



**Dominion®**

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**September 25, 2009**

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

Serial No. NA3-09-005RA  
Docket No. 52-017  
COL/JPH

**DOMINION VIRGINIA POWER**  
**NORTH ANNA UNIT 3 COMBINED LICENSE APPLICATION**  
**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER No. 031 -**  
**REVISED RESPONSE (FSAR CHAPTER 13)**

On February 10, 2009, Dominion provided a response to RAI Question 13.03-3, Emergency Action Levels, which stated that Dominion had selected Option 2 and would address the four critical elements identified in RAI 13.03-3 within 30 days of a standard RAI response template developed by NEI for use by the industry. NEI never submitted the standard RAI response template to the NRC for endorsement.

This response supersedes the previous response provided in Dominion's letter dated February 10, 2009 and is based on discussions between Dominion and NRC staff on August 13, 2009. Dominion chooses Option 2 for the North Anna 3 Emergency Plan submittal and the four critical EAL elements identified in RAI 13.03-3 are addressed in Enclosure 1. This information will be incorporated into a future submission of the North Anna Unit 3 COLA, as described in Enclosure 1.

Please contact Regina Borsh at (804) 273-2247 (regina.borsh@dom.com) if you have questions.

Very truly yours,

Eugene S. Grecheck

DOB9  
LRO

Enclosure:

1. Response to RAI Letter 031, RAI Question 13.03-3 – Revised

Commitments made by this letter:

1. Submit a fully developed set of site-specific Emergency Action Levels (EALs) to the NRC in accordance with NEI 07-01, Revision 0, "Methodology for the Development of Emergency Action Levels" submitted to the NRC on July 21, 2009 at least 180 days prior to initial fuel load.
2. The information provided in the RAI responses will be incorporated into a future submission of the North Anna Unit 3 COLA, as described in the Enclosure.

COMMONWEALTH OF VIRGINIA

COUNTY OF HENRICO

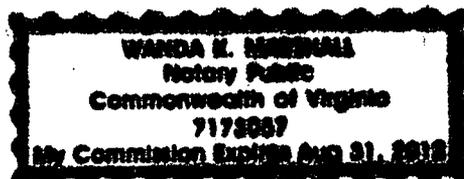
The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Eugene S. Grecheck, who is Vice President-Nuclear Development of Virginia Electric and Power Company (Dominion Virginia Power). He has affirmed before me that he is duly authorized to execute and file the foregoing document on behalf of the Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 25<sup>th</sup> day of September, 2009

My registration number is 7173057 and my

Commission expires: August 31, 2012

Wanda K. Marshall  
Notary Public



cc: U. S. Nuclear Regulatory Commission, Region II  
T. A. Kevern, NRC  
I. Berrios, NRC  
J. Jessie, NRC  
M. Eudy, NRC  
J. T. Reece, NRC

**ENCLOSURE 1**

**Response to NRC RAI Letter 031**

**RAI Question 13.03-3 - Revised**

**NRC RAI 13.03-3**

*The initial Emergency Action Levels (EALs), which are required by 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50, must be approved by the NRC. Recent combined license (COL) applications have been submitted that do not fully address certain aspects of the required EAL scheme. This is because various equipment set points and other information cannot be determined until the as-built information is available; e.g., head corrections, radiation shine, final technical specifications, and equipment calculations and tolerances. The NRC has been evaluating possible options to ensure applicants address the regulations and provides the following:*

*Option 1 – Submit an entire EAL scheme, which contains all site-specific information, including set points. Until this information is finalized, EALs would remain an open item.*

*Option 2 – Submit emergency plan Section D, “Emergency Classification System,” which addresses the four critical elements of an EAL scheme (listed below). The NRC will determine the acceptability of the EAL scheme.*

- Critical Element 1 – Applicant proposes an overview of its emergency action level scheme including defining the four emergency classification levels, (i.e., Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency), as stated in NEI 99-01, Revision 5, with a general list of licensee actions at each emergency classification level.*
- Critical Element 2 – Applicant proposes to develop the remainder of its EAL scheme by using a specified NRC endorsed guidance document. In the development of its EALs, the proposed EALs should be developed with few or no deviations or differences, other than those attributable to the specific reactor design. NEI 07-01, if endorsed, will be applicable to the AP1000 and ESBWR (passive) reactor designs, and NEI 99-01 is applicable to all (non-passive) reactor designs. If applicable, EALs related to digital instrumentation and control must be included. The NRC must find in the Safety Evaluation Report that this approach is acceptable for each site.*
- Critical Element 3 – Applicant proposes a License Condition (LC) that the applicant will create a fully developed set of EALs in accordance with the specified guidance document. These fully developed EALs must be submitted to the NRC for confirmation at least 180 days prior to fuel load.*
- Critical Element 4 – The EALs must be kept in a document controlled by 10 CFR 50.54(q), such as the emergency plan; or a lower tier document, such as the Emergency Plan Implementing Procedures.*

*Please review the two options provided above, identify which option will be chosen, and provide the detailed EAL information in support of the chosen option. Please inform the NRC which option you intend to pursue within two weeks of receipt of this RAI.*

### **Dominion Response**

This response supersedes the previous response provided in Dominion's letter dated February 10, 2009 and is based on discussions between Dominion and NRC staff on August 13, 2009.

Dominion chooses Option 2 for the North Anna 3 Emergency Plan submittal. Currently, Subsection II.D of the NA3 Emergency Plan discusses the EAL scheme based on NUREG-0654 and draft NEI 07-01, Revision 0, "Methodology for the Development of Emergency Action Levels." Appendix 1 of the Plan provides detailed initiating conditions (ICs) and Emergency Action Levels (EALs) based on the draft NEI 07-01, Revision 0 guidance.

As discussed below, changes to the NA3 Emergency Plan will be incorporated as described in the attached markup of this response. All references to NEI 07-01, Revision 0, will be removed from the Emergency Plan as well as the entire contents of Appendix 1 which will be shown as "Reserved."

The NA3 approach to each of the Critical Elements discussed in the NRC's Request for Additional Information (RAI) 13.03-3 is described below:

Critical Element 1 - Emergency Plan Subsection II.D.1 provides an overview defining the four emergency classification levels: Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency. For sake of completeness, the response below provides the classification level definitions currently in the Emergency Plan. A third paragraph was added for each classification describing the associated licensee actions at each level.

#### ***Notification of Unusual Event***

Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of safety systems occurs.

Potential degradation of the level of safety of the plant is indicated primarily by exceeding plant technical specification Limiting Condition of Operation (LCO) allowable action statement time for achieving required mode change. Precursors of more serious events should also be included because precursors do represent

a potential degradation in the level of safety of the plant. Minor releases of radioactive materials are included. In this emergency class, however, releases do not require monitoring or offsite response.

Actions undertaken at the NOUE emergency class include promptly informing State and local offsite authorities of the event, augmenting on-shift resources as needed, assessment and response, and escalation to a more severe class, if appropriate. If the emergency class is not escalated to a more severe class, then State and local offsite authorities will be notified of event termination in accordance with implementing procedures.

### **Alert**

Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of hostile action. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline (PAG) exposure levels.

Rather than discussing the distinguishing features of "potential degradation" and "potential substantial degradation," a comparative approach would be to determine whether increased monitoring of plant functions is warranted at the Alert level as a result of safety system degradation. This addresses the operations staff's need for help, independent of whether an actual decrease in plant safety is determined. This increased monitoring can then be used to better determine the actual plant safety state, whether escalation to a higher emergency class is warranted, or whether de-escalation or termination of the emergency class declaration is warranted. Dose consequences from these events are small fractions of the EPA PAG plume exposure levels.

Actions undertaken at the Alert emergency class include those described for the NOUE emergency class and activation of the Technical Support Center and Operational Support Center. In addition, Emergency Operations Facility and other key emergency personnel are alerted, on-site monitoring teams are dispatched, periodic plant status updates and meteorological assessments are provided to offsite authorities, as are dose estimates, if any event related releases are occurring.

### **Site Area Emergency**

Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile actions that result in intentional damage or malicious act: 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are

not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.

The discriminator (threshold) between Site Area Emergency and General Emergency is whether or not the EPA PAG plume exposure levels are expected to be exceeded outside the site boundary. This threshold, in addition to dynamic dose assessment considerations discussed in the EAL guidelines, clearly addresses NRC and offsite emergency response agency concerns as to timely declaration of a General Emergency.

Actions undertaken at the Site Area Emergency emergency class include those described for the Alert emergency class and activation of the Emergency Operations Facility. In addition, an individual is dedicated to provide plant status updates to offsite authorities and periodic media briefings (jointly with offsite authorities when practicable), senior technical and management staff are made available for consultation with NRC and the Commonwealth of Virginia on a periodic basis, and release and dose projections based on available plant condition information and foreseeable contingencies are provided.

### ***General Emergency***

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

The bottom line for the General Emergency is whether evacuation or sheltering of the general public is indicated based on EPA PAGs, and therefore should be interpreted to include radionuclide release regardless of cause. In addition, it should address concerns as to uncertainties in systems or structures (e.g., containment) response, and also events such as waste gas tank releases and severe spent fuel pool events that may affect the public. To better assure timely notification, EALs in this category must primarily be expressed in terms of plant function status, with secondary reliance on dose projection. In terms of fission product barriers, loss of two barriers with loss or potential loss of the third barrier constitutes a General Emergency.

Actions undertaken at the General Emergency emergency class are identical to those described for the Site Area Emergency emergency class except there is no more severe emergency class.

Critical Element 2 - The remainder of the site-specific EAL scheme will be developed using NEI 07-01, Revision 0. The fully developed site-specific EAL scheme will be included in an Emergency Plan Implementing Procedure (EPIP),

in accordance with NRC NEI 07-01, Revision 0, submitted on July 21, 2009. Accordingly, the current EAL scheme will be removed from Appendix 1 and Appendix 1 of the Emergency Plan will be noted as "Reserved" as shown in the attached markup.

Appendix 5 of the Emergency Plan includes in the list of EIPs, an EIP addressing Emergency Classification. Section II.D of the Emergency Plan will be revised to refer to the applicable EIP. As a result, several other changes will be made throughout the Emergency Plan to remove references to NEI 07-01, Revision 0, as the basis for EAL scheme and methodology used in the NA3 Emergency Plan.

Critical Element 3 – Dominion intends to submit a fully developed set of site-specific Emergency Action Levels (EALs) to the NRC in accordance with NEI 07-01, Revision 0, submitted on July 21, 2009. The fully developed site-specific EAL scheme will be submitted to the NRC for confirmation at least 180 days prior to initial fuel load.

Critical Element 4 – As discussed in Critical Element 2, the fully developed site-specific EAL scheme will be incorporated into a future EIP. Accordingly, Section II.P.7 of the Emergency Plan will be revised to indicate that future changes to the EIP containing the EAL scheme will require an evaluation under 10 CFR 50.54(q) to determine if these changes will reduce the effectiveness of the Emergency Plan.

### **Proposed COLA Revision**

Part 5, Emergency Plan and Table 2.3-1 of Part 10, Tier 1-ITAAC, will be revised as shown in attached markup.

### **Markup of North Anna COLA**

The attached markup represents Dominion's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

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**Explanatory Notes Regarding the Emergency Plan and Supplemental Information**

The North Anna Power Station Unit 3 Combined License Emergency Plan consists of a basic plan and eight appendices. The basic plan follows the format of NUREG-0654 and provides detailed information regarding each of the sixteen Planning Standards and associated Evaluation Criteria. The eight appendices that follow provide additional detailed information on various aspects of the Emergency Plan. Supplemental information includes the detailed evacuation time estimate report and current state and local emergency planning documents. Emergency Planning Inspections, Test, Analyses, and Acceptance Criteria (ITAAC) are included in Part 10 of the COLA.

<b>Emergency Plan</b>	
Basic Plan	North Anna Power Station Unit 3 Combined License Application Emergency Plan
Appendix 1	<del>Emergency Action Levels</del> <u>[reserved]</u>
Appendix 2	Assessment and Monitoring for Actual or Potential Off-site Consequences of a Radiological Emergency
Appendix 3	Public Alert and Notification System Conceptual Design
Appendix 4	Evacuation Time Estimate (summary)
Appendix 5	Implementing Procedures
Appendix 6	Emergency Equipment and Supplies
Appendix 7	Certification Letters
Appendix 8	Cross-Reference to Regulations, Guidance, and State and Local Plans
<b>Supplemental Information</b>	
Evacuation Time Estimate Report	
<i>State and Local Emergency Planning Documents</i>	
Virginia Emergency Operations Plan, Radiological Emergency Response Basic Plan	
Louisa County Radiological Emergency Response Plan	
Spotsylvania County Radiological Emergency Response Plan	
Orange County Radiological Emergency Response Plan	
Caroline County Radiological Emergency Response Plan	
Hanover County Radiological Emergency Response Plan	

## I. Introduction

This emergency plan describes the plans established by Dominion for responding to a radiological emergency at North Anna Power Station (NAPS) Unit 3. Portions of this plan incorporate content by reference from Part 2, Site Safety Analysis Report, of the North Anna ESPA (Reference 19). This plan uses the format "SSAR Section x.y.z" to identify content incorporated from Part 2 of the ESPA.

### A. Purpose

This Emergency Plan describes the pre-planned facilities, equipment, response organizations, assessment and protective actions, and cooperative agreements established by Dominion to provide for adequate protection of life and property in the event of a radiological emergency at Unit 3. In this context, protection of life and property includes:

- Notifying and mobilizing affected members of the licensee staff, Federal, Commonwealth of Virginia, risk jurisdiction, and commercial response organizations, and the public;
- Limiting the radiological impact of the emergency on plant employees and affected members of the public; and
- Limiting the potential adverse impact of protective actions, such as evacuations or sheltering.

The impact of plant emergencies is limited through the implementation of pre-planned and controlled preparatory, assessment, and protective actions consistent with this plan.

### B. Scope

This emergency plan applies to planning for and response to any radiological emergency condition at Unit 3. Section II.D describes the emergency classification system. ~~Appendix 4 identifies~~ Implementing procedures identify radiological emergency conditions, ~~and their initiating conditions,~~ and Emergency Action Levels (EALs).

This emergency plan has been coordinated with the plans of affected government agencies and private sector support organizations listed in Section II.A. Ongoing coordination with affected risk jurisdiction, Commonwealth of Virginia, and Federal agencies and private sector support organizations is imperative to provide for an effective emergency response capability.

### C. Planning Basis and Emergency Planning Zones

#### 1. Planning Basis

This plan has been developed to meet the requirements of 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses For Nuclear Power Plants," (Reference 1). Consistent with those requirements, this plan is based on the requirements of 10 CFR Part 50, "Domestic Licensing Of Production And Utilization

## II. Emergency Plan

### A. Assignment of Responsibility (Organization Control)

The description of participating organizations in SSAR Section 13.3.2.2.2.a is incorporated by reference.

#### 1. Emergency Organization

##### a. Participating Organizations

Appendix 8 provides a cross-reference to the related provisions in the COVRRP and risk jurisdiction RERPs.

##### b. Concept of Operations

Dominion's responsibilities during an emergency condition focus on taking actions to:

- Assess plant conditions
- Classify emergency conditions
- Notify affected agencies of emergency conditions
- Provide technical expertise to affected agencies
- Provide support for offsite assessment and protective activities
- Make protective action recommendations
- Mitigate the consequences of adverse plant conditions by monitoring and controlling plant parameters
- Request assistance from off-site agencies, as needed
- Provide support to affected agencies for communications with the affected public
- Terminate emergency conditions

Normal operations at Unit 3 are conducted under the authority of the Shift Manager and directed from the Unit 3 Control Room. In the event of an abnormal condition, the Shift Manager directs the activities of the plant staff in performing initial assessment, corrective, and protective functions. Using approved operating ~~and emergency~~ procedures, including the ~~Emergency Action Levels (EALs) provided in Appendix 4~~ implementing procedures, the Shift Manager determines if an emergency condition exists and, if so, the proper emergency classification. Based on this classification and plant conditions, the Shift Manager assumes the role of the *Emergency Coordinator*<sup>1</sup>,

1. Throughout this plan, certain position titles, such as *Emergency Coordinator* and *EOF Director*, are used consistent with the provisions of existing regulations, guidance, and Dominion documents. The position titles are provided in italics to denote their generic application. The actual position titles to be used in the execution of this plan will be established in emergency plan implementing procedures or other facility documentation.

### 3. Radiological Laboratories

Radiological laboratories available to support emergency response efforts are available through the Commonwealth of Virginia to respond to an emergency at the NAPS site. These resources include those facilities listed below. Estimated travel times to the NAPS site are provided parenthetically.

- University of Virginia, Charlottesville, Virginia (45 minutes)
- Virginia Commonwealth Laboratories, Richmond, Virginia (75 minutes)
- Virginia Commonwealth University Medical Center, Richmond, Virginia (75 minutes)
- Newport News Shipbuilding & Drydock, Newport News, Virginia (3 1/2 hours)
- VDH Radiological Health Program Mobile Laboratory (1 hour)

North Anna maintains fixed laboratory equipment to support sampling analysis and monitoring. The equipment includes multichannel analyzers, proportional counters, a tritium analyzer, and whole body counters; arrangements are maintained for reading thermoluminescent dosimeters (TLDs).

The listed laboratory facilities are available to support emergency response activities on a 24-hour per day basis.

### 4. Other Supporting Organizations

Dominion has made arrangements to obtain additional emergency response support from the INPO Fixed Nuclear Facility Voluntary Assistance Agreement signatories and the Radiation Emergency Assistance Center/Training Site (REAC/TS). Certification letters, provided in Appendix 7, outline the scope of the expected support.

### D. Emergency Classification System

~~Dominion has developed and implemented~~ uses a standard emergency classification scheme, based on system and effluent parameters, ~~on which~~ allows affected Commonwealth of Virginia and risk jurisdiction response organizations ~~may rely for determining to determine~~ initial offsite response measures. ~~The initiating conditions include the conditions provided in NEI 07-01, Rev. 0, Methodology for Development of Emergency Action Levels, Advanced Passive Light Water Reactors (Reference 13) as it applies to ESBWRs and the postulated accidents identified in the FSAR.~~

The description of the emergency classification system in SSAR Section 13.3.2.2.2.d is incorporated by reference.

## 1. Classification System

~~Appendix E of 10 CFR Part 50-10 CFR 50, Appendix E~~ identifies four distinct classes of emergencies. ~~The definitions of these emergency classes are more fully discussed in NEI 07-01, as follows:~~

- Notification of Unusual Event (NOUE) - Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of safety systems occurs.

Potential degradation of the level of safety of the plant is indicated primarily by exceeding plant technical specification Limiting Condition of Operation (LCO) allowable action statement time for achieving required mode change. Precursors of more serious events should also be included because precursors do represent a potential degradation in the level of safety of the plant. Minor releases of radioactive materials are included. In this emergency class, however, releases do not require monitoring or offsite response.

Actions undertaken at the NOUE emergency class include promptly informing State and local offsite authorities of the event, augmenting on-shift resources as needed, assessment and response, and escalation to a more severe class, if appropriate. If the emergency class is not escalated to a more severe class, then State and local offsite authorities will be notified of event termination in accordance with implementing procedures.

- Alert – Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of hostile action. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline (PAG) exposure levels.

Rather than discussing the distinguishing features of “potential degradation” and “potential substantial degradation,” a comparative approach would be to determine whether increased monitoring of plant functions is warranted at the Alert level as a result of safety system degradation. This addresses the operations staff's need for help, independent of whether an actual decrease in plant safety is determined. This increased monitoring can then be used to better determine the actual plant safety state, whether escalation to a higher emergency class is warranted, or whether de-escalation or termination of the emergency class declaration is warranted. Dose consequences from these events are small fractions of the EPA PAG plume exposure levels.

Actions undertaken at the Alert emergency class include those described for the NOUE emergency class and activation of the Technical Support Center and Operational Support Center. In addition, Emergency Operations Facility and other key emergency personnel are alerted, on-site monitoring teams are dispatched, periodic plant status updates and meteorological assessments are provided to offsite authorities, as are dose estimates, if any event related releases are occurring.

- Site Area Emergency - Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile actions that result in intentional damage or malicious act: 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

The discriminator (threshold) between Site Area Emergency and General Emergency is whether or not the EPA PAG plume exposure levels are expected to be exceeded outside the site boundary. This threshold, in addition to dynamic dose assessment considerations discussed in the EAL guidelines, clearly addresses NRC and offsite emergency response agency concerns as to timely declaration of a General Emergency.

Actions undertaken at the Site Area Emergency emergency class include those described for the Alert emergency class and activation of the Emergency Operations Facility. In addition, an individual is dedicated to provide plant status updates to offsite authorities and periodic media briefings (jointly with offsite authorities when practicable), senior technical and management staff are made available for consultation with NRC and the Commonwealth of Virginia on a periodic basis, and release and dose projections based on available plant condition information and foreseeable contingencies are provided.

- General Emergency – Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

The bottom line for the General Emergency is whether evacuation or sheltering of the general public is indicated based on EPA PAGs, and therefore should be interpreted to include radionuclide release regardless of cause. In addition, it should address concerns as to uncertainties in systems or structures (e.g., containment) response, and also events such as waste gas tank releases and severe spent fuel pool events

that may affect the public. To better assure timely notification, EALs in this category must primarily be expressed in terms of plant function status, with secondary reliance on dose projection. In terms of fission product barriers, loss of two barriers with loss or potential loss of the third barrier constitutes a General Emergency.

Actions undertaken at the General Emergency emergency class are identical to those described for the Site Area Emergency emergency class except there is no more severe emergency class.

~~Appendix 1 provides~~ Implementing procedures provide recognition categories, the associated initiating condition matrices, and the ~~emergency action levels~~ EALs.

## 2. Emergency Action Levels

The description of emergency action levels provided in SSAR Section 13.3.2.2.2.c is incorporated by reference. The following information supplements that description.

~~Dominion adopts the methodology provided in NEI 07-01, Rev. 0. Because this document has not yet been endorsed by the NRC, EALs contained in this plan are subject to further review and modification based on the version of NEI 07-01 ultimately endorsed in a future revision to USNRC Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors (Reference 14) or other accepted guidance, modified consistent with the improvements to facility design and operation as reflected in the ESBWR DCD. Appendix 1 provides~~ Implementing procedures provide the parameter values and equipment status that are indicative of each emergency class.

## 3. Commonwealth/Risk Jurisdiction EAL Scheme

This NUREG-0654 criterion does not apply to the licensee, but to State and local plans. Appendix 8 provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## 4. Commonwealth/Risk Jurisdiction Emergency Action Procedures

Appendix 8 provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## E. Notification Methods and Procedures

Dominion maintains procedures for notification of Commonwealth of Virginia and risk jurisdiction response organizations and licensee emergency responders. These procedures include, or make reference to, the pre-planned content of messages to Commonwealth of Virginia and risk jurisdiction organizations. Dominion also makes arrangements to provide prompt notification to members of the public within the plume exposure pathway EPZ.

The descriptions of notification methods and procedures provided in SSAR Section 13.3.2.2.2.e are incorporated by reference.

## 1. Notification of Commonwealth and Risk Jurisdiction Authorities

Dominion maintains systems and procedures needed to provide prompt notification of affected Commonwealth of Virginia, risk jurisdiction, and Federal authorities following the declaration of any emergency condition, consistent with the emergency classification and action level scheme described in ~~Appendix 1~~ implementing procedures. The *Emergency Coordinator* initiates notification of affected Commonwealth of Virginia and risk jurisdiction authorities, including escalation or de-escalation of any emergency condition. The affected authorities include the Commonwealth of Virginia and the following risk jurisdictions:

- Caroline County
- Hanover County
- Louisa County
- Orange County
- Spotsylvania County

The primary notification method to be used is the Insta-phone system, which is accessible from the Control Room, TSC, and EOF. Back-up notification capability is maintained through the use of commercial telephone systems. Message content and verification methods are established in implementing procedures.

Dominion maintains systems and procedures needed to provide prompt notification of the USNRC Operations Center following the declaration of any emergency condition. The USNRC will be notified as soon as is practical following the notification of the Commonwealth of Virginia and risk jurisdiction authorities and within one (1) hour of the emergency declaration, including escalation or de-escalation of any emergency declaration. The primary notification method to be used is the Emergency Notification System, which is accessible from the Control Room, TSC, and EOF. Back-up notification capability is maintained through the use of commercial telephone systems.

Appendix 8 provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## 2. Notification and Mobilization of Licensee Response Organizations

The description of the methods and procedures used for notifying and mobilizing the Dominion ERO provided in SSAR Section 13.3.2.2.2.e is incorporated by reference. The following information supplements that description.

The *Emergency Coordinator* directs the notification and mobilization of the licensee emergency response organization following the declaration of an Alert or higher level emergency. Although Dominion does not expect that the augmented resources of the emergency response organization would be required for a Notification of Unusual Event,

## **11. Emergency Kits**

Appendix 6 provides a description of the emergency equipment and supplies typically provided for use by emergency response personnel.

Appendix 8 provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **12. Receipt of Field Monitoring Data**

Health Physics personnel located in the EOF are designated as the point of contact for the receipt of off-site monitoring data results and sample media analysis results collected by Dominion personnel.

Appendix 8 provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **I. Accident Assessment**

The descriptions of provisions for accident assessment provided in SSAR Section 13.3.2.2.2.i are incorporated by reference.

### **1. Parameters Indicative of Emergency Conditions**

~~Appendix 1 identifies~~ Implementing procedures describe plant system and effluent parameter values that are indicative of off-normal conditions. ~~Appendix 1 includes and~~ the various indications that correspond to the emergency initiating conditions ~~based on the methodology provided in NEI-07-01, Rev. 0.~~ Plant procedures specify the types and capabilities of the instruments used to indicate emergency conditions.

### **2. Plant Monitoring Systems**

Section 7.5.1 of the ESBWR Design Control Document describes the Post-Accident Monitoring Systems and is incorporated into this plan by reference.

### **3. Determination of Source Term and Radiological Conditions**

- a. Appendix 2 and plant procedures provide means for relating various measured parameters, including containment radiation monitor reading, to the source term available for release within plant systems.
- b. Appendix 2 and plant procedures provide means for relating various measured parameters, including effluent monitor readings, to the magnitude of the release of radioactive materials.

In the event of a hostile attack against the site, conditions may dictate initiation of protective measures other than personnel assembly, accountability and evacuation. The *Emergency Coordinator* makes decisions regarding appropriate protective measures based on evaluation of site conditions, including input from the Security force. If, based on the judgment of the *Emergency Coordinator*, personnel assembly, accountability, and evacuation may result in undue hazards to site personnel, the *Emergency Coordinator* may direct other protective measures, including:

- Evacuation of personnel from areas and buildings perceived as high-value targets
- Site evacuation by opening, while continuing to defend, security gates
- Dispersal of key personnel
- On-site sheltering
- Staging of ERO personnel in alternate locations pending restoration of safe conditions
- Implementation of accountability measures following restoration of safe conditions

Appendix 6 provides a description of the emergency response supplies and equipment to be provided.

## 7. Protective Action Recommendations and Bases

Public Protective Action Recommendations (PARs) are based on plant conditions, estimated offsite doses, or some combination of both. Dominion provides Protective Action Recommendations promptly to the Virginia EOC. ~~The Emergency Action Levels~~ EALs correspond to the projected dose to the population at risk and are determined consistent with the methodology ~~discussed in NEI 07-01~~ described in implementing procedures.

If the *Emergency Coordinator* declares a General Emergency or a Site Area Emergency with a potential for loss of three fission product barriers, then Dominion will communicate to the Virginia EOC a PAR to evacuate a two mile radius around the facility, evacuate five miles downwind (downwind sector and adjacent sectors), and to shelter in place for the remainder of the plume exposure pathway EPZ.

In addition to the EAL-based PAR, Dominion provides PARs based on offsite dose projections. The Health Physics staff is responsible for conducting offsite dose projections periodically throughout any emergency during which there is an actual or potential release of an amount of radioactive material that is likely to result in offsite consequences. Implementing procedures will establish requirements for performing required calculations and projections.

The projected doses are compared to the Protective Action Guides shown in Table II-3, as derived from EPA 400-R-92-001, "Manual of Protective Action Guides and Protective

- Virginia Commonwealth University Medical Center Radiation Emergency Plan
- Department of Energy – Federal Radiological Monitoring and Assessment Center Operations Plan

Appendix 8 provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

#### **7. Implementing Procedures**

Appendix 5 provides a topical listing of EIPs that support this plan.

Certain emergency plan features recommended by NUREG-0654 (e.g., Evaluation Criterion D.1, which addresses identification of parameter values and status for each emergency class, and Evaluation Criterion I.3, which addresses methods and techniques for determining source terms and the magnitude of releases) are procedural in nature and have been more appropriately placed in plant procedures, including EIPs. Changes to the affected portions of these procedures are developed and approved consistent with the requirements of 10 CFR 50.54(q).

Appendix 8 provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

#### **8. Table of Contents**

The format for this Emergency Plan directly follows the format of NUREG-0654, Rev. 1 as outlined in the Table of Contents.

Appendix 8 provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

#### **9. Emergency Plan Reviews**

Dominion's independent assessment organization performs, or oversees the performance of, periodic independent reviews of the emergency preparedness program consistent with the requirements of 10 CFR 50.54(t). The reviews include, at a minimum, the following:

- The Emergency Plan
- Emergency plan implementing procedures and practices
- The emergency preparedness training program
- Readiness testing (e.g., drills and exercises)
- ERFs, equipment, and supplies
- Interfaces with Commonwealth of Virginia and risk jurisdiction government agencies

### III. References and Appendices

#### A. Cited References

1. U.S. Nuclear Regulatory Commission, "Early Site Permits; Standard Design Certifications; And Combined Licenses For Nuclear Power Plants," 10 CFR Part 52, as amended.
2. U.S. Nuclear Regulatory Commission, "Domestic Licensing Of Production And Utilization Facilities," 10 CFR Part 50, as amended.
3. U.S. Nuclear Regulatory Commission, "Emergency Plans," 10 CFR 50.47, as amended.
4. U.S. Nuclear Regulatory Commission, "Emergency Planning and Preparedness for Production and Utilization Facilities," 10 CFR Part 50, Appendix E, as amended.
5. U.S. Nuclear Regulatory Commission, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" NUREG-0654/FEMA-REP-1, Revision 1, October 1980.
6. U.S. Nuclear Regulatory Commission, "Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants," NUREG 75/014 (WASH-1400), October 1975.
7. U.S. Nuclear Regulatory Commission, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," NUREG-0396; EPA 520/1-78-016, December 1978.
8. U.S. Nuclear Regulatory Commission, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," Regulatory Guide 1.183, July 2000.
9. GE Nuclear Energy, "ESBWR Design Control Document," Revision 5, May 2008.
10. North Anna Power Station Unit 3 Final Safety Analysis Report, Revision 1, November 2008.
11. U.S. Department of Energy, "Federal Radiological Monitoring and Assessment Center Operations Plan," DOE/NV 11718-080, December 2005.
12. U.S. Department of Homeland Security, "National Response Plan," December 2004.
13. ~~Nuclear Energy Institute, "Methodology for Development of Emergency Action Levels, Advanced Passive Light Water Reactors," NEI 07-01, Rev. 0, September 2007. [Deleted]~~

### **C. Appendices**

Appendix 1 - ~~Emergency Action Levels and Initiating Conditions~~ [reserved]

Appendix 2 - Assessment and Monitoring for Actual or Potential Offsite Consequences of a Radiological Emergency

Appendix 3 - Public Alert and Notification System

Appendix 4 - Evacuation Time Estimates (summary)

Appendix 5 - Emergency Plan Implementing Procedures – Topical List

Appendix 6 - Emergency Equipment and Supplies

Appendix 7 - Certification Letters

Appendix 8 - Cross-Reference to Regulations, Guidance, and State and Local Plans

**Appendix 1—~~Emergency Action Levels~~ Reserved**

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Note: To a limited extent, certain details of the Commonwealth and risk jurisdiction plans may be specific to Unit 3. Such details will be developed at a later date consistent with the commitments outlined in the certification letters provided in ~~Appendix 4~~ Appendix 7 of this plan.

<b>Requirement</b>	<b>Corresponding COL Emergency Plan Provision</b>
10 CFR 50.47(b)(1)	II.A, II.B, II.C
10 CFR 50.47(b)(2)	II.A, II.B, II.C, II.E, II.F
10 CFR 50.47(b)(3)	II.A, II.B, II.C, II.H
10 CFR 50.47(b)(4)	II.D, App. 1
10 CFR 50.47(b)(5)	II.E, II.F, II.J
10 CFR 50.47(b)(6)	II.E, II.F, II.J
10 CFR 50.47(b)(7)	II.G
10 CFR 50.47(b)(8)	II.H
10 CFR 50.47(b)(9)	II.H, II.I
10 CFR 50.47(b)(10)	II.J, II.K
10 CFR 50.47(b)(11)	II.J, II.K
10 CFR 50.47(b)(12)	II.L
10 CFR 50.47(b)(13)	II.M
10 CFR 50.47(b)(14)	II.N
10 CFR 50.47(b)(15)	II.O
10 CFR 50.47(b)(16)	II.P
10 CFR 50.72(a)(3)	II.E.1
10 CFR 50.72(a)(4)	II.F.1.f
10 CFR 50.72(c)(3)	II.E.4
10 CFR 50 App E.IV	COL Emergency Plan, including App. 4 and Evacuation Time Estimate
10 CFR 50 App E.IV.A	II.A, II.B, II.C, II.E, II.F, II.J, II.K, II.L
10 CFR 50 App E.IV.B	II.D, II.H, II.I, App. 1
10 CFR 50 App E.IV.C	II.A, II.D, II.E, II.F, App. 1
10 CFR 50 App E.IV.D	II.A, II.E, II.F, II.G, App. 3
10 CFR 50 App E.IV.E	II.B, II.F, II.H, II.I, II.L, II.N, App. 2, App. 6
10 CFR 50 App E.IV.F	II.N, II.O
10 CFR 50 App E.IV.G	II.P
10 CFR 50 App E.IV.H	II.M

**Table 2.3-1 ITAAC For Emergency Planning**

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
<b>1.0 Emergency Classification System</b>			
<p>10 CFR 50.47(b)(4) – 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.</p>	<p>1.1 A standard emergency classification and emergency action level (EAL) scheme exists, and identifies facility system and effluent parameters constituting the bases for the classification scheme. [D.1**]</p> <p>[**D.1 corresponds to NUREG-0654 /FEMA-REP-1 evaluation criteria.]</p> <p><b>ITAAC element addressed in:</b>  COL EP II.D.1, Appendix 1</p>	<p>1.1 An inspection of the control room, technical support center (TSC), and emergency operations facility (EOF) will be performed to verify that they have displays for retrieving facility system and effluent parameters identified in the following list of EALs- <del>(Reference COL EP Appendix 1)-</del> <u>Emergency Plan Implementing Procedures (EIPs).</u></p> <p><del>Abnormal Rad Levels/Radiological Effluents: AU1 (EALs 1, 2), AU2, AA1 (EALs 1, 2), AA2, AA3, AS1 (EALs 1), AG1 (EAL 1)</del></p> <p><del>Cold Shutdown/Refueling System Malfunction CU1, CU2, CU3, CU4, CU7, CU8, CA1, CA4, CS1, CG2</del></p> <p><del>Fission Product Barrier Thresholds:</del></p> <p><del><b>Fuel Clad Barrier Thresholds Values:</b></del></p> <ol style="list-style-type: none"> <li><del>1. Reactor Vessel Water Level</del></li> <li><del>2. Primary Containment Radiation Monitoring</del></li> <li><del>3. Other Indications</del></li> </ol>	<p>1.1.1 A report exists that confirms the specific parameters identified in the EALs listed in ITA Section 1.1 have been retrieved and displayed in the control room, TSC, and EOF.</p> <p>1.1.2 A report exists that confirms the ranges available in the control room, TSC, and EOF encompasses the values for the specific parameters identified in the EALs listed in ITA Section 1.1.</p>

**Table 2.3-1 ITAAC For Emergency Planning**

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
<del>4.0 Emergency Classification System (continued)</del>			
		<p><del>RCS Barrier Threshold Values:</del></p> <ol style="list-style-type: none"> <li><del>1. Primary Containment Pressure</del></li> <li><del>2. Reactor Vessel Water Level</del></li> <li><del>3. RCS Leak Rate</del></li> <li><del>4. Primary Containment Radiation Monitoring</del></li> </ol> <p><del>Containment Barrier Threshold Values:</del></p> <ol style="list-style-type: none"> <li><del>1. Primary Containment Conditions</del></li> <li><del>2. Primary Containment Isolation Failure or Bypass</del></li> <li><del>3. Primary Containment Radiation Monitoring</del></li> </ol> <p><del>Hazards or Other Conditions Affecting Plant Safety: HU1 (EAL 2), HA1 (EALs 1, 2)</del></p> <p><del>System Malfunction: SU1, SU4 (EAL 1), SU8, SA1, SA2, SA4, SS1, SS2, SS3, SS6, SG1, SG2</del></p>	

**Table 2.3-1 ITAAC For Emergency Planning**

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
<b>6.0 Accident Assessment</b>			
<p>10 CFR 50.47(b)(9) – Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.</p>	<p>6.1 The means exist to provide initial and continuing radiological assessment throughout the course of an accident. [I.2]</p> <p><b>ITAAC element addressed in:</b>  COL EP II.I.2, Appendix 2</p>	<p>6.1 A test of the emergency plan will be conducted by performing an exercise or drill to verify the capability to perform accident assessment.</p>	<p>6.1 A report exists that confirms an exercise or drill has been accomplished, including use of selected monitoring parameters identified in the EALs listed in ITA Section 1.1, thresholds listed in the EPIPs, to assess simulated degraded plant conditions and initiate protective actions in accordance with the following criteria:</p> <p>A. Accident Assessment and Classification</p> <ol style="list-style-type: none"> <li>1. Initiating conditions identified, EALs parameters determined, and the emergency correctly classified throughout the drill.</li> <li>2. Protective action recommendations developed and communicated to appropriate authorities.</li> </ol>