



Dominion[®]

**North Anna 3
Combined
License
Application**

**Part 5:
Emergency Plan**

**Revision 1
December 2008**

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

REVISION SUMMARY

Revision 0 to Revision 1

Section	Changes
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.19, Appendix 1–Executive Summary, Appendix 1–1.0, Appendix 1–3.0	RAI 13.03-2.2, IBR is SSAR in ESPA versus ESP
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.10, III.A.19, IC HU4, Appendix 2–1.0, Appendix 2–2.1, Appendix 2–2.2, Appendix 8	Made references to Unit 3. Editorial changes. Corrected references. Added reference to MD plan (Appendix 8). Updated Appendix 4 with ETE R1 executive summary.
II.B.8, II.C.3	RAI 13.03-2.3, Vendor Support During Emergency Events
II.E.1, II.F.1.d	Added locations of ENS access and description of communication capabilities between the Control Room/TSC and radiological field personnel.
II.G.4.a, II.G.4.c	RAI 13.03-2-8, Classification of Titles in Public Information Structure
II.H.1, II.H.2	Corrected description of technical data display in TSC.
Table II-2	RAI 13.03-2.9, Required Minimum Staffing Times
II.J.10.a, Figure II-5	RAI ETE-4, Evacuation Routes, Monitoring Points, and Shelter Locations
II.P.4	Changed FSRC to proper noun.
Appendix 1–Executive Summary	Deleted incorrect reference.
Appendix 8	Editorial corrections.

Contents

I. Introduction

A. Purpose	I-1
B. Scope	I-1
C. Planning Basis and Emergency Planning Zones	I-1
1. Planning Basis	I-1
2. Emergency Planning Zones	I-2
3. Site and Area Description	I-3

II. Emergency Plan

A. Assignment of Responsibility (Organization Control)	II-1
1. Emergency Organization	II-1
2. Functions, Responsibilities, and Legal Basis	II-7
3. Written Agreements	II-7
4. Continuous Operations	II-7
B. Onsite Emergency Organization	II-10
1. Onsite Emergency Organization	II-10
2. Emergency Coordinator	II-11
3. Emergency Coordinator Line of Succession	II-11
4. Emergency Coordinator Responsibilities	II-11
5. Plant Emergency Response Staff	II-12
6. Interfaces Between Functional Areas	II-13
7. Corporate Support for the Plant Staff	II-13
8. Support from Contractor and Private Organizations	II-13
9. Risk Jurisdiction Emergency Response Support	II-14
C. Emergency Response Support and Resources	II-20
1. Federal Response Capability	II-20
2. Offsite Organization Representation in the EOF	II-20
3. Radiological Laboratories	II-21
4. Other Supporting Organizations	II-21
D. Emergency Classification System	II-21
1. Classification System	II-21
2. Emergency Action Levels	II-23
3. Commonwealth/Risk Jurisdiction EAL Scheme	II-23
4. Commonwealth/Risk Jurisdiction Emergency Action Procedures	II-24

Contents

E. Notification Methods and Procedures	II-24
1. Notification of Commonwealth and Risk Jurisdiction Authorities	II-24
2. Notification and Mobilization of Licensee Response Organizations	II-25
3. Message Content	II-25
4. Follow-up Messages to Offsite Authorities	II-25
5. Disseminating Information to the Affected Public	II-26
6. Instructions to the Public in the Plume Exposure EPZ	II-26
7. Written Messages to the Public	II-27
F. Emergency Communications	II-27
1. Description of Communication Links	II-27
2. Communication with Fixed and Mobile Medical Support Facilities	II-29
3. Communication System Tests	II-29
G. Public Education and Information	II-30
1. Public Information Program	II-30
2. Distribution and Maintenance of Public Information	II-30
3. News Media Coordination	II-31
4. Information Exchange	II-31
5. News Media Training	II-32
H. Emergency Facilities and Equipment	II-32
1. On-Site Emergency Response Facilities	II-32
2. Emergency Operations Facility	II-33
3. Commonwealth/Risk Jurisdiction Emergency Operations Centers	II-34
4. Activation and Staffing of Emergency Response Facilities	II-34
5. Onsite Monitoring Systems	II-35
6. Access to Data from Monitoring Systems	II-35
7. Offsite Radiological Monitoring Equipment	II-36
8. Meteorological Instrumentation and Procedures	II-36
9. Operational Support Center	II-37
10. Emergency Equipment and Supplies	II-37
11. Emergency Kits	II-38
12. Receipt of Field Monitoring Data	II-38

Contents

I. Accident Assessment	II-38
1. Parameters Indicative of Emergency Conditions	II-38
2. Plant Monitoring Systems	II-38
3. Determination of Source Term and Radiological Conditions	II-38
4. Relationship Between Effluent Monitor Reading and Exposure and Contamination Levels	II-39
5. Meteorological Information	II-39
6. Determination of Release Rates and Projected Doses When Installed Instruments Are Inoperable or Off-Scale	II-39
7. Field Monitoring Capability	II-39
8. Assessing Hazards Through Liquid or Gaseous Release Pathways	II-40
9. Measuring Radioiodine Concentrations	II-40
10. Relating Measured Parameters to Dose Rates	II-40
11. Tracking of Plume Using Federal and Commonwealth Resources	II-40
J. Protective Response	II-41
1. On-Site Notification	II-41
2. Evacuation Routes and Transportation	II-41
3. Personnel Monitoring and Decontamination	II-42
4. Non-Essential Personnel Evacuation and Decontamination	II-42
5. Personnel Accountability	II-42
6. Protective Measures	II-42
7. Protective Action Recommendations and Bases	II-43
8. Evacuation Time Estimates	II-44
9. Implementation of Protective Measures	II-44
10. Protective Measures Implementation	II-44
11. Protective Measures Specified by the Commonwealth	II-46
12. Registering and Monitoring Evacuees	II-46

Contents

K. Radiological Exposure Control	II-48
1. On-Site Exposure Guidelines and Authorizations	II-48
2. Radiation Protection Program	II-49
3. Dosimetry and Dose Assessment	II-50
4. Commonwealth of Virginia and Risk Jurisdiction Responder Exposure Authorizations	II-50
5. Decontamination Action Levels	II-50
6. Contamination Control Measures	II-51
7. Decontamination of Relocated Site Personnel	II-51
L. Medical and Public Health Support	II-51
1. Hospital and Medical Support	II-51
2. On-Site First Aid Capability	II-52
3. Emergency Medical Facilities Within the Commonwealth	II-52
4. Medical Emergency Transportation	II-52
M. Recovery and Re-Entry	II-53
1. Recovery Plans and Procedures	II-53
2. Recovery Organization	II-53
3. Changes in Organizational Structure	II-54
4. Updating Total Population Exposure During Recovery Operations	II-54
N. Exercises and Drills	II-54
1. Exercises	II-55
2. Drills	II-56
3. Conduct of Drills and Exercises	II-58
4. Exercise and Drill Evaluation	II-58
5. Drill and Exercise Critiques	II-58
O. Radiological Emergency Response Training	II-59
1. General	II-59
2. Onsite Emergency Response Training	II-60
3. First Aid Team Training	II-60
4. Emergency Response Training and Qualification	II-60
5. Retraining	II-62

Contents

P. Responsibility for the Planning Effort	II-62
1. Training	II-62
2. Responsibility for Radiological Emergency Response Planning	II-62
3. Emergency Planning Coordinator	II-62
4. Plan Reviews and Updates	II-63
5. Distribution of Revised Plans	II-63
6. Supporting Plans	II-63
7. Implementing Procedures	II-64
8. Table of Contents	II-64
9. Emergency Plan Reviews	II-64
10. Emergency Telephone Numbers	II-65
 III. References and Appendices	
A. Cited References	III-1
B. Supplemental References	III-2
C. Appendices	III-5
 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–Implementing Procedures – Topical List	
Appendix 6–Emergency Equipment and Supplies	
Appendix 7–Certification Letters	
Appendix 8–Cross-Reference to Regulations, Guidance, and State and Local Plans	

Tables

Table II-1	Responsibility for Emergency Response Functions	II-9
Table II-2	Plant Staff Emergency Functions	II-17
Table II-3	Protective Action Guides	II-44
Table II-4	Emergency Worker Exposure Guidelines	II-49
Table A1-A	Recognition Category “A” Initiating Condition Matrix	A1-15
Table A1-C	Recognition Category “C” Initiating Condition Matrix	A1-27
Table A1-F-1	Recognition Category “F” Initiating Condition Matrix	A1-42
Table A1-F-2	EAL Fission Product Barrier Table Thresholds for LOSS or POTENTIAL LOSS of Barriers*	A1-44
Table A1-H	Recognition Category “H” Initiating Condition Matrix	A1-52
Table A1-S	Recognition Category “S” Initiating Condition Matrix	A1-73

Figures

Figure I-1	North Anna Site Plume Exposure Pathway EPZ	I-4
Figure I-2	North Anna Site Ingestion Exposure Pathway EPZ	I-5
Figure II-1	Emergency Response Organization Interrelationships	II-10
Figure II-2	North Anna Unit 3 Emergency Response Organization – On-Site	II-15
Figure II-3	North Anna Unit 3 Augmented Emergency Response Organization	II-16
Figure II-4	Routes to Assembly Areas.	II-47
Figure II-5	Radiological Monitoring Locations	II-48

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
COVERERP	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
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
REAC/TS	Radiation Emergency Assistance Center / Training Site
SPDS	Safety Parameter Display System
TEDE	Total Effective Dose Equivalent
TSC	Technical Support Center
UHF	Ultra High Frequency
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 19](#)). This plan uses the format “SSAR Section x.y.z” to identify content incorporated from Part 2 of the ESPA.

A. Purpose

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

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

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

B. Scope

This emergency plan applies to planning for and response to any radiological emergency condition at Unit 3. [Section II.D](#) describes the emergency classification system. [Appendix 1](#) identifies radiological emergency conditions and their initiating conditions.

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 General Electric - Hitachi (GEH) ESBWR as described in the ESBWR 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

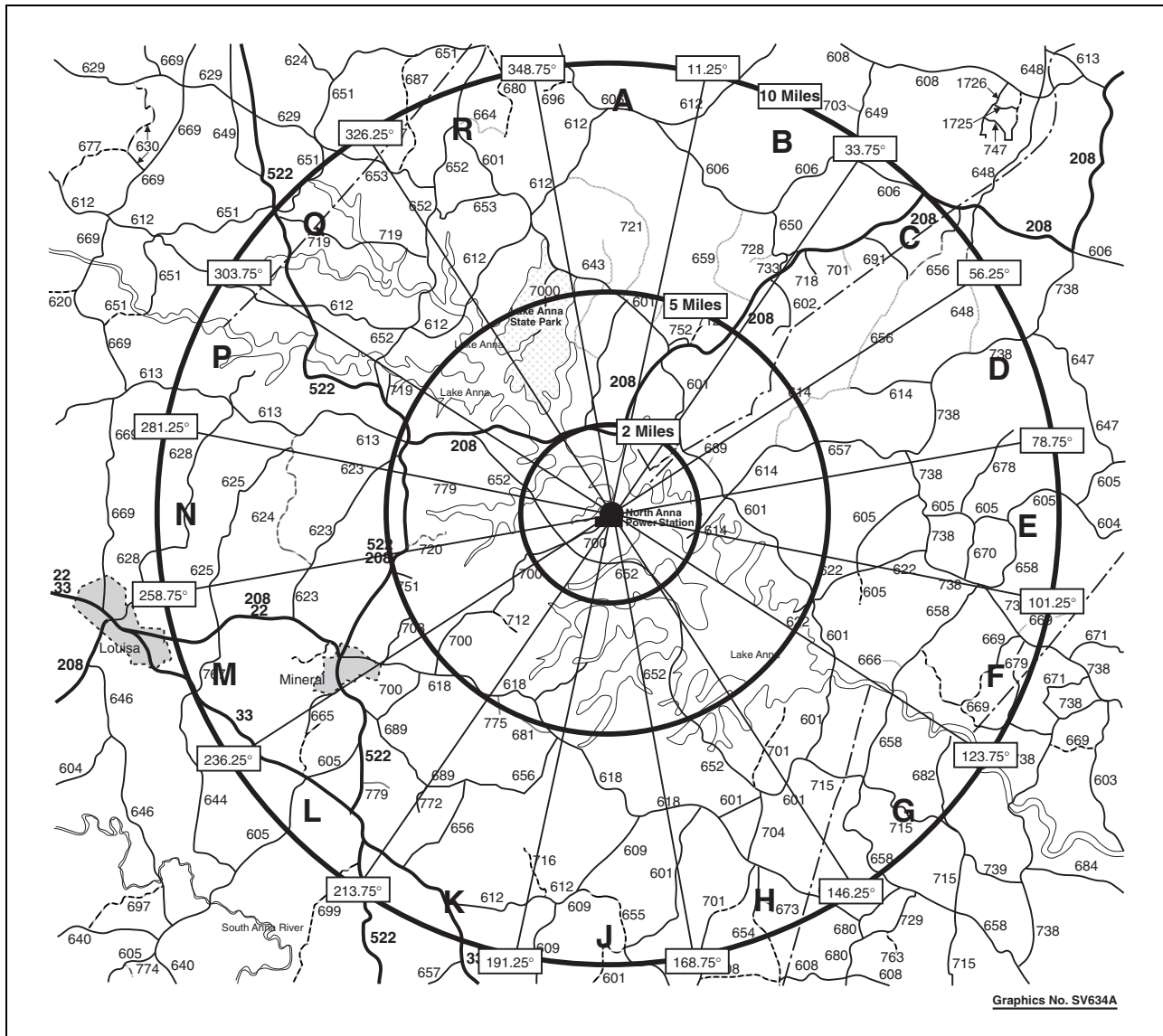
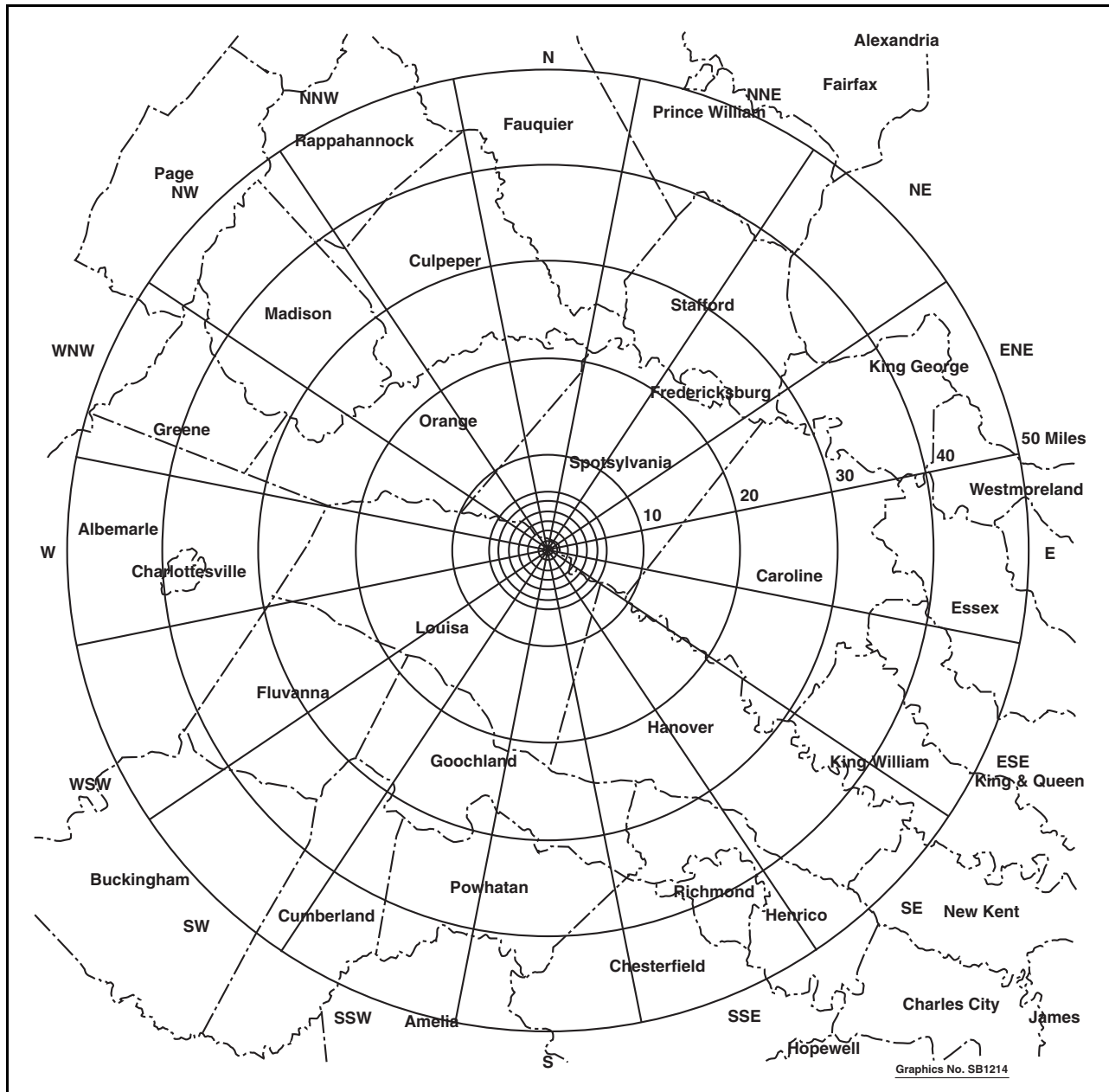


Figure I-2 North Anna Site Ingestion Exposure Pathway EPZ



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 and emergency procedures, including the Emergency Action Levels (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*¹, makes or directs initial

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.

notifications to affected plant staff 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)^{2,3,4}. 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.

-
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 COVRRP 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 copies of the certification letters 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 Plan ([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.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 locations⁵. 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

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 COVERP 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 COVERP and risk jurisdiction RERPs.

2. Functions, Responsibilities, and Legal Basis

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

3. Written Agreements

[Appendix 7](#) provides copies of the certification letters 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 Plan; therefore, no certification letters are required for these agencies.

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

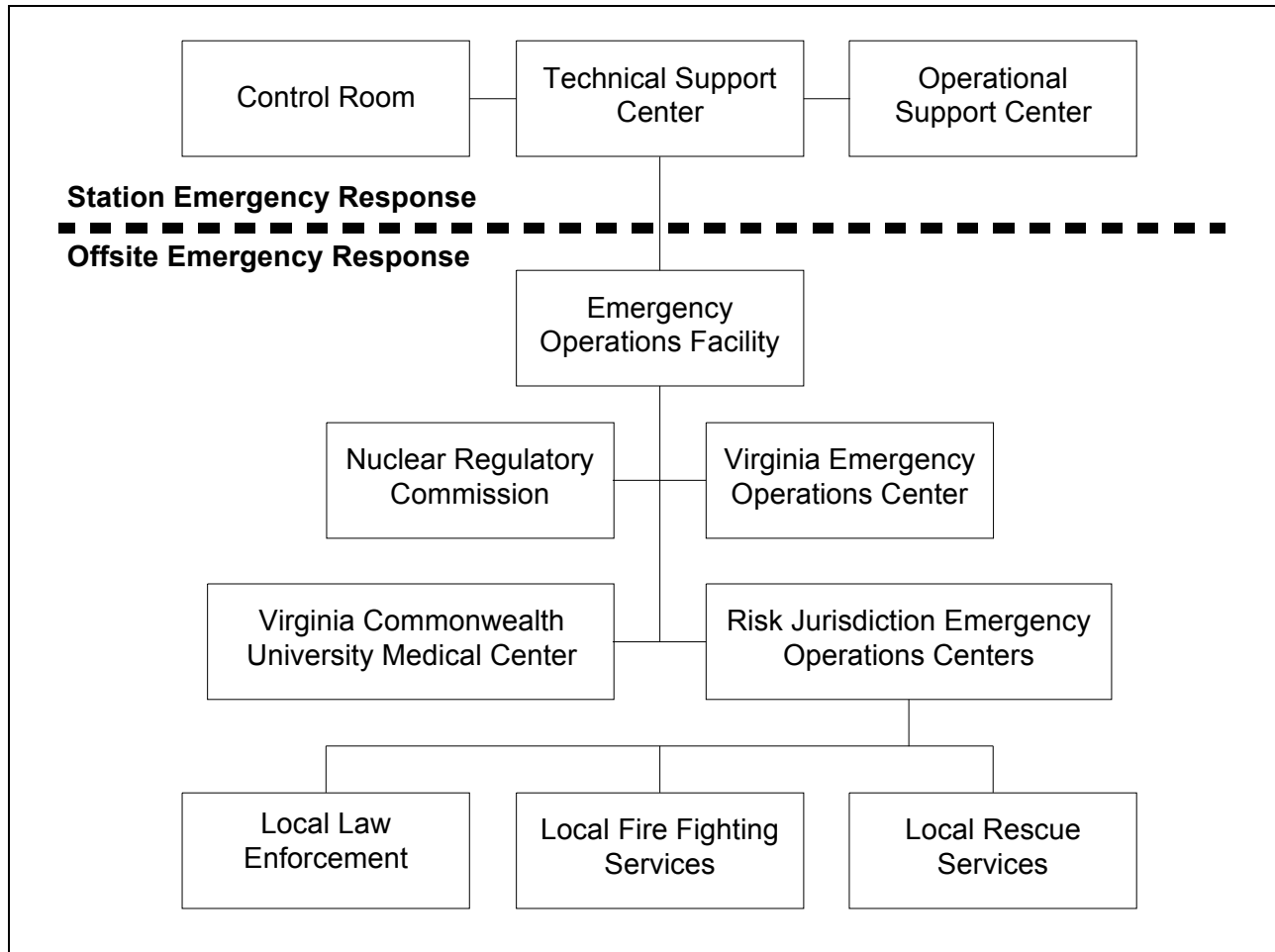
[Appendix 8](#) provides a cross-reference to the related provisions in the COVRERP and risk jurisdiction RERPs.

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). EIPs 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, GEH, provide technical support for emergency response activities. GEH 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 certification letters for organizations providing these services.

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

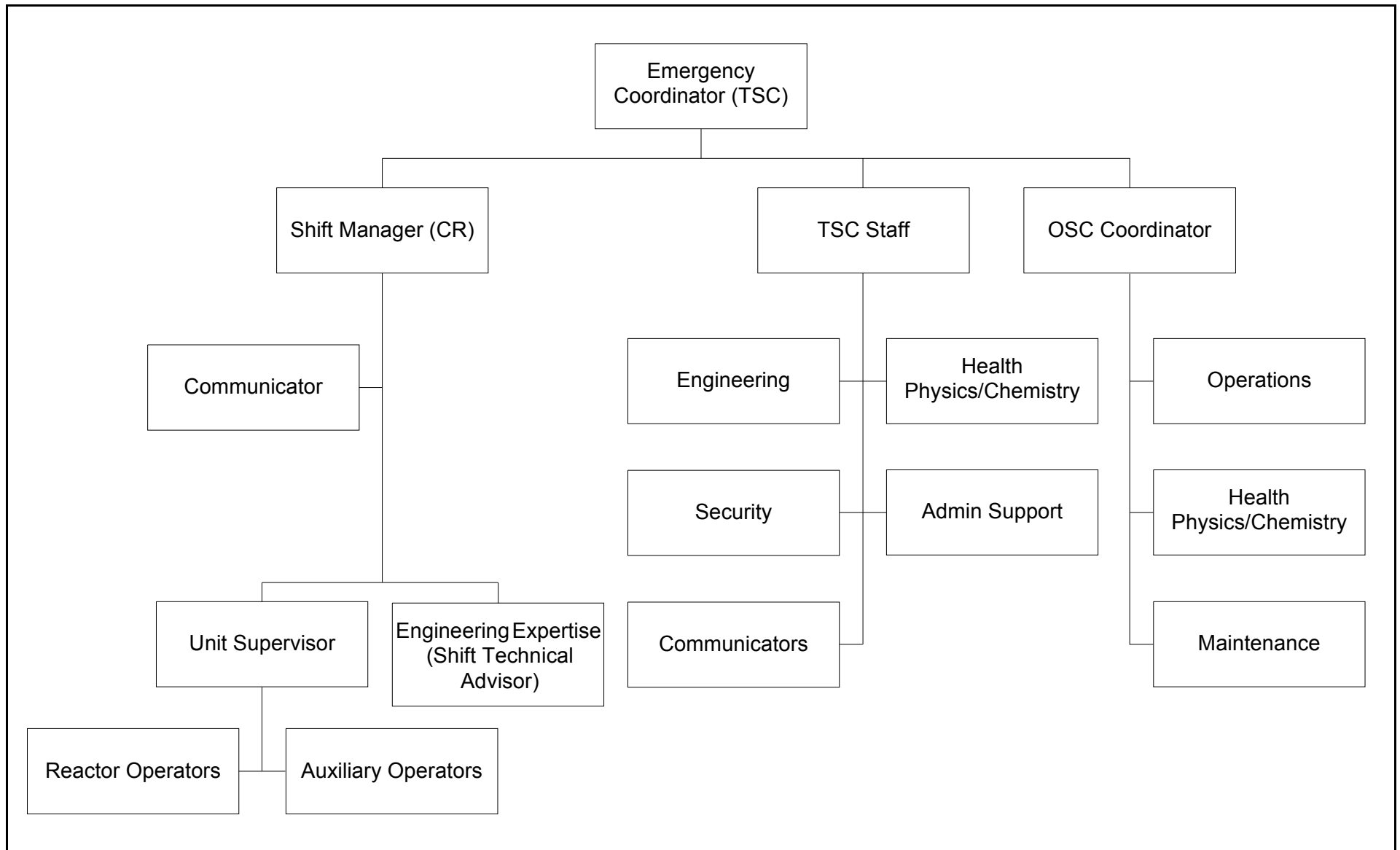


Figure II-3 North Anna Unit 3 Augmented Emergency Response Organization

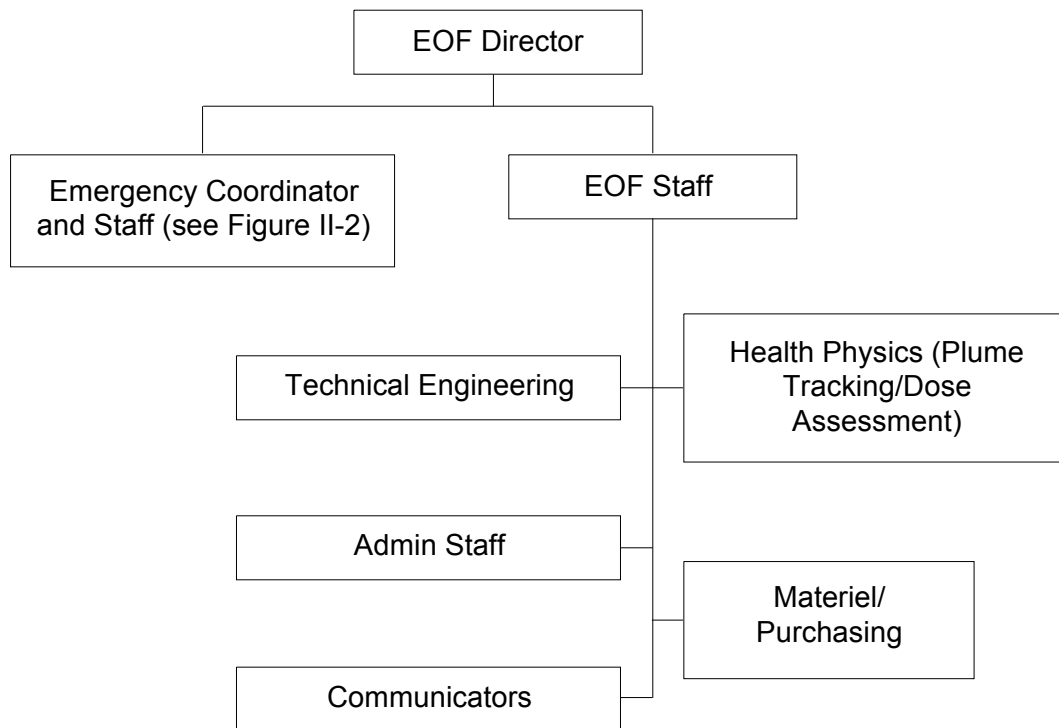


Table II-2 Plant Staff Emergency Functions

Major Functional Area	Major Tasks	Position, Title, or Expertise	On Shift ^{2,3}	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 ¹		
Notification and Communication	Notify licensee, Commonwealth of Virginia, risk jurisdiction, and Federal personnel and maintain communication	Emergency Communicator	1 ⁴	1 ⁴	2 ⁴
Radiological Accident Assessment and Support of Operational Accident Assessment	EOF Director	Senior Manager			1
	Dose Assessment	Radiological Assessment Coordinator		1	
	Off-site surveys			2 ⁴	2 ⁴
	On-site (out of plant)	HP Technicians		1 ⁴	1 ⁴
	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 ^{2,3}	Capability for Additions	
				Approx 45 min	Approx 60 min
Plant System Engineering, Repair and Corrective Actions	Technical Support	Shift Technical Advisor function ⁵	1		
		Technical Support Team Member (Core and Thermal Hydraulics)			1 ⁶
		Technical Support Team Member (Electrical)			1
		Technical Support Team Member (Mechanical)			1
	Repair and Corrective Actions	Damage Control Team Member (Mechanical Maintenance)	1 ¹		2
		Damage Control Team Member (Electrical Maintenance)	1 ¹	1	1
		Damage Control Team Member (Instrumentation and Control)		1	
Protective Actions (In-Plant)	Radiation Protection a. Access Control b. HP Coverage for repair, corrective actions, search and rescue, first aid, and firefighting c. Personnel monitoring d. Dosimetry	HP Technicians	2 ¹	2 ⁴	2 ⁴
Firefighting	Firefighting	Fire Team Members	Per FSAR	Local Support	
Rescue Operations and First Aid	First Aid	First Aid Team Member	2 ^{1, 4}	Local Support	

Table II-2 Plant Staff Emergency Functions

Major Functional Area	Major Tasks	Position, Title, or Expertise	On Shift ^{2,3}	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			
Totals			16	10	16

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 directly or 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). Certification letters, provided in [Appendix 7](#), outline the scope of the expected support.

D. Emergency Classification System

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

The description of the emergency classification system in [SSAR Section 13.3.2.2.d](#) is incorporated by reference.

1. Classification System

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

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

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

- 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.

- 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.

- 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.

[Appendix 1](#) provides recognition categories, the associated initiating condition matrices, and the emergency action levels.

2. Emergency Action Levels

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

Dominion adopts the methodology provided in NEI 07-01, Rev. 0. Because this document has not yet been endorsed by the NRC, EALs contained in this plan are subject to further review and modification based on the version of NEI 07-01 ultimately endorsed in a future revision to USNRC Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors ([Reference 14](#)) or other accepted guidance, modified consistent with the improvements to facility design and operation as reflected in the ESBWR DCD. [Appendix 1](#) provides 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 COVERP 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.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.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 ESBWR 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 COVRRP 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 COVRRP 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 COVRRP and risk jurisdiction RERPs.

- d. 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 COVRRP and risk jurisdiction RERPs.

- e. 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 COVRRP and risk jurisdiction RERPs.

- f. Dominion provides for communications between Control Room/TSC/EOF and the NRC Operations Center via dedicated telephone lines.
- g. 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 COVRRP 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 COVRRP 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.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 COVERP 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 COVERP 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 COVERP 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 COVERP 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 COVERP 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 electrical building. The ESBWR 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 26 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 by the Human-System Interface (HSI). The HSI function is described in [DCD Section 18.8](#).

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.

The EOF is located at Dominion's Innsbrook Technical Center in Glen Allen, Virginia, approximately 30 miles from Unit 3. Because the proposed location of the EOF involves an exception to the guidance in NUREG-0696 for locating an EOF within 20 miles of the TSC, Dominion is requesting NRC approval of the proposed location for the EOF. This request 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, risk jurisdiction, 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.5](#) provides a description of emergency response organization training and qualification.

The size of the EOF is sufficient to support 35 people. The location of the EOF precludes the necessity of providing radiation monitoring systems.

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

The EOF draws its primary power from commercial power. There is electrical generator backup power to the EOF. A loss of commercial power should not impact any of the voice or data communications equipment located in the 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 by the Human-System Interface (HSI). The HSI function is described in [DCD Section 18.8](#).

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 follows⁶:

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

- 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 EIPs. The descriptions of ERF notification and staffing provided in [SSAR Sections 13.3.2.2.2.e.2](#) and [13.3.2.2.2.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.

[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.

- [Sections 3.7.4](#) of the FSAR and the [DCD](#) provide a description of the seismic monitoring system.
- [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](#).
- [Sections 11.5](#) of the FSAR and the [DCD](#) provide description of the plant process monitoring systems.
- [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

- 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.

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

2. Plant Monitoring Systems

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

3. Determination of Source Term and Radiological Conditions

- a. [Appendix 2](#) and plant procedures provide means for relating various measured parameters, including containment radiation monitor reading, to the source term available for release within plant systems.

- b. [Appendix 2](#) and plant procedures provide means for relating various measured parameters, including effluent monitor readings, to the magnitude of the release of radioactive materials.

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](#) and [Appendix 2](#) provides 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.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 COVERP 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 COVERP 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 COVERP.

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 COVERP.

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 COVERP.

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. The Emergency Action Levels correspond to the projected dose to the population at risk and are determined consistent with the methodology discussed in NEI 07-01.

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		Protective Action Recommendation
Total Effective Dose Equivalent (TEDE)	Committed Dose Equivalent Thyroid (CDE Thyroid)	
< 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

- 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 COVERP 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 COVERP and risk jurisdiction RERPs.
- l. 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 COVERP 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 COVERP.

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 COVERP.

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 COVERP and risk jurisdiction RERPs.

Figure II-4 Routes to Assembly Areas

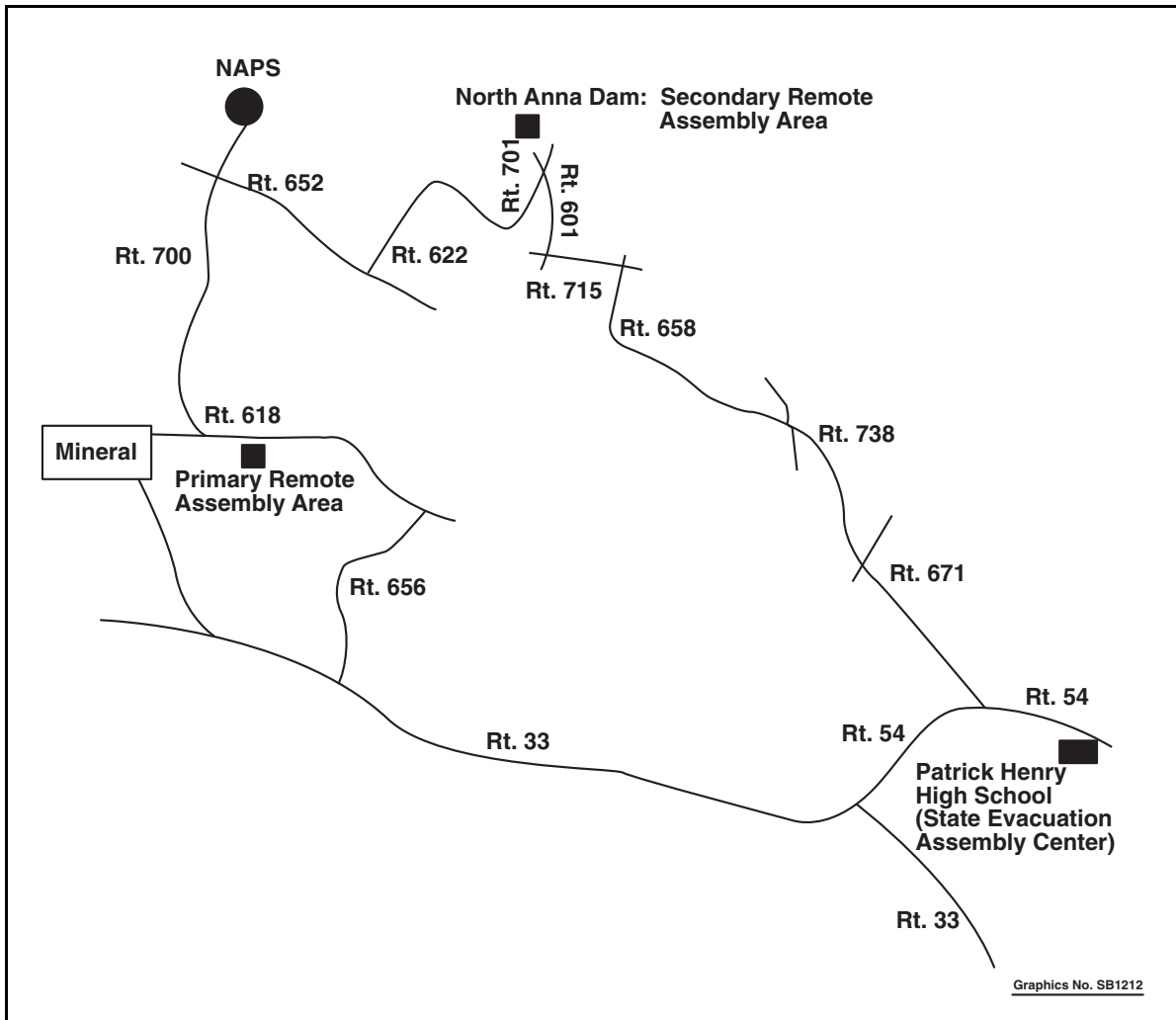
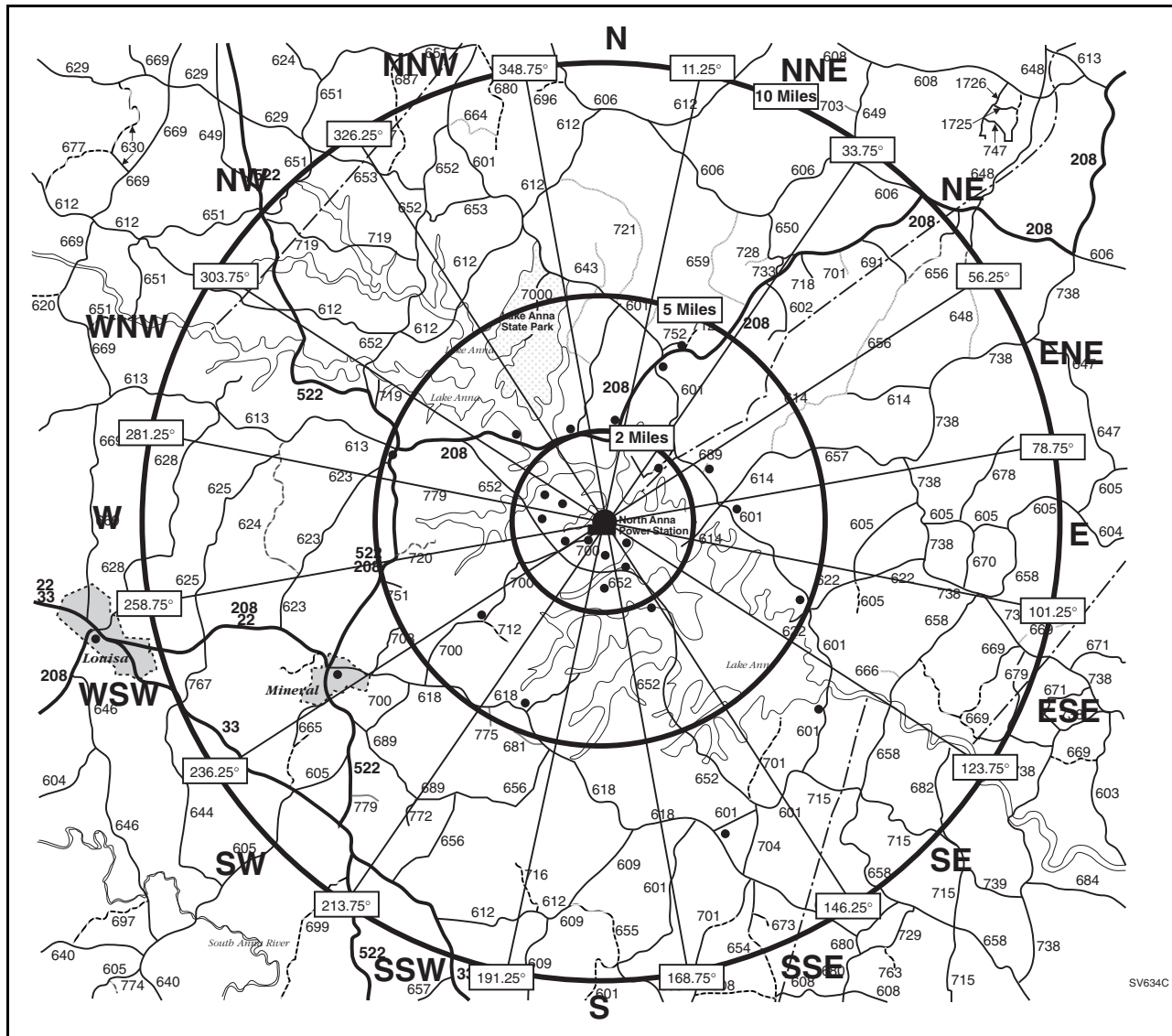


Figure II-5 Radiological Monitoring Locations



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 ^{Note 1}	>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 EIPs, 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 COVERP 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 COVERP 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 COVERP 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 COVERP 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 COVERERP 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 copies of the relevant certification letters.

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

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 EIPs.

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 COVERP. |

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 COVERP. |

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 COVERP 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.

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

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 COVERP 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 Emergency Planning Coordinator 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 COVERP 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 COVERP 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 COVERP 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 13.3.2.2.2.p](#) are incorporated by reference.

1. Training

Dominion develops and implements a process to provide training to the *Emergency Planning Coordinator* 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. Emergency Planning Coordinator

Dominion establishes an *Emergency Planning Coordinator* 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 *Emergency Planning Coordinator* 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 *Emergency Planning Coordinator* 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 *Emergency Planning Coordinator* (or designee) incorporates any necessary changes. Changed pages are marked and dated to highlight the changes. The *Emergency Planning Coordinator* 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 *Emergency Planning Coordinator* certifies the plan to be current.

[Appendix 8](#) provides a cross-reference to the related provisions in the COVERP 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 COVERP 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 EIPs that support this plan.

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

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

8. Table of Contents

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

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

9. Emergency Plan Reviews

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

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

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 *Emergency Planning Coordinator* 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. GE Nuclear Energy, "ESBWR Design Control Document," Revision 5, May 2008. |
10. North Anna Power Station Unit 3 Final Safety Analysis Report, Revision 1, November 2008. |
11. U.S. Department of Energy, "Federal Radiological Monitoring and Assessment Center Operations Plan," DOE/NV 11718-080, December 2005.
12. U.S. Department of Homeland Security, "National Response Plan," December 2004.
13. Nuclear Energy Institute, "Methodology for Development of Emergency Action Levels, Advanced Passive Light Water Reactors," NEI 07-01, Rev. 0, September 2007.

14. U.S. Nuclear Regulatory Commission, "Emergency Planning and Preparedness for Nuclear Power Reactors," Regulatory Guide 1.101, Revision 3, August 1992.
15. U.S. Environmental Protection Agency, "Manual of Protective Action Guides for Nuclear Incidents," EPA-400-R-92-001, 1991.
16. KLD Associates, Inc., "Development of Evacuation Time Estimates for North Anna Power Station," Revision 1, September 2008.
17. U.S. Nuclear Regulatory Commission, "Development of Evacuation Time Estimate Studies for Nuclear Power Plants," NUREG/CR-6863, January 2005.
18. 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.
19. 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 93-53 – Effect of Hurricane Andrew on Turkey Point Nuclear Generating Station and Lessons Learned
20. USNRC IN 2004-19 – Problems Associated with Back-Up Power Supplies to Emergency Response Facilities and Equipment
21. USNRC IN 2002-14 – Ensuring a Capability to Evacuate Individuals, Including Members of the Public, from the Owner-Controlled Area
22. USNRC IN 88-15 – Availability of USFDA-Approved Potassium Iodide for Use in Emergencies Involving Radioactive Iodine
23. USNRC IN 96-19 – Failure of Tone alert Radios to Activate When Receiving a Shortened Activation Signal
24. USNRC IN 2002-25 – Challenges to Licensees’ Ability to Provide Prompt Public Notification and Information During an Emergency Preparedness Event
25. USNRC IN 2005-06 – Failure to Maintain Alert and Notification System Tone Alert Radio Capability
26. USNRC RIS 01-016 – Update of Evacuation Time Estimates
27. USNRC RIS 2003-12 – Clarification of NRC Guidance for Modifying Protective Actions
28. USNRC RIS 2004-13 - Consideration of Sheltering in Licensee's Range of Protective Action Recommendations, including Supplement 1
29. USNRC RIS 2005-08 – Endorsement of NEI Guidance “Range of Protective Actions for Nuclear Power Plant Incidents”

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

C. Appendices

Appendix 1 - Emergency Action Levels and Initiating Conditions

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

Appendix 3 - Public Alert and Notification System

Appendix 4 - Evacuation Time Estimates (summary)

Appendix 5 - Emergency Plan Implementing Procedures – Topical List

Appendix 6 - Emergency Equipment and Supplies

Appendix 7 - Certification Letters

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

Appendix 1–Emergency Action Levels

EXECUTIVE SUMMARY

This appendix provides the set of Emergency Action Levels and Initiating Conditions based on industry guidance provided in NEI 07-01, "Methodology for Development of Emergency Action Levels, Advanced Passive Light Water Reactors," Rev. 0 Draft September 2007. Emergency Action Levels are presented by Recognition Category:

- A - Abnormal Rad Levels/Radiological Effluent
- C - Cold Shutdown/Refueling System Malfunction
- F - Fission Product Barrier Degradation
- H - HAZARDS or OTHER Conditions Affecting Plant Safety
- S - System Malfunction

Each of these Recognition Categories is structured in the following way:

- Recognition Category - As described above.
- Emergency Class – Notice of Unusual Event (NOUE), Alert, Site Area Emergency or General Emergency.
- Initiating Condition - Symptom- or Event-Based, Generic Identification and Title.
- Operating Mode Applicability - Power Operation, Hot Standby, Safe/Stable Shutdown, Cold Shutdown, Refueling, Defueled, All, or Not Applicable.
- Emergency Action Level(s) corresponding to the IC.
- Basis information for plant-specific readings and factors that may relate to changing the generic IC or EAL to a different emergency class, such as for Loss of All AC Power.

For Recognition Category F, the information is presented in a matrix format. The presentation method was chosen to clearly show the synergism among the Emergency Action Levels and to support more accurate dynamic assessments. For Recognition Category F, the Emergency Action Levels are arranged by safety function or fission product barrier. Classifications are based on various combinations of safety function or fission product barrier challenges.

The primary threshold for Notification of Unusual Event as operation outside the safety envelope for the plant as defined by plant Technical Specifications, including LCOs and Action Statement Times. In addition, certain precursors of more serious events such as earthquakes are included in Notification of Unusual Event Emergency Action Levels. This provides a clear demarcation between the lowest emergency class and "non-emergency" notifications specified by 10 CFR 50.72.

The approved Design Certification does not include detailed design data for those items specific to a site location. In many cases this data is necessary to determine EAL thresholds. In these cases this document provides a [site specific] placeholder.

The approved Design Certification does not include some detailed design information such as setpoints and some instrument numbers which are being developed by GEH. In many cases this data is necessary to determine EAL thresholds. Appropriately, this document provides a [TBD] placeholder for future inclusion. This applies to certain site specific values, as well. Development of the site specific EAL scheme was based on this concept.

ACRONYMS

AC	Alternating Current
APRM	Average Power Range Monitor
CDE	Committed Dose Equivalent
CET	Core Exit Thermocouple
CFR	Code of Federal Regulations
Ci	Curie
CMT/CNMT	Containment
CSF	Critical Safety Function
DC	Direct Current
DG	Diesel Generator
EAL	Emergency Action Level
EOF	Emergency Operations Facility
EOP	Emergency Operating Procedure
EPA	Environmental Protection Agency
EPG	Emergency Procedure Guideline
EPIP	Emergency Plan Implementing Procedure
EPRI	Electric Power Research Institute
ERG	Emergency Response Guideline
FAA	Federal Aviation Administration
FAQ	Frequently Asked Question
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FSAR	Final Safety Analysis Report
GE	General Emergency
HCTL	Heat Capacity Temperature Limit
IC	Initiating Condition
IRWST	In Containment Refueling Water Storage Tank
Keff	Effective Neutron Multiplication Factor
LCO	Limiting Condition of Operation

ACRONYMS

LOCA	Loss of Coolant Accident
LWR	Light Water Reactor
MCR	Main Control Room
MSL	Main Steam Line
MSIV	Main Steam Isolation Valve
mR	milliRoentgen
Mw	Megawatt
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NOUE	Notification of Unusual Event
OBE	Operating Basis Earthquake
ODCM	Off-site Dose Calculation Manual
PA	Protected Area
PAG	Protective Action Guideline
PIP	Plant Investment Protection
PLS	Plant Control System
POAH	Point of Adding Heat
PRA/PSA	Probabilistic Risk Assessment / Probabilistic Safety Assessment
PWR	Pressurized Water Reactor
psig	Pounds per Square Inch Gauge
Q-DCIS	Safety Related Distributed Control and Information System
R	Rem
RCS	Reactor Coolant System
RMS	Radiation Monitoring System
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RWCU/SDC	Reactor Water Cleanup/Shutdown Cooling System
SAG	Severe Accident Guideline
SCBA	Self Contained Breathing Apparatus

ACRONYMS

SBGTS	Stand-By Gas Treatment System
SPDS	Safety Parameter Display System
SRNM	Source Range Neutron Monitor
SRO	Senior Reactor Operator
SSE	Safe Shutdown Earthquake
TEDE	Total Effective Dose Equivalent
TBD	To Be Determined
TOAF/TAF	Top of Active Fuel
TSC	Technical Support Center

1.0 METHODOLOGY FOR DEVELOPMENT OF EMERGENCY ACTION LEVELS

This appendix provides the set of Emergency Action Levels and Initiating Conditions based on industry guidance provided in NEI 07-01, "Methodology for Development of Emergency Action Levels, Advanced Passive Light Water Reactors," Rev. 0 Draft September 2007.

The approved Design Certification does not include detailed design data for those items specific to a site location. In many cases this data is necessary to determine EAL thresholds. In these cases this document provides a [site specific] placeholder.

The approved Design Certification does not include some detailed design information such as setpoints and some instrument numbers which are being developed by GEH. In many cases this data is necessary to determine EAL thresholds. Appropriately, this document provides a [TBD] placeholder for future inclusion. This applies to certain site specific values, as well. Development of the site specific EAL scheme was based on this concept.

2.0 CHANGES

Reserved.

3.0 DEVELOPMENT OF BASIS FOR GENERIC APPROACH

The Emergency Action Levels (EALs) and Initiating Conditions (ICs) provided in this appendix address the emergency classification scheme discussed in [Section II.D](#). In addition to radiological events, non-radiological events are included in the classification scheme only to the extent that these events represent challenges to the continued safety of the reactor plant and its operators. There are existing reporting requirements (EPA, OSHA) under which utilities operate. There are also requirements for emergency preparedness involving hazardous chemical releases. While the proposed classification structure could be expanded to include these non-radiological hazards, these events are beyond the scope of this document.

This classification scheme is based on the four classification levels described in [Section II.D](#).

3.1 Emergency Action Levels

ICs/EALs are for unplanned events. A planned evolution involves preplanning to address the limitations imposed by the condition, the performance of required surveillance testing, and the implementation of specific controls prior to knowingly entering the condition. Planned evolutions to test, manipulate, repair, or perform maintenance or modifications to systems and equipment that result in an EAL Threshold Value being met or exceeded are not subject to classification and activation requirements as long as the evolution proceeds as planned. However, these conditions may be subject to the reporting requirements of 10 CFR 50.72.

Classifications are based on evaluation of each Unit. All classifications are to be based upon VALID indications, reports or conditions. Indications, reports or conditions are considered VALID when

they are verified by 1) an instrument channel check, or 2) indications on related or redundant indications, or 3) by direct observation by plant personnel, such that doubt related to the indication's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

With the emergency classes defined, the thresholds that must be met for each EAL to be placed under the emergency class can be determined. There are two basic approaches to determining these EALs. EALs and emergency class boundaries coincide for those continuously measurable, instrumented ICs, such as radioactivity, core temperature, coolant levels, etc. For these ICs, the EAL will be the threshold reading that most closely corresponds to the emergency class description using the best available information.

The Emergency Coordinator must remain alert to events or conditions that lead to the conclusion that exceeding the EAL threshold is IMMINENT. Under certain plant conditions, an alternate instrument or a temporary instrument may be installed to facilitate monitoring the parameter. In addition, visual observation may be sufficient to detect that a parameter is approaching or has reached a classifiable threshold. In these cases, the classification of the event is appropriate even if the instrument normally used to monitor the parameter is inoperable or has otherwise failed to detect the threshold. If, in the judgment of the Emergency Coordinator, an IMMINENT situation is at hand, the classification should be made as if the threshold has been exceeded.

For discrete (discontinuous) events, the approach will have to be somewhat different. Typically, in this category are internal and external hazards such as FIRE or earthquake. The purpose for including hazards in EALs is to assure that station personnel and off-site emergency response organizations are prepared to deal with consequential damage these hazards may cause. If, indeed, hazards have caused damage to safety functions or fission product barriers, this should be confirmed by symptoms or by observation of such failures. Therefore, it may be appropriate to enter an Alert status for events approaching or exceeding design basis limits such as Operating Basis Earthquake, design basis wind loads, FIRE within VITAL AREAs, etc. This would give the operating staff additional support and improved ability to determine the extent of plant damage. If damage to barriers or challenges to Critical Safety Functions (CSFs) have occurred or are identified, then the additional support can be used to escalate or terminate the Emergency Class based on what has been found. Security events must reflect potential for increasing security threat levels.

The Emergency Operating Procedures (EOPs) contain detailed instructions regarding the monitoring of these functions and provides a scheme for classifying the significance of the challenge to the functions. In providing EALs based on these schemes, the emergency classification can flow from the EOP assessment rather than being based on a separate EAL assessment. This is desirable as it reduces ambiguity and reduces the time necessary to classify the event.

3.2 Treatment of Multiple Events and Emergency Class Upgrading

When multiple simultaneous events occur, the emergency classification level is based on the highest EAL reached. For example, two Alerts remain in the Alert category. Or, an Alert and a Site Area Emergency is a Site Area Emergency.

Although the majority of the EALs provide very specific thresholds, the Emergency Coordinator must remain alert to events or conditions that lead to the conclusion that exceeding the EAL threshold is IMMINENT. If, in the judgment of the Emergency Coordinator, an IMMINENT situation is at hand, the classification should be made as if the threshold has been exceeded. While this is particularly prudent at the higher emergency classes (as the early classification may provide for more effective implementation of protective measures), it is nonetheless applicable to all emergency classes.

3.3 Classifying Transient Events

There may be cases in which a plant condition that exceeded an EAL threshold was not recognized at the time of occurrence, but is identified well after the condition has occurred (e.g., as a result of routine log or record review) and the condition no longer exists. In these cases, an emergency should not be declared.

Reporting requirements of 10 CFR 50.72 are applicable and the guidance of NUREG-1022, Event Reporting Guidelines 10 CFR 50.72 and 50.73, should be applied.

Existing guidance for classifying transient events addresses the period of time of event recognition and classification (15 minutes). However, in cases when an EAL declaration criterion may be met momentarily during the normal expected response of the plant, declaration requirements should not be considered to be met when the conditions are a part of the designed plant response or result in appropriate operator actions.

3.4 Operating Mode Applicability

The plant operating mode that existed at the time that the event occurred, prior to any protective system or operator action initiated in response to the condition, is compared to the mode applicability of the EALs. If an event occurs, and a lower or higher plant operating mode is reached before the emergency classification can be made, the declaration shall be based on the mode that existed at the time the event occurred.

For events that occur in Cold Shutdown or Refueling, escalation is via EALs that have Cold Shutdown or Refueling for mode applicability, even if Safe/Stable Shutdown (or a higher mode) is entered during any subsequent heatup. In particular, the Fission Product Barrier Matrix EALs are applicable only to events that initiate in Safe/Stable Shutdown or higher.

3.1.1 ESBWR Operating Modes

Power Operations (1)	Mode Switch in Run
Startup (2)	Mode Switch in Startup or Refuel
Hot Shutdown (3)	Mode Switch in Shutdown, Average Reactor Coolant Temperature greater than 420°F
Stable Shutdown (4)	Mode Switch in Shutdown, Average Reactor Coolant Temperature less than or equal to 420°F and greater than 200°F
Cold Shutdown (5)	Mode Switch in Shutdown, Average Reactor Coolant Temperature less than or equal to 200°F
Refueling (6)	Mode Switch in Shutdown or Refuel, and one or more vessel head bolts less than fully tensioned.
Defueled (None)	All reactor fuel removed from reactor pressure vessel

4.0 HUMAN FACTORS CONSIDERATIONS

Human factors considerations were included in the development of NEI 07-01.

5.0 EMERGENCY ACTION LEVELS

This section of the appendix specifies each IC and EAL including basis information.

5.1 Generic Arrangement

The information is presented by Recognition Categories:

- A - Abnormal Rad Levels/Radiological Effluent
- C - Cold Shutdown/Refueling System Malfunction
- F - Fission Product Barrier Degradation
- H - HAZARDS or OTHER Conditions Affecting Plant Safety
- S - System Malfunction

The Initiating Conditions for each of the above Recognition Categories are in the order of NOUE, Alert, Site Area Emergency, and General Emergency. For all Recognition Categories, an Initiating Condition matrix versus Emergency Class is first shown. For Recognition Category F, the barrier-based EALs are presented in Table A1-F-2.

With the exception of Recognition Category F, each of the EAL guides in Recognition Categories is structured in the following way:

- Recognition Category - As described above.
- Emergency Class - NOUE, Alert, Site Area Emergency or General Emergency.

- Initiating Condition – Symptom- or Event-Based, Generic Identification and Title.
- Operating Mode Applicability - These modes are defined in the Technical Specifications.
- Emergency Action Level(s) – These EALs are conditions and indications that were considered to meet the criteria of the IC.
- Basis – Provides information that explains the IC and EALs. The bases are written to assist the personnel developing operator aids and procedures.

For Recognition Category F, basis information is presented in a format consistent with [Table A1-F-1](#) and A1-F-2. The presentation method shown for Fission Product Barrier Function Matrix was chosen to clearly show the synergism among the EALs and to support more accurate dynamic assessments.

5.2 Generic Bases

The primary threshold for NOUEs is operation outside the safety envelope for the plant as defined by plant Technical Specifications, including LCOs and Action Statement Times. In addition, certain precursors of more serious events are included in NOUE IC/EALs. This provides a clear demarcation between the lowest emergency class and “non-emergency” notifications specified by 10 CFR 50.72.

For a number of Alerts, IC/EALs are chosen based on hazards which may cause damage to plant safety functions (i.e., tornadoes, hurricanes, FIRE in plant VITAL AREAs) or require additional help directly (Control Room evacuation) and thus increased monitoring of the plant is warranted. The symptom-based and barrier-based IC/EALs are sufficiently anticipatory to address the results of multiple failures, regardless of whether there is or is not a common cause. Declaration of the Alert will already result in the staffing of the TSC for assistance and additional monitoring. Thus, direct escalation to the Site Area Emergency is unnecessary. Other Alerts, that have been specified, correspond to conditions which are consistent with the emergency class description.

The basis for declaring a Site Area Emergency and General Emergency is primarily the extent and severity of fission product barrier challenges, based on plant conditions as presently known or as can be reasonably projected.

With regard to the Hazards Recognition Category, the existence of a hazard that represents a potential degradation in the level of safety of the plant is the basis of NOUE classification. If the hazard results in VISIBLE DAMAGE to plant structures or equipment associated with safety systems or if system performance is affected, the event may be escalated to an Alert. The reference to “duration” or to “damage” to safety systems is intended only to size the event. Consequential damage from such hazards, if observed, would be the basis for escalation to Site Area Emergency or General Emergency, by entry to System Malfunction or Fission Product Barrier IC/EALs.

5.3 Site-Specific Implementation

Reserved.

5.4 Definitions

In the IC/EALs, selected words have been set in all capital letters. These words are defined terms having specific meanings as they relate to this procedure. Definitions of these terms are provided below:

BOMB: An explosive device suspected of having sufficient force to damage plant systems or structures.

CIVIL DISTURBANCE: A group of persons violently protesting station operations or activities at the site.

CONTAINMENT CLOSURE: (The Tech. Spec. [Section 3.6](#) required and site-specific procedurally defined action taken to secure primary or the Reactor Building and the associated structures, systems, and components as a functional barrier to fission product release under existing plant conditions.

EXPLOSION: A rapid, violent, unconfined combustion, or catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures, systems, or components.

FIRE: Combustion characterized by heat and light. Sources of smoke, such as slipping drive belts or overheated electrical equipment do not constitute FIRES. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

HOSTAGE: A person(s) held as leverage against the station to ensure that demands will be met by the station.

HOSTILE ACTION: An act toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take HOSTAGES, and/or intimidates the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the nuclear power plant. Non-terrorism-based EALs should be used to address such activities, (i.e., violent acts between individuals in the OWNER CONTROLLED AREA).

HOSTILE FORCE: One or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.

IMMINENT: Mitigation actions have been ineffective, additional actions are not expected to be successful, and trended information indicates that the event or condition will occur. Where “IMMINENT” timeframes are specified, they shall apply.

NORMAL PLANT OPERATIONS: Activities at the plant site associated with routine testing, maintenance, or equipment operations, in accordance with normal operating or administrative procedures. Entry into abnormal or emergency operating procedures, or deviation from normal security or radiological controls posture, is a departure from NORMAL PLANT OPERATIONS.

POINT OF ADDING HEAT: A reactor power level at which sufficient energy is being added to the reactor coolant from the reactor to result in a bulk coolant temperature increase. [This value may vary slightly based on plant core loading and time of life.]

PROJECTILE: An object directed toward a nuclear power plant that could have an effect sufficient to cause concern for its continued operability, reliability, or safety of personnel.

PROTECTED AREA: Typically, the area which normally encompasses all controlled areas within the security PROTECTED AREA fence.

REACTOR BUILDING ISOLATION: See CONTAINMENT CLOSURE.

SECURITY CONDITION: Any security event as listed in the approved security contingency plan that constitutes a threat/compromise to site security, threat/risk to site personnel, or a potential degradation to the level of safety of the plant. A SECURITY CONDITION does not involve a HOSTILE ACTION.

SIGNIFICANT TRANSIENT: (ESBWR) [TBD].

STRIKE ACTION: A work stoppage within the PROTECTED AREA by a body of workers to enforce compliance with demands made on (site-specific). The STRIKE ACTION must threaten to interrupt NORMAL PLANT OPERATIONS.

UNISOLABLE: A breach or leak that cannot be promptly isolated.

UNPLANNED: A parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

VALID: An indication, report, or condition, is considered to be VALID when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator’s operability, the condition’s existence, or the report’s accuracy is removed. Implicit in this definition is the need for timely assessment.

VISIBLE DAMAGE: Damage to equipment or structure that is readily observable without measurements, testing, or analysis. Damage is sufficient to cause concern regarding the continued operability or reliability of affected structure, system, or component. Example

damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, paint blistering. Surface blemishes (e.g., paint chipping, scratches) should not be included.

VITAL AREA: Any area, normally within the PROTECTED AREA, which contains equipment, systems, components, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

5.5 Abnormal Rad Levels/Radiological Effluent EALs

Table A1-A Recognition Category “A” Initiating Condition Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	NOUE
AG1 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. <i>Op. Modes: All</i>	AS1 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. <i>Op. Modes: All</i>	AA1 Any Release of Gaseous or Liquid Radioactivity to the Environment Greater Than 200 Times the Off-site Dose Calculation Manual for 15 Minutes or Longer. <i>Op. Modes: All</i>	AU1 Any Release of Gaseous or Liquid Radio-activity to the Environment Greater Than Two Times the Off-site Dose Calculation Manual for 60 Minutes or Longer. <i>Op. Modes: All</i>
		AA3 Rise in Radiation Levels Within the Facility that Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown <i>Op. Modes: All</i>	AU2 UNPLANNED Rise in Plant Radiation Levels. <i>Op. Modes: All</i>
		AA2 Damage to Irradiated Fuel or Loss of Water Level that Has Resulted or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel. <i>Op. Modes: All</i>	

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

AU1

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Any Release of Gaseous or Liquid Radioactivity to the Environment Greater Than 2 Times the Off-site Dose Calculation Manual for 60 Minutes or Longer.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2 or 3)

Note: *The Emergency Coordinator 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.*

1. VALID reading on any of the following radiation monitors greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.

Plant Stack	D11-PRM-RMS-13	[TBD]
Liquid Radwaste Discharge	D11-PRM-RMS-11	[TBD]
Isolation Condenser Vent Exhaust	D11-PRM-RMS-19	[TBD]

2. VALID reading on any of the following radiation monitors greater than the reading shown for 60 minutes or longer:

Main Steamline	D11-PRM-RMS-01	[TBD]
Containment Purge Exhaust	D11-PRM-RMS-23	[TBD]
Drywell Sump LCW/HCW Discharge	D11-PRM-RMS-16	[TBD]
Turbine Bldg. Combined Ventilation Exhaust	D11-PRM-RMS-10	[TBD]
Radwaste Bldg. Ventilation Exhaust	D11-PRM-RMS-17	[TBD]

3. Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates greater than 2 times (site-specific ODCM) for 60 minutes or longer.

Basis:

This IC addresses a potential or actual decrease in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of a degradation in these features and/or controls.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

The ODCM multiples are specified in ICs AU1 and AA1 only to distinguish between non-emergency conditions, and from each other. While these multiples obviously correspond to an off-site dose or dose rate, the emphasis in classifying these events is the degradation in the level of safety of the plant, NOT the magnitude of the associated dose or dose rate.

This EAL includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit. The Emergency Coordinator should not wait until 60 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 60 minutes. Also, if an ongoing release is detected and the starting time for that release is unknown, the Emergency Coordinator should, in the absence of data to the contrary, assume that the release has exceeded 60 minutes.

Threshold #1 addresses radioactivity releases, that for whatever reason, cause effluent radiation monitor readings to exceed two times the Technical Specification limit and releases are not terminated within 60 minutes.

Threshold #2 addresses effluent or accident radiation monitors on non-routine release pathways (i.e., for which a discharge permit would not normally be prepared).

Threshold #3 addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

AU2

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Rise in Plant Radiation Levels.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2)

1. a. UNPLANNED water level drop in a refueling pathway as indicated by:

Rx Well Cavity	G21-FAPCS-LS-N020-Low	[TBD]
Buffer Pool	G21-FAPCS-LS-N019-Low	[TBD]
Upper Fuel Transfer Pool	G21-FAPCS-LS-N018-Low	[TBD]
Skimmer Surge Tank A/B Level	G21-FAPCS-LS-R621-Low,	[TBD]
	G21-LS-R622-Low-Low	[23 feet]
Spent Fuel Storage Pool	G21-FAPCS-LS-R634-Low,	[TBD]
	G21-LS-R632	[TBD],
	G21-LS-R633	[TBD]
Lower Fuel Transfer Pool	G21-FAPCS-LS-N026-Low	[TBD]
Visual observation		

AND

b. VALID rise in area radiation reading indicated by:

Refueling Floor Area #1, EL 34000 (Reactor Building)	D21-ARM-RMS-01
Refueling Floor Area #2, EL 34000 (Reactor Building)	D21-ARM-RMS-02
New Fuel Buffer Pool, EL 27000 (Reactor Building)	D21-ARM-RMS-03
New Fuel Buffer Pool, EL 27000 (Reactor Building)	D21-ARM-RMS-04
Fuel Handling Machine (IFTS), EL 34000 (Reactor Building)	D21-ARM-RMS-40
Spent Fuel Floor, EL 4650 (Fuel Building)	D21-ARM-RMS-01
Fuel Handling Machine, EL 4650, (Fuel Building)	D21-ARM-RMS-02
Fuel Transfer Cask Area, EL 4650 (Fuel Building)	D21-ARM-RMS-03
IFTS Fuel Building Isolation Valve Room (Inside), EL 4600	D21-ARM-RMS-12

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

2. VALID Area Radiation Monitor readings or survey results indicate a rise by a factor of 1000 over normal* levels.

* Normal levels can be considered as the highest reading in the past twenty-four hours excluding the current peak value.

Basis:

This IC addresses elevated radiation levels as a result of water level lowering but above the RPV flange or events that have resulted, or may result, in unexpected rise in radiation dose rates within plant buildings. These radiation levels represent a loss of control over radioactive material and may represent a potential degradation in the level of safety of the plant.

Classification as a NOUE is warranted as a precursor to a more serious event. The refueling pathway is a site specific combination of cavities, tubes, canals and pools. While a radiation monitor could detect a rise in dose rate due to a drop in the water level, it might not be a reliable indication of whether or not the fuel is covered. For refueling events where the water level drops below the RPV flange classification would be via CU2. This event escalates to an Alert per [IC AA2](#) if irradiated fuel outside the reactor vessel is uncovered. For events involving irradiated fuel in the reactor vessel, escalation would be via the Fission Product Barrier Matrix for events in operating modes 1-4.

Threshold #2 addresses elevated in-plant radiation levels encountered during operation of plant processes that represent a degradation in the control of radioactive material, and represent a potential degradation in the level of safety of the plant. This EAL excludes in-plant radiation levels that may result from use of radiographic sources. A specific list of ARMs is not required as it would restrict the applicability of the Threshold. The intent is to identify loss of control of radioactive material in any monitored area. This event escalates to an Alert per [IC AA3](#) if the increase in dose rates impedes personnel access necessary for safe operation.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

AA1

Initiating Condition -- ALERT

Any Release of Gaseous or Liquid Radioactivity to the Environment Greater Than 200 Times the Off-site Dose Calculation Manual for 15 Minutes or Longer.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2 or 3)

Note: *The Emergency Coordinator 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.*

1. VALID reading on any effluent monitor that exceeds 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer.

Plant Stack	D11-PRM-RMS-13 [TBD]
Liquid Radwaste Discharge	D11-PRM-RMS-11 [TBD]
Isolation Condenser Vent Exhaust	D11-PRM-RMS-19 [TBD]

2. VALID reading on any of the following radiation monitors greater than the reading shown for 15 minutes or longer:

Main Steamline	D11-PRM-RMS-01 [TBD]
Containment Purge Exhaust	D11-PRM-RMS-23 [TBD]
Drywell Sump LCW/HCW Discharge	D11-PRM-RMS-16 [TBD]
Turbine Bldg. Combined Ventilation Exhaust	D11-PRM-RMS-10 [TBD]
Radwaste Bldg. Ventilation Exhaust	D11-PRM-RMS-17 [TBD]

3. Confirmed sample analyses for gaseous or liquid releases indicates concentrations or release rates, greater than 200 times {site specific ODCM value} for 15 minutes or longer.

Basis:

The Emergency Coordinator 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.

This IC addresses a potential or actual decrease in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of a degradation in the features and/or controls established to prevent unintentional releases, or control and monitor intentional releases.

The ODCM multiples are specified in [IC AU1](#) and [IC AA1](#) only to distinguish between non-emergency conditions, and from each other. While these multiples obviously correspond to an off-site dose or dose rate, the emphasis in classifying these events is the degradation in the level of safety of the plant, NOT the magnitude of the associated dose or dose rate.

This EAL includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit.

The Emergency Coordinator should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes. Also, if an ongoing release is detected and the starting time for that release is unknown, the Emergency Coordinator should, in the absence of data to the contrary, assume that the release has exceeded 15 minutes.

Threshold #1 addresses radioactivity releases that for whatever reason cause effluent radiation monitor readings that exceed two hundred times the alarm setpoint established by the radioactivity discharge permit. This alarm setpoint may be associated with a planned batch release, or a continuous release path.

Threshold #2 addresses effluent or accident radiation monitors on non-routine release pathways (i.e., for which a discharge permit would not normally be prepared).

Threshold #3 addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

AA2

Initiating Condition -- ALERT

Damage to Irradiated Fuel or Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2)

1. A VALID alarm or elevated reading on any of the following due to damage to irradiated fuel or loss of water level

Refueling Floor Area #1, EL 34000 (Reactor Building)	D21-ARM-RMS-01
Refueling Floor Area #2, EL34000 (Reactor Building)	D21-ARM-RMS-02
New Fuel Buffer Pool, EL 27000 (Reactor Building)	D21 -ARM-RMS -03
New Fuel Buffer Pool, EL 27000 (Reactor Building)	D21 -ARM-RMS -04
Fuel Handling Machine (IFTS), EL 34000 (Reactor Building)	D21-ARM-RMS-40
Spent Fuel Floor, EL 4650 (Fuel Building)	D21-ARM-RMS-01
Fuel Handling Machine, EL 4650 (Fuel Building)	D21-ARM-RMS-02
Fuel Transfer Cask Area, EL 4650 (Fuel Building)	D21-ARM-RMS-03
IFTS Fuel Building Isolation Valve Room (Inside), EL 4650	D21-ARM-RMS-12

2. A water level drop in the reactor refueling pathway resulting in irradiated fuel becoming uncovered as indicated by:

Rx Well Cavity	G21-FAPCS-LS-N020-Low	[TBD]
Buffer Pool	G21-FAPCS-LS-N019-Low	[TBD]
Upper Fuel Transfer Pool	G21- FAPCS-LS-N018-Low	[TBD]
Skimmer Surge Tank A/B Level	G21-FAPCS-LS-R621-Low,	[TBD]
	G21-FAPCS-LS-R622-Low-Low	[23 feet]
Spent Fuel Storage Pool	G21-FAPCS-LS-R634-Low,	[TBD]
	G21-FAPCS-LS-R632,	[TBD]
	G21-FAPCS-LS-R633	[TBD]
Lower Fuel Transfer Pool Visual observation	G21-FAPCS-LS-N026-Low	[TBD]

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

Basis:

This IC addresses specific events that have resulted, or may result, in unexpected rise in radiation dose rates within plant buildings, and may be a precursor to a radioactivity release to the environment. These events represent a loss of control over radioactive material and represent degradation in the level of safety of the plant.

Threshold #1 addresses radiation monitor indications of fuel uncover and/or fuel damage. Elevated readings on ventilation monitors may be indication of a radioactivity release from the fuel, confirming that damage has occurred. Raised background at the monitor due to water level lowering may mask raised ventilation exhaust airborne activity and needs to be considered. Application of this threshold requires understanding of the actual radiological conditions present in the vicinity of the monitor.

In Threshold #2, site-specific indications may include instrumentation such as water level and local area radiation monitors, and personnel (e.g., refueling crew) reports. The refueling pathway is a site specific combination of cavities, tubes, canals and pools.

Escalation, if appropriate, would occur via [IC AS1](#) or [IC AG1](#) or Emergency Coordinator judgment.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

AA3

Initiating Condition -- ALERT

Rise in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown

Operating Mode Applicability: All

Emergency Action Levels:

1. Dose rate greater than 15 mR/hr in the following areas requiring continuous occupancy to maintain plant safety functions:

Main Control Room	D11-PRM-RMS-04A, B
Technical Support Center	D11-PRM-RMS-20
Central Alarm Station	D11-PRM-RMS-TBD
Secondary Alarm Station	D11-PRM-RMS-TBD

Basis:

The cause and/or magnitude of the increase in radiation levels are not a concern of this IC. The Emergency Coordinator must consider the source or cause of the increased radiation levels and determine if any other IC may be involved.

Areas requiring continuous occupancy include the Control Room and TSC.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

AS1

Initiating Condition -- SITE AREA EMERGENCY

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.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2 or 3)

Note: *If dose assessment results are available at the time of declaration, the classification should be based on dose assessment instead of radiation monitor values. While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated/completed in order to determine if the classification should be subsequently escalated.*

Note: *The Emergency Coordinator 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.*

1. VALID reading on any of the following radiation monitors greater than the reading shown for 15 minutes or longer:

Plant Stack	D11-PRM-RMS-13 [Setpoint TBD]
-------------	-------------------------------

Isolation Condenser Vent Exhaust	D11-PRM-RMS-19 [Setpoint TBD]
----------------------------------	-------------------------------

2. Dose assessment using actual meteorology indicates doses greater than 100 mrem TEDE or 500 mrem thyroid CDE at or beyond the site boundary.
3. Field survey results indicate closed window dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer; or analyses of field survey samples indicate thyroid CDE greater than 500 mrem for one hour of inhalation, at or beyond the site boundary.

Basis:

This IC addresses radioactivity releases that result in doses at or beyond the site boundary that exceed a small fraction of the EPA Protective Action Guides (PAGs). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The Emergency Coordinator should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

AG1

Initiating Condition -- GENERAL EMERGENCY

Off-site Dose Resulting from an Actual or IMMEDIATE 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.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2 or 3)

Note: *If dose assessment results are available at the time of declaration, the classification should be based on dose assessment instead of radiation monitor values. Do not delay declaration awaiting dose assessment results.*

Note: *The Emergency Coordinator 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.*

1. VALID reading on any of the following radiation monitors greater than the reading shown for 15 minutes or longer:

Plant Stack	D11-PRM-RMS-13 [Setpoint TBD]
-------------	-------------------------------

Isolation Condenser Vent Exhaust	D11-PRM-RMS-19 [Setpoint TBD]
----------------------------------	-------------------------------

2. Dose assessment using actual meteorology indicates doses greater than 1000 mrem TEDE or 5000 mrem thyroid CDE at or beyond the site boundary.
3. Field survey results indicate closed window dose rates greater than 1000 mR/hr expected to continue for 60 minutes or longer; or analyses of field survey samples indicate thyroid CDE greater than 5000 mrem for one hour of inhalation, at or beyond site boundary.

Basis:

This IC addresses radioactivity releases that result in doses at or beyond the site boundary that exceed the EPA Protective Action Guides (PAGs). Public protective actions will be necessary. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public and likely involve fuel damage.

The Emergency Coordinator should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes.

5.6 Cold Shutdown/Refueling System Malfunction EALs

Table A1-C Recognition Category “C” Initiating Condition Matrix

GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		NOUE	
CG1	Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged. Op. Modes: Cold Shutdown, Refueling	CS1	Loss of RPV Inventory Affecting Core Decay Heat Removal Capability. Op. Modes: Cold Shutdown, Refueling	CA1	Loss of RCS/RPV Inventory. Op. Modes: Cold Shutdown, Refueling	CU1	RCS Leakage Op. Mode: Cold Shutdown
						CU2	UNPLANNED Loss of RCS/RPV Inventory Op. Mode: Refueling
						CU3	All Safety Related DC Batteries Not Being Charged for Greater Than 30 Minutes Due to Loss of Power to PIP Busses. Op. Modes: Cold Shutdown, Refueling, Defueled
				CA4	Inability to Maintain Plant in Cold Shutdown. Op. Modes: Cold Shutdown, Refueling	CU4	UNPLANNED Loss of Decay Heat Removal Capability. Op. Modes: Cold Shutdown, Refueling
						CU6	UNPLANNED Loss of All On-site or Off-site Communications Capabilities. Op. Modes: Cold Shutdown, Refueling, Defueled

Table A1-C Recognition Category “C” Initiating Condition Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	NOUE
			CU7 UNPLANNED Loss of Required DC Power for 15 Minutes or longer. <i>Op. Modes: Cold Shutdown, Refueling</i>
			CU8 Inadvertent Criticality. <i>Op Modes:, Cold Shutdown, Refueling</i>

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CU1

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

RCS Leakage.

Operating Mode Applicability: Cold Shutdown

Emergency Action Levels:

Note: *The Emergency Coordinator 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.*

1. RCS leakage results in the inability to maintain or restore RPV level greater than Level 2 setpoint [338.5 inches (8597 mm)] on B21-NBS-LI R604A-D Wide Range for 15 minutes or longer.

Basis:

This IC is included as a NOUE because it is considered to be a potential degradation of the level of safety of the plant. The inability to establish and maintain level is indicative of loss of RCS inventory. Prolonged loss of RCS Inventory may result in escalation to the Alert level via either [IC CA1](#) (Loss of RCS/RPV Inventory with Irradiated Fuel in the RPV) or [IC CA4](#) (Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV).

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CU2

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of RCS/RPV Inventory.

Operating Mode Applicability: Refueling

Emergency Action Levels: (1 or 2)

Note: *The Emergency Coordinator 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.*

1. RPV level drop below the RPV flange for 15 minutes or longer.
2. RPV level cannot be determined with a loss of RPV inventory as indicated by unexplained Drywell Equipment or Floor Drain Sumps level rise on Drywell K10-HCW Sump LE-[TBD] OR Drywell K10-LCW Sump LE-[TBD]

Basis:

This IC is included as a NOUE because it may be a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant. Refueling evolutions that decrease RCS water level below the RPV flange are carefully planned and procedurally controlled. An UNPLANNED event that results in water level decreasing below the RPV flange warrants declaration of a NOUE due to the reduced RCS inventory that is available to keep the core covered. The allowance of 15 minutes was chosen because it is reasonable to assume that level can be restored within this time frame using one or more of the redundant means of refill that should be available. If level cannot be restored in this time frame then it may indicate a more serious condition exists. Continued loss of RCS Inventory will result in escalation to the Alert level via either [IC CA1](#) (Loss of RCS/RPV Inventory with Irradiated Fuel in the RPV) or [IC CA4](#) (Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV).

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CU3

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

All Safety Related DC Batteries Not Being Charged for 30 Minutes or Longer Due to Loss of Power to PIP Busses.

Operating Mode Applicability: Cold Shutdown
 Refueling
 Defueled

Emergency Action Level:

Note: *The Emergency Coordinator 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.*

1. Loss of all AC power capability to PIP busses 1000A3 AND 1000B3 for 30 minutes or longer.

Basis:

The off-site AC power system supplies power for the unit in cold shutdown, refueling, and defueled conditions. Both the normal off-site and standby on-site AC power systems are non-Class 1E with no Technical Specification requirements. All safety-related functions associated with the unit in cold shutdown and refueling are provided by the safety-related on-site Class 1E DC power systems.

Loss of DC power potentially compromises all safety related plant systems requiring electric power.

Escalation to an Alert, if appropriate, is by Abnormal Radiation Levels/Radiological Effluent, or Emergency Coordinator Judgment ICs. Thirty minutes was selected as a threshold to exclude transient or momentary power losses, and is appropriate because of the passive cooling systems and the on-site safety-related Class 1E DC power systems.

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CU4

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of Decay Heat Removal Capability.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Levels: (1 or 2)

Note: *The Emergency Coordinator 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.*

1. An event results in RCS temperature exceeding 200 F on C51-TC-[TBD].
2. Loss of all RCS temperature and RPV level indication for 15 minutes or longer.

Basis:

This IC is included as a NOUE because it may be a precursor of more serious conditions and, as a result, is considered to be a potential degradation of the level of safety of the plant. Monitoring RCS temperature and RPV level will determine if escalation to the Alert level via [IC CA4](#) or [IC CA1](#) will occur if required.

Any reduction of RCS inventory to the predetermined setpoint will result in an Alert based on [IC CA1](#) or [IC CA4](#).

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CU6

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of All On-site or Off-site Communications Capabilities.

Operating Mode Applicability: Cold Shutdown
Refueling
Defueled

Emergency Action Levels: (1 or 2)

1. Loss of all of the following on-site communications capability affecting the ability to perform routine operations:
 - Plant Page/party Line
 - PABX
 - Sound Powered Phones
 - Plant Radios
2. Loss of all of the following off-site communication methods affecting the ability to perform offsite notifications:
 - Insta-phone Loop
 - Emergency Notification System
 - Health Physics Network
 - Reactor Safety Counterpart Link
 - Protective Measures Counterpart Link
 - Management Counterpart Link

Basis:

The purpose of this IC and its associated EALs is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate problems with off-site authorities. The loss of off-site communications ability is expected to be significantly more comprehensive than the condition addressed by 10 CFR 50.72.

The availability of one method of ordinary off-site communications is sufficient to inform state and local authorities of plant conditions.

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CU7

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of Required DC Power for 15 minutes or longer.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Level:

Note: *The Emergency Coordinator 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.*

1. a. Loss of All Vital DC Busses 11, 12, 21, 22, 31, 32, 41, AND 42 based on bus voltage less than [TBD] V for 15 minutes or longer.

AND

- b. Failure to restore power to at least one required DC bus in less than 15 minutes from the time of loss.

Basis:

The purpose of this IC and its associated EALs is to recognize a loss of the Class 1E DC, which provides electrical power for safety related and vital control and monitoring instrumentation loads. It also provides power for safe shutdown when all the on-site and off-site AC power sources are lost and cannot be recovered for 72 hours.

UNPLANNED is included in this IC to preclude the declaration of an emergency as a result of planned maintenance activities.

Bus voltage of [TBD] VAC is the minimum bus voltage necessary for the operation of safety-related instrumentation and controls. This voltage value incorporates a margin significantly longer than the allowed 15 minutes of operation before the onset of inability to operate those loads.

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CU8

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Inadvertent Criticality.

Operating Mode Applicability: Cold Shutdown
 Refueling

Emergency Action Levels:

1. An UNPLANNED SRNM sustained positive period.

Basis:

This IC addresses criticality events that occur in Cold Shutdown or Refueling modes such as fuel assembly loading errors (mis-located and mis-oriented). This IC indicates a potential degradation of the level of safety of the plant, warranting a NOUE classification.

Escalation would be by Emergency Coordinator judgment.

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CA1

Initiating Condition -- ALERT

Loss of RCS/RPV Inventory.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Levels: (1 or 2)

Note: *The Emergency Coordinator 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.*

1. RCS inventory reduced below Level 1 setpoint [218.4 inches (5547 mm) above TAF] on RPV Water Level B21-NBS-LI R604A-D Wide Range for 15 minutes or longer.
2. RCS/RPV level cannot be determined for 30 minutes or longer with a loss of RCS/RPV inventory as indicated by unexplained Drywell Equipment or Floor Drain Sumps level rise on Drywell K10-HCW Sump LE-[TBD] OR Drywell K10-LCW Sump LE-[TBD]

Basis:

These thresholds serve as precursors to a loss of ability to adequately cool the fuel. The magnitude of this loss of water indicates that makeup systems have not been effective and may not be capable of preventing further RPV level lowering and potential core uncover. This condition will result in a minimum classification of Alert. The inability to restore and maintain level after reaching this setpoint would therefore be indicative of a failure of the RCS barrier.

The Level 1 actuation setpoint was chosen to indicate that those makeup efforts are failing. The inability to restore and maintain level after reaching this setpoint would therefore be indicative of a failure of the RCS barrier.

If all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump or tank level changes.

The 30-minute duration for the loss of level indication was chosen to allow [IC CA1](#) to be an effective precursor to [IC CS1](#). This provides time to increase makeup and isolate leakage prior to core uncover. Whether or not the actions in progress will be effective should be apparent within 30 minutes.

If RPV level continues to decrease then escalation to Site Area Emergency will be via [IC CS1](#) (Loss of RPV Inventory Affecting Core Decay Heat Removal Capability).

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CA4

Initiating Condition -- ALERT

Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Levels: (1 or 2)

Note: *The Emergency Coordinator 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.*

1. An UNPLANNED event results in RCS temperature exceeding 200 degrees F as indicated by any of the following for greater than the specified duration on table:
 - Core Inlet Temperature, C51-TC-[TBD],
 - RWCU Bottom Head Suction Temperature G31-RWCU-SDC-TT-N005, -N006, A-1, B-1 through A-4, B-4
 - RWCU Suction Temperature G31-RWCU-SDC-TT-N001, -N002, A-1, B-1 through A-4, B-4

Table: RCS Reheat Duration Thresholds

RCS	REACTOR BUILDING ISOLATION	Duration
Intact	N/A	60 minutes [*]
Open	Established	20 minutes [*]
	Not Established	0 minutes

- If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, the EAL is not applicable.

2. An UNPLANNED event results in RCS Pressure increase greater than 10 psi due to a loss of RCS cooling.

Basis:

For Threshold 1, the RCS Reheat Duration Threshold table addresses complete loss of functions required for core cooling for greater than 60 minutes during refueling and cold shutdown modes when RCS integrity is established. The 60 minute time frame should allow sufficient time to restore cooling without there being a substantial degradation in plant safety.

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

The RCS Reheat Duration Threshold table also addresses the complete loss of functions required for core cooling for greater than 20 minutes during refueling and cold shutdown modes when CONTAINMENT CLOSURE is established but RCS integrity is not established. The allowed 20 minute time frame was included to allow operator action to restore the heat removal function, if possible.

Finally, complete loss of functions required for core cooling during refueling and cold shutdown modes when neither CONTAINMENT CLOSURE nor RCS integrity are established.

The note (*) indicates that this EAL is not applicable if actions are successful in restoring an RCS heat removal system to operation and RCS temperature is being reduced within the specified time frame.

In Threshold 2, the 10 psi pressure increase covers situations where, due to high decay heat loads, the time provided to restore temperature control, should be less than 60 minutes. The RCS pressure setpoint chosen should be 10 psi or the lowest pressure that the site can read on installed Control Board instrumentation that is equal to or greater than 10 psi.

Escalation to Site Area Emergency would be via CS1 should boiling result in significant RPV level loss leading to core uncover.

A loss of Technical Specification components alone is not intended to constitute an Alert. The same is true of a momentary UNPLANNED excursion above the Technical Specification cold shutdown temperature limit when the heat removal function is available.

The Emergency Coordinator must remain alert to events or conditions that lead to the conclusion that exceeding the EAL threshold is IMMINENT. If, in the judgment of the Emergency Coordinator, an IMMINENT situation is at hand, the classification should be made as if the threshold has been exceeded.

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CS1

Initiating Condition -- SITE AREA EMERGENCY

Loss of RCS/RPV Inventory Affecting Core Decay Heat Removal Capability.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Levels: (1 or 2 or 3)

Note: *The Emergency Coordinator 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.*

1. WITH REACTOR BUILDING ISOLATION NOT established:

RPV level less than Level 0.5 Setpoint [39.4 inches (1000 mm) above TAF] on
B21-NBS-LI-R615A-D

OR

2. With REACTOR BUILDING ISOLATION established

RPV level less than Level 0 Setpoint [0 inches (0 mm)] on B21-NBS-LI-R615A-D

OR

3. RPV level cannot be monitored for 60 minutes or longer with a loss of RPV inventory as indicated by unexplained Drywell Equipment or Floor Drain Sumps level rise on Drywell K10-HCW Sump LE-[TBD] OR Drywell K10-LCW Sump LE-[TBD]

Basis:

Under the conditions specified by this IC, continued lowering in RPV level is indicative of a loss of inventory control. Inventory loss may be due to an RPV breach, pressure boundary leakage, or continued boiling in the RPV.

The 60-minute duration allows sufficient time for actions to be performed to recover needed cooling equipment and is considered to be conservative.

Declaration of a Site Area Emergency is warranted under the conditions specified by the IC. Escalation to a General Emergency is via [IC CG1](#) (Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV) or radiological effluent [IC AG1](#) (Off-site Dose Resulting from an Actual or IMMINENT Release of Gaseous Radioactivity Exceeds 1000 mrem TEDE or 5000 mrem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology).

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

CG1

Initiating Condition -- GENERAL EMERGENCY

Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged.

Operating Mode Applicability: Cold Shutdown
Refueling

Emergency Action Level:

Note: *The Emergency Coordinator 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.*

1. a. CONTAINMENT challenged as indicated by one or more of the following:

- Explosive mixture inside containment
- Pressure above [TBD value]
- REACTOR BUILDING ISOLATION *not* established
- Reactor Building radiation monitors above [TBD value]

AND

b. Core uncover for 30 minutes or longer as indicated by **EITHER**:

- Less than Level 0 Setpoint [0 inches (0 mm)] on B21-NBS-LI-R615A-D.

OR

- RPV level cannot be monitored with core uncover indicated by EITHER of the following:
 - Drywell Radiation Monitors T62-RMS-RDT-[TBD] reading greater than {site-specific} high setpoint
 - Unexplained Drywell Equipment or Floor Drain Sumps level rise on Drywell K10-HCW Sump LE-[TBD] OR Drywell K10-LCW Sump LE-[TBD]

Basis:

These conditions represent the inability to restore and maintain RPV level to above the top of active fuel. Fuel damage is probable if RPV level cannot be restored, as available decay heat will cause boiling, further reducing the RPV level. With the CONTAINMENT breached or challenged then the potential for unmonitored fission product release to the environment is high. This represents a direct path for radioactive inventory to be released to the environment. This is consistent with the definition of a General Emergency. The General Emergency is declared on the occurrence of the loss or IMMINENT loss of function of *all three* barriers.

COLD SHUTDOWN/REFUELING SYSTEM MALFUNCTION

Analysis indicates that core damage may occur within an hour following continued core uncovering; therefore, conservatively, 30 minutes was chosen.

If CONTAINMENT CLOSURE is re-established prior to exceeding the 30 minute core uncovering time limit then escalation to General Emergency would not occur.

Sump or tank level rise must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

As water level in the RPV lowers, the dose rate above the core will increase. The dose rate due to this core shine should result in up-scaled radiation monitor indication and possible alarm. Additionally, post-TMI studies indicated that the installed nuclear instrumentation will operate erratically when the core is uncovered.

The General Emergency is declared on the occurrence of the loss or IMMINENT loss of function of *all three* barriers. RCS barrier failure resulting in core uncovering for 30 minutes or more may cause fuel clad failure. With the CONTAINMENT breached or challenged then the potential for unmonitored fission product release to the environment is high. This represents a direct path for radioactive inventory to be released to the environment. This is consistent with the definition of a General Emergency.

5.7 FISSION PRODUCT BARRIER DEGRADATION EALs

Table A1-F-1 Recognition Category “F” Initiating Condition Matrix

See Table A1-F-2 for EAL Thresholds

GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		NOUE	
FG1	Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier <i>Op. Modes: Power Operation, Hot Standby, Startup, Safe/Stable Shutdown</i>	FS1	Loss or Potential Loss of ANY Two Barriers <i>Op. Modes: Power Operation, Hot Standby, Startup, Safe/Stable Shutdown</i>	FA1	ANY Loss or ANY Potential Loss of EITHER Fuel Clad <u>OR</u> RCS <i>Op. Modes: Power Operation, Hot Standby, Startup, Safe/Stable Shutdown</i>	FU1	ANY Loss or ANY Potential Loss of Containment <i>Op. Modes: Power Operation, Hot Standby, Startup, Safe/Stable Shutdown</i>

FISSION PRODUCT BARRIERS

NOTES

1. The logic used for these initiating conditions reflects the following considerations:
 - The Fuel Clad Barrier and the RCS Barrier are weighted more heavily than the Containment Barrier. NOUE ICs associated with RCS and Fuel Clad Barriers are addressed under System Malfunction ICs.
 - At the Site Area Emergency level, there must be some ability to dynamically assess how far present conditions are from the threshold for a General Emergency. For example, if Fuel Clad and RCS Barrier “Loss” EALs existed, that, in addition to off-site dose assessments, would require continual assessments of radioactive inventory and containment integrity. Alternatively, if both Fuel Clad and RCS Barrier “Potential Loss” EALs existed, the Emergency Coordinator would have more assurance that there was no immediate need to escalate to a General Emergency.
 - The ability to escalate to higher emergency classes as an event deteriorates must be maintained. For example, RCS leakage steadily increasing would represent an increasing risk to public health and safety.
 - The Containment Barrier should not be declared lost or potentially lost based on exceeding Technical Specification action statement criteria, unless there is an event in progress requiring mitigation by the Containment barrier. When no event is in progress (Loss or Potential Loss of either Fuel Clad and/or RCS) the Containment Barrier status is addressed by Technical Specifications.

Table A1-F-2 EAL Fission Product Barrier Table
Thresholds for LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also, multiple events could occur which result in the conclusion that exceeding the loss or Potential loss thresholds is IMMINENT. In this IMMINENT loss situation use judgement and classify as if the thresholds are exceeded.

General Emergency Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier		Site Area Emergency Loss or Potential Loss of ANY two Barriers		Alert ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS		Unusual Event Any loss or ANY Potential Loss of Containment	
<u>Fuel Clad Barrier Threshold Values</u>		<u>RCS Barrier Threshold Values</u>		<u>Containment Barrier Threshold Values</u>			
Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss
1. Primary Coolant Activity Level		1. Primary Containment Pressure		1. Primary Containment Conditions			
1. Primary coolant activity greater than [TBD-300 uCi/gm]	Not Applicable	1. Primary containment pressure greater than 1.85 psig on T62-CMS-PI-[TBD]-A-D due to RCS leakage	Not Applicable	1. Primary containment pressure rise followed by a rapid unexplained drop in primary containment pressure <u>OR</u> 2. Primary containment pressure response not consistent with LOCA conditions		1. Primary containment pressure 45 psig on T62-CMS-PI-[TBD]-A-D and rising <u>OR</u> 2. H ₂ greater than 6% <u>AND</u> 3. O ₂ greater than 5% <u>OR</u> 4. RPV pressure <u>AND</u> suppression pool temperature cannot be maintained below the HCTL	
<u>OR</u>		<u>OR</u>		<u>OR</u>		<u>OR</u>	
2. Reactor Vessel Water Level		2. Reactor Vessel Water Level		2. Reactor Vessel Water Level			
1. RPV water level cannot be restored and maintained above Post Accident Monitor Fuel Zone Range 0 inches (0 mm) B21-LI-R615A-D	1. RPV water level cannot be restored and maintained above Level 0.5 Setpoint Post Accident Monitor Fuel Zone Range 39.4 inches (1000 mm) B21-LI-R615A-D	1. RPV water level cannot be restored and maintained above Level 0.5 Setpoint Post Accident Monitor Fuel Zone Range 39.4 inches (1000 mm) B21-LI-R615A-D	Not Applicable	Not Applicable		1. Primary Containment Flooding is required.	
<u>OR</u>		<u>OR</u>		<u>OR</u>		<u>OR</u>	

Table A1-F-2 EAL Fission Product Barrier Table
Thresholds for LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also, multiple events could occur which result in the conclusion that exceeding the loss or Potential loss thresholds is IMMINENT. In this IMMINENT loss situation use judgement and classify as if the thresholds are exceeded.

General Emergency Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier		Site Area Emergency Loss or Potential Loss of ANY two Barriers		Alert ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS		Unusual Event Any loss or ANY Potential Loss of Containment	
<u>Fuel Clad Barrier Threshold Values</u>		<u>RCS Barrier Threshold Values</u>		<u>Containment Barrier Threshold Values</u>			
Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss
3. Not Applicable		3. RCS Leak Rate		3. Primary Containment Isolation Failure or Bypass			
Not applicable	Not applicable	1. UNISOLABLE Main Steamline Break as indicated by: Failure of both valves in any one line to close <u>AND</u> 1a. Steamline High Flow greater than 140% rated <u>OR</u> 1b. Main Steam Line Low Pressure less than 750 psig <u>OR</u> 1c. Main Steam Tunnel Ambient Temperature greater than [TBD] <u>OR</u> 2. Automatic Depressurization System automatically <u>OR</u> manually initiated.	1. RCS leak greater than 100 gpm in the drywell. <u>OR</u> 2. UNISOLABLE primary system leakage outside primary containment as indicated by exceeding EITHER of the following: 2a. Max Safe Operating Temperature. <u>OR</u> 2b. Max Safe Area Radiation.	1. Failure of all valves in any one line to close <u>AND</u> direct downstream pathway to the environment exists after a primary containment isolation signal <u>OR</u> 2. Intentional primary containment venting per EOPs <u>OR</u> 3. UNISOLABLE primary system leakage outside Containment as indicated by exceeding EITHER of the following: 3a. Max Safe Operating Temperature. <u>OR</u> 3b. Max Safe Area Radiation.	1. Feedline break as indicated by: [TBD]		
<u>OR</u>		<u>OR</u>		<u>OR</u>		<u>OR</u>	

Table A1-F-2 EAL Fission Product Barrier Table
Thresholds for LOSS or POTENTIAL LOSS of Barriers*

*Determine which combination of the three barriers are lost or have a potential loss and use the following key to classify the event. Also, multiple events could occur which result in the conclusion that exceeding the loss or Potential loss thresholds is IMMINENT. In this IMMINENT loss situation use judgement and classify as if the thresholds are exceeded.

General Emergency Loss of ANY two Barriers AND Loss or Potential Loss of Third Barrier		Site Area Emergency Loss or Potential Loss of ANY two Barriers		Alert ANY loss or ANY Potential Loss of EITHER Fuel Clad or RCS		Unusual Event Any loss or ANY Potential Loss of Containment	
<u>Fuel Clad Barrier Threshold Values</u>		<u>RCS Barrier Threshold Values</u>		<u>Containment Barrier Threshold Values</u>			
Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss		
4. Primary Containment Radiation Monitoring		4. Primary Containment Radiation Monitoring		4. Primary Containment Radiation Monitoring			
1. Primary containment radiation monitor reading greater than (5% clad failure dispersed in the drywell) R/hr on [TBD]	Not Applicable	1. Primary containment radiation monitor reading greater than (normal operating chemistry dispersed in the drywell) R/hr on [TBD]	Not Applicable	Not applicable		1. Primary containment radiation monitor reading greater than (20% clad failure dispersed in the drywell) R/hr on [TBD]	
<u>OR</u>		<u>OR</u>		<u>OR</u>		<u>OR</u>	
5. Other Indications		5. Other Indications		5. Other Indications			
1. [MSL Rad Monitors Drywell Fission Product Monitor – TBD]	Not Applicable	Not Applicable	Not Applicable	Not Applicable		Not Applicable	
<u>OR</u>		<u>OR</u>		<u>OR</u>		<u>OR</u>	
6. Emergency Coordinator Judgment		6. Emergency Coordinator Judgment		6. Emergency Coordinator Judgment			
1. Any condition in the judgment of the Emergency Coordinator that indicates Loss or Potential Loss of the Fuel Clad Barrier		1. Any condition in the judgment of the Emergency Coordinator that indicates Loss or Potential Loss of the RCS Barrier		1. Any condition in the judgment of the Emergency Coordinator that indicates Loss or Potential Loss of the Containment barrier			

FISSION PRODUCT BARRIERS

Basis Information For Table A1-F-2 Emergency Action Level Fission Product Barrier Reference Table

FUEL CLAD BARRIER THRESHOLDS: (1 or 2 or 3 or 4 or 5 or 6)

1. Primary Coolant Activity Level

This [TBD] value corresponds to 300 $\mu\text{Ci/gm}$ I-131 equivalent. Assessment by the EAL Task Force indicates that this amount of coolant activity is well above that expected for iodine spikes and corresponds to less than 5% fuel clad damage.

There is no potential loss associated with this condition.

2. Reactor Vessel Water Level

The “Loss” value is the top of active fuel which is used in EOPs to indicate challenge of core cooling. This is the minimum value to assure core cooling without further degradation of the clad.

Level 0.5 corresponds to a water level 39.4 inches above the top of the active fuel. The “Potential Loss” Threshold is the same as the RCS barrier “Loss” Threshold #2. Thus, this Threshold indicates a “Loss” of RCS barrier and a “Potential Loss” of the Fuel Clad Barrier. This Threshold appropriately escalates the emergency class to a Site Area Emergency.

3. Not applicable

4. Primary Containment Radiation Monitoring

The [TBD] reading is a value which indicates the release of reactor coolant, with elevated activity indicative of fuel damage, into the drywell.

There is no potential loss associated with this condition.

5. Other Indications

Main Steam Line Monitors and the Drywell Fission Product Monitor at the specified values are indicative of fuel clad failure.

6. Emergency Coordinator Judgment

This Threshold addresses any other factors that are to be used by the Emergency Coordinator in determining whether the Fuel Clad barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this Threshold as a factor in Emergency Coordinator judgment that the barrier may be considered lost or potentially lost. (See also [IC SG1](#), “Prolonged Loss of All Off-site and On-site AC Power for greater than 72 hours,” for additional information.)

FISSION PRODUCT BARRIERS

RCS BARRIER THRESHOLDS: (1 or 2 or 3 or 4 or 5 or 6)

The RCS Barrier is the reactor coolant system pressure boundary and includes the reactor vessel and all reactor coolant system piping up to the isolation valves.

1. Primary Containment Conditions

1.85 psig drywell pressure is based on the drywell high pressure set point which indicates a LOCA.

There is no potential loss associated with this condition.

2. Reactor Vessel Water Level

Level 0.5 corresponds to a water level 39.4 inches above the top of the active fuel.

There is no potential loss associated with this condition.

3. RCS Leak Rate

An UNISOLABLE MSL break is a breach of the RCS barrier. Thus, this Threshold is included for consistency with the Alert emergency classification. Automatic Depressurization System automatically or manually initiated indicates a breach of the RCS.

The potential loss of RCS based on leakage is set at a level indicative of a breach of the RCS but which is well within the makeup capability of the CRD high pressure injection. Core uncover is not a significant concern for a 100 gpm leak; however, break propagation leading to significantly larger loss of inventory is possible.

Potential loss of RCS based on primary system leakage outside the drywell is determined from site-specific temperature or area radiation Max Normal setpoints in the areas of the plant which indicate a direct path from the RCS to areas outside primary containment. The indicators should be confirmed to be caused by RCS leakage.

4. Primary Containment Radiation Monitoring

The [TBD] reading is a value which indicates the release of reactor coolant to the drywell.

There is no potential loss associated with this condition.

5. Other Indications

Not applicable.

6. Emergency Coordinator Judgment

This Threshold addresses any other factors that are to be used by the Emergency Coordinator in determining whether the RCS barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this Threshold as a factor in Emergency Coordinator

judgment that the barrier may be considered lost or potentially lost. (See also [IC SG1](#), "Prolonged Loss of All Off-site and On-site AC Power for greater than 72 hours," for additional information.)

FISSION PRODUCT BARRIERS

PRIMARY CONTAINMENT BARRIER THRESHOLDS: (1 or 2 or 3 or 4 or 5 or 6)

The Primary Containment Barrier includes the drywell, the wetwell, their respective interconnecting paths, and other connections up to and including the outermost containment isolation valves. Containment Barrier Thresholds are used primarily as discriminators for escalation from an Alert to a Site Area Emergency or a General Emergency.

1. Primary Containment Conditions

Rapid unexplained loss of pressure (i.e., not attributable to drywell spray or condensation effects) following an initial pressure increase indicates a loss of containment integrity. The 45 psig for potential loss of containment is based on the primary containment design pressure. Existence of an explosive mixture means hydrogen and oxygen concentration of at least the lower deflagration limit curve exists.

The Heat Capacity Temperature Limit (HCTL) is the highest suppression pool temperature from which Emergency RPV Depressurization will not raise:

- Suppression chamber temperature above the maximum temperature capability of the suppression chamber and equipment within the suppression chamber which may be required to operate when the RPV is pressurized,
- Suppression chamber pressure above Primary Containment Pressure Limit A, while the rate of energy transfer from the RPV to the containment is greater than the capacity of the containment vent.

The HCTL is a function of RPV pressure and suppression pool water level. It is utilized to preclude failure of the containment and equipment in the containment necessary for the safe shutdown of the plant and therefore, the inability to maintain plant parameters below the limit constitutes a potential loss of containment.

2. Reactor Vessel Water Level

There is no loss threshold associated with this condition.

The entry into the Primary Containment Flooding emergency procedure indicates reactor vessel water level can not be restored and that a core melt sequence is in progress. [Entry into Containment Flooding procedures is a logical escalation in response to the inability to maintain reactor vessel level.

The conditions in this potential loss Threshold represent a potential core melt sequences which, if not corrected, could lead to vessel failure and increased potential for containment failure.

FISSION PRODUCT BARRIERS

3. Containment Isolation Failure or Bypass

This Threshold addresses the inability to isolate the containment when containment isolation is required. Also, an intentional venting of primary containment for pressure control per EOPs to the environment is considered a loss of containment. Containment venting for temperature or pressure when not in an accident situation should not be considered. In addition, the presence of area radiation or temperature alarms high setpoint indicating UNISOLABLE primary system leakage outside the drywell are covered after a containment isolation. The indicators should be confirmed to be caused by RCS leakage.

The use of the modifier “direct” in defining the release path discriminates against release paths through interfacing liquid systems. The existence of an in-line charcoal filter does not make a release path indirect since the filter is not effective at removing fission noble gases.

4. Containment Radiation Monitoring

There is no loss associated with this condition.

The [TBD] reading is a value which indicates significant fuel damage well in excess of that required for loss of RCS and Fuel Clad. A major release of radioactivity requiring off-site protective actions from core damage is not possible unless a major failure of fuel cladding allows radioactive material to be released from the core into the reactor coolant. Regardless of whether containment is challenged, this amount of activity in containment, if released, could have such severe consequences that it is prudent to treat this as a potential loss of containment, such that a General Emergency declaration is warranted.

5. Other Indications

Not applicable.

6. Emergency Coordinator Judgment

This Threshold addresses any other factors that are to be used by the Emergency Coordinator in determining whether the Containment barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this Threshold as a factor in Emergency Coordinator judgment that the barrier may be considered lost or potentially lost. The Containment Barrier should not be declared lost or potentially lost based on exceeding Technical Specification Action Statement criteria, unless there is an event in progress requiring mitigation by the Containment barrier. When no event is in progress (Loss or Potential Loss of either Fuel Clad and/or RCS) the Containment Barrier status is addressed by Technical Specifications. (See also [IC SG1](#), “Prolonged Loss of All Off-site and On-site AC Power for greater than 72 hours,” for additional information.)

5.8 HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY EALs

Table A1-H Recognition Category “H” Initiating Condition Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	NOUE
		HA1 Natural or Destructive Phenomena Affecting VITAL AREAS. <i>Op. Modes: All</i>	HU1 Natural or Destructive Phenomena Affecting the PROTECTED AREA. <i>Op. Modes: All</i>
		HA2 FIRE or EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe/Stable Shutdown. <i>Op. Modes: All</i>	HU2 FIRE Within PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection <u>OR</u> EXPLOSION within the Protected Area Boundary <i>Op. Modes: All</i>
		HA3 Access To a VITAL AREA Is Prohibited Due To Release of Toxic, Corrosive, Asphyxiant or Flammable Gases Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or Safely Shutdown the Reactor <i>Op. Modes: All</i>	HU3 Release of Toxic, Corrosive, Asphyxiant, or Flammable Gases Deemed Detrimental to NORMAL PLANT OPERATIONS. <i>Op. Modes: All</i>
	HS2 Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established. <i>Op. Modes: All</i>	HA5 Control Room Evacuation Has Been Initiated. <i>Op. Modes: All</i>	

Table A1-H Recognition Category “H” Initiating Condition Matrix

GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		NOUE	
HG1	HOSTILE ACTION Resulting in Loss Of Physical Control of the Facility. <i>Op. Modes: All</i>	HS4	HOSTILE ACTION within the PROTECTED AREA <i>Op. Modes: All</i>	HA4	HOSTILE ACTION within the OWNER CONTROLLED AREA or Airborne Attack Threat. <i>Op. Modes: All</i>	HU4	Confirmed SECURITY CONDITION or Threat Which Indicates a Potential Degradation in the Level of Safety of the Plant. <i>Op. Modes: All</i>
HG2	Other Conditions Existing Which in the Judgment of the Emergency Coordinator Warrant Declaration of a General Emergency. <i>Op. Modes: All</i>	HS3	Other Conditions Existing Which in the Judgment of the Emergency Coordinator Warrant Declaration of a Site Area Emergency. <i>Op. Modes: All</i>	HA6	Other Conditions Existing Which in the Judgment of the Emergency Coordinator Warrant Declaration of an Alert. <i>Op. Modes: All</i>	HU5	Other Conditions Existing Which in the Judgment of the Emergency Coordinator Warrant Declaration of a NOUE. <i>Op. Modes: All</i>

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HU1

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Natural or Destructive Phenomena Affecting the PROTECTED AREA.

Operating Mode Applicability: All

Emergency Action Level: (1 or 2 or 3)

1. Seismic event identified by any 2 of the following:
 - Earthquake felt in plant.
 - Seismic event confirmed by [site-specific indication or method TBD].
 - National Earthquake Center.
2. Tornado striking within PROTECTED AREA boundary or high wind gust greater than [TBD].
3. Turbine failure resulting in casing penetration or damage to turbine or generator seals.

Basis:

These Thresholds are categorized on the basis of the occurrence of an event of sufficient magnitude to be of concern to plant operators

Threshold #1: Damage may be caused to some portions of the site, but should not affect ability of safety functions to operate.

The National Earthquake Center can confirm that an earthquake has occurred in the area of the plant.

Threshold #2 is based on the assumption that a tornado striking (touching down) or high winds within the PROTECTED AREA may have potentially damaged plant structures containing functions or systems required for safe shutdown of the plant. If such damage is confirmed visually or by other in-plant indications, the event may be escalated to Alert.

Threshold #3 addresses main turbine rotating component failures of sufficient magnitude to cause observable damage to the turbine casing or to the seals of the turbine generator. This Threshold is consistent with the definition of a NOUE while maintaining the anticipatory nature desired and recognizing the risk to non-safety related equipment. Escalation of the emergency classification is based on potential damage done by projectiles generated by the failure. These events would be classified by the radiological ICs or Fission Product Barrier ICs.

Threshold #4, in NEI 07-01, is used for other site-specific phenomena, such as hurricane, flood, or seiche, that can also be precursors of more serious events. These events cannot be experienced at the North Anna Power Station site and this NEI 07-01 EAL is not included.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HU2

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

FIRE Within the PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection OR EXPLOSION Within the PROTECTED AREA Boundary.

Operating Mode Applicability: All

Emergency Action Level:

1. FIRE not extinguished in less than 15 minutes of Control Room notification or receipt of a Control Room FIRE alarm in any of the following areas:
 - Containment
 - Reactor Building
 - Fuel Building
 - Control Building
 - Turbine Building
 - Electrical Building
 - Radwaste Building
2. EXPLOSION within the Protected Area boundary.

Basis:

The purpose of Threshold #1 is to address the magnitude and extent of FIRES that may be potentially significant precursors to damage to safety systems. As used here, "detection" is visual observation and report by plant personnel or sensor alarm indication. The 15 minute time period begins with a credible notification that a FIRE is occurring, or indication of a VALID fire detection system alarm. Validation of a fire detection system alarm includes actions that can be taken with the Control Room or other nearby site-specific location to ensure that the alarm is not spurious. An alarm is assumed to be an indication of a FIRE unless it is disproved within the 15 minute period by personnel dispatched to the scene.

The 15 minute duration is to size the FIRE and to discriminate against small FIRES that are readily extinguished. Fires inside the protected area, located near equipment, that last 15 minutes or longer can result in a challenge to the site fire brigade. This represents a degradation in plant operational status.

For Threshold #2 only those EXPLOSIONS of sufficient force to damage permanent structures or equipment within the PROTECTED AREA should be considered. The Emergency Coordinator also needs to consider any security aspects of the EXPLOSION, if applicable.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

Escalation to a higher emergency class is by [IC HA2](#), "FIRE Affecting the Operability of Plant Safety Systems Required for the Current Operating Mode".

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HU3

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Release of Toxic, Corrosive, Asphyxiant, or Flammable Gases Deemed Detrimental to NORMAL PLANT OPERATIONS.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2)

1. Toxic, corrosive, asphyxiant or flammable gases in amounts that have or could adversely affect NORMAL PLANT OPERATIONS.
2. Report by Local, County or State Officials for evacuation or sheltering of site personnel based on an off-site event.

Basis:

This IC is based on the existence of uncontrolled releases of toxic or flammable gas that may enter the site boundary and affect NORMAL PLANT OPERATIONS.

During the initial stages of a potential gas release, actions that are taken as precautions (such as pre-cautionary evacuation of a room or area while conditions are assessed) do not constitute an adverse affect on NORMAL PLANT OPERATIONS.

The fact that SCBA may be worn does not eliminate the need to declare the event.

It is intended that releases of toxic, corrosive, asphyxiant or flammable gases are of sufficient quantity, and the release point of such gases is such that NORMAL PLANT OPERATIONS would be affected.

An asphyxiant is a gas capable of reducing the level of oxygen in the body to dangerous levels. Most commonly, asphyxiants work by merely displacing air in an enclosed environment. This reduces the concentration of oxygen below the normal level of around 19%, which can lead to breathing difficulties, unconsciousness or even death.

Escalation of this Threshold is via HA3, which involves a quantified a release of toxic or flammable gas affecting access to VITAL AREAS.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HU4

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Confirmed SECURITY CONDITION or Threat Which Indicates a Potential Degradation in the Level of Safety of the Plant.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2 or 3)

1. A SECURITY CONDITION that does NOT constitute a HOSTILE ACTION as reported by the security shift supervision.
2. A credible site specific security threat notification.
3. A validated notification from NRC providing information of an aircraft threat.

Basis:

Reference is made to security shift supervision because these individuals are the designated personnel on-site qualified and trained to confirm that a security event is occurring or has occurred. Training on security event classification confirmation is closely controlled due to the strict secrecy controls placed on the plant Safeguards Contingency Plan.

Threshold #1 is based on Site Security Plans. Security events which do not represent a potential degradation in the level of safety of the plant are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72. Security events assessed as HOSTILE ACTIONS are classifiable under [IC HA4](#), [IC HS4](#) and [IC HG1](#).

This threshold is based on Unit 3 security plans.

Threshold #2 is to ensure that appropriate notifications for the security threat are made in a timely manner. This includes information of a credible threat.

Threshold #3 is to ensure that notifications for the security threat are made in a timely manner and that Off-site Response Organizations and plant personnel are at a state of heightened awareness regarding the credible threat. Only the plant to which the specific threat is made need declare the Notification of Unusual Event.

A higher initial classification could be made based upon the nature and timing of the threat and potential consequences.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HU5

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Other Conditions Existing Which in the Judgment of the Emergency Coordinator Warrant Declaration of a NOUE.

Operating Mode Applicability: All

Emergency Action Level:

1. Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress 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.

Basis:

This EAL addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Coordinator to fall under the NOUE emergency class.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HA1

Initiating Condition -- ALERT

Natural or Destructive Phenomena Affecting the Plant VITAL AREAS.

Operating Mode Applicability: All

Emergency Action Levels: (1 or 2 or 3 or 4 or 5)

1. Seismic event greater than Operating Basis Earthquake (OBE) {0.10g} as indicated by seismic instrumentation.

AND

- Confirmed by **EITHER**:
 - Earthquake felt in plant
 - National Earthquake Center
- 2. Tornado striking or high winds greater than [TBD] mph resulting in VISIBLE DAMAGE to any of the following structures containing safety systems or components OR Control Room indication of degraded performance of those systems.
 - Containment Building
 - Reactor Building
 - Control Building
 - Electrical Building
- 3. Vehicle crash within PROTECTED AREA boundary and resulting in VISIBLE DAMAGE to any of the following structures containing safety systems or components OR Control Room indication of degraded performance of those safety systems:
 - Containment
 - Reactor building
 - Fuel Building
 - Control Building
 - Turbine Building
 - Electrical Building
 - Radwaste Building
- 4. Turbine failure-generated projectiles result in any VISIBLE DAMAGE to or penetration of the Electrical Building.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

5. Internal flooding in any areas of the plant that creates an industrial safety hazard (e.g., electric shock) that precludes access necessary to operate or monitor equipment.

Basis:

These Thresholds escalate from HU1 in that the occurrence of the event has resulted in **VISIBLE DAMAGE** to plant structures or areas containing equipment necessary for a safe shutdown, or has caused damage to the safety systems in those structures evidenced by control indications of degraded system response or performance. The occurrence of **VISIBLE DAMAGE** and/or degraded system response is intended to discriminate against lesser events. The initial “report” should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this Threshold to assess the actual magnitude of the damage. The significance here is not that a particular system or structure was damaged, but rather, that the event was of sufficient magnitude to cause this degradation. Escalation to higher classifications occurs on the basis of System Malfunctions.

Seismic events of this magnitude can result in a plant **VITAL AREA** being subjected to forces beyond design limits, and thus damage may be assumed to have occurred to plant safety systems.

Wind loads of this magnitude can cause damage to safety functions.

Threshold #4 addresses the threat to safety related equipment imposed by projectiles generated by main turbine rotating component failures. This list of areas includes all areas containing safety structure, system, or component, their controls, and their power supplies.

Note that this Threshold would not normally be applicable in cold shutdown, refueling, or defueled modes since steam is not normally available to rotate the main turbine in these plant conditions. If steam from alternate sources is being used to rotate the main turbine for testing, then this EAL would be applicable in these shutdown modes.

This Threshold is, therefore, consistent with the definition of an **ALERT** in that if projectiles have damaged or penetrated areas containing safety structure, system, or component the potential exists for substantial degradation of the level of safety of the plant.

Threshold #5 addresses the effect of internal flooding that has created industrial safety hazards (e.g., electrical shock) that preclude necessary access to operate or monitor safety equipment.

Threshold #6, in NEI 07-01, is used for other site-specific phenomena such as hurricane, flood, or seiche, that can also be precursors of more serious events. These events cannot be experienced at the North Anna Power Station site and this NEI 07-01 EAL is not included.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HA2

Initiating Condition -- ALERT

FIRE or EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe/Stable Shutdown.

Operating Mode Applicability: All

Emergency Action Level:

1. FIRE or EXPLOSION resulting in VISIBLE DAMAGE to any of the following structures containing safety systems, or components **OR** Control Room indication of degraded performance of those safety systems:
 - Containment
 - Reactor building
 - Fuel Building
 - Control Building
 - Turbine Building
 - Electrical Building
 - Radwaste Building

Basis:

The reference to damage of systems is used to identify the magnitude of the FIRE/EXPLOSION and to discriminate against minor FIRES/EXPLOSIONs. The reference to safety systems is included to discriminate against FIRES/EXPLOSIONs in areas having a low probability of affecting safe operation. The significance here is not that a safety system was degraded but the fact that the FIRE/EXPLOSION was large enough to cause damage to these systems.

The inclusion of a "VISIBLE DAMAGE" should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this Threshold to assess the actual magnitude of the damage. The occurrence of the EXPLOSION with reports of evidence of damage is sufficient for declaration. The Emergency Coordinator also needs to consider any security aspects of the EXPLOSIONs.

Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels/Radiological Effluent, or Emergency Coordinator Judgment ICs.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HA3

Initiating Condition -- ALERT

Access to a VITAL AREA Is Prohibited Due To Release of Toxic, Corrosive, Asphyxiant or Flammable Gases Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or Safely Shutdown the Reactor.

Operating Mode Applicability: All

Emergency Action Levels:

1. Access to a VITAL AREA is prohibited due to toxic, corrosive, asphyxiant, or flammable gases which jeopardizes operation of systems required to maintain safe operations or safely shutdown the reactor.

Basis:

Gases in a Plant Vital Area can affect the ability to safely operate or safely shutdown the reactor.

Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels/Radioactive Effluent, or Emergency Coordinator Judgment ICs.

During the initial stages of a potential gas release, actions that are taken as precautions (such as pre-cautionary evacuation of a room or area while conditions are assessed) do not constitute jeopardizing operation of systems required to maintain safe operations or safely shutdown the reactor.

The fact that self contained breathing apparatus (SCBA) may be worn does not eliminate the need to declare the event

An asphyxiant is a gas capable of reducing the level of oxygen in the body to dangerous levels. Most commonly, asphyxiants work by merely displacing air in an enclosed environment. This reduces the concentration of oxygen below the normal level of around 19%, which can lead to breathing difficulties, unconsciousness or even death.

This Threshold addresses concentrations at which gases can ignite/support combustion. An uncontrolled release of flammable gasses within a facility structure has the potential to affect safe operation of the plant by limiting either operator or equipment operations due to the potential for ignition and resulting equipment damage/personnel injury.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HA4

Initiating Condition - ALERT

HOSTILE ACTION Within the OWNER CONTROLLED AREA or Airborne Attack Threat.

Operating Mode Applicability: All

Emergency Action Level: (1 or 2)

1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the (site specific security shift supervision).
2. A validated notification from NRC of an airliner attack threat within 30 minutes of the site.

Basis:

These EALs address the contingency for a very rapid progression of events, such as that experienced on September 11, 2001. They are not premised solely on the potential for a radiological release. Rather the issue includes the need for rapid assistance due to the possibility for significant and indeterminate damage from additional air, land or water attack elements.

The fact that the site is under serious attack or is an identified attack target with minimal time available for further preparation or additional assistance to arrive requires a heightened state of readiness and implementation of protective measures that can be effective (such as on-site evacuation, dispersal or sheltering).

Threshold #1 addresses the potential for a very rapid progression of events due to a HOSTILE ACTION. It is not intended to address incidents that are accidental events or acts of civil disobedience, such as small aircraft impact, hunters, or physical disputes between employees within the OWNER CONTROLLED AREA. Those events are adequately addressed by other EALs.

Threshold #2 addresses the immediacy of an expected threat arrival or impact on the site within a relatively short time.

The intent of this EAL is to ensure that notifications for the airliner attack threat are made in a timely manner and that OROs and plant personnel are at a state of heightened awareness regarding the credible threat. Airliner is meant to be a large aircraft with the potential for causing significant damage to the plant.

This EAL is met when a plant receives information regarding an airliner attack threat from NRC and the airliner is within 30 minutes of the plant. Validation is performed by calling the NRC or by other approved methods of authentication. Only the plant to which the specific threat is made need declare the Alert.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

The NRC Headquarters Operations Officer will communicate to the licensee if the threat involves an airliner (airliner is meant to be a large aircraft with the potential for causing significant damage to the plant). The status and size of the plane may be provided by the NRC.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HA5

Initiating Condition -- ALERT

Control Room Evacuation Has Been Initiated.

Operating Mode Applicability: All

Emergency Action Level:

1. Abnormal Operating Procedure [TBD] Forced Control Room Evacuation, requires Control Room evacuation.

Basis:

With the Control Room evacuated, additional support, monitoring and direction through the Technical Support Center and/or other emergency response facilities is necessary. Inability to establish plant control from outside the Control Room will escalate this event to a Site Area Emergency.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HA6

Initiating Condition -- ALERT

Other Conditions Existing Which in the Judgment of the Emergency Coordinator Warrant Declaration of an Alert.

Operating Mode Applicability: All

Emergency Action Level:

1. Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress 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 exposure levels.

Basis:

This Threshold addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Coordinator to fall under the Alert emergency class.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HS2

Initiating Condition – SITE AREA EMERGENCY

Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established.

Operating Mode Applicability: All

Emergency Action Level:

1. a. Control room evacuation has been initiated.

AND

- b. Control of the plant cannot be established per [procedure TBD] in less than [TBD] minutes.

Basis:

Expeditious transfer of safety systems has not occurred but fission product barrier damage may not yet be indicated. The intent of this IC is to capture those events where control of the plant cannot be reestablished in a timely manner. The determination of whether or not control is established at the remote shutdown panel is based on Emergency Coordinator judgment. The Emergency Coordinator is expected to make a reasonable, informed judgment within the site-specific time for transfer that control of the plant from the remote shutdown panel has been achieved.

The intent of the EAL is to establish control of important plant equipment and knowledge of important plant parameters in a timely manner. Primary emphasis should be placed on those components and instruments that supply protection for and information about safety functions. These safety functions are reactivity control (ability to shutdown the reactor and maintain it shutdown), reactor water level (ability to cool the core), and decay heat removal (ability to maintain a heat sink) for an ESBWR.

Escalation of this event, if appropriate, would be by Fission Product Barrier Degradation, Abnormal Rad Levels/Radiological Effluent, or Emergency Coordinator Judgment ICs.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HS3

Initiating Condition – SITE AREA EMERGENCY

Other Conditions Existing Which in the Judgment of the Emergency Coordinator Warrant Declaration of a Site Area Emergency.

Operating Mode Applicability: All

Emergency Action Level:

1. Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts: (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.

Basis:

This EAL addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Coordinator to fall under the emergency class description for Site Area Emergency.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HS4

Initiating Condition – SITE AREA EMERGENCY

HOSTILE ACTION Within the PROTECTED AREA.

Operating Mode Applicability: All

Emergency Action Level:

1. A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the site security shift supervision.

Basis:

This condition represents an escalated threat to plant safety above that contained in the Alert in that a HOSTILE FORCE has progressed from the OWNER CONTROLLED AREA to the PROTECTED AREA.

This EAL addresses the contingency for a very rapid progression of events, such as that experienced on September 11, 2001. It is not premised solely on the potential for a radiological release. Rather the issue includes the need for rapid assistance due to the possibility for significant and indeterminate damage from additional air, land or water attack elements.

The fact that the site is under serious attack with minimal time available for further preparation or additional assistance to arrive requires offsite emergency response organization readiness and preparation for the implementation of protective measures.

This EAL addresses the potential for a very rapid progression of events due to a HOSTILE ACTION. It is not intended to address incidents that are accidental events or acts of civil disobedience, such as small aircraft impact, hunters, or physical disputes between employees within the PROTECTED AREA. Those events are adequately addressed by other EALs.

Escalation of this emergency classification level, if appropriate, would be based on actual plant status after impact or progression of attack.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HG1

Initiating Condition – GENERAL EMERGENCY

HOSTILE ACTION Resulting in Loss of Physical Control of the Facility.

Operating Mode Applicability: All

Emergency Action Level: (1 or 2)

1. A HOSTILE ACTION has occurred such that plant personnel are unable to operate equipment required to maintain safety functions.
2. A HOSTILE ACTION has caused failure of Spent Fuel Cooling Systems and IMMINENT fuel damage is likely for a freshly off-loaded reactor core in pool.

Basis:

This IC encompasses conditions under which a HOSTILE ACTION has resulted in a loss of physical control of VITAL AREAS (containing vital equipment or controls of vital equipment) required to maintain safety functions and control of that equipment cannot be transferred to and operated from another location.

If control of the plant equipment necessary to maintain safety functions can be transferred to another location, then the above initiating condition is not met.

This EAL also addresses failure of spent fuel cooling systems as a result of HOSTILE ACTION if IMMINENT fuel damage is likely.

HAZARDS OR OTHER CONDITIONS AFFECTING PLANT SAFETY

HG2

Initiating Condition – GENERAL EMERGENCY

Other Conditions Existing Which in the Judgment of the Emergency Coordinator Warrant Declaration of a General Emergency.

Operating Mode Applicability: All

Emergency Action Level:

1. Other conditions exist which in the judgment of the Emergency Coordinator indicate that events are in progress 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 at or beyond, the site boundary.

Basis:

This EAL addresses unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Coordinator to fall under the General Emergency class.

5.9 System Malfunction EALs

Table A1-S Recognition Category “S” Initiating Condition Matrix

GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		NOUE	
SG1	All Safety Related DC Batteries Not Being Charged for Greater Than 72 Hours Due to Loss of Power to PIP Busses. <i>Op. Modes: Power Operation, Startup, Hot Standby, Safe/Stable Shutdown</i>	SS1	All Safety Related DC Batteries Not Being Charged for 24 Hours or Longer Due to Loss of Power to PIP Busses. <i>Op. Modes: Power Operation, Startup, Hot Standby, Safe/Stable Shutdown</i>	SA1	All Safety Related DC Batteries Not Being Charged for 60 Minutes or Longer Due to Loss of Power to PIP Busses. <i>Op. Modes: Power Operation, Startup, Hot Standby, Safe/Stable Shutdown</i>	SU1	All Safety Related DC Batteries Not Being Charged for 30 Minutes or Longer Due to Loss of Power to PIP Busses. <i>Op. Modes: Power Operation, Startup, Hot Standby, Safe/Stable Shutdown</i>
SG2	Automatic Scram (Trip) and All Manual Actions Fail to Shutdown the Reactor and Indication of an Extreme Challenge to the Ability to Cool the Core Exists. <i>Op. Modes: Power Operation, Startup</i>	SS2	Automatic Scram (Trip) Fails to Shutdown the Reactor and Manual Actions Taken From the Reactor Control Console are NOT Successful in Shutting Down the Reactor <i>Op. Modes: Power Operation, Startup</i>	SA2	Automatic Scram (Trip) Fails to Shutdown the Reactor and the Manual Actions Taken From the Reactor Control Console are Successful in Shutting Down the Reactor <i>Op. Modes: Power Operation, Startup</i>	SU2	Inability to Reach Required Shutdown Mode Within Technical Specification Limits. <i>Op. Modes: Power Operation, Startup, Hot Standby, Safe/Stable Shutdown</i>
		SS6	Inability to Monitor a SIGNIFICANT TRANSIENT in Progress. <i>Op. Modes: Power Operation, Startup, Hot Standby, Safe/Stable Shutdown</i>	SA4	Loss of Indicating and Monitoring Functions <i>Op. Modes: Power Operation, Startup, Hot Standby, Safe/Stable Shutdown</i>		

Table A1-S Recognition Category “S” Initiating Condition Matrix

GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	NOUE
	SS3 Loss of All Vital DC Power for 15 Minutes or Longer. <i>Op. Modes: Power Operation, Startup, Hot Standby, Safe/Stable Shutdown</i>		SU4 Fuel Clad Degradation. <i>Op. Modes: Power Operation, Startup, Hot Standby</i>
			SU5 RCS Leakage. <i>Op. Modes: Power Operation, Startup, Hot Standby, Safe/Stable Shutdown</i>
			SU6 UNPLANNED Loss of All On-site OR Off-site Communications Capabilities. <i>Op. Modes: Power Operation, Startup, Hot Standby, Safe/Stable Shutdown</i>
			SU8 Inadvertent Criticality. <i>Op Modes: Hot Standby, Safe/Stable Shutdown</i>

SYSTEM MALFUNCTION

SU1

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

All Safety Related DC Batteries Not Being Charged for 30 Minutes or Longer Due to Loss of Power to PIP Busses.

Operating Mode Applicability: Power Operation
 Startup
 Hot Standby
 Safe/Stable Shutdown

Emergency Action Level:

Note: The Emergency Coordinator 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.

1. PIP Busses 1000A3 and 1000B3 de-energized for 30 minutes or longer.

Basis:

Prolonged de-energization of the PIP busses reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete loss of DC Power. 30 minutes was selected as a threshold to exclude transient or momentary losses of AC power.

SYSTEM MALFUNCTION

SU2

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Inability to Reach Required Shutdown Mode Within Technical Specification Limits.

Operating Mode Applicability: Power Operation
 Startup
 Hot Standby
 Safe/Stable Shutdown

Emergency Action Level:

1. Plant is not brought to required operating mode within Technical Specifications LCO Action Statement Time.

Basis:

Limiting Conditions of Operation (LCOs) require the plant to be brought to a required shutdown mode when the Technical Specification required configuration cannot be restored. Depending on the circumstances, this may or may not be an emergency or precursor to a more severe condition. An immediate NOUE is required when the plant is not brought to the required operating mode within the allowable Action Statement time in the Technical Specifications. Declaration of a NOUE is based on the time at which the LCO-specified Action Statement time period elapses under the site Technical Specifications and is not related to how long a condition may have existed.

SYSTEM MALFUNCTION

SU4

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Fuel Clad Degradation.

Operating Mode Applicability: Power Operation
 Startup
 Hot Standby

Emergency Action Levels: (1 or 2)

1. [TBD] radiation monitor readings indicating fuel clad degradation greater than Technical Specification 3.4.3 allowable limits.
2. [TBD] coolant sample activity value indicating fuel clad degradation greater than Technical Specification 3.4.3 allowable limits.

Basis:

This IC is included as a NOUE because it is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems. EAL #1 addresses site-specific radiation monitor readings such as BWR air ejector monitors, PWR failed fuel monitors, etc., that provide indication of fuel clad integrity. EAL #2 addresses coolant samples exceeding coolant Technical Specifications for iodine spike. Escalation of this IC to the Alert level is via the Fission Product Barrier Degradation Monitoring ICs.

SYSTEM MALFUNCTION

SU5

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

RCS Leakage.

Operating Mode Applicability: Power Operation
 Startup
 Hot Standby
 Safe/Stable Shutdown

Emergency Action Levels: (1 or 2)

1. Unidentified or pressure boundary leakage greater than 50 gpm.
2. Total leakage greater than 75 gpm.

Basis:

This IC is included as a NOUE because it may be a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant. The value for the unidentified leakage (including the pressure boundary) was selected as it is observable with normal Control Room indications and is 10 times the Technical Specification limit. Lesser values must generally be determined through time-consuming surveillance tests (e.g., mass balances).

Relief valve normal operation should be excluded from this IC. However, a relief valve that operates and fails to close per design should be considered applicable to this IC if the relief valve cannot be isolated.

The EAL for identified leakage is set at a higher value due to the lesser significance of identified leakage in comparison to unidentified or pressure boundary leakage and is 2.5 times the Technical Specification limit. In either case, escalation of this IC to the Alert level is via Fission Product Barrier Degradation ICs.

SYSTEM MALFUNCTION

SU6

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

UNPLANNED Loss of All On-site or Off-site Communications Capabilities.

Operating Mode Applicability: Power Operation
 Startup
 Hot Standby
 Safe/Stable Shutdown

Emergency Action Levels: (1 or 2)

1. Loss of all of the following on-site communication methods affecting the ability to perform routine operations:
 - Plant Page/Party Line
 - PABX
 - Sound Powered Phones
 - Plant Radios
2. Loss of all of the following off-site communication methods affecting the ability to perform offsite notifications:
 - Insta-phone Loop
 - Emergency Notification System
 - Health Physics Network
 - Reactor Safety Counterpart Link
 - Protective Measures Counterpart Link
 - Management Counterpart Link

Basis:

The purpose of this IC and its associated EALs is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate problems with off-site authorities. The loss of off-site communications ability is expected to be significantly more comprehensive than the condition addressed by 10 CFR 50.72.

The availability of one method of ordinary off-site communications is sufficient to inform state and local authorities of plant conditions.

SYSTEM MALFUNCTION

SU8

Initiating Condition -- NOTIFICATION OF UNUSUAL EVENT

Inadvertent Criticality.

OPERATING MODE APPLICABILITY Hot Standby

Safe/Stable Shutdown

Emergency Action Level:

1. UNPLANNED SRNM Short Period Alarm.

Basis:

This IC addresses inadvertent criticality events. This IC indicates a potential degradation of the level of safety of the plant, warranting a NOUE classification. This IC excludes inadvertent criticalities that occur during planned reactivity changes associated with reactor startups.

Escalation would be by the Fission Product Barrier Matrix, as appropriate to the operating mode at the time of the event, or by Emergency Coordinator judgment.

SYSTEM MALFUNCTION

SA1

Initiating Condition -- ALERT

All Safety Related DC Batteries Not Being Charged for Greater Than 60 Minutes Due to Loss of Power to PIP Busses.

Operating Mode Applicability:	Power Operation
	Startup
	Hot Standby
	Safe/Stable Shutdown

Emergency Action Level:

1. PIP Busses 1000A3 and 1000B3 de-energized for greater than 60 minutes.

Basis:

This IC and the associated EALs are intended to provide an escalation from [IC SU1](#). Prolonged de-energization of the PIP busses reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete loss of DC Power. 60 minutes was selected as an escalation to ensure augmented support is available to the operating crew.

The condition indicated by this IC is the degradation of the AC power systems.

SYSTEM MALFUNCTION

SA2

Initiating Condition -- ALERT

Automatic Scram (Trip) Fails to Shutdown the Reactor AND the Manual Actions Taken from the Reactor Control Console are Successful in Shutting Down the Reactor

Operating Mode Applicability: Power Operation
 Startup

Emergency Action Level:

1. a. An Automatic Reactor Protection System actuation failed to shutdown the reactor.

AND

b. Manual actions taken at the reactor control console successfully shutdown the reactor as indicated by less than [0.25% power].

Basis:

A manual actuation is any set of actions by the reactor operator(s) at the reactor control console which causes or should cause control rods to be rapidly inserted into the core and shuts down the reactor (e.g., reactor trip button, Alternate Rod Insertion).

If actions taken at the reactor control console fail to shutdown the plant, the event would escalate to a Site Area Emergency.

This condition indicates failure of the automatic protection system to scram (trip) the reactor. This condition is more than a potential degradation of a safety system in that a front line automatic protection system did not function in response to a plant transient. Thus the plant safety has been compromised because design limits of the fuel may have been exceeded. An Alert is indicated because conditions may exist that lead to potential loss of fuel clad or RCS.

SYSTEM MALFUNCTION

SA4

Initiating Condition -- ALERT

Loss of Indicating and Monitoring Functions.

Operating Mode Applicability: Power Operation
 Startup
 Hot Standby
 Safe/Stable Shutdown

Emergency Action Level:

Note: *The Emergency Coordinator 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.*

1. Loss of any three Q-DCIS Indicating and Monitoring Functions for 15 minutes or longer.

Basis:

This IC recognizes the difficulty associated with monitoring changing plant conditions without the use of a major portion of the control and indication systems.

This Alert will be escalated to a Site Area Emergency if the operating crew cannot monitor the transient in progress.

SYSTEM MALFUNCTION

SS1

Initiating Condition -- SITE AREA EMERGENCY

All Safety Related DC Batteries Not Being Charged for 24 Hours or Longer Due to Loss of Power to PIP Busses.

Operating Mode Applicability:

- Power Operation
- Startup
- Hot Standby
- Safe/Stable Shutdown

Emergency Action Level:

Note: *The Emergency Coordinator 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.*

1. PIP Busses 1000A3 and 1000B3 de-energized for 24 hours or longer.

Basis:

Prolonged de-energization of the PIP busses reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete loss of DC Power. 24 hours was selected as a threshold to escalate for recognition of the seriousness of the issue in that power has been unable to be restored through normal and abnormal operating procedures.

Escalation to General Emergency is via Fission Product Barrier Degradation or [IC SG1](#), "Prolonged Loss of All Off-site and On-site AC Power for greater than 72 hours."

SYSTEM MALFUNCTION

SS2

Initiating Condition -- SITE AREA EMERGENCY

Automatic Scram (Trip) Fails to Shutdown the Reactor AND Manual Actions Taken from the Reactor Control Console are NOT Successful in Shutting Down the Reactor

Operating Mode Applicability: Power Operation
 Startup

Emergency Action Level:

1. An Automatic Reactor Protection System actuation failed to shutdown the reactor.

AND

2. Manual actions taken at the reactor control console DO NOT shutdown the reactor as indicated by greater than [0.25% power].

Basis:

Under these conditions, the reactor is producing more heat than the maximum decay heat load for which the safety systems are designed [*typically 3 to 8% power*]. A Site Area Emergency is indicated because conditions exist that lead to IMMINENT loss or potential loss of both fuel clad and RCS.

A manual trip/scram initiation is not considered successful if action away from the Control Room control panels was required to trip/scram the reactor.

A manual trip/scram is any set of actions by the reactor operator(s) at the Control Room control panels which causes control rods to be rapidly inserted into the core and brings the reactor subcritical.

Escalation of this event to a General Emergency would be due to a prolonged condition leading to challenges in maintaining core-cooling or heat sink.

SYSTEM MALFUNCTION

SS3

Initiating Condition -- SITE AREA EMERGENCY

Loss of All Vital DC Power for 15 Minutes or Longer.

Operating Mode Applicability: Power Operation
 Startup
 Hot Standby
 Safe/Stable Shutdown

Emergency Action Level:

Note: *The Emergency Coordinator 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.*

1. Less than 210V on all Vital DC Busses 11, 12, 21, 22, 31, 32, 41, and 42 for 15 minutes or longer.

Basis:

Loss of all DC power compromises ability to monitor and control plant safety functions. Prolonged loss of all DC power will cause core uncovering and loss of containment integrity when there is significant decay heat and sensible heat in the reactor system. Fifteen minutes for the initiating condition was selected as a threshold to exclude transient or momentary power losses.

Escalation to a General Emergency would occur by Abnormal Rad Levels/Radiological Effluent, Fission Product Barrier Degradation, or Emergency Coordinator judgment ICs.

SYSTEM MALFUNCTION

SS6

Initiating Condition -- SITE AREA EMERGENCY

Inability to Monitor a SIGNIFICANT TRANSIENT in Progress.

Operating Mode Applicability:

- Power Operation
- Startup
- Hot Standby
- Safe/Stable Shutdown

Emergency Action Level:

1. a. UNPLANNED Loss of all Q-DCIS Indicating and Monitoring Functions

AND

- b. A SIGNIFICANT TRANSIENT as indicated by [TBD] in progress.

Basis:

This IC recognizes the inability of the Control Room staff to monitor the plant response to a transient. A Site Area Emergency is considered to exist if the Control Room staff cannot monitor safety functions needed for protection of the public.

SYSTEM MALFUNCTION

SG1

Initiating Condition -- GENERAL EMERGENCY

All Safety Related DC Batteries Not Being Charged for Greater Than 72 Hours Due to Loss of Power to PIP Busses.

Operating Mode Applicability: Power Operation
 Startup
 Hot Standby
 Safe/Stable Shutdown

Emergency Action Level:

1. PIP Busses 1000A3 and 1000B3 de-energized for greater than 72 hours.

Basis:

The DC Battery design is for at least 72 hours of safety related power. If the DC busses have been de-energized, then the reactor is being maintained in a safe shutdown condition by gravity and natural circulation by refilling the Isolation Condenser and PCC Pools using the on-site Fire Protection System.

This IC is specified to assure that in the unlikely event of a prolonged station blackout, timely recognition of the seriousness of the event occurs and that declaration of a General Emergency occurs as early as is appropriate, based on a reasonable assessment of the event trajectory.

The likelihood of restoring at least one bus should be based on a realistic appraisal of the situation since a delay in an upgrade decision based on only a chance of mitigating the event could result in a loss of valuable time in preparing and implementing public protective actions.

Under these conditions, fission product barrier monitoring capability may be degraded. Although it may be difficult to predict when power can be restored, it is necessary to give the Emergency Coordinator a reasonable idea of how quickly to declare a General Emergency based on two major considerations:

1. Are there any present indications that core cooling is already degraded to the point that Loss or Potential Loss of Fission Product Barriers is IMMINENT?
2. If there are no present indications of such core cooling degradation, how likely is it that power can be restored in time to assure that a loss of two barriers with a potential loss of the third barrier can be prevented?

SYSTEM MALFUNCTION

Thus, indication of continuing core cooling degradation must be based on Fission Product Barrier monitoring with particular emphasis on Emergency Coordinator judgment as it relates to IMMINENT Loss or Potential Loss of fission product barriers and degraded ability to monitor fission product barriers.

SG2

Automatic Scram (Trip) and All Manual Actions Fail to Shutdown the Reactor and Indication of an Extreme Challenge to the Ability to Cool the Core Exists.

Emergency Action Level:

- AND**

a. RPV level less than Level 0 Setpoint [0 inches (0 mm)] on B21-NBS-LI-R615A-D

OR

- Basis:**

Under the conditions of this EAL, efforts to bring the reactor subcritical to the extent that the reactor is producing more heat than the maximum decay heat load for which the safety systems were designed are not successful. This situation could be a precursor for a core melt sequence.

In the event either of these challenges exists at a time that the reactor has not been brought below the power associated with the Safety System Design, a core melt sequence exists. In this situation, core degradation can occur rapidly. For this reason, the General Emergency declaration is intended to be anticipatory of the fission product barrier matrix declaration to permit maximum off-site intervention time.

**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."¹ 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 [Section II.I](#) 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."² 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."³

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."⁴ 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-0737.⁵

-
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.”¹ 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.”²

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.”³ Provisions related to remote interrogation and communications are discussed in [Section II.F](#) of this emergency plan.

3.0 Conceptual 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) related to atmospheric transport and diffusion assessment are addressed in [Section 2.3.3](#) of the NAESP application. These 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 Generic ITAAC Element 6.1 and the requirements of [Section 13.3.2.2.2.i](#) of the NAESP application.

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 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 Generic ITAAC Element 6.2 and the requirements of [Section 13.3.2.2.h.3](#) of the NAESP application.
- 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 Generic ITAAC Element 6.1 and the requirements of [Section 2.3.3.1.1](#) of the NAESP application.
- The means exist to make rapid assessment of potential magnitude and locations of any radiological hazards through gaseous release pathways. This addresses both Generic ITAAC Element 6.5 and the requirements of [Section 13.3.2.2.i.1](#) of the NAESP Application.
- 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 Generic ITAAC Element 6.7 and the requirements of [Section 13.3.2.2.k.3](#) of the NAESP Application.

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. COVERP 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.

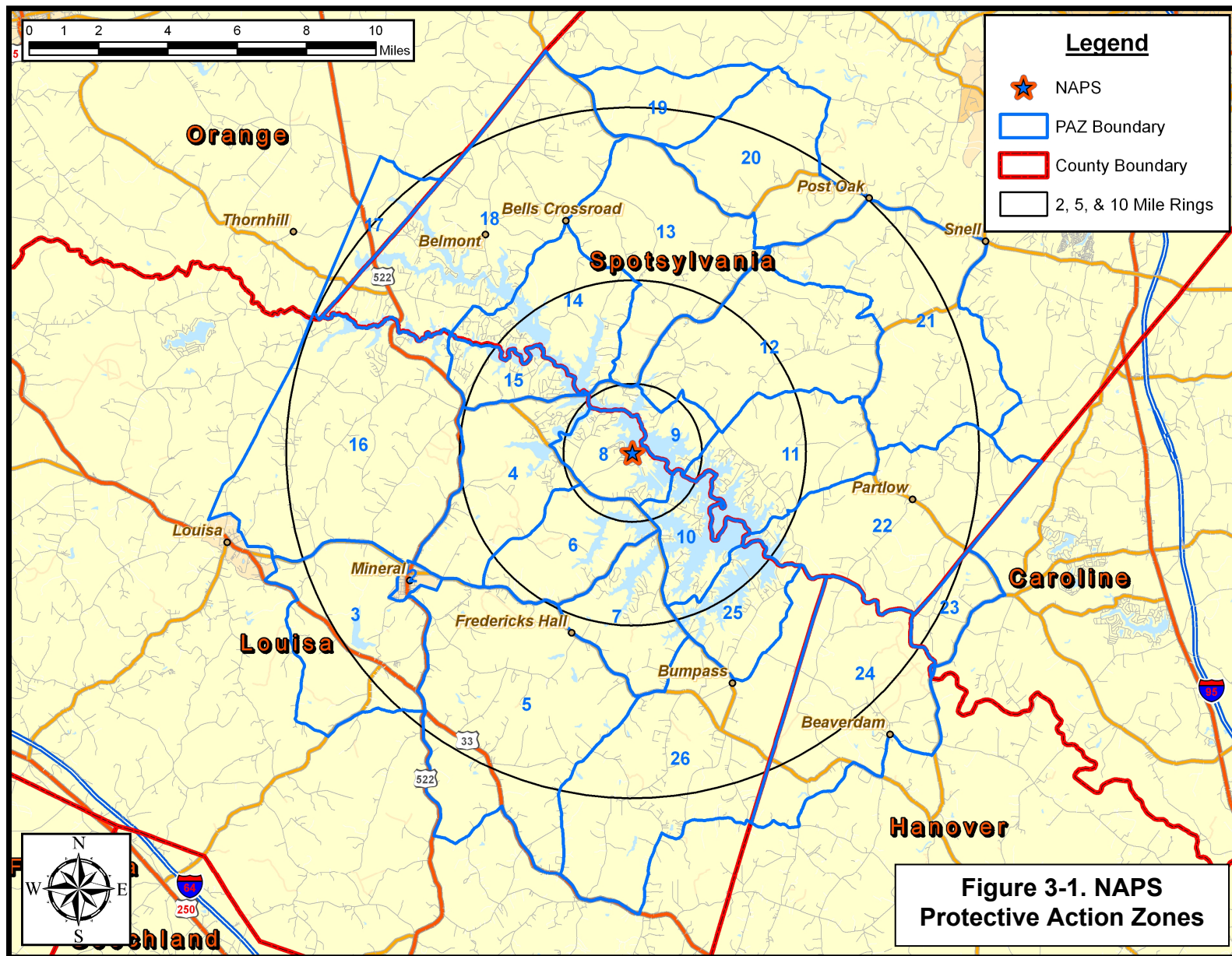


Table 3-1. Permanent Resident Population and Vehicles by PAZ		
PAZ	2008 POPULATION	2008 VEHICLES
2	645	358
3	1,843	1,025
4	1,842	1,022
5	1,740	968
6	727	404
7	939	522
8	885	490
9	426	236
10	1,151	638
11	1,345	748
12	1,467	814
13	1,312	728
14	1,719	952
15	1,589	879
16	2,153	1,200
17	223	124
18	3,624	2,008
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
TOTAL:	33,423	18,556

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	
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	X
Evacuate 2 mile ring and 5 miles downwind																										
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		X	X	X												
R05	NE					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	
R08	SSE, S					X	X	X	X	X															X	
R09	SSW					X	X	X	X	X																
R10	SW			X		X	X	X	X	X																
R11	WSW			X		X		X	X	X																
R12	W			X		X		X	X	X					X											
R13	WNW, NW			X		X		X	X	X				X	X											
R14	NNW					X		X	X	X			X	X	X											
Evacuate 5 mile ring and downwind to EPZ boundary																										
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					X	
R16	NNE			X		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	
R20	ESE			X		X	X	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	X	X
R22	SSE, S			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
R24	SW, WSW	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	
R26	WNW, NW			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	

Table 6-2. Evacuation Scenario Definitions					
Scenario	Season	Day of Week	Time of Day	Weather	Special
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

Scenario:	Summer		Summer		Summer	Scenario:	Winter			Winter			Winter	Scenario:	Summer	
	Midweek		Weekend		Midweek Weekend		Midweek			Weekend			Midweek Weekend		Midweek	Midweek
	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)		(13)	(14)
	Midday		Midday		Evening		Midday			Midday			Evening		Midday	Midday
Region Wind Toward:	Good Weather	Rain	Good Weather	Rain	Good Weather	Region Wind Toward:	Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather	Region Wind Toward:	New Plant Construction	New Plant Construction + Refueling
Entire 2-Mile Region, 5-Mile Region, and EPZ																
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
2-Mile Ring and Downwind to 5 Miles																
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
5-Mile Ring and Downwind to EPZ Boundary																
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	Midweek
Scenario:	(1)	(2)	(3)	(4)	(5)	Scenario:	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Scenario:	(13)	(14)
Region Wind Toward:	Midday		Midday		Evening	Region Wind Toward:	Midday			Midday			Evening	Region Wind Toward:	Midday	Midday
	Good Weather	Rain	Good Weather	Rain	Good Weather		Good Weather	Rain	Snow	Good Weather	Rain	Snow	Good Weather		New Plant Construction	New Plant Construction + Refueling
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)
Louisa County Schools								
Thomas Jefferson Elementary School	90	5	1.53	3	1:40	9.89	15	1:55
Jouett Elementary School	90	5	4.23	8	1:45	17.10	26	2:10
Louisa County High School	90	5	3.55	7	1:45	8.08	13	1:55
Louisa County Middle School	90	5	3.30	6	1:45	8.07	13	1:55
Mineral Christian Preschool (DAYCARE)	90	5	3.49	6	1:45	9.02	14	1:55
Spotsylvania County Schools								
Berkeley Elementary School	90	5	2.06	4	1:40	7.97	12	1:55
Livingston Elementary School	90	5	9.29	16	1:55	7.21	11	2:05
Post Oak Middle School	90	5	4.21	8	1:45	7.26	11	1:55
Spotsylvania High School	90	5	3.19	6	1:45	7.98	12	1:55
Average for EPZ:					1:45	Average:		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
Average for EPZ:					3:20	Average for EPZ:						3:45

*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 Letters



COMMONWEALTH of VIRGINIA

MICHAEL M. CLINE
State Coordinator

JANET L. CLEMENTS
Deputy Coordinator

JAMES W. KECK
Deputy Coordinator

Department of Emergency Management

September 24, 2007

10501 Trade Court
Richmond, Virginia 23236-3713
(804) 897-6500
(TDD) 674-2417
FAX (804) 897-6506
www.vaemergency.com

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd
Glen Allen, VA 23060

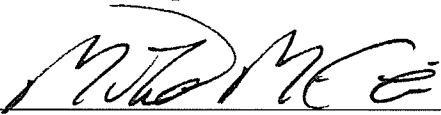
Dear Mr. Grecheck,

The Virginia Department of Emergency Management has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, the Virginia Department of Emergency Management and certifies 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 Virginia Department of Emergency Management concurs with the proposed emergency classification system, initiating conditions, emergency action levels described in the Combined License Application Emergency Plan and evacuation time estimates.

It is my 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.



Signature



Date

State Coordinator
Title



COMMONWEALTH of VIRGINIA

ROBERT B. STROUBE, M.D., M.P.H.
STATE HEALTH COMMISSIONER

Department of Health
P O BOX 2448
RICHMOND, VA 23218

TTY 7-1-1 OR
1-800-828-1120

August 28, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd
Glen Allen, VA 23060

Dear Mr. Grecheck,

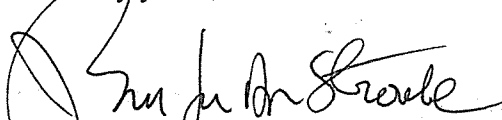
The Virginia Department of Health (VDH) has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, and VDH certifies its commitment that:

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

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

It is my 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.

Sincerely yours,



Robert B. Stroube, M.D., M.P.H.
State Health Commissioner



COMMONWEALTH OF VIRGINIA

Colonel W. S. (Steve) Flaherty
Superintendent

(804) 674-2000

DEPARTMENT OF STATE POLICE

9300 Brook Road
Glen Allen, Virginia 23060
PHONE 804-553-3457

Lt. Colonel Robert B. Northern
Deputy Superintendent

September 11, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd
Glen Allen, VA 23060

Dear Mr. Grecheck,

The Department of State Police has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, the Department of State Police and certifies its commitment that:

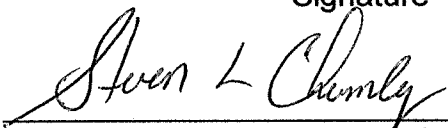
- proposed emergency plans are practicable;
- the Department of State Police is committed to participating in further development of the plans, including any required field demonstrations; and
- the Department of State Police is committed to executing their responsibilities under the plans in the event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

Furthermore, the Department of State Police concurs with the proposed emergency classification system, initiating conditions, emergency action levels described in the Combined License Application Emergency Plan and evacuation time estimates.

It is my 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.


Signature

9/11/07
Date

 STEVEN L. CHUMLEY
Division Commander



COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

Department of Game and Inland Fisheries

J. Carlton Courter, III
Director

September 21, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Boulevard
Glen Allen, VA 23060

Dear Mr. Grecheck:

The Virginia Department of Game and Inland Fisheries, has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, and certifies its commitment that:

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

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

It is my 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.

Sincerely,

A handwritten signature in cursive script, reading "J. Carlton Courter, III".

J. Carlton Courter, III
Director



MCV Campus

V i r g i n i a C o m m o n w e a l t h U n i v e r s i t y

Medical Center

In the tradition of the Medical College of Virginia

VCU Health System Administration

Main Hospital
1250 East Marshall Street, Suite 2-300
P.O. Box 980510
Richmond, Virginia 23298-0510

804 828-0938
Fax: 804 828-1657
TDD: 1-800-828-1120
www.vcuhealth.org

September 4, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd
Glen Allen, VA 23060

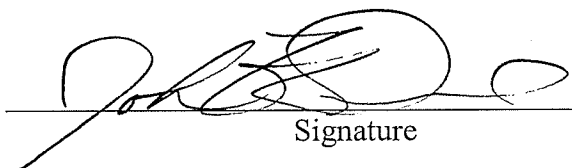
John F. Duval
Chief Executive Officer
VCU Hospitals

Dear Mr. Grecheck,

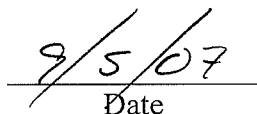
The MCV Hospitals has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station. The MCV Hospitals certifies that:

- the proposed emergency plans medical response component is practicable;
- the MCV Hospitals is committed to participating in further development of the plans, including any required field demonstrations; and
- the Medical College of Virginia/Virginia Commonwealth University is committed to executing their responsibilities under the plans in the event of an emergency.

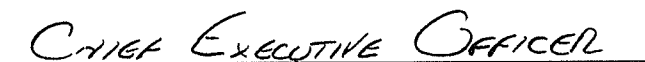
It is our understanding that the specific nature of arrangements in support of emergency preparedness for operation of the proposed new nuclear unit will be clearly established in a properly executed and binding letter of agreement that will be included in the North Anna Unit 3 Combined License Application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



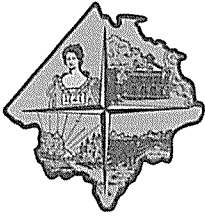
Signature



Date



Title



County of Caroline
Department of Fire-Rescue & Emergency Management

September 7, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd
Glen Allen, VA 23060

Dear Mr. Grecheck,

The Caroline County Fire-Rescue and Emergency Mgmt. has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, Caroline County Fire-Rescue and Emergency Mgmt. and certifies its commitment that:

- proposed emergency plans are practicable;
- Caroline County Fire-Rescue and Emergency Mgmt. is committed to participating in further development of the plans, including any required field demonstrations; and
- Caroline County Fire-Rescue and Emergency Mgmt. is committed to executing their responsibilities under the plans in the event of an emergency.

Furthermore, Caroline County Fire-Rescue and Emergency Mgmt. concurs with the proposed emergency classification system, initiating conditions, emergency action levels described in the Combined License Application Emergency Plan and evacuation time estimates.

It is my 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.



Signature

7 September 2007
Date

Director
Title



Office of the Sheriff

Sheriff A. A. "Tony" Lippa, Jr.

CAROLINE COUNTY SHERIFF'S OFFICE

P.O. Box 39 118 Courthouse Lane Bowling Green, VA 22427

Phone (804)-633-1123 Fax (804)-633-1124

www.co.caroline.va.us



September 12, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd
Glen Allen, VA 23060

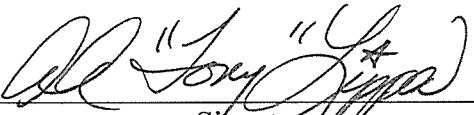
Dear Mr. Grecheck,

The Caroline County Sheriff's Office has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, and the Caroline County Sheriff's Office certifies its commitment that:

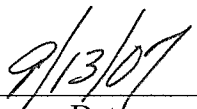
- proposed emergency plans are practicable;
- Caroline County Sheriff's Office is committed to participating in further development of the plans, including any required field demonstrations; and
- Caroline County Sheriff's Office is committed to executing their responsibilities under the plans in the event of an emergency.

Furthermore, Caroline County Sheriff's Office concurs with the proposed emergency classification system, initiating conditions, emergency action levels described in the Combined License Application Emergency Plan and evacuation time estimates.

It is my 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.



Signature



Date



Title

BOARD OF SUPERVISORS

ROBERT R. SETLIFF, CHAIRMAN
CHICKAHOMINY DISTRICT

AUBREY M. STANLEY, VICE-CHAIRMAN
BEAVERDAM DISTRICT

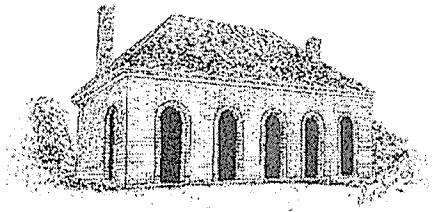
TIMOTHY E. ERNST
ASHLAND DISTRICT

JOHN E. GORDON, JR.
SOUTH ANNA DISTRICT

CHARLES D. MCGHEE
HENRY DISTRICT

ELTON J. WADE, SR.
COLD HARBOR DISTRICT

J. T. "JACK" WARD
MECHANICSVILLE DISTRICT



HANOVER COURTHOUSE

HANOVER COUNTY

ESTABLISHED IN 1720

COUNTY ADMINISTRATOR'S OFFICE

CECIL R. HARRIS, JR.
COUNTY ADMINISTRATOR

JOHN H. HODGES
DEPUTY COUNTY ADMINISTRATOR

JOSEPH P. CASEY
DEPUTY COUNTY ADMINISTRATOR

MARILYN J. BLAKE
ASSISTANT COUNTY ADMINISTRATOR

CECIL V. MARTINETTE, JR.
ASSISTANT COUNTY ADMINISTRATOR

P.O. Box 470, HANOVER, VA 23069
WWW.CO.HANOVER.VA.US

PHONE: 804-365-6005
FAX: 804-365-6234

September 5, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd.
Glen Allen, VA 23060

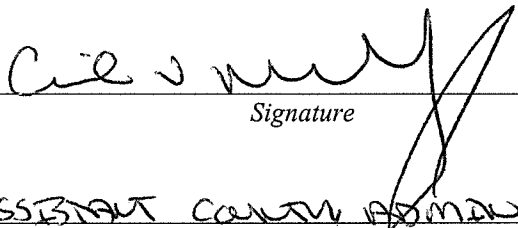
Dear Mr. Grecheck,

Hanover County has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, Hanover County and certifies its commitment that:

- The proposed emergency plans are practicable;
- Hanover County is committed to participating in further development of the plans, including any required field demonstrations; and
- Hanover County is committed to executing their responsibilities under the plans in the event of an emergency.

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

It is my 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.



Signature

9/7/07

Date

ASSISTANT COUNTY ADMINISTRATOR

Title

MEMBER OF
NATIONAL SHERIFFS' ASSN.



OFFICE OF SHERIFF
COLONEL V. STUART COOK
P.O. BOX 40
HANOVER, VIRGINIA 23069
804-365-6110 804-730-6110

MEMBER OF
VIRGINIA STATE SHERIFFS' ASSN.



August 29, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Boulevard
Glen Allen, VA 23060

Dear Mr. Grecheck:

The Hanover County Sheriff's Office has completed its review of the Combined License Application Emergency Plan ("the Plan") supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station. This agency certifies its commitment in that:

1. The proposed Plan is practical;
2. The Hanover County Sheriff's Office is committed to participating in further development of the Plan, to include any required field demonstrations; and
3. The Hanover County Sheriff's Office is committed to executing their responsibilities under the Plan in the event of an emergency.

Furthermore, the Hanover County Sheriff's Office concurs with the proposed emergency classification system, initiating conditions, emergency action levels described in the Plan and evacuation time estimates.

It is my 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.

8/29/07
Date

V. Stuart Cook
Sheriff

/l/zj

A State and Nationally Accredited Law Enforcement Agency



LOUISA COUNTY SHERIFF'S OFFICE

ASHLAND D. FORTUNE - SHERIFF
P. O. Box 504 • LOUISA, VIRGINIA 23093



September 12, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Dear Mr. Grecheck,

The Louisa County Sheriff's Office has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, Louisa County Sheriff's Office and certifies its commitment that:

- ❖ Proposed emergency plans are practicable;
- ❖ Louisa County Sheriff's Office is committed to participating in further development of the plans, including any required field demonstrations; and
- ❖ Louisa County Sheriff's Office is committed to executing their responsibilities under the plans in the event of an emergency.

Furthermore, Louisa County Sheriff's Office concurs with the proposed emergency classification system, initiating conditions, emergency action levels described in the Combined License Application Emergency Plan and evacuation time estimates.

It is my 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.

A handwritten signature in cursive script, reading 'Ashland D. Fortune'.

Ashland D. Fortune, Sheriff
Louisa County

Date: 09/13/07

Louisa County Volunteer Firefighters Association

September 7, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd
Glen Allen, VA 23060

Dear Mr. Grecheck,

The Louisa County Volunteer Firefighters Association has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, and certifies its commitment that:

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

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

It is my 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.

Ricky Bywaters
Signature

9-7-2007
Date

President
Title



EMSAL
EMERGENCY MEDICAL SERVICES ASSOCIATION of LOUISA



P.O. Box 1306 Louisa, Virginia 23093

September 21, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd
Glen Allen, VA 23060

Dear Mr. Grecheck,

EMSAL has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, and EMSAL certifies its commitment that:

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

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

It is my 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.

R. Garland Nichols
Signature

9-21-07
Date

President
Title

ORANGE COUNTY, VIRGINIA

OFFICE OF THE COUNTY ADMINISTRATOR

WILLIAM C. ROLFE
COUNTY ADMINISTRATOR

PHONE: (540) 672-3313
FAX: (540) 672-1679
brolfe@orangecova.com



R. LINDSAY GORDON III BUILDING
112 WEST MAIN STREET
P O BOX 111
ORANGE, VIRGINIA 22960

September 12, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd
Glen Allen, VA 23060

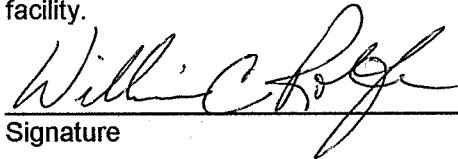
Dear Mr. Grecheck,

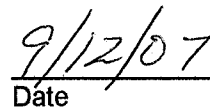
The County of Orange has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station and certifies its commitment that:

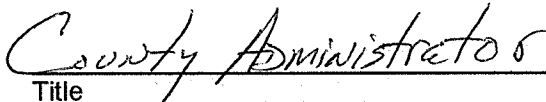
- Proposed emergency plans are practicable;
- Orange County is committed to participating in further development of the plans, including any required field demonstrations; and
- Orange County is committed to executing their responsibilities under the plans in the event of an emergency.

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

It is my 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.


Signature


Date


Title

Sheriff Mark A. Amos
(540) 672-1200
Fax (540) 672-9435



P.O. Box 445
Orange, Virginia 22960
email:mamos@orangecova.com

ORANGE COUNTY SHERIFF'S OFFICE

September 11, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd.
Glen Allen, Va. 23060

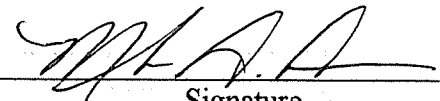
Dear Mr. Grecheck,

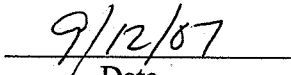
The Orange County Sheriffs Office has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, Orange County Sheriffs Office and certifies its commitment that:

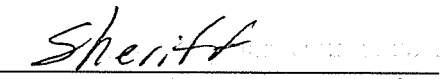
- Proposed emergency plans are practicable;
- Orange County Sheriffs Office is committed to participating in further development of the plans, including any required field demonstrations; and
- Orange County Sheriffs Office is committed to executing their responsibilities under the plans in the event of an emergency.

Furthermore, Orange County Sheriffs Office concurs with the proposed emergency classification system, initiating conditions, emergency action levels described in the Combined License Application Emergency Plan and evacuation time estimates.

It is my 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.


Signature


Date


Title



SPOTSYLVANIA COUNTY
Department of Fire, Rescue, and
Emergency Management (FREM)

8800 Courthouse Road, Room 414
P. O. Box 818
Spotsylvania, VA 22553

PHONE: (540) 507-7900 FAX: (540) 582-6957

August 27, 2007

Mr. Eugene S. Grecheck
Vice President-Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Boulevard
Glen Allen, VA 23060

Nuclear Generating Unit at the North Anna Power Station

Dear Mr. Grecheck:

The Spotsylvania County Department of Fire, Rescue, and Emergency Management (FREM) has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station.

- Spotsylvania FREM is committed that proposed emergency plans be practicable;
- Spotsylvania FREM is committed to participating in further development of the plans, including any required field demonstrations; and
- Spotsylvania FREM is committed to executing their responsibilities under the plans in the event of an emergency.

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

It is my 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 the construction and operation of this nuclear facility.

Signature: 
Division Chief-Emergency Management

Date: 08-28-07

SPOTSYLVANIA COUNTY SHERIFF'S OFFICE



Office of Sheriff
Sheriff Howard D. Smith
Post Office Box 124
Spotsylvania, Virginia 22553
Phone: 540-582-7115 • Fax: 540-582-9448

September 24, 2007

Mr. Eugene S. Grecheck
Vice President Nuclear Support Services
Dominion Resources Services, Inc.
5000 Dominion Blvd
Glen Allen, VA 23060

Dear Mr. Grecheck,

The Spotsylvania County Sheriff's Office has reviewed the emergency plan supporting the Combined License Application for a new nuclear generating unit at the North Anna Power Station, and certifies its commitment that:

- proposed emergency plans are practicable;
- The Spotsylvania County Sheriff's Office is committed to participating in further development of the plans, including any required field demonstrations; and
- The Spotsylvania County Sheriff's Office is committed to executing their responsibilities under the plans in the event of an emergency.

Furthermore, the Spotsylvania County Sheriff's Office concurs with the proposed emergency classification system, initiating conditions, emergency action levels described in the Combined License Application Emergency Plan and evacuation time estimates.

It is my 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.

A handwritten signature in black ink, appearing to read "Howard D. Smith", written over a horizontal line.

Signature

A handwritten date "9/24/07" in black ink, written over a horizontal line.

Date

The word "SHERIFF" written in a stylized, handwritten font in black ink, positioned above a horizontal line.

Title



An Accredited Law Enforcement Agency

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 letters provided in [Appendix 1](#) of this plan.

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

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						

NUREG-0654							
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						

NUREG-0654

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

NUREG-0654							
Eval. Criterion	COL EPlan	Commonwealth of Virginia	Caroline County	Hanover County	Louisa County	Orange County	Spotsylvania County
J.10.l		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

NUREG-0654

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	Plan §XII	Plan §XII	Plan §XII	Plan §XII
N.1.b	Plan §II.N.1.b	App. 13 §II	Plan §XII	Plan §XII	Plan §XII	Plan §XII	Plan §XII
N.2.a	Plan §II.N.2.a	App. 13 §II.C.1	Plan §XII.B.1	Plan §XII.B.1	Plan §XII.B.1	Plan §XII.B.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	not applicable, see COVRERP	not applicable, see COVRERP	not applicable, see COVRERP	not applicable, see COVRERP

NUREG-0654							
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	Plan §XII	Plan §XII	Plan §XII	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	Plan §XII	Plan §XII	Plan §XII	Plan §XII
N.3.b	Plan §II.N.3.b	App. 13 §II.D.2	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP
N.3.c	Plan §II.N.3.c	App. 13 §II.D.3	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP
N.3.d	Plan §II.N.3.d	App. 13 §II.D.4	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP
N.3.e	Plan §II.N.3.e	App. 13 §II.D.5	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP
N.3.f	Plan §II.N.3.f	App. 13 §II.D	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP
N.4	Plan §II.N.4	App. 13 §II.A.4	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP
N.5	Plan §II.N.5	App. 13 §II.A.4	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP
O.1	Plan §II.O.1	App. 13 §II.E	Plan §XII.A	Plan §XII.A	Plan §XII.A	Plan §XII.A	Plan §XII.A
O.1.a	Plan §II.O.1.a						
O.1.b		App. 13 §II.E.1	Plan §XII	Plan §XII	Plan §XII	Plan §XII	Plan §XII
O.2	Plan §II.O.2						

NUREG-0654

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	Plan §XII	Plan §XII	Plan §XII	Plan §XII
O.4.b	Plan §II.O.4.b	App. 13 §II.E.2	See COVRERP	See COVRERP	See COVRERP	See COVRERP	See COVRERP
O.4.c	Plan §II.O.4.c	App. 13 §II.E.6	See COVRERP	See COVRERP	See COVRERP	See COVRERP	See COVRERP
O.4.d	Plan §II.O.4.d	App. 13 §II.E.3	Plan §XII	Plan §XII	Plan §XII	Plan §XII	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	Plan §XII	Plan §XII	Plan §XII	Plan §XII
O.4.g	Plan §II.O.4.g		Plan §XII	Plan §XII	Plan §XII	Plan §XII	Plan §XII
O.4.h	Plan §II.O.4.h	App. 13 §II.E.3	Plan §XII	Plan §XII	Plan §XII	Plan §XII	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	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP
O.5	Plan §II.O.5	App. 13 §§II.E.1 & 6	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP	Plan §XII, see COVRERP
P.1	Plan §II.P.1	App. 13 §§II.E.1 & 6	Plan §§VII.A & XII.A	Plan §§VII.A & XII.A	Plan §§VII.A & XII.A	Plan §§VII.A & XII.A	Plan §§VII.A & XII.A
P.2	Plan §II.P.2	Plan §VII.B, App. 2	Plan §VII	Plan §VII	Plan §VII	Plan §VII	Plan §VII
P.3	Plan §II.P.3	Plan §X.C	Plan §VII	Plan §VII	Plan §VII	Plan §VII	Plan §VII
P.4	Plan §II.P.4	Plan §X.C.1	Plan §§VII & XI	Plan §§VII & XI	Plan §§VII & XI	Plan §§VII & XI	Plan §§VII & XI
P.5	Plan §II.P.5	Plan §X.C, App. 2	Plan §§VII & XI	Plan §§VII & XI	Plan §§VII & XI	Plan §§VII & XI	Plan §§VII & XI

NUREG-0654

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	Plan §I	Plan §I	Plan §I	Plan §I
P.7	Plan §II.P.7, App. 5	Plan Att. (un-numbered)	Plan §XIV	Plan §XIV	Plan §XIV	Plan §XIV	Plan §XIV
P.8	Plan §II.P.8, App. 8	Plan pages i through ix	Plan pages i through xvii	Plan pages i through xvii	Plan pages i through xvii	Plan pages i through xvii	Plan pages i through xvii
P.9	Plan §II.P.9						
P.10	Plan §II.P.10	Plan §IX.B	Plan §X	Plan §X	Plan §X	Plan §X	Plan §X