



**North Anna 3  
Combined  
License  
Application**

**Part 5:  
Emergency Plan**

**Revision 3**

**December 2011**

## 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.

Emergency Plan	
Basic Plan	North Anna Power Station Unit 3 Combined License Application Emergency Plan
<a href="#">Appendix 1</a>	Emergency Action Levels
<a href="#">Appendix 2</a>	Assessment and Monitoring for Actual or Potential Off-site Consequences of a Radiological Emergency
<a href="#">Appendix 3</a>	Public Alert and Notification System Conceptual Design
<a href="#">Appendix 4</a>	Evacuation Time Estimate (summary)
<a href="#">Appendix 5</a>	Implementing Procedures
<a href="#">Appendix 6</a>	Emergency Equipment and Supplies
<a href="#">Appendix 7</a>	Certification Letter
<a href="#">Appendix 8</a>	Cross-Reference to Regulations, Guidance, and State and Local Plans
Supplemental Information	
<a href="#">Evacuation Time Estimate Report</a>	
<i>State and Local Emergency Planning Documents</i>	
Virginia Emergency Operations Plan, Radiological Emergency Response Basic Plan	
Maryland Radiological Event Plan (formerly known as Annex Q)	
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	

## REVISION SUMMARY

### Revision 3

Section	Change	Reason for Change
II.N.1.b	Added treatment of remedial exercise requirements.	R-COLA R2
Appendix 1, Table of Contents	Deleted.	R-COLA R2
Appendix 1, ppA1-1 thru A1-37	Replaced with table of EAL Differences and Deviations from guidance provided in NEI 99-01, Rev. 5 and NEI 07-01, Rev. 0 (for EALs related to digital controls).	R-COLA R2

## Revision 2

Section	Changes
All	<p>Part 5 revised to reflect the change from ESBWR technology to US-APWR technology.</p> <p><a href="#">Explanatory Notes</a> revised to reflect insertion of EALs based on NEI 99-01.</p> <p>I.B – Revised to reflect insertion of EALs in App. 1.</p> <p>I.C.3 – Revised to reflect technology change.</p> <p>II.A.1.b – Revised to reflect technology change; Revised to reflect consolidation of Certification Letters and title change to National Response Framework.</p> <p>II.A.3 – Revised to reflect consolidation of Certification Letters and title change to National Response Framework.</p> <p>Sec. II.B.8 – Revised to reflect technology change.</p> <p>Sec. II.B.9 – Revised to reflect consolidation of Certification Letters.</p> <p>Sec. II.C.1.a – Revised to reflect NRC's preferred method of requesting Federal assistance.</p> <p>Sec. II.C.4 – Revised to reflect consolidation of Certification Letters.</p> <p>Sec. II.D.2 – Revised to reflect insertion of EALs in App. 1.</p> <p>Sec. II.F.1 – Revised to reflect technology change.</p> <p>Sec. II.H.1 – Revised to reflect technology change and correct reference.</p> <p>Sec. II.H.5.c – Editorial correction.</p> <p>Sec. II.H.6.b – Revised to reflect consolidation of Certification Letters.</p> <p>Sec. II.H.8 – Provided reference for met system description.</p> <p>Sec. II.H.9 – Provided OSC location to reflect technology change.</p> <p>Sec. II.I.2 – Revised to reflect technology change and provide reference for PASS description.</p> <p>Sec. II.I.5 – Updated to reflect complete and correct references.</p> <p>Sec. II.L.1 – Revised to reflect consolidation of Certification Letters.</p> <p>Sec. III.A – Revised to reflect technology change, title change, and editorial corrections.</p> <p>Sec. III.C – Revised to reflect insertion of EALs.</p> <p>App. 1 – Changed title and inserted App. 1 EALs.</p> <p>App. 2, Sec 1.0 &amp; 2.3 – Provided correct reference.</p> <p>App. 4 – Corrected page footer.</p> <p>App. 7 – Revised to reflect consolidation of Certification Letters.</p> <p>App. 8 – Revised to reflect consolidation of Certification Letters.</p>

### ***Revision 2 (continued)***

<b>Section</b>	<b>Changes</b>
<a href="#">Explanatory Notes, I.B, II.A.1.b, II.D, II.D.1, II.D.2, II.I.1, II.P.7, III.A.12, Appendix 1, Appendix 8</a>	RAI 13.03-3- Revised, Emergency Action Levels
<a href="#">II.H.1, II.H.2</a>	RAI 13.03-4, Clarify Change to HSI Function From SPDS Function
<a href="#">II.H.2</a>	RAI 13.03-5, Clarify New EOF

### ***Revision 1***

<b>Section</b>	<b>Changes</b>
<a href="#">I, I.C.2, I.C.3, II.A, II.B, II.C, II.D, II.D.2, II.E, II.E.2, II.E.6, II.E.7, II.F, II.G, II.H, II.H.4, II.I, II.I.7, II.J, II.J.8, II.K, II.L, II.O, II.P, III.A.18, Appendix 1—Executive Summary, Appendix 1–1.0, Appendix 1–3.0</a>	RAI 13.03-2.2, IBR is SSAR in ESPA versus ESP
<a href="#">I.A, I.B, I.C.3, II.A.1.b, II.B.1, II.H.2, II.H.5.a, II.H.5.b, II.H.5.c, II.H.5.d, II.K.2, II.L.1, II.N.2.b, II.P.9, III.A.9, III.A.9, III.A.18, IC HU4, Appendix 2–1.0, Appendix 2–2.1, Appendix 2–2.2, Appendix 8</a>	Made references to Unit 3. Editorial changes. Corrected references. Added reference to MD plan (Appendix 8). Updated Appendix 4 with ETE R1 executive summary.
<a href="#">II.B.8, II.C.3</a>	RAI 13.03-2.3, Vendor Support During Emergency Events
<a href="#">II.E.1, II.F.1.d</a>	Added locations of ENS access and description of communication capabilities between the Control Room/TSC and radiological field personnel.
<a href="#">II.G.4.a, II.G.4.c</a>	RAI 13.03-2-8, Classification of Titles in Public Information Structure
<a href="#">II.H.1, II.H.2</a>	Corrected description of technical data display in TSC.
<a href="#">Table II-2</a>	RAI 13.03-2.9, Required Minimum Staffing Times
<a href="#">II.J.10.a, Figure II-5</a>	RAI ETE-4, Evacuation Routes, Monitoring Points, and Shelter Locations
<a href="#">II.P.4</a>	Changed FSRC to proper noun.
<a href="#">Appendix 1—Executive Summary</a>	Deleted incorrect reference.
<a href="#">Appendix 8</a>	Editorial corrections.

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**Appendix 3—Public Alert and Notification System**

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## Acronyms and Abbreviations

AED	Automatic External Defibrillator
ALARA	As Low As Reasonably Achievable
CDE	Committed Dose Equivalent
CFR	Code of Federal Regulations
COL	Combined License
COVRERP	Commonwealth of Virginia Radiological Emergency Response Plan
CPR	Cardio-Pulmonary Resuscitation
CR	Control Room
DCD	Design Control Document
DEQ	Department of Environmental Quality
DHS	(U.S.) Department of Homeland Security
DOE	(U.S.) Department of Energy
EAL	Emergency Action Level
EAS	Emergency Alert System
EDE	Effective Dose Equivalent
ENS	Emergency Notification System
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EPA	(U.S.) Environmental Protection Agency
EPIP	Emergency Plan Implementing Procedure
EPZ	Emergency Planning Zone
ERDS	Emergency Response Data System
ERF	Emergency Response Facility
ERO	Emergency Response Organization
ESP	Early Site Permit
ETE	Evacuation Time Estimate
FEMA	Federal Emergency Management Agency
FRMAC	Federal Radiological Monitoring and Assessment Center
FRMAP	Federal Radiological Monitoring Assessment Plan
FSAR	Final Safety Analysis Report
GUI	Graphic User Interface
HEAR	Hospital Emergency Alerting Radio
HPN	Health Physics Network
INPO	Institute of Nuclear Power Operations
ITAAC	Inspections, Tests, Analyses and Acceptance Criteria
JIC	Joint Information Center
LAN	Local Area Network

LCO	Limiting Condition of Operation
MIDAS	Meteorological Information and Dose Assessment System
MIDAS-NU	MIDAS-Nuclear
NAEP	North Anna Emergency Plan
NAPS	North Anna Power Station
NEI	Nuclear Energy Institute
NOAA	(U.S.) National Oceanographic and Atmospheric Administration
NOUE	Notification of Unusual Event
NRC	(U.S.) Nuclear Regulatory Commission
NWS	(U.S.) National Weather Service
ODCM	Offsite Dose Calculation Manual
ORO	Offsite Response Organization
OSC	Operational Support Center
PAG	Protective Action Guide
PAR	Protective Action Recommendation
PMCL	Protective Measures Counterpart Link
POI	Point of Interest
QA	Quality Assurance
REAC/TS	Radiation Emergency Assistance Center/Training Site
RERP	Radiological Emergency Response Plan
RM/F	Radiation Monitors and Flow
RPP	Radiation Protection Program
RSCL	Reactor Safety Counterpart Link
SOSC	State On Scene Coordinator
SPDS	Safety Parameter Display System
Sv	Sievert
TEDE	Total Effective Dose Equivalent
TSC	Technical Support Center
UHF	Ultra High Frequency
US-APWR	US-Advanced Pressurized Water Reactor
VCUMC	Virginia Commonwealth University Medical Center
VDEM	Virginia Department of Emergency Management
VDH	Virginia Department of Health
WAN	Wide Area Network

## 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 18](#)). 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 1](#) identifies radiological emergency conditions, 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

Facilities,” ([Reference 2](#)) primarily Section 50.47, “Emergency Plans,” ([Reference 3](#)) and Appendix E, “Emergency Planning and Preparedness for Production and Utilization Facilities” ([Reference 4](#)). This plan is also based on the guidance provided in NUREG-0654/FEMA-REP-1, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants” ([Reference 5](#)).

## **2. Emergency Planning Zones**

NUREG-0654 establishes two Emergency Planning Zones (EPZs) for which planning for predetermined actions should be implemented – the plume exposure pathway EPZ, which has a radius of approximately ten miles, and the ingestion exposure pathway EPZ, which has a radius of approximately fifty miles. When recommending the size of these EPZs in 1978, the NRC/EPA Task Force on Emergency Planning considered the 1975 Reactor Safety Study (WASH-1400) ([Reference 6](#)). The NRC/EPA Task Force on Emergency Planning determined that this study was the best available source of information on the relative likelihood of large accidental releases of radioactivity, given a core melt event ([Reference 7](#)). Since that time, significant advances have been made in understanding the timing, magnitude, and chemical form of fission product releases from severe nuclear power plant accidents ([Reference 8](#)). The plan recognizes that the size of these areas is subject to change if later analyses, design-specific factors, and legislative or regulatory initiatives warrant.

### **Plume Exposure Pathway EPZ**

The plume exposure pathway EPZ is that area where the principal sources of incident-related radiation exposures are likely to be whole body gamma radiation exposures and inhalation exposures from the passing radioactive plume. As a result of this exposure scenario, any exposures resulting from a radiological incident at the facility are likely to have a duration from less than one hour to a few days.

The plume exposure pathway EPZ consists of an area about 10 miles in radius around the site. [Figure I-1](#) provides an illustration of the plume exposure pathway EPZ. The description of the plume exposure pathway EPZ in [SSAR Section 13.3.2.2.1](#) is incorporated by reference. Collectively, the affected counties are referred to as the risk jurisdictions.

### **Ingestion Exposure Pathway EPZ**

The ingestion exposure pathway EPZ is that area where the principal sources of incident-related radiation exposures are likely to result from ingestion of contaminated water and food, including milk, fresh vegetables, and aquatic foodstuffs. As a result of

this exposure scenario, any exposures resulting from a radiological incident at the facility are likely to have a duration from a few hours to months.

The ingestion exposure pathway EPZ consists of an area about 50 miles in radius around the site. [Figure I-2](#) provides an illustration of the ingestion exposure pathway EPZ. The description of the Ingestion Exposure Pathway EPZ in SSAR [Section 13.3.2.2.1](#) is incorporated by reference.

### **3. Site and Area Description**

Unit 3 consists of a Mitsubishi US-Advanced Pressurized Water Reactor (US-APWR) as described in the US-APWR Design Control Document (DCD) ([Reference 9](#)) and the associated Final Safety Analysis Report (FSAR) ([Reference 10](#)).

The site and area descriptions in SSAR [Section 13.3.2.1.1](#) are incorporated by reference.

## **Figure I-1 North Anna Site Plume Exposure Pathway EPZ**

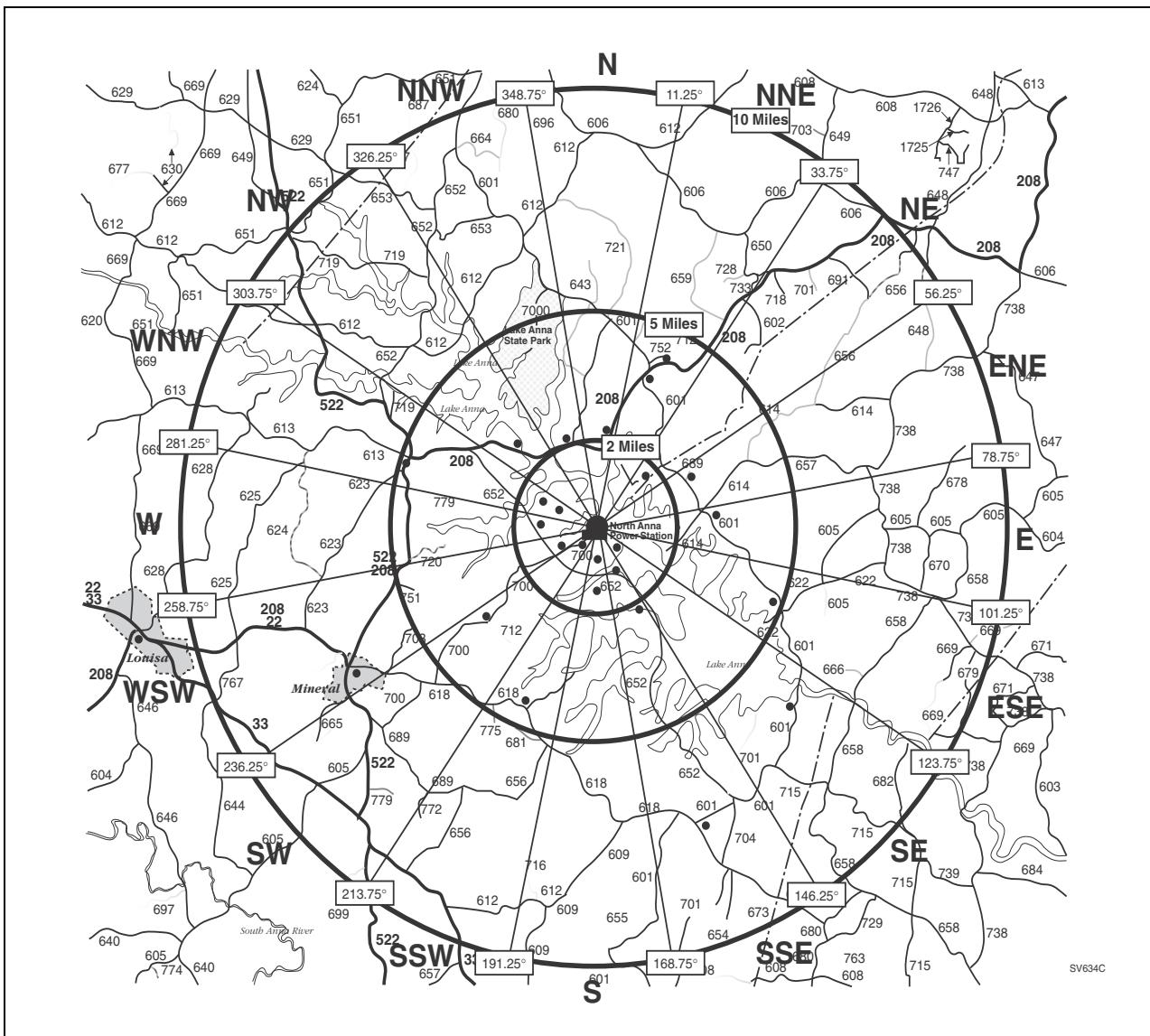
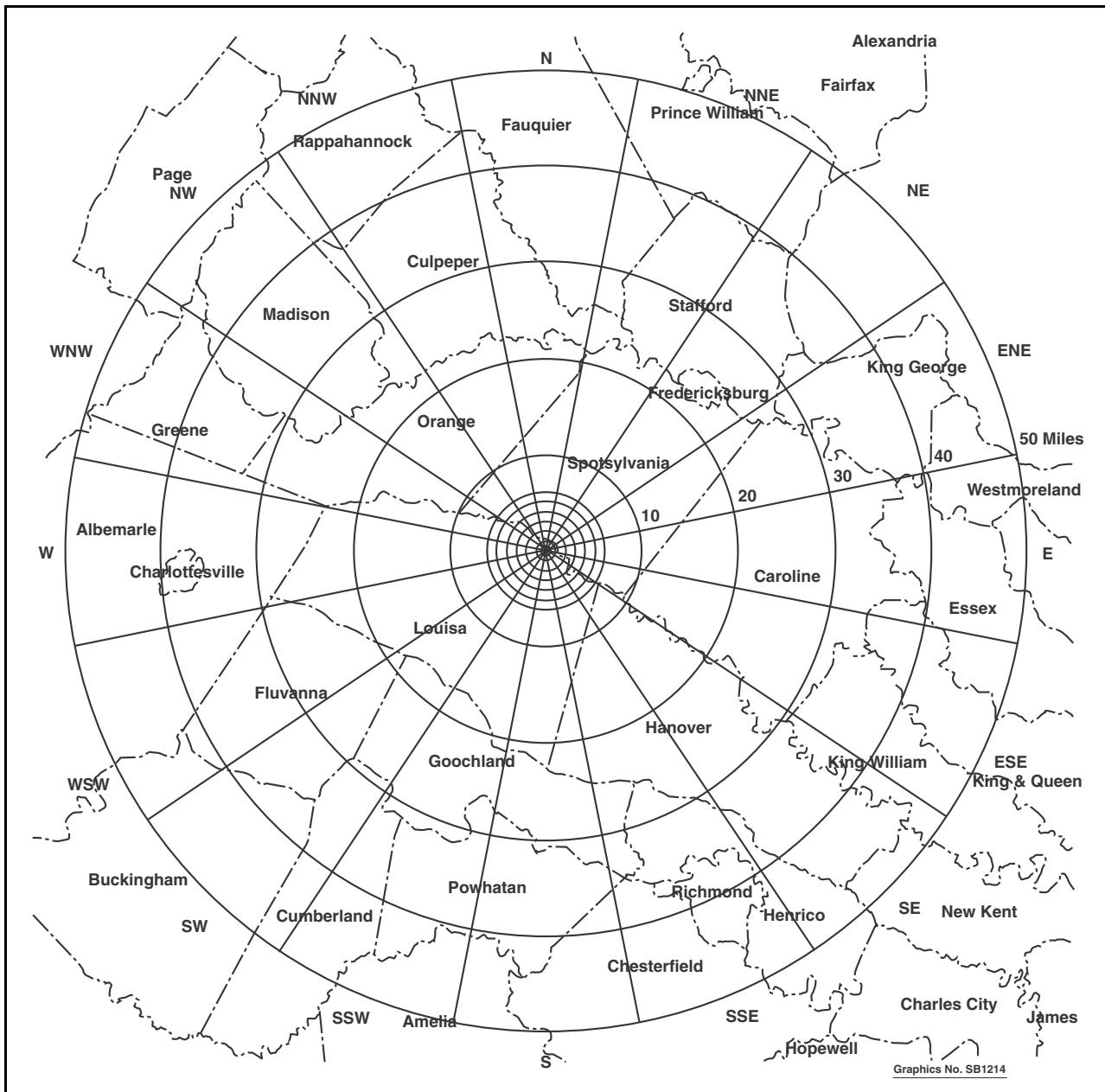


Figure I-2 North Anna Site Ingestion Exposure Pathway EPZ



## 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 COVRERP 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 procedures, including the EALs provided in [Appendix 1](#), 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>, makes or directs initial notifications to affected plant staff

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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.

and Commonwealth of Virginia, risk jurisdiction, and Federal authorities, and determines if activation of the Dominion emergency response facilities (ERFs) is desirable or required.

The Unit 3 Control Room is the initial center for coordination of emergency response affecting the unit. For emergencies classified as Alert, Site Area Emergency and General Emergency, the *Emergency Coordinator* directs the activation of the emergency response organization (ERO)<sup>2,3,4</sup>. The *Emergency Coordinator* may direct the activation of all or part of the ERO for a Notification of Unusual Event, based on an assessment of plant conditions and support needs.

The Unit 3 Technical Support Center (TSC) acts in support of the command and control function of the Unit 3 Control Room. The TSC provides an area for station personnel who have expertise in diverse areas of plant operation to support the emergency response. This facility is equipped with communication equipment, computer terminals, printers, off-site and on-site computer access, plant drawings, procedures and other materials and equipment to support its function. Personnel in the TSC assess the accident condition and make recommendations to the Control Room, the Emergency Operations Facility (EOF) and off-site agencies as necessary to provide for the safety of plant personnel and members of the general public. After the EOF is operational and activated, the EOF assumes many of the functions of the TSC and relies on the TSC as a vital link to the station. The TSC provides the EOF with up-to-date plant parameters, which allows the EOF staff to perform its assigned tasks.

Following activation of the ERFs and receipt of an adequate turnover, the *Site Vice President* or other designated member of the station management staff relieves the Shift Manager of *Emergency Coordinator* responsibilities and directs the activities of the on-site emergency response organization from the TSC. If the EOF is activated, the *EOF Director* assumes responsibility for the licensee's offsite emergency response efforts, coordinates the availability and utilization of corporate and external resources, and manages recovery efforts.

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2. If an event is transient in nature such that staffing of the ERO is not practical prior to termination of the event, then the ERO may not be staffed; however, notifications to affected authorities will be completed consistent with the requirements of this plan.
  3. The ERO may be staffed prior to the declaration of an emergency situation, such as in anticipation of severe weather that is likely to result in the declaration of an emergency condition.
  4. Under some circumstances, such as unanticipated natural events or hostile action against the facility, the *Emergency Coordinator* may judge that movement of personnel as needed to staff the emergency response facilities may create undue personnel hazards. Under such circumstances, the Emergency Coordinator may elect to postpone staffing of the emergency response facilities and implement compensatory measures as needed to provide for ongoing personnel and facility safety.

The Operational Support Center (OSC) provides an operational center to provide support to the TSC and Control Room. The OSC dispatches assessment and repair teams as directed by the *Emergency Coordinator*, providing operational information, radiological assessment, and manpower for in-plant functions.

[Table II-1, Responsibility for Emergency Response Functions](#), summarizes the responsibilities and activities of the ERFs under the various emergency classifications.

### **Coordination with NAPS Units 1&2**

Dominion has identified the need to coordinate emergency response actions taken at Unit 3 with Units 1&2. As noted previously in this section the *Emergency Coordinator* is responsible for making notifications to affected plant staff, which may include the Unit 1&2 Control Room. This notification and subsequent communications are important to apprise the Unit 1&2 staffs of any actions they may be required to take.

Additionally, in the unlikely event that emergencies are declared at Unit 3 simultaneously with Unit 1 or 2, the *Emergency Coordinator* function is designated from onsite shift management in accordance with emergency plan implementing procedures (EPIPs). The *Emergency Coordinator* discharges those duties described in this Emergency Plan, as well as those described in the Unit 1&2 Emergency Plan and provides for coordination of activities between the on-site ERFs.

### **Commonwealth of Virginia Government Response**

The Commonwealth of Virginia organization for response to radiological emergencies is based on normal governmental structures and channels of communication. The Governor directs the emergency response through the State Coordinator of the Virginia Department of Emergency Management (VDEM). The State Coordinator of the VDEM coordinates the overall response, and the Virginia Department of Health (VDH) provides technical advice and assistance on radiological accident assessment, protective action, radiological control, and radiological monitoring.

When notification is received, the COVRERP is implemented and the VDH initiates action to assess and evaluate the radiological situation in order to provide guidance and assistance to risk jurisdiction governments. After the initial immediate actions, subsequent protective actions are implemented based on the results of the Commonwealth of Virginia evaluation of the radiological situation and the company's recommendations. Commonwealth of Virginia and Federal agencies provide assistance as required. Response operations at the state level are coordinated by the VDEM.

The Commonwealth of Virginia also provides police support during activation of this plan. The first response is likely to be from police units normally based in the local area. These resources can be supplemented as needed by additional units dispatched from other parts of the state. The Virginia State Police also provides traffic control and additional security.

The State Coordinator of the VDEM coordinates the overall response operations at the state level and performs specific duties as defined in the Virginia Emergency Operations Plan, Radiological Emergency Response Basic Plan. The Virginia Emergency Operations Center (EOC) is located at 7700 Midlothian Turnpike, Richmond, Virginia. There are local EOCs in the risk jurisdictions. The VDH sends appropriate liaison personnel to the EOF upon activation.

VDH personnel provide technical advice and assistance on radiological accident assessment, protective actions, radiological exposure control, and radiological monitoring. Virginia EOC staffing is augmented when notification is received of a radiological emergency classified as an Alert or above. Included in the planned response is a team sent to the EOF, which provides direct interface between the VDH and the company's radiological assessment personnel.

Additional Commonwealth of Virginia organizations having possible responsibilities in a radiological emergency are listed in the COVRERP. Requests for support services from these organizations are coordinated through the VDEM.

[Figure II-1, Emergency Response Organization Interrelationships](#), depicts the interrelationships among the various Commonwealth of Virginia and Federal organizations that may respond to an emergency at the facility.

### Risk Jurisdiction Government Emergency Response

Responsibility for radiological emergency response rests primarily with the elected officials of local governments. As time is a major factor in realizing the benefits of protective action in the event of a radiological emergency, certain of these actions are predetermined and agreed upon by the local governing body and are implemented without delay upon notification of a radiological emergency. An Insta-phone with backup by commercial telephone, having extensions available in the Control Room, TSC and EOF, is used for normal transmission of emergency notifications to these authorities. Receipt of message by Insta-phone constitutes verification. If the message was received by means other than by Insta-phone, procedures for authentication of an emergency, via the use of call-back numbers, are maintained in the COVRERP and risk jurisdiction RERPs. Risk jurisdiction law enforcement personnel also respond to these Plans. They can perform essentially the same

functions as the Virginia State Police and coordinate their efforts with that organization.

In the event of an emergency, the Station is in communication with the risk jurisdiction Emergency Services Directors, who have the capability of activating their EOCs. The Station relies upon the risk jurisdictions to provide assistance in the event an evacuation from the site requires a remote assembly point or for any services the risk jurisdictions are capable of providing to mitigate the results of the emergency.

The risk jurisdiction health department is the primary health response agency, with the Virginia Health Department providing assistance to them as required, with emphasis on the special requirements for those individuals who are contaminated with radioactivity. Accident assessment personnel operate from the Virginia EOC.

In the event of an emergency, notification and coordination with the risk jurisdictions within the ingestion exposure pathway EPZ are the responsibility of the VDEM and VDH in cooperation with the Virginia Department of Agriculture and Consumer Services and the Virginia Department of Environmental Quality (DEQ), Water Division.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### **Federal Government Emergency Response**

The Station also maintains close contact with the NRC Operations Center and/or the NRC Region II offices in Atlanta, Georgia. This is an important function to provide accurate information and assessment of the emergency to the Federal Government. As a result of these communications, the NRC can best appraise their response to the emergency. In a like manner, the U.S. Department of Energy, Oak Ridge Operations, is available to provide radiological assistance to the Station.

The Federal Radiological Monitoring and Assessment Center (FRMAC) Operations Plan ([Reference 11](#)) provides for the coordinated management of Federal technical response activities related to a radiological emergency. Its primary goals include:

- Assisting the Commonwealth of Virginia and Federal Coordinating Agency with personnel, equipment, and technical resources, as needed;
- Collecting offsite environmental radiological data; and,
- Providing the data and related assessments to involved State agencies and to the Federal Coordinating Agency.

The Department of Energy (DOE), because of its history and capabilities in radiological monitoring and assessment, was assigned the responsibility to prepare for, establish, and manage the FRMAC. The FRMAC may be activated when a major

radiological emergency exists, and the Federal government responds when a State, other governmental entity with jurisdiction, or a regulated entity requests federal support.

Further information concerning objectives and organization is provided in the FRMAC Operations Plan.

[Appendix 7](#) provides a copy of the certification letter established between Dominion and the supporting Commonwealth of Virginia and risk jurisdiction agencies and private sector organizations supporting this plan. The responsibilities of many Federal agencies are established in the National Response Framework ([Reference 12](#)) and therefore no agreement letters are required for these agencies.

c. Organizational Interrelationships

The interfaces between and among the onsite and offsite functional areas of emergency response described in SSAR [Section 13.3.2.2.2.b.1](#) are incorporated by reference. [Figure II-1](#) illustrates these interrelationships.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

d. Individual in Charge of Emergency Response

In the event of an abnormal condition, the Shift Manager determines if an emergency condition exists and, if so, classifies the emergency. Upon declaration of an emergency, the Shift Manager or Unit Supervisor assumes the role of the *Emergency Coordinator* and is in charge of the emergency response for the facility.

If required by the emergency classification, or if deemed appropriate by the *Emergency Coordinator*, emergency response personnel are notified and instructed to report to their emergency response locations<sup>5</sup>. The Shift Manager is relieved as *Emergency Coordinator* when the designated management representative reports to the station and is updated as to the status of the unit, the emergency actions taken, and the current status of the emergency. Following this relief, the *Emergency Coordinator* may relocate to the TSC.

The EOF may be activated concurrent with the TSC and always is activated upon declaration of a Site Area Emergency or General Emergency. The EOF is staffed by Dominion personnel, including the *EOF Director*, who directs the activities of this facility. The senior Dominion representative is responsible for ensuring the EOF communicates emergency status to the Commonwealth of Virginia and risk

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5. See [Section II.A.1.a](#) of this plan regarding situations under which staffing of the emergency response facilities may be deferred.

jurisdiction governments, directs the efforts of the offsite monitoring teams, makes radiological assessments, recommends offsite protective measures to the Commonwealth of Virginia, and arranges through the company for dispatch of any special assistance or services requested by the station.

The Director Nuclear Protection Services and Emergency Preparedness reports to Dominion's senior nuclear executive who is responsible for the total execution of the radiological emergency response effort at Dominion's fleet of nuclear power plants.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

e. 24 Hour Emergency Response Capability

Dominion maintains capability for 24 hour response, including staffing of communications links, through training of multiple responders for key emergency response positions, consistent with the staffing requirements of [Section II.B.5](#) and the training requirements of [Section II.O](#).

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

**2. Functions, Responsibilities, and Legal Basis**

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

**3. Written Agreements**

[Appendix 7](#) provides a copy of the certification letter established between Dominion and the Commonwealth of Virginia and risk jurisdiction government agencies and private sector organizations committed to supporting further development and implementation of this plan.

The responsibilities of many Federal agencies are established in the National Response Framework; therefore, no certification letters are required for these agencies.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

**4. Continuous Operations**

Dominion maintains capability for continuous operations through training of multiple responders for key emergency response positions, consistent with the training requirements established in [Section II.O](#). The *Emergency Coordinator* bears responsibility for ensuring continuity of technical, administrative, and material resources during emergency operations.

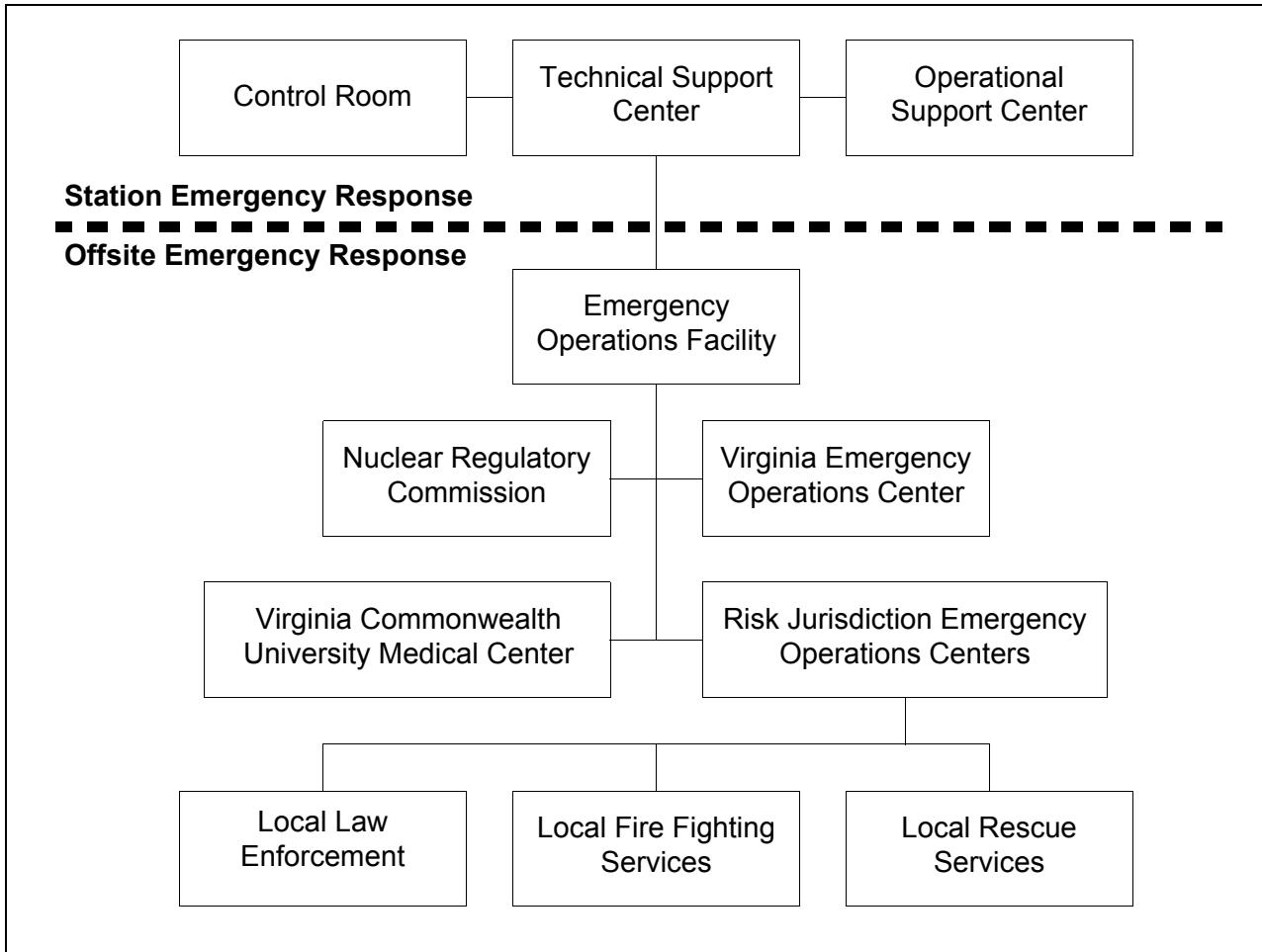
[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

**Table II-1 Responsibility for Emergency Response Functions**

Function	Emergency Classification			
	NOUE	Alert	Site Area Emergency	General Emergency
Supervision of reactor operations and manipulation of controls	CR	CR	CR	CR
Management of plant operations	CR (TSC)	TSC	TSC	TSC
Technical support for reactor operations	CR (TSC)	TSC	TSC	TSC
Management of corporate emergency response resources	CR (TSC) (EOF)	TSC (EOF)	EOF	EOF
Monitoring of radioactive effluents and the environs; dose assessment and projection	CR (TSC) (EOF)	TSC (EOF)	EOF	EOF
Provision of information to Commonwealth of Virginia and risk jurisdiction emergency response organizations, including Protective Action Recommendations	CR (TSC) (EOF)	TSC (EOF)	EOF	EOF
Management of recovery operations	CR (TSC) (EOF)	TSC (EOF)	TSC/EOF	TSC/EOF
Technical support for recovery operations	CR (TSC) (EOF)	TSC (EOF)	TSC/EOF	TSC/EOF

Note: Listing of facilities in parentheses indicates that activation of these facilities or performance of these functions is optional, based on management assessment of plant conditions and emergency response needs.

**Figure II-1 Emergency Response Organization Interrelationships**



## B. Onsite Emergency Organization

### 1. Onsite Emergency Organization

The description of the Onsite Emergency Organization in [SSAR Section 13.3.2.2.2.b](#) is incorporated by reference.

[Figure II-2](#) illustrates the onsite emergency response organization (ERO). EPIPs provide details regarding ERO position functions.

The minimum staff required to conduct routine and immediate emergency operations is maintained at the station consistent with 10 CFR 50.54(m) and this plan. Staffing is described in [FSAR Section 13.1](#). Station administrative procedures provide the details of the normal station organization, including reporting relationships.

Upon declaration of an emergency, designated members of the normal staff complement fulfill corresponding roles within the emergency response organization. For example, Health Physics personnel undertake radiation protection activities, Security personnel

undertake Security activities, Engineering personnel focus on plant assessment and technical support for operations, and Operations personnel focus on plant operations.

## **2. Emergency Coordinator**

The Shift Manager/Unit Supervisor position is continuously staffed consistent with 10 CFR 50.54(m). Upon recognition of an emergency condition, the individual filling this position assumes the duties of the *Emergency Coordinator* until relieved by a qualified member of the management staff consistent with [Section II.B.3](#) or until termination of the emergency condition, whichever comes first.

The individual filling the *Emergency Coordinator* role has the responsibility and authority to initiate any required emergency response actions, including notification of affected Federal, Commonwealth of Virginia, and risk jurisdiction authorities and provision of Protective Action Recommendations to offsite authorities. Upon staffing of the ERO, the *EOF Director* relieves the *Emergency Coordinator* of responsibility for notification of and coordination with offsite authorities.

## **3. Emergency Coordinator Line of Succession**

If the Shift Manager is rendered unable to fulfill the duties and responsibilities of the *Emergency Coordinator* position (such as due to personal illness or injury) the Unit Supervisor or, in the absence of a Unit Supervisor (i.e., as may be permitted in cold shutdown or refueling modes), a Reactor Operator present on shift (a position that also will be continuously staffed) assumes the *Emergency Coordinator* position until relieved by a qualified member of the management staff as outlined below.

A trained, higher level member of the licensee's management staff may assume *Emergency Coordinator* responsibilities from the Shift Manager after becoming fully familiar with the pertinent plant and radiological conditions and status of emergency response/accident mitigation efforts.

## **4. Emergency Coordinator Responsibilities**

The *Emergency Coordinator* has the responsibility and authority to initiate emergency actions necessary to protect the life, health, and safety of the plant staff. Any required evacuations of individuals (including members of the public) from the plant's Exclusion Area are conducted cooperatively with Commonwealth of Virginia and risk jurisdiction agencies. The non-delegable responsibilities of the *Emergency Coordinator* include:

- Classifying the emergency
- Authorizing notification to the NRC, Commonwealth of Virginia and risk jurisdiction agencies of the emergency status
- Recommending protective measures

- Authorizing emergency exposure limits

Other responsibilities of the *Emergency Coordinator* include:

- Activating emergency personnel and facilities
- Reducing power or shutting down the reactor
- Committing company funds as necessary
- Acquiring emergency equipment or supplies
- Ordering site evacuation
- Restricting access to the site
- Notifying company management
- Implementing work schedules
- Directing onsite emergency activities

As indicated in [Table II-1](#), the EOF may assume responsibility for:

- Management of corporate emergency response resources
- Monitoring of radioactive effluents and the environs
- Dose assessment and dose projections, including recommending protective measures
- Provision of information regarding emergency status to offsite emergency response support organizations, including notification to the NRC, the Commonwealth of Virginia, and the risk jurisdiction agencies

## 5. Plant Emergency Response Staff

Dominion will establish minimum emergency response staffing consistent with [Table II-2](#), which has been based on the guidance provided in Table B-1 of NUREG-0654. [Figure II-2](#) illustrates the plant staff emergency organization.

Upon declaration of an emergency, members of the plant staff assume positions in the emergency response organization consistent with their training and management assignments. [Figure II-3](#) provides an illustration of the augmented plant staff emergency response organization.

The ERO, when fully activated, includes the positions described in [Table II-2](#). Additional personnel may be designated as emergency responders providing special expertise deemed beneficial, but not mandatory, to the planned response. The individuals assigned as responders for the emergency positions are designated based on the technical requirements of the position.

The onsite emergency organization provides for the key functions of accident assessment, radiological monitoring and analysis, security, fire-fighting, first aid and rescue, and communications.

## **6. Interfaces Between Functional Areas**

[Figure II-1](#) illustrates the interfaces between and among the site functional areas of emergency response activity, Dominion EOF support, the affected Commonwealth of Virginia and risk jurisdiction government response organizations, the NRC, and other offsite organizations.

## **7. Corporate Support for the Plant Staff**

Upon declaration of an Alert, Site Area Emergency, or General Emergency, the *Emergency Coordinator* directs the activation and notification of the onsite and offsite ERFs. Dominion management, technical, and administrative personnel staff the EOF and provide (or coordinate) augmented support for the plant staff.

The Dominion corporate staff focuses on discharging management, technical and administrative activities as needed to support the plant staff and to relieve the plant staff of external coordination responsibilities, including notification of and coordination with offsite authorities and release of information to the media. In addition to the activities discussed in [Table II-2](#), activities of the Dominion corporate staff include:

- Logistical support for plant personnel
- Technical support for planning and recovery/re-entry operations
- Management-level interface with governmental authorities
- Coordination with, and release of information to, the news media

## **8. Support from Contractor and Private Organizations**

The Institute of Nuclear Power Operations (INPO) serves as a clearinghouse for industry wide support during an emergency. When notified of an emergency situation, INPO provides emergency response as requested. INPO provides the following emergency support functions:

- Assistance to the affected utility in locating sources of emergency manpower and equipment
- Analysis of the operational aspects of the incident
- Dissemination to member utilities of information concerning the incident
- Organization of industry experts who could advise on technical matters

If requested, one or more suitably qualified members of the INPO staff will report to the *EOF Director* and assist in coordinating INPO's response to the emergency.

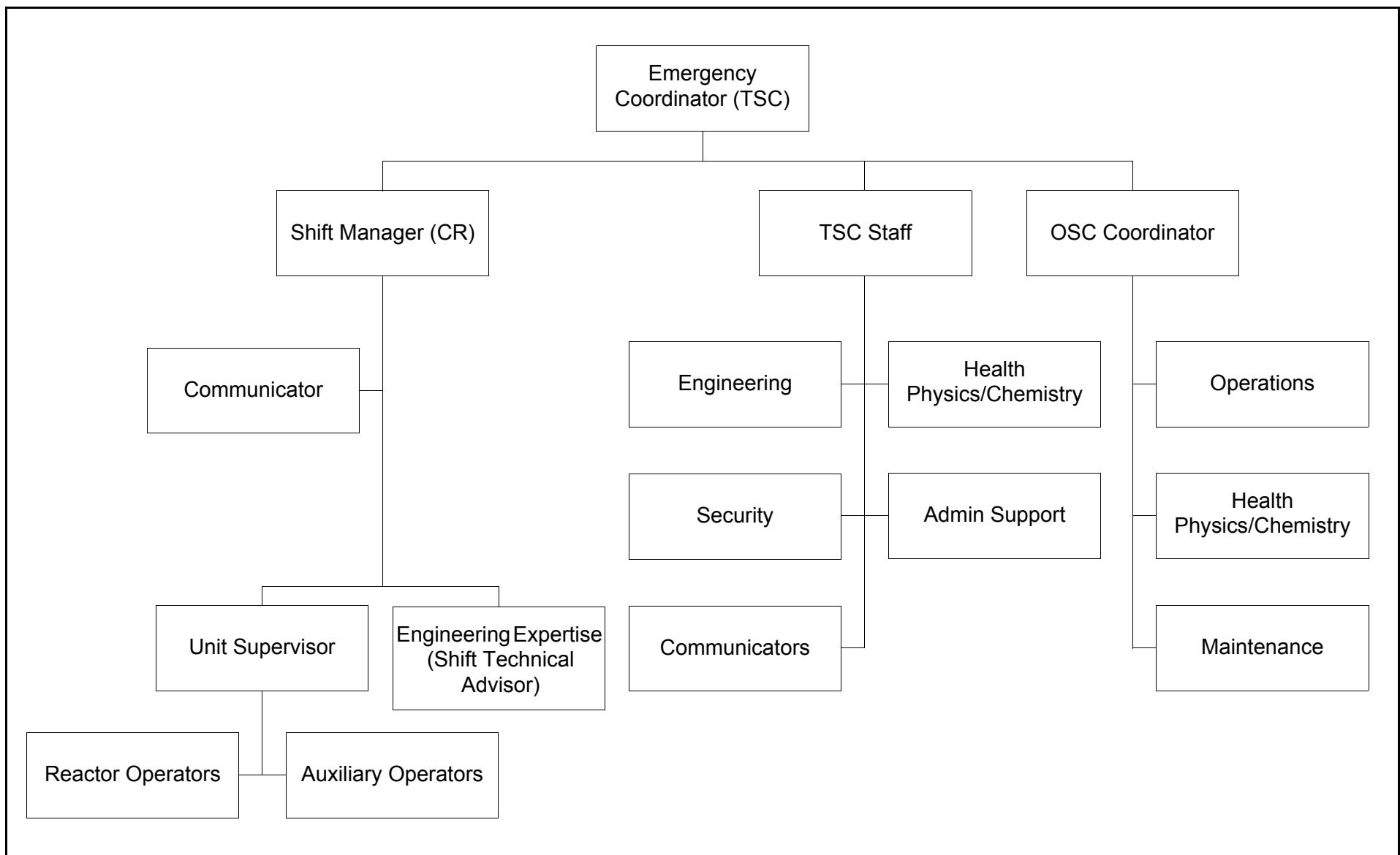
Dominion may request that the reactor vendor, Mitsubishi, provide technical support for emergency response activities. Mitsubishi will operate primarily from its corporate offices, with a small contingent at the plant if requested.

If required at the time of the event, additional resources can be obtained through purchase agreements with the supporting institutions. These agreements would be negotiated on an as-needed basis.

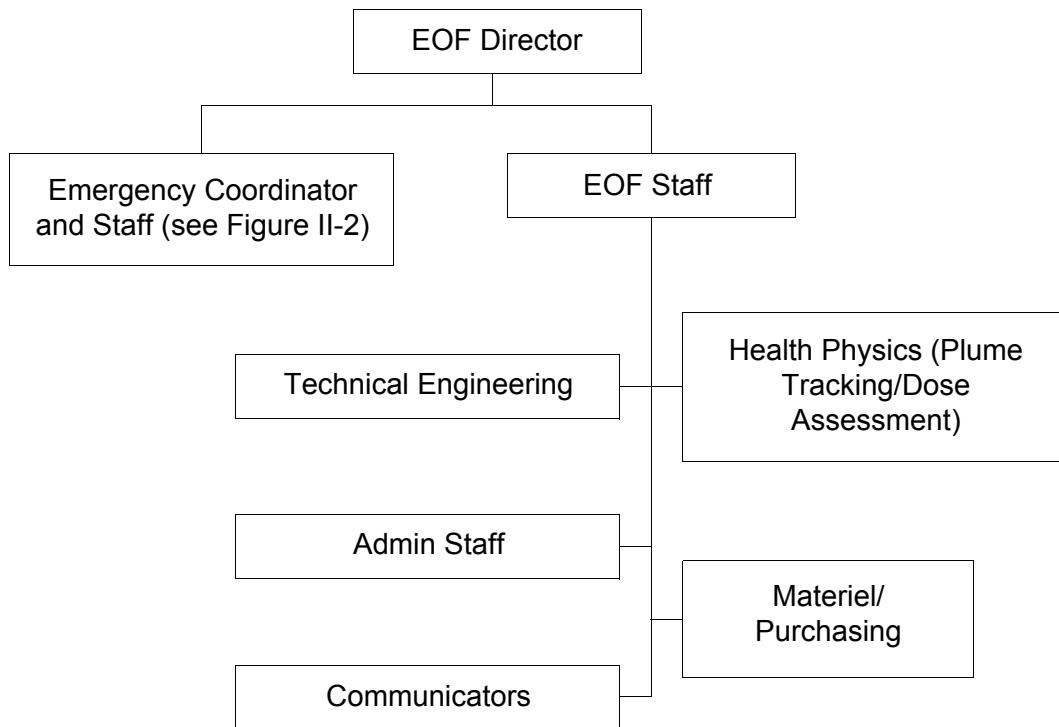
#### **9. Risk Jurisdiction Emergency Response Support**

Dominion has established and will maintain agreements for risk jurisdiction emergency response support services, including fire fighting, rescue squad, medical and hospital services. [Appendix 7](#) provides the certification letter for organizations providing these services.

**Figure II-2 North Anna Unit 3 Emergency Response Organization – On-Site**



**Figure II-3 North Anna Unit 3 Augmented Emergency Response Organization**



**Table II-2 Plant Staff Emergency Functions**

Major Functional Area	Major Tasks	Position, Title, or Expertise	On Shift <sup>2,3</sup>	Capability for Additions	
				Approx 45 min	Approx 60 min
Plant Operations and Assessment of Operational Aspects	Supervision of Station Operations and Assessment of Operational Aspects of Plant Operations	Shift Manager-(SRO)	1		
		Unit Supervisor (SRO)	1		
		Control Room Operator (RO)	2		
		Non-Licensed Operator	2		
Emergency Direction and Control <i>(Emergency Coordinator)</i>	Direction and Control of On-Site Emergency Activities	Shift Manager	1 <sup>1</sup>		
Notification and Communication	Notify licensee, Commonwealth of Virginia, risk jurisdiction, and Federal personnel and maintain communication	Emergency Communicator	1 <sup>4</sup>	1 <sup>4</sup>	2 <sup>4</sup>
Radiological Accident Assessment and Support of Operational Accident Assessment	EOF Director	Senior Manager			1
	Dose Assessment	Radiological Assessment Coordinator		1	
	Off-site surveys		2 <sup>4</sup>	2 <sup>4</sup>	
	On-site (out of plant)	HP Technicians		1 <sup>4</sup>	1 <sup>4</sup>
	In-plant surveys		1	1	1
	Chemistry/Radiochemistry	Chemistry	1		1

**Table II-2 Plant Staff Emergency Functions**

Major Functional Area	Major Tasks	Position, Title, or Expertise	On Shift <sup>2,3</sup>	Capability for Additions	
				Approx 45 min	Approx 60 min
Plant System Engineering, Repair and Corrective Actions	Technical Support	Shift Technical Advisor function <sup>5</sup>	1		
		Technical Support Team Member (Core and Thermal Hydraulics)			1 <sup>6</sup>
		Technical Support Team Member (Electrical)			1
	Repair and Corrective Actions	Technical Support Team Member (Mechanical)			1
		Damage Control Team Member (Mechanical Maintenance)	1 <sup>1</sup>		2
		Damage Control Team Member (Electrical Maintenance)		1	1
	Radiation Protection (In-Plant)	Damage Control Team Member (Instrumentation and Control)		1	
		HP Technicians	2 <sup>1</sup>	2 <sup>4</sup>	2 <sup>4</sup>
		a. Access Control b. HP Coverage for repair, corrective actions, search and rescue, first aid, and firefighting c. Personnel monitoring d. Dosimetry			
Protective Actions	Firefighting	Fire Team Members	Per FSAR	Local Support	
Rescue Operations	First Aid and First Aid	First Aid Team Member	2 <sup>1, 4</sup>	Local Support	

**Table II-2 Plant Staff Emergency Functions**

Major Functional Area	Major Tasks	Position, Title, or Expertise	On Shift <sup>2,3</sup>	Capability for Additions		
				Approx 45 min	Approx 60 min	
Site Access Control and Personnel Accountability	Security, firefighting, communications, personnel accountability	Security Team Members	Staffing levels for the on-shift, initial additions and supplemental additions are provided in the Security Plan.			
		Security Team Leader				
<b>Totals</b>				<b>16</b>	<b>10</b>	
				<b>16</b>		

1. This coverage is initially provided by personnel assigned other functions.
2. The minimum shift crew will be as defined in 10 CFR 50.54(m)(2)(i) and the Technical Specifications.
3. On-shift positions may be vacant for up to two hours due to unforeseen circumstances, such as sudden illness.
4. These resources are common between North Anna Units 1&2 and Unit 3 and may be shared.
5. These duties may be performed by an appropriately qualified SRO.
6. The Shift Technical Advisor function provides core thermal/hydraulics expertise prior to supplemental staff addition.

## C. Emergency Response Support and Resources

The arrangements for emergency response support and resources described in [SSAR Section 13.3.2.2.2.c](#) are incorporated by reference.

### 1. Federal Response Capability

- a. Under some complex circumstances it may be necessary to obtain offsite radiological monitoring support from Federal government agencies. The *Emergency Coordinator/EOF Director* may request FRMAC assistance through the NRC.
- b. Federal radiological monitoring assistance may be provided by DOE-Oak Ridge under the DOE Radiological Assistance Program. Support available from DOE-Oak Ridge includes medical support from the Radiation Emergency Assistance Center/Training Site (REAC/TS). Dominion estimates that a FRMAC Advance Party could be expected at the site within 6 to 14 hours following the order to deploy, based on the availability of airports near the site.

Dominion expects that NRC assistance from NRC's offices in Atlanta, GA, will arrive in the site vicinity within 7-8 hours following notification.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- c. Dominion provides facilities and resources needed to support the Federal response through the EOF. Available resources include office space and telephone and radio communications circuits. Dominion also provides limited office space and telephone communications facilities for NRC personnel in the TSC.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### 2. Offsite Organization Representation in the EOF

- a. 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.
- b. Dominion does not expect risk jurisdiction representatives to be present at the EOF. A VDEM State On-Scene Coordinator (SOSC) serves as the Commonwealth's representative to provide interface between the utility and Commonwealth of Virginia and risk jurisdiction governments.

### **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). A certification letter in [Appendix 7](#), outlines the scope of the expected support.

## **D. Emergency Classification System**

Dominion uses a standard emergency classification scheme, based on system and effluent parameters, which allows affected Commonwealth of Virginia and risk jurisdiction response organizations to determine initial offsite response measures.

The description of the emergency classification system in [SSAR Section 13.3.2.2.2.d](#) is incorporated by reference.

### **1. Classification System**

10 CFR 50, Appendix E identifies four distinct classes of emergencies:

- 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 recognition categories, the associated initiating condition matrices, and the EALs.

## **2. Emergency Action Levels**

The description of emergency action levels provided in [SSAR Section 13.3.2.2.c](#) is incorporated by reference. The following information supplements that description.

[Appendix 1](#) provides 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.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](#). 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, all or part of the emergency response organization may be mobilized at the Notification of Unusual Event level at the discretion of the *Emergency Coordinator*.

When staffing of the ERO is required, or desired by the *Emergency Coordinator*, affected personnel may be notified by a multifaceted process, including alarms, announcements, pagers, telephones, on-line messages, etc. Notification and mobilization of the emergency response organization is initiated in accordance with implementing procedures.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **3. Message Content**

The content of initial emergency notification messages from the plant to affected Commonwealth of Virginia and risk jurisdiction authorities includes information addressing the class of emergency, status of any radioactive releases, the locations of

any potentially-affected populations, and recommendations regarding public protective actions.

The COVRERP provides the notification form used for notification of Commonwealth and risk jurisdiction authorities. [Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

#### **4. Follow-up Messages to Offsite Authorities**

Follow-up messages from the plant to affected Commonwealth of Virginia and risk jurisdiction authorities include the following information, to the extent the information is available and appropriate, as mutually agreed upon between Dominion and VDEM:

- Incident date, time, and location;
- Name of and contact information for caller;
- Emergency classification;
- Information regarding any actual or potential radioactive releases, including medium, i.e., airborne, waterborne, surface spill, estimated duration/impact time, release point and elevation, chemical and physical form, and estimates of total and relative quantities and concentrations of noble gases, iodines, and particulates;
- Meteorological conditions, including wind speed and direction, stability class, and precipitation;
- Actual or projected exposure rates and projected integrated dose at the site boundary;
- Projected exposure rates and integrated doses at the projected peak location and at 2, 5, and 10 miles, including affected sectors;
- Estimates of surface contamination levels in the plant, onsite, and offsite;
- Emergency response actions underway;
- Recommended emergency actions, including protective action recommendations;
- Requests for any onsite support by offsite organizations (e.g., firefighting or medical transportation support); and
- Prognosis for changes in event classification or other conditions based on current assessments of plant conditions.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

#### **5. Disseminating Information to the Affected Public**

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.

## **6. Instructions to the Public in the Plume Exposure EPZ**

The description of the methods and procedures used for providing instructions to members of the public provided in [SSAR Section 13.3.2.2.2.e](#) is incorporated by reference. The following information supplements that description.

The primary method of alerting the public is by sounding the Alert and Notification System sirens. Other alerting methods may include telephone communications, television and radio communications via the Emergency Alert System (EAS) stations, public address systems, bull horns from patrol cars, and personal contact.

The Commonwealth of Virginia and risk jurisdiction governments have ultimate responsibility for warning the public. Should it be necessary, Commonwealth of Virginia and risk jurisdiction authorities will alert the public within the plume exposure pathway EPZ using alternative methods described in the Virginia Emergency Operations Plan, Radiological Emergency Response Basic Plan and the risk jurisdiction Radiological Emergency Response Plans. Details of alternate methods are located in the same section of the respective plans as the primary methods. Members of the public within the plume exposure pathway EPZ shall be informed of what actions to take following activation of the Alert and Notification System. Upon hearing the alert, they are instructed to turn on their radios or television sets to the EAS to receive further instructions. The affected risk jurisdictions and the Commonwealth of Virginia have a 24 hour per day capability to activate the system. If the Commonwealth of Virginia cannot be contacted, the risk jurisdictions can contact the EAS control station directly in accordance with their respective plans.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **7. Written Messages to the Public**

The description of the processes used for providing written messages to the public provided in [SSAR Section 13.3.2.2.2.g](#) is incorporated by reference. The following information supplements that description.

Affected Commonwealth of Virginia and risk jurisdiction officials bear responsibility for providing written emergency messages intended for the public, in particular providing instructions regarding specific protective actions. Dominion supports development of these messages by providing supporting information.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## F. Emergency Communications

Dominion maintains systems and procedures that provide for prompt communications between its ERFs and between the site and offsite ERFs. The descriptions of plans for implementing emergency communications provided in [SSAR Section 13.3.2.2.2.f](#) are incorporated by reference.

### 1. Description of Communication Links

Dominion maintains reliable communications links both within the plant and between the plant and external emergency response organizations. [Section 9.5.2](#) of the US-APWR DCD provides a description of communications systems that are within the scope of the certified design.

- a. Dominion maintains capabilities for 24 hour per day emergency notification to the Commonwealth of Virginia and risk jurisdiction emergency response network. Commonwealth of Virginia/risk jurisdiction warning points are manned 24 hours per day. This communications link consists of an Insta-phone loop with links to risk jurisdictions and the Commonwealth of Virginia. If the Insta-phone is out of service, regular commercial telephone will be used to make the notifications and the above localities have a system to call back to the power station and verify the message.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- b. Provisions for communicating with Commonwealth of Virginia and risk jurisdiction governments include an Insta-Phone loop that has been installed to permit simultaneous telephone-speaker communications from the Station to the risk jurisdictions and the Virginia EOC on a 24-hour per day basis. This loop can be activated from the Control Room, TSC, or EOF.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- c. Separate telephone lines are dedicated for communications with the NRC and include the following:
  - Emergency Notification System (ENS): Provide for initial notifications, as well as ongoing information about plant systems, status and parameters, will be provided to the NRC. ENS lines are located in the Control Room, TSC and EOF.
  - Management Counterpart Link (MCL): Provides for internal discussions between the NRC Executive Team Director/members and the NRC Director of Site Operations or licensee management. MCL lines are located in the TSC and EOF.

- Health Physics Network (HPN): Provide for communications regarding radiological and meteorological conditions, assessments, trends, and protective measures. HPN lines are located in the TSC and EOF.
- Reactor Safety Counterpart Link (RSCL): Allows for internal NRC discussions regarding plant and equipment conditions. RSCL lines are located in the TSC and EOF.
- Protective Measures Counterpart Link (PMCL): Allows for conduct of internal NRC discussions on radiological releases, meteorological conditions, and protective measures. PMCL lines are located in the TSC and EOF.
- Local Area Network (LAN) Access: Provides access to the NRC local area network. Jacks are provided in the TSC and EOF.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- Dominion provides capability for communications between the Control Room or TSC and the EOF, risk jurisdiction and Virginia EOCs via the Insta-Phone loop as described in [Section II.F.1.b](#). Communications capabilities between the Control Room or TSC and radiological field personnel are also provided.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- Notification, alerting and activation of emergency response personnel in the TSC, OSC, and EOF are described in [Section II.E.2](#).

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- Dominion provides for communications between Control Room/TSC/EOF and the NRC Operations Center via dedicated telephone lines.

- Dominion will activate the Emergency Response Data System (ERDS) within one hour of the declaration of an Alert or higher emergency classification in accordance with the applicable facility procedure(s).

## **2. Communication with Fixed and Mobile Medical Support Facilities**

Dominion maintains communications systems that allow for communications between the site and fixed and mobile medical support facilities. The communications systems include both commercial telephone communications with fixed facilities and radio communications to the ambulance.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### **3. Communication System Tests**

Dominion conducts tests of its emergency communications system as follows:

- Communications with the facility and EOF and the Commonwealth of Virginia/risk jurisdiction warning points are tested monthly.
- Communications between the Virginia/risk jurisdiction EOCs and field assessment teams are tested annually.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **G. Public Education and Information**

Dominion maintains a coordinated program to educate affected members of the public regarding emergency notification methods and actions. The descriptions of plans for implementing a public information program provided in [SSAR Section 13.3.2.2.2.g](#) are incorporated by reference.

### **1. Public Information Program**

Dominion coordinates with affected Commonwealth of Virginia and risk jurisdiction authorities to disseminate pertinent emergency response information to members of the public in the plume exposure pathway EPZ on a yearly basis. Information may be provided via a number of methods. Distribution methods may include providing informational publications such as brochures or calendars through mailings to individual households in the plume exposure pathway EPZ. Emergency public information may also be distributed in telephone directories and utility bills, through public information postings, and information distributed via local media outlets. The distributed information includes:

- Educational information on radiation;
- Information regarding notification methods and immediate actions;
- Protective measures, such as information addressing evacuation routes, relocation centers, sheltering, respiratory protection, and radioprotective drugs;
- Information addressing special needs of the handicapped; and
- Point of contact for additional information.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **2. Distribution and Maintenance of Public Information**

Dominion coordinates with affected Commonwealth of Virginia and risk jurisdiction authorities to disseminate pertinent emergency response information to members of the public in the plume exposure pathway EPZ on a yearly basis. Written information applicable to permanent residences is provided in a form that is likely to be maintained in the residence (e.g., calendars, brochures) so it will be available during an emergency.

Information intended for transients (individuals on vacation in, camping in, or traveling through the plume exposure pathway EPZ) may include public postings, publications provided to hotels, motels, and campgrounds, and information published in telephone directories. These sources of information provide transients sources for local emergency information, such as local radio and television stations.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **3. News Media Coordination**

- a. The outlet for emergency information is the Joint Information Center. Dominion's *Chief Technical Spokesperson* will serve as the primary licensee spokesperson and media contact in the Joint Information Center. The *Chief Technical Spokesperson* gathers information from the ERO for dissemination to the news media and updates the news media on a periodic basis throughout any emergency situation during which the members of the media respond to the JIC.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- b. Dominion provides a designated space for limited numbers of news media personnel within the EOF.

## **4. Information Exchange**

- a. The Dominion public affairs liaison has access to required public information, primarily through communications with the *Chief Technical Spokesperson* and designated members of the EOF staff.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- b. The Dominion public affairs liaison coordinates continuity and consistency of information with designated members of the Commonwealth of Virginia and risk jurisdiction emergency response organizations on a periodic basis.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- c. Rumor control is accomplished through ongoing contact with the *Chief Technical Spokesperson* and by the activities of a Dominion public affairs liaison in the JIC, who monitors communications, identifies rumors, and makes appropriate contacts to obtain and disseminate accurate information through the representatives in the JIC. The rumor control number is announced by the VDEM Public Affairs Office at media briefings and in press releases.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## 5. News Media Training

News media training is accomplished through briefings for the news media offered on a yearly basis. These annual briefings acquaint members of the media organizations with the emergency plans, information regarding radiation hazards, and points of contact for release of public information during an emergency.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## H. Emergency Facilities and Equipment

The descriptions of ERFs in [SSAR Section 13.3.2.2.2.h](#) are incorporated by reference.

### 1. On-Site Emergency Response Facilities

The TSC and OSC are provided to support emergency operations consistent with the guidance provided in NUREG-0737, Supplement 1.

The function of the TSC is to provide an area and resources for use by personnel providing plant management and technical support to the plant operating staff during emergency evolutions. The TSC relieves the reactor operators of peripheral duties and communications not directly related to reactor system manipulations and prevents congestion in the Control Room.

The TSC is located in the Access Building. The US-APWR Design Certification Document provides pertinent design information (instrumentation, data system equipment, and power supplies) for the TSC in Tier 2.

[Section II.B.5](#) provides a description of the TSC staff. [Section II.O.4](#) provides a description of emergency response organization training and qualification.

The size of the TSC is sufficient to support a staff of 25 people.

The TSC is environmentally controlled to provide room air temperature, humidity and cleanliness appropriate for personnel and equipment. The room is provided with radiological protection and monitoring equipment necessary to monitor personnel radiation exposure and to maintain personnel doses less than 0.05 Sv (5 rem) total effective dose equivalent (TEDE), as defined in 10 CFR 50.2, for the duration of the accident. The level of protection is similar to the main control room. However, in the event that off-site and on-site AC power were unavailable, the TSC could be evacuated and the TSC management function transferred to a location unaffected by the radiation release.

The TSC is provided with reliable voice and data communication with the main control room and EOF and reliable voice communications with the OSC, NRC Operations Center and Virginia and risk jurisdiction EOCs. Control room data communication of emergency response data system (ERDS) data with the NRC Operations Center is also provided as appropriate. [Section II.F](#) provides a description of the communications capabilities provided in the TSC.

Display capability of the technical data system in the TSC includes a workstation that, at minimum, is capable of displaying the parameters that are required of a Safety Parameter Display System (SPDS). The SPDS function is described in [DCD Section 18.7](#) through its incorporated references.

Key reference materials are available to the TSC staff via Local Area Network connection from the Nuclear Electronic Document Library, including:

- Up-to-date, as-built drawings, schematics, and diagrams showing conditions and locations of plant structures and systems down to component level
- Plant technical specifications
- Plant operating procedures
- Emergency operating procedures
- Final Safety Analysis Report
- Up-to-date records related to licensee, State, and local emergency response plans
- Offsite population distribution data
- Evacuation plans

[Section II.H.9](#) provides a description of the OSC.

## **2. Emergency Operations Facility**

The function of the EOF is to provide a location for Dominion management to direct and coordinate emergency response activities, with emphases on providing support to the

plant staff and coordinating emergency response activities with offsite response agencies.

Dominion provides both a Local EOF and Central EOF to support the North Anna site. The Local EOF is the primary EOF used to support emergency response activities at the North Anna site. The Central EOF may be activated in lieu of the Local EOF to support emergency response activities for emergencies, such as severe storms, that affect both the North Anna and Surry sites. The Central EOF also may be activated if the Local EOF is unavailable.

Except for the radiation protection functions of the Local EOF discussed below, the minimum capacities, capabilities, and plant parameter displays of the Local EOF and Central EOF are similar. Therefore, the remainder of this plan refers simply to "the EOF" when describing the features, activation, and operation of the EOF.

The Local EOF and Central EOF are the same as those used for NAPS Units 1 and 2. The Local EOF is located within the owner-controlled area and the Central EOF at Dominion's Innsbrook Technical Center in Glen Allen, Virginia, approximately 30 miles from Unit 3. This configuration does not alter the functions of the EOF as described in NUREG-0696.

Provisions are made for staffing of the EOF by Dominion, Commonwealth of Virginia, and NRC personnel. Dominion also makes provisions for accommodating a limited number of media personnel in the EOF. [Section II.B.5](#) provides a description of the Dominion EOF staff. [Section II.O.4](#) provides a description of emergency response organization training and qualification.

The size of the EOF is sufficient to support 35 people. The Local EOF was designed to provide a specified protection factor from gamma radiation. The Local EOF also has a specially designed ventilation system to limit the exposure of its occupants and further assure its availability during an emergency. Provisions exist for dedicated radiation monitoring equipment to measure airborne particulate and direct radiation. The location of the Central EOF precludes the necessity of providing radiation monitoring systems.

[Section II.F](#) provides a description of the communications capabilities provided in the EOF.

The Local EOF and Central EOF draw power from commercial power sources. There is electrical generator backup power to the Central EOF. A loss of commercial power should not impact any of the voice or data communications equipment located in the Central EOF. Common Dominion telecommunications infrastructure that supports EOF functions, including, but not limited to, fiber optic transmission equipment, telephone switching equipment and data network routers, is configured to operate from at least one

and usually multiple backup power sources in the event of a loss of commercial power. These backup sources include generator, DC battery and UPS systems.

Display capability of the technical data system in the EOF includes a workstation that, at minimum, is capable of displaying the parameters that are required of an SPDS. The SPDS function is described in [DCD Section 18.7](#) through its incorporated references.

Key reference materials will be available to the EOF staff via Local Area Network connection from the Nuclear Electronic Document Library, including:

- Plant technical specifications
- Plant operating procedures
- Emergency operating procedures
- Final Safety Analysis Report
- Up-to-date records related to licensee, State, and local emergency response plans
- Offset population distribution data
- Evacuation plans
- Up-to-date, as-built drawings, schematics, and diagrams showing conditions and locations of plant structures and systems down to component level

### **3. Commonwealth/Risk Jurisdiction Emergency Operations Centers**

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### **4. Activation and Staffing of Emergency Response Facilities**

Dominion staffs and activates the designated ERFs as follows<sup>6</sup>:

- Notification of Unusual Event – ERF staffing not normally needed, but may be undertaken at the discretion of the *Emergency Coordinator*.
- Alert, Site Area Emergency and General Emergency – Staffing of the TSC and OSC required.
- Site Area Emergency and General Emergency – Staffing of the EOF required.

Following declaration of an emergency condition, the ERFs are staffed and activated in accordance with EPIPs. The descriptions of ERF notification and staffing provided in [SSAR Sections 13.3.2.2.e.2](#) and [13.3.2.2.f.4](#) are incorporated by reference.

Commonwealth of Virginia and risk jurisdiction emergency response personnel also staff their ERFs consistent with the provisions of their respective plans.

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6. See [Section II.A.1.a](#) of this plan regarding situations under which staffing of the emergency response facilities may be deferred.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## 5. Onsite Monitoring Systems

Dominion maintains and operates onsite monitoring systems needed to provide data that is essential for initiating emergency measures and performing accident assessment. This includes monitoring systems for geophysical phenomena, radiological conditions, plant processes, and fire hazards.

- a. [Section 3.7.4](#) of the FSAR and the DCD provide a description of the seismic monitoring system.
- b. [Sections 12.3](#) of the FSAR and the DCD provide a description of the installed radiological monitoring systems. In addition to the installed systems, Dominion maintains an adequate supply of portable radiation monitoring and sampling equipment, including dedicated emergency response equipment, consistent with [Sections II.H.7, II.H.10, and II.H.11](#) and [Appendix 6](#).
- c. [Section 11.5](#) of the FSAR and the DCD provide a description of the plant process monitoring systems.
- d. [Sections 9.5.1](#) of the FSAR and the DCD provide a description of the plant fire monitoring system.

## 6. Access to Data from Monitoring Systems

- a. Dominion acquires meteorological data from the National Weather Service (NWS) during periods when the primary system is unavailable. Back-up seismic data is available from the U.S. Geological Survey (National Earthquake Information Center) and the Virginia Polytechnic Institute and State University (Virginia Tech) Seismological Observatory. Streamflow data is available from the U.S. Geological Survey. Flooding data is available from NOAA's Hydro-Meteorological Reports. Other data sources, such as commercial media outlets, may also be used.
- b. Offsite environmental radiological monitoring equipment includes a series of continuous air samplers and environmental monitoring dosimeters surrounding the facility. The facility's Offsite Dose Calculation Manual (ODCM) describes the monitoring systems. In addition to the monitoring systems, equipment, and radiological laboratory facilities provided at the plant, Dominion maintains arrangements to obtain back-up radiological monitoring and analysis support from offsite organizations. [Section II.A](#) provides a description of these arrangements and the capabilities of the affected organizations and facilities. [Appendix 7](#) provides

pertinent certifications from these support organizations.

- c. [Section II.C.3](#) provides a description of the available laboratory facilities.

## **7. Offsite Radiological Monitoring Equipment**

Dominion provides offsite radiological monitoring equipment suitable for assessment of the offsite radiological consequences of facility incidents, for use by its offsite monitoring field teams. [Appendix 6](#) provides a description of the types of radiological monitoring equipment provided for field team use.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **8. Meteorological Instrumentation and Procedures**

The station's Meteorological Monitoring System provides the capability for providing data that are used for predicting atmospheric effluent transport and diffusion. The system consists of a primary and a backup tower, the locations of which were chosen so as to be representative of regional conditions.

The parameters monitored by the site's primary meteorological tower are listed below.

### **10 Meter Elevation:**

- Wind speed
- wind direction
- horizontal wind direction fluctuation
- temperature (used with 48.4 meter data for differential temperature)
- dew point temperature

### **48.4 Meter Elevation:**

- Wind speed
- wind direction
- horizontal wind direction fluctuation
- temperature (used with 10 meter data for differential temperature)

Precipitation is monitored at the ground level.

The NAPS backup meteorological monitoring site consists of instrumentation on a freestanding 10 meter tower. This tower is located approximately 1300 feet northeast of the Unit 1 containment building and serves as the backup meteorological monitoring site. A sensor at the top of the mast monitors wind speed, wind direction, and horizontal wind

direction fluctuation. [SSAR Section 2.3](#) provides a detailed description of the Meteorological Monitoring System.

## **9. Operational Support Center**

The function of the OSC is to provide a common area and the necessary supporting resources for the assembly of designated operations support personnel during emergency conditions. Designated plant support personnel, as indicated in [Section II.B](#), assemble in the OSC to provide support to both the Control Room and TSC. Personnel reporting to the OSC can be assigned duties in support of emergency operations. Assessment, corrective action, and rescue personnel are dispatched by the OSC to locations in the plant, as directed by the TSC and Control Room.

The OSC is located in the Health Physics Room in the Access Building. The OSC is not designed to remain habitable under all projected emergency conditions; however, implementing procedures make provisions for relocating the OSC as needed, based on ongoing assessments of plant conditions and facility habitability.

The OSC provides dedicated telephone extensions for communicating with the Control Room and the TSC. This permits personnel reporting to the OSC to be assigned to duties in support of emergency operations. The OSC is also equipped with a separate telephone line to provide for communications with on-site and off-site locations, as needed. [Section II.F](#) provides a description of the communications capabilities provided in the OSC.

## **10. Emergency Equipment and Supplies**

Dominion performs inspection, inventory, and appropriate operational tests of dedicated emergency equipment and instruments on a quarterly basis consistent with [Section II.P](#). Plant procedures establish requirements for performing inventories and operational tests. Dominion maintains sufficient reserves of equipment and instruments to replace any items that are removed from the emergency kits for calibration or repair.

[Appendix 6](#) provides a description of the emergency equipment and supplies to be provided.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **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](#) describes plant system and effluent parameter values that are indicative of off-normal conditions and the various indications that correspond to the emergency initiating conditions. Plant procedures specify the types and capabilities of the instruments used to indicate emergency conditions.

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

[Section 7.5.1.1](#) of the US-APWR DCD describes the Post-Accident Monitoring Systems and is incorporated into this plan by reference. [Section 9.3.2](#) of the US-APWR DCD discusses post-accident sampling capabilities.

#### **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.

#### **4. Relationship Between Effluent Monitor Reading and Exposure and Contamination Levels**

Dose assessment procedures include the relationship between effluent monitor readings and onsite and offsite exposures and contamination for various meteorological conditions. [Appendix 2](#) provides a description of the emergency dose assessment program used at NAPS. Information includes dose and dose rate determinations based on plant effluent monitors, and contamination estimates based on deposition assumptions and meteorological conditions.

## 5. Meteorological Information

[Section II.H.8](#), [Appendix 2](#), and [SSAR Section 2.3](#) provide a description of the meteorological monitoring systems that are used to provide initial values and continuing assessment of meteorological conditions under emergency conditions.

## 6. Determination of Release Rates and Projected Doses When Installed Instruments Are Inoperable or Off-Scale

Plant procedures establish processes for estimating release rates and projected doses if the associated instrumentation is inoperable or off-scale. These procedures include the following considerations:

- Estimated releases based on field monitoring data
- Surrogate instrumentation and methods to estimate extent of fuel damage.

[Appendix 2](#) provides a description of the emergency dose assessment program used at NAPS. Information includes dose and dose rate determinations based on plant effluent monitors, and contamination estimates based on deposition assumptions and meteorological conditions.

## 7. Field Monitoring Capability

Dominion provides emergency response field teams composed of one or more radiation protection technicians trained in accordance with the emergency preparedness training requirements established in [Section II.O](#) of this plan. [SSAR Section 13.3.2.2.2.i](#) discusses field team activities and is incorporated by reference.

[Appendix 6](#) provides a description of the instrumentation that is available for performance of field monitoring in the plume exposure pathway EPZ. In addition to the required instrumentation, Dominion provides protective equipment (including respiratory protection and radioprotective drugs), communications equipment, and supplies to facilitate performance of radiation, surface contamination, and airborne radioactivity monitoring. Implementing procedures provide guidance for field monitoring teams' performance of monitoring activities. Field monitoring teams act under the direction of Health Physics personnel in the TSC prior to activation of the EOF and, following activation of the EOF, under the direction of Health Physics personnel in that facility.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## 8. Assessing Hazards Through Liquid or Gaseous Release Pathways

Dominion trains, designates, equips, dispatches, and coordinates field teams consistent with [Section II.I.7](#). The field teams perform sampling of offsite media as needed to assess the actual or potential magnitude and locations of radiological hazards. Dominion

notifies and activates field team personnel consistent with [Section II.E](#). Mobilization times are consistent with [Section II.B](#).

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

#### **9. Measuring Radioiodine Concentrations**

Dominion equips field teams with portable air samplers, appropriate filters or other sampling media (e.g., silver zeolite or other media capable of collecting airborne radioiodine samples), and analysis equipment capable of detecting radioiodine concentrations at or below  $10^{-7}$  microcuries per milliliter under field conditions, taking into consideration potential interference from noble gas activity and background radiation. [Appendix 6](#) provides information regarding emergency supplies, equipment, and instruments.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP.

#### **10. Relating Measured Parameters to Dose Rates**

Plant implementing procedures establish the means for relating measured parameters, such as surface, airborne, or waterborne activity levels, to dose rates for those key isotopes listed in Table 3 of NUREG-0654. Implementing procedures also establish provisions for estimating the projected dose based on projected and actual dose rates. Health Physics personnel are responsible for directing implementation of these procedures under emergency conditions.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP.

#### **11. Tracking of Plume Using Federal and Commonwealth Resources**

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.

### **J. Protective Response**

The descriptions of protective response measures provided in [SSAR Section 13.3.2.2.2.j](#) are incorporated by reference.

#### **1. On-Site Notification**

Dominion establishes and implements methods to inform personnel within the protected area (within the Security fence) and exclusion area (within 5000 feet of the Unit 3 containment) of an emergency condition requiring individual action.

Dominion informs individuals located within the protected area primarily via use of the plant public announcement system and audible warning systems. In high noise areas or

other areas where these systems may not be audible, other measures, such as visible warning signals or personal notifications, may be used.

Dominion informs individuals located within the exclusion area, but outside of the protected area, via audible warnings provided by warning systems and the activities of the Security Force (e.g., vehicle-mounted public address systems) and activities of the Virginia Department of Game and Inland Fisheries. Dominion provides information regarding the meaning of the various warning systems, and the appropriate response actions, via plant training programs, visitor orientation, escort instructions, posted instructions, or within the content of audible messages.

Dominion maintains the ability to notify individuals within the Protected Area within about 15 minutes of the declaration of any emergency requiring individual response actions, such as accountability or evacuation.

## **2. Evacuation Routes and Transportation**

Dominion has established evacuation routes to assembly areas consistent with [Figure II-4](#). If the evacuation routes are rendered impassable, such as due to radiological or meteorological conditions, then provisions will be made to retain affected personnel on site.

Affected individuals evacuate the site via personal vehicles. If any individual on site does not have access to a personal vehicle, the affected individual will evacuate with another evacuating individual. Dominion directs evacuees to a designated assembly area.

Dominion informs individuals of the evacuation routes and appropriate instructions via plant training programs, visitor orientation, escort instructions, posted instructions, or within the content of audible messages.

Should site evacuation via either designated evacuation route be determined to be inadvisable due to adverse conditions (e.g., weather-related, radiological, or traffic density conditions), Dominion will direct affected individuals to a safe onsite area (as determined by the *Emergency Coordinator* or designee) for accountability and, if necessary, contamination monitoring and decontamination.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **3. Personnel Monitoring and Decontamination**

Dominion has established the primary and secondary assembly areas to provide a location for personnel monitoring. The *Emergency Coordinator* directs contamination monitoring of personnel, vehicles, and personal property arriving at the assembly area when there is a likelihood that individuals and their property may have become contaminated before or during the site evacuation.

#### **4. Non-Essential Personnel Evacuation and Decontamination**

In the event of a Site Area Emergency or General Emergency, Dominion may evacuate non-essential personnel (i.e., personnel who do not have an emergency response assignment) consistent with the provisions of [Section II.J.2](#). Appropriate equipment and supplies are provided from the facility to the assembly areas to facilitate contamination monitoring.

#### **5. Personnel Accountability**

Dominion provides the capability to account for individuals within the Protected Area and to identify any missing individuals within 30 minutes following initiation of assembly and accountability measures. Dominion also provides a capability to account for individuals within the protected area continuously after the initial accountability. Dominion maintains these capabilities consistent with the requirements of the facility Security Plan.

#### **6. Protective Measures**

Dominion provides equipment and supplies to provide adequate protection for individuals remaining or arriving onsite during an emergency. The equipment and supplies include:

- a. respiratory protection equipment;
- b. protective clothing; and
- c. radioprotective drugs.

Onsite supplies of protective clothing and respiratory protection equipment may be augmented by that provided by offsite responders, such as firefighters responding to the site.

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. EALs correspond to the projected dose to the population at risk and are determined consistent with the methodology described in [Appendix 1](#).

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 Actions for Nuclear Incidents,” ([Reference 15](#)) and Protective Action Recommendations are developed based on the results of these comparisons.

Prior to activation of the EOF, the *Emergency Coordinator* is responsible for determining PARs and communicating the PARs to the Virginia EOC. Following activation of the EOF, *EOF Director* assumes these responsibilities. The *Emergency Coordinator* or *EOF Director* provides PAR to the Virginia EOC, which is responsible for implementing the protective actions, using the communications systems discussed in [Section II.H](#) of this

plan or by direct communications in the EOF.

**Table II-3 Protective Action Guides**

Projected Dose		
Total Effective Dose Equivalent (TEDE)	Committed Dose Equivalent Thyroid (CDE Thyroid)	Protective Action Recommendation
< 1 rem	< 5 rem	No protective action required based on projected dose
≥1 rem	≥5 rem	Evacuate affected zones and shelter the remainder of the plume exposure pathway EPZ

#### **8. Evacuation Time Estimates**

Dominion has conducted an Evacuation Time Estimate (ETE) ([Reference 16](#)) which is summarized in [Appendix 4](#). The ETE is consistent with the guidance provided in Appendix 4 of NUREG-0654 and NUREG/CR-6863, “Development of Evacuation Time Estimate Studies for Nuclear Power Plants” ([Reference 17](#)). The ETE updates the information in [SSAR Section 13.3.2.1](#). The ETE does not reveal the existence of any significant impediments to the development of emergency plans.

Population distribution and evacuation time estimates are summarized in [Appendix 4](#).

#### **9. Implementation of Protective Measures**

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.

#### **10. Protective Measures Implementation**

- a. Radiological monitoring locations are shown in [Figure II-5](#). Evacuation routes, evacuation areas, and locations of assembly areas are presented in [Figures 10-1](#) through [10-4](#) of the ETE report.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- b. [Appendix 4](#) provides maps of the plume exposure pathway EPZ illustrating population distribution around the facility by evacuation area and in a sector format.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- c. Warnings to the public within the plume exposure pathway EPZ are the responsibility of Commonwealth of Virginia and risk jurisdiction officials. The primary method of warning the public is by the use of the Early Warning System sirens. Other warning methods may include telephone communications, television and radio Emergency Alert System stations, public address systems, bull horns from patrol cars and personal contact. There are currently no hospitals, prisons, or nursing homes within the plume exposure pathway EPZ.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- d. 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.
- e. 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.
- f. 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.
- g. 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.
- h. 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.
- i. 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.
- j. 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.
- k. 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.

- I. 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.
- m. Specific protective action recommendations, based on NUREG-0654, Supplement 3 ([Reference 18](#)) and on plant and meteorological conditions, are included in an implementing procedure.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP.

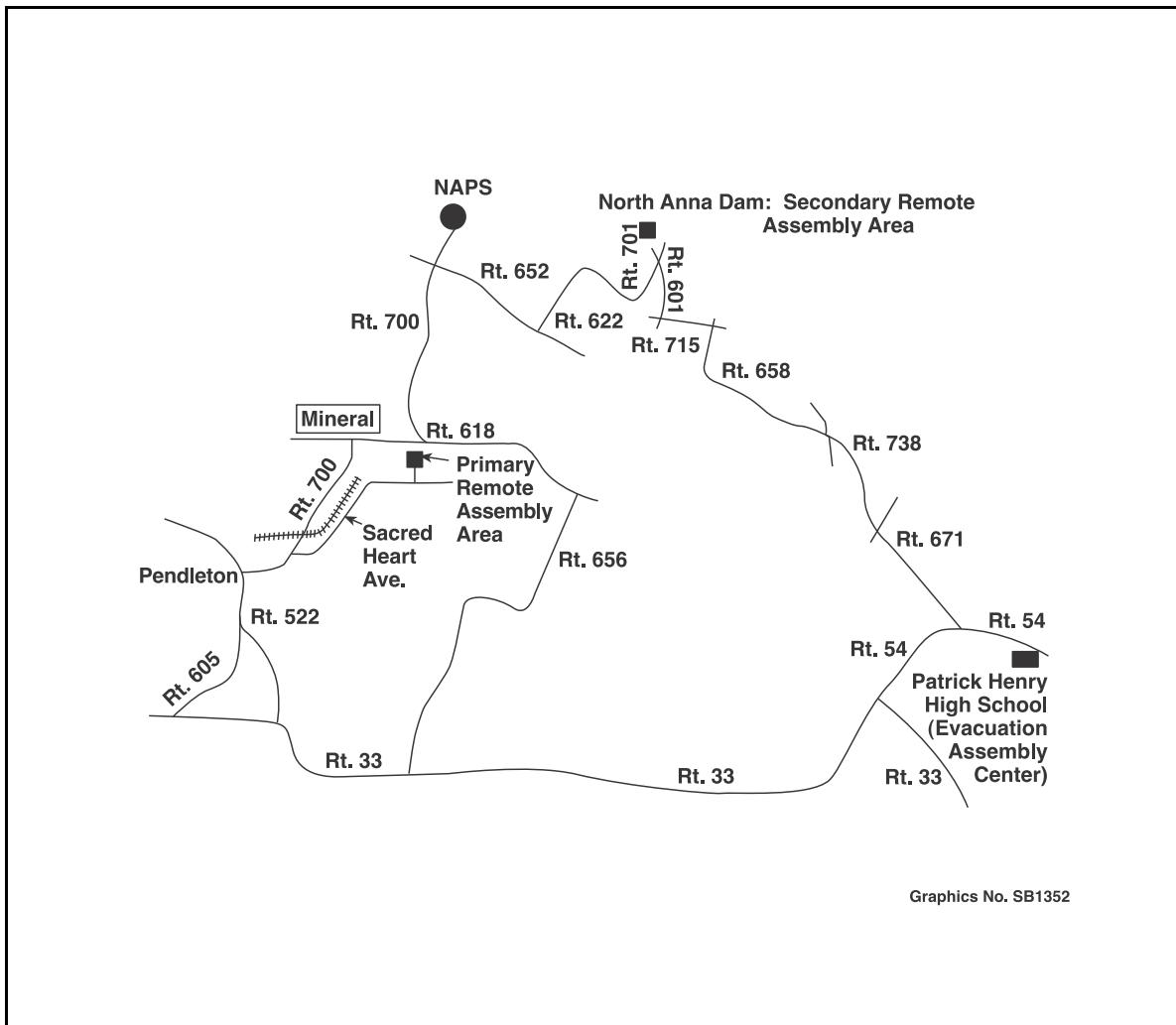
#### **11. Protective Measures Specified by the Commonwealth**

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.

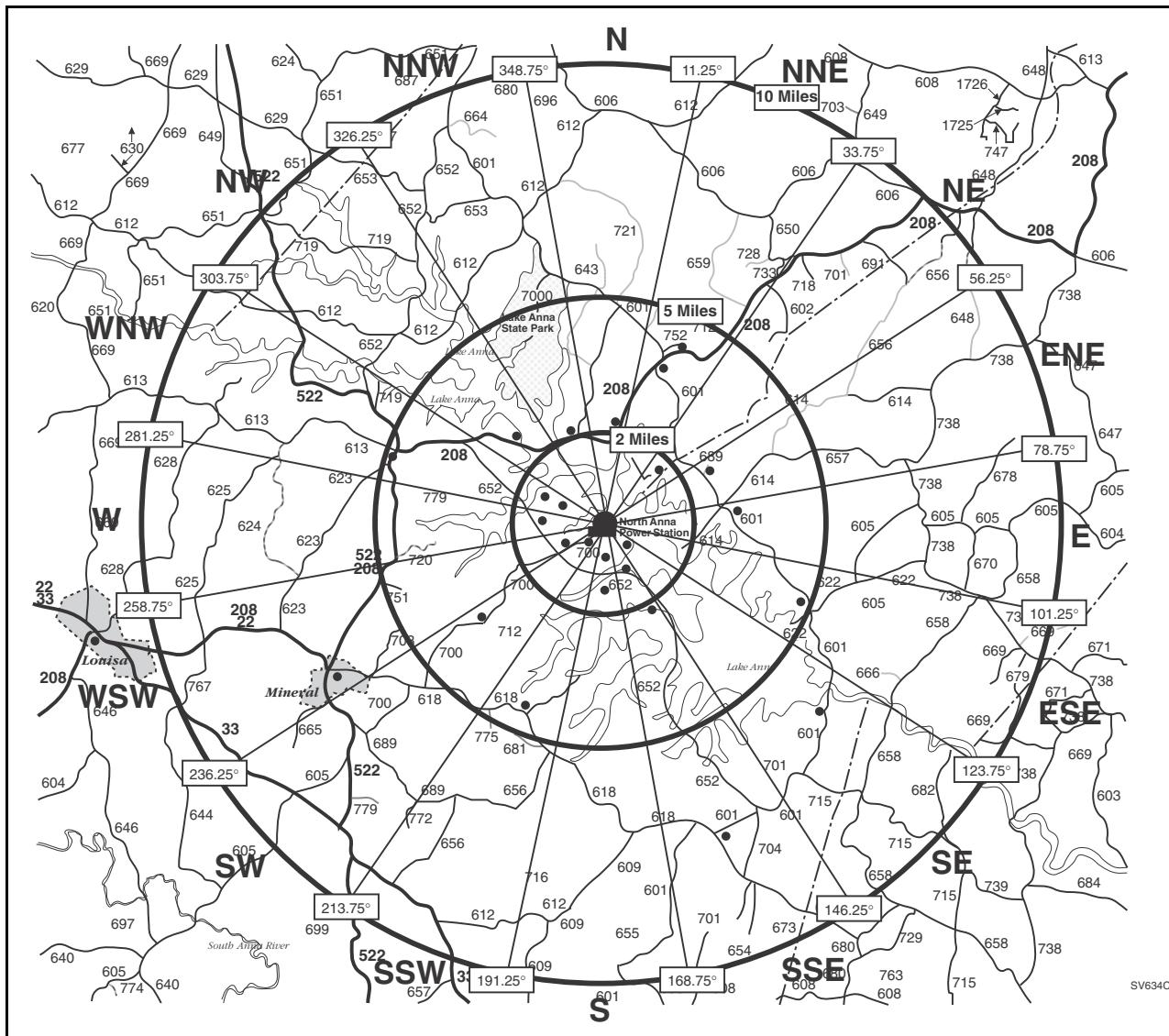
#### **12. Registering and Monitoring Evacuees**

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.

Figure II-4 Map to North Anna Remote Assembly Areas



**Figure II-5 Radiological Monitoring Locations**



- Indicates radiological monitoring location

## K. Radiological Exposure Control

The descriptions of radiological exposure control measures in [SSAR Section 13.3.2.2.2.k](#) are incorporated by reference.

### 1. On-Site Exposure Guidelines and Authorizations

Dominion implements onsite exposure guidelines for emergency response personnel consistent with those published in EPA 400-R-92-001, Table 2-2, "Guidance on Dose Limits for Workers Performing Emergency Services." The applicable guidelines are provided in [Table II-4](#).

Prior to activation of the EOF, the *Emergency Coordinator*, in consultation with facility Health Physics personnel, is responsible for authorization of any emergency exposures resulting in doses exceeding the numerical values of the occupational dose limits provided in 10 CFR Part 20. Following activation of the EOF, the *EOF Director*, in consultation with Health Physics personnel and the *Emergency Coordinator*, authorizes any exposures in excess of the numerical values of the occupational dose limits provided in 10 CFR Part 20. If exposures in excess of the numerical values of the occupational dose limits provided in 10 CFR Part 20 are required, these exposures will be limited to individuals who are properly trained and knowledgeable of the tasks to be completed and the risks associated with the exposures. Selection criteria for volunteer emergency workers include consideration of those who are in good physical health, are familiar with the consequences of emergency exposure, and are not a declared pregnant worker. It is preferable, though not mandatory, that volunteers be older than 45 years of age and not be a female capable of reproduction. Efforts are made to maintain personnel doses ALARA.

**Table II-4 Emergency Worker Exposure Guidelines**

Activity	Dose Guideline in rem		
	TEDE	Lens of the Eye	Other Organs
Any activity other than those specifically authorized below	5	15	50
Protecting Valuable Property	10	30	100
Lifesaving or Protection of Large Populations	25	75	250
Lifesaving or Protection of Large Populations <sup>Note 1</sup>	>25	>75	>250

Note 1: This guideline applies only to volunteers who are fully aware of the risks involved.

## 2. Radiation Protection Program

Chapter 12 of the FSAR describes a radiation protection program (RPP) consistent with the requirements of 10 CFR Part 20. The RPP, in concert with the EPIPs, to be developed prior to loading of nuclear fuel, includes provisions for implementing emergency exposure guidelines. Implementing procedures establish procedures for allowing onsite volunteers to receive radiation doses in the course of carrying out life-saving and other emergency response activities, including provisions for expeditious decision-making and consideration of the relative risks.

### **3. Dosimetry and Dose Assessment**

- a. Dominion maintains a site personnel radiation dosimetry program that includes the capability to determine both external and internal doses consistent with the requirements of 10 CFR Part 20. The external dosimetry program includes provisions and requirements for use of both permanent record and self-reading dosimeters (e.g., pocket or electronic dosimeters). Dosimeter ranges are sufficient to measure both planned routine and foreseeable accident photon doses. Plant procedures associated with this plan establish requirements for distributing dosimeters to emergency responders, including those individuals responding to the site from offsite locations. Internal doses are typically estimated through the use of whole body counting and/or in-vitro sampling and analysis routines. Plant procedures associated with this plan or the RPP establish requirements for determining internal doses based on in-vivo or in-vitro analyses results or by assessment of individual exposures to airborne radioactive materials.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- b. Implementing procedures also establish guidance for wearers to periodically read their self-reading dosimeters to monitor compliance with emergency exposure guidelines. Dominion maintains individual dose records in accordance with the requirements of 10 CFR Part 20 and the RPP and its supporting procedures.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### **4. Commonwealth of Virginia and Risk Jurisdiction Responder Exposure Authorizations**

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.

### **5. Decontamination Action Levels**

- a. Dominion implements requirements for personnel and area decontamination, including decontamination action levels and criteria for returning areas and items to normal use, in procedures supporting the RPP.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

- b. Dominion implements procedures for decontamination of onsite emergency personnel wounds, supplies, instruments and equipment, and for waste disposal. Dominion provides decontamination supplies with emergency kits consistent with [Appendix 6](#).

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **6. Contamination Control Measures**

- a. The FSAR and Security Plan establish requirements for site access control from offsite locations. Following a site evacuation, law enforcement agencies control access to the owner-controlled area consistent with the requirements of the supporting Commonwealth of Virginia and risk jurisdiction plans. The site Security Force controls entry to the restricted area by individuals, including emergency responders, who must enter the site during an emergency. The RPP and its supporting procedures establish requirements for limiting access to areas having significant radiological hazards, consistent with the requirements of 10 CFR Part 20 and [Chapter 12](#) of the FSAR.
- b. Should the potential exist for contamination of onsite food or drinking water supplies that renders these supplies non-consumable, arrangements will be made for transport of non-contaminated offsite supplies to the site.
- c. Dominion permits areas and items to be returned to normal (i.e., non-contaminated) use following conduct of appropriate surveys and verification that the contamination levels meet the criteria provided in the RPP or its supporting procedures.

## **7. Decontamination of Relocated Site Personnel**

Dominion makes provisions for protective clothing, contamination monitoring, and decontamination, including decontamination of radioiodine contamination on the skin, at the offsite assembly area or other location as directed. [Appendix 6](#) provides a description of the emergency equipment and supplies to be provided.

## **L. Medical and Public Health Support**

The descriptions of plans for medical and public health support in [SSAR Section 13.3.2.2.2.I](#) are incorporated by reference.

### **1. Hospital and Medical Support**

Dominion has established a certification letter with the Virginia Commonwealth University Medical Center (VCUMC) under which VCUMC will provide medical services for injured personnel from Unit 3. VCUMC has established a specialized area of the

hospital for treatment with appropriate Health Physics functions, and implements a coded system to alert hospital team members. Radiation monitoring equipment, dosimeters, and protective clothing are available at VCUMC.

VCUMC established and maintains the capability to evaluate the radiation exposure and/or uptake of accident victims and to handle contaminated victims. These capabilities are established and maintained through training courses consistent with [Section II.O](#), periodic drills and exercises consistent with [Section II.N](#), and services provided consistent with agreements between Dominion and the medical support providers.

In the event that a contaminated injured person is transported from Unit 3 to an offsite medical facility, Dominion may provide to the facility one or more technicians qualified to perform radiological monitoring if requested by the facility to support the radiological aspects of the medical treatment and post-treatment efforts.

[Appendix 7](#) provides a copy of the relevant certification letter.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **2. On-Site First Aid Capability**

Dominion maintains a trained First Aid Team at the site to provide 24 hour per day first aid support consistent with [Section II.B](#). Dominion maintains First Aid Team readiness through training consistent with [Section II.O](#) and drills and exercises consistent with [Section II.N](#).

## **3. Emergency Medical Facilities Within the Commonwealth**

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.

## **4. Medical Emergency Transportation**

Contaminated injured personnel will be suitably clothed or prepared to prevent the spread of contamination in the transporting vehicle, if practical considering the medical condition of the injured person. Communication can be maintained with VCUMC from the station. The Station can also communicate with the site ambulance, if used, by use of an ultra-high frequency (UHF) radio, and the ambulance can communicate with VCUMC by way of the Hospital Emergency Alerting Radio (HEAR) system. In addition, arrangements have been made with local volunteer rescue squads to transport injured contaminated personnel to VCUMC. Response team members have received training concerning transportation of contaminated injured individuals. A Health Physics technician, with appropriate instrumentation, would normally accompany contaminated injured personnel to VCUMC. The approximate time to transport a patient to VCUMC is

75 minutes. The estimated time for local rescue squads to arrive at the station is 30 minutes.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## M. Recovery and Re-Entry

### 1. Recovery Plans and Procedures

Dominion implements recovery plans and procedures that provide guidance for a range of recovery and re-entry activities, including:

- Recovery/re-entry organization;
- Responsibilities for recovery/re-entry decision-making, including decisions for relaxing protective measures based on existing and potential hazardous conditions;
- Means for informing members of the emergency response organization that recovery operations are to be initiated and related changes in the organizational structure; and
- Methods for periodically updating estimates of total population exposure.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### 2. Recovery Organization

Under some circumstances, particularly those involving significant damage to the facility or offsite consequences, there may be a need for ongoing assessment and recovery actions following the cessation of emergency response activities. Prior to entering the recovery/re-entry phase of operations following an emergency, Dominion establishes a recovery organization consistent with the existing conditions and continuing organizational needs.

The recovery organization includes those management, technical, and administrative personnel necessary to provide for timely and effective recovery of the facility based on assessments of plant conditions and desired end states. The recovery process is further outlined in the EPIP specifically designed for administration of the recovery program. The basic organization may be modified, as required, to address the needs of the given situation. The *EOF Director* assumes control and direction of the recovery operation with the authority and responsibilities set forth in the EPIPs.

The recovery organization develops plans and procedures designed to address both immediate and long term actions. The necessity to maintain protective measures implemented during the emergency will be evaluated and, if deemed appropriate, the recovery organization will recommend relaxation of the protective measures. Because it is not possible to foresee all of the consequences of an event, specific recovery

procedures may need to be written to address specialized requirements. Where possible, existing station procedures are utilized. Any special recovery procedures require the same review and approval process accorded other station procedures.

Depending on plant conditions and the scope of required activities, the recovery organization may discharge its activities from one or more designated ERFs or from other locations as specified by the responsible recovery organization managers. As recovery operations progress, the recovery organization may be augmented or reduced as needed to maintain effectiveness and meet ongoing operational needs.

In general, Dominion would not expect a recovery organization to be necessary following declaration and termination of a Notification of Unusual Event or Alert.

### **3. Changes in Organizational Structure**

The recovery process is implemented when the facility's emergency response organization managers, with concurrence of Commonwealth of Virginia and Federal agencies, have determined the station to be in a stable and controlled condition. Upon the determination, Dominion notifies the NRC Operations Center, the Virginia EOC, and the risk jurisdiction EOCs that the emergency has been terminated and any required recovery has commenced.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP.

### **4. Updating Total Population Exposure During Recovery Operations**

Total population doses are periodically estimated in the affected sectors and zones utilizing population distribution data from within the affected areas. Health Physics personnel initially determine Total Effective Dose Equivalent (TEDE) due to external exposure from airborne material, external exposure from ground deposition, and internal exposure due to inhalation. Initial calculations also are performed for determination of Thyroid Committed Dose Equivalent (CDE) resulting from inhalation of radioiodines. The methodology used is consistent with that presented in EPA-400-R-92-001. Determination of total population doses includes assessments of exposure received from (but not necessarily limited to) immersion, inhalation, ground shine, and ingestion of radioactive materials.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP.

## **N. Exercises and Drills**

Dominion implements a program of periodic drills and exercises to evaluate major portions of emergency response capabilities and to develop and maintain key emergency response skills. Identified deficiencies are corrected.

## 1. Exercises

### a. Exercise Scope and Frequency

Dominion conducts emergency exercises in accordance with NRC and DHS rules (e.g., 10 CFR 50.47(b)(14) and 44 CFR 350.9). These exercises are developed and implemented to periodically test and evaluate major portions of the affected emergency plans, procedures, and organizations. Unless otherwise specified, emergency exercises simulate an emergency that results in offsite radiological releases requiring response by offsite authorities.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### b. Exercise Scenarios and Participation

Dominion conducts exercises on a periodic basis. The exercises:

- Test the adequacy of timing and content of implementing procedures and methods
- Test emergency equipment and communications networks
- Test the public notification system
- Test the familiarity of emergency organization personnel with their duties

The scenario varies from year to year so that the major elements of the plans and preparedness organizations are tested within a six year period.

Dominion will conduct a full participation exercise (which tests as much of the licensee, Commonwealth of Virginia and risk jurisdiction emergency plans as is reasonably achievable without mandatory public participation) within two years before initiation of scheduled initial fuel loading. This exercise will include (consistent with existing DHS rules and guidance) participation by the Commonwealth of Virginia, State of Maryland and affected local governments within the plume exposure pathway EPZ and the ingestion exposure pathway EPZ.

If the full participation exercise is conducted more than one year prior to initial fuel loading, Dominion will conduct an exercise that tests the onsite emergency plans within one year before initiation of full power operations. This exercise may, but need not, have participation by the Commonwealth of Virginia and risk jurisdictions.

Dominion conducts an exercise of its onsite emergency plan every two years. The exercise may be included in the biennial full participation exercise discussed below.

Dominion conducts exercises involving full participation by offsite authorities having a role under the plan at least biennially. If any offsite authority has a role under a

radiological response plan for more than one site, Dominion offers that authority an opportunity to participate in one exercise every two years.

Dominion offers the Commonwealth of Virginia and State of Maryland, an opportunity to participate in the ingestion pathway portion of exercises, regardless of the state's participation in other licensed facility's emergency exercises.

At least once every 6 years, an exercise should be initiated during off-hours (between 6 pm and 4 am on a weekday or during a weekend). Dominion conducts unannounced exercises on a periodic basis, to the extent such exercises can be supported by affected internal and external organizations. To the extent practicable, as limited by the exercise planning process, some exercises are conducted under various weather conditions. If NRC, in consultation with FEMA, determines that the results of the biennial exercise do not provide reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency, Dominion will conduct a remedial exercise. During the remedial exercise, Dominion will allow for State and local participation to an extent sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercise.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## 2. Drills

Dominion maintains adequate emergency response capabilities between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of onsite emergency response capabilities. The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, protective action decision making, and plant system repair and corrective actions. Upon request, Dominion allows affected Commonwealth of Virginia and risk jurisdiction governments located within the plume exposure pathway EPZ to participate in the drills.

During these drills, activation of all of the ERFs may not be necessary. Dominion may use the drills to consider accident management strategies, provide supervised instruction, allow the operating staff to resolve problems and focus on internal training objectives. Dominion may include one or more drills as portions of an exercise.

The activities undertaken in the event of an actual declared emergency may be used to satisfy emergency drill requirements, provided that these activities demonstrate adequate execution of the specified activities.

The drill program includes the following:

a. Communications Drills

Dominion conducts monthly tests of communications with Commonwealth of Virginia and risk jurisdiction governments within the plume exposure pathway EPZ, as identified in [Section II.A](#).

Dominion conducts quarterly tests of communications with Federal emergency response organizations, as identified in [Section II.A](#).

Dominion conducts annual tests of communications between the facility, Virginia and risk jurisdiction EOCs, and field assessment teams.

Communications drills evaluate both the operability of the communications system(s) and the ability to understand message content.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

b. Fire Drills

Dominion conducts fire drills as required by [Section 9.5.1](#) of the FSAR.

c. Medical Emergency Drills

Dominion conducts medical emergency drills that include a simulated contaminated injured individual and participation by the local support services agencies (i.e., medical transportation and offsite medical treatment facility) on a yearly basis.

[Appendix 8](#) provides a cross-reference to the related provisions in risk jurisdiction RERPs.

d. Radiological Monitoring Drills

Dominion conducts radiological monitoring drills, involving both onsite and offsite radiological monitoring activities on a yearly basis. Radiological monitoring drills include collection and analysis of the sample media for which the facility is responsible, communications with monitoring teams, and recordkeeping activities. Dominion may coordinate radiological monitoring drills with those drills conducted by Commonwealth of Virginia and risk jurisdiction government entities or may conduct these drills independently.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

e. Health Physics Drills

Dominion conducts on-site Health Physics drills on a semi-annual basis. Health Physics drills include:

- Response to and analysis of simulated elevated airborne and liquid samples and direct radiation measurements in the environment
- Analysis of in-plant liquid samples with simulated or actual elevated radiation levels

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP.

**3. Conduct of Drills and Exercises**

Dominion develops drill and exercise scenarios and related materials that clearly establish the following:

- a. Basic objectives and evaluation criteria
- b. Date, time period, location, and participating organizations
- c. Simulated events
- d. Time schedule of real and simulated initiating events
- e. Narrative summary describing the conduct of the exercise or drill, including items such as simulated casualties, offsite response to the facility, personnel rescue, use of protective equipment, monitoring team deployment, and public information activities
- f. Arrangements for official observers and the advance materials to be provided to them

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

**4. Exercise and Drill Evaluation**

One or more qualified instructors/evaluators supervise and evaluate drills and exercises. A qualified instructor/evaluator is an individual whose knowledge, skills, and abilities have been evaluated by the Manager Emergency Preparedness or designee and determined to be sufficient for observing and evaluating the planned activities against the established criteria. For example, a qualified instructor/evaluator may be an individual who has been trained to fill the emergency response position to be observed or may be a supervisor or instructor for the position.

Exercises may be critiqued by Federal and Commonwealth of Virginia observers/evaluators.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## 5. Drill and Exercise Critiques

Dominion conducts a critique following conduct of the exercise. Participants may include selected Dominion, NRC, Commonwealth of Virginia, risk jurisdiction, and other participants and observers/evaluators. Input from the critique participants, is evaluated to determine the need for changes to the plan, procedures, equipment, facilities, and other components of the emergency preparedness and response program.

Dominion tracks identified corrective actions to completion using the facility's corrective action program.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## O. Radiological Emergency Response Training

### 1. General

Dominion implements a training program that provides for initial training and retraining for individuals who have been assigned emergency response duties, including both onsite staff and offsite individuals who may be called on to provide assistance in the event of an emergency.

The description of the emergency preparedness training program in [SSAR Section 13.3.2.2.2.o](#) is incorporated by reference.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

#### a. Offsite Emergency Response Training

Dominion provides for the conduct of site-specific training for offsite personnel who may be called upon to provide assistance in the event of an emergency. This includes emergency responders employed by agencies identified in [Section II.A](#).

Dominion offers training for affected hospital, ambulance/rescue, police, and firefighting personnel that includes their expected emergency response roles, notification procedures, and radiation protection precautions. For these and any other offsite emergency responders who may be required to enter the site under emergency conditions, Dominion offers training that addresses site access procedures and identifies (by position) the individual who will control their activities on site.

Training for offsite support personnel includes the following, to the extent appropriate to the assigned duties and responsibilities:

- The basic scope of the emergency plan
- Emergency classifications
- Notification methods
- Basic radiation protection
- Station access procedures
- The individual, by title, in the station emergency response organization who will direct their activities onsite
- Definition of support roles

[Appendix 8](#) provides a cross-reference to these provisions in State and Local Plans, as applicable.

b. Mutual Aid Agreements

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.

## **2. Onsite Emergency Response Training**

The emergency response training program includes on-site Dominion personnel who may be called upon to respond to an emergency. The training program includes, to the extent appropriate, practical drills consistent with [Section II.N](#), during which individuals demonstrate the ability to discharge the assigned emergency response function. The instructor/evaluator corrects any erroneous performance noted during these practical drills and, as appropriate, demonstrates proper performance consistent with approved procedures and accepted standards.

## **3. First Aid Team Training**

Dominion provides first aid training equivalent to Red Cross Multi-Media Training (e.g., Red Cross First Aid/Cardiopulmonary Resuscitation (CPR), Automated External Defibrillation (AED) for the Workplace), consistent with the projected hazards and events, for those individuals assigned to render treatment during a medical emergency.

## **4. Emergency Response Training and Qualification**

Dominion conducts a program for instructing and qualifying personnel who implement this plan. Individuals complete the required training prior to assignment to a position in the emergency response organization. The training program establishes the scope, nature, and frequency of the required training and qualification measures.

Emergency response personnel are trained in the following subjects, to the extent appropriate to their duties and responsibilities: emergency response organization; emergency classification system; personnel accountability; emergency exposure limits; ERFs; security access control and site evacuation process; and exposure control techniques.

Dominion implements a program to provide position-specific emergency response training for designated members of the emergency response organization. The content of the training program is appropriate for the duties and responsibilities of the assigned position. The affected positions, and the scope of the associated training programs, include:

- a. Emergency response directors and coordinators – Emergency condition assessment and classification, notification systems and procedures, organizational interfaces, site evacuation, radiation exposure controls, offsite support, and recovery.
- b. Accident assessment personnel - Emergency condition assessment and classification, notification systems and procedures, organizational interfaces.
- c. Radiological monitoring and analysis personnel – Dose assessment, emergency exposure evaluation, protective measures, protective actions, contamination control and decontamination, monitoring systems and procedures.
- d. Police, Security and firefighting personnel - Notification of station personnel, facility activation, personnel accountability and evacuation, and access control. (Note: Offsite police and firefighting personnel will receive training consistent with [Section II.O.1.a.](#))
- e. Damage control/repair/corrective action teams - Damage control organization, communication systems, and planning and coordination of damage control tasks.
- f. First aid/rescue personnel - Emergency organizational interfaces, firefighting, search and rescue procedures, and communications systems.
- g. Local support services/emergency service personnel – Training consistent with [Section II.O.1.a.](#)
- h. Medical support personnel - Training consistent with [Section II.O.1.a.](#)
- i. Corporate office support personnel - Applicable procedures and organizational interfaces.

- j. Emergency communicators - Notifications and reports to offsite authorities and communication systems as appropriate for individual position assignments.

Dominion offers to provide training for local support services personnel, including emergency service, police, and firefighting personnel, consistent with [Section II.O.1.a](#).

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **5. Retraining**

Dominion conducts, or supports the conduct of, annual retraining for those categories of emergency response personnel listed in [Section II.O](#). Failure of Dominion ERO members to successfully complete this training in a timely manner as specified in plant training program requirements results in the individual's removal from the ERO pending completion of the required training.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

## **P. Responsibility for the Planning Effort**

Dominion implements an organizational structure and processes to periodically review, update, distribute, and control this plan consistent with facility quality assurance and document control requirements. Dominion also implements a program to provide training to personnel responsible for the emergency planning effort appropriate to their duties and responsibilities.

The descriptions of plans for maintaining emergency preparedness in [SSAR Section 13.3.2.2.p](#) are incorporated by reference.

### **1. Training**

Dominion develops and implements a process to provide training to the Manager Emergency Preparedness and support staff. Training may include formal education, professional seminars, plant-specific training, industry meetings, and other activities and forums that provide for an exchange of pertinent information.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### **2. Responsibility for Radiological Emergency Response Planning**

The *Site Vice President* holds the overall authority and responsibility for ensuring that an adequate level of emergency preparedness is maintained.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### **3. Manager Emergency Preparedness**

Dominion establishes a Manager Emergency Preparedness position. The incumbent is responsible for developing and updating site emergency plans and coordination of these plans with other response organizations.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### **4. Plan Reviews and Updates**

The Manager Emergency Preparedness is responsible for conducting or coordinating an annual review of this plan to verify the plan and its supporting agreements are current. This review includes consideration of any changes that may be necessary to address issues identified during the course of drills, exercises, and actual emergency events. The Manager Emergency Preparedness also reviews and updates the plan and agreements as needed (e.g., following changes to Commonwealth of Virginia and risk jurisdiction plans that may affect the content of the facility's plan) to verify they remain current.

Upon completion of the annual review, the Manager Emergency Preparedness (or designee) incorporates any necessary changes. Changed pages are marked and dated to highlight the changes. The Manager Emergency Preparedness forwards the updated plan to the Facility Safety Review Committee (FSRC) for review and approval. If a proposed revision is judged to decrease the effectiveness of these documents with respect to the requirements of 10 CFR 50.47(b) or 10 CFR Part 50, Appendix E, the proposed changes are submitted to the NRC for approval in accordance with the requirements of 10 CFR 50.54(q) prior to implementation.

Following completion of the annual review and any required updates, the Manager Emergency Preparedness certifies the plan to be current.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### **5. Distribution of Revised Plans**

The facility's document control organization distributes the updated plan to organizations/individuals with responsibility for implementing the plans.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### **6. Supporting Plans**

The following list identifies supporting plans and their sources.

- Commonwealth of Virginia Plan (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
- 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 EPIPs 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 EPIPs. 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
- Dominion's independent assessment organization subjects review findings to management controls consistent with the facility's corrective action program.
- Dominion's independent assessment organization documents review results and improvement recommendations and reports these results to Dominion management. Dominion makes those portions of the reviews that address the adequacy of interfaces with Commonwealth of Virginia and risk jurisdiction governments available to the affected governments.
- Dominion retains review records for a period of at least five years in accordance with facility document control requirements.

## **10. Emergency Telephone Numbers**

The Manager Emergency Preparedness is responsible for ensuring a review of the emergency personnel notification list is performed on a quarterly basis and for ensuring required revisions are incorporated. Documentation of this review shall be filed by the facility's records management organization.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

### **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. North Anna Power Station, Final Safety Analysis Report.
10. U.S. Department of Energy, "Federal Radiological Monitoring and Assessment Center Operations Plan," DOE/NV 11718-080, December 2005.
11. U.S. Department of Homeland Security, "National Response ,".
12. [Deleted]
13. U.S. Nuclear Regulatory Commission, "Emergency Planning and Preparedness for Nuclear Power Reactors," Regulatory Guide 1.101, Revision 3, August 1992.

14. U.S. Environmental Protection Agency, "Manual of Protective Action Guides for Nuclear Incidents," EPA-400-R-92-001, 1991.
15. KLD Associates, Inc., "Development of Evacuation Time Estimates for North Anna Power Station," Revision 1, September 2008.
16. U.S. Nuclear Regulatory Commission, "Development of Evacuation Time Estimate Studies for Nuclear Power Plants," NUREG/CR-6863, January 2005.
17. U.S. Nuclear Regulatory Commission, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants - Criteria for Protective Action Recommendations for Severe Accidents," NUREG-0654/FEMA-REP-1, Supplement 3, July 1996.
18. North Anna Early Site Permit Application, Revision 9, September 2006.

## **B. Supplemental References**

1. USNRC IN 91-77- Shift Staffing at Nuclear Power Plants
2. USNRC IN 93-81 – Implementation of Engineering Expertise On Shift
3. USNRC IN 95-48 – Results of Shift Staffing Study
4. USNRC IN 86-16 – NRC On-Scene Response During a Major Emergency
5. USNRC RIS 2002-21 – National Guard and Other Emergency Responders Located in the Licensee's Controlled Area
6. NEI 99-01 – Methodology for Development of Emergency Action Levels
7. USNRC RIS 2003-18 - Use of NEI 99-01, Methodology for Development of Emergency Action Levels (including Supplements 1 and 2)
8. USNRC IN 97-05 – Offsite Notification Capabilities
9. USNRC RIS 00-011 – NRC Emergency Telecommunications System, including Supplement 1
10. USNRC IN 87-58 – Continuous Communications Following Emergency Notifications
11. USNRC IN 93-53 – Effect of Hurricane Andrew on Turkey Point Nuclear Generating Station and Lessons Learned
12. USNRC IN 97-05 – Offsite Notification Capabilities

13. USNRC IEB 79-18 – Audibility Problems Encountered on Evacuation of Personnel from High-Noise Areas
14. USNRC RIS 2002-16 – Current Incident Response Issues
15. FEMA-REP-11 – Guide to Preparing Emergency Public Information Materials
16. USNRC IEC 80-09 – Problems with Plant Internal Communications Systems
17. USNRC IN 85-44 – Emergency Communications System Monthly Test
18. USNRC IN 86-16 – NRC On-Scene Response During a Major Emergency
19. USNRC IN 2004-19 – Problems Associated with Back-Up Power Supplies to Emergency Response Facilities and Equipment
20. USNRC IN 2002-14 – Ensuring a Capability to Evacuate Individuals, Including Members of the Public, from the Owner-Controlled Area
21. USNRC IN 88-15 – Availability of USFDA-Approved Potassium Iodide for Use in Emergencies Involving Radioactive Iodine
22. USNRC IN 96-19 – Failure of Tone alert Radios to Activate When Receiving a Shortened Activation Signal
23. USNRC IN 2002-25 – Challenges to Licensees' Ability to Provide Prompt Public Notification and Information During an Emergency Preparedness Event
24. USNRC IN 2005-06 – Failure to Maintain Alert and Notification System Tone Alert Radio Capability
25. USNRC RIS 01-016 – Update of Evacuation Time Estimates
26. USNRC RIS 2003-12 – Clarification of NRC Guidance for Modifying Protective Actions
27. USNRC RIS 2004-13 - Consideration of Sheltering in Licensee's Range of Protective Action Recommendations, including Supplement 1
28. USNRC RIS 2005-08 – Endorsement of NEI Guidance “Range of Protective Actions for Nuclear Power Plant Incidents”
29. FEMA-REP-10 – Guide for the Evaluation of Alert and Notification systems for Nuclear Power Plants

30. USNRC IN 98-020 – Problems with Emergency Preparedness Respiratory Protection Programs
31. USNRC IN 86-98 – Offsite Medical Services
32. 44 CFR 350, Review And Approval of State and Local Radiological Emergency Plans and Preparedness
33. USNRC IN 85-41 – Scheduling of Pre-Licensing Emergency Preparedness Exercises
34. USNRC IN 87-54 – Emergency Response Exercises
35. USNRC Bulletin 2005-02 – Emergency Preparedness and Response Actions for Security-Based Events
36. USNRC RIS 2005-02 – Clarifying the Process for Making Emergency Plan Changes, February 2005
37. USNRC RIS 2006-02 – Good Practices for Licensee Performance During the Emergency Preparedness Component of Force-on-force Exercises
38. USNRC RIS 2006-03 – Guidance on Requesting an Exemption from Biennial Emergency Preparedness Exercise Requirements
39. USNRC Generic Letter 80-34 – Clarification of NRC Requirements for Emergency Response Facilities at Each Site
40. USNRC Generic Letter 80-93 – Emergency Preparedness
41. USNRC Generic Letter 81-10 – Post-TMI Requirements for the Emergency Operations Facility
42. USNRC Generic Letter 89-15 – Emergency Response Data System
43. USNRC Generic Letter 91-14 – Emergency Telecommunications
44. USNRC IE Bulletin 80-15 – Possible Loss of Emergency Notification System (ENS) With Loss of Offsite Power

## C. Appendices

Appendix 1 - Emergency Action Levels

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 Letter

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

## **Appendix 1—Emergency Action Levels**

## **EMERGENCY CLASSIFICATION AND ACTION LEVEL SCHEME**

### **NORTH ANNA POWER STATION UNIT 3 COMBINED LICENSE APPLICATION**

#### **FOREWORD**

This Emergency Classification and Action Level Scheme for the North Anna Power Station (NAPS) Unit 3 document is based on NEI 99-01, *Methodology for Development of Emergency Action Levels*, Revision 5. Initiating Conditions and Emergency Action Levels associated with the digital control system are based on NEI 07-01, *Methodology for Development of Emergency Action Levels for Advanced Passive Light Water Reactors*, Revision 0 (July 2009).

Some detailed design information, such as setpoints and instrument numbers, are not yet available for the Mitsubishi US-APWR. In many cases this data is necessary to determine emergency action level thresholds. Appropriately, this Appendix provides the methodology to be employed to incorporate this information when it is available.

## **EXECUTIVE SUMMARY**

Dominion must respond to a formal set of threshold conditions that require NAPS Unit 3 personnel to take specific actions with regard to notifying state and local governments and the public when certain off-normal indicators or events are recognized. Four emergency classes are identified in 10 CFR 50. Levels of response and the conditions leading to those responses are defined in joint NRC/FEMA guidelines contained in Appendix 1 of NUREG-0654/ FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," October 1980. The nuclear industry developed NEI 99-01, "Methodology for Development of Emergency Action Levels," Revision 5, which is endorsed as an alternative approach to Appendix 1 of NUREG-0654. NEI 99-01, Revision 5 was used to develop North Anna Power Station Unit 3 Emergency Action Levels.

NAPS Unit 3 is a Mitsubishi US-APWR. The US-APWR is a pressurized water reactor (PWR). The core is surrounded by a steel neutron reflector which increases reactivity and reduces required U-235 enrichment. In addition, the US-APWR uses more advanced SGs (compared to the current generation PWRs) which create drier steam allowing for the use of higher efficiency turbines. Safety systems have enhanced redundancy, utilizing 4 trains each capable of supplying 50% of the needed makeup water instead of 2 trains capable of 100%. Also, more reliance is placed on the accumulators which have been redesigned and increased in size. The improvements in this passive system have led to the elimination of the LHSI System, an active system. Advancements in digital technology have been incorporated into the instrument and control system for the US-APWR.

Because the US-APWR is of conventional design, the guidance in NEI 99-01 applies with the exception of the digital instrument and control systems. NEI 07-01, "Methodology for Development of Emergency Action Levels for Passive Light Water Reactors," includes information relevant to digital instrument and control systems and was useful in developing Initiating Conditions and Emergency Action Levels for North Anna Power Station Unit 3. Accordingly, the emergency classification and action level scheme was developed by modifying the generic guidance in NEI 99-01 to make it applicable to the US-APWR and adapting the guidance in NEI 07-01 for the digital control system to the US-APWR design.

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
None		CU7	<p>Initiating Condition – NOTIFICATION OF UNUSUAL EVENT</p> <p>UNPLANNED Partial Loss of Indicating and Monitoring and Control Functions for <math>\geq 15</math> Minutes.</p> <p><i>Operating Mode Applicability: Cold Shutdown, Refueling</i></p> <p>Example Emergency Action Level Threshold:</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>2. UNPLANNED partial Loss of [Site specific] Indicating, Monitoring, and Control Functions for 15 minutes or longer.</p>	<p>Initiating Condition – NOTIFICATION OF UNUSUAL EVENT</p> <p>UNPLANNED Partial Loss of Indicating and Monitoring and Control Functions for <math>\geq 15</math> Minutes.</p> <p><i>Operating MODE Applicability: Cold Shutdown, Refueling</i></p> <p>Emergency Action Level Threshold:</p> <ol style="list-style-type: none"> <li>1. UNPLANNED partial Loss of Protection and Safety Monitoring System (PSMS) and Plant Control and Monitoring System (PCMS) Indicating, Monitoring and Control Functions for 15 minutes or longer.</li> </ol>	<p><b>Deviation:</b> There is no analogous Cold Shutdown or Refueling IC in NEI 99-01. NEI 99-01 considers an analog control system and annunciators for the current fleet of reactors. The US-APWR incorporates an advanced digital instrumentation and control system. Guidance provided in NEI 07-01, Rev. 0, was used to develop the loss of digital I&amp;C for the US-APWR. The digital I&amp;C systems used in the US-APWR are comparable to the Westinghouse AP1000 systems specifically addressed in NEI 07-01.</p> <p><b>Difference:</b> The Emergency Director note was not included. This is procedural information and incorporated in training.</p>	

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
None		CA7	<p>Initiating Condition – ALERT Inability to Monitor and Control the Plant for <math>\geq 15</math> Minutes.</p> <p><i>Operating Mode Applicability: Cold Shutdown, Refueling</i></p> <p>Example Emergency Action Level Threshold:</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>2. UNPLANNED Loss of [Site specific] Digital Monitoring and Control Functions for 15 minutes or longer.</p>	CA9	<p>Initiating Condition – ALERT Inability to Monitor and Control the Plant for <math>\geq 15</math> Minutes.</p> <p><i>Operating MODE Applicability: Cold Shutdown, Refueling</i></p> <p>Emergency Action Level Threshold: 2. UNPLANNED Loss of all PSMS, PCMS, and DAS digital monitoring and control function for 15 minutes or longer.</p>	<p><b>Deviation:</b> There is no analogous Cold Shutdown or Refueling IC in NEI 99-01. NEI 99-01 considers an analog control system and annunciators for the current fleet of reactors. The US-APWR incorporates an advanced digital instrumentation and control system. Guidance provided in NEI 07-01, Rev. 0, was used to develop the loss of digital I&amp;C for the US-APWR. The digital I&amp;C systems used in the US-APWR are comparable to the Westinghouse AP1000 systems specifically addressed in NEI 07-01.</p> <p><b>Difference:</b> The Emergency Director note was not included. This is procedural information and incorporated in training.</p>

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
SU3	<p>Initiating Condition – NOTIFICATION OF UNUSUAL EVENT</p> <p>UNPLANNED loss of safety system annunciation or indication in the control room for 15 minutes or longer.</p> <p>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Level:</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</i></p> <p>2. UNPLANNED loss of greater than approximately 75% of the following for 15 minutes or longer:</p> <ul style="list-style-type: none"> <li>a. (Site-specific control room safety system annunciation)</li> <li>OR</li> <li>b. (Site-specific control room safety system indication)</li> </ul>	None		None		<p><b>Deviation:</b> There is no analogous IC for a digital control system. Hence, loss of monitoring and control immediately escalates to ALERT via SA7. NEI 99-01 considers an analog control system and annunciators for the current fleet of reactors. The US-APWR incorporates an advanced digital instrumentation and control system. Guidance provided in NEI 07-01, Rev. 0, was used to develop the loss of digital I&amp;C for the US-APWR. The digital I&amp;C systems used in the US-APWR are comparable to the Westinghouse AP1000 systems specifically addressed in NEI 07-01.</p>

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
SA4	<p>Initiating Condition – ALERT</p> <p>UNPLANNED loss of safety system annunciation or indication in the control room with EITHER (1) a SIGNIFICANT TRANSIENT in progress, or (2) compensatory indicators unavailable.</p> <p>Operating MODE Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. a. UNPLANNED loss of greater than approximately 75% of the following for 15 minutes or longer:</p> <ul style="list-style-type: none"> <li>• (Site specific control room safety system annunciation)</li> <li>OR</li> <li>• (Site specific control room safety system indication)</li> </ul> <p>b. EITHER of the following:</p> <ul style="list-style-type: none"> <li>• A SIGNIFICANT TRANSIENT is in progress.</li> <li>• Compensatory indications are unavailable</li> </ul>	SA7	<p>Initiating Condition – ALERT</p> <p>UNPLANNED Partial Loss of Indicating, Monitoring and Control Functions for ≥ 15 Minutes.</p> <p><i>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p> <p>Example Emergency Action Level Threshold:</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. UNPLANNED Partial Loss of [Site specific] Indicating, Monitoring and Control Functions for 15 minutes or longer.</p>	SA7	<p>Initiating Condition – ALERT</p> <p>UNPLANNED Partial Loss of Indicating, Monitoring and Control Functions for ≥ 15 Minutes.</p> <p><i>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p> <p>Emergency Action Level Threshold:</p> <p>1. UNPLANNED Loss of All Protection and Safety Monitoring System (PSMS) and Plant Control and Monitoring System (PCMS) Indicating and Monitoring Functions for 15 minutes or longer.</p>	<p><b>Deviation:</b> NEI 99-01 considers an analog control system and annunciators for the current fleet of reactors. The US-APWR incorporates an advanced digital instrumentation and control system. Guidance provided in NEI 07-01, Rev. 0, was used to develop the loss of digital I&amp;C for the US-APWR. The digital I&amp;C systems used in the US-APWR are comparable to the Westinghouse AP1000 systems specifically addressed in NEI 07-01.</p> <p><b>Difference:</b> The Emergency Director note was not included. This is procedural information and incorporated in training.</p>

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
SS6	<p>Initiating Condition – SITE AREA EMERGENCY</p> <p>Inability to monitor a SIGNIFICANT TRANSIENT in progress.</p> <p>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time.</i></p> <p>1. a. Loss of greater than approximately 75% of the following for 15 minutes or longer:</p> <ul style="list-style-type: none"> <li>• (Site specific control room safety system annunciation)</li> <li>OR</li> <li>• (Site specific control room safety system indication)</li> </ul> <p>AND</p> <p>a. A SIGNIFICANT TRANSIENT is in progress.</p> <p>AND</p> <p>b. Compensatory indications are unavailable.</p>	SS7	<p>Initiating Condition – SITE AREA EMERGENCY</p> <p>Inability to Monitor and Control the Plant for <math>\geq 15</math> minutes.</p> <p><i>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p> <p>1. UNPLANNED Loss of [Site specific] Digital Monitoring and Control Functions for 15 minutes or longer.</p>	SS7	<p>Initiating Condition – SITE AREA EMERGENCY</p> <p>Inability to Monitor and Control the Plant for <math>\geq 15</math> minutes.</p> <p><i>Operating MODE Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</i></p> <p>Emergency Action Level Threshold:</p> <p>1. UNPLANNED Loss of all PSMS, PCMS, and DAS Digital Monitoring and Control Functions for 15 minutes or longer.</p>	<p><b>Deviation:</b> NEI 99-01 considers an analog control system and annunciators for the current fleet of reactors. The US-APWR incorporates an advanced digital instrumentation and control system. Guidance provided in NEI 07-01, Rev. 0, was used to develop the loss of digital I&amp;C for the US-APWR. The digital I&amp;C systems used in the US-APWR are comparable to the Westinghouse AP1000 systems specifically addressed in NEI 07-01.</p> <p><b>Difference:</b> The Emergency Director note was not included. This is procedural information and incorporated in training.</p>

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
CU2	<p>Initiating Condition – NOTIFICATION OF UNUSUAL EVENT</p> <p>UNPLANNED loss of RCS/RPV Inventory</p> <p>Operating Mode Applicability: Refueling</p> <p>Example Emergency Actions Levels (1 or 2)</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time.</i></p> <p>1. UNPLANNED RCS/RPV level drop as indicated by either of the following:</p> <ul style="list-style-type: none"> <li>• RCS/RPV water level drop below the RPV flange for 15 minutes or longer when the RCS/RPV level band is established above the RPV flange.</li> <li>• RCS/RPV water level drop below the RCS level band for 15 minutes or longer when the RCS/RPV level band is established below the RPV flange.</li> </ul> <p>2. RCS/RPV level cannot be monitored with a loss RCS/RPV inventory as indicated by an unexplained level rise in (site specific sump or tank).</p>	CU2	Not applicable to US-APWR	CU2	<p>Initiating Condition – NOTIFICATION OF UNUSUAL EVENT</p> <p>UNPLANNED loss of RCS/RPV Inventory</p> <p><i>Operating MODE Applicability: Refueling</i></p> <p>Emergency Action Level Thresholds: (1 or 2)</p> <ol style="list-style-type: none"> <li>1. UNPLANNED RCS/RV level drop indicated by RCS/RV water level drop below the RV flange {site-specific Threshold Value on RCS Level wide range (L-402)} for 15 minutes or longer.</li> <li>2. RCS/RV level cannot be monitored with a loss of RCS/RV inventory as indicated by an unexplained level rise in ANY one of the following: <ul style="list-style-type: none"> <li>• Refueling Water Storage Pit Level on L-1400, L-1401, L-1402, L-1403</li> <li>• Containment Vessel Reactor Coolant Drain Tank (CVDT) Level on L-1000</li> <li>• Pressurizer Relief Tank Level on L-560</li> <li>• CCW Surge Tank (Train A &amp; B) Level on L-1200 and L-1201 for Train A, L-1210 and L-1211 for Train B</li> <li>• Containment Sump Level on L-1083</li> </ul> </li> </ol>	<p><b>Deviation:</b> EAL Threshold #1 deviates from NEI 99-01 because an EAL Threshold is not provided for an established RCS/RV level band as being above or below the RV flange prior to the “UNPLANNED RCS/RV level drop.” As stated in the NEI 99-01 basis, “Refueling evolutions that decrease RCS water level below the RPV flange are carefully planned and procedurally controlled.” If already below the flange due to a planned evolution, an unplanned RCS drop will simply expedite the transition to an Alert. The EAL Threshold provided accommodates an unplanned RCS/RV level drop below the RV flange.</p> <p><b>Difference:</b> The Emergency Director note was not included. This is procedural information and incorporated in training.</p> <p><b>Note:</b> Unit 3 preliminary EAL is consistent with NEI 99-01 EAL Threshold #2. Preliminary EAL Threshold #1 provides a placeholder for specific design information that was not available at the time the preliminary EAL Threshold was developed.</p>

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
HA1	<p>Initiating Condition – ALERT Natural or destructive phenomena affecting VITAL AREAS. Operating Mode Applicability: All Example Emergency Action Levels: (1 or 2 or 3 or 4 or 5)</p> <p>4. Turbine failure-generated PROJECTILES resulting in VISIBLE DAMAGE to or penetration of <b>ANY</b> of the following structures containing safety systems or components <b>OR</b> control room indication of degraded performance of those safety systems: (site specific structure list)</p>	HA1	Not applicable to US-APWR		EAL Threshold # 4 not included.	<p><b>Deviation:</b> The turbine-generator of the US-APWR is configured in such a way that damage to components indicated in this EAL is not possible.</p> <p><b>Note:</b> Unit 3 preliminary EALs are consistent with NEI 99-01 EAL Thresholds #1, 2, 3, 5 and 6.</p>
	<p>Abnormal Rad Levels/Radiological Effluent EALs Note: NEI 99-01, Rev. 5, designates all initiating conditions as AU, AA, AS, or AG.</p>				<p>Abnormal Rad Levels/Radiological Effluent EALs Note: All North Anna Unit 3 initiating conditions are designated as RU, RA, RS, or RG.</p>	<p><b>Difference:</b> Designations for Abnormal Rad Levels/Radiological Effluent EALs are preceded with an R instead of an A for consistency with the nomenclature used for North Anna Units 1 and 2.</p>

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
AU1	<p>Initiating Condition – NOTIFICATION OF UNUSUAL EVENT</p> <p>Any release of gaseous or liquid radioactivity to the environment greater than 2 times the Radiological Effluent Technical Specifications/ODCM for 60 minutes or longer.</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2 or 3 or 4 or 5)</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</i></p> <p>4. VALID reading on perimeter radiation monitoring system reading greater than 0.10 mR/hr above normal* background for 60 minutes or longer. [for sites having telemetered perimeter monitors]</p> <p>5. VALID indication on automatic real-time dose assessment capability indicating greater than (site specific value) for 60 minutes or longer. [for sites having such capability]</p> <p>*Normal can be considered as the highest reading in the past twenty-four hours excluding the current peak value.</p>	AU1	Not applicable to US-APWR	RU1	EAL Thresholds #4 and 5 not included.	<p><b>Difference:</b> The Emergency Director note was not included. This is procedural information and incorporated in training.</p> <p><b>Difference:</b> Neither perimeter monitoring AU1 EAL Threshold #4 nor automatic real time dose assessment (AU1 EAL Threshold #5) is installed in Unit 3.</p> <p><b>Note:</b> Unit 3 preliminary EALs are consistent with NEI 99-01 EAL Thresholds #1, 2, and 3.</p>

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
AA1	<p>Initiating Condition – ALERT</p> <p>Any release of gaseous or liquid radioactivity to the environment greater than 200 times the Radiological Effluent Technical Specifications/ODCM for 15 minutes or longer.</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2 or 3 or 4 or 5)</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown.</i></p> <p>4. VALID reading on perimeter radiation monitoring system reading greater than 10.0 mR/hr above normal* background for 15 minutes or longer. [for sites having telemetered perimeter monitors]</p> <p>5. VALID indication on automatic real-time dose assessment capability indicating greater than (site specific value) for 15 minutes or longer. [for sites having such capability]</p> <p>*Normal can be considered as the highest reading in the past twenty-four hours excluding the current peak value.</p>	AA1	Not applicable to US-APWR	RA1	EAL Thresholds #4 and 5 not included.	<p><b>Difference:</b> The Emergency Director note was not included. This is procedural information and incorporated in training.</p> <p><b>Difference:</b> Neither perimeter monitoring (AA1 EAL Threshold #4) nor automatic real time dose assessment (AA1 EAL Threshold #5) is installed Unit 3.</p> <p><b>Note:</b> Unit 3 preliminary EALs are consistent with NEI 99-01 EAL Thresholds #1, 2, and 3.</p>

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
AS1	<p>Initiating Condition – SITE AREA EMERGENCY</p> <p>Off-site dose resulting from an actual or IMMINENT release of gaseous radioactivity Greater Than 100 mrem TEDE or 500 mrem Thyroid CDE for the actual or projected duration of the release.</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2 or 3 or 4)</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.</i></p> <p>3. VALID perimeter radiation monitoring system reading greater than 100 mR/hr for 15 minutes or longer. [for sites having telemetered perimeter monitors]</p>	AS1	Not applicable to US-APWR	RS1	EAL Threshold #3 not included.	<p><b>Difference:</b> The Emergency Director note was not included. This is procedural information and incorporated in training.</p> <p><b>Difference:</b> Perimeter monitoring (AS1 EAL Threshold #3) is not installed in Unit 3.</p> <p><b>Note:</b> Unit 3 preliminary EALs are consistent with NEI 99-01 EAL Thresholds #1, 2, and 4.</p>

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
AG1	<p>Initiating Condition – GENERAL EMERGENCY</p> <p>Off-site dose resulting from an actual or IMMINENT release of gaseous radioactivity greater than 1000 mrem TEDE or 5000 mrem Thyroid CDE for the actual or projected duration of the release using actual meteorology</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2 or 3 or 4)</p> <p><i>Note: The Emergency Director should not wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time. If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.</i></p> <p>3. VALID perimeter radiation monitoring system reading greater than 1000 mR/hr for 15 minutes or longer. [for sites having telemetered perimeter monitors]</p>	AG1	Not applicable to US-APWR	RG1	EAL Threshold #3 not included.	<p><b>Difference:</b> The Emergency Director note was not included. This is procedural information and incorporated in training.</p> <p><b>Difference:</b> Perimeter monitoring (AG1 EAL Threshold #3) is not installed in Unit 3.</p> <p><b>Note:</b> Unit 3 preliminary EALs are consistent with NEI 99-01 EAL Thresholds #1, 2, and 4.</p>
HU1	<p>Initiating Condition – NOTIFICATION OF UNUSUAL EVENT</p> <p>Natural or destructive phenomena affecting the PROTECTED AREA.</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2 or 3 or 4 or 5)</p> <p>5. (Site specific occurrences affecting the PROTECTED AREA).</p>	HU1	Not applicable to US-APWR	HU1	EAL Threshold # 5 not included.	<p><b>Difference:</b> No site-specific occurrences affecting the Protected Area were identified.</p> <p><b>Note:</b> Unit 3 preliminary EALs are consistent with NEI 99-01 EAL Thresholds #1, 2, 3, and 4.</p>

## North Anna Unit 3—Preliminary EAL Differences and Deviations from NEI Guidance

NEI 99-01, Rev. 5		NEI 07-01, Rev. 0		North Anna Unit 3 Preliminary EALs		Justification
IC		IC		IC		
SU8	Initiating Condition – NOTIFICATION OF UNUSUAL EVENT Inadvertent criticality. Operating Mode Applicability: Hot Standby, Hot Shutdown Example Emergency Action Level: 1. UNPLANNED sustained positive startup rate observed on nuclear instrumentation.	SU8	Not applicable to US-APWR	SU8	Initiating Condition – NOTIFICATION OF UNUSUAL EVENT Inadvertent criticality. Operating Mode Applicability: Hot Standby, Hot Shutdown Emergency Action Level Threshold: 1. UNPLANNED sustained positive startup rate observed.	<b>Difference:</b> Operators are trained and understand that a positive startup rate can only be observed on nuclear instrumentation. Unit 3 EAL SU8 provides discussion on information and Basis.

Note 1: NEI 07-01, Revision 0, is relevant to the US-APWR to address Initiating Conditions and Emergency Action Levels for digital instrumentation and control. All other Initiating Conditions and Emergency Action Levels are based on NEI 99-01, Revision 5.

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

## 1.0 Introduction

This appendix provides information regarding atmospheric transport and diffusion assessment discussed in Appendix 2 to NUREG-0654, Rev. 1, "Meteorological Criteria for Emergency Preparedness at Operating Nuclear Power Plants."<sup>1</sup> Three topics are identified in Appendix 2 to NUREG-0654:

- Meteorological measurements
- Atmospheric transport and diffusion assessment
- Remote interrogation

Since they are discussed in [FSAR Section 2.3](#), only a brief discussion of meteorological measurements is provided in this Appendix. Similarly, information regarding remote interrogation is included in and is only briefly discussed below. This Appendix describes the conceptual design of the software used for the atmospheric transport and diffusion assessment models used by Dominion for its nuclear power plants, including Unit 3.

## 2.0 Discussion

10 CFR 50.47 requires that the emergency plan provide "adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use."<sup>2</sup> 10 CFR 50, Appendix E, requires emergency facilities and equipment shall include "equipment for determining the magnitude of and for continuously assessing the impact of the release of radioactive materials to the environment."<sup>3</sup>

### 2.1 Meteorological Measurements

Appendix 2 to NUREG-0654, Rev. 1 clarifies that in order to address the requirement in Appendix E, "the nuclear power plant operator shall have meteorological measurements from primary and backup systems."<sup>4</sup> The design of the system for meteorological measurement system is discussed in [FSAR Section 2.3](#). This design addresses the guidance provided in Supplement 1 to NUREG-0737.<sup>5</sup>

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1. U.S. Nuclear Regulatory Commission, NUREG-0654/FEMA REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Washington, DC, November 1980.
  2. 10 CFR 50.47(b)(9)
  3. 10 CFR 50, Appendix E, IV.E.2
  4. NUREG-0654, Rev. 1, Appendix 2, "Meteorological Criteria for Emergency Preparedness at Operating Nuclear Power Plants," Washington, DC, November 1980.
  5. U.S. Nuclear Regulatory Commission, NUREG-0737, Supplement 1, "Clarification of TMI Action Plan Requirements," Washington, DC, January 1983

## 2.2 Atmospheric Transport and Diffusion Assessment

Atmospheric transport and diffusion assessment requirements are discussed in Appendix E to 10 CFR 50 which states, “the means to be used for determining the magnitude of and for continually assessing the impact of the release of radioactive material shall be described.”<sup>1</sup> Two classes of atmospheric transport and diffusion models are discussed in NUREG-0654. This Appendix discusses the software used for Unit 3, which addresses guidance associated with the “Class B” model described in Appendix 2 of NUREG-0654, Rev. 1: “a numerical model which predicts the spatial and temporal variations of plume distribution and provides estimates of deposition and relative concentration of radioactivity within the plume exposure and ingestion pathway emergency planning zones for the duration of any radioactive materials releases during a declared emergency.”<sup>2</sup>

## 2.3 Remote Interrogation

Guidance concerning remote interrogation is also discussed in Appendix 2 of NUREG-0654, Rev. 1. The guidance supports the requirement in 10 CFR 50, Appendix E for “provisions for communications among the nuclear power reactor control room, the onsite technical support center and the near-site emergency operations facility; and among the nuclear facility, the principal State and local emergency operations centers, and field assessment teams.”<sup>3</sup> Provisions related to remote interrogation and communications are discussed in .

## 3.0 Design : Atmospheric Transport and Diffusion Assessment

The remainder of this Appendix focuses on the conceptual design for the atmospheric transport and diffusion assessment models used by Dominion. Inspections, tests, analyses, and acceptance criteria (ITAAC) address requirements in 10 CFR 50.47(b)(9), discussed previously in this Appendix, and address evaluation criteria from NUREG-0654, Rev. 1 that are discussed in [Section II.I](#) of this plan. The conceptual design addresses the following program elements for accident assessment:

- The means exist to provide initial and continuing radiological assessment throughout the course of an accident. This addresses both ITAAC 6.1 and the requirements of [Section 13.3.2.2.2.i](#).
- The means exist to determine the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors. This addresses both ITAAC 6.2 and the requirements of [Section 13.3.2.2.2.h.3](#).

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1. 10 CFR 50, Appendix E, IV.B
  2. NUREG-0654, Rev. 1, Appendix 2, “Meteorological Criteria for Emergency Preparedness at Operating Nuclear Power Plants,” Washington, DC, November 1980.
  3. 10 CFR 50, Appendix E, IV.E.9.c

- The means exist to continuously assess the impact of the release of radioactive materials to the environment, accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions. This addresses both ITAAC 6.1 and the requirements of [Section 2.3.3.1.1](#).
- The means exist to make rapid assessment of potential magnitude and locations of any radiological hazards through gaseous release pathways. This addresses both ITAAC 6.5 and the requirements of [Section 13.3.2.2.2.i.1](#).
- The means exist to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with the EPA protective action guides (PAGs). This addresses both ITAAC 6.7 and the requirements of [Section 13.3.2.2.2.k.3](#).

### **3.1 Overview, Introduction, and Functions**

The software system is designed for use by Dominion's nuclear power plant units to address their emergency preparedness and accident analyses needs. This software is referred to as MIDAS (Meteorological Information and Dose Assessment System) or MIDAS-NU (MIDAS-Nuclear). [Section 3.2](#) discusses the accident and routine release calculations. [Section 3.3](#) is divided into general categories such as "data acquisition," "data summary display," and "utilities."

#### **3.1.1 Summary and Purpose**

The MIDAS system is comprised of a series of software components that function in a multi-tasked Microsoft Windows™ environment. The computer receives data from external devices including meteorological and plant effluent monitors. Data can be received via serial port devices or over a local area network (LAN)/wide area network (WAN) connection. Reports are displayed on the screen and printed out. Also, reports can be sent via LAN/WAN connection to central control units.

Input data are available periodically from measuring devices on a meteorological tower and from effluent monitors that measure concentrations or dose. Calculations are made in the computer that can be used to determine the health impact of the release. The user schedules runs from a Graphic User Interface (GUI).

The released material is tracked in the environment as it is carried by the wind and dispersed. The three most important parameters are wind speed, wind direction, and atmospheric turbulence. The wind speed determines the initial dilution and plume travel speed. The wind direction determines the effluent plume trajectory. The turbulence determines the rate of spread or growth of the plume. These factors, along with assumptions related to the rate of deposit of particulate matter, are used to determine plume concentration and deposition as a function of location and time.

The accumulated doses to a stationary person are computed based on the estimated variation of the effluent concentration and deposition. The plume tracks are plotted on site maps.

The time-integrated doses resulting from a longer exposure or release can be calculated and results plotted or printed in tabular form. For proper display of time-integrated long-term releases, doses from each release are added on the grid and an isopleth (filled contour showing potentially dangerous areas) is plotted.

### **3.1.2 General Software Specifications**

Software is written in ANSI 1977 compatible FORTRAN, Visual Basic 5 (compiled), or C. The modular nature of the software facilitates modifications. Software modifications follow established quality assurance procedures. Each computer is run under the Microsoft Windows™ operating system as a stand-alone unit. Separate files are available for receipt of meteorological and effluent monitor data. Running of the plume model calculations does not interfere with ongoing, real-time data acquisition and storage.

### **3.1.3 User Interface**

The software is written to interact with the user from the GUI. The user is prompted for information needed from a series of input screens. The software checks for invalid entries insofar as practicable. The user is not allowed to confirm an input screen until requirements for input from that screen are satisfied. Entries are made with the mouse including those on the keypad pop-up menu.

## **3.2 Accident Calculations**

The primary functions of the MIDAS system are to collect and process data, perform atmospheric dispersion calculations, prompt the user for minimum input, estimate dose due to radiological exposure, and display results in a color graphics format. MIDAS-NU incorporates a fast-running, time-dependent, variable trajectory, Gaussian plume segment atmospheric dispersion model. The transport portion of model enables the plume direction and location to vary every 15 minutes as the wind speed, direction, and other weather conditions change. Radiation doses/exposures are accumulated in a polar grid, enabling plume direction changes when the meteorological conditions vary. Results are contoured and displayed on a map. Wind fields are computed from onsite meteorological data input to the system.

MIDAS-NU also has a simple model that estimates transport and dispersion of releases in a uniform wind field, with no changes in the meteorological or release parameters. This is used only in the back calculation module.

It is important to note that the models used in MIDAS-NU are estimating tools. MIDAS-NU results are highly dependent on the accuracy of the current local weather conditions and other input data (e.g., terrain, building characteristics, and amount of material released) that are processed within MIDAS-NU. The more accurate the data that is supplied to MIDAS-NU, the more accurate its predictive estimates will be. Due to uncertainties associated with input information and inherent in dispersion models in general, MIDAS-NU predictions should not necessarily be regarded as fact.

### 3.3 Data Acquisition

Meteorological and field sensor data is collected and its quality checked to assure that an adequate database is available for dispersion calculations and support of emergency operations. Hardware and software specific to the data being collected may be needed in order to collect the data and transmit it to the MIDAS system. The collected data are stored within the overall MIDAS system and therefore available for calculations in the future. Fifteen-minute averages of meteorological data are computed from the data collected and written into the appropriate files. Bad or missing data will be flagged by the data codes for each record. There are a number of tasks in MIDAS that can be used to display or edit the data. A task is a discrete processing action within the software that performs an important function. For each function selected a different task list will be shown. The tasks are selected by clicking on the task text and then "Run Task" to execute. These tasks are accessed using the MDVDCOLL icon. When selected the user will be presented with the menu shown below. Every task may not be available on every system.

Calculations assume that the hourly average is representative of the 15 minute period centered on each 15 minute period (00, 15, 30, 45) (e.g., the time on the hour is from 7.5 minutes before the hour to 7.5 minutes after the hour.).

For the hourly averaging, the following technique is used:

- Speeds, delta temperatures, temperatures, and miscellaneous sensors are averaged. Directions are vector averaged.
- Rain is accumulated.
- Field radiation monitor data are reported as rad/hr.
- Cloud cover is in percent.
- Effluent monitor data are averaged.

### 3.4 Data Summary Displays

After the databases have been conditioned, the file contents can be inspected using a series of data summary displays described in the following sections. The resulting function/task menu is displayed.

When the Average display tasks are selected the user will enter parameters to describe the data to be displayed. These parameters will include the amount of data displayed for each parameter (time groups), the sensors to be displayed, the date range (start date and end date), averaging time for the data (data frequency) and the type of data (raw or workspace). Similar data are required for Data Quality.

### **3.4.1 Meteorological Displays**

A task is provided to print the hour or 15 minute meteorological parameter averages received over any specified time period (within the bounds of the file). The “trend plot” tasks can be used to plot meteorological data making it easy to spot problem areas in the data. The data summary routines can be used in conjunction with edits to inspect and correct data. The summaries may show, for example, that a particular edit was not successful or resulted in data that was suspect. Further edits of data would then be in order.

### **3.4.2 Radiological Displays**

Radiation monitors typically send gamma dose rate measurements (in R/hr). Averages would be updated every 15 minutes.

## **3.5 Utilities**

The system incorporates a series of utilities that are separate from standard Microsoft WINDOWS™ utilities. These include the ability to initialize raw data and other types of files as appropriate. They also include capability to save (archive) from or restore to workspace or raw data files. Other utilities necessary for system startup will be provided along with any data that must be loaded.

### **Appendix 3—Public Alert and Notification System**

The Public Alert and Notification System is the same as that used for NAPS Units 1 and 2. COVRERP Appendix 3 provides a description of the Public Alert and Notification System.

#### **Appendix 4—Evacuation Time Estimates (summary)\***

\*Note: Attachment 4 is the executive summary from the full report.

## EXECUTIVE SUMMARY

This report describes the analyses undertaken and the results obtained by a study to develop Evacuation Time Estimates (ETE) for the North Anna Power Station (NAPS) located in Louisa County, Virginia. ETE are part of the required planning basis and provide NAPS and State and local governments with site-specific information needed for Protective Action decision-making.

In the performance of this effort, all available prior documentation published by Federal Government agencies and relevant to Evacuation Time Estimates was reviewed. Most important of these are:

- Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, NUREG 0654/FEMA-REP-1, Rev. 1, November 1980.
- Analysis of Techniques for Estimating Evacuation Times for Emergency Planning Zones, NUREG/CR-1745, November 1980.
- Development of Evacuation Time Estimates for Nuclear Power Plants, NUREG/CR-6863, January 2005.

### Overview of Project Activities

This project began in May, 2007 and extended over a period of 7 months. This report was revised in 2008 in response to RAI from the NRC. These revisions included a refinement of the calculations performed earlier. The major activities performed are briefly described in chronological sequence:

- Attended “kick-off” meetings with Dominion Generation personnel and emergency management personnel representing state and local governments.
- Reviewed prior ETE reports prepared for NAPS.
- Studied Geographical Information Systems (GIS) maps of the area in the vicinity of NAPS, then conducted a detailed field survey of the highway network.
- Obtained GIS shapefiles of address points within the EPZ from Virginia Department of Emergency Management (VDEM) and estimated 2008 population from this data.
- Synthesized this information to create an analysis network representing the highway system topology and capacities within the Emergency Planning Zone (EPZ), plus a “Shadow” area extending 15 miles radially from the plant.
- Designed and sponsored a telephone survey of residents within the EPZ to gather focused data needed for this ETE study that were not contained within the

census database. The survey instrument was reviewed and modified by State and county personnel prior to the survey.

- Data collection forms (provided to the counties at the kickoff meeting) were returned with data pertaining to employment, transients, and special facilities in each county.
- The traffic demand and trip-generation rates of evacuating vehicles were estimated from the gathered data. The trip generation rates reflected the estimated mobilization time (i.e., the time required by evacuees to prepare for the evacuation trip) computed using the results of the telephone survey of EPZ residents.
- Following Federal guidelines, the EPZ is subdivided into 25 Protective Action Zones (PAZ). These PAZ are then grouped within circular areas or “keyhole” configurations (circles plus radial sectors) that define a total of 27 Evacuation Regions.
- The time-varying external circumstances are represented as Evacuation Scenarios, each described in terms of the following factors: (1) Season (Summer, Winter); (2) Day of Week (Midweek, Weekend); (3) Time of Day (Midday, Evening); and (4) Weather (Good, Rain, and Snow). Two special scenarios – construction of a new unit with and without refueling at the operating unit – were considered.
- The Planning Basis for the calculation of ETE is:
  - A rapidly escalating accident at NAPS that quickly assumes the status of General Emergency such that the Advisory to Evacuate is virtually coincident with the siren alert.
  - While an unlikely accident scenario, this planning basis will yield ETE, measured as the elapsed time from the Advisory to Evacuate until the last vehicle exits the impacted Region, that represent “upper bound” estimates. This conservative Planning Basis is applicable for all initiating events.
- If the emergency occurs while schools are in session, the ETE study assumes that the children will be evacuated by bus directly to specified Evacuation Assembly Centers (EAC) located outside the EPZ. Parents, relatives, and neighbors are advised to not pick up their children at school prior to the arrival of the buses dispatched for that purpose. The ETE for school children are calculated separately.
- Evacuees who do not have access to a private vehicle will either ride-share with relatives, friends or neighbors, or be evacuated by buses provided as specified in the county evacuation plans. Those in special facilities will likewise be evacuated with public transit, as needed: bus, van, or ambulance, as required. Separate ETE are calculated for the transit-dependent evacuees and for those

evacuated from special facilities.

- In response to RAI obtained from the NRC, refinements to the IDYNEV input data were introduced and a second set of ETE calculations were undertaken using updated transient population estimates. In addition, two snow scenarios were introduced.

### Computation of ETE

A total of 378 ETE were computed for the evacuation of the general public. Each ETE quantifies the aggregate evacuation time estimated for the population within one of the 27 Evacuation Regions to completely evacuate from that Region, under the circumstances defined for one of the 14 Evacuation Scenarios ( $27 \times 14 = 378$ ). Separate ETE are calculated for transit-dependent evacuees, including school children for applicable scenarios.

Except for Region R03, which is the evacuation of the entire EPZ, only a portion of the people within the EPZ would be advised to evacuate. That is, the Advisory to Evacuate applies only to those people occupying the specified impacted region. It is assumed that 100 percent of the people within the impacted region will evacuate in response to this Advisory. The people occupying the remainder of the EPZ outside the impacted region may be advised to take shelter.

The computation of ETE assumes that a portion of the population within the EPZ but outside the impacted region, will elect to "voluntarily" evacuate. In addition, a portion of the population in the "Shadow" region beyond the EPZ that extends to a distance of 15 miles from NAPS, will also elect to evacuate. These voluntary evacuees could impede those who are evacuating from within the impacted region. The impedance that could be caused by voluntary evacuees is considered in the computation of ETE for the impacted region.

The computational procedure is outlined as follows:

- A link-node representation of the highway network is coded. Each link represents a unidirectional length of highway; each node usually represents an intersection or merge point. The capacity of each link is estimated based on the field survey observations and on established procedures.
- The evacuation trips are generated at locations called "zonal centroids" located within the EPZ. The trip generation rates vary over time reflecting the mobilization process, and from one location (centroid) to another depending on population density and on whether a centroid is within, or outside, the impacted area.
- The computer models compute the routing patterns for evacuating vehicles that

are compliant with federal guidelines (outbound relative to the location of NAPS), then simulate the traffic flow movements over space and time. This simulation process estimates the rate that traffic flow exits the impacted region.

- The ETE statistics provide the elapsed times for 50 percent, 90 percent, 95 percent and 100 percent, respectively, of the population within the impacted region, to evacuate from within the impacted region. These statistics are presented in tabular and graphical formats.
- All ETE presented in this report reflect the work performed in 2008.

### Traffic Management

This study includes the development of a comprehensive traffic management plan designed to expedite the evacuation of people from within an impacted region. This plan, which should be reviewed by State and local law enforcement personnel, is also designed to control access into the EPZ after returning commuters have rejoined their families.

The plan is documented in the form of detailed schematics specifying: (1) the directions of evacuation travel to be facilitated, and other traffic movements to be discouraged; (2) the traffic control personnel and equipment needed (cones, barricades) and their deployment; (3) the locations of these “Traffic Control Points” (TCP); (4) the priority assigned to each traffic control point indicating its relative importance and how soon it should be manned relative to others; and (5) the number of traffic control personnel required.

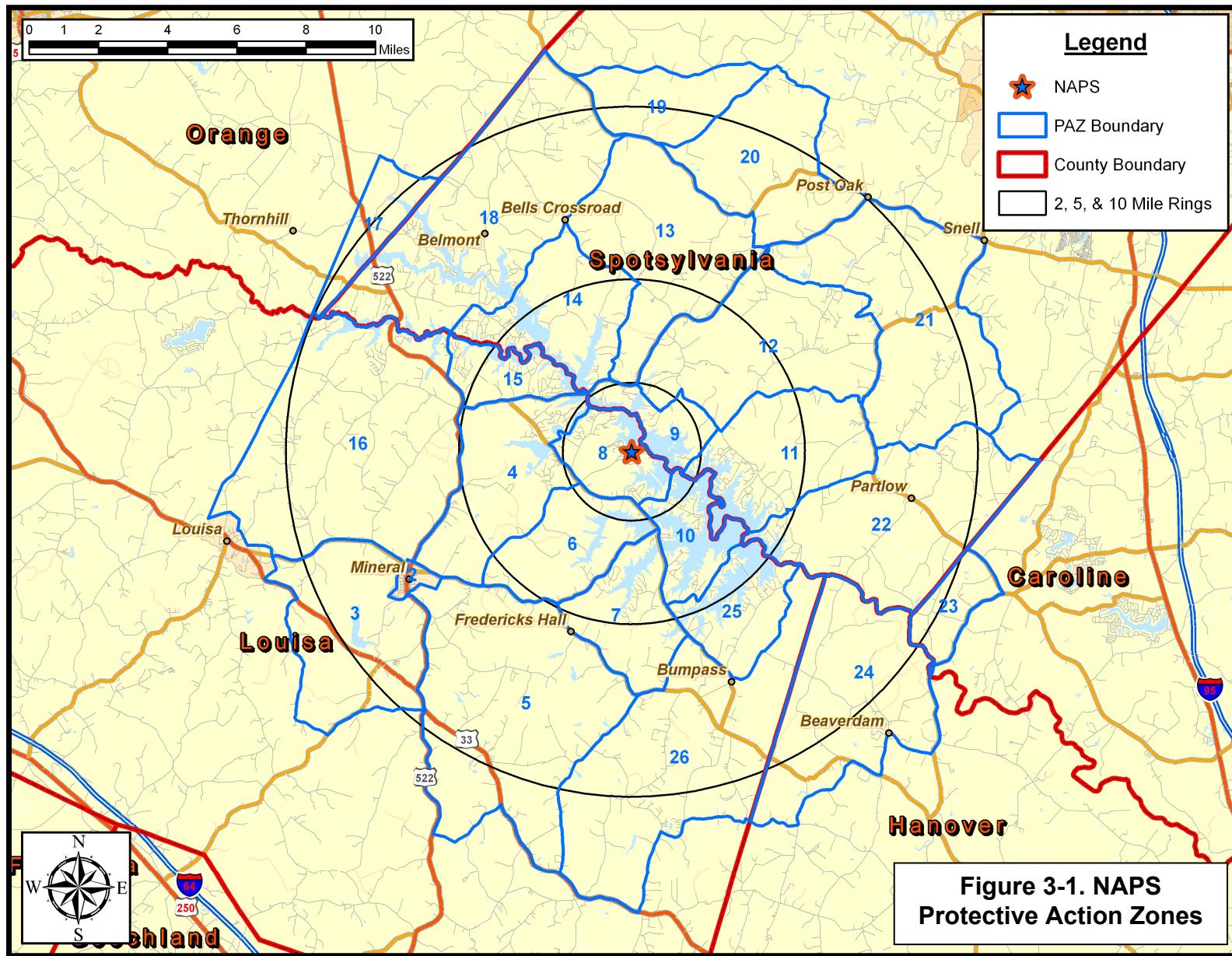
### Selected Results

A compilation of selected information is presented on the following pages in the form of Figures and Tables extracted from the body of the report; these are described below.

- Figure 3-1 displays a map of the NAPS site showing the layout of the 25 PAZ that comprise, in aggregate, the Emergency Planning Zone (EPZ).
- Table 3-1 presents the estimates of permanent resident population and vehicles for 2008 in each PAZ based on the data provided by VDEM and on the results of the telephone survey.
- Table 6-1 defines each of the 27 Evacuation Regions in terms of their respective groups of PAZ.
- Table 6-2 lists the 14 Evacuation Scenarios.
- Tables 7-1C and 7-1D are compilations of Evacuation Time Estimates (ETE).

These data are the times needed to *clear the indicated regions* of 95 and 100 percent of the population occupying these regions, respectively. These computed ETE include consideration of mobilization time, and of estimated voluntary evacuations from other regions within the EPZ and from the shadow region.

- Table 8-3A presents ETE for the schoolchildren in good weather.
- Table 8-5A presents ETE for the transit-dependent population in good weather.



**Table 3-1. Permanent Resident Population and Vehicles by PAZ**

<b>PAZ</b>	<b>2008 POPULATION</b>	<b>2008 VEHICLES</b>
2	645	358
3	1,843	1,025
4	1,842	1,022
5	1,740	968
6	727	404
7	939	522
8	885	490
9	426	236
10	1,151	638
11	1,345	748
12	1,467	814
13	1,312	728
14	1,719	952
15	1,589	879
16	2,153	1,200
17	223	124
18	3,624	2,008
19	352	197
20	1,025	571
21	2,125	1,181
22	1,639	909
23	341	190
24	989	549
25	902	500
26	2,420	1,343
<b>TOTAL:</b>	<b>33,423</b>	<b>18,556</b>

**Table 6-1. Description of Evacuation Regions**

Region	Description	Protective Action Zone (PAZ)																								
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
R01	2 mile ring				X		X	X	X																	
R02	5-mile ring			X		X	X	X	X	X	X	X	X	X	X										X	
R03	Full EPZ	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
<b>Evacuate 2 mile ring and 5 miles downwind</b>																										
Region	Wind Direction Toward:	Protective Action Zone (PAZ)																								
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
R04	N, NNE				X		X	X	X																	
R05	NE				X		X	X	X	X	X	X	X	X												
R06	ENE, E			X		X	X	X	X	X																
R07	ESE, SE			X		X	X	X	X	X																X
R08	SSE, S			X	X	X	X	X	X																	X
R09	SSW			X	X	X	X	X	X																	
R10	SW		X		X	X	X	X	X	X																
R11	WSW		X	X		X	X	X	X	X																
R12	W	X	X	X		X	X	X	X	X																X
R13	WNW, NW		X	X		X	X	X	X	X								X	X							
R14	NNW		X	X	X		X	X	X	X					X	X	X									
<b>Evacuate 5 mile ring and downwind to EPZ boundary</b>																										
Region	Wind Direction Toward:	Protective Action Zone (PAZ)																								
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
R15	N			X		X	X	X	X	X	X	X	X	X	X	X										X
R16	NNE		X		X	X	X	X	X	X	X	X	X	X	X	X										X
R17	NE		X		X	X	X	X	X	X	X	X	X	X	X	X										X
R18	ENE		X		X	X	X	X	X	X	X	X	X	X	X	X										X
R19	E	X		X	X	X	X	X	X	X	X	X	X	X	X	X										X
R20	ESE		X		X	X	X	X	X	X	X	X	X	X	X	X										X
R21	SE		X		X	X	X	X	X	X	X	X	X	X	X	X										X
R22	SSE, S		X	X	X	X	X	X	X	X	X	X	X	X	X	X										X
R23	SSW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										X
R24	SW, WSW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									X
R25	W	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						X
R26	WNW, NW			X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						X
R27	NNW			X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						X

**Table 6-2. Evacuation Scenario Definitions**

<b>Scenario</b>	<b>Season</b>	<b>Day of Week</b>	<b>Time of Day</b>	<b>Weather</b>	<b>Special</b>
1	Summer	Midweek	Midday	Good	None
2	Summer	Midweek	Midday	Rain	None
3	Summer	Weekend	Midday	Good	None
4	Summer	Weekend	Midday	Rain	None
5	Summer	Midweek, Weekend	Evening	Good	None
6	Winter	Midweek	Midday	Good	None
7	Winter	Midweek	Midday	Rain	None
8	Winter	Midweek	Midday	Snow	None
9	Winter	Weekend	Midday	Good	None
10	Winter	Weekend	Midday	Rain	None
11	Winter	Weekend	Midday	Snow	None
12	Winter	Midweek, Weekend	Evening	Good	None
13	Summer	Midweek	Midday	Good	New Plant Construction
14	Summer	Midweek	Midday	Good	New Plant Construction + Refueling

**Table 7-1C. Time To Clear The Indicated Area of 95 Percent of the Affected Population**

	Summer		Summer		Summer Midweek Weekend		Winter			Winter			Winter Midweek Weekend		Summer	Summer	
	Midweek	Weekend	(3)	(4)			Midweek	(6)	(7)	(8)	(9)	(10)	(11)		Midweek	Midweek	
Scenario:	(1)	(2)	(3)	(4)	(5)	Scenario:	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Scenario:	(13)	(14)	
Region Wind Toward:	Midday	Midday	Evening	Good Weather	Region Wind Toward:	Good Weather	Midday	Midday	Evening	Region Wind Toward:	Good Weather	Rain	Snow	Good Weather	Rain	Snow	New Plant Construction + Refueling
<b>Entire 2-Mile Region, 5-Mile Region, and EPZ</b>																	
R01 2-mile ring	3:20	3:20	2:40	2:40	2:50	R01 2-mile ring	3:20	3:20	3:50	2:40	2:40	3:20	2:50	R01 2-mile ring	3:15	3:20	
R02 5-mile ring	3:20	3:20	2:40	2:40	2:50	R02 5-mile ring	3:20	3:20	4:00	2:40	2:40	3:20	2:50	R02 5-mile ring	3:35	3:40	
R03 Entire EPZ	3:30	3:30	3:20	3:30	3:00	R03 Entire EPZ	3:30	3:40	4:10	2:50	3:00	3:40	3:00	R03 Entire EPZ	3:50	3:55	
<b>2-Mile Ring and Downwind to 5 Miles</b>																	
R04 N,NNE	3:10	3:10	2:20	2:20	2:40	R04 N,NNE	3:20	3:20	3:50	2:30	2:30	3:10	2:40	R04 N,NNE	3:10	3:20	
R05 NE	3:20	3:20	2:30	2:30	2:40	R05 NE	3:20	3:20	3:50	2:40	2:40	3:20	2:50	R05 NE	3:20	3:20	
R06 ENE,E	3:20	3:20	2:40	2:40	2:50	R06 ENE,E	3:30	3:30	4:00	2:40	2:40	3:20	2:50	R06 ENE,E	3:20	3:20	
R07 ESE,SE	3:20	3:20	2:40	2:40	2:50	R07 ESE,SE	3:20	3:20	4:00	2:50	2:50	3:20	2:50	R07 ESE,SE	3:20	3:25	
R08 SSE,S	3:10	3:10	2:40	2:40	2:50	R08 SSE,S	3:20	3:20	4:00	2:50	2:50	3:30	2:50	R08 SSE,S	3:25	3:35	
R09 SSW	3:20	3:20	2:40	2:40	2:50	R09 SSW	3:20	3:20	3:50	2:40	2:50	3:20	2:50	R09 SSW	3:20	3:25	
R10 SW	3:20	3:20	2:40	2:40	2:50	R10 SW	3:20	3:20	4:00	2:50	2:50	3:30	2:50	R10 SW	3:25	3:35	
R11 WSW	3:20	3:20	2:40	2:40	2:50	R11 WSW	3:20	3:20	4:00	2:40	2:40	3:30	2:50	R11 WSW	3:20	3:30	
R12 W	3:20	3:20	2:30	2:30	2:50	R12 W	3:20	3:20	4:00	2:40	2:40	3:20	2:40	R12 W	3:25	3:35	
R13 WNW,NW	3:10	3:20	2:30	2:30	2:40	R13 WNW,NW	3:20	3:20	3:50	2:40	2:40	3:20	2:50	R13 WNW,NW	3:30	3:35	
R14 NNW	3:10	3:10	2:30	2:30	2:40	R14 NNW	3:20	3:20	3:50	2:40	2:40	3:20	2:50	R14 NNW	3:20	3:25	
<b>5-Mile Ring and Downwind to EPZ Boundary</b>																	
R15 N	3:20	3:20	3:20	3:30	2:50	R15 N	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R15 N	3:35	3:45	
R16 NNE	3:30	3:30	3:20	3:30	2:50	R16 NNE	3:30	3:30	4:00	2:50	3:00	3:30	3:00	R16 NNE	3:40	3:45	
R17 NE	3:30	3:30	3:00	3:10	2:50	R17 NE	3:30	3:30	4:00	2:50	3:00	3:30	3:00	R17 NE	3:40	3:45	
R18 ENE	3:30	3:30	3:00	3:10	2:50	R18 ENE	3:30	3:30	4:00	2:50	3:00	3:30	2:50	R18 ENE	3:40	3:45	
R19 E	3:20	3:30	2:50	3:00	2:50	R19 E	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R19 E	3:40	3:45	
R20 ESE	3:30	3:30	2:50	3:00	3:00	R20 ESE	3:30	3:30	4:00	2:50	2:50	3:30	3:00	R20 ESE	3:45	3:50	
R21 SE	3:30	3:30	2:40	2:50	2:50	R21 SE	3:30	3:30	4:00	2:50	2:50	3:30	3:00	R21 SE	3:45	3:50	
R22 SSE,S	3:20	3:30	2:40	2:50	2:50	R22 SSE,S	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R22 SSE,S	3:50	3:50	
R23 SSW	3:20	3:20	2:40	2:50	2:50	R23 SSW	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R23 SSW	3:50	3:50	
R24 SW,WSW	3:20	3:20	3:00	3:00	2:50	R24 SW,WSW	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R24 SW,WSW	3:45	3:50	
R25 W	3:20	3:20	3:20	3:30	2:50	R25 W	3:30	3:30	4:00	2:50	3:00	3:30	2:50	R25 W	3:40	3:50	
R26 WNW,NW	3:20	3:20	3:20	3:30	2:50	R26 WNW,NW	3:30	3:30	4:00	2:50	3:00	3:30	2:50	R26 WNW,NW	3:40	3:45	
R27 NNW	3:20	3:20	3:20	3:20	2:50	R27 NNW	3:30	3:30	4:00	2:50	2:50	3:30	2:50	R27 NNW	3:35	3:45	

**Table 7-1D. Time To Clear The Indicated Area of 100 Percent of the Affected Population**

	Summer		Summer		Summer		Winter			Winter			Winter		Summer	Summer
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Midweek	
Scenario:	(1)	(2)	(3)	(4)	(5)	Scenario:	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Scenario:	(13)	(14)
Region Wind Toward:	Midday	Midday	Midday	Evening	Good Weather	Region Wind Toward:	Midday	Midday	Midday	Midday	Midday	Midday	Midday	Region Wind Toward:	Midday	Midday
Entire 2-Mile Region, 5-Mile Region, and EPZ																
R01 2-mile ring	5:00	5:00	4:00	4:00	4:00	R01 2-mile ring	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R01 2-mile ring	5:00	5:00
R02 5-mile ring	5:00	5:00	4:40	4:40	4:30	R02 5-mile ring	5:00	5:00	6:00	4:40	4:40	5:10	4:30	R02 5-mile ring	5:00	5:00
R03 Entire EPZ	5:10	5:10	4:50	4:50	4:50	R03 Entire EPZ	5:10	5:10	6:10	4:50	4:50	5:20	4:50	R03 Entire EPZ	5:10	5:10
2-Mile Ring and Downwind to 5 Miles																
R04 N,NNE	5:00	5:00	4:00	4:00	4:00	R04 N,NNE	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R04 N,NNE	5:00	5:00
R05 NE	5:00	5:00	4:00	4:00	4:00	R05 NE	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R05 NE	5:00	5:00
R06 ENE,E	5:00	5:00	4:00	4:00	4:00	R06 ENE,E	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R06 ENE,E	5:00	5:00
R07 ESE,SE	5:00	5:10	4:00	4:10	4:00	R07 ESE,SE	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R07 ESE,SE	5:00	5:00
R08 SSE,S	5:00	5:00	4:00	4:10	4:00	R08 SSE,S	5:00	5:00	6:00	4:00	4:00	5:10	4:00	R08 SSE,S	5:00	5:00
R09 SSW	5:00	5:00	4:00	4:10	4:00	R09 SSW	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R09 SSW	5:00	5:00
R10 SW	5:00	5:00	4:00	4:10	4:00	R10 SW	5:00	5:00	6:00	4:00	4:10	5:00	4:00	R10 SW	5:00	5:00
R11 WSW	5:00	5:00	4:00	4:00	4:00	R11 WSW	5:00	5:00	6:00	4:00	4:00	5:00	4:00	R11 WSW	5:00	5:00
R12 W	5:00	5:00	4:00	4:00	4:10	R12 W	5:00	5:00	6:00	4:00	4:00	5:00	4:10	R12 W	5:00	5:00
R13 WNW,NW	5:00	5:00	4:40	4:40	4:40	R13 WNW,NW	5:00	5:00	6:00	4:40	4:40	5:00	4:40	R13 WNW,NW	5:00	5:00
R14 NNW	5:00	5:00	4:40	4:40	4:40	R14 NNW	5:00	5:00	6:00	4:40	4:40	5:00	4:40	R14 NNW	5:00	5:00
5-Mile Ring and Downwind to EPZ Boundary																
R15 N	5:00	5:10	4:50	4:50	4:50	R15 N	5:00	5:10	6:10	4:50	4:50	5:10	4:50	R15 N	5:00	5:00
R16 NNE	5:10	5:10	4:50	4:50	4:50	R16 NNE	5:10	5:10	6:10	4:50	4:50	5:20	4:50	R16 NNE	5:10	5:10
R17 NE	5:10	5:10	4:50	4:50	4:50	R17 NE	5:10	5:10	6:10	4:50	5:00	5:20	4:50	R17 NE	5:10	5:10
R18 ENE	5:10	5:10	4:40	4:50	4:50	R18 ENE	5:10	5:10	6:10	4:50	5:00	5:20	4:50	R18 ENE	5:10	5:10
R19 E	5:10	5:10	4:50	4:50	4:50	R19 E	5:10	5:10	6:10	4:50	4:50	5:10	4:50	R19 E	5:10	5:10
R20 ESE	5:10	5:10	4:50	4:50	4:50	R20 ESE	5:10	5:10	6:10	4:50	4:50	5:20	4:50	R20 ESE	5:10	5:10
R21 SE	5:10	5:10	4:50	4:50	4:50	R21 SE	5:10	5:10	6:10	4:50	4:50	5:20	4:50	R21 SE	5:10	5:10
R22 SSE,S	5:10	5:10	4:50	4:50	4:50	R22 SSE,S	5:10	5:10	6:10	4:50	4:50	5:20	4:50	R22 SSE,S	5:10	5:10
R23 SSW	5:10	5:10	4:50	4:50	4:50	R23 SSW	5:10	5:10	6:10	4:50	4:50	5:10	4:50	R23 SSW	5:10	5:10
R24 SW,WSW	5:10	5:10	4:50	4:50	4:50	R24 SW,WSW	5:10	5:10	6:10	4:50	4:50	5:10	4:50	R24 SW,WSW	5:10	5:10
R25 W	5:10	5:10	4:50	4:50	4:50	R25 W	5:10	5:10	6:10	4:50	4:50	5:10	4:50	R25 W	5:10	5:10
R26 WNW,NW	5:00	5:10	4:40	4:40	4:50	R26 WNW,NW	5:00	5:10	6:10	4:40	4:40	5:10	4:50	R26 WNW,NW	5:10	5:10
R27 NNW	5:00	5:10	4:40	4:40	4:50	R27 NNW	5:00	5:00	6:10	4:50	4:50	5:10	4:40	R27 NNW	5:00	5:00

**Table 8-4A. School Evacuation Time Estimates - Good Weather**

School	Driver Mobilization Time(min)	Loading Time (min)	Dist. to EPZ Boundary (mi.)	Travel Time to EPZ Bndry (min)*	ETE (hr:min)	Dist. EPZ Bndry to EAC (mi.)	Travel Time EPZ Bndry to EAC (min)**	ETE to EAC (hr:min)
<b>Louisa County Schools</b>								
Thomas Jefferson Elementary School	90	5	1.53	3	<b>1:40</b>	9.89	15	<b>1:55</b>
Jouett Elementary School	90	5	4.23	8	<b>1:45</b>	17.10	26	<b>2:10</b>
Louisa County High School	90	5	3.55	7	<b>1:45</b>	8.08	13	<b>1:55</b>
Louisa County Middle School	90	5	3.30	6	<b>1:45</b>	8.07	13	<b>1:55</b>
Mineral Christian Preschool (DAYCARE)	90	5	3.49	6	<b>1:45</b>	9.02	14	<b>1:55</b>
<b>Spotsylvania County Schools</b>								
Berkeley Elementary School	90	5	2.06	4	<b>1:40</b>	7.97	12	<b>1:55</b>
Livingston Elementary School	90	5	9.29	16	<b>1:55</b>	7.21	11	<b>2:05</b>
Post Oak Middle School	90	5	4.21	8	<b>1:45</b>	7.26	11	<b>1:55</b>
Spotsylvania High School	90	5	3.19	6	<b>1:45</b>	7.98	12	<b>1:55</b>
<b>Average for EPZ:</b>						<b>1:45</b>	<b>Average:</b>	
2:00								

\*Average speed within EPZ output by PC-DYNEV = 35.0 mph.

\*\*Average speed outside EPZ (assumed) = 40.0 mph.

Table 8-6A. Transit Dependent Evacuation Time Estimates - Good Weather												
Route Number	Single Wave					Second Wave						
	Mobilization (min.)	Route Length (mi.)	Route Travel Time (min.)*	Pickup Time (min.)	ETE (hr:min)	Mobilization (min.)	Unload (min.)	Driver Rest (min.)	Return time to EPZ (min.)	Route Travel Time (min.)**	Pickup Time (min.)	ETE (hr:min)
1	120	22.1	46	30	3:20	120	5	10	20	38	30	3:45
2A	120	22.8	47	30	3:20	120	5	10	20	40	30	3:45
2B	120	27.9	58	30	3:30	120	5	10	20	49	30	3:55
2C	120	31.9	66	30	3:40	120	5	10	20	55	30	4:00
3A	120	21.8	45	30	3:15	120	5	10	20	38	30	3:45
3B	120	16.4	34	30	3:05	120	5	10	20	29	30	3:35
4	120	17.1	35	30	3:05	120	5	10	20	30	30	3:35
5	120	22.0	46	30	3:20	120	5	10	20	38	30	3:45
<b>Average for EPZ:</b>					<b>3:20</b>	<b>Average for EPZ:</b>						

\*Average speed within EPZ output by PC-DYNEV at 2:00 = 29.0 mph.

\*\* Average speed within EPZ output by PC-DYNEV at 2:35 = 34.5 mph.

## **Appendix 5—Implementing Procedures – Topical List**

Emergency plan implementing procedures address a range of actions needed to implement the contents of this emergency plan. The emergency plan implementing procedures address, at a minimum, the following topics, including parenthetical references to the affected sections of this plan:

- Emergency Classification ([II.D](#))
- Notifications Associated with Emergency Conditions ([II.E](#), [II.L.1](#))
- Emergency Communications ([II.F](#))
- Protective Action Recommendations ([II.J.7](#), [II.J.10](#))
- Activation of the Emergency Response Organization ([I.B](#))
- Site Assembly, Accountability, and Evacuation ([II.J.4](#), [II.J.5](#))
- Core Damage Assessment ([II.I](#))
- Radiation Protection Under Emergency Conditions ([II.K](#))
- Plume Tracking and Assessment of Offsite Radiological Conditions ([II.I](#))
- Respiratory Protection and Distribution of Radioprotective Drugs ([II.J.6](#))
- Personnel Monitoring ([II.K.2](#), [II.K.3](#))
- Decontamination ([II.K.5](#), [II.K.7](#))
- Obtaining and Analyzing High Activity Samples Under Emergency Conditions ([II.I](#))
- Emergency Media Relations ([II.G](#))
- Recovery and Reentry ([II.M](#))

Additional plant procedures address various activities that are required to support the ongoing maintenance of emergency preparedness. These supporting procedures are not included within the body of the emergency plan implementing procedures. These supporting procedures address, at a minimum, the following topics, including parenthetical references to the affected sections of this plan:

- Emergency Equipment Inventory and Operational Tests ([II.H.10](#))
- Conduct of Emergency Drills and Exercises ([II.N](#))
- Testing of Emergency Communications Systems ([II.N](#), [II.F](#))
- Emergency Plan Training ([II.G.5](#), [II.O](#), [II.P.1](#))
- Maintaining Emergency Preparedness ([II.P](#))

## **Appendix 6—Emergency Equipment and Supplies**

Dominion maintains inventories of emergency equipment and supplies for use by emergency response personnel in the ERFs and by Dominion's offsite field monitoring teams. The actual inventories are based on the activities that occur in, or are dispatched from, the affected facility. Actual inventories are established in inventory lists in accordance with plant procedures. Emergency kit inventories typically include the following:

- Radiation survey instrument(s)
- Surface contamination control and survey supplies
- Air sampling equipment and sampling media
- Scaler(s) or other appropriate radio-analytical counting instrument(s)
- Protective clothing
- Contamination control and decontamination supplies
- Respiratory protection equipment
- Radiological control posting and warning supplies
- Personnel monitoring equipment (record and instantaneous reading dosimeters)
- Radioiodine blocking agent
- Emergency lighting equipment
- Appropriate maps
- Computer equipment
- Plans, procedures, and drawings
- Communications equipment
- Administrative and recordkeeping supplies
- Batteries and other expendable supplies
- First aid supplies (e.g., bandages, stretchers, splints, topical ointments)

## **Appendix 7—Certification Letter**



## ***COMMONWEALTH of VIRGINIA***

*Department of Emergency Management*

MICHAEL M. CLINE  
State Coordinator

JACK E. KING  
Chief Deputy Coordinator

BRETT A. BURDICK  
Deputy Coordinator

10501 Trade Court  
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June 11, 2010

### **MEMORANDUM**

**TO:** Mrs. Leslie N. Hartz  
Vice President, Nuclear Support Services  
Dominion Resources Services, Inc.

**FROM:** Signatory Agencies in Support of the Original North Anna Power Station Emergency Operations Plan, dated July 1974

**SUBJECT:** Combined License Application for a new nuclear generating unit at the North Anna Power Station

The below-signed state agencies and localities have reviewed the emergency plan supporting the revised Combined License Application for a new nuclear generating unit at the North Anna Power Station. This memorandum updates correspondence filed with Dominion Resources Services, Inc., dated during the period of August-September 2007. The organizations severally certify its commitment that:

- Proposed emergency plans are practicable;
- Virginia Department of Emergency Management is committed to participating in further development of the plans, including any required field demonstrations; and
- Virginia Department of Emergency Management is committed to executing their responsibilities under the plans in the event of an emergency.

Furthermore, the organizations concur with the proposed emergency classification system, initiating conditions, and emergency action levels described in the Combined License Application Emergency Plan and evacuation time estimates.

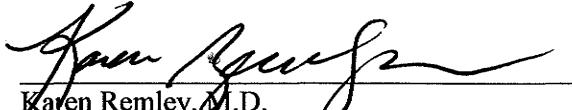
It is with joint understanding that the specific nature of arrangements in support of emergency preparedness for operation of the proposed new nuclear unit will be clearly established in a properly executed and binding letter of agreement that will be included in the North Anna Unit 3 Combined License Application Emergency Plan if and when Dominion Energy proceeds with construction and operation of this nuclear facility.

**MEMORANDUM**

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June 11, 2010

We, the below signed, look forward to continuing our partnership in these efforts:



Karen Remley, M.D.  
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[Nancy.glasheen@vdh.virginia.gov](mailto:Nancy.glasheen@vdh.virginia.gov)

Date: 6/11/10

*on behalf of Col. Flaherty.*  
*Captain Steve S. Charley*  
Colonel W. S. (Steve) Flaherty  
Superintendent, Virginia Department of State  
Police  
[Steve.Flaherty@vsp.virginia.gov](mailto:Steve.Flaherty@vsp.virginia.gov)  
*STEVEN CHALSTY D.V.P. VIRGINIA.GOV*  
*DIV. 1 COMMANDER*

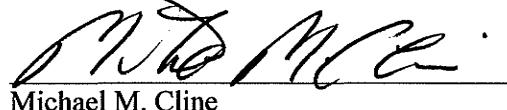
Date: 6/11/10

*John F. Duval*  
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Hospitals

Date: 6-11-10

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Date: 6/11/10



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Date: 11 Jun 10

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*Dabney W. Watts*  
Robert W. Duncan Dabney W. Watts  
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*David E. Layman*  
David E. Layman  
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Date: 6-15-2010

*Cecil R. Harris, Jr.*  
Cecil R. Harris, Jr.  
County Administrator, Hanover County  
Jim Taylor  
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Date: 6-16-10

MEMORANDUM

Page 3

June 11, 2010

V. Stuart Cook  
Colonel V. Stuart Cook  
Sheriff, Hanover County  
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Date: 6-16-10

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Date: 6/11/10

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Date: 6-15-10  
Mark A. Amos  
Mark A. Amos  
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Date: 6/15/2010  
OCO Manager

Dale Mullen  
Dale Mullen  
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Date: 6/11/2010

Robert C. Dubé  
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Date: 6/11/10

Julie G. Jordan  
Julie G. Jordan  
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Date: 6/11/2010

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Date: 6/15/10

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

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 letter provided in [Appendix 7](#) of this plan.

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

<b>Requirement</b>	<b>Corresponding COL Emergency Plan Provision</b>
10 CFR 50 App E.IV.G	<b>II.P</b>
10 CFR 50 App E.IV.H	<b>II.M</b>

## NUREG-0654

Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
A.1.a	Plan §II.A.1.a	Plan §VII, App. 3	Plan §VII	Plan §VII	Plan §VII	Plan §VII	Plan §VII
A.1.b	Plan §II.A.1.b	Plan §VIII, App. 3	Plan §VIII	Plan §VIII	Plan §V.II	Plan §V.II	Plan §VIII
A.1.c	Plan §II.A.1.c	App. 3	Plan Att. 12 & 13	Plan Att. 12 & 13	Plan Att. 12 & 13	Plan Att. 12 & 13	Plan Att. 12 & 13
A.1.d	Plan §II.A.1.d	Plan §VII.C	Plan §VII.A	Plan §VII.A	Plan §VII.A	Plan §VII.A	Plan §VII.A
A.1.e	Plan §II.A.1.e	App. 10 §II.A	Plan §§VII.A, IX.A., IX.B, ESF #5	Plan §§VII.A, IX.A., IX.B, ESF #5	Plan §VII.A, App. 5	Plan §VII.A, App. 5	Plan §§VII.A, IX.A., IX.B, ESF #5
A.2.a		App. 2 Tab A	Plan Att. 13	Plan Att. 13	Plan Att. 13	Plan Att. 13	Plan Att. 13
A.2.b		Plan §I	Plan §I.A	Plan §I.A	Plan §I	Plan §I	Plan §I.A
A.3	Plan §II.A.3	Plan Att. 1	Plan Att. 14	Plan Att. 14	Plan Att. 14	Plan Att. 14	Plan Att. 14
A.4	Plan §II.A.4	App. 1 §C	Plan §VII	Plan §VII	Plan §V.II	Plan §V.II	Plan §VII
B.1	Plan §II.B.1						
B.2	Plan §II.B.2						
B.3	Plan §II.B.3						
B.4	Plan §II.B.4						
B.5	Plan §II.B.5						
B.6	Plan §II.B.6						
B.7	Plan §II.B.7						
B.7	Plan §II.B.7						
B.7	Plan §II.B.7						

## NUREG-0654

Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
B.7	Plan §II.B.7						
B.7	Plan §II.B.7						
B.8	Plan §II.B.8						
B.9	Plan §II.B.9						
C.1.a	Plan §II.C.1.a	App. 2 §1.E					
C.1.b	Plan §II.C.1.b	App. 2 §II					
C.1.c	Plan §II.C.1.c	App. 2 Tab B	Plan §IX.A	Plan §IX.A	Plan §IX.A	Plan §IX.A	Plan §IX.A
C.2.a		Plan §VII.D, App. 1 §D.3, App. 2 §I.A.2	not applicable	not applicable	not applicable	not applicable	not applicable
C.2.b	Plan §II.C.2.b						
C.3	Plan §II.C.3	App. 6 §II.C.3					
C.4.	Plan §II.C.4, App. 7	App. 6	Plan Att. 14	Plan Att. 14	Published separately	Published separately	Plan Att. 14
D.1	Plan §II.D.1, App. 1						
D.2	Plan §II.D.2, App. 1						
D.3		App. 5	Plan §VIII.A	Plan §VIII.A	Plan §VIII.A	Plan §VIII.A	Plan §VIII.A
D.4		Plan §VIII.B, App. 5	Plan §VIII.E	Plan §VIII.E	Plan §VIII.E	Plan §VIII.E	Plan §VIII.E

## NUREG-0654

Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
E.1	Plan §II.E.1	App. 4	Plan §VIII.C, ESF #2 & #5	Plan §VIII.C, ESF #2 & #5	Plan §VIII.C, App. 1 & 5	Plan §VIII.C, App. 1 & 5	Plan §VIII.C, ESF #2 & #5
E.2	Plan §II.E.2	Plan §VIII.C, App. 1 Tab A, App. 4	Plan §VIII.C, ESF #2 & #5	Plan §VIII.C, ESF #2 & #5	Plan §VIII.C, App. 1 & 5	Plan §VIII.C, App. 1 & 5	Plan §VIII.C, ESF #2 & #5
E.3	Plan §II.E.3						
E.4	Plan §II.E.4						
E.4.a	Plan §II.E.4						
E.4.b	Plan §II.E.4						
E.4.c	Plan §II.E.4						
E.4.d	Plan §II.E.4						
E.4.e	Plan §II.E.4						
E.4.f	Plan §II.E.4						
E.4.g	Plan §II.E.4						
E.4.h	Plan §II.E.4						
E.4.i	Plan §II.E.4						
E.4.j	Plan §II.E.4						
E.4.k	Plan §II.E.4						
E.4.l	Plan §II.E.4						
E.4.m	Plan §II.E.4						
E.4.n	Plan §II.E.4						

## NUREG-0654

Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
E.5		Plan §IX.C, App. 9, Annex M Tab A & B	Plan §§VIII.D & IX.C, ESF #2 & #5	Plan §§VIII.D & IX.C, ESF #2 & #5	Plan §VIII.D, App. 2 & 5	Plan §VIII.D, App. 2 & 5	Plan §§VIII.D & IX.C, ESF #2 & #5
E.6	Plan §II.E.6	Plan §IX.C, App. 4 §II.B	Plan §§VIII.D & IX.C, ESF #2	Plan §§VIII.D & IX.C, ESF #2	Plan §VIII.D, App. 2 & 5	Plan §VIII.D, App. 2 & 5	Plan §§VIII.D & IX.C, ESF #2
E.7	Plan §II.E.7	Annex M Tab A Att. 1	Plan §IX.C, ESF #2	Plan §IX.C, ESF #2	Plan §IX.C, App. 2	Plan §IX.C, App. 2	Plan §IX.C, ESF #2
F.1.a	Plan §II.F.1.a	App. 10 §II	Plan §IX.B	Plan §IX.B	Plan §VII, App. 5	Plan §VII, App. 5	Plan §IX.B
F.1.b	Plan §II.F.1.b	App. 10 §IV.H	Plan §IX.B, ESF #5	Plan §IX.B, ESF #5	Plan §IX.B.	Plan §IX.B.	Plan §IX.B, ESF #5
F.1.c	Plan §II.F.1.c	App. 10 §IV.I	See COVRERP	See COVRERP	See COVRERP	See COVRERP	See COVRERP
F.1.d	Plan §II.F.1.d	App. 10 §II	Plan §IX.B	Plan §IX.B	Plan §IX.B	Plan §IX.B	Plan §IX.B
F.1.e	Plan §II.F.1.e	App. 10 §II	Plan §VIII.C	Plan §VIII.C	Plan §VIII.C, App. 5	Plan §VIII.C, App. 5	Plan §VIII.C
F.1.f	Plan §II.F.1.						
F.2	Plan §II.F.2	App. 10 §III.E	Plan §IX.B	Plan §IX.B	Plan §IX.B	Plan §IX.B	Plan §IX.B
F.3	Plan §II.F.3	App. 10, App. 13 §II.C.1	Plan §IX.B	Plan §IX.B	Plan §IX.B	Plan §IX.B	Plan §IX.B
G.1	Plan §II.G.1	App. 10 §II.A.1	Plan §IX.C.1	Plan §IX.C.1	Plan §IX.C.1	Plan §IX.C.1	Plan §IX.C.1
G.2	Plan §II.G.2	App. 9 §II.A	Plan §IX.C.1	Plan §IX.C.1	Plan §IX.C.1	Plan §IX.C.1	Plan §IX.C.1
G.3.a	Plan §II.G.3.a	App. 9 §III.A	Plan §IX.C.2	Plan §IX.C.2	Plan §IX.C.2	Plan §IX.C.2	Plan §IX.C.2
G.3.b	Plan §II.G.3.b						

## NUREG-0654

Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
G.4.a	Plan §II.G.4.a	App. 9 §III	Plan §IX.C.2, ESF #5	Plan §IX.C.2, ESF #5	Plan §IX.C.2, App. 2	Plan §IX.C.2, App. 2	Plan §IX.C.2, ESF #5
G.4.b	Plan §II.G.4.b	App. 9 §III.A	ESF #5	ESF #5	Plan §IX.C.2, App. 2	Plan §IX.C.2, App. 2	ESF #5
G.4.c	Plan §II.G.4.c	App. 9 §III	Plan §IX.C.2, ESF #5	Plan §IX.C.2, ESF #5	Plan §IX.C.2, App. 2	Plan §IX.C.2, App. 2	Plan §IX.C.2, ESF #5
G.5	Plan §II.G.5	App. 9, Annex M	Plan §IX.C.1	Plan §IX.C.1	Plan §IX.C.1	Plan §IX.C.1	Plan §IX.C.1
H.1	Plan §II.H.1						
H.2	Plan §II.H.2						
H.3		Plan §VII, App. 1, App. 4	Plan §IX.A, App. 1	Plan §IX.A, App. 1	Plan §IX.A, App. 2	Plan §IX.A, App. 2	Plan §IX.A, App. 1
H.4	Plan §II.H.4	App. 1 §C	Plan §IX.A, ESF #5	Plan §IX.A, ESF #5	Plan §IX.A, App. 1 & 5	Plan §IX.A, App. 1 & 5	Plan §IX.A, ESF #5
H.5	Plan §II.H.5						
H.5.a	Plan §II.H.5.a						
H.5.b	Plan §II.H.5.b						
H.5.c	Plan §II.H.5.c						
H.5.d	Plan §II.H.5.d						
H.6.a	Plan §II.H.6.a						
H.6.b	Plan §II.H.6.b						
H.6.c	Plan §II.H.6.c						

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Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
H.7	Plan § II.H.7, App. 6	App. 7 §III & Tab E	Plan §VII.B	Plan §VII.B	Plan §VIII.B, App. 6	Plan §VIII.B, App. 6	Plan §VII.B
H.8	Plan § II.H.8, App. 2						
H.9	Plan § II.H.9, App. 2						
H.10	Plan § II.H.10, App. 6	App. 7 §III.A.1 & Tab E	Plan §VII.A.1	Plan §VII.A.1	Plan §VII.A.1	Plan §VII.A.1	Plan §VII.A.1
H.11	Plan § II.H.11, App. 6	App. 7	ESF #6 & #7 & #8	ESF #6 & #7 & #8	App. 3 & 6	App. 3 & 6	ESF #6 & #7 & #8
H.12	Plan § II.H.12	App. 6 §II.C	Plan §VIII.B, ESF #10	Plan §VIII.B, ESF #10	Plan §VIII.B, App. 6	Plan §VIII.B, App. 6	Plan §VIII.B, ESF #10
I.1	Plan § II.I.1						
I.2	Plan § II.I.2						
I.3.a	Plan § II.I.3.a						
I.3.b	Plan § II.I.3.b						
I.4	Plan § II.I.4						
I.5	Plan § II.I.5						
I.6	Plan § II.I.6						
I.7	Plan § II.I.7, App. 6	App. 6 §II.C	Plan §VIII.B, ESF #10	Plan §VIII.B, ESF #10	Plan §VIII.B, App. 6	Plan §VIII.B, App. 6	Plan §VIII.B, ESF #10
I.8	Plan § II.I.8	App. 6 §II.C, App. 7 §II.B	ESF #10	ESF #10	App. 6	App. 6	ESF #10

## NUREG-0654

Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
I.9	Plan §II.I.9	App. 6 §II.C.3.b					
I.10	Plan §II.I.10, App. 2	Bureau of Radiological Health SOP					
I.11		App. 6 §II.C.3					
J.1.a	Plan §II.J.1						
J.1.b	Plan §II.J.1						
J.1.c	Plan §II.J.1						
J.1.d	Plan §II.J.1						
J.2	Plan §II.J.2	App. 5 Tab A, App. 5 Tab B Att. 6	Not applicable in Caroline County.	Not applicable in Hanover County.	Not applicable in Louisa County	Not applicable in Orange County	Not applicable in Spotsylvania County.
J.3	Plan §II.J.3						
J.4	Plan §II.J.4						
J.5	Plan §II.J.5						
J.6.a	Plan §II.J.6.a						
J.6.b	Plan §II.J.6.b						
J.6.c	Plan §II.J.6.c						
J.7	Plan §II.J.7, App. 2						
J.8	Plan §II.J.8, App. 4						

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Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
J.9		App. 6 §II.C	Plan §§V.D & VIII.F	Plan §§V.D & VIII.F	Plan §§V.D & VIII.F	Plan §§V.D & VIII.F	Plan §§V.D & VIII.F
J.10.a	Plan §II.J.10.a	App. 5 Tab B Att. 6	Plan Att. 10 & 11, ESF #6 & #10	Plan Att. 10 & 11, ESF #6 & #10	Plan Att. 10, App. 4 & 6	Plan Att. 10, App. 4 & 6	Plan Att. 10 & 11, ESF #6 & #10
J.10.b	Plan §II.J.10.b	App. 5 Tab B Att. 6	Plan Att. 6-9	Plan Att. 6-9	Plan Att. 9 & 10	Plan Att. 9 & 10	Plan Att. 6-9
J.10.c	Plan §II.J.10.c, App. 3	App. 4 §II.B	Plan §VIII.D, ESF #2	Plan §VIII.D, ESF #2	Plan §VIII.D, App. 4	Plan §VIII.D, App. 4	Plan §VIII.D, ESF #2
J.10.d		App. 4 §II.B.3, App. 5	Plan §§V.D & VII.A.4, ESF #6 & 10	Plan §§V.D & VII.A.4, ESF #6 & 10	Plan §§V.D & VII.A.4, App. 4	Plan §§V.D & VII.A.4, App. 4	Plan §§V.D & VII.A.4, ESF #6 & 10
J.10.e		App. 8	Plan §V.D, ESF #6 & 10	Plan §V.D, ESF #6 & 10	Plan §V.D, App. 3, App. 6	Plan §V.D, App. 3, App. 6	Plan §V.D, ESF #6 & 10
J.10.f		App. 8	not applicable	not applicable	not applicable	not applicable	not applicable
J.10.g		App. 5	Plan §V.D, ESF #13	Plan §V.D, ESF #13	Plan §V.D, App. 3	Plan §V.D, App. 3	Plan §V.D, ESF #13
J.10.h		App. 5, App. 11	Plan §V.D, ESF #6	Plan §V.D, ESF #6	Plan §V.D, App. 3	Plan §V.D, App. 3	Plan §V.D, ESF #6
J.10.i		App. 5 Tab B Att. 6	Plan Att. 5 & 10	Plan Att. 5 & 10	Plan Att. 5 & 10	Plan Att. 5 & 10	Plan Att. 5 & 10
J.10.j		Annex A Tab C	Plan §§V.D & VII.A.2, ESF #13	Plan §§V.D & VII.A.2, ESF #13	Plan §§V.D & VII.A.2, App. 4	Plan §§V.D & VII.A.2, App. 4	Plan §§V.D & VII.A.2, ESF #13
J.10.k		App. 12 §III.A	Plan §VII, ESF #13	Plan §VII, ESF #13	Plan §V.D, App. 4	Plan §V.D, App. 4	Plan §VII, ESF #13

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Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
J.10.I		App. 5 Tab B Att. 6	Plan Att. 5 & 10	Plan Att. 5 & 10	Plan Att. 11	Plan Att. 11	Plan Att. 5 & 10
J.10.m	Plan §II.J.10.m	App. 7					
J.11		App. 7 (Also see Maryland Plan)					
J.12		App. 11	Plan §V.D, ESF #6	Plan §V.D, ESF #6	Plan §V.D, App. 3	Plan §V.D, App. 3	Plan §V.D, ESF #6
K.1	Plan §II.K.1						
K.1	Plan §II.K.1						
K.1	Plan §II.K.1						
K.1	Plan §II.K.1						
K.1	Plan §II.K.1						
K.1	Plan §II.K.1						
K.1	Plan §II.K.1						
K.2	Plan §II.K.2						
K.3.a	Plan §II.K.3.a	App. 7 §II & III	Plan §§VIII.B & VIII.F, ESF #10	Plan §§VIII.B & VIII.F, ESF #10	Plan §§VIII.B & VIII.F, App. 6	Plan §§VIII.B & VIII.F, App. 6	Plan §§VIII.B & VIII.F, ESF #10
K.3.b	Plan §II.K.3.b	App. 7 Tabs C & G	Plan §VIII.F, ESF #10	Plan §VIII.F, ESF #10	Plan §VIII.F, App. 6	Plan §VIII.F, App. 6	Plan §VIII.F, ESF #10
K.4		App. 7	Plan §VIII.F, ESF #10	Plan §VIII.F, ESF #10	Plan §VIII.F, App. 6	Plan §VIII.F, App. 6	Plan §VIII.F, ESF #10

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Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
K.5.a	Plan §II.K.5.a	App. 7 §II.B.3	ESF #6	ESF #6	App. 3 & 6	App. 3 & 6	ESF #6
K.5.b	Plan §II.K.5.b	App. 7 Tab D, App. 11	ESF #6 & #10	ESF #6 & #10	App. 3 & 9	App. 3 & 9	ESF #6 & #10
K.6.a	Plan §II.K.6.a						
K.6.b	Plan §II.K.6.b						
K.6.c	Plan §II.K.6.c						
K.7	Plan §II.K.7						
L.1	Plan §II.L.1	Annex H Tab A	ESF #6	ESF #6	App. 3 & 8 & 9	App. 3 & 8 & 9	ESF #6
L.2	Plan §II.L.2						
L.3		Annex H Tab A					
L.4	Plan §II.L.4	Annex H Tab C	ESF #6	ESF #6	App. 3 & 8	App. 3 & 8	ESF #6
M.1	Plan §II.M.1	App. 11	ESF #5	ESF #5	App. 1 & 6	App. 1 & 6	ESF #5
M.2	Plan §II.M.2						
M.3	Plan §II.M.3	App. 11					
M.4	Plan §II.M.4	App. 11					
N.1.a	Plan §II.N.1.a	App. 13	Plan §XII				
N.1.b	Plan §II.N.1.b	App. 13 §II	Plan §XII				
N.2.a	Plan §II.N.2.a	App. 13 §II.C.1	Plan §XII.B.1				
N.2.b	Plan §II.N.2.b						
N.2.c	Plan §II.N.2.c	App. 13 §II.C.2	not applicable, see COVRERP				

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Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
N.2.d	Plan §II.N.2.d	App. 13 §II.C.3	Plan §XII				
N.2.e(1)	Plan §II.N.2.e	App. 13 §II.C.4					
N.2.e(2)	Plan §II.N.2.e						
N.3.a	Plan §II.N.3.a	App. 13 §II.D.1	Plan §XII				
N.3.b	Plan §II.N.3.b	App. 13 §II.D.2	Plan §XII, see COVRERP				
N.3.c	Plan §II.N.3.c	App. 13 §II.D.3	Plan §XII, see COVRERP				
N.3.d	Plan §II.N.3.d	App. 13 §II.D.4	Plan §XII, see COVRERP				
N.3.e	Plan §II.N.3.e	App. 13 §II.D.5	Plan §XII, see COVRERP				
N.3.f	Plan §II.N.3.f	App. 13 §II.D	Plan §XII, see COVRERP				
N.4	Plan §II.N.4	App. 13 §II.A.4	Plan §XII, see COVRERP				
N.5	Plan §II.N.5	App. 13 §II.A.4	Plan §XII, see COVRERP				
O.1	Plan §II.O.1	App. 13 §II.E	Plan §XII.A				
O.1.a	Plan §II.O.1.a						
O.1.b		App. 13 §II.E.1	Plan §XII				
O.2	Plan §II.O.2						

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Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
O.3	Plan §II.O.3						
O.4.a	Plan §II.O.4.a	App. 13 §II.E	Plan §XII				
O.4.b	Plan §II.O.4.b	App. 13 §II.E.2	See COVRERP				
O.4.c	Plan §II.O.4.c	App. 13 §II.E.6	See COVRERP				
O.4.d	Plan §II.O.4.d	App. 13 §II.E.3	Plan §XII				
O.4.e	Plan §II.O.4.e						
O.4.f	Plan §II.O.4.f	App. 13 §II.E.3	Plan §XII				
O.4.g	Plan §II.O.4.g		Plan §XII				
O.4.h	Plan §II.O.4.h	App. 13 §II.E.3	Plan §XII				
O.4.i	Plan §II.O.4.i						
O.4.j	Plan §II.O.4.j	App. 13 §II.E.4	Plan §XII, see COVRERP				
O.5	Plan §II.O.5	App. 13 §§II.E.1 & 6	Plan §XII, see COVRERP				
P.1	Plan §II.P.1	App. 13 §§II.E.1 & 6	Plan §§VII.A & XII.A				
P.2	Plan §II.P.2	Plan §VII.B, App. 2	Plan §VII				
P.3	Plan §II.P.3	Plan §X.C	Plan §VII				
P.4	Plan §II.P.4	Plan §X.C.1	Plan §§VII & XI				
P.5	Plan §II.P.5	Plan §X.C, App. 2	Plan §§VII & XI				

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Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
P.6	Plan §II.P.6	Plan Att. 1	Plan §I				
P.7	Plan §II.P.7, App. 5	Plan Att. (un-numbered)	Plan §XIV				
P.8	Plan §II.P.8, App. 8	Plan pages i through ix	Plan pages i through xvii				
P.9	Plan §II.P.9						
P.10	Plan §II.P.10	Plan §IX.B	Plan §X				