



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

March 31, 2015

Mr. Terry D. Hobbs  
General Manager, Decommissioning  
Crystal River Nuclear Plant (NA2C)  
15760 West Power Line Street  
Crystal River, FL 34428-6708

SUBJECT: CRYSTAL RIVER UNIT 3 - ISSUANCE OF AMENDMENT REGARDING  
CHANGES TO THE EMERGENCY PLAN AND EMERGENCY ACTION LEVELS  
(TAC NO. MF3415)

Dear Mr. Hobbs:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 246 to Facility Operating License No. DPR-72 for the Crystal River Unit 3 Nuclear Generating Plant (CR-3) in response to the application from Duke Energy Florida, Inc. (DEF, or the licensee) dated September 26, 2013, as supplemented by letters dated March 28, 2014, May 23, 2014, and October 6, 2014. The amendment revises the CR-3 emergency plan and emergency action level scheme to reflect the low likelihood of any credible accident at the plant, in its permanently shutdown and defueled condition, that could result in radiological releases requiring offsite protective measures. The changes were submitted to the NRC for approval in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.54(q)(4) and 10 CFR Part 50, Appendix E, Section IV.B.2.

The amendment revises the CR-3 emergency plan and emergency action level scheme to comply with the requirements of 10 CFR 50.47, "Emergency plans," and 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," subject to the exemptions granted to the licensee by the NRC letter to the licensee dated March 30, 2015. In addition, the emergency action level scheme revision is based on the NRC-endorsed Nuclear Energy Institute (NEI) document NEI 99-01, Rev. 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012. NEI 99-01, Rev. 6, provides guidance for permanently shutdown and defueled nuclear power plants for the development of a site-specific emergency classification scheme.

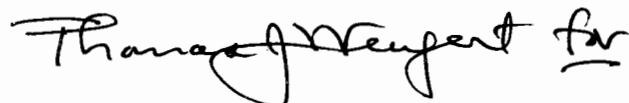
The NRC staff concluded that the CR-3 revised emergency plan and emergency action level scheme provide (1) an adequate basis for finding an acceptable state of emergency preparedness, and (2) reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency based on the permanently shutdown and defueled condition of the CR-3 facility.

T. Hobbs

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

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas J. Wengert for".

Michael D. Orenak, Project Manager  
Plant Licensing IV-2 and Decommissioning  
Transition Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosures:

1. Amendment No. 246 to DPR-72
2. Safety Evaluation

cc w/enclosures: Distribution via ListServ



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DUKE ENERGY FLORIDA, INC.

CITY OF ALACHUA

CITY OF BUSHNELL

CITY OF GAINESVILLE

CITY OF KISSIMMEE

CITY OF LEESBURG

CITY OF NEW SMYRNA BEACH AND UTILITIES COMMISSION

CITY OF NEW SMYRNA BEACH

CITY OF OCALA

ORLANDO UTILITIES COMMISSION AND CITY OF ORLANDO

SEMINOLE ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-302

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 246  
License No. DPR-72

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the Crystal River Unit 3 Nuclear Generating Plant (the facility) Facility Operating License No. DPR-72 filed by Duke Energy Florida, Inc., et al. (the licensees), dated September 26, 2013, as supplemented by letters dated March 28, 2014, May 23, 2014, and October 6, 2014, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

- E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is hereby amended to authorize the revision to the Crystal River Unit 3 Nuclear Generating Plant Emergency Plan and Emergency Action Level Scheme as set forth in the Duke Energy Florida, Inc. application dated September 26, 2013, as supplemented by letters dated March 28, 2014, May 23, 2014, and October 6, 2014, and as evaluated in the NRC staff's safety evaluation dated March 31, 2015.
3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



William M. Dean, Director  
Office of Nuclear Reactor Regulation

Date of Issuance: March 31, 2015



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 246 TO

FACILITY OPERATING LICENSE NO. DPR-72

DUKE ENERGY FLORIDA, INC., ET AL.

CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT

DOCKET NO. 50-302

1.0 INTRODUCTION

The Crystal River Unit 3 Nuclear Generating Plant (CR-3) is a decommissioning nuclear power reactor located at Red Level, Florida in Citrus County, about 5 miles south of Levy County. The site is 7.5 miles northwest of Crystal River, Florida, and 90 miles north of St. Petersburg, Florida. CR-3 is situated on the Gulf of Mexico, within the Crystal River Energy Complex. Duke Energy Florida, Inc. (DEF or the licensee) is the holder of the CR-3 Facility Operating License No. DPR-72, 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).

CR-3 has been shutdown since September 26, 2009, and the final removal of fuel from its reactor vessel was completed on May 28, 2011. By letter dated February 20, 2013 (Reference 1), DEF submitted a certification to the U.S. Nuclear Regulatory Commission (NRC) of permanent cessation of power operations and permanent removal of fuel from the reactor vessel, pursuant to 10 CFR 50.82(a)(1)(i) and (ii). Upon docketing of this certification, the 10 CFR Part 50 license for CR-3 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). CR-3 is authorized to possess and store irradiated nuclear fuel. Such spent fuel is currently stored onsite in a spent fuel pool (SFP).

By letter dated September 26, 2013 (Reference 2), DEF requested a license amendment to revise the CR-3 Radiological Emergency Response Plan, referred to hereafter as the Permanently Defueled Emergency Plan (PDEP), and the CR-3 Emergency Action Level (EAL) scheme. DEF submitted the CR-3 PDEP and the CR-3 EAL scheme to the NRC for approval in accordance with 10 CFR 50.54(q)(4) and 10 CFR Part 50, Appendix E, Section IV.B.2. By letters dated March 28, 2014, May 23, 2014, and October 6, 2014 (References 3, 4, and 5, respectively), DEF supplemented its original license amendment request (LAR). The October 6, 2014, supplement contained Rev. 2 to the PDEP.

The supplemental letters submitted by DEF 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 January 7, 2014 (79 FR 857).

### 1.1 Discussion

DEF submitted its proposed PDEP as a license amendment request in accordance with 10 CFR 50.54(q)(4), contingent on the NRC's prior approval of exemptions requested by DEF to the requirements of 10 CFR 50.47 and Appendix E to 10 CFR Part 50. By letter dated March 30, 2015 (Reference 6), the NRC granted DEF exemptions from certain emergency planning (EP) requirements in 10 CFR 50.47 and Appendix E to 10 CFR Part 50, in accordance with 10 CFR 50.12, and based, in part, on the low risks associated with a permanently shutdown and defueled nuclear power reactor.

In granting the requested exemptions to DEF, the NRC primarily relied on the CR-3 site-specific analyses, which provided reasonable assurance that (1) an offsite radiological release would not exceed the U.S. Environmental Protection Agency's (EPA's) Protective Action Guides (PAGs) at the site's exclusion area boundary (EAB) for any remaining applicable design-basis accidents (DBAs); and (2) in the unlikely event of a severe beyond DBA resulting in a loss of all cooling to the spent fuel stored in the CR-3 SFP, sufficient time would be available to initiate appropriate mitigating actions, and if needed, for offsite authorities to implement protective actions using a comprehensive emergency management plan (CEMP)<sup>1</sup> approach to protect the health and safety of the public. The Commission's approval of the requested exemptions is documented in a Staff Requirements Memorandum, dated December 30, 2014 (Reference 7), responding to SECY-14-0118, "Request by Duke Energy Florida, Inc. for Exemptions from Certain Emergency Planning Requirements," dated October 29, 2014 (Reference 11). With the NRC's granting of approval of the requested EP exemptions, DEF states that the proposed CR-3 PDEP will continue to meet the remaining applicable planning standards in 10 CFR 50.47(b) and requirements in 10 CFR Part 50, Appendix E.

In addition to the proposed emergency plan changes in the PDEP, DEF proposes to change the entire EAL scheme to reflect the permanently shutdown and defueled status of CR-3. 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 its entire EAL scheme. DEF states that the proposed changes to the EAL scheme are consistent with the methodology for permanently shutdown and defueled reactors provided by the Nuclear Energy Institute (NEI) document NEI 99-01, Rev. 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012 (Reference 9), which has been endorsed by the NRC.

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<sup>1</sup> A CEMP in this context, also referred to as an emergency operations plan (EOP), is addressed in the Federal Emergency Management Agency's (FEMA's) Comprehensive Preparedness Guide (CPG) 101, "Developing and Maintaining Emergency Operations Plans." CPG 101 is the foundation for State, territorial, tribal, and local emergency planning in the United States. It promotes a common understanding of the fundamentals of risk-informed planning and decision making and helps planners at all levels of government in their efforts to develop and maintain viable, all-hazards, all-threats emergency plans. An EOP is flexible enough for use in all emergencies. It describes how people and property will be protected; details who is responsible for carrying out specific actions; identifies the personnel, equipment, facilities, supplies and other resources available; and outlines how all actions will be coordinated. A CEMP is often referred to as a synonym for "all hazards planning."

## 2.0 REGULATORY EVALUATION

### 2.1 Emergency Plan

Section 50.47 of 10 CFR, "Emergency plans," sets forth 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 10 CFR 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 the fuel from its 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 their licensees to request exemptions, under 10 CFR 50.12, which allow changes to the facilities' emergency plans 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 NRC granted such an EP exemption to DEF on March 30, 2015 (Reference 6).

This consistent practice of granting exemptions from the Commission's EP regulations for permanently shutdown and defueled licensees is a well-established part of the NRC regulatory process that 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 on 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.

Rev. 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" (Reference 10), provides a common reference and guidance source for power reactor licensees to develop radiological emergency response plans. NUREG-0654/FEMA-REP-1 provides guidance for the format and content of the emergency plan, including evaluation criteria for each of the planning standards in 10 CFR 50.47(b).

## 2.2 Emergency Action Level Scheme

Paragraph 50.47(b)(4) of 10 CFR provides the requirement for an EAL scheme. As exempted for CR-3, it 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.~~

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, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, as exempted for CR-3, 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 CR-3 EAL scheme provided in the licensee's application letter as supplemented by the licensee's responses to the NRC staff's requests for additional information (RAIs). Enclosure 3 of the licensee's letter dated May 23, 2014 (Reference 4) contains the final version of the licensee's proposed site-specific EAL scheme for CR-3, which was reviewed by the NRC for acceptability.

As part of this review, the NRC staff assessed the site-specific modifications made by DEF to the guidance provided by NEI 99-01, Rev. 6 (Reference 9). The purpose of NEI 99-01, Rev. 6, is to provide guidance to nuclear power plant operators for the development of a site-specific emergency classification scheme. The methodology described in this document is consistent with Federal regulations, and related NRC requirements and guidance. In particular, this methodology has been endorsed by the NRC, by letter dated March 28, 2013 (Reference 11), as an acceptable method for developing the EALs required by 10 CFR 50.47(b)(4), related sections of 10 CFR Part 50, Appendix E, and the associated planning standard evaluation elements of NUREG-0654/FEMA-REP-1, Rev. 1 (Reference 10). In addition, the NEI 99-01, Rev. 6, methodology also provides guidance for permanently shutdown and defueled nuclear power reactors for the development of a site-specific emergency classification scheme.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Emergency Plan

The certifications of permanent cessation of operations and permanent removal of fuel made by the licensee under 10 CFR 50.82 have been docketed, therefore, DEF is no longer authorized to operate the CR-3 reactor or emplace or retain fuel in the CR-3 reactor vessel. Consequently, the CR-3 PDEP describes the licensee's plan for responding to emergencies that may arise at CR-3 while it is in a permanently shutdown and defueled configuration. Recognizing that there are no credible DBAs that would result in offsite dose consequences that would exceed the EPA PAGs and require offsite radiological emergency planning, the PDEP no longer specifies offsite radiological emergency planning activities. Additionally, the onsite emergency planning activities of the CR-3 PDEP are reduced in scope to a level commensurate with the reduced risk of the facility in its permanently shutdown and defueled condition. 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 DEF dated March 30, 2015 (Reference 6).

This section of the NRC staff's Safety Evaluation (SE) summarizes the NRC staff's technical evaluation of the CR-3 PDEP using the planning standards of 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, as exempted, and the evaluation criteria provided in NUREG-0654/FEMA-REP-1, as applicable to 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50, as exempted.

##### 3.1.1 Assignment of Responsibility (Organizational Control)

Paragraph 50.47(b)(1) of 10 CFR, as exempted, 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 CR-3 PDEP identifies that the primary responsibilities for emergency response by CR-3 and by State and local organizations have been assigned, that the emergency responsibilities of the various supporting organizations have been specifically established, and that each principal response organization has staff to respond and to augment its response.

The CR-3 Shift Supervisor is at the station 24-hours a day and is the senior management position at the station during off-normal hours. This position is responsible for monitoring conditions and approving onsite activities. The Shift Supervisor shall assume the position of Emergency Coordinator once an emergency declaration has been made.

Designated on-shift CR-3 staff positions are available 24 hours per day. The licensee's onsite Emergency Response Organization (ERO) will be activated and will augment the on-shift staff during an Alert classification, at the direction of the Emergency Coordinator. The on-shift staff can perform all required response actions, including initiation of SFP mitigation measures, until the ERO arrives.

Offsite response organization assistance (i.e., fire, ambulance, and local law enforcement agency (LLEA)) is requested by the Emergency Coordinator. The Emergency Coordinator coordinates the offsite response organizations' response, plant access, and radiological controls with the onsite activities. State and local government agency response offsite will be in accordance with each agency's CEMP approach, and will be commensurate with the hazard posed by the emergency. The following letters of agreement are in place for those local agencies that may respond to the site, and for the hospital that may be required to treat a contaminated injured individual from the CR-3 site, as designated in the CR-3 PDEP:

- Citrus County Sheriff's Department, Division of Emergency Management (assistance to the Plant Fire Brigade and law enforcement),
- Nature Coast Emergency Medical Services (EMS) (ambulance services), and
- Seven Rivers Medical Center (offsite medical services).

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(1), as exempted, pertaining to the responsibilities for emergency response, is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

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 NRC staff reviewed the CR-3 PDEP and found that it identifies that the on-shift licensee responsibilities for emergency response are unambiguously defined, that adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, that timely augmentation of response capabilities is available, and that the interfaces among various onsite response activities and offsite support and response activities are specified.

DEF has designated personnel on-shift at all times who would provide the initial response to an event. 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 augmenting ERO arrives 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 on-shift personnel is unchanged when an event occurs.

The CR-3 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 at the direction of the Emergency Coordinator. The Emergency Coordinator is responsible for ensuring that an ERO callout method is initiated to augment the on-shift staff. The minimum augmented staff is a Communicator, Radiation Controls Coordinator, and an Emergency Mitigation Coordinator. The on-shift Shift Supervisor assumes the responsibilities of the Emergency Coordinator. DEF states that the goal of the ERO is to augment the on-shift staff within 2 hours of an Alert classification. The table of on-shift positions and the augmented positions that fulfill emergency staffing capabilities is provided in Table 6.1 of the CR-3 PDEP. This table provides a graphical representation of the functional responsibilities for designated on-shift positions and the augmented positions that fulfill emergency staffing capabilities.

The CR-3 PDEP further provides that, in the event of an emergency at CR-3 that requires personnel and other support resources beyond those available within the CR-3 ERO, augmentation resources are available from CR-3 staff and the staff of other Duke Energy facilities. Additional support to CR-3 is available from offsite organizations, as previously discussed in Section 3.1.1 of this SE.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(2) pertaining to the onsite emergency organization for emergency response is addressed in an acceptable manner in the 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, requires in a licensee's emergency plan that:

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 CR-3 PDEP identifies that arrangements for requesting and effectively using assistance resources have been made, and that other organizations capable of augmenting the planned response have been identified. Fire, ambulance, and LLEA response is at the request and direction of the Emergency Coordinator. 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 PDEP. These letters of agreement are discussed in Section 3.1.1 above.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(3), as exempted, pertaining to the emergency response support and resources for emergency response is addressed in an acceptable manner in the 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, requires in a licensee's emergency plan that:

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 CR-3 PDEP identifies that the emergency classification system covers a spectrum of possible radiological and non-radiological emergencies at CR-3. The emergency classification system 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 CR-3, in order of increasing severity, are a Notification of Unusual Event and Alert. Each of these emergency classes requires notification to the State, which notifies local agencies, as designated in the PDEP, as well as to the NRC. The classification of emergencies up to an Alert is consistent with the regulations for an independent spent fuel storage installation in 10 CFR 72.32(a)(3) and the CR-3 exemptions as granted in the NRC letter dated March 30, 2015 (Reference 6).

The CR-3 emergency classification system is based on NEI 99-01, Rev. 6, as applied to a permanently shutdown and defueled power reactor with fuel stored in a SFP, with emergency classification levels of a Notification of Unusual Event and Alert. Once indications are available

to plant operators that an EAL has been met, the licensee assesses the event and promptly declares the corresponding emergency classification level as soon as possible, and within 30 minutes. Notification to the State authorities designated in the PDEP, and to the NRC, is required within 60 minutes of the event being declared.

Methods for detecting and evaluating accidents applicable to CR-3 for emergency classification include the use of installed systems, instrumentation, alarms, and approved procedures.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(4), as exempted, pertaining to the emergency classification system for emergency response is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility. The NRC staff evaluation of the EAL scheme for the permanently shutdown and defueled status of CR-3 is provided in Section 3.2 of this SE.

### 3.1.5 Notification Methods and Procedures

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

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 CR-3 PDEP identifies the Emergency Coordinator position, which is assumed by the on-shift Shift Supervisor upon the declaration of an emergency, as having the authority and responsibility for: declaring emergencies, initiating notifications to Federal and State officials, and initiating corrective and mitigative actions. The CR-3 ERO is activated by a plant announcement and by an ERO callout system, as directed by the Emergency Coordinator. In the event that personnel required to staff emergency positions are not onsite, they may be contacted through manual notification by commercial telephone and/or wireless devices capable of receiving text messages.

The State Hot Ringdown System (SHRD) is a communication system used to notify the State Watch Office Tallahassee (SWOT), as designated in the PDEP, of a declared emergency. Notification of an emergency is provided verbally to the SWOT based on the content of the Florida Nuclear Plant Emergency Notification Form. The form may also be transmitted electronically. The content of the initial notification and follow-up message form has been established in conjunction with the State of Florida. The Florida Nuclear Plant Emergency Notification Form contains the date and time of the incident, the class of the emergency, and the applicable EAL. As additional information describing the emergency situation and local conditions becomes available, supplemental messages containing additional detail are provided. Notification to the SWOT, as designated in the PDEP, will be made within 60 minutes of an event declaration; the SWOT will notify the Division of Emergency Management and Citrus County officials of an emergency at CR-3. Notification of the SWOT, using the SHRD, is the responsibility of the Emergency Coordinator.

The Event Notification System (ENS) is a dedicated telephone system used by the licensee to notify the NRC Operations Center. The NRC will be notified as soon as possible after State notification, but within 60 minutes of event declaration. In the event of the failure of the ENS, commercial phone lines will be used to notify the NRC. Notification of the NRC is the responsibility of the Emergency Coordinator.

Medical, LLEA, and firefighting support services, which may be requested to respond onsite, are primarily notified for assistance via the Citrus County Emergency Dispatch (911 Center). Requests for support services are the responsibility of the Emergency Coordinator.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(5), as exempted, pertaining to the notification methods and procedures for emergency response, is addressed in an acceptable manner in the 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, requires in a licensee's emergency plan that:

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

The CR-3 PDEP identifies that provisions exist for prompt communications among principal response organizations to emergency personnel. The following communication methods provide 24-hour capability internal to the plant and for plant-to-offsite communications:

- Commercial telephone systems,
- Plant public address system,
- Portable UHF radios,
- SHRD,
- Satellite telephones,
- ERO callout method, and
- NRC ENS.

If an emergency involves personnel injury, the Emergency Coordinator can request assistance from offsite medical support organizations, which include Seven Rivers Medical Center and the Nature Coast EMS. Based on the type of injury and degree of possible contamination, the requirements for medical care will be determined, and the appropriate medical facility and personnel needed to accompany the injured personnel will be notified.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(6), as exempted, pertaining to the emergency communications for emergency response, is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

~~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.~~

The CR-3 PDEP identifies that the Emergency Coordinator will notify Duke Energy Corporate Communications following a CR-3 emergency event declaration. The Corporate Nuclear Communications emergency response plan requires that Duke Energy Corporate Communications be notified at an Alert classification and a near-site response team will be established for CR-3. The near-site response team will be staffed with a company spokesperson and media communicators, who will provide local interaction with the media to facilitate dissemination of information to the public in a timely manner, if an event occurs at CR-3. Briefings with media organizations will be coordinated between Duke Energy Corporate Communications and the near-site response team.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(7), as exempted, pertaining to the public education and information for emergency response is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

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

The CR-3 PDEP identifies that the control room is where plant systems and equipment parameters are monitored. The control room is the principal emergency control center. Control room personnel will assess plant conditions; evaluate the magnitude and potential consequences of any abnormal conditions; initiate preventative, mitigating, and corrective actions; and perform notifications. When activated, ERO responders will physically report to the control room or the Emergency Support Center (ESC). The ESC is provided as a point of assembly for augmented resources providing technical expertise to assist the Emergency Coordinator and the control room in the assessment, mitigation, and response to an emergency. It also supports the dispatch of emergency teams. The ESC is located in the control complex adjacent to the control room.

The CR-3 PDEP also identified the ERO Augmentation Facility. DEF maintains an offsite facility that would be available as a staging area for augmentation staff in the event that access to

CR-3 is impeded. The alternate facility is located at the Duke Energy Operations Center in Inverness, Florida, approximately 30 miles from the CR-3 site.

DEF maintains the radiation monitors described in the Permanently Defueled EAL Basis Manual that monitor areas near the SFP and control complex (control room and adjacent ESC) and monitor gaseous and liquid releases. Installed and portable radiation monitoring and sampling equipment, including dedicated emergency response equipment, are maintained.

Off-site hydrologic monitoring data is available to DEF from the Southwest Florida Water Management District, which maintains monitoring wells throughout Citrus County. Additional hydrologic data could be obtained from the public water supplies identified in the Final Safety Analysis Report.

DEF acquires meteorological data from a meteorological tower located onsite. The following meteorological parameters are measured: wind speed/wind direction (175 feet), wind speed/wind direction (33 feet), ambient temperature (175 feet/33 feet), and delta temperature (stability class). Real time meteorological data is digitally displayed in the control room, and computerized data acquisition is capable of collecting real time data. DEF maintains the capability to obtain meteorological data from other sources if the meteorological tower data is unavailable.

Annunciator and computer alarms are provided for a variety of parameters, including the Spent Fuel Cooling System to indicate SFP level, temperature, and pump status.

Emergency kit contents listed in Table 12.1 of the PDEP are inspected, inventoried, and operationally checked at least quarterly and any time a kit is opened and used, in accordance with plant procedure HPP-409, "Inventory and Availability of Emergency Supplies/Equipment." Sufficient reserves of instruments/equipment are provided to replace those that are removed from emergency kits for calibration or repair. Calibration of instruments has been established at intervals recommended by instrument suppliers, or as required by Federal regulations.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(8) pertaining to the emergency facilities and equipment for emergency response is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

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

The CR-3 PDEP identifies that there are methods, systems, and equipment in use for assessing and monitoring actual or potential consequences of a radiological emergency condition at CR-3. The assessment activities required to evaluate a particular emergency depend on the specific nature and classification of that emergency. The EALs identify the system parameter and

effluent parameter values that can be used to determine the emergency condition. Declaration of an emergency classification is performed by the Emergency Coordinator in accordance with the EAL scheme.

Additionally, there are implementing procedures that utilize radiological instrumentation readings and site meteorological data to provide a rapid method of determining the magnitude of any potential radioactive release during an accident condition. Although CR-3 is permanently shutdown and defueled with spent fuel in the SFP, and there is a low likelihood of any credible accident resulting in radiological releases requiring offsite protective measures, CR-3 maintains the capability to perform dose assessment on a 24-hour per day basis. Initial dose assessment is the responsibility of the Emergency Coordinator. Subsequent dose assessments are the responsibility of the ERO's Radiation Controls Coordinator.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(9), as exempted, pertaining to the accident assessment for emergency response, is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

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 CR-3 PDEP identifies that protective actions for individuals at the site are provided for their health and safety. Implementation guidelines for onsite protective actions are provided in the Emergency Plan Implementing Procedures, which continue to provide for a range of protective actions to protect individuals at the site, including from a hostile action event.

Emergency Plan Implementing Procedure EM-501, "Operation of the Emergency Support Center (ESC)," provides an Emergency Team Authorization (ETA) form that should be generated and approved by either the Emergency Coordinator or the Radiation Controls Coordinator. This form contains the following subject area: "Equipment Used," to include "Protective Clothing/Equipment" and "Respiratory," and is used to authorize the dispatch of a designated team of personnel from the ESC for the performance of specific emergency-related tasks. Prior to dispatch, the form has a step to ensure team members have protective clothing, dosimetry, respiratory devices, and/or other protective equipment as specified by the ETA form.

The CR-3 PDEP also provides that accountability should be considered and used as a protective action whenever a site-wide risk to health or safety exists and prudence dictates. If personnel accountability is required, at the direction of the Emergency Coordinator, all individuals at the site (including employees without emergency assignments, visitors, and contractor personnel) shall be notified of an emergency over the public address system and by the sounding of the Site Evacuation Alarm. Accountability of all personnel onsite should be accomplished within 60 minutes of the sounding of the Site Evacuation Alarm, following the declaration by the Emergency Coordinator of an Alert or at any time deemed necessary. Personnel will remain in the assembly areas until instructed to return to work, report to the main assembly area (Site Administration Building auditorium), or leave the Crystal River Energy Complex. Security implements evacuation of the Energy Complex when directed by the Emergency Coordinator. Plant procedures provide instructions to be given to non-essential personnel describing the methods and routes for evacuation, including radiological monitoring for personnel. The expectation is that evacuation will occur by private vehicle using staged release and two lanes on the Plant Access Road.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(10), as exempted, pertaining to the protective actions for individuals at the site during an emergency, is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

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 CR-3 PDEP identifies the means for controlling radiological exposures for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with the EPA Emergency Worker and Lifesaving Activity Protective Action Guides. As necessary, the Radiation Controls Coordinator will ensure Radiological Control Areas (RCAs) are established in response to the event. The Radiation Controls Coordinator will direct control of access to all RCAs unless immediate access is authorized by the Emergency Coordinator to facilitate emergency repairs. The external dosimetry program includes provisions and requirements for use of both permanent record and self-reading dosimeters. Implementing procedures associated with this plan establish requirements for distributing dosimeters to emergency responders, including those individuals responding to CR-3 from offsite locations. Implementing procedures also establish guidance for wearers to periodically read their self-reading dosimeters to maintain compliance with emergency exposure guidelines. Provisions have been established, both onsite and through service organizations, to provide 24-hour per day capability to read dosimeters to determine the doses received by emergency workers. DEF maintains individual dose records in accordance with the requirements of 10 CFR Part 20 and the Radiation Protection Program and its supporting procedures.

The CR-3 PDEP further provides that all reasonable measures shall be taken to control the radiation exposure within applicable limits specified in 10 CFR Part 20 to emergency response personnel providing rescue, first aid, decontamination, emergency transportation, medical treatment services, and corrective actions or assessment actions. The Emergency Coordinator is responsible for authorizing plant and emergency response personnel to receive doses in excess of 10 CFR Part 20 limits, if necessary. This authorization is coordinated with the Radiation Controls Coordinator.

All personnel decontamination, even during an emergency, will be performed under the supervision of the Health Physics Section and in accordance with plant procedures. CR-3 maintains dedicated decontamination and clothing supplies onsite. Individual exposure records are required to be documented and maintained in accordance with the CR-3 Radiation Protection Program.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(11) pertaining to the radiological exposure control for onsite emergency response is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

Arrangements are made for medical services for contaminated injured individuals.

The CR-3 PDEP identifies that arrangements are made for medical services for contaminated injured individuals. CR-3 maintains on-shift personnel and equipment to provide first aid for personnel working at the site. All medical response personnel are, at a minimum, certified by the State of Florida as Emergency Medical Technicians. Training topics are established as per the State certification requirements. First aid supplies and equipment are located throughout CR-3.

The CR-3 PDEP further provides that if immediate professional medical help is required, local ambulance service is available via a letter of agreement with Nature Coast EMS to assist in the transportation of seriously injured or radioactively contaminated injured personnel.

Arrangements have been made with the Seven Rivers Regional Medical Center for the medical treatment of personnel. Hospital personnel have been instructed and trained in the treatment and care of patients with injuries of a non-radiological or radiological nature. The individuals and organizations providing emergency medical assistance either have the capability for evaluation of radiation exposure and uptake, or they are provided this capability from DEF in the form of personnel and/or equipment. DEF assures that persons providing these services are adequately prepared to handle contaminated individuals through detailed training classes, drills, and exercises.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(12) pertaining to the medical and first

aid support for onsite emergency response is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

General plans for recovery and reentry are developed.

The Emergency Coordinator is responsible for providing notification of the emergency termination and the initiation of recovery operations to the NRC, State of Florida, the CR-3 ERO, and other organizations that may be providing onsite support.

The CR-3 PDEP identifies that the plant recovery operations will begin immediately following emergency termination. Recovery operations will address the specific emergency circumstances. Recovery planning includes equipment to be repaired or replaced, licensing implications, special training requirements, offsite support, and determination of causes and consequences. Site procedures addressing recovery operations provide an outline for a short-term recovery plan.

The Decommissioning Director, who is directly responsible for the decommissioning of CR-3 and reports to the Vice President of Project Management and Construction, has ultimate responsibility for the overall effectiveness of CR-3's PDEP. The Decommissioning Director shall be responsible for the development and implementation of the recovery plan and shall provide for detailed monitoring of the implementation and status reporting. The Decommissioning Director also has the authority to revise or halt activities as circumstances dictate.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(13) pertaining to the recovery and reentry for emergency response is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

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 CR-3 PDEP identifies that (1) periodic exercises will be conducted to evaluate major portions of emergency response capabilities; (2) periodic drills will be conducted to develop and maintain key skills; and (3) deficiencies identified as a result of exercises or drills will be corrected. CR-3 will conduct a biennial exercise to test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communication networks, and to ensure that emergency personnel are familiar with their duties. CR-3, if requested, will also invite offsite response organizations to participate in the exercise.

The following equipment and proficiency drills may be performed as part of an exercise, a drill, or as an independent drill:

- communication drills (monthly),
- medical emergency drills (annually),
- radiological monitoring drills (annually),
- fire drills (in accordance with Fire Protection plan)
- health physics drills (biannually),
- assembly and accountability drills (annually), and
- staff augmentation drills (annually).

The PDEP further provides that critiques will evaluate the performance of the organization. The ability of CR-3 personnel to self-evaluate weaknesses and identify areas for improvement is the key to successful drill conduct.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(14) pertaining to the exercises and drills for emergency response is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

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

The CR-3 PDEP identifies that the training program for emergency response personnel is based on the requirements of Appendix E to 10 CFR Part 50 and position specific responsibilities as defined in the PDEP. ERO personnel in the following categories receive initial training and retraining each year thereafter:

- Shift Managers/Emergency Directors, Technical Directors, and Radiation Protection Directors,
- plant operators and maintenance personnel,
- emergency mitigation personnel (including the Emergency Mitigation Coordinator)
- radiation monitoring personnel (including the Radiation Controls Coordinator),
- Fire Brigade,
- communications personnel,
- Emergency Coordinators,
- State and local support services,
- security personnel, and
- medical personnel.

The Training Program is used to assure that all plant employees, contractor personnel, and plant visitors receive appropriate initial indoctrination, training, and requalification, which familiarizes the personnel with the plant layout, structures, and systems.

The CR-3 PDEP provides that refresher ERO training content given to CR-3 personnel includes the following topics: the purpose of emergency planning, offsite agencies, ERO notification, the emergency response facility, emergency response protocol, emergency classifications, drills and exercises, onsite protective actions, relief staffing, recovery, and hostile threats. Additional requalification training topics are based on student and drill feedback, audits, identified deficiencies from drills, and the results of the program review by the Emergency Planning Coordinator. Personnel will be retrained annually.

In conjunction with plant indoctrination, specific training programs are in effect for the Fire Brigade personnel. The Fire Protection plan will maintain the training program for offsite fire response personnel and includes initial training, continuing training, and drill participation requirements. Additionally, the Fire Brigade Leader is cognizant of the system interrelationships for maintaining spent fuel cooling and SFP inventory.

The training program for offsite support services personnel (medical services and law enforcement) is described in the State plan and the letters of agreement with the supporting organizations. Training program topics include radiation fundamentals, fundamentals of nuclear fuel storage, fundamentals of radiation detection and measurement, management of radiation injuries, radiation protection and decontamination, and warning and communication procedures.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(15) pertaining to the radiological emergency response training is addressed in an acceptable manner in the 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 in a licensee's emergency plan that:

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

The CR-3 PDEP identifies that the Decommissioning Director has overall authority and responsibility for emergency response planning. As discussed above in Section 3.1.13, the Decommissioning Director has overall authority and responsibility for emergency response planning. Responsibilities for plan development and review and for the distribution of the PDEP have been assigned to the Emergency Planning Coordinator. The Emergency Planning Coordinator training will consist of periodic reviews of federal Emergency Preparedness requirements, guidance documents, and various site-specific documents related to Emergency Preparedness. Training is supplemented primarily by on-the-job activities and attendance of short courses, seminars, or executive conferences that relate specifically to emergency preparedness. These responsibilities include maintaining the PDEP and implementing procedures, and letters of agreements. Additionally, the CR-3 PDEP provides the frequencies for required reviews.

Duke Energy maintains a Corporate Nuclear Oversight Section (NOS) that will support audits of the CR-3 PDEP according to Corporate NOS audit practices and instructions that meet the requirements of 10 CFR 50.54(t). The audits will be completed by Corporate NOS personnel

and will include the review of the CR-3 PDEP, its implementing procedures and practices, training, readiness testing, equipment, and interfaces with State and local governments. The audit will be conducted as soon as reasonably practicable after a change occurs in personnel, procedures, equipment, or facilities that could adversely affect emergency preparedness, but no longer than 12 months after the change. All elements of the Emergency Preparedness Program must be reviewed at least once every 24 months.

Based on the NRC staff's review of the CR-3 PDEP as described above, the NRC staff concludes that the planning standard of 10 CFR 50.47(b)(16) pertaining to the emergency plan development and review is addressed in an acceptable manner in the PDEP, considering the permanently shutdown and defueled status of the facility.

### 3.2 Emergency Action Level Scheme

CR-3 currently utilizes an EAL scheme based on Nuclear Management and Resources Council, Inc./National Environmental Studies Project (NUMARC/NESP)-007, Rev. 2, "Methodology for Development of Emergency Action Levels" (Reference 12), which was endorsed by the NRC in a letter dated September 21, 1999 (Reference 13), as applied to an operating power reactor facility, with site-specific modifications for design differences and/or licensee preference. The licensee proposes to convert to an EAL scheme using the NRC-endorsed development guidance of NEI 99-01, Rev. 6 (Reference 9), as applied to a permanently shutdown and defueled power reactor with fuel stored in a SFP and with site-specific modifications for design differences and/or licensee preference.

As discussed in the NRC safety evaluation associated with the exemptions granted to DEF (Reference 6) from certain emergency planning requirements of 10 CFR 50.47 and Appendix E to 10 CFR Part 50, there are no longer any DBAs at CR-3 that can result in a significant radiological release beyond the site's EAB. Therefore, the risks and consequences of a radiological release at CR-3, based on its permanently shutdown and defueled condition, are insufficient to warrant classification as a Site Area Emergency or General Emergency. As a result, the only Initiating Conditions (ICs) and Emergency Action Levels (EALs) applicable to CR-3 in its permanently shutdown and defueled condition are either a Notification of Unusual Event or an Alert classification.

In its application and supplemental letters, DEF submitted its proposed EAL scheme for CR-3 along with its technical basis, a comparison matrix, the EAL numbering scheme, and an explanation of any difference or deviation from NEI 99-01, Rev. 6.

The proposed site-specific EAL scheme is unique to CR-3, as it contains site-specific designations and descriptions. However, to ensure consistency and regulatory stability, the NRC staff reviewed the proposed site-specific EAL scheme to ensure that the following key characteristics of an effective EAL scheme are in place:

- Consistency (i.e., the EALs would lead to similar decisions under similar circumstances at different plants), up to and including standardization in intent, if not in actual wording;
- Human factors engineering and user friendliness;

- Potential for classification upgrade only when there is an increasing threat to public health and safety;
- Ease of upgrading and downgrading;
- Thoroughness in addressing and disposing of the issues of completeness and accuracy raised in Appendix 1 to NUREG-0654;
- Technical completeness for each classification level;
- Logical progression in classification for multiple events; and
- The use of objective and observable values.

To aid in understanding the nomenclature used in this SE, for each category of EALs reviewed the following naming/numbering convention is used: the first letter signifies the category; the second letter signifies the emergency classification levels (ECL). The proposed EAL scheme for CR-3 includes two ECLs: (1) Notification of Unusual Event (U), and (2) Alert (A). ICs for entry into each of the two ECLs are specified for conditions relating to abnormal radiological levels/radiological effluents (A), hazards and other conditions affecting plant safety (H), and system malfunction (S), based on the permanently shutdown and defueled status of the facility with spent fuel stored onsite in a spent fuel pool. For each IC, specific EAL threshold values are identified that would require the declaration of an ECL. The EAL scheme is intended to provide multiple and diverse threshold values for all of the emergency classification levels (Notification of Unusual Event and Alert) to ensure accurate EAL classification and timely declaration.

In applying the guidance in NEI 99-01, Rev. 6, developers should attempt to keep their site-specific schemes as close to the generic guidance as possible to ensure that the intent of the generic ICs and EALs within the context of site-specific characteristics (e.g., locale, plant design, operating features, terminology, etc.) is met. DEF made the following site-specific changes to incorporate the generic EAL scheme globally throughout the proposed EAL scheme:

- CR-3 used the term “Unusual Event (UE),” instead of “Notification of Unusual Event (NOUE),” as CR-3 determined that its use was consistent with the current EAL matrix and agreed in meaning and intent with NEI 99-01, Rev. 6.
- CR-3 removed reference to the “Operating Mode,” as it did not apply to a facility in a permanently shutdown and defueled condition.
- CR-3 removed the term “Example” from “Example Emergency Action Levels” and changed the numbering of the EALs.

The NRC staff determined that these changes are editorial in nature, and as such, acceptable, since they do not impact the overall EAL scheme. An evaluation of the acceptability of the EALs is provided in the following sections.

### 3.2.1 CATEGORY 'PD-A': ABNORMAL RADIOLOGICAL RELEASE/RADIOLOGICAL EFFLUENT

#### 3.2.1.1 EAL PD-AU1, "Release of gaseous or liquid radioactivity greater than 2 times the 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 has determined that the instrumentation and set points derived for this EAL are consistent with the overall EAL scheme development guidance, address the site-specific implementation strategies provided, and are considered part of a standard EAL scheme.

CR-3 made the following site-specific changes to the generic EAL scheme:

- Inserted "ODCM" for site-specific effluent release controlling document in the IC.
- Added "VALID" to the NEI 99-01 EAL #1 (PD-AU1.1) and changed "ANY" to "an," so that EAL PD-AU1 reads: "VALID reading on an effluent radiation monitor that is greater than the reading shown for 60 minutes or longer." The term "VALID" is defined in the EAL as, "An indication, report, or condition, is considered to be valid when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's function, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment."

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. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

#### 3.2.1.2 EAL 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 has determined that the instrumentation and set points derived for this EAL are consistent with the overall EAL scheme development guidance, address the site-specific implementation strategies provided, and are considered part of a standard EAL scheme.

CR-3 made the following site-specific changes to the generic EAL scheme:

- Deleted text in parentheses and added site-specific monitor and threshold value.
- Deleted text in parentheses and added “EXCLUSION AREA BOUNDARY.”

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. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

### 3.2.1.3 EAL 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 has determined that the instrumentation and set points derived for this EAL are consistent with the overall EAL scheme development guidance, address the site-specific implementation strategies provided, and are considered part of a standard EAL scheme.

As a site-specific change to the generic EAL scheme, CR-3 deleted text in parentheses and added plant-specific radiation monitors.

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. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

### 3.2.1.4 EAL PD-AA2, “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 requires 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 maintain spent fuel integrity.

As a site-specific change to the generic EAL scheme, CR-3 deleted text in parentheses and added site-specific areas.

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. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

### 3.2.2 CATEGORY 'PD-H' - HAZARDS

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

This EAL is based upon any security-related event listed in the approved CR-3 Security Plan that constitutes a threat/risk to site personnel or a potential degradation to the level of safety of the plant.

As a site-specific change to the generic EAL scheme, CR-3 deleted text in parentheses and added site-specific information.

Based on the NRC staff's review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

#### 3.2.2.2 EAL 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.

As a site-specific change to the generic EAL scheme, CR-3 deleted text in parentheses and added site-specific information.

Based on the NRC staff's review of this EAL, the NRC staff finds that the licensee-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

#### 3.2.2.3 EAL PD-HU2, "Hazardous event affecting SAFETY SYSTEM equipment necessary for spent fuel cooling"

This EAL is based upon the effect 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.

CR-3 made the following site-specific changes to the generic EAL scheme:

- Deleted “site-specific hazards.”
- Added “hurricane” and “Toxic/Chemical” to the list of potential hazards.

CR-3 also made the following site-specific changes to the EAL basis document:

- Added “This condition can be determined by indications or physical observation. All these conditions must be present.”

The site-specific change added to the EAL basis document clarifies the intent of the IC because the guidance in NEI 99-01, Rev. 6, states that for this IC, the damage must be of sufficient magnitude that the system(s) train cannot, or potentially cannot, perform its design function. The declaration of this EAL requires all of the conditions to be met.

Based on the NRC staff's review of this EAL and EAL basis document, the NRC staff finds that the licensee-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme. While there are site-specific differences to what is provided in the generic EAL development guidance and EAL basis document, these documents continue to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, are acceptable for implementation.

#### 3.2.2.4 EAL PD-HU3, “Other conditions exist which in the judgment of the Emergency Coordinator warrant declaration of an [*Notification of*] Unusual Event”

This EAL set is based upon providing the decision-maker with EALs to consider when its judgment deems an emergency classification is warranted.

As a site-specific change to the generic EAL scheme, CR-3 replaced “Director” with “Coordinator.”

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. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

#### 3.2.2.5 EAL PD-HA3, “Other conditions exist which in the judgment of the Emergency Coordinator warrant declaration of an Alert”

This EAL is based upon providing the decision-maker with EALs to consider when its judgment deems an emergency classification is warranted.

As a site-specific change to the generic EAL scheme, CR-3 replaced “Director” with “Coordinator.”

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, and while there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

### 3.2.3 CATEGORY ‘PD-S’: SYSTEM MALFUNCTION

#### 3.2.3.1 EAL PD-SU1, “UNPLANNED spent fuel pool temperature rise.”

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

The NRC staff has determined that the value for this EAL is consistent with the overall EAL scheme development guidance, addresses the site-specific implementation strategies provided, and is considered part of a standard EAL scheme.

As a site-specific change to the generic EAL scheme, CR-3 deleted text in parentheses and added site-specific information.

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. While there are site-specific differences to what is provided in the generic EAL development guidance, this EAL continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, is acceptable for implementation.

## 3.3 Conclusions

### 3.3.1 Emergency Plan Conclusions

Based on the NRC staff’s review of the proposed CR-3 PDEP as described in Section 3.1, the NRC staff finds that the proposed PDEP meets the standards in 10 CFR 50.47(b) and the requirements in Appendix E of 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 NRC staff concludes that the licensee’s proposed CR-3 PDEP in its application dated September 26, 2013, as supplemented by letters dated March 28, 2014, May 23, 2014, and October 6, 2014, 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, Rev. 6, and the licensee’s evaluation of the proposed changes. DEF chose, in part, to modify its EAL scheme from the generic EAL scheme development guidance provided in NEI 99-01, Rev. 6, in order to adopt a format more in alignment with its currently approved EAL scheme, as well as in alignment with licensee-specific writer’s guides

and preferences. The NRC staff determined that these modifications are editorial in nature and do not alter the intent of any specific EAL within an EAL set, EAL category or within the entire EAL scheme as stated in NEI 99-01, Rev. 6.

Based on its review, the NRC staff has determined that the proposed EAL scheme uses objective and observable values, is worded in a manner that addresses human factors engineering and user friendliness concerns, follows logical 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.

Furthermore, the NRC staff has determined that the proposed changes meet the guidance in NEI 99-01, Rev. 6, the planning standards of 10 CFR 50.47(b)(4), the requirements in Appendix E to 10 CFR Part 50, and are consistent with the exemptions granted as described in the NRC letter dated March 30, 2015 (Reference 6). Therefore, the NRC staff concludes that the proposed EAL scheme, as stated in Enclosure 3 of the licensee's letter dated May 23, 2014 (Reference 4), 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 Florida State official was notified of the proposed issuance of the amendment on February 10, 2015. 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 which was published in the *Federal Register* on January 7, 2014 (79 FR 857). 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. Letter from Duke Energy Florida, Inc. to U.S. Nuclear Regulatory Commission, "Crystal River Unit 3 – Certification of Permanent Cessation of Power Operations and that Fuel Has Been Permanently Removed from the Reactor," February 20, 2013 (ADAMS Accession No. ML13056A005).
2. Letter from Duke Energy Florida, Inc. to U.S. Nuclear Regulatory Commission, "Crystal River Unit 3 - License Amendment Request #315, Revision 0, Permanently Defueled Emergency Plan and Emergency Action Level Scheme, and Request for Exemption to Certain Radiological Emergency Response Plan Requirements Defined by 10 CFR 50," September 26, 2013 (ADAMS Accession No. ML13274A584).
3. Letter from Duke Energy Florida, Inc. to U.S. Nuclear Regulatory Commission, "Crystal River Unit 3 - Exemptions to Radiological Emergency Response Plan Requirements Defined by 10 CFR 50.47 and Appendix E to Part 50, Revision 1, and Response to Request for Additional Information," March 28, 2014 (ADAMS Accession No. ML14098A072).
4. Letter from Duke Energy Florida, Inc. to U.S. Nuclear Regulatory Commission, "Crystal River Unit 3 – Permanently Defueled Emergency Plan and Emergency Action Level Scheme, Revision 1, and Response to Request for Additional Information," May 23, 2014 (ADAMS Accession No. ML14154A408).
5. Letter from Duke Energy Florida, Inc. to U.S. Nuclear Regulatory Commission, "Crystal River Unit 3 – Permanently Defueled Emergency Plan, Revision 2 and Response to Request for Additional Information," October 6, 2014 (ADAMS Accession No. ML14288A122).
6. NRC Exemption Approval Letter, Crystal River, Unit 3 – Exemptions from Certain Emergency Planning Requirements and Related Safety Evaluation (ADAMS Accession Nos. ML15058A906 and ML15040A090).
7. Staff Requirements Memorandum (SRM) to SECY-14-0118, "Request by Duke Energy Florida, Inc. for Exemptions from Certain Emergency Planning Requirements," December 30, 2014" (ADAMS Accession No. ML14364A111).

8. SECY-14-0118, "Request by Duke Energy Florida, Inc., for Exemptions from Certain Emergency Planning Requirements," October 29, 2014 (ADAMS Accession No. ML14219A444).
9. Nuclear Energy Institute (NEI) 99-01, Rev. 6, "Development of Emergency Action Levels for Non-Passive Reactors," November 2012 (ADAMS Accession No. ML12326A805).
10. U.S. Nuclear Regulatory Commission and Federal Emergency Management Agency, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," NUREG-0654/FEMA-REP-1, November 1980 (ADAMS Accession No. ML040420012).
11. Letter from Mark Thaggard, U.S. Nuclear Regulatory Commission, to Susan Perkins-Grew, Nuclear Energy Institute, "U.S. Nuclear Regulatory Commission Review and Endorsement of NEI-99-01, Revision 6, dated November 2012," March 28, 2013 (ADAMS Accession No. ML12346A463).
12. NUMARC/NESP-007, Rev. 2, "Methodology for Development of Emergency Action Levels," January 1992 (ADAMS Accession No. ML041120174).
13. Letter from U.S. Nuclear Regulatory Commission to John Cowan, "Safety Evaluation of Florida Power Corporation's Proposed Emergency Action Levels Changes for Crystal River Unit 3," September 21, 1999 (ADAMS Legacy Accession No. 9909270112).

Principal Contributors: Michael B. Norris, NSIR  
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Date: March 31, 2015

T. Hobbs

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

Sincerely,

*/RA by Thomas Wengert for/*

Michael D. Orenak, Project Manager  
Plant Licensing IV-2 and Decommissioning  
Transition Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosures:

1. Amendment No. 246 to DPR-72
2. Safety Evaluation

cc w/enclosures: Distribution via ListServ

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**ADAMS Accession No.: ML15027A209**

\*Memo dated 1/13/15    \*\*Via E-mail

OFFICE	NRR/DORL/LPL4-2/PM	NRR/DORL/LPL4-2/LA	NSIR/DPR/ORLOB/BC*	OGC – NLO**	NRR/DORL/LPL4-2/BC
NAME	MOrenak	PBlechman	JAnderson	JWachutka	MKhanna
DATE	3/24/15	3/9/15	1/13/15	3/26/15	3/30/15
OFFICE	NRR/DORL/DD**	NRR/DORL/D	NRR/D	NRR/DORL/LPL4-2/PM	
NAME	GWilson	MEvans	WDean	MOrenak (TWengert for)	
DATE	3/30/15	3/31/15	3/30/15	3/31/15	

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