan Perkins-Grew, Nuclear Energy Institute, "U.S. Nuclear Regulatory Commission Review and Endorsement of NEI 99-01, Revision 6, dated November 2012 (TAC No. D92368)," dated March 28, 2013 (ADAMS Accession No. ML12346A463).
19. U.S. Nuclear Regulatory Commission, Generic Letter 89-01, "Implementation of Programmatic Controls for Radiological Effluent Technical Specifications in the Administrative Controls Section of the Technical Specifications and the Relocation of Procedural Details of RETS to the Offsite Dose Calculation Manual or to the Process Control Program," dated January 31, 1989 (ADAMS Accession No. ML031140051).
20. Fort Calhoun Station Updated Safety Analysis Report Chapter 9.6, "Auxiliary Systems – Spent Fuel Pool Cooling System," dated February 23, 2012 (ADAMS Accession No. ML12226A497).

Principal Contributor: R. Kinard, NSIR/DPR

Date: December 12, 2017

SUBJECT: FORT CALHOUN STATION, UNIT 1 - ISSUANCE OF AMENDMENT
 RE: REVISE EMERGENCY PLAN TO THE PERMANENTLY DEFUELED
 EMERGENCY PLAN AND PERMANENTLY DEFUELED EMERGENCY ACTION
 LEVEL SCHEME (CAC NO. MF8951; EPID L-2016-LLA-0036) DATED
 DECEMBER 12, 2017

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*memo dated

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