13.0 CONDUCT OF OPERATIONS

13.1 Organizational Structure of Applicant

13.1.1 Introduction

This section describes the organizational structure, including the design, construction, and preoperational responsibilities of the organizational structure. The management and technical support organization includes a description of the corporate or home office organization, its functions and responsibilities, the number and the qualifications of personnel. Its activities include facility design, design review, design approval, construction management, testing, and operation of the plant. The descriptions of the design, construction, and preoperational responsibilities include the following:

- How these responsibilities are assigned by the headquarters staff and implemented within the organizational units,
- The responsible working- or performance-level organizational unit,
- The estimated number of persons to be assigned to each unit with responsibility for the project,
- The general educational and experience requirements for identified positions or classes of positions, and
- Early plans for providing technical support for the operation of the facility.

This section also describes the structure, functions, and responsibilities of the onsite organization established to operate and maintain the plant. The applicant renumbered Subsection 13.1.1 and added other subsections in Final Safety Analysis Report (FSAR) Section 13.1. Several of these subsections are new and differ from the structure in Section 13.1 of Regulatory Guide (RG) 1.206.

13.1.2 Summary of Application

Section 13.1 of the North Anna 3 Combined License (COL) Application FSAR incorporates by reference Section 13.1 of the Economic Simplified Boiling-Water Reactor (ESBWR) design control document (DCD), Revision 5.

In addition, in FSAR Section 13.1, the applicant provided the following:

COL Item

- NAPS COL 13.1-1-A Management and Technical Support Organization

North Anna Power Station (NAPS) COL 13.1-1-A provides North Anna 3 site-specific information to resolve DCD COL Item 13.1-1-A. DCD COL Item 13.1-1-A requires the COL applicant to describe the organizational structure. NAPS COL 13.1-1-A describes organizational positions at the nuclear power station, in owner/applicant corporations, and the associated functions and responsibilities.

NAPS COL 13.1-1-A replaces the first paragraph of Section 13.1 of the ESBWR DCD, Revision 5 with the following:

> This section describes the organization of Unit 3. The organizational structure is described in this section and is consistent with the Human System Interface (HSI) design assumptions used in the design of the ESBWR as described in DCD Chapter 18. The organizational structure is consistent with the ESBWR (Human Factors Engineering) HFE design requirements and complies with the requirements of 10 CFR 50.54(i) through (m).

13.1.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed in the Final Safety Evaluation Report (FSER) related to the DCD.

The regulatory basis for acceptance of the resolution to the NAPS COL 13.1-1-A is satisfied based on following the guidance of Standard Review Plan (SRP) (NUREG-0800) Chapter 13, "Conduct of Operations," Section 13.1.1, "Management and Technical Support Organization;" and SRP (Nureg-0800) Chapter 13, "Conduct Of Operations," Section 13.13.1.2 - 13.1.3, "Operating Organization."

13.1.4 Technical Evaluation

The NRC staff reviewed Section 13.1 of the North Anna 3 COL FSAR and checked the referenced DCD to ensure that the combination of the DCD and the information in the COL represent the complete scope of information relating to this review topic [1]. The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the relevant information related to the Organizational Structure of the Applicant.

Section 13.1 of the DCD is being reviewed by the staff under Docket Number 52-010. The NRC staff's technical evaluation of the information incorporated by reference related to the Organizational Structure of the Applicant will be documented in the staff safety evaluation report on the design certification application for the ESBWR.

The staff reviewed the information in COL FSAR as follows:

The staff reviewed the resolution to the following NAPS COL information item included under Section 13.1 of the North Anna 3 COL. In this review, the staff used the applicable sections of the SRP (NUREG-0800) and in RG 1.206 as guidance.

The staff reviewed the information contained in the COL FSAR:

COL Item

- NAPS COL 13.1-1-A Management and Technical Support Organization

[1] See Section 1.2.2, "Finality of Referenced NRC Approvals," for a discussion on the staff's review related to verification of the scope of information to be included within a COL application that references a design certification.

NAPS COL 13.1-1-A is related to the organizational structure of the COL applicant, which describes organizational positions at a nuclear power plant, in owner/applicant corporations, and the associated functions and responsibilities.

The applicant provided the following additional North Anna 3 site-specific COL information to resolve DCD COL item 13.1-1-A, which addresses the organizational structure of the COL applicant. The DCD COL Item 13.1-1-A states:

> "The COL Applicant referencing the ESBWR will submit documentation that demonstrates that their organizational structure is consistent with the ESBWR HFE design requirements and complies with the requirements of 10 CFR 50.54 (i) through (m)."

The applicant provided additional information as part of the FSAR to describe the organizational positions at a nuclear power station, in owner/applicant corporations, and the associated functions and responsibilities. The applicant stated that Table 13.1-201, "Generic Position/Site Specific Position Cross Reference" provides the estimated number of positions required for each function. In addition, Table 13.1-201 provides a cross-reference to identify site-specific position titles.

The applicant added new sections and information related to the site-specific organizational structure in Section 13.1 that extends beyond the structure in RG 1.206. The new section titles are:

13.1.1 Management and Technical Support Organization
13.1.2 Operating Organization
13.1.3 Qualifications Requirements of Nuclear Plant Personnel
Table 13.1-201 for the generic position/site-specific position cross reference
Table 13.1-202 for minimum on-duty operations shift organization for a two-unit plant

In addition, the applicant added a new appendix to Chapter 13 for future designation as historical information titled, "Appendix 13AA Design and Construction-Responsibilities."

Section 13.1.2.1.1.8 indicates that the listing of responsibilities for the Manager of Radiation Protection and Chemistry is incomplete. The staff issued RAI 13.01.02 -13.01.03-5, requesting the applicant to revise the responsibilities of the Manager in demonstrating compliance with 10 CFR 20.1301 and Appendix I to 10 CFR Part 50. In the response to this RAI, the applicant committed to revise Section 13.1.2.1.1.8 by adding a function describing the management of programs associated with liquid and gaseous effluents and related offsite doses to members of the public. The staff finds the response acceptable. This RAI is now **Confirmatory Item 13.01.02-13.01.03-5**.

Section 13.1.2.1.1.10 indicates that the list of responsibilities for Radiation Protection Technicians is incomplete. Under RAI 13.01.02-13.01.03-6, the applicant was requested to revise the responsibilities of technicians to demonstrate compliance with 10 CFR 20.1301 and Appendix I to 10 CFR Part 50. In the response, the applicant committed to revise Section 13.1.2.1.1.10 by expanding functions describing the management of radioactive waste to include the shipment of radwaste for offsite processing, storage, and disposal; and by adding a function for the management of liquid and gaseous effluents and radiological monitoring in evaluating offsite doses to members of the public. The staff finds these responses acceptable. This RAI is now **Confirmatory Item 13.01.02-13.01.03-6**.

The staff has reviewed NAPS COL 13.1-1-A and concludes that the management, technical support, and operating organizations, as described, are acceptable and meet the requirements of 10 CFR 50.40(b) and 10 CFR 50.80, as applicable. This conclusion is based on the following:

The applicant has described its organization for the management of, and its means of providing, technical support for the plant staff for the design, construction, and operation of the facility. The applicant also described plans for managing the project and utilizing the nuclear steam supply system vendor and the Architect Engineer. These plans give adequate assurance that the applicant will establish an acceptable organization; that sufficient resources are available to provide offsite technical support; and that the applicant is able to satisfy commitments for the design, construction, and operation of the facility.

The applicant has also described the assignment of plant operating responsibilities, the reporting chain up through the chief executive officer, the functions and responsibilities of each major plant staff group, the proposed shift crew complement for a single-unit or multiple-unit operation, the qualification requirements for members of the plant staff, and staff qualifications. Resumes for management and principal supervisory and technical positions will be submitted upon request after position vacancies are filled.

The applicant's operating organization is characterized as follows:

1. The applicant is technically qualified, as specified in 10 CFR 50.40(b) and 10 CFR 50.80, as applicable.

2. An adequate number of licensed operators will be available at all required times to satisfy the minimum staffing requirements of 10 CFR 50.54(j).

3. On-shift personnel are able to provide initial facility response in the event of an emergency.

4. Organizational requirements for the plant manager and radiation protection manager have been satisfied.

5. Qualification requirements and qualifications of plant personnel conform to the guidance of RG 1.8.

6. Organizational requirements conform to the guidance of RG 1.33.

These findings contribute to the judgment that the applicant complies with the requirements of 10 CFR 50.40(b) and 10 CFR 50.80, as applicable. That is, the applicant is technically qualified to engage in design and construction activities and to operate a nuclear power plant; the applicant will have the necessary managerial and technical resources to support the plant staff in the event of an emergency; and the applicant has identified the organizational positions responsible for fire protection matters and has delegated the authority to these positions to implement fire protection requirements.

The applicant added text to Section 13.1.1.4, "Qualification of Technical Support Personnel," stating that the qualifications of managers and supervisors of the technical support organization will meet the education and experience requirements described in ANSI/ANS-3.1-1993 and in RG 1.8. The applicant also stated that the qualification and experience requirements of headquarters staff will be established in corporate policy and procedure manuals.

The applicant added text to FSAR Section 13.1.3, "Qualification Requirements of Nuclear Plant Personnel." Section 13.1.3.1 states that the qualifications of managers, supervisors, operators, and technicians of the operating organization will meet the education and experience requirements, as described in ANSI/ANS-3.1-1993 and endorsed and amended by RG 1.8. For operators and senior reactor operators (SROs), the requirements are modified in Section 13.2 of the NAPS FSAR. In addition, Section 13.1.3.2 states that resumes and other documentation of the qualifications and experience of initial appointees to appropriate management and supervisory positions will be available for review after position vacancies are filled.

The applicant added Table 13.1-202, "Minimum Shift Staffing for Unit 3." Table 13.1-202 describes the minimum composition of the operating shift crew for all modes of operation. Position titles, license requirements, and minimum shift staffing for the various modes of operation are in Technical Specifications and administrative procedures.

13.1.5 Post Combined License Activities

There are no post COL activities related to this section.

13.1.6 Conclusion

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the relevant information relating to the Organizational Structure of the Applicant and there is no outstanding information expected to be addressed in the COL FSAR related to this subsection.

The staff is reviewing the information in the DCD Section 13.1 on Docket No. 52-010. The results of the NRC's staff's technical evaluation of the information related to the Organizational Structure of the Applicant incorporated by reference in the North Anna 3 COL FSAR will be documented in the staff safety evaluation report on the DC application for the ESBWR. The SER on the ESBWR is not yet complete and this is being tracked as part of Open Item [1-1]. The staff will update Section 13.1 of this SER to reflect the final disposition of the design certification application.

In addition, the staff compared the additional COL information in the application to the relevant NRC regulations, acceptance criteria defined in NUREG-0800, Section 13.1, and other NRC RGs and concludes that the applicant is in compliance with the NRC regulations. NAPS COL Item 13.1-1-A and NAPS Supplemental Item 13.1-1, involving the management and technical support organization, are adequately addressed by the applicant and can be considered closed. In conclusion, the applicant has provided sufficient information for satisfying the requirements of 10 CFR 50.40(b) and 10 CFR 50.80, as applicable.

13.2 Training

13.2.1 Introduction

This section addresses the description of and schedule for the training program for reactor operators, senior reactor operators, and non-licensed plant staff. The program includes a schedule of the training programs for each functional group of employees in the organization. This section also addresses the scope of licensing examinations as well as training requirements and the re-qualification programs.

13.2.2 Summary of Application

Section 13.2 of the North Anna 3 COL FSAR incorporates by reference Section 13.2 of the ESBWR DCD, Revision 5.

In addition, in FSAR Section 13.2, the applicant provided the following:

COL Items

- STD COL 13.2-1-A Reactor Operator Training

Replaces DCD information and references Appendix 13BB for licensed operator training program and requalification program descriptions, Section 13.1 for training program schedules, and Section 13.4 for requalification program implementation..

- STD COL 13.2-2-A Training for Non-Licensed Plant Staff

Replaces the DCD information and references Appendix 13BB for description of the non-licensed plant staff training program, and Section 13.1 for a schedule showing the approximate timing of initial training relative to fuel load.

Supplemental Information

- STD SUP 13.2-1 Training Program

Adds introductory material under Section 13.2 and references Appendix 13BB for information on training programs and Section 13.4 for implementation milestones.

- STD SUP 13.2-2 Information additional to NEI 06-13

Adds a reference to NEI 06-13-A, “Technical Report on a Template for an Industry Training Program Description,” which is incorporated by reference.

13.2.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed in the FSER related to the DCD.

In addition, the regulatory basis for acceptance of the applicant COL Section 13.2 is established in 10 CFR Parts 19, 26, 50, 52, 55; Appendix E of 10 CFR Part 50; and the guidance of RG 1.8, and 1.149; NUREG-1021, “Operator Licensing Examination Standards for Power Reactors,” and NUREG-1220, “Training Review Criteria and Procedures.” STD COL Items 13.2-1-A and 13.2-2-A are satisfied based on NUREG-0800, Chapter 13.2.1, “Reactor Operator Requalification Program; Reactor Operator Training,” and Chapter 13.2.2, “Non-Licensed Plant Staff Training.”

Operational program for the Non-Licensed Plant Staff Training Program is established in 10 CFR 50.120 and 10 CFR 52.79(a)(33).

Operational program for the Reactor Operator Training Program is established in 10 CFR 55.13, 55.31, 55.41, 55.43, and 55.45.

Operational program for the Reactor Operator Requalification Program is satisfied based on meeting the requirements of 10 CFR 50.34(b), 50.54(i), and 55.59.

13.2.4 Technical Evaluation

The NRC staff reviewed Section 13.2 of the North Anna 3 COL FSAR and checked the referenced DCD to ensure that the combination of the DCD and the information in the COL represent the complete scope of information relating to this review topic.[1] The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the relevant information related to Training.

Section 13.2 of the DCD is being reviewed by the staff under Docket Number 52-010. The NRC staff's technical evaluation of the information incorporated by reference related to Training will be documented in the staff safety evaluation report on the design certification application for the ESBWR.

The staff reviewed the information in COL FSAR as follows:

The staff reviewed the resolution to the following COL and supplemental information items included under Section 13.2 of the North Anna COL. In the review, the staff used the applicable sections of the SRP (NUREG-0800) and RG 1.206 as guidance.

COL Items

- STD COL 13.2-1-A Reactor Operator Training

STD COL Item 13.2.1-A states the following:

> The COL Applicant will provide a description of, and the schedule for, the training program for reactor operators and senior reactor operators, and the licensed operator requalification program.

To address this information item, the applicant replaced that sentence in Section 13.2, "Training," to supplement the DCD with the following text, which the applicant identified as STD SUP 13.2-1:

> Descriptions of the training program and licensed operator requalification program for reactor operators and senior reactor operators are addressed in Appendix 13BB.

The applicant provided the following text to supplement Section 13.2, "Training," to supplement the DCD, in Appendix 13BB, "Training Program." This text is also identified by the applicant as STD SUP 13.2-2.

> NEI 06-13-A, "Technical Report on a Template for an Industry Training Program Description," is incorporated by reference with the following supplements.

[1] See Section 1.2.2, "Finality of Referenced NRC Approvals," for a discussion on the staff's review related to verification of the scope of information to be included within a COL application that references a design certification.

NUREG-0800, Section 13.2.1, states that the applicant should contain a description of the training program for reactor operators (ROs) and SROs. In the technical report in Appendix 13BB, the applicant provided a complete generic training program description for use with COL applications. In a letter dated March 7, 2009, the staff stated that NEI 06-13A, Revision 1, provided an acceptable template for describing licensed operator and non-licensed plant staff training programs. The applicant has incorporated by reference NEI 06-13A, Revision 1. The staff determined that this template is acceptable because it meets the criteria of NUREG-0800, Chapter 13.2.1.

The applicant added the following sentence in Section 13.2, "Training," to supplement the DCD:

> A schedule showing approximate timing of initial licensed operator training relative to fuel loading is addressed in Section 13.1.

NUREG-0800, Section 13.2.1, states that the applicant should describe the scheduling of the training program for ROs and SROs. In FSAR Appendix 13BB, the applicant stated that NEI 06-13A, Revision 1, is incorporated by reference. NEI 06-13A addressed training program schedules in Section 1, "Training Program Description." In FSAR Section 13.1, "Organizational Structure of Applicant," the applicant included a schedule showing the approximate timing of initial licensed operator training relative to fuel loading. The staff concluded that the applicant-provided licensed operator training program schedule provided sufficient information to satisfy the criteria of NUREG-0800, Chapter 13.2.1. The staff determined that this program is acceptable because it meets the criteria of NUREG-0800, Chapter 13.2.1.

- STD COL 13.2-2-A Training for Non-Licensed Plant Staff

STD COL Information Item 13.2.2-A states the following:

> The COL Applicant will provide a description of, and the schedule for, the training program for non-licensed plant staff.

To address this information item, the applicant replaced that sentence in Section 13.2, "Training," to supplement the DCD with the following text, which the applicant identified as STD COL 13.2.2.A:

> A description of the training program for non-licensed plant staff is addressed in Appendix 13BB. A schedule showing approximate timing of initial training for non-licensed plant staff relative to fuel load is addressed in Section 13.1.

NUREG-0800, Section 13.2.2, states that the applicant training program should meet the guidelines of RG 1.8 for non-licensed personnel. The applicant will provide for positions covered by 10 CFR 50.120 to meet the requirements of 10 CFR 50.120 at least 18 months before fuel load. In addition, the applicant will provide a commitment to conduct formal onsite training and on-the-job training so that the entire plant staff will be qualified before initial fuel load. Table 13.4-201 details the commitments and applicable requirement met. In FSAR Appendix 13BB, the applicant stated that NEI 06-13A is incorporated by reference. The staff determined this is acceptable because the applicant will include in the training programs those subjects that are required by regulation and will base the training programs on SAT, as required by regulation, in accordance with NEI 06-13A. The staff concluded that the applicant has provided sufficient information to satisfy NUREG-0800, Section 13.2.2, with the exception of NUREG-0800, Section 13.2.2.I.1.D.i and ii. This acceptance criterion requires a commitment

under the fire protection program to conduct periodic drills during construction and provisions for the indoctrination of construction personnel.

The applicant FSAR Chapter 13, Section 13.2.2 refers to Section 13.1, which states that the site construction executive is responsible for site fire protection during construction but does not specifically address the above criteria of NUREG-0800. The staff issued RAI 13.02.02-1 requesting the applicant to address the differences between the applicant FSAR and NUREG-0800, Section 13.2.2.I.1.D.i and ii. The applicant has responded to RAI 13.02.02-1 (RAI 2352, Letter from Dominion Power dated September 11, 2008, Serial no. NA3-08-091R). The staff has reviewed this response and determined this section to be acceptable provided the applicant includes the Fire Protection Training as described in their response. The staff verified that the RAI 13.02.02-1 response is incorporated in Section 13.1 in Revision 1 of the RCOL and thus determined that the response meets the guidance of NUREG-0800, Chapter 13.2.2, and is acceptable.

Supplemental Information

- STD SUP 13.2-1 Training Program
- STD SUP 13.2-2 Information Additional to NEI 06-13

The applicant added the following sentence in Section 13.2, "Training," to supplement the DCD; this text is also identified by the applicant as STD SUP 13.2-1:

> Requalification training is implemented in accordance with Section 13.4.

NUREG-0800, Section 13.2.1, states that the applicant should describe the requalification program for ROs and SROs. In FSAR Appendix 13BB, the applicant stated that NEI 06-13A, Revision 0, is incorporated by reference. NEI 06-13A addressed the requalification program descriptions in Section 1, "Training Program Description." In FSAR Section 13.4, "Operational Program Implementation," the applicant described the licensed operator requalification program. The staff concluded that the applicant-provided licensed operator requalification program meets the criteria in NUREG-0800, Section 13.2.1. The staff determined that this program is acceptable because it meets the criteria of NUREG-0800, Chapter 13.2.1.

The applicant provided the following text to supplement Section 13.2, "Training," Appendix 13BB, "Training Program," to address cold license training program procedures.

> Add the following information to NEI 06-13A.

NEI 06-13A, Revision 0, did not address a cold license training plan. The applicant inserted a new appendix, Appendix 13BB, "Training Program," that provided information additional to NEI 06-13A, Revision 0, that did address cold license training. In the new appendix, licensed operator training will be conducted in the construction phase before the initial commercial operation to support preoperational testing and cold and hot functional activities, which addresses an issue that is not addressed in NEI 06-13A, Revision 0. NEI 06-13A, Revision 1, has been written with additional information that addresses cold license testing and is endorsed by the staff. The staff issued RAI 13.02.01-1 requesting Dominion to address these differences between NEI 06-13A, Revision 1, and Appendix 13BB. In a letter dated September 11, 2008, Dominion stated that NEI 06-13A, Revision 1, will be incorporated by reference in Appendix 13BB. The staff verified that NEI 06-13A, Revision 1, is incorporated by reference in Appendix

13BB in Revision 1 of the COL FSAR. The staff determined that the change made to Appendix 13BB is acceptable and meets the guidance of NUREG-0800, Chapter 13.2.1.

NUREG-0800, Section 13.2.1, states that the training program description should address subject matter, duration, organization, position titles, and schedule. In FSAR, Appendix 13BB, the applicant stated that NEI 06-13A is incorporated by reference. NEI 06-13A included information on subject matter, duration, organization, position titles, and schedule, in Section 1, "Training Program Description." The staff concluded that the NEI 06-13A training program description information provided sufficient information to satisfy the criteria in NUREG-0800, Section 13.2.1. The staff determined that this program is acceptable because it meets the criteria of NUREG-0800, Chapter 13.2.1.

NUREG-0800, Section 13.2.1, states that the training program for licensed operators should include the subjects in 10 CFR 55.31, 55.41, 55.43, 55.45, and RG 1.8, should also include provisions for upgrading licenses, and should be based on use of the systems approach to training (SAT) defined in 10 CFR 55.4. In FSAR, Appendix 13BB, the applicant stated that NEI 06-13A is incorporated by reference. NEI 06-13A stated that the training program for licensed operators is in accordance with and includes the subjects in 10 CFR Part 55, and specifically in 10 CFR 55.41, 55.43, 55.45, and RG 1.8, in Section 1.1, "Licensed Operator Training." NEI 06-13A also states that training programs are developed, established, implemented, and maintained using an SAT as defined by 10 CFR 55.4, in Section 1, "Training Program Description." The staff determined that this program is acceptable because the applicant will include in the training programs those subjects that are required by regulation, and will base the training programs on SAT, as required by regulation and in accordance with NEI 06-13A. The staff concluded that the applicant has provided sufficient information to satisfy NUREG-0800, Section 13.2.1.

NUREG-0800, Section 13.2.1, states that the licensed operator requalification program should include the content described in 10 CFR 55.59 or should be based on the use of a SAT as defined in 10 CFR 55.4. In FSAR Appendix 13BB, the applicant stated that NEI 06-13A is incorporated by reference. NEI 06-13A stated that the licensed operator training program content and schedule comply with 10 CFR 55.59, in Section 1.1, "Licensed Operator Training." NEI 06-13A also stated that training programs are developed, established, implemented, and maintained using an SAT as defined by 10 CFR 55.4, in Section 1, "Training Program Description." The staff determined that this is acceptable because the applicant will include in the training programs those subjects that are required by regulation, and will base the training programs on SAT as required by regulation and in accordance with NEI 06-13A. The staff concluded that the applicant has provided sufficient information to satisfy NUREG-0800, Section 13.2.1.

NUREG-0800, Section 13.2.1, states that the program for providing simulator capability should be as described in 10 CFR 55.31, 55.45, 55.46, 50.34(f)(2)(i) and RG 1.149. In FSAR, Appendix 13BB, the applicant stated that NEI 06-13A is incorporated by reference. NEI 06-13A stated that licensed operators will receive plant simulator training to demonstrate an understanding and the ability to perform the actions listed in 10 CFR 55.45, in Section 1.1, "Licensed Operator Training." NEI 06-13A also stated that a simulator will be used for training licensed operators and for the administration of operating tests, in accordance with 10 CFR 55.46, in Section 1.1, "Licensed Operator Training." NEI 06-13A also referenced RG 1.149 in Section 1.6, "References." NEI 06-13A did not mention 10 CFR 55.31, but that regulatory section addressed how applicants apply to become licensed operators. Hence, nothing in 10 CFR 55.31 addressed anything about simulator capability. NEI 06-13A also did not mention

50.34(f)(2)(i), which requires that simulators include the capability to simulate small-break LOCAs. However, the FSAR, Chapter 1, Table 1.9-202, "Conformance with Regulatory Guides," stated that the application conformed to the recommendations of RG 1.149, Revision 3. The staff determined that this is acceptable because the applicant will provide the simulator capability required by regulation. The staff concluded that the applicant has provided sufficient information to satisfy NUREG-0800, Section 13.2.1.

NUREG-0800, Section 13.2.1, states that the training program should include the means for evaluating training program effectiveness in accordance with a SAT. In FSAR Appendix 13BB, the applicant stated that NEI 06-13A is incorporated by reference. NEI 06-13A includes a training effectiveness evaluation program, in Section 1.5, "Training Effectiveness Evaluation Program." Also, NEI 06-13A stated that training programs are developed, established, implemented, and maintained using a SAT as defined by 10 CFR 55.4 in Section 1, "Training Program Description." The staff determined that this program is acceptable because the applicant will provide the means for evaluating training program effectiveness, as required by NUREG-0800, Section 13.2.1. The staff concluded that the applicant has provided sufficient information to satisfy NUREG-0800, Section 13.2.1.

NUREG-0800, Section 13.2.1, states that applicants should provide implementation milestones for the reactor operator training program. In FSAR, Appendix 13BB, the applicant stated that NEI 06-13A is incorporated by reference. NEI 06-13A includes implementation milestones in Section 1, "Training Program Description." The staff determined that this program is acceptable because the applicant has provided implementation milestones as required by NUREG-0800, Section 13.2.1. The staff concluded that the applicant has provided sufficient information to satisfy NUREG-0800, Section 13.2.1.

13.2.5 Post Combined License Activities

There are no post COL activities related to this section.

13.2.6 Conclusion

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the relevant information relating to Training and there is no outstanding information expected to be addressed in the COL FSAR related to this subsection.

The staff is reviewing the information in the DCD Section 13.2 on Docket No. 52-010. The results of the NRC's staff's technical evaluation of the information related to Training incorporated by reference in the North Anna 3 COL FSAR will be documented in the staff safety evaluation report on the DC application for the ESBWR. The SER on the ESBWR is not yet complete and this is being tracked as part of Open Item [1-1]. The staff will update Section 13.2 of this SER to reflect the final disposition of the design certification application.

In addition, the staff has compared the additional COL and Supplemental information in the application for this section to the relevant NRC regulations; acceptance criteria defined in NUREG-0800, Section 13.2; and other NRC RGs and concluded that the applicant is in compliance with the NRC regulations. COL Items STD COL 13.2-1-A and 2-A and supplements STD SUP 13.2-1 and STD SUP 13.2-2, relating to training, are adequately addressed by the applicant and can be considered closed. In conclusion, with the incorporation of the responses

to RAI 13.02.01-1 and RAI 13.02.02-1 into Revision 1 of the COL FSAR, the applicant has provided sufficient information for satisfying the criteria of NUREG-0800.

13.3 Emergency Planning

13.3.1 Introduction

This section addresses the plans, design features, facilities, functions, and equipment necessary for emergency planning that must be considered in a COL application. This discussion includes both the applicant's onsite plan and State and local (offsite) plans, which the NRC and the Federal Emergency Management Agency (FEMA) have evaluated to determine whether there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

The COL applicant is Virginia Electric and Power Company (Dominion) and the Old Dominion Electric Cooperative (ODEC), for the NAPS. The applicant has proposed a complete and integrated emergency plan for the new Unit 3 (hereafter referred to as the "COL Plan"), which consists of a basic plan (COL application Part 5), eight appendices, and supplemental information consisting of an evacuation time estimate (ETE) report. As discussed below, the applicant incorporated by reference the Early Site Permit (ESP) for the NAPS site, and the DCA for an ESBWR. The applicant also provided (in Part 10) a set of inspections, tests, analyses, and acceptance criteria (ITAAC) that will be completed before fuel load, which address required elements of emergency preparedness that cannot be completed during the COL application stage. Finally, the applicant provided the current NAPS offsite plans for the affected State and local jurisdictions.

FSAR Figure 2.0-205, "Unit 3 Power Block Building Locations Within the ESP Proposed Facility Boundary," and Figure 2.1-201, "Site Plan with Topography," show that the proposed NAPS Unit 3 site footprint is located within the proposed facility boundary; (i.e., the ESP plant parameter envelope). The boundary of Unit 3 is entirely within the existing NAPS site exclusion area boundary (EAB), so that for purposes of evaluating the adequacy of the offsite emergency plans, little distinction exists between NAPS Units 1 and 2 and the proposed Unit 3.

As described below, the staff, in consultation with FEMA, reviewed the COL application; the radiological emergency response plans (RERPs) for the Commonwealth of Virginia and the affected counties; responses to requests for additional information (RAIs);[1] and generally available reference materials in accordance with Section 13.3, "Emergency Planning," of the NRC's SRP (NUREG-0800), Revision 3, March 2007 .

FEMA reviewed the RERPs for the Commonwealth of Virginia, the local government plans for Caroline, Hanover, Louisa, Orange, and Spotsylvania Counties in Virginia, and the applicant's responses to RAIs.[2] On August 22, 2008, and December 23, 2008, FEMA provided its findings and determinations (i.e., Interim Findings Reports, ADAMS Accession ML082470307 and ML090070398, respectively), regarding the adequacy of the offsite radiological emergency

[1] In letters dated July 18, 2008, and July 21, 2008, NRC staff requested additional information from the COL applicant (Dominion) (RAI Letter Nos. 018 and 019, respectively). Dominion provided responses to the RAIs on November 24, 2008, and September 3, 2008, respectively.

[2] In a letter dated August 22, 2008, FEMA requested additional information from Dominion regarding the offsite emergency plans submitted in the COL application. In a letter dated October 24, 2008, Dominion provided responses to the RAIs, which had been prepared by the Commonwealth of Virginia Department of Emergency Management (VDEM) on October 22, 2008.

response planning and preparedness for the proposed North Anna Unit 3. In a letter dated March 4, 2009, (ADAMS Accession ML090790498) FEMA clarified that subsequent to FEMA's findings documented in the August 22, 2008, Interim Findings Report, FEMA has identified 37 open items associated with the Interim Findings Report. The staff reviewed the FEMA findings and determinations, and the overall FEMA conclusions are reflected below for the various planning standards that relate to offsite emergency plans and in SER Section 13.3.6, "Conclusions."

13.3.2 Summary of Application

Consistent with 10 CFR 52.77, 52.79 and 52.80, the contents of the North Anna COL application that address the NAPS emergency plan for the proposed Unit 3 include the following:

- Part 1 – General and Administrative Information
- Part 2 – Final Safety Analysis Report (FSAR)
- Part 5 – Emergency Plan
- Part 7 – Departures Report
- Part 10 – Tier 1/ITAAC

COL application Part 1, "General and Administrative Information," references and incorporates the ESBWR DCD, which is currently under review by the NRC in a design certification proceeding on Docket No. 52-010.

In COL application Part 5, "Emergency Plan," the applicant provided the North Anna Power Station Unit 3 Combined License Application Emergency Plan (i.e., COL Plan). The applicant also incorporated by reference the information from the ESP Site Safety Analysis Report (SSAR) (Revision 9, September 2006), which addressed siting issues in the ESP proceeding for the North Anna ESP site. The ESP SSAR was submitted as part of the NAPS ESP application, which was docketed on October 23, 2003 (Docket No. 52-008).

COL application Part 10, "Tier 1/ITAAC," included Tier 1 emergency planning ITAAC in Table 2.3-1, "ITAAC For Emergency Planning." The application also included supplemental information, consisting of an ETE report (KLD TR-420, Revision 1), "North Anna Power Station–Development of Evacuation Time Estimates," dated September 2008; and State and local emergency planning documents.

Part 7, "Departures Report," states that there are no departures in the COL application from the ESBWR standard design described in the DCD. There are also no variances or exemption requests associated with emergency planning. Supplemental information is provided throughout Part 2 (FSAR), including Section 13.3, "Emergency Planning." The ESBWR DCD Standard Plan COL Information Items (STD COL) and supplemental information (STD SUP) associated with emergency planning are identified below.

- STD COL 13.3-1-A, "Identification of OSC and Communication Interfaces with Control Room and TSC"

- STD COL 13.3-2-A, “Identification of EOF and Communication Interfaces with Control Room and TSC”

- STD COL 13.3-3-A, “Decontamination Facilities”

- STD COL 13.4-2-A, “Implementation Milestones—Operational Programs” (Table 13.4-201, Item 14), “Emergency Planning” [see SER Section 13.3.5]

- STD COL 14.3-1-A, “Emergency Planning ITAAC” [see SER Section 14.3]

- STD SUP 13.5-28, “Emergency Preparedness Procedures” [see SER Sections 13.3.5 and 13.5.2]

13.3.3 Regulatory Basis

The staff’s review considered the regulatory requirements of 10 CFR 52.79(a)(21) and 10 CFR 52.79(a)(22)(i), which require that the application include emergency plans that comply with the requirements of 10 CFR 50.47 and Appendix E to 10 CFR Part 50, and emergency plan certifications from State and local governmental agencies with emergency planning responsibilities. The staff also considered 10 CFR 52.81, which (in part) requires the staff to review the application according to the standards set out in 10 CFR Part 50. In addition, the staff considered the applicable requirements in 10 CFR 52.77, 10 CFR 52.80, 10 CFR 50.33(g), 10 CFR 50.34(b)(6)(v), 10 CFR 50.34(f)(2), and 10 CFR 100.21(g).

Guidance concerning the review and evaluation of emergency planning information submitted in a COL application, and for determining compliance with the applicable regulations, is contained in SRP Section 13.3, “Emergency Planning.” The SRP identifies NUREG-0654/FEMA-REP-1, Revision 1, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” NUREG-0696, “Functional Criteria for Emergency Response Facilities,” and various other related guidance that the staff should consider during the review. The applicable application acceptance criteria are identified in Section 13.3.II of the NUREG-0800.

The regulatory basis for the ESP SSAR information that is incorporated by reference is documented in NUREG-1835, “Safety Evaluation Report for an Early Site Permit (ESP) at the North Anna ESP Site,” September 2005. The regulatory basis for the ESBWR DCD information that is incorporated by reference will be documented as part of the ongoing review of the standard DCA.

13.3.4 Technical Evaluation

NRC staff reviewed Section 13.3 of the North Anna 3 COL FSAR (Part 2), the North Anna Unit 3 Emergency Plan (Part 5), and the emergency planning (EP) ITAAC (Part 10), for conformance to the applicable standards and requirements identified in SRP Section 13.3, “Emergency Planning.” In addition, the staff conducted three site area visits to the NAPS consisting of reviews of existing onsite emergency response facilities (ERFs) and various areas within the 10-mile emergency planning zone (EPZ). These visits were conducted on December 8, 2003, August 16, 2006, and April 16, 2008.

In COL application Part 1, “General and Administrative Information,” the applicant incorporated by reference the ESBWR DCD. The staff is reviewing the information in DCD Section 13.3 on

Docket No. 52-010. The results of the staff's technical evaluation of the information related to emergency planning incorporated by reference in the North Anna 3 COL FSAR will be documented in the staff's SER on the DCA for the ESBWR. The SER on the ESBWR is not yet complete and is being tracked as part of Open Item [1-1]. The staff will update Section 13.3 of this SER to reflect the final disposition of the DCA.

The applicant incorporated by reference the information from Revision 9 of the ESP SSAR, which addressed siting issues in the ESP proceeding for the NAPS ESP site. SSAR Section 13.3, "Emergency Planning," provides a description of major features of the proposed Unit 3 emergency plan, and the staff's associated findings are contained in NUREG-1835. ESP-003 was issued to Dominion Nuclear North Anna, LLC, for the North Anna ESP site on November 27, 2007 (Docket No. 52-008), pursuant to 10 CFR 52.24, "Issuance of Early Site Permit." ESP-003 and NUREG-1835 reflect the NRC's review of "major features" of the emergency plan submitted by the ESP applicant (Dominion Nuclear North Anna, LLC) for the ESP site pursuant to 10 CFR 52.17(b)(2)(i).

The previous technical review of the ESP SSAR, together with the review of the onsite emergency planning information submitted in the COL application (see below), address all of the relevant evaluation criteria in the 16 planning standards of NUREG-0654/FEMA-REP-1, consistent with SRP Section 13.3, "Emergency Planning." The emergency planning information in the COL application supplements was in the ESP SSAR. Without re-evaluating the adequacy of the material submitted in the ESP SSAR, the staff's review of the COL application considered Section 13.3, "Emergency Planning," of the ESP SSAR and the associated NRC findings in NUREG-1835.

The NAPS Unit 3 COL emergency plan consists of a basic plan and eight appendices. The basic plan follows the format of NUREG-0654/FEMA-REP-1. The plan provides detailed information regarding each of the 16 planning standards and associated evaluation criteria from NUREG-0654/FEMA-REP-1. The structure (format) of the staff's review of the on site emergency plan (provided below) is patterned after these 16 planning standards. Bracketed ("[ ]") alphanumeric designations identify the applicable evaluation criteria used by the staff to determine compliance with the respective regulations.

The staff also reviewed the ITAAC in COL application (Part 10) Table 2.3-1 against the generic emergency planning ITAAC in SRP Table 14.3.10-1, "Emergency Planning–Generic Inspections, Tests, Analyses, & Acceptance Criteria (EP ITAAC)," pursuant to SRP Section 14.3.10, "Emergency Planning–Inspections, Tests, Analyses, and Acceptance Criteria."

Pursuant to 10 CFR 52.79(a)(21) and 10 CFR 52.81, the staff reviewed the COL application according to the standards in 10 CFR Part 50, including 10 CFR 50.47 and Appendix E to 10 CFR Part 50. Under 10 CFR 50.47(a)(1)(ii), no initial COL under 10 CFR Part 52 will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. In addition, under 10 CFR 50.47(a)(2), the NRC will base its finding on a review of the FEMA findings and determinations as to whether State and local emergency plans are adequate and whether there is reasonable assurance that they can be implemented, and on the NRC assessment as to whether the applicant's onsite emergency plans are adequate and whether there is reasonable assurance that they can be implemented. Implementation milestones associated with the

emergency plans are provided below under Section 13.3.5, "Post-Combined License Activities."[1]

The staff reviewed the applicant's onsite emergency plan, responses to RAIs, and generally available reference materials. In addition, the staff reviewed selected portions of the emergency response plans for the State of Maryland and the Commonwealth of Virginia, including the Virginia counties of Caroline, Hanover, Louisa, Orange, and Spotsylvania for understanding and content, in relation to consistency with various sections of the COL Plan that address offsite support and response. The staff's review and findings apply only to the proposed NAPS Unit 3. Changes to the emergency plan for Units 1 and 2 should be addressed in accordance with 10 CFR 50.54(q).

13.3.4.1 *Assignment of Responsibility – Organization Control (10 CFR 50.47(b)(1); NUREG-0654/FEMA-REP-1, planning standard A)*

The regulation in 10 CFR 50.47(b)(1), as reflected in planning standard A, requires that primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the EPZs have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

In COL Application Part 5, "Emergency Plan" (COL Plan), Section II.A, "Assignment of Responsibility (Organization Control)," the applicant described the responsibilities of the applicant and of various local, State, and Federal agencies, as well as private sector organizations, that are part of the emergency response organization (ERO) for the NAPS site and may be required to respond to an emergency at the NAPS site. NRC staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/ FEMA-REP-1, planning standard A, "Assignment of Responsibility (Organization Control)." Planning standard A provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(1).

[A.1.a-d, A.3][2] In COL Plan Section II.A, the applicant incorporated by reference Sections 13.3.2.2.2.a and 13.3.2.2.2.b.1 of the NAPS ESP SSAR (hereinafter referred to as the "ESP Plan"),[3] in regard to the description of participating organizations, and the interfaces between and among the onsite and offsite functional areas of emergency response. In Sections 13.3.2 and 13.3.3.2 of NUREG-1835, the staff found this information was acceptable.

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1 Sample FSAR Table 13.4-x, "Operational Programs Required by NRC Regulation and Program Implementation," in Section 13.4, "Operational Programs," of the SRP (NUREG-0800, Revision 3, March 2007, identifies EP as Operational Program (Item) No. 14.

2 The bracketed, alphanumeric designations used throughout this report identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with regulations.

3 Section 13.3, "Emergency Plan," of the NAPS ESP application (Part 2, SSAR) ("ESP Plan"), consists of proposed "major features" of the emergency plan for additional reactor units at the NAPS site, submitted pursuant to 10 CFR 52.17(b)(2)(i). The staff's evaluation of the ESP Plan is reflected in the SER, published in September 2005 as NUREG-1835. On November 27, 2007, the NRC issued ESP No. ESP-003 (Docket No. 52-008), which reflects (in Section 1.E) the staff's findings associated with the major features of the ESP Plan.

In addition, ESP Plan Section 13.3.2.2.2.a includes references to certification letters (letters of agreement) with various agencies (discussed below) for the existing North Anna 3 emergency plan, which are included in COL Plan Appendix 7, "Certification Letters." These letters of agreement describe contacts and arrangements pertaining to respective concept of operations.

[A.1.a-e] Dominion provided additional information in COL Plan Section II.A that addresses the concept of operations for the onsite organization; coordination of emergency response actions taken at Unit 3 with Units 1 and 2; and the relationships with local, State, and Federal agencies. Table II-1, "Responsibility for Emergency Response Functions," summarizes the responsibilities and activities of the ERFs under the four emergency classifications. Figure II-1, "Emergency Response Organization Interrelationships," provides a block diagram that illustrates the interrelationships among the station and offsite EROs. Subsection II.A.1.b lists the following actions that Dominion is responsible for taking during an emergency condition:

- 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 (PARs)
- Mitigate consequences of adverse plant conditions by monitoring/controlling plant parameters
- Request assistance from offsite agencies, as needed
- Provide support to affected agencies for communications with the affected public
- Terminate emergency conditions

[A.1.d] In COL Plan subsection II.A.1.d, Dominion stated that based on the emergency classification and plant conditions, the Unit 3 Shift Manager (or Unit Supervisor) assumes the role of the Emergency Coordinator and is in charge of the emergency response for the facility. The Emergency Coordinator makes or directs initial notifications to affected plant staff and Commonwealth of Virginia, risk jurisdiction, and Federal authorities, and determines whether activation of the Dominion ERFs is desirable or required. The Shift Manager is relieved as Emergency Coordinator when the designated management representative (e.g., Site Vice President) 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.

In addition, the EOF may be activated concurrently with the TSC, and is always 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 that the EOF communicates emergency status to the Commonwealth of Virginia and risk 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 the dispatch of any special assistance or services requested by the station. The Director of 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 (RER) effort at Dominion's fleet of nuclear power plants.

[A.1.e, A.4] COL Plan subsection II.A.1.e states that Dominion maintains the capability for a 24-hour response and for continuous (24-hour) operations for a protracted period, 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 of the COL Plan and the training requirements of Section II.O of the COL Plan. **[A.1.d]** The Emergency Coordinator bears responsibility for ensuring the continuity of technical, administrative, and material resources during emergency operations.

[A.1] The staff finds that the applicant has identified the appropriate organizations (including identification by title of the specific individual in charge of emergency response) that are intended to be part of the overall response organization. The applicant has specified the concepts of operations and the relationships of the organizations to the total effort. The interrelationships are illustrated in a block diagram, and each organization is capable of providing 24-hour-per-day emergency response, including 24-hour-per-day staffing of communications links for the necessary organizations. **[A.4]** In addition, the staff finds that the applicant's organization will be capable of continuous (24-hour) operations for a protracted period, and the Emergency Coordinator has been identified as the individual who will be responsible for providing the necessary technical, administrative, and material support (i.e., assuring continuity of resources) for the duration of the emergency.

Pursuant to 10 CFR 52.79(a)(22)(i), the COL application must contain all emergency plan certifications that have been obtained from the State and local governmental agencies with emergency planning responsibilities. These certifications must state that (1) the proposed emergency plans are practicable; (2) these agencies are committed to participating in any further development of the plans, including any required field demonstrations; and (3) these agencies are committed to executing their responsibilities under the plans in the event of an emergency.

In addition, the staff considered Section 13.3, "Emergency Planning," of the SRP (NUREG-0800), which states that the agreement information should be up-to-date when the application is submitted and should reflect the use of the proposed site for possible construction of a new reactor(s). For an existing reactor site, the letters of agreement or other certifications should clearly address the presence of an additional reactor(s) at the site, and any impact that would have on governmental agency or private organization emergency planning responsibilities, including acknowledgment by the agencies or organization of the proposed expanded responsibilities. NUREG-0654/FEMA-REP-1 evaluation criterion II.A.3 states that each plan shall include written agreements referring to the concept of operations developed among Federal, State, and local agencies and other support organizations having an emergency response role within the EPZs.

[A.3, B.8, B.9, L1, L.4] COL Plan Section II.A.3, "Written Agreements," states that Appendix 7 of the COL Plan 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 the COL

Plan. Furthermore, the responsibilities of many Federal agencies are established in the National Response Framework.

In addition, the incorporation by reference of ESP Plan Section 13.3.2.2.2.a into the COL application serves to include the letters of agreement that had been submitted with the ESP application. As discussed in Section 13.3.2 of NUREG-1835, these letters of agreement from the various agencies specifically acknowledged the agencies' awareness of the ESP application for the NAPS site and stated that the existing agency arrangements would apply to a prospective additional reactor(s) at the NAPS site. The certification letters (or letters of agreement) in Appendix 7 of the COL Plan supplement and update those submitted in the ESP application. The staff reviewed the updated certification letters in Appendix 7, and finds that they adequately address the requirements and guidance cited above, in regard to each agency's participation in support of a new generating unit at the NAPS. In addition, the certification letters meet 10 CFR 52.79(22)(i).

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report..

Conclusion

As discussed above, the open item identified by FEMA needs to be resolved in order to meet the requirements of 10 CFR 50.47(b)(1). NRC staff will determine whether this planning standard is acceptable and will document the determination in the FSER. The determination will be based on information the applicant has provided to date and the applicant's response to the open item identified by FEMA.

13.3.4.2 *Onsite Emergency Organizations (10 CFR 50.47(b)(2); NUREG-0654/FEMA-REP-1, planning standard B)*

The regulation in 10 CFR 50.47(b)(2), as reflected in the planning standard B, requires that on-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available, and interfaces among various onsite response activities and offsite support and response activities are specified.

In COL Plan, Section II.B, "Onsite Emergency Organization," the applicant described the organizational structure that would be available to respond to an emergency at the NAPS site. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard B," Onsite Emergency Organization." Planning standard B provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(2).

[B.6, B.9] In COL Plan Section II.B, the applicant incorporated by reference Sections 13.3.2.2.2.b of the ESP Plan, in regard to interfaces among various onsite response

activities, and the identification of offsite support and response activities. In Section 13.3.3 of NUREG-1835, the staff found this information was acceptable.

[B.1, B.5, B.7] In COL Plan Section II.B, the applicant stated that Figure II-2, "North Anna Unit 3 Emergency Response Organization—Onsite," illustrates the onsite ERO and that upon the declaration of an emergency, designated members of the normal staff fill corresponding roles within the ERO. Station administrative procedures provide the details of the normal station organization, including reporting relationships, and emergency plan implementing procedures (EPIPs) provide details regarding ERO position functions. The minimum staff required to conduct routine and immediate emergency operations is maintained at the station, consistent with 10 CFR 50.54(m) and the COL Plan. Staffing is further described in Subsection 13.1 of the NAPS Unit 3 FSAR. The staff reviewed this material and found that it describes the detailed management, technical support, and operating organizations that support the emergency planning and response organization for Unit 3. The staff finds that this information adequately describes the onsite emergency organization and its relationship to the responsibilities and duties of the normal staff complement.

[B.2, B.4] 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 or until termination of the emergency condition. The Emergency Coordinator has the responsibility and authority to initiate any required emergency response actions including the notification of affected Federal, Commonwealth of Virginia, and risk jurisdiction authorities and the provision of PARs to offsite authorities. **[B.6]** Figure II-1, "Emergency Response Organization Interrelationships," 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.

The non-delegable responsibilities of the Emergency Coordinator are listed in Section II.B.4, and include authorizing offsite notifications and recommending protective measures. With the staffing of the ERO, the EOF Director relieves the Emergency Coordinator of responsibility for notifying and coordinating with offsite authorities. **[B.3]** If the Shift Manager is rendered unable to fulfill the duties and responsibilities of the Emergency Coordinator position, the Unit Supervisor or an on-shift Reactor Operator assumes the Emergency Coordinator position until relieved by a qualified member of the management staff. The staff finds that the applicant has adequately designated an individual as the Emergency Coordinator who has the authority and responsibility to initiate emergency actions, including recommending protective actions to the authorities responsible for implementing offsite emergency measures. The staff also finds that the applicant has clearly specified which responsibilities may not be delegated to other elements of the emergency organization, and the applicant has identified an adequate line of succession for the Emergency Coordinator position.

[B.5] In COL Plan Section II.B.5, "Plant Emergency Response Staff," the applicant stated that Dominion will establish minimum emergency response staffing consistent with COL Plan Table II-2, "Plant Staff Emergency Functions," which was based on the guidance in Table B-1, "Minimum Staffing Requirements for NRC Licensees for Nuclear Power Plant Emergencies," 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 ERO consistent with their training and management assignments, and provide for the key functions of accident assessment, radiological monitoring and analysis, security, fire-fighting, first aid and rescue, and

communications. Figure II-3, “North Anna Unit 3 Augmented Emergency Response Organization,” provides an illustration of the augmented plant staff ERO. The ERO, when fully activated, includes the positions described in Table II-2.

In **RAI 13.03-2.9**, the staff asked the applicant to explain why the two columns in Table II-2, under the heading, “Capability for Additions,” did not reflect the comparable columns in Table B-1 of NUREG-0654 in regard to designating staff augmentation times. That is, Table II-2 did not indicate any specific times for staff augmentation, and Table B-1 did. In the response to **RAI 13.03-2.9**, the applicant revised Table II-2 by adding “Approx 45 min” and “Approx 60 min” to the two column headings. The applicant further stated that these estimated capability times for staff augmentation are similar to the comparable estimated times for Units 1 and 2. The staff finds this response acceptable because the comparable table for Units 1 and 2 in Table 5.1, “Minimum Staffing Requirements for Emergencies,” of the North Anna Emergency Plan (NAEP) (Revision 28, pages 5.18 through 5.20) indicates staff augmentation of “Additional Within Approx. 45 Min.” and “60 Min.”

[B.7] 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, providing technical and administrative activities to support the plant staff, and relieving the plant staff of external coordination responsibilities, including the release of information to the news media. In addition to the major tasks listed in Table II-2, corporate activities include logistical support for plant personnel; technical support for planning and recovery/re-entry operations; management-level interface with governmental authorities; and coordination with and the release of information to the news media.

[B.8] The Institute of Nuclear Power Operations (INPO), when notified of an emergency situation, would provide requested emergency response technical assistance, including emergency manpower and equipment. Dominion may also request the reactor vendor, General Electric-Hitachi (GEH), to provide technical support for emergency response activities. GEH would 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.

[B.9] In addition, Dominion has established and will maintain agreements for risk jurisdiction emergency response support services, including fire fighting, rescue squad, and medical and hospital services. Appendix 7 of the COL Plan provides certification letters for organizations providing these services.

Conclusion

NRC staff concludes that the information provided in the COL application is consistent with the guidelines in planning standard B of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(2) and Sections III, IV.A, and IV.C of Appendix E to 10 CFR Part 50 insofar as the information describes the essential elements of advanced planning and the provisions made to cope with emergency situations.

13.3.4.3 *Emergency Response Support and Resources (10 CFR 50.47(b)(3); NUREG-0654/FEMA-REP-1, planning standard C)*

The regulation in 10 CFR 50.47(b)(3), as reflected in the planning standard C, requires that arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee near-site EOF have been made, and other organizations capable of augmenting the planned response have been identified.

In COL Plan Section II.C, "Emergency Response Support and Resources," the applicant addressed the responsibilities and concepts of operations for the various organizations that would support the NAPS site, including Unit 3, in an emergency. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard C, "Emergency Response Support and Resources." Planning standard C provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(3).

[C.1.a-c, C.3, C.4] In COL Plan Section II.C, the applicant incorporated by reference Section 13.3.2.2.2.c of the ESP Plan, in regard to arrangements for emergency response support and resources. In Section 13.3.3.4 of NUREG-1835, the staff found this information was acceptable. In addition, COL Plan Section II.C.4 includes a reference to letters of agreement with various agencies (discussed below) that are included in COL Plan Appendix 7.

[C.1.a] The applicant provided additional information in COL Plan Section II.C, including identifying the Emergency Coordinator/EOF Director as the person who may request Federal Radiological Monitoring and Assessment Center (FRMAC) assistance—either directly or through the NRC. **[C.1.b]** Dominion expects that a FRMAC Advance Party could be expected at the site within 6 to 14 hours following the order to deploy. NRC assistance from the Atlanta (Georgia) office could arrive within 7 to 8 hours following notification. **[C.1.c]** Section II.C.1.c states that Dominion will provide facilities and resources needed to support the Federal response consisting of TSC and EOF office space, telephones, and radio communication circuits. (Notification of Federal authorities is also discussed in SER Section 13.3.4.1.) **[C.2.b]** Dominion does not expect risk jurisdiction representatives to be present at the EOF. A VDEM State On-Scene Coordinator will represent the State in the EOF. The Coordinator will also provide an interface between the utility and the Commonwealth and risk jurisdiction governments.

[C.3] The NAPS maintains fixed laboratory equipment to support sampling analysis and monitoring. The equipment includes multichannel analyzers, proportional counters, whole body counters, and a tritium analyzer. (Systems for post-accident sampling, including associated provisions and procedures, are discussed in SER Section 9.3.2, "Process and Post-Accident Sampling Systems.") In addition, the station maintains arrangements for reading thermoluminescent dosimeters. These resources are supplemented by offsite laboratory facilities, listed in COL Plan Section II.C.3 and ESP SSAR Section 13.3.2.2.2.c.2, which are available to support emergency response activities on a 24-hour basis.

[C.4] COL Plan Section II.C.4, "Other Supporting Organizations," states that 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. Certification letters in Appendix 7 of the COL Plan outline the scope of the expected support. SER Sections 13.3.4.1, 13.3.4.2, 13.3.4.12, and 13.3.4.16 provide additional information pertaining to letters of agreement and arrangements with nuclear and other facilities, organizations, and individuals that can be relied on to assist in an emergency.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report.

Conclusion

As discussed above, the open item identified by FEMA needs to be resolved in order to meet the requirements of 10 CFR 50.47(b)(3). The NRC will determine whether this planning standard is acceptable and will document the determination in the FSER. The determination will be based on information the applicant has provided to date and the applicant's response to the open item identified by FEMA.

13.3.4.4 *Emergency Classification System (10 CFR 50.47(b)(4); NUREG-0654/FEMA-REP-1, planning standard D)*

The regulation in 10 CFR 50.47(b)(4), as reflected in the planning standard D, requires that a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and that State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

In COL Plan Section II.D, "Emergency Classification System," the applicant addressed the emergency classification and action level scheme that will apply to North Anna Unit 3. NRC staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA- REP-1, planning standard D, "Emergency Classification System." Planning standard D provides detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(4).

The staff also considered the requirements in Sections IV.B and IV.C of Appendix E to 10 CFR Part 50, which require four emergency classes: unusual event, alert, site-area emergency, and general emergency. In addition, the applicant must describe emergency action levels (EALs) that are based on in-plant conditions and instrumentation and onsite and offsite monitoring. The initial EALs must be discussed and agreed upon by the applicant (or licensee) and State and local governmental authorities, and approved by the NRC.

[D.1, D.2] In COL Plan Section II.D, the applicant incorporated by reference Sections 13.3.2.2.2.c and 13.3.2.2.2.d of the ESP Plan, in regard to a description of the emergency classification system and EALs, respectively. In Sections 13.3.3.4 and 13.3.3.5 of NUREG-1835, the staff found this information acceptable. The applicant provided additional information in COL Plan Section II.D, which states that Dominion has developed and implemented a

standard emergency classification scheme based on system and effluent parameters that affected Commonwealth of Virginia and risk jurisdiction response organizations may rely on for determining initial offsite response measures.

The applicant stated that the initiating conditions (ICs) include the conditions provided in Nuclear Energy Institute (NEI) 07-01, Revision 0, "Methodology for Development of Emergency Action Levels—Advanced Passive Light-Water Reactors," as it applies to ESBWRs and the postulated accidents identified in the [COL application, Part 2] FSAR. Appendix 1, "Emergency Action Levels," of the COL Plan provides the parameter values and equipment status that are indicative of each emergency class**.** ITAAC 1.1.1 states that the specific parameters identified in the EALs listed in Inspections, Tests, Analyses (ITA) Section 1.1 have been retrieved and displayed in the control room, TSC, and EOF. ITAAC 1.1.2 states that the ranges available in the control room, TSC, and EOF encompass the values for the specific parameters identified in the EALs listed in ITA Section 1.1. The executive summary in Appendix 1 states that the set of EALs and ICs are based on industry guidance in NEI 07-01 (Revision 0, Draft, September 2007).

In COL Plan Section II.D.2, "Emergency Action Levels," the applicant stated that Dominion adopts the methodology provided in NEI 07-01, Revision 0, which has not yet been endorsed by the NRC. Therefore, the EALs contained in the COL Plan are subject to further review and modification based on a future version of NEI 07-01.

In **RAI 13.03-2.15** and **RAI 14.03.10-1.5**, NRC staff asked the applicant to explain the references to the September 2007 (Revision 0) version of NEI 07-01, including the proposed EALs and ICs that are based on a document that has not been endorsed by the NRC and are referenced in the concurrences provided by offsite agencies in COL application Appendix 7, "Certification Letters." The staff is currently reviewing NEI 07-01 as a separate action. NEI 07-01 has undergone multiple revisions by NEI since the September 2007 version.

In addition, in **RAI 14.03.10-1.5**, the staff stated that ITAAC 1.1 in COL application Table 2.3-1, "ITAAC for Emergency Planning," does not reflect the completion of a fully developed set of EALs that are consistent with Section IV.B of Appendix E to 10 CFR Part 50, including reflecting the current status of NEI 07-01. The staff asked the applicant to revise ITAAC 1.1 to reflect the requirements for a standard emergency classification and action level scheme, with clear and objective acceptance criteria.

In the responses to **RAI 13.03-2.15** and **RAI 14.03.10-1.5**, the applicant stated that upon NRC approval of (Topical Report) NEI 07-01, Appendix 1 of the EP (Part 5) will be updated—including the EALs and ICs—to reflect the approved version of NEI 07-01. At that time, the applicant will determine whether updated certification letters from offsite agencies are required.

Finally, in **RAI 13.03-3**, the staff identified two options that are available to applicants in order to address the initial EAL requirement in 10 CFR 50.47(b)(4) and Section IV.B of Appendix E to 10 CFR Part 50. Under Option 1, an applicant must submit an entire EAL scheme. Under Option 2, an applicant must submit Section D, "Emergency Classification System," of its emergency plan that addresses four critical elements. These critical elements include the identification of a license condition that requires the applicant to create a fully developed set of EALs in accordance with a specified guidance document (i.e., NEI 07-01). In the applicant's February 10, 2009, response to RAI 13.03-3, the applicant elected to implement Option 2. The applicant also stated the following: "As described in NEI's January 29, 2009 letter to NRC, NEI is developing a standard RAI response template that will address the four elements specified by

Option 2. Once NRC notifies NEI by letter that the template is acceptable for reference, Dominion will supplement its response within 30 days and submit plans in accordance with the approved NEI template for addressing the four EAL elements."

The staff has identified as **Open Item 13.03-3**, the applicant's submission of a supplemental response to RAI 13.03-3, which adequately addresses the four critical elements of Option 2 and identified in **RAI 13.03-3**.

In FEMA's August 22, 2008, and December 23, 2008, Interim Findings Reports, FEMA found that the offsite emergency plans were adequate in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1.

Conclusion

As discussed above, the applicant needs to provide final clarification regarding the use of the EAL scheme that is based on NEI 07-01, consistent with the applicable regulations and guidance, in order to meet 10 CFR 50.47(b)(4). NRC staff will determine whether this planning standard is acceptable and will document the determination in the FSER. The determination will be based on information the applicant has provided to date in response to **Open Item 13.03-3**.

13.3.4.5 *Notification Methods and Procedures (10 CFR 50.47(b)(5); NUREG-0654/FEMA-REP-1, planning standard E)*

The regulation in 10 CFR 50.47(b)(5), as reflected in the planning standard E, requires that procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow-up messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway EPZ have been established.

In COL Plan Section II.E, "Notification Methods and Procedures," the applicant addressed the specific methods and sequencing of notifications that will be covered in the appropriate implementing procedures for NAPS Unit 3 in an emergency. NRC staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard E, "Notification Methods and Procedures." Planning standard E provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(5).

[E.1, E.2, E.6, J.1, J.2, J.4, J.5] In COL Plan Section II.E, the applicant incorporated by reference Sections 13.3.2.2.2.e, 13.3.2.2.2.f, and 13.3.2.2.2.g of the ESP Plan in regard to the descriptions of notification methods and procedures. In Sections 13.3.3.6, 13.3.3.7, and 13.3.3.8 of NUREG-1835, the staff found this information acceptable. The applicant provided additional information in COL Plan Section II.E, which states that Dominion maintains procedures for notifying 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.

[E.1] In COL Plan Section II.E.1, "Notification of Commonwealth and Risk Jurisdiction Authorities," the applicant stated that Dominion maintains systems and procedures needed to promptly notify 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 of NUREG-0654/FEMA-REP-1. (The emergency classification and action level scheme is addressed in Section 13.3.4.4 of this report.) ITAAC 2.1.1 states that communications have been established via the Operational Hot Line among the control room, the Commonwealth of Virginia, and the five risk jurisdictions. The Emergency Coordinator initiates the notification of affected Commonwealth of Virginia and risk jurisdiction authorities, including the escalation or de-escalation of any emergency condition. The primary notification method is the Insta-phone system, which is accessible from the control room, TSC, and EOF. Backup notification capability is maintained through the use of commercial telephone systems. Message content and verification methods are established in the implementing procedures.

Dominion maintains the systems and procedures needed to provide prompt notification of the NRC Operations Center following the declaration of any emergency condition. The NRC will be notified as soon as practical following notification of the Commonwealth of Virginia and risk jurisdiction authorities, and within one hour of the emergency declaration—including the escalation or de-escalation of any emergency declaration. The primary notification method is the Emergency Notification System (ENS), with back-up notification capability through the commercial telephone systems. (Emergency notification and communication systems are discussed further in SER Section 9.5.2, "Communication Systems.")

In **RAI 13.03-2.16**, the staff asked the applicant (in part) to discuss how the Unit 3 emergency plan addresses the latest applicable requirements associated with notifications and responses that are related to an imminent or actual safeguard threat against the facility or other safeguard event. In the applicant's response to **RAI 13.03-2.16**, the applicant stated that Appendix 1 of the Unit 3 emergency plan contains EAL classification criteria for security events, and Section II.E of the emergency plan addresses notification for the classified events. In addition, Dominion plans to include the immediate notification of the NRC in the Operations Abnormal Procedures similar to those for Units 1 and 2. For Unit 3, these types of events are addressed in Part 8, Security Plan, Appendix C, "Responsibility Matrix," (referencing Dominion's letter Serial No. NA3-07-002). (See also the applicant's related response to **RAI 13.03-2.16** in Section 13.3.4.14 of this report.)

[E.2] Notification and mobilization of the ERO is initiated in accordance with implementing procedures. The Emergency Coordinator directs the notification and mobilization of the licensee ERO following the declaration of an alert or higher level emergency. The Coordinator has the discretion to mobilize all or part of the ERO at the Notification of Unusual Event level. ITAAC 2.2 states that notification to the NAPS Unit 3 ERO has been performed.

The staff finds that the applicant has provided for the establishment of procedures that will describe mutually agreeable bases for notification of response organizations, and that those procedures will be consistent with the emergency classification and action level scheme in Appendix 1 to NUREG-0654/FEMA-REP-1. The adequacy of procedures for alerting, notifying, and mobilizing emergency response personnel—including the means for message verification—will be determined after receipt of those procedures through the inspection process. Section V, "Implementing Procedures," of Appendix E to 10 CFR Part 50, requires the submission of [onsite] detailed implementing procedures no less than 180 days before the scheduled date for the initial loading of fuel. In addition, the adequacy of the procedures will be demonstrated

through a review of their use during an exercise, pursuant to Units 3 ITAAC 8.1. (See SER Section 13.3.5.)

[E.3] 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 the emergency, the status of any radioactive releases, the locations of any potentially-affected populations, and recommendations regarding protective public actions. **[E.4]** Follow-up messages from the plant to affected Commonwealth of Virginia and risk jurisdiction authorities will include various detailed information to the extent that the information is available and appropriate, and mutually agreed upon by Dominion and VDEM. The staff finds that the content of the initial emergency messages to be sent from the plant is adequate, and that the applicant has made provisions for follow-up messages from the facility to offsite authorities that contain the appropriate information, are consistent with evaluation criterion II.E.4 of NUREG-0654/FEMA-REP-1, and support the timely and necessary offsite response.

[E.6] The primary method of alerting the public is by sounding the Alert and Notification System (ANS) 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 in accordance with their respective RERPs. **[E.7]** Affected Commonwealth of Virginia and risk jurisdiction officials bear responsibility for providing emergency messages intended for the public; in particular, by providing instructions regarding specific protective actions. Dominion supports development of these messages by providing supporting information.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report.

Conclusion

As discussed above, the open item identified by FEMA needs to be resolved in order to meet the requirements of 10 CFR 50.47(b)(5). NRC staff will determine whether this planning standard is acceptable and will document the determination in the FSER. The determination will be based on information the applicant has provided to date and the applicant's response to the open item identified by FEMA.

13.3.4.6 *Emergency Communications (10 CFR 50.47(b)(6); NUREG-0654/FEMA-REP-1, planning standard F)*

The regulation in 10 CFR 50.47(b)(6), as reflected in the planning standard F, requires that provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.

In COL Plan Section II.F, "Emergency Communications," the applicant described the communication capabilities between the NAPS site and the Commonwealth of Virginia and risk jurisdiction governments. NRC staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard F, "Emergency

Communications." Planning standard F provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(6).

[F.1.b, F.1.c, F.1.e, F.2] In COL Plan Section II.F, the applicant incorporated by reference Section 13.3.2.2.2.f of the ESP Plan, in regard to the description of the provisions for prompt communications among principal response organizations to emergency personnel and to the public. In Section 13.3.3.7 of NUREG-1835, the staff found this information acceptable. The applicant provided additional information in COL Plan Section II.F, which addresses existing provisions for emergency communications and states that Dominion maintains systems and procedures that provide prompt communications between its ERFs and between the onsite and offsite ERFs.

[F.1.a, F.1.b, F.1.d] In COL Plan Section II.F.1, "Description of Communication Links," the applicant stated that Dominion maintains capabilities for 24-hours-per-day emergency notification to the Commonwealth of Virginia and risk jurisdiction emergency response network. Commonwealth of Virginia and risk jurisdiction warning points are staffed 24 hours per day. This communications link consists of an Insta-phone loop—which can be activated from the control room, TSC, or EOF—with links to the Commonwealth of Virginia and risk jurisdiction governments. If the Insta-phone is out of service, regular commercial telephone will be used to make the notifications. The offsite agencies have a system to call back to the power station and verify the notification message. Dominion also provides communications capabilities between the control room or the TSC and radiological field personnel. (Emergency notification and communication systems are discussed further in SER Section 9.5.2, "Communication Systems.")

The staff finds that provisions exist for 24-hour-per-day notification and activation of the State and local emergency response network, and that adequate provisions exist for communications with contiguous State and local governments within the EPZs. **[F.1.e]** Procedures for notifying, alerting, and activating emergency response personnel in the TSC, operational support center (OSC), and EOF are described in COL Plan Section II.E.2, and are addressed in SER Section 13.3.4.5. ITAAC 3.1.1, ITAAC 3.1.2, ITAAC 3.1.3, and ITAAC 3.1.4 state that communications have been established between and among the OSC, TSC, EOF, Commonwealth of Virginia, risk jurisdictions, and radiological monitoring teams. The staff reviewed other application sections that deal with the availability of 24-hour emergency communications and response and discusses those reviews in SER Sections 13.3.4.1, 13.3.4.2, 13.3.4.5, 13.3.4.8, and 13.3.4.12.

[F.1.c. F.1.f] Dominion provides for communications between the control room/TSC/EOF and the NRC Operations Center via dedicated telephone lines. In addition to the ENS, Health Physics Network, Reactor Safety Counterpart Link, and Protective Measures Counterpart Link, separate dedicated telephone lines for communications with the NRC include the Management Counterpart Link (MCL) and Local Area Network (LAN). The MCL lines are located in the TSC and EOF and provide for internal discussions between the NRC Executive Team and the NRC Director of Site Operations or licensee management. The LAN has jacks in the TSC and EOF, and provides access to the NRC LAN. Finally, Dominion will activate the Emergency Response Data System (ERDS) within 1 hour of the declaration of an Alert or higher emergency classification.

ITAAC 3.2 states that communications have been established from the control room, TSC, and EOF to the NRC headquarters and Region II Emergency Operations Centers (EOCs), with an

access port for ERDS. SER Section 13.3.4.3 discusses the assistance available from Federal agencies, including coordination and communications among those agencies, with the State and local agencies, and with the NAPS site. Thus, the staff finds that adequate provisions exist for communications with Federal EROs and between the NAPS site and the NRC.

[F.2] In COL Plan Sections II.F.2 and II.F.3, the applicant stated that 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. **[F.3, H.10, N.2.a]** Dominion conducts tests of its emergency communications system consisting of monthly testing of communications with the facility and EOF and the Commonwealth of Virginia/risk jurisdiction warning points. Dominion also conducts annual testing of communications between the Virginia/risk jurisdiction EOCs and field assessment teams. The staff finds that a coordinated communication link exists for fixed and mobile medical support facilities, and that the applicant has adequately provided for periodic testing of the entire emergency communications system.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report.

Conclusion

As discussed above, the open item identified by FEMA needs to be resolved in order to meet the requirements of 10 CFR 50.47(b)(6). NRC staff will determine whether this planning standard is acceptable and will document the determination in the FSER. The determination will be based on information the applicant has provided to date and the applicant's response to the open item identified by FEMA.

13.3.4.7 *Public Education and Information (10 CFR 50.47(b)(7); NUREG-0654/FEMA-REP-1, planning standard G)*

The regulation in 10 CFR 50.47(b)(7), as reflected in the planning standard G, requires that information be made available periodically to the public concerning notification methods and initial actions it should take in an emergency (e.g., listening to a local broadcast station and remaining indoors), that the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) be established in advance, and that procedures for coordinating dissemination of information to the public be established.

In COL Plan Section II.G, "Public Education and Information," the applicant provided a general description of the public education and information program for the NAPS site. NRC staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard G, "Public Education and Information." Planning standard G provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(7).

[B.7.d, G.1-G.5, H.2, J.10.c] In COL Plan Section II.G, the applicant incorporated by reference Section 13.3.2.2.2.g of the ESP Plan, in regard to the description of the emergency information program for the public and the news media. In Section 13.3.3.8 of NUREG-1835, the staff found this information acceptable. The applicant provided additional information in COL Plan Section II.G, which addresses the dissemination of information to the public and the news media. Dominion maintains a coordinated program to educate affected members of the public regarding emergency notification methods and actions.

[G.1] In COL Plan Section II.G.1, "Public Information Program," the applicant stated that Dominion coordinates with affected Commonwealth of Virginia and risk jurisdiction authorities to disseminate pertinent emergency response information to members of the public in the [10-mile] 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. Example of the distributed information includes notification methods and immediate actions to take.

[G.2] COL Plan Section II.G.2, "Distribution and Maintenance of Public Information," states that 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 with sources for local emergency information, such as local radio and telephone stations.

[B.7.d, G.3, G.4, G.5, H.2] COL Plan Sections II.G.3 and II.G.5 address news media coordination and training, respectively. **[G.3.b]** ITAAC 4.1 states that the Emergency News Center has space for a limited number of members from the news media. The outlet for emergency information is the Joint Information Center (JIC), an element of the Corporate Emergency Response Center that is located at the Innsbrook Technical Center in Glen Allen, Virginia. **[G.3.a, G.4.a]** Dominion's Chief Technical Spokesperson will serve as the primary licensee spokesperson and media contact in the JIC. **[G.4.b]** 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. 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 emergency plans, information regarding radiation hazards, and points of contact for the release of public information during an emergency. The staff finds that the licensee has an adequate program for acquainting the news media on a periodic basis with emergency plans, information concerning radiation, and points of contact for the release of public information in an emergency.

[G.4.a] In COL Plan Section II.G.4, "Information Exchange," the applicant addressed the designation of a company spokesperson. In **RAI 13.03-2.8**, the staff asked the applicant for

clarification regarding the referenced titles of those who would act as company spokespersons. In the applicant's response to **RAI 13.03-2.8**, the applicant provided revisions to subsections II.G.4.a and II.G.4.c, which clarified the titles. The applicant stated that the Dominion public affairs liaison has access to required public information, primarily through communications with the Chief Company Spokesperson and designated the members of the EOF staff. The Dominion public affairs liaison coordinates continuity and consistency of information with designated members of the Commonwealth of Virginia and risk jurisdiction EROs on a periodic basis. **[G.4.c]** Rumor control is accomplished through ongoing contact with the Chief Technical Spokesperson and through the activities of a Dominion public affairs liaison in the JIC. This liaison 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. The staff finds that the applicant has designated a spokesperson that should have access to all necessary information and has established adequate coordinated arrangements for dealing with rumors.

The staff reviewed the various emergency information communication publications, including the brochure entitled "North Anna Power Station Emergency Public Information for Residents and Visitors in the Communities of [Louisa, Spotsylvania, Orange, Caroline, and Hanover Counties]" (Revision September 2007), and the NAPS 2008 Nuclear Emergency Planning Information Calendar. The staff finds that the application has adequately provided for a coordinated and periodic dissemination of information to the public regarding how people will be notified and what actions they should take in an emergency. The application includes the establishment of a public information program that annually provides permanent and transient adult populations within the 10-mile plume exposure EPZ with an adequate opportunity to become aware of the information.

In FEMA's August 22, 2008, and December 23, 2008, Interim Findings Reports, FEMA found that the offsite emergency plans were adequate in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1.

Conclusion

NRC staff concludes that the information provided in the COL application is consistent with the guidelines in planning standard G of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(7), and Sections III, IV.B, IV.D, IV.E, and IV.F of Appendix E to 10 CFR Part 50, insofar as the information describes the essential elements of advanced planning and the provisions made to cope with emergency situations.

13.3.4.8 *Emergency Facilities and Equipment (10 CFR 50.47(b)(8); NUREG-0654/FEMA-REP-1, planning standard H)*

The regulation in 10 CFR 50.47(b)(8), as reflected in the planning standard H, requires that adequate emergency facilities and equipment to support the emergency response be provided and maintained.

In COL Plan Section II.H, "Emergency Facilities and Equipment," the applicant described the ERFs and the equipment that will be used to assess an accident and monitor functions following the declaration of an emergency. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable

guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard H, "Emergency Facilities and Equipment." Planning standard H provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(8).

[H.1, H.2] In COL Plan Section II.H, the applicant incorporated by reference Section 13.3.2.2.2.h of the ESP Plan in regard to the description of ERFs. As described in Section 13.3.3.9 of NUREG-1835, on March 3, 2005, the ESP applicant withdrew its request for NRC staff to evaluate major feature H—associated with emergency facilities and equipment—as part of the application for the North Anna ESP site. Since the ESP applicant had withdrawn its request that major feature H (of the ESP SSAR) be evaluated, the staff reached no conclusion regarding the acceptability of ESP major feature H. As part of the review of the COL application, the staff reviewed the description of the emergency facilities and equipment in COL Plan Section II.H, which includes the information in Section 13.3.2.2.2.h of the ESP plan.

[H.1, H.9] In COL Plan Section II.H, the applicant stated that the TSC and OSC are provided to support emergency operations consistent with the guidance in NUREG-0737, Supplement 1. Consistent with Section 13.3, "Emergency Planning," of the SRP (NUREG-0800), the staff determined compliance with the applicable regulations relating to emergency facilities and equipment (i.e., 10 CFR 50.47(b)(8) and Section IV.E of Appendix E to 10 CFR Part 50), using the guidance in NUREG-0654/FEMA-REP-1, and through it NUREG-0696. Supplement 1 to NUREG-0737 (published in January 1983) provides additional related guidance that primarily summarizes and supplements the information in NUREG-0696 (published in February 1981).

[H.4] Dominion staffs and activates the designated ERFs (i.e., TSC, OSC, and EOF), consistent with the emergency classification and in accordance with EPIPs. The descriptions of ERF notification and staffing are provided in Sections 13.3.2.2.2.e.2 and 13.3.2.2.2.f.4 of the NAPS ESP [SSAR]. The Commonwealth of Virginia and risk jurisdiction emergency response personnel also staff their ERFs consistent with the provisions in their respective plans.

[H.5, H.6, H.7] Dominion maintains and operates onsite monitoring systems needed to provide data that are essential for initiating emergency measures and for performing accident assessments, which includes monitoring systems for geophysical phenomena, radiological conditions, plant processes, and fire hazards. Dominion also provides offsite radiological monitoring equipment that is suitable for assessing the offsite radiological consequences of facility incidents and for use by offsite monitoring field teams.

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 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 of the COL Plan describes these arrangements and the capabilities of the affected organizations and facilities. Appendix 7, "Certification Letters," provides pertinent certifications from these support organizations. Section II.C.3 of the COL Plan describes the available laboratory facilities.

[H.6, H.8] Dominion acquires meteorological data from the National Weather Service during periods when the primary system is unavailable. Back-up seismic data are available from the U.S. Geological Survey (National Earthquake Information Center) and the Virginia Polytechnic

Institute and State University (Virginia Tech) Seismological Observatory. Stream flow data are available from the U.S. Geological Survey. Flooding data are available from the National Oceanographic and Atmospheric Administration Hydro-Meteorological Reports.

The station's Meteorological Monitoring System enables a capability for providing data that are used to predict atmospheric effluent transport and diffusion. The system consists of a primary and a back-up tower in selected locations that are representative of regional conditions. The NAPS back-up meteorological monitoring site consists of instrumentation on a freestanding 10-meter tower located approximately 1,300 feet northeast of the Unit 1 containment building. The tower serves as the back-up meteorological monitoring site. A sensor at the top of the mast monitors wind speed, wind direction, and horizontal wind direction fluctuation. (For more information on meteorological instrumentation and methods, see SER Section 2.3.3, "Onsite Meteorological Measurements Program.")

[H.7, H.10, H.11] Dominion performs inspection, inventory, and appropriate operational tests of dedicated emergency equipment and instruments on a quarterly basis. 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, "Emergency Equipment and Supplies," of the COL Plan describes the emergency equipment and supplies that are typically used by emergency response personnel, including field teams.

[H.5, H.6] The staff finds that the applicant has adequately identified onsite monitoring systems that will be used to initiate emergency measures in addition to the provisions for acquiring data from, or gaining emergency access to, offsite monitoring and analysis equipment. **[H.7, H.8, H.10]** The staff finds that the applicant has provided for adequate offsite meteorological instrumentation and radiological monitoring equipment in the vicinity of the nuclear facility, including sufficient reserves of instruments and equipment to replace those that are removed for calibration or repair. **[H.11]** In addition, the applicant has identified emergency kits by general category (e.g., protective equipment, communications equipment, radiological monitoring equipment, and emergency supplies).

Technical Support Center

[H.1] In COL Plan Section II.H.1, "OnSite Emergency Response Facilities," the applicant stated that 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, and its size is sufficient to support a staff of 26 people. ITAAC 5.1.3 states that the TSC has been located in the electrical building. ITAAC 5.1.1 states that the TSC has at least 174 square meters (1,875 square feet) of floor space. The ESBWR DCD provides pertinent (Tier 2) TSC design information (instrumentation, data system equipment, and power supplies).

The TSC is environmentally controlled to provide room air temperature, humidity and cleanliness appropriate for personnel and equipment. The room is equipped with radiological protection and monitoring equipment necessary to monitor personnel radiation exposure and to maintain personnel doses less the 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. (ITAAC 5.1.4 states that the TSC includes radiation monitors and a ventilation system with high-efficiency particulate air and charcoal filters.) ITAAC 5.1.5 states that back-up electrical power supply is available for the TSC. In the event that offsite and onsite AC power are unavailable, the TSC could be evacuated and the TSC management function transferred to a location unaffected by the radiation release or other habitability concern.

In **RAI 13.03-2.13**, the staff asked the applicant to describe how the transfer of the TSC management function comports with NUREG-0696, which calls for a transfer to the control room. In the applicant's response to **RAI 13.03-2.13**, the applicant stated that if the TSC is uninhabitable or unavailable, the Main Control Room (MCR) is the preferred location for transfer of the management function, and that the ESBWR Control Room Habitability Area design allows the relocation of TSC personnel to the MCR with no adverse impacts on the MCR operating crew. The staff finds the applicant's response acceptable. (The control room ventilation system and other aspects associated with habitability, including the number of people the control room can accommodate, are addressed in SER Section 6.4, "Control Room Habitability System," and SER Section 9.4.1, "Control Room Area Ventilation System." In addition, an evaluation and analysis of the offsite radiological consequences of postulated accidents with fission product releases, in regard to control room and TSC habitability, are addressed in SER Section 15.0.3, "Design Basis Accident Radiological Consequences Analyses for Advanced Light Water Reactors.")

The TSC is equipped with reliable voice and data communication with the main control room and the EOF, and reliable voice communications with the OSC, NRC Operations Center, and Virginia and risk jurisdiction EOCs. ERDS data from the MCR to the NRC Operations Center is also provided, as appropriate. ITAAC 5.1.2 states that the various listed communications equipment has been provided in the TSC, and that voice transmission and reception have been accomplished. Section II.F of the COL Plan describes the communications capabilities provided in the TSC.

Display capability of the technical data system in the TSC includes a workstation that, at a minimum, is capable of displaying the parameters that are required by NUREG-0654, NUREG-0696, and NUREG-0737 (Supplement 1) and are designed and installed in accordance with HSI design principles described in ESBWR DCD Section 18.8, "Human Factors Engineering." Key reference materials are available to the TSC staff via the LAN connection from the Nuclear Electronic Document Library. Section II.B.5 of the COL Plan describes the TSC staff. Section II.O of the COL Plan describes ERO training and qualification.

In Revision 0 of the COL application, submitted November 2007, the applicant had described in Part 5 Section II.H, "Emergency Facilities and Equipment," the display capabilities of the technical data systems in the TSC and EOF. The description included the capability of displaying the parameters that are required for the Safety Parameter Display System (SPDS). The SPDS function is described in Subsection 18.4.2.11 of the ESBWR DCD. (Information systems associated with the ERFs and the accident monitoring and display systems are discussed in SER Section 7.5, "Information Systems Important to Safety.") In Revision 1 of the COL application, submitted in December 2008, the applicant changed the "SPDS function" reference to the "HSI function" without providing the basis for the change or a description of the HSI function. NRC staff issued **RAI 13.03-4** requesting the applicant to adequately address the introduction of the HSI function as described above. This issue is identified as **Open Item 13.03-4.**

Emergency Operations Facility

[H.2] In COL Plan Section II.H.2, "Emergency Operations Facility," the applicant stated that the function of the EOF is to provide a location for Dominion management to direct and coordinate emergency response activities, with an emphasis on providing support to the plant staff and coordinating emergency response activities with offsite response agencies. **[H.12]** Health physics personnel located in the EOF are designated as the point of contact for receiving offsite monitoring data results and sample media analysis results collected by Dominion personnel. In regard to the EOF location, the applicant stated that the EOF location precludes the necessity of providing radiation monitoring systems. The applicant further stated the following:

> The EOF is located at Dominion's Innsbrook Technical Center in Glen Allen, Virginia, approximately 30 miles from North Anna 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. (Emphasis added.)

In **RAI 13.03-2.12**, the staff asked the applicant to clarify the Unit 3 EOF description, in relation to the NAPS Units 1 and 2 Local Emergency Operations Facility (LEOF) and Central Emergency Operations Facility (CEOF). The LEOF is described in Section 7.1.4, "Local Emergency Operations Facility," and the CEOF is described in Section 7.1.5, "Corporate Emergency Response Center and Central Emergency Operations Facility," of the NAEP (Revision 28, page 7.4), which supports Units 1 and 2. The CEOF is located at the Innsbrook Technical Center in Glen Allen, Virginia.

The staff initially thought that the existing (Units 1 and 2) CEOF would also support Unit 3, given the same reference to the Innsbrook Technical Center location in Glen Allen, Virginia. However, the applicant's response to **RAI 13.03-2.12** states that the existing LEOF and CEOF support Units 1 and 2 and will not support Unit 3. The applicant further stated the following:

> In Unit 3 emergency plan, Section II.H.2, the exception to the guidance in NUREG-0696 is for the proposed EOF at Dominion's Innsbrook Technical Center in Glen Allen, Virginia. A formal request for the exception will be submitted to the NRC to enable construction prior to and demonstration during the full participation exercise (ref Section II.N.1.b).

Although the applicant has described various requirements associated with an EOF, the introduction of a new EOF facility that will be located approximately 30 miles from Unit 3 precludes a full evaluation and finding by the staff as to its adequacy in support of Unit 3, because the applicant has not followed the appropriate process for such a request (see below). As indicated above, the applicant (1) is requesting (in the COL application) NRC approval of the proposed location for the EOF, and (2) will be submitting to the NRC a formal request for an exception to enable construction of the EOF. The applicant's intended path for NRC approval of the new EOF is unclear in relation to the applicable regulatory bases in support of NRC's reasonable assurance determination associated with emergency planning and the issuance of a COL for Unit 3.

The applicant's self-identified need to submit a request for an exception is undefined in relation to the regulatory basis, as well as to the proper form and content of such a request. Finally, the application does not fully address the generic ITAAC that would be required for a new EOF,

which is in ITAAC 8.2 of Table C.II.1-B1 in RG 1.206 (March 2007). The staff issued **RAI 13.03-5,** asking the applicant to clarify the resolution of Dominion's request for NRC approval of the proposed EOF location. The RAI also requested the applicant to include all required EOF-related ITAAC in the application. This issue is identified as **Open Item 13.03-5**.

[H.2] COL Plan Section II.H.2 further states that the size of the EOF is sufficient to support 35 people. ITAAC 5.2.1 states that the EOF has at least 243 square meters (2,625 square feet). The provisions indicate that the EOF staff will be personnel from Dominion and the Commonwealth of Virginia, risk jurisdiction, and NRC. Dominion's provisions also accommodate a limited number of media personnel in the EOF. (Section II.B.5 of the COL Plan describes the Dominion EOF staff. Section II.O of the COL Plan describes emergency response organization training and qualification.) ITAAC 5.2.2 states that voice transmission and reception have been accomplished between the EOF and TSC. In addition, ITAAC 5.2.3 states that voice transmission and reception have been accomplished via the Operational Hot Line among the EOF, Commonwealth of Virginia, and the counties of Caroline, Hanover, Louisa, Orange, and Spotsylvania.

The EOF draws its primary power from commercial power and has electrical generator back-up power. A loss of commercial power should not impact any of the voice or data communications equipment located in the EOF. In the event of a loss of commercial power, common Dominion telecommunications infrastructure that supports EOF functions is configured to operate from at least one, and usually from multiple back-up power sources. This infrastructure includes—but is not limited to—fiber optic transmission equipment, telephone switching equipment, and data network routers, The back-up sources include generator, DC battery, and uninterrupted power supply systems. Section II.F of the COL Plan describes the communications capabilities of the EOF.

Display capability of the technical data system in the EOF includes a workstation that, at a minimum, is capable of displaying the parameters that are required by NUREG-0654, NUREG-0696, and NUREG-0737 (Supplement 1) and that are designed and installed in accordance with HSI design principles described in ESBWR DCD Section 18.8, "Human Factors Engineering." Key reference materials will be available to the EOF staff via the LAN connection from the Nuclear Electronic Document Library.

Operational Support Center

[H.1, H.9] In COL Plan Section II.H.9, "Operational Support Center," the applicant stated that 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 of the COL Plan, assemble in the OSC to provide support to both the control room and the 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 applicant did not identify the specific location of the OSC in support of Unit 3.

NUREG 0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," in criterion H.9, requires that:

> Each licensee shall provide for an onsite operations support center (assembly area) which shall have adequate capacity, and supplies, including, for example, respiratory protection, protective clothing, portable lighting, portable radiation monitoring equipment, cameras and communications equipment for personnel present in the assembly area.

Although the applicant adequately described the functions of the OSC in its Emergency Plan, NRC staff has determined that the review of the adequacy of the Operations Support Center and the adequacy of interfaces between the OSC and other ERFs could not be completed without knowing the planned location of the OSC. The staff therefore issued **RAI 13.03-8**, requesting the applicant to adequately describe the planned location of the OSC. This issue is identified as **Open Item 13.03-8**.

The OSC is not designed to remain habitable under all projected emergency conditions. However, implementing procedures make provisions for relocating the OSC as needed and are based on ongoing assessments of plant conditions and facility habitability. ITAAC 5.1.6 states that the OSC is in a separate location from the control room. The OSC provides dedicated telephone extensions for communicating with the control room and the TSC, which 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 communicate with onsite and offsite locations as needed. Section II.F of the COL Plan describes the communications capabilities in the OSC. ITAAC 5.1.7 states that the various listed communications equipment has been provided in the OSC, and voice transmission and reception have been accomplished.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report.

Conclusion

The applicant also needs to revise the ITAAC table to reflect the guidance in RG 1.206 that is applicable to the establishment of a new EOF and to obtain Commission approval of the proposed EOF location, consistent with the applicable regulations and guidance, in order to meet 10 CFR 50.47(b)(8). NRC staff has also requested the applicant to provide a clear description of the planned location of the primary and alternate OSC in support of Unit 3. In addition, the applicant needs to describe the "HSI function" in relation to its replacement of the SPDS in the TSC and EOF. The staff will determine whether this planning standard is acceptable. The staff will document the determination in the FSER based on information the applicant has provided to date and the applicant's responses to the open items.

13.3.4.9 *Accident Assessment (10 CFR 50.47(b)(9); NUREG-0654/FEMA-REP-1, planning standard I)*

The regulation in 10 CFR 50.47(b)(9), as reflected in the planning standard I, requires the use of adequate methods, systems, and equipment for assessing and monitoring the actual or potential offsite consequences of a radiological emergency condition.

In COL Plan Section II.I, "Accident Assessment," the applicant described the methods, systems, and equipment available for assessing and monitoring actual or potential consequences of a radiological emergency. NRC staff reviewed this section, as well as other relevant portions of

the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard I, "Accident Assessment." Planning standard I provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(9).

[I.5, I.7, I.11] In COL Plan Section II.I, the applicant incorporated by reference Section 13.3.2.2.2.i of the ESP Plan, in regard to the description of methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition. In Section 13.3.3.10 of NUREG-1835, the staff found this information acceptable. The applicant provided additional information in COL Plan Section II.I.

[I.1, I.2] In COL Plan Section II.I.1, "Parameters Indicative of Emergency Conditions," the applicant stated that Appendix 1, "Emergency Action Levels," identifies plant system and effluent parameter values that are indicative of off-normal conditions and include the various indications that correspond to the emergency ICs based on the methodology provided in NEI 07-01, Revision 0. (A discussion of NEI 07-01 and EALs is addressed in SER Section 13.3.4.4.) Section 7.5.1 of the ESBWR DCD describes the post-accident monitoring systems. Plant procedures will specify the types and capabilities of the instruments used to indicate emergency conditions. (Systems for post-accident sampling, including associated provisions and procedures, are discussed in SER Section 9.3.2, "Process and Post-Accident Sampling Systems.")

ITAAC 6.1 states that an exercise or drill has been accomplished, including the use of selected monitoring parameters identified in the EALs listed in ITA Section 1.1 to assess simulated degraded plant conditions and to initiate protective actions. Various criteria relating to accident assessment and classification and radiological assessment and control are listed as applicable acceptance criteria.

[I.3] Appendix 2, "Assessment and Monitoring for Actual or Potential Offsite Consequences of a Radiological Emergency," and plant procedures provide the means for relating various measured parameters, including containment radiation monitor readings to the source term available for release within plant systems, and effluent monitor readings to the magnitude of the release of radioactive materials. ITAAC 6.2.1 states that a methodology has been established to determine the source term of releases of radioactive materials within plant systems.

[I.4] Dose assessment procedures include the relationship between effluent monitoring 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. ITAAC 6.3 states that a methodology has been provided (for various meteorological conditions) to establish the relationship between effluent monitor readings and onsite and offsite exposures and contamination.

[I.6] Plant procedures establish processes for estimating release rates and projected doses if the associated instrumentation is inoperable or off-scale. Plant procedures consider estimated releases based on field monitoring data and surrogate instrumentation and methods to estimate the extent of fuel damage. Appendix 2 of the COL Plan 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.

[I.1, I.2] The staff finds that the applicant has adequately identified plant system and effluent parameter values that characterize a spectrum of off-normal conditions and accidents and that have the onsite capability and resources to provide initial values and continuing assessments throughout the course of an accident. **[I.4, I.10]** In addition, the applicant has adequately established the relationship between effluent monitor readings and onsite and offsite exposures and contamination for various meteorological conditions, which include relating the various measured parameters to dose rates for key isotopes and gross radioactivity measurements.

[I.5] In Section II.H.8 and Appendix 2 of the COL Plan, the applicant provided a description of the meteorological monitoring systems that are used to provide initial values and continuing assessments of meteorological conditions under emergency conditions. (Additional details about meteorological instrumentation and methods are discussed in SER Section 2.3.3, "Onsite Meteorological Measurements Program.") ITAAC 6.4 states that the specified meteorological data is available in the control room, TSC, and EOF. **[I.5]** The staff finds that the applicant has sufficient capability to acquire and evaluate the necessary meteorological information, as discussed in SER Section 13.3.4.8, and has made adequate provisions for access to this information by the EOF, TSC, control room, NRC, and the affected State(s).

[I.7, I.8, I.9] 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 the COL Plan. The field teams perform a sampling of offsite media as needed to assess the actual or potential magnitude and locations of radiological hazards. ITAAC 6.5 states that a methodology has been established to rapidly assess the actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways. Dominion will notify and activate field team personnel consistent with Section II.E of the COL Plan. Mobilization times are consistent with Section II.B of the COL Plan.

Appendix 6, "Emergency Equipment and Supplies," provides a description of the instrumentation that is available for monitoring the plume exposure pathway EPZ. 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 [and measuring] radioiodine concentrations at or below 10^{-7} µCi/ml (microcuries per milliliter) under field conditions, taking into consideration potential interference from noble gas activity and background radiation. ITAAC 6.6 states that instrumentation used for monitoring I-131 to detect airborne concentrations as low as 1E-07 µCi/cc (microcuries per cubic centimeter) has been provided. In addition to the required instrumentation, Dominion provides protective equipment (including respiratory protection and radioprotective drugs); communications equipment; and supplies to facilitate the performance of radiation, surface contamination, and airborne radioactivity monitoring.

Implementing procedures establish provisions for estimating the projected dose based on projected and actual dose rates. These procedures provide guidance for field monitoring teams to monitor activities. Field monitoring teams act under the direction of health physics personnel in the TSC before activation of the EOF and under EOF health physics personnel after activation of the facility. (Additional descriptions of field team capabilities and resources are in COL Plan Section II.H and in SER Section 13.3.4.8.). **[I.10]** 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 NUREG-0654/FEMA-REP-1, Table 3, "Radionuclides with Significant Contribution to Dominant Exposure Modes." ITAAC 6.7 states that there are established means for relating contamination levels and airborne radioactivity levels to dose rates and gross radioactivity measurements for the specified isotopes.

[I.7, I.8, I.9, I.10] The staff finds that the applicant has adequately described the capability and resources for field monitoring within the 10-mile plume exposure EPZ. In addition, the applicant has the methods, equipment, and expertise to rapidly assess actual or potential radiological hazards, including the capability to detect and measure radioiodine airborne concentrations within the 10-mile plume exposure EPZ as low as 10^{-7} µCi/cc under field conditions, and to relate the various measured parameters to dose rates for key isotopes and gross radioactivity measurements.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report.

Conclusion

As discussed above, the open item identified by FEMA needs to be resolved in order to meet the requirements of 10 CFR 50.47(b)(9). NRC staff will determine whether this planning standard is acceptable and will document this determination in the FSER based on information the applicant has provided to date and the applicant's response to the open item identified by FEMA.

13.3.4.10 *Protective Response (10 CFR 50.47(b)(10); NUREG-0654/FEMA-REP-1, planning standard J)*

The regulation in 10 CFR 50.47(b)(10), as reflected in the planning standard J, requires that a range of protective actions have been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of KI, as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.

In COL Plan Section II.J, "Protective Response," the applicant described the protective actions that have been developed to limit radiation exposure of plant personnel and the public following an accident at the NAPS site. NRC staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard J, "Protective Response." Planning standard J provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(10).

[J.2, J.7, J.8, J.10.l] In COL Plan Section II.J, the applicant incorporated by reference Section 13.3.2.2.2.j of the ESP Plan regarding the description of protective actions associated with the plume exposure pathway EPZ and the ingestion exposure pathway EPZ. In

Section 13.3.3.11 of NUREG-1835, the staff found this information acceptable. The applicant provided additional information in COL Plan Section II.J.

[J.1, J.5] In Section II.J, the applicant stated that Dominion establishes and implements methods to inform personnel within the protected area (within the security fence) and the exclusion area (within 5,000 feet of the Unit 3 containment) of an emergency within about 15 minutes of the declaration of an emergency. The methods include accounting for individuals within the protected area and identifying missing persons within 30 minutes following the initiation of assembly and accountability measures; which is consistent with the facility Security Plan. Notification is accomplished through the plant public announcement system, audible warning systems, visible warning signals, and personal notifications**.** ITAAC 7.1.1 states that during a drill or exercise, notification and instructions were provided to onsite workers and visitors within the protected area over the plant public announcement system. ITAAC 7.1.2 states that during a drill or exercise, audible warnings were provided to individuals outside of the protected area but within the owner-controlled area.

[J.2, J.3, J.4] Dominion has established evacuation routes to primary and secondary assembly areas, which are shown in Figure II-4, "Routes to Assembly Areas." If the evacuation routes are rendered impassable due to traffic, weather, or radiological conditions, Dominion will direct affected individuals to a safe onsite area. Individuals will evacuate the site via personal vehicles and will be directed to an assembly area for radiological monitoring and decontamination, if required. Appropriate equipment and supplies will be provided from the facility to the assembly areas to facilitate contamination monitoring. In addition, Section 6.4.2, "Decontamination and First Aid," of the NAEP (Revision 28) for Units 1 and 2 states that should decontamination of vehicles or personnel be warranted, health physics personnel can perform the task at the station, the assembly areas, or at the Patrick Henry High School in Hanover County (which is the State evacuation assembly center).

[J.6] In COL Plan Section II.J.6, "Protective Measures," Dominion provides equipment and supplies for adequate protection of individuals remaining or arriving onsite during an emergency. The equipment and supplies include respiratory protection equipment, protective clothing, and radioprotective drugs. In addition, Section 6.3.3.3, "Thyroid Blocking Agent," of the NAEP states that an EPIP addresses the approval process for administering a thyroid-blocking agent in a potential radioiodine inhalation situation. The process was authorized by the company's employee health services staff, in consultation with the company's medical support staff. Appendix 6, "Emergency Equipment and Supplies," provides a description of the emergency response supplies and equipment to be provided. 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. The staff reviewed Appendix 6 and finds that it adequately identifies equipment and supplies that are typically included in emergency kits.

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

- Evacuation of personnel from areas and buildings perceived as high-value targets

- Site evacuation by opening (and continuing to defend) security gates
- Dispersal of key personnel
- Onsite sheltering
- Staging of ERO personnel in alternate locations, pending the restoration of safe conditions
- Implementation of accountability measures following the restoration of safe conditions

EALs that address security threats and events and hostile actions for each emergency class are addressed in SER Section 13.3.4.4.

[J.7, J.10.m] In COL Plan Section II.J.7, "Protective Action Recommendations and Bases," the applicant stated that public PARs are based on plant conditions, estimated offsite doses, or some combination of both. Consistent with the methodology discussed in NEI 07-01, Dominion determines the EALs that correspond to the projected dose to the population at risk. If the Emergency Coordinator declares a general emergency or site area emergency (with a potential for loss of three fission product barriers), Dominion will communicate to the Virginia EOC a PAR to evacuate a 2-mile radius around the facility and 5 miles downwind (i.e., the downwind and adjacent sectors), and to shelter-in-place for the remainder of the plume exposure pathway EPZ.

In addition to the plant conditional-based PAR, Dominion provides PARs based on offsite dose projections. The health physics staff is responsible for periodically conducting offsite dose projections, consistent with implementing procedures that will establish calculation and projection requirements. Projected doses will be compared to the protective action guides shown in COL Plan Table II-3, "Protective Action Guides," which is derived from U. S. Environmental Protection Agency (EPA) 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (May 1992), from which PARs will be developed. Implementing procedures include specific PARs based on NUREG-0654/FEMA-REP-1, Supplement 3, "Criteria for Protective Action Recommendations for Severe Accidents," and on plant and meteorological conditions.

Before EOF activation, the Emergency Coordinator is responsible for determining PARs and communicating them to the Virginia EOC responsible for implementing protective actions. Following EOF activation, the EOF Director assumes these responsibilities. The communications systems are described in COL Plan Sections II.F and II.H and addressed in SER Sections 13.3.4.6 and 13.3.4.8, respectively. The staff finds that the applicant has established an adequate mechanism for recommending protective actions to the appropriate State and local authorities, which include EALs corresponding to a projected dose to the population at risk. (EALs are described in COL Plan Section II.D, "Emergency Classification System," and addressed in SER Section 13.3.4.4.)

[J.8] Dominion has conducted an ETE. The ETE report is included in the COL application as supplemental information to the emergency plan and is summarized in COL Plan Appendix 4, "Evacuation Time Estimate (summary)." SER Section 13.3.4.17, "Evacuation Time Estimate (ETE) Analysis," summarizes an evaluation of the ETE Report, which was conducted by NRC staff and contractor staff at the Pacific Northwest National Laboratory (PNNL) and Sandia National Laboratory (SNL).

[J.10.a, J.10.b] The ETE report provides maps of the plume exposure pathway EPZ, which illustrate the population distribution around the NAPS, evacuation areas and routes, and location of assembly areas (see ETE report Figures 10-1 through 10-4). Dosimetry and air sampler locations within the NAPS 10-mile EPZ are shown in NAEP Figure 7.1, "Monitoring Location Map," and are listed in Figure 7.2, "Monitoring Location Listing." In addition, radiological monitoring locations are in COL Plan Figure II-5.

[J.10.c] Section 7.6, "Early Warning System," of the NAEP states that the company has installed (and is responsible for maintaining and periodically testing) an Early Warning System (EWS), consisting of sirens located throughout the 10-mile EPZ. The purpose of the EWS is to ensure that essentially 100 percent of the population within 5 miles of the NAPS site can be alerted within 15 minutes, and that essentially 100 percent of the population within 5 to 10 miles from the site—who may not have received the initial notification—can be alerted within 45 minutes.

Warnings to the public within the plume exposure pathway EPZ are the responsibility of Commonwealth of Virginia and risk jurisdiction officials. The primary method for warning the public is the EWS sirens. Other warning methods may include telephone communications, television and radio EAS stations, public address systems, bull horns from patrol cars, and personal contact. (There are no hospitals, prisons, or nursing homes within the plume exposure pathway EPZ.) Additional information on the means for notifying all segments of the transient and resident populations is in COL Plan Sections II.D, II.E, and II.G. These sections are discussed in SER Sections 13.3.4.4, 13.3.4.5, and 13.3.4.7, respectively.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report.

Conclusion

As discussed above, the open item identified by FEMA needs to be resolved in order to meet the requirements of 10 CFR 50.47(b)(10). NRC staff will determine whether this planning standard is acceptable and will document this determination in the FSER. The determination will be based on information the applicant has provided to date and the applicant's response to the open item identified by FEMA.

13.3.4.11 *Radiological Exposure Control (10 CFR 50.47(b)(11); NUREG-0654/FEMA-REP-1, planning standard K)*

The regulation in 10 CFR 50.47(b)(11) as reflected in the planning standard K, requires that the means for controlling radiological exposures in an emergency be established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

In COL Plan Section II.K, "Radiological Exposure Control," the applicant described the emergency exposure limits for emergency workers, including decisions and efforts made to minimize exposures. NRC staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard K, "Radiological

Exposure Control." Planning standard K provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(11).

[K.1, K.2, K.3.a, K.4, K.5.a, K.5.b] In COL Plan Section II.K, the applicant incorporated by reference Section 13.3.2.2.2.k of the ESP Plan, in regard to the description of radiological exposure control measures. In Section 13.3.3.12 of NUREG-1835, the staff found this information acceptable. The applicant provided additional information in COL Plan Section II.K.

[K.1, K.2] In COL Plan Section II.K.1, "Emergency Exposure Guidelines," the applicant stated that Dominion implements onsite exposure guidelines for emergency response personnel, consistent with EPA 400-R-92-001, Table 2-2, "Guidance on Dose Limits for Workers Performing Emergency Services," which are reflected in COL Plan Table II-4, "Emergency Worker Exposure Guidelines." Before EOF activation, the Emergency Coordinator (in consultation with facility health physics personnel) is responsible for authorizing emergency exposures exceeding 10 CFR Part 20 limits. Following EOF activation, the EOF Director (in consultation with health physics personnel and the Emergency Coordinator) has this responsibility.

Chapter 12, "Radiation Protection," of the NAPS Unit 3 FSAR describes a radiation protection program (RPP) that is consistent with the requirements of 10 CFR Part 20. The RPP, in concert with the EPIPs, include 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 decisionmaking and consideration of the relative risks. (Additional discussions on the radiation protection and health physics programs are in SER Section 12.0, "Radiation Protection.")

[K.3.a, K.3.b] Dominion maintains a site personnel radiation dosimetry program that includes the capability to determine both external and internal doses. The program maintains individual dose records consistent with the requirements of 10 CFR Part 20 and the RPP (including supporting procedures). The external dosimetry program includes provisions and requirements for using both permanent records and self-reading dosimeters, with dosimeter ranges that are sufficient to measure both planned routine and foreseeable accident doses. Plant-implementing procedures establish guidance and requirements associated with dosimetry distribution and use (e.g., periodically reading self-reading dosimeters to monitor compliance with emergency exposure guidelines), and determining internal doses.

[K.5.a, K.5.b, K.7] Dominion implements procedures (supporting the RPP) that address the decontamination of personnel, supplies, instruments, and equipment. Dominion makes provisions for protective clothing, contamination monitoring, and decontamination—including decontamination for radioiodine contamination on the skin—at the offsite assembly area (or other designated location). The procedures include decontamination action levels, criteria for returning areas and items to normal use, and instructions for waste disposal. COL Plan Appendix 6, "Emergency Equipment and Supplies," provides a description of the emergency equipment and supplies, including decontamination supplies with emergency kits.

[K.6.a, K.6.b, K.6.c] In COL Plan Section II.K.6, "Contamination Control Measures," the applicant stated that 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's 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 FSAR Chapter 12.

Should the potential exist for contamination of onsite food or drinking water supplies that renders these supplies non-consumable, arrangements will be made for transporting non-contaminated offsite supplies to the NAPS site. Dominion permits areas and items to be returned to normal (i.e., non-contaminated) use following surveys to verify that contamination levels meet the criteria provided in the RPP or its supporting procedures.

The staff finds that the applicant has established onsite exposure guidelines that are consistent with the EPA emergency worker and lifesaving activity protective action guides. In addition, the staff finds that the applicant has provided an adequate onsite RPP to be implemented during emergencies. The program includes provisions for using dosimetry, establishing the means for contamination control, and decontaminating both onsite and relocated onsite personnel.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report.

Conclusion

As discussed above, the open item identified by FEMA needs to be resolved in order to meet the requirements of 10 CFR 50.47(b)(11). NRC staff will determine whether this planning standard is acceptable and will document this determination in the FSER. The determination will be based on information the applicant has provided to date and the applicant's response to the open item identified by FEMA.

13.3.4.12 *Medical and Public Health Support (10 CFR 50.47(b)(12); NUREG-0654/FEMA-REP-1, planning standard L)*

The regulation in 10 CFR 50.47(b)(12), as reflected in the planning standard L, requires that arrangements be made for medical services for contaminated injured individuals.

In COL Plan Section II.L, "Medical and Public Health Support," the applicant described the provisions to assist personnel who may be injured, receive high-radiation doses, or be externally contaminated. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. In this evaluation, the staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard L, "Medical and Public Health Support." Planning standard L provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(12).

[A.3, B.9, L.1, L.4] In COL Plan Section II.L, the applicant incorporated by reference Section 13.3.2.2.2.l of the ESP Plan in regard to descriptions of plans for medical and public health support. These descriptions included contacts and arrangements for medical services for contaminated injured individuals and were supported by a letter of agreement with the Medical

College of Virginia Hospitals/Virginia Commonwealth University (MCVH/VCU), which describes arrangements that have been made to provide emergency services to the NAPS. These arrangements would apply to the ESP site. In Section 13.3.3.13 of NUREG-1835, the staff found this information acceptable.

[A.3, B.9, L.1, L.2, L.4] The applicant provided additional information in COL Plan Section II.L, including a certification letter from MCVH/VCU (in COL Plan Appendix 7), which addresses the facility's continued availability in support of a new unit at the NAPS. (Certification letters in support of Unit 3 are also discussed in Section 13.3.4.1.) **[L.1]** In addition, Section II.L.1 states that the hospital has 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 that are consistent with Section II.O of the COL Plan, periodic drills and exercises that are consistent with Section II.N of the COL Plan, and services that are consistent with agreements between Dominion and the medical support providers. Furthermore, 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.

[L.2] Dominion maintains a trained First Aid Team at the site to provide 24-hour-per-day first aid support, consistent with COL Plan Section II.B, and maintains First Aid Team readiness through training consistent with COL Plan Section II.O and drills and exercises consistent with COL Plan Section II.N. **[L.4]** In addition, Dominion has made arrangements with local volunteer rescue squads to transport injured contaminated personnel to the hospital and will provide for a health physics technician (with appropriate instrumentation) to accompany the person to the hospital. As practicable, contaminated injured personnel will be suitably clothed or prepared to prevent the spread of contamination in the transporting vehicle.

The staff reviewed the certification letter from MCVH/VCU and the additional information provided in COL Plan Section II.L. The staff finds that Dominion has made adequate arrangements for hospital and medical services and has the capability of evaluating radiation exposure and uptake, including the assurance that persons providing these services are adequately prepared to handle contaminated individuals. In addition, the staff finds that the applicant has provided for onsite first aid capability, including arrangements for transporting victims of radiological accidents to medical support facilities.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report.

Conclusion

As discussed above, the open item identified by FEMA needs to be resolved in order to meet the requirements of 10 CFR 50.47(b)(12). NRC staff will determine whether this planning standard is acceptable and will document the determination in the FSER. This determination will be based on information the applicant has provided to date and the applicant's response to the open item identified by FEMA.

13.3.4.13 *Recovery and Reentry Planning and Post-accident Operations (10 CFR 50.47(b)(13); NUREG-0654/FEMA-REP-1, planning standard M)*

The regulation in 10 CFR 50.47(b)(13), as reflected in the planning standard M, requires that general plans for recovery and reentry be developed.

In COL Plan Section II.M, "Recovery and Re-Entry," the applicant described the steps that will take once the emergency situation has ended to mitigate the consequences of the event and to minimize any effects on the health and safety of the public and emergency workers. NRC staff reviewed this section, as well as other relevant portions, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard M. Planning standard M provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(13).

[M.1] In COL Plan Section II.M.1, "Recovery Plans and Procedures," the applicant stated that Dominion implements plans and procedures that provide guidance for a range of recovery and re-entry activities, including organization, decisionmaking, informing the public, and estimating the total population exposure. COL Plan Appendix 5, "Implementing Procedures–Topical List," lists EPIPs by topic that supports the North Anna Unit 3 emergency plan. These listed EPIPs address a range of actions needed to implement the contents of the emergency plan. The Recovery and Reentry EPIP will outline the recovery process and the administration of the recovery program. (The submission of detailed implementing procedures is addressed below in SER Section 13.3.5.)

[M.2, M.3] In Section II.M, the applicant further stated that before entering the recovery and re-entry phase of operations, Dominion would establish a recovery organization that is consistent with the existing conditions and continuing organizational needs. The EOF Director assumes control and direction of the recovery operation and has the authority and responsibilities set forth in the relevant EPIPs. Depending on plant conditions and the scope of activities, the recovery organization may discharge its activities from one or more designated ERFs or from other locations specified by the recovery organization managers.

[M.1, M.2, M.3] The recovery process is implemented when the facility's ERO managers, with concurrence of Commonwealth of Virginia and Federal agencies, have determined the station to be in a stable and controlled condition. Upon this 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. The recovery organization develops plans and procedures that are designed to address both immediate and long-term actions. Specific recovery procedures may be written to address special requirements and will supplement the existing station procedures. The necessity to maintain protective measures implemented during the emergency will be evaluated and if appropriate, the recovery organization will recommend the relaxation of existing protective measures.

[M.4] Total population doses will be periodically estimated utilizing population distribution data from the affected areas. Health Physics personnel will determine the TEDE and the thyroid committed dose equivalent that are consistent with the methodology in EPA 400-R-92-001.

The staff finds that the applicant has developed general plans for re-entry and recovery and has designated the individuals responsible for the recovery organization. The plans specify the

means for informing members of the response organizations that a recovery operation is to be initiated and include a description of the means for reaching decisions to relax protective measures. The staff also finds that the applicant's method for periodically estimating total population exposure is acceptable.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report.

Conclusion

As discussed above, the open item identified by FEMA needs to be resolved in order to meet the requirements of 10 CFR 50.47(b)(13). NRC staff will determine whether this planning standard is acceptable and will document its determination in the FSER. This determination will be based on information the applicant has provided to date and the applicant's response to the open item identified by FEMA.

13.3.4.14 *Exercises and Drills (10 CFR 50.47(b)(14); NUREG-0654/FEMA-REP-1, planning standard N)*

The regulation in 10 CFR 50.47(b)(14), as reflected in the planning standard N, requires that periodic exercises be conducted to evaluate major portions of emergency response capabilities, periodic drills be conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills be corrected.

In COL Plan Section II.N, "Exercises and Drills," the applicant described the conduct and frequency of emergency exercises and drills, including coordination between the NAPS site and offsite EROs. NRC staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard N, "Exercises and Drills." Planning standard N provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(14).

[N.1, N.2] In COL Plan Section II.N, the applicant stated that Dominion implements a program of periodic drills and exercises to evaluate major portions of emergency response capabilities, develop and maintain key emergency response skills, and correct identified deficiencies. **[N.2]** Dominion develops and implements exercises to periodically test and evaluate major portions of emergency plans, procedures, and organizations and may simulate an emergency that results in offsite radiological releases requiring response by offsite authorities. In **RAI 13.03-2.16**, the staff asked the applicant (in part) to describe how the facility response capabilities will be demonstrated in relation to an imminent or actual safeguard threat against the facility or other safeguard event. In the applicant's response to **RAI 13.03-2.16**, the applicant stated that the demonstration of facility response capabilities in response to hostile actions will be integrated into Force-on-Force and emergency exercises. (See also the applicant's related response to **RAI 13.03-2.16** in Section 13.3.4.5 of this report.)

The exercises test the adequacy of timing and content of implementing procedures and methods, equipment and communications, the public notification system, and the familiarity of

emergency organization personnel with their duties. The exercise 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 conducts an exercise of the onsite emergency plan every two years and exercises involving full or partial participation by offsite authorities at least biennially. In addition, Dominion periodically conducts exercises during off-hours, under various weather conditions, and without a prior announcement.

Dominion will conduct a full or partial participation exercise within two years before the initiation of a scheduled initial fuel loading, which will include the participation of 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 before initial fuel loading, Dominion will conduct an exercise that tests the onsite emergency plans within one year before initiating full power operations. ITAAC 8.1.1.1 states that an exercise was conducted within the specified time periods of Appendix E to 10 CFR Part 50, onsite exercise objectives were met, and there were no uncorrected onsite exercise deficiencies. ITAAC 8.1.2.1 states that onsite emergency response personnel were mobilized to fill emergency response positions.

[N.2] 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 responses. Upon request, Dominion allows affected Commonwealth of Virginia and risk jurisdiction governments to participate in the drills. A response to an actual declared emergency may be used to satisfy drill requirements, if the response demonstrates an adequate execution of various emergency tasks. The drill program includes the following areas with associated conduct frequency:

- Communication Drills – Dominion conducts monthly tests of communications with Commonwealth of Virginia and risk jurisdiction governments (identified in COL Plan Section II.A, and discussed in SER Section 13.3.4.1). In addition, Dominion conducts quarterly tests of communications with Federal response organizations, and annual test of communications between the facility, the Virginia and risk jurisdiction EOCs, and field assessment teams. The communication drills evaluate both the operability of the communication systems and the ability of the participants to understand message content.

- Fire Drills – Dominion conducts fire drills as required by Subsection 9.5.1 of the Unit 3 FSAR.

- Medical Emergency Drills – Dominion conducts yearly medical emergency drills that include a simulated contaminated injured individual and participation of the local support services agencies (i.e., medical transportation and an offsite treatment facility).

- Radiological Monitoring Drills – Dominion conducts yearly radiological monitoring drills involving both onsite and offsite radiological monitoring activities, which include collection and analysis of sample media, communications with monitoring teams, recordkeeping activities.

- Health Physics Drills – On a semi-annual basis, Dominion conducts onsite health physics drills that include a response to (and analysis of) simulated elevated airborne and liquid samples, direct radiation measurements in the environment, and an analysis of in-plant liquid samples (with simulated or actual elevated radiation levels).

[N.3] Dominion develops drill and exercise scenarios and related materials that provide a narrative summary describing the conduct of the exercise or drill; establish basic objectives and evaluation criteria, including timing and simulated events; and identify participating organizations, including arrangements for official observers. ITAAC 8.1.1.2 states that exercise objectives, including specific acceptance criteria, addressed each of the eight listed EP Program Elements.

In **RAI 14.03.10-1.4.d**, the staff asked the applicant to explain, in part, why COL application Part 10 Table 2.3-1, "ITAAC For Emergency Planning," does not identify (in the acceptance criteria associated with ITAAC 8.1) exercise objectives and associated acceptance criteria called for in RG 1.206, Appendix B, Table C.II.1-B1, "Emergency Planning—Generic Inspections, Test, Analysis, and Acceptance Criteria (EP-ITAAC)." In the applicant's response to **RAI 14.03.10-1.4.d**, the applicant stated the following:

> "In order to ensure that future exercise objectives are sufficient for a comprehensive test of the COL Emergency Plan, Acceptance Criterion 8.1.1.2 includes a list of EP Program Elements that must be tested, including developing exercise objectives and specific acceptance criteria. Additionally, other Acceptance Criteria provide details directly related to specific objectives that must be met. Acceptance Criteria 2.1.1 and 2.2 address specific notification methods and procedures, Acceptance Criteria 3.1.1, 3.1.2, 3.1.3, 3.1.4, and 3.2 address specific emergency communication objectives, and Acceptance Criterion 6.1 speaks directly to accident assessment and classification and radiological assessment and control."

NRC staff considered the *other* acceptance criteria that the applicant cited as directly related to specific (exercise) objectives that must be met. The staff determined that this listing does not comprise all onsite exercise objectives and associated acceptance criteria that would be required for a full-participation exercise. Acceptance Criterion 8.1.1.2 identifies what the applicant refers to as eight *(EP) Program Elements*. The criterion states that exercise objectives and specific acceptance criteria address each of the Program Elements. In addition, Acceptance Criteria 2.1.1, 2.2, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2, and 6.1—which relate to notification, communications, accident assessment and classification, and radiological assessment and control—do not directly address three of the eight listed Program Elements. Further, there are no acceptance criteria for ITAAC 2.3, and the "NOTE" provided states that the EP Program Element is addressed by Acceptance Criterion 8.1.1.2. The staff does not agree that ITAAC 2.3 is addressed by Acceptance Criterion 8.1.1.2.

Even though the applicant listed other acceptance criteria that may relate to specific exercise objectives, the list is unacceptable because it does not provide a sufficiently complete identification of onsite exercise objectives and associate acceptance criteria, consistent with generic Acceptance Criterion 14.1.1 of Table C.II.1-B1 in Appendix B to RG 1.206 (at C.II.1-B-12). Specifically, the bracketed statement in Acceptance Criterion 14.1.1 states—in regard to onsite exercise objectives only—that "[t]he COL applicant will identify exercise objectives and associated acceptance criteria." The purpose of the bracketed statement in Acceptance Criterion 14.1.1 is to give the COL applicant maximum flexibility when crafting the ITAAC. Such flexibility is intended to allow an applicant to determine which onsite exercise objectives and acceptance criteria (i.e., scope and detail) are appropriate for their specific circumstance.

The COL applicant's (Dominion's) identification of a limited set of eight so-called *EP Program Elements* and references to a few other (emergency planning) ITAAC do not present a set of acceptable onsite exercise objectives and acceptance criteria. Consistent with the above discussion, the applicant must identify specific onsite exercise objectives and associated acceptance criteria for an exercise (in the form of ITAAC) that are specific in regard to exercise objectives and associated acceptance criteria for Unit 3. In addition, the applicant must provide an acceptance criterion for ITAAC 2.3 that is consistent with Acceptance Criterion 5.3 in Table C.II.1-B1 to RG 1.206 (at C.II.1-B-4). The staff therefore issued **RAI 13.03-6,** requesting that the applicant to provide the needed information. This issue is identified as **Open Item 13.03-6**.

In **RAI 14.03.10-1.4.a**, the staff asked the applicant to explain why Table 2.3-1 does not include an acceptance criterion to reflect the offsite exercise objectives associated with a full or partial participation exercise. The RAI asks how this apparent omission is consistent with the intent of generic ITAAC Acceptance Criterion 14.1.3 in Table C.II.1, "Emergency Planning—Generic Inspection, Test, Analysis, and Acceptance Criteria (EP ITAAC)," in RG 1.206 (Appendix B). In the response applicant stated the following:

> Acceptance Criterion 8.1.1.2 in Table 2.3-1 specifically states that "Exercise objectives, including specific acceptance criteria addressed each of the following Emergency Planning (EP) Program Elements…" This Acceptance Criterion is inclusive because it does not specify "onsite" nor "offsite."
>
> Dominion recognizes that a full participation exercise must be conducted prior to fuel loading and that offsite exercise objectives must be met or deficiencies addressed prior to operation above 5 percent power. FEMA will evaluate offsite response during the full participation exercises and render their finding with respect to the adequacy of offsite response in support of North Anna Unit 3 operations. FEMA's finding will be the determining factor for the NRC to authorize fuel loading and operation above 5 percent power. (Reference 10 CFR 50.54(gg)).

The applicant's response implies that ITAAC Acceptance Criterion 14.1.3 in Table C.II.1 is not needed. The reasons given are (1) Acceptance Criterion 8.1.1.2 in Table 2.3-1 is inclusive because it does not specify onsite or offsite, (2) offsite exercise objectives must be met or deficiencies addressed before operation above 5 percent power, and (3) FEMA's findings will be the determining factor for NRC staff to authorize fuel loading and operation above 5 percent power—referencing 10 CFR 50.54(gg).

The applicant has neither provided an appropriate acceptance criterion in Table 2.3-1 that reflects generic ITAAC 14.1.3, nor adequately explained why it is not required. The referenced Acceptance Criterion 8.1.1.2, which addresses ITAAC Acceptance Criterion 14.1.1 in Table C.II.1, is associated with *onsite* exercise objectives and deficiencies and not *offsite* exercise objectives and deficiencies. (See the discussion above regarding **RAI 14.03.10-1.4.d**.) In addition, the statements that offsite exercise objectives must be met or deficiencies addressed before operating above 5 percent power, and that the FEMA findings will be the determining factor for NRC staff to authorize fuel loading and operation above 5 percent power, merely restate what is in ITAAC Acceptance Criterion 14.1.3 and 10 CFR 50.54(gg). Finally, the applicant's reference to 10 CFR 50.54(gg) does not include an explanation regarding its relationship to generic ITAAC Acceptance Criterion 14.1.3.

The applicant's response did not describe how the COL application has fully addressed the requirements associated with Acceptance Criterion 14.1.3, such that generic ITAAC Acceptance Criterion 14.1.3 is not required in COL application Table 2.3-1. As discussed above, the staff finds that the applicant did not provide the appropriate acceptance criterion reflecting generic ITAAC Acceptance Criterion 14.1.3. The staff issued **RAI 13.03-7,** requesting the applicant to clarify how the COL application has fully addressed the requirements associated with Acceptance Criterion 14.1.3, such that generic ITAAC Acceptance Criterion 14.1.3 is not required in COL application Table 2.3-1, or to provide an ITAAC consistent with Acceptance Criterion 14.1.3. This issue is identified as **Open Item 13.03-7**.

Section 8.5, "Emergency Drills," and Section 8.6, "Emergency Exercises," of the NAEP (Revision 28) state that drills and exercises will be structured to allow for free play and independent decisionmaking by the participants. **[N.4]** 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 and determined to be sufficient for observing and evaluating the planned activities against the established criteria. Exercises may be critiqued by Federal and Commonwealth of Virginia observers/evaluators. ITAAC 8.1.2.2 states that onsite emergency response personnel performed their assigned responsibilities.

[N.5] Dominion conducts a critique following an emergency preparedness and response exercise. Participants may include selected Dominion, NRC, Commonwealth of Virginia, risk jurisdiction, and other participants and observers/evaluators. The participants critique the exercise, and their input 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.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. In addition, FEMA found that one evaluation criterion, N.2.c, was inadequate in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified these as open items in the report.

Conclusion

The applicant needs to identify specific onsite and offsite exercise objectives and associated acceptance criteria for a full or partial participation exercise (in the form of ITAAC) that are specific in regard to exercise objectives and associated acceptance criteria for Unit 3. In addition, the applicant needs to address the requirements associated with Acceptance Criterion 14.1.3, such that the generic ITAAC Acceptance Criterion 14.1.3 is not required or the applicant provides an ITAAC consistent with the acceptance criterion. NRC staff will determine whether this planning standard is acceptable and will document the determination in the FSER. This determination will be based on information the applicant has provided to date and the applicant's responses to the open items.

13.3.4.15 *Radiological Emergency Response Training (10 CFR 50.47(b)(15); NUREG-0654/FEMA-REP-1, planning standard O)*

The regulation in 10 CFR 50.47(b)(15), as reflected in the planning standard O, requires that RER training is provided to those who may be called on to assist in an emergency.

In COL Plan Section II.O, "Radiological Emergency Response Training," the applicant described the training that will be conducted for both onsite and offsite response organizations in support of an emergency at the NAPS site. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan against NUREG-0654/FEMA-REP-1, planning standard O, "Radiological Emergency Response Training." Planning standard O provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(15).

[O.1, O.2, O.3, O.4, O.5] In COL Plan Section II.O, the applicant incorporated by reference Section 13.3.2.2.2.o of the ESP Plan in regard to the description of the emergency preparedness training program. In Section 13.3.3.14 of NUREG-1835, the staff found that this information was acceptable. The applicant provided additional information in COL Plan Section II.O, which addresses existing training provisions and states that 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 provided assistance in the event of an emergency.

[O.1, O.3, O.4] In COL Plan Section II.O.3, "First Aid Team Training," and Section II.O.4, "Emergency Response Training and Qualification," the applicant stated that Dominion conducts a program for instructing and qualifying personnel who implement the COL Plan. Individuals complete the required training before they are assigned to a position in the ERO. The training program establishes the scope, nature, and frequency of the required training and qualification measures (e.g., individuals assigned to render treatment during an emergency receive first aid training equivalent to the Red Cross Multi-Media training). 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
- Emergency response facilities
- Security access control and site evacuation process
- Exposure control techniques

Dominion implements a program to provide position-specific emergency response training for designated members of the ERO. The content of the training program is appropriate for the duties and responsibilities of the assigned position. In addition to the emergency response

positions identified in ESP Plan Section 13.3.2.2.2.o, **[O.5]** Dominion conducts, or supports the conduct of, annual retraining for damage control/repair/corrective action teams and corporate office support personnel. 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.

[O.2] For members of Dominion's onsite personnel who may be called upon to respond to an emergency, the training program includes practical drills (consistent with Section II.N of the COL Plan), 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.

[O.1.a] In COL Plan Subsection II.O.1.a, "Offsite Emergency Response Training," the applicant stated that 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 COL Plan Section II.A. Dominion offers training for affected hospital, ambulance/rescue, police, and firefighting personnel. 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 activities on site. (Training and retraining programs for non-licensed staff that support emergency preparedness are addressed in SER Section 13.2.2, "Non-Licensed Plant Staff Training.")

In FEMA's August 22, 2008, and December 23, 2008, Interim Findings Reports, FEMA found that the offsite emergency plans were adequate in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. NRC staff finds that the applicant has established an adequate training program that includes initial and annual retraining for members of the onsite emergency organization, and offsite emergency organizations, who may be called on to assist in an emergency at the NAPS site. In addition, the training program for members of the onsite emergency organization includes classroom training as well as practical drills and exercises. Each individual demonstrates the ability to perform the assigned emergency function.

Conclusion

NRC staff concludes that the information provided in the COL application is consistent with the guidelines in planning standard O of NUREG-0654/ FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(15) and Sections III, IV.A, and IV.F of Appendix E to 10 CFR Part 50, insofar as the information describes the essential elements of advanced planning and the provisions made to cope with emergency situations.

13.3.4.16 *Responsibility for the Planning Effort – Development, Periodic Review, and Distribution of Emergency Plans (10 CFR 50.47(b)(16); NUREG-0654/ FEMA-REP-1, planning standard P)*

The regulation in 10 CFR 50.47(b)(16), as reflected in the planning standard P, requires that responsibilities for plan development and review and for distribution of emergency plans be established and that planners be properly trained.

In COL Plan Section II.P, "Responsibility for the Planning Effort," the applicant described the responsibilities and authorities associated with developing and maintaining emergency preparedness for the NAPS site, including training and conducting independent reviews of the emergency preparedness program. NRC staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was to evaluate the emergency plan compared to NUREG-0654/FEMA-REP-1, planning standard P, "Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans." Planning standard P provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(16).

[P.1, P.2, P.3, P.4, P.5, P.8] In COL Plan Section II.P, the applicant incorporated by reference Section 13.3.2.2.2.p of the ESP Plan in regard to the description of plans for maintaining emergency preparedness. In Section 13.3.3.15 of NUREG-1835, the staff found this information acceptable. The applicant provided additional information in COL Plan Section II.P, which states that Dominion implements an organizational structure and processes to periodically review, update, distribute, and control the COL 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 that is appropriate to assigned duties and responsibilities.

[P.3, P.4, P.10] In COL Plan Section II.P, the applicant stated that Dominion establishes an Emergency Planning Coordinator position. The incumbent is responsible for developing and updating site emergency plans (including a quarterly review of the emergency personnel notification list), coordinating these plans with other response organizations, and conducting or coordinating an annual review of the COL Plan to verify that it is current (including supporting agreements). The review includes the consideration of any changes that may be necessary to address issues identified during the course of drills, exercises, and actual emergency events. The changed plan pages are marked and dated to highlight the change. Documentation of the reviews is filed by the facility's records management organization.

[P.9] Dominion's independent assessment organization performs or oversees the performance of periodic independent reviews of the emergency preparedness program. The reviews are consistent with the requirements of 10 CFR 50.54(t) and include, at a minimum, the following:

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

Dominion's independent assessment organization documents review results and improvement recommendations and reports these results to Dominion management—consistent with the corrective action program. 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 the review records for a period of at least 5 years (in accordance with facility document control requirements).

[P.1] 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.

The staff finds that the applicant has adequately identified those individuals (by title) who have the authority and responsibility for radiological emergency response planning, as well as for developing and updating the emergency plans and coordinating with other response organizations. In addition, the staff finds that the training and qualifications of the personnel responsible for radiological emergency planning in support of the NAPS site are adequate.

[P.6] In COL Plan Section II.P.6, "Supporting Plans," the applicant listed the supporting plans and their sources, which consist of the Commonwealth of Virginia Plan (Virginia Emergency Operations Plan, Radiological Emergency Response Basis Plan); RERPs for the Counties of Louisa, Spotsylvania, Orange, Caroline, and Hanover; and the U.S. Department of Energy's Federal Radiological Monitoring and Assessment Center Operations Plan.

[P.8] The format for the COL Plan is outlined in the Table of Contents, and a cross-reference of the plan to the evaluation criteria in NUREG-0654/FEMA-REP-1 is provided in Appendix 8.
[P.7] In COL Plan Appendix 5, the applicant provided a topical list of EPIPs that addressed a range of actions needed to implement the contents of the COL Plan, including the section(s) of the COL Plan to be implemented by each procedure. The staff finds this list acceptable, because it is consistent with the applicable evaluation criteria in NUREG-0654/FEMA-REP-1.

In FEMA's December 23, 2008, Interim Findings Report, FEMA found that the offsite emergency plans were "adequate – corrections must be made," in regard to this planning standard and the associated evaluation criteria in NUREG-0654/FEMA-REP-1. FEMA identified this as an open item in the report.

Conclusion

As discussed above, the open item identified by FEMA needs to be resolved in order to meet the requirements of 10 CFR 50.47(b)(16). NRC staff will determine whether this planning standard is acceptable and will document the determination in the FSER. The determination will be based on information the applicant has provided to date and the applicant's response to the open item identified by FEMA.

13.3.4.17 *Evacuation Time Estimate Analysis—Summary*

Section IV, "Content of Emergency Plans," of Appendix E to 10 CFR Part 50 requires that the nuclear power reactor operating license application provide an analysis of the time required to evacuate and to take other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations. The staff's primary focus was to evaluate the ETE analysis against Appendix 4, "Evacuation Time Estimates within the Plume Exposure Pathway Emergency Planning Zone," to NUREG-0654/FEMA-REP-1. Appendix 4 includes detailed guidance that the staff should consider in determining whether the ETE analysis meets the applicable regulatory requirements in Appendix E to 10 CFR Part 50.

The North Anna 3 COL Application (Part 5) Emergency Plan ("COL Plan") includes an analysis of the time required to evacuate the plume exposure EPZ and to take other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations. The analysis consists of a September 2008 ETE report (KLD TR-420) (Revision 1) entitled, "North Anna Power Station—Development of Evacuation Time Estimates," which was prepared by KLD Associates, Inc. The ETE report describes the analyses undertaken and the results obtained by a study to develop evacuation time estimates (ETE) for the NAPS. The following list identifies ETE report sections and associated content:

- Section 1 – Introduction (basic description of the process used to estimate the ETE)
- Section 2 – Study Estimates and Assumptions (population estimates and address points)
- Section 3 – Demand Estimation (estimated number of people who would need to be evacuated)
- Section 4 – Estimation of Highway Capacity (Reference: Highway Capacity Manual)
- Section 5 – Estimation of Trip Generation Time (elapsed times for mobilization activities)
- Section 6 – Demand Estimation for Evacuation Scenarios
- Section 7 – General Population Evacuation Time Estimates (ETE)
- Section 8 – Transit-Dependent and Special Facility Evacuation Time Estimates
- Section 9 – Traffic Management Strategy (designed to expedite traffic movement)
- Section 10 – Evacuation Routes (for the 5 counties surrounding the NAPS)
- Section 11 – Surveillance of Evacuation Operations (traffic control points, personnel, etc.)
- Section 12 – Confirmation Time (stratified random sample and a telephone survey)
- Section 13 – Recommendations (includes ETE report conclusions)

Evacuation time estimates are part of the required emergency planning basis. These estimates provide the licensee and State and local governments with site-specific information needed for protective action decisionmaking. The ETE is a separate report that is provided as supplemental information to the emergency plan. An executive summary from the full ETE report is provided in the COL Plan as Appendix 4. The applicant coordinated the development of the ETE report with emergency planners—who are involved in emergency response for the NAPS site—from the Commonwealth of Virginia and the Counties of Louisa, Spotsylvania, Orange, Hanover, and Caroline.

The ETE report was reviewed by NRC staff and by contractor staff at the PNNL and SNL. The reviewers checked the ETE for internal consistency, consistency with other parts of the emergency plan, and consistency with other parts of the COL application, including the FSAR. Citations in the ETE were verified by comparison to the cited document text. General descriptions of the NAPS region, population, and highways were verified using Internet searches and aerial photographs. Laboratory staff also drove the designated evacuation routes.

On July 7, 2008, NRC staff sent ETE-related RAIs to the applicant (RAI Letter No. 15, ADAMS Accession ML081890212), and on October 2, 2008, the applicant responded to the RAIs (ADAMS Accession ML090280239). PNNL reviewed the applicant's responses and provided the NRC with a Technical Evaluation Report on February 11, 2009 (ADAMS Accession ML090510061). PNNL found that the applicant's responses to all of the ETE-related RAIs (i.e., **RAIs ETE-1 through ETE-45**) were acceptable and therefore resolved the issues identified in the RAIs. PNNL concluded that the information provided in the September 2008 ETE report (Revision 1) is consistent with the applicable NRC requirements and guidance and is therefore acceptable.

Conclusion

NRC staff concludes that the information provided in the COL application is consistent with the guidelines in planning standard J and Appendix 4 of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(10) and Section IV of Appendix E to 10 CFR Part 50, insofar as the information describes the essential elements of advanced planning and the provisions made to cope with emergency situations.

13.3.5 Post-Combined License Activities

Activities that the COL Holder (i.e., licensee) shall perform after the COL is issued, which are applicable to emergency planning, consist of the implementation milestones and license conditions listed below, and the ITAAC that are conditions to the COL. The COL ITAAC that are applicable to emergency planning for North Anna Unit 3 are in Table 2.3-1 of COL application Part 10. Pursuant to 10 CFR 52.97(b), these include the inspections, tests, and analyses that the [COL] licensee shall perform and the acceptance criteria that, if met, are necessary and sufficient to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the provisions of the *Atomic Energy Act*, and the Commission's rules and regulations.

The following are applicable Operational Program No. 14 ("Emergency Planning") implementation milestones and license conditions. Operational Program No. 14 is also addressed in SER Section 13.4, "Operational Programs Implementation," and the development and implementation of operating procedures are addressed in SER Section 13.5.2, "Operating and Maintenance Procedures."

Implementation Milestones

- A full participation exercise conducted within 2 years of the scheduled date for initial loading of fuel, as required by Section IV.F.2(a)(ii) of Appendix E to 10 CFR Part 50.

- Onsite exercise conducted within 1 year before the scheduled date for initial loading of fuel, as required by Section IV.F.2(a)(ii) of Appendix E to 10 CFR Part 50.

- Licensee's detailed implementing procedures for the [onsite] emergency plan submitted at least 180 days before the scheduled date for initial loading of fuel, as required by Section V of Appendix E to 10 CFR Part 50. [STD SUP 13.5-28]

(See also STD COL 13.4-2-A [Part 2 FSAR Table 13.4-201, "Operational Programs Required by NRC Regulations," Item 14, "Emergency Planning"] and STD SUP 13.5-28.)

13.3.6 Conclusion

NRC staff reviewed the complete and integrated emergency plans provided in the NAPS COL application for the proposed North Anna Unit 3. The staff reviewed the onsite emergency plan against the relevant requirements of 10 CFR 50.33(g), 10 CFR 50.34(b)(6)(v), 10 CFR 50.34(f)(2), 10 CFR 50.47, Appendix E to 10 CFR Part 50, 10 CFR 52.77, 10 CFR 52.79(a)(21), 10 CFR 52.79(a)(22)(i), 10 CFR 52.80, 10 CFR 52.81, and 10 CFR 100.21(g), using the guidance criteria in SRP Section 13.3 (NUREG-0800), NUREG-0654/FEMA- REP-1 (Revision 1), NUREG-0696, and Supplement 1 to NUREG-0737.

Pursuant to 10 CFR 52.80, COL applications must contain a description of the proposed inspections, tests, and analyses applicable to emergency planning that the licensee shall perform, and the acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, the facility has been constructed and will be operated in conformity with the COL, the Atomic Energy Act, and the NRC's rules and regulations. The applicant included a list of proposed ITAAC in Part 10, Table 2.3-1 of the COL application for North Anna Unit 3. The staff reviewed Table 2.3-1 and finds that the ITAAC are subject to revisions associated with the Open Items identified above.

FEMA's findings and determinations concerning the adequacy of offsite emergency planning and preparedness are based on reviewing State and local emergency plans. FEMA identified 37 open items associated with various NUREG-0654/FEMA-REP-1 planning standard evaluation criteria in its Interim Findings Report.

As part of the findings, FEMA conditioned its final conclusion of adequacy of the offsite emergency plans on (1) the correction of various NUREG-0654/FEMA-REP-1 planning standard evaluation criteria; (2) an adequate demonstration of the ITAAC relating to the offsite exercise objective; and (3) the satisfactory demonstration of plan implementation during a joint exercise with the licensee and State and local governments, as described in 44 CFR 350.9, "Exercises."

As a result of the open items identified above and the resolution of FEMA's conditional findings of adequacy of the offsite plans, the staff is unable to finalize its conclusions regarding the adequacy of the emergency plans for North Anna Unit 3 in accordance with the applicable requirements. After NRC staff completes the review of the applicant's resolution of open items,and FEMA resolves the open items and conditions associated with its findings, the staff's evaluation regarding the adequacy of the overall state of emergency preparedness for the North Anna site—in support of Unit 3—will be presented in a supplement to this report.

13.4 Operational Program Implementation

13.4.1 Introduction

In this section, the applicant identifies the operational programs required by NRC regulations and provides a description and the proposed implementation milestones for each program.

13.4.2 Summary of Application

Section 13.4 of the North Anna 3 COL FSAR incorporates by reference Section 13.4 of the ESBWR DCD Revision 5.

In addition, in FSAR Section 13.4, the applicant provided the following:

COL Items

- STD COL 13.4-1-A Operational Programs
- STD COL 13.4-2-A Implementation Milestones

The applicant provided the information applicable to both COL items in FSAR Table 13.4-201, which lists each operational program, the regulatory requirement for the program, the associated implementation milestone(s), and the section of the FSAR in which the operational program is fully described consistent with the guidance in RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR edition)."

13.4.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed in the FSER related to the ESBWR DCD.

In addition, in the Staff Requirements Memorandum on SECY-05-0197, the Commission provided the directions regarding operational programs:

1. Include license conditions for operational programs in the COL, where implementation requirements are not specified in the regulations.

2. Identify the list of operational programs required to be included in a COL application.

3. Use the proposed generic emergency planning/emergency preparedness (EP) Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) as a model for EP ITAAC to be included in COL applications.

SRP Section 13.4, "Operational Programs," provides guidance for staff review. For a COL application, the staff reviews the applicable table in FSAR Section 13.4 to ensure that all required operational programs are included. The staff's review of the operational program description and the proposed implementation milestones is performed within the identified SRP section reviews.

13.4.4 Technical Evaluation

The NRC staff reviewed Section 13.4 of the North Anna 3 COL FSAR and checked the referenced DCD to ensure that the combination of the DCD and the information in the COL represent the complete scope of information relating to this review topic.[1] The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the relevant information related to Operational Program Implementation.

Section 13.4 of the DCD is being reviewed by the staff under Docket Number 52-010. The NRC staff's technical evaluation of the information incorporated by reference related to Operational

[1] See Section 1.2.2, "Finality of Referenced NRC Approvals," for a discussion on the staff's review related to verification of the scope of information to be included within a COL application that references a design certification.

Program Implementation will be documented in the staff safety evaluation report on the design certification application for the ESBWR.

The staff reviewed the information in COL FSAR as follows:

The staff reviewed the COL information items included under Section 13.4 of the North Anna 3 COL. In this review, the staff used Section 13.4 of the SRP and RG 1.206 as guidance.

COL Items

- STD COL 13.4-1-A Operational Programs
- STD COL 13.4-2-A Implementation Milestones

NRC staff reviewed FSAR Table 13.4-201 and determined that the applicant had identified the operational programs required by NRC regulations and had provided a description of the proposed implementation milestones for each program. The technical evaluation of the operational programs to ensure that the applicant has fully described the programs and their associated implementation milestones is provided in the respective section of this SER.

13.4.5 Post Combined License Activities

In FSAR Table 13.4-201, the applicant identified the implementation milestones for each operational program. These implementation milestones specify activities to be completed following issuance of the COL. Implementation of each operational program will be evaluated by the staff according to the respective implementation milestone.

13.4.6 Conclusion

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the relevant information relating to Operational Program Implementation and there is no outstanding information expected to be addressed in the COL FSAR related to this subsection.

The staff is reviewing the information in the DCD Section 13.4 on Docket No. 52-010. The results of the NRC's staff's technical evaluation of the information related to Operation Program Implementation incorporated by reference in the North Anna 3 COL FSAR will be documented in the staff safety evaluation report on the DC application for the ESBWR. The SER on the ESBWR is not yet complete and this is being tracked as part of Open Item [1-1]. The staff will update Section 13.4 of this SER to reflect the final disposition of the design certification application.

In addition, the staff has compared the additional COL information to the relevant NRC regulations; acceptance criteria defined in NUREG-0800, Section 13.4; and other NRC RGs and concluded that the applicant is in compliance with the NRC regulations. COL Information Items STD COL 13.4-1-A and 2-A are adequately addressed by the applicant in FSAR Table 13.4-201 and can be considered closed.

13.5 PLANT PROCEDURES

This Section addresses the administrative and operating procedures that the operating organization (plant staff) uses to ensure that routine operating, off-normal, and emergency activities are conducted in a safe manner. This section is divided into two subsections—Administrative Procedures and Operating and Emergency Operating Procedures—which are described below. Inspection of procedures will occur as part of the construction inspection program.

13.5.1 Administrative Procedures

13.5.1.1 *Introduction*

The administrative procedures the applicant uses to ensure routine operating, off-normal, and emergency activities are conducted in a safe manner are provided. In plant procedures, the applicant provided a brief description of the nature and content of the procedures and a schedule for the preparation of appropriate written administrative and operating procedures. The applicant delineated in the description of the procedures the functional position for procedural revisions and approval before implementation.

13.5.1.2 *Summary of Application*

Section 13.5.1 of the North Anna 3 COL FSAR incorporated by reference Section 13.5.1 of the ESBWR DCD, Revision 5.

In addition, in FSAR Section 13.5.1, the applicant provided the following:

COL Item

- STD COL 13.5-1-A Administrative Procedures to Provide a Nominal Schedule

Administrative Procedures are developed in accordance with the nominal schedule presented in Table 13.5-202.

Supplemental Information

- STD SUP 13.5-09 Administrative Procedures for Activities that Are Important to Safety
- STD SUP 13.5-10 Administrative Procedures Described in ASME NQA-1
- STD SUP 13.5-11 Procedure Control as Discussed in the QAPD
- STD SUP 13.5-12 Procedure Style (Writer) Guide
- STD SUP 13.5-13 Procedures for Maintenance and Control of Procedural Updates
- STD SUP 13.5-14 Pre-COL Administrative Programs and Procedures

- STD SUP 13.5-15 Administrative Procedures for Control of Operation Activities

- STD SUP 13.5-16 Plant Administrative Procedures

13.5.1.3 *Regulatory Basis*

The regulatory basis of the information that is incorporated by reference is addressed in the FSER related to the DCD.

The regulatory basis for acceptance of the applicant COL, Section 13.5.1 is established in 10 CFR 50.17 ("Contents of Applications; Technical Information"), 10 CFR Part 52 ("Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants"); Appendix B of 10 CFR Part 50; and the guidance of RGs 1.8 1.33 1.70, and 1.206; STD COL Information Item 13.5-1-A is satisfied based on NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," Section 13.5.1.1, "Administrative Procedures—General."

13.5.1.4 *Technical Evaluation*

The NRC staff reviewed Section 13.5.1 of the North Anna 3 COL FSAR and checked the referenced DCD to ensure that the combination of the DCD and the information in the COL represent the complete scope of information relating to this review topic.[1] The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the relevant information related to Administrative Procedures.

Section 13.5.1 of the DCD is being reviewed by the staff under Docket Number 52-010. The NRC staff's technical evaluation of the information incorporated by reference related to Administrative Procedures will be documented in the staff safety evaluation report on the design certification application for the ESBWR.

The staff reviewed the information in COL FSAR as follows:

The staff reviewed the resolution to the following COL and supplemental information items included under Section 13.5.1 of the North Anna 3 COL FSAR. In this review, the staff used the applicable sections of the SRP (NUREG-0800) and RG 1.206 as guidance.

The staff reviewed the information contained in the COL FSAR:

COL Item

- STD COL 13.5-1-A Administrative Procedures to Provide a Nominal Schedule

[1] See Section 1.2.2, "Finality of Referenced NRC Approvals," for a discussion on the staff's review related to verification of the scope of information to be included within a COL application that references a design certification.

STD COL Item 13.5-1-A replaces the second paragraph of Section 13.5.1 to supplement the DCD with the following:

> Administrative procedures are developed in accordance with the nominal schedule presented in Table 13.5-202.

DCD Section 13.5.1 stated that the applicant shall develop the Administrative Procedures. In FSAR Section 13.5.1, the applicant stated that the new paragraph of 13.5.1 was added to address the development of the administrative procedures in accordance with the nominal schedule presented in Table 13.5-202. The staff reviewed Section 13.5.1 and Table 13.5-202 and determined that it addressed the development of the administrative procedures within the timeline specified in NUREG-0800, Section 13.5.1.1. The staff concluded that the new paragraph meets the criteria found in NUREG-0800, Section 13.5.1.1.

NUREG-0800, Section 13.5.1.1, states that the applicant must address COL information items. The staff concluded that the applicant had appropriately addressed the COL information item. The staff determined that this information is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.1.1.

Supplemental Information

- STD SUP 13.5-09 Administrative Procedures for Activities that Are Important to Safety

STD SUP 13.5-09 states the following:

> This section describes administrative procedures that provide administrative control over activities that are important to safety for the operation of the facility.

NUREG-0800, Section 13.5.1.1, states that the applicant should describe the procedures that provide for administrative control over safety-related activities for the operation of the facility. In FSAR Section 13.5.1.1, the applicant replaced the first sentence of the paragraph to supplement the DCD with an applicant-specific description of facility administrative controls. The staff concluded that the applicant-provided system administrative procedure descriptions meet the criteria in NUREG-0800, Section 13.5.1.1. The staff determined that this description is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.1.1.

- STD SUP 13.5-10 Administrative Procedures Described in ASME NQA-1

STD SUP 13.5-10 states the following:

> Procedures outline the essential elements of the administrative programs and controls as described in ASME NQA-1 and Section 17.5. These procedures are organized such that the program elements are prescribed in documents normally referred to as administrative procedures.
>
> Administrative procedures contain adequate programmatic controls to provide effective interface between organizational elements. This includes contractor and owner organizations providing support to the station operating organization.

NUREG-0800, Section 13.5.1.1, states that the applicant should describe the procedures that provide for administrative control over safety-related activities for the operation of the facility but not required to include detailed written procedures in the SAR. In FSAR, Section 13.5.1.1, the applicant listed the Category (A) Controls and Category (B) Specific Procedures as described in NUREG-0800, Section 13.5.1.1. The staff determined that this information is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.1.1.

- STD SUP 13.5-11 Procedure Control as Discussed in the QAPD

STD SUP 13.5-11 states the following:

> Procedure control is discussed in the QAPD. Type and content of procedures are discussed throughout Section 13.5.

NUREG-0800, Section 13.5.1.1, states that the applicant should describe the procedures that provide for administrative control over safety-related activities for the operation of the facility but are not required to include detailed written procedures in the SAR. In FSAR Section 13.5.1.1, the applicant listed the Category (A) Controls and Category (B) Specific Procedures as stated in NUREG-0800, Section 13.5.1.1. The STD SUP 13.5-11 refers to the QAPD and to Section 13.5. The staff's review of these sections concluded that the applicant has provided an adequate procedure-control description in the SAR that meets the criteria in NUREG-0800, Section 13.5.1.1. The staff determined that this description is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.1.1.

- STD SUP 13.5-12 Procedure Style (Writer) Guide

STD SUP 13.5-12 states the following:

> A procedure style (writer's) guide promotes the standardization and application of HFE principles to procedures. The writer's guide establishes the process for developing procedures that are complete, accurate, consistent, and easy to understand and follow. The guide provides objective criteria so that procedures are consistent in organization, style, and content. The writer's guide includes criteria for procedure content and format including the writing of action steps and the specification of acceptable acronym lists and acceptable terms to be used.

NUREG-0800, Section 13.5.1.1, Category (A) Controls, states that the applicant should describe the procedure review and approval process; inherent to this is the use of a procedure writer's guide. In FSAR Section 13.5.1.1, the applicant added a new paragraph (STD SUP 13.5-12) that described the writer's guide to promote the standardization of procedures, including human factors applications and consistent organization, style, and content. The staff concluded that the applicant has provided general operating procedure descriptions that meet the criteria in NUREG-0800, Section 13.5.2.1. The staff determined that this description is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-1 Procedures for Maintenance and Control of Procedural Updates

STD SUP 13.5-13 states the following:

> Procedure maintenance and control of procedure updates are performed in accordance with the QAPD.

NUREG-0800, Section 13.5.1.1, states that the applicant should describe the procedures that provide for administrative control over safety-related activities for the operation of the facility but are not required to include detailed written procedures in the SAR. In FSAR Section 13.5.1.1, the applicant listed the Category (A) Controls and Category (B) Specific Procedures, as stated in NUREG-0800, Section 13.5.1.1. In STD SUP 13.5-13, the applicant stated that control of procedure maintenance and control of procedure updates are performed in accordance with the QAPD. The staff determined that this information is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.1.1.

- STD SUP 13.5-14 Pre-COL Administrative Programs and Procedures

STD SUP 13.5-14 states the following:

> The administrative programs and associated procedures developed in the pre-COL phase are described in Table 13.5-201 (for future designation as historical information).

NUREG-0800, Section 13.5.1.1, states that the applicant should describe the procedures that provide for administrative control over safety-related activities for the operation of the facility but are not required to include detailed written procedures in the SAR. In FSAR Section 13.5.1.1, the applicant listed the Category (A) Controls and Category (B) Specific Procedures, as stated in NUREG-0800, Section 13.5.1.1. The STD SUP 13.5-14 refers to Section 13.5, Table 13.5-201. The staff review of these sections concluded that the applicant has provided an adequate procedure control description in the SAR that meets the criteria found in NUREG-0800, Section 13.5.1.1. The staff determined that this information is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.1.1.

- STD SUP 13.5-15 Administrative Procedures for Control of Operation Activities

STD SUP 13.5-15 states the following:

> Section 13.5.1.1, “Administrative Procedures-General,” describes those procedures that provide administrative controls with respect to procedures, including those that define and provide controls for operational activities of the plant staff.

NUREG-0800, Section 13.5.1.1, states that the applicant should describe the procedures that provide for administrative control over safety-related activities for the operation of the facility but are not required to include detailed written procedures in the SAR. In FSAR Section 13.5.1.1, the applicant listed the Category (A) Controls and Category (B) Specific Procedures, as stated in NUREG-0800, Section 13.5.1.1. The staff’s review of these listed procedures, regulatory requirements, and proposed completion times per Table 13.5-202 and concluded that the applicant has provided an adequate procedure control description in the SAR that meets the criteria in NUREG-0800, Section 13.5.1.1. The staff determined that this description is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.1.1.

- STD SUP 13.5-16 Plant Administrative Procedures

STD SUP 13.5-16 states the following:

Plant administrative procedures provide procedural instructions for the following:

- Procedures review and approval
- Procedure adherence
- Scheduling for surveillance tests and calibration
- Log entries
- Record retention
- Containment access
- Bypass of safety function and jumper control
- Communication systems
- Equipment control procedures—These procedures provide for control of equipment, as necessary, to maintain personnel and reactor safety, and to avoid unauthorized operation of equipment
- Control of maintenance and modifications
- Fire Protection Program procedures
- Crane Operation Procedures—Crane operators who operate cranes over fuel pools are qualified and conduct themselves in accordance with ANSI B30.2 (Chapter 2-3), “Overhead and Gantry Cranes” (Reference 13.5-201)
- Temporary changes to procedures
- Temporary procedure issuance and control
- Special orders of a temporary or self-canceling nature
- Standing orders to shift personnel including the authority and responsibility of the shift manager, senior reactor operator in the control room, control room operator, and shift technical advisor
- Manipulation of controls and assignment of shift personnel to duty stations per the requirements of 10 CFR 50.54 (i), (j), (k), (l), and (m), including delineation of the space designated for the “At the Controls” area of the Control Room
- Shift relief and turnover procedures

- Fitness for duty
- Control Room access
- Working hour limitations
- Feedback of design, construction, and applicable important industry and operating experience
- Shift Manager administrative duties
- Verification of correct performance of operational activities
- A vendor interface program that provides vendor information for safety-related components is incorporated into plant documentation

NUREG-0800, Section 13.5.1.1, states that the applicant should describe the procedures that provide for administrative control over safety-related activities for the operation of the facility but are not required to include detailed written procedures in the SAR. In FSAR Section 13.5.1.1, the applicant listed the Category (A) Controls and Category (B) Specific Procedures, as stated in NUREG-0800, Section 13.5.1.1. The staff's review of these listed procedures, regulatory requirements, and proposed completion times per Table 13.5-202 concluded that the applicant has provided adequate procedure control description in the SAR that meets the criteria in NUREG-0800, Section 13.5.1.1. The staff determined that this description is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.1.1.

13.5.1.5 *Post Combined License Activities*

There are no post COL activities related to this section.

13.5.1.6 *Conclusion*

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the relevant information relating to Administrative Procedures and there is no outstanding information expected to be addressed in the COL FSAR related to this subsection.

The staff is reviewing the information in the DCD Section 13.5.1 on Docket No. 52-010. The results of the NRC's staff's technical evaluation of the information related to Administrative Procedures incorporated by reference in the North Anna 3 COL FSAR will be documented in the staff safety evaluation report on the DC application for the ESBWR. The SER on the ESBWR is not yet complete and this is being tracked as part of Open Item [1-1]. The staff will update Section 13.5.1 of this SER to reflect the final disposition of the design certification application.

In addition, the staff has compared the additional COL and supplemental information in the application for this section to the relevant NRC regulations, acceptance criteria defined in NUREG-0800, Section 13.5.1; and other NRC RGs and concluded that the applicant is in compliance with the NRC regulations. COL Information Item STD COL 13.5-1-A and supplemental information items STD SUP 13.5-9 through 13.5-16 relating to administrative procedures are adequately addressed by the applicant and can be considered closed.

13.5.2 Operating and Maintenance Procedures

13.5.2.1 *Introduction*

The administrative and operating procedures that the plant staff uses to ensure that routine operating, off-normal, and emergency activities are conducted in a safe manner are provided. The plant procedures provide a brief description of the nature and content of the procedures and a schedule for the preparation of appropriate written administrative procedures. It delineates in the description of administrative procedures the functional position for procedural revision and approval prior to implementation.

13.5.2.2 *Summary of Application*

Section 13.5.2 of the North Anna 3 COL FSAR, incorporates by reference Section 13.5.2 of the ESBWR DCD, Revision 5.

In addition, in FSAR Section 13.2, the applicant provided the following:

COL Items

- STD COL 13.5-2-A Plant Operating Procedures Development Plan

Operating Procedures are developed in accordance with Section 13.5.2.1 and Maintenance Procedures are developed in accordance with Section 13.5.2.2.6.1.

- STD COL 13.5-3-A Emergency Procedures Development

Emergency Procedures are developed in accordance with Section 13.5.2.1.4.

- STD COL 13.5-4-A Implementation of the Plant Procedures Plan

A Plant Operations Procedures Development Plan is established in accordance with Section 13.5.2.1.

- STD COL 13.5-5-A Procedures Included in Scope of Plan

The scope of procedures in the Plant Operating Procedures Development Plan is addressed in Section 13.5.2.1.

- STD COL 13.5-6-H Procedures for Calibration, Inspection, and Testing

Surveillance procedures that cover safety-related logic circuitry are addressed in Section 13.5.2.2.6.3.

Supplemental Information

- STD SUP 13.5-17 Operating and Maintenance Procedures
- STD SUP 13.5-18 Classifications of Operating Procedures
- STD SUP 13.5-19 System Operating Procedures

- STD SUP 13.5-20 General Operating Procedures
- STD SUP 13.5-21 Abnormal Operating Procedures
- STD SUP 13.5-22 Emergency Operating Procedures
- STD SUP 13.5-23 Alarm Response Procedures
- STD SUP 13.5-24 Temporary Procedures
- STD SUP 13.5-25 Fuel Handling Procedures
- STD SUP 13.5-26, Maintenance and Other Operating Procedures
- STD SUP 13.5-27 Plant Radiation Protection Procedures
- STD SUP 13.5-28 Emergency Preparedness Procedures
- STD SUP 13.5-29 Instrument Calibration and Test Procedures
- STD SUP 13.5-30 Chemistry Procedures
- STD SUP 13.5-31 Radioactive Waste Management Procedures
- STD SUP 13.5-32 Maintenance, Inspection, Surveillance, and Modification Procedures
- STD SUP 13.5-33 Inspection Procedures
- STD SUP 13.5-34 Modification Procedures
- STD SUP 13.5-35 Heavy Load Handling Procedures
- STD SUP 13.5-36 Material Control Procedures
- STD SUP 13.5-37 Security Procedures
- STD SUP 13.5-38 Refueling and Outage Planning Procedures

13.5.2.3 *Regulatory Basis*

The regulatory basis of the information that is incorporated by reference is addressed in the FSER related to the DCD.

The regulatory basis for acceptance of the applicant COL Section 13.5.2 is established in 10 CFR 50.17, “Contents of Applications; Technical Information;” 10 CFR Part 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants;” Appendix B of 10 CFR 50; and the guidance of RGs 1.8, 1.33, 1.70, and 1.206. STD COL and supplemental information items are satisfied based on NUREG-0800, Chapter 13.5.2.1, “Operating and Emergency Operating Procedures.”

13.5.2.4 *Technical Evaluation*

The NRC staff reviewed Section 13.5.2 of the North Anna 3 COL FSAR and checked the referenced DCD to ensure that the combination of the DCD and the information in the COL represent the complete scope of information relating to this review topic.[1] The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the relevant information related to Operating and Maintenance Procedures.

Section 13.5.2 of the DCD is being reviewed by the staff under Docket Number 52-010. The NRC staff's technical evaluation of the information incorporated by reference related to Operating and Maintenance Procedures will be documented in the staff safety evaluation report on the design certification application for the ESBWR.

The staff reviewed the information in COL FSAR as follows:

NRC staff reviewed Section 13.5.2 of the North Anna 3 COL FSAR and considered the referenced DCD. The staff's review confirmed that the information contained in the application and incorporated by reference addresses the relevant information related to operating and maintenance procedures. The staff is reviewing Section 13.5.2 of the ESBWR DCD on Docket No. 52-010. The staff's technical evaluation of the information incorporated by reference and related to the operating and maintenance procedures will be documented in the corresponding SER.

In addition, the staff reviewed the resolution to the following COL and supplemental information items included under Section 13.5.2 of the North Anna COL. In this review, the staff used the applicable sections of the SRP (NUREG-0800) and RG 1.206 as guidance.

The staff reviewed the information contained in the COL FSAR:

COL Items

- STD COL 13.5-2-A Plant Operating Procedures Development Plan

STD COL Item 13.5-2-A replaces the third paragraph of Section 13.5.2 to supplement the DCD with the following:

> Operating Procedures are developed in accordance with Section 13.5.2.1 and Maintenance Procedures are developed in accordance with Section 13.5.2.2.6.1.

DCD Section 13.5.2 stated that the applicant will develop operating and maintenance procedures. In FSAR Section 13.5.2, the applicant stated that new paragraph 13.5.2.1 was added to address the development of operating procedures, and that new paragraph 13.5.2.2.6.1 was added to address the development of maintenance procedures. The staff reviewed paragraph 13.5.2.2.6.1 and determined that it addressed the development of operating procedures, which are to be developed at least six months before fuel load. The staff reviewed paragraph 13.5.2.1 and determined that it addressed the development of maintenance

[1] See Section 1.2.2, "Finality of Referenced NRC Approvals," for a discussion on the staff's review related to verification of the scope of information to be included within a COL application that references a design certification.

procedures. The staff concluded that these new paragraphs meet the criteria in NUREG-0800, Section 13.5.2.1.

NUREG-0800, Section 13.5.2.1, states that the applicant must address COL information items. The staff concluded that the applicant had appropriately addressed the COL information item. The staff determined that this information is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD COL 13.5-3-A Emergency Procedures Development

STD COL item 13.5-3-A replaces the last sentence of Section 13.5.2 to supplement the DCD with the following:

> Emergency Procedures are developed in accordance with Section 13.5.2.1.4.

DCD Section 13.5.2 stated that the applicant will develop emergency procedures. In FSAR Section 13.5.2, the applicant stated that new paragraph 13.5.2.1.4 was added to address the development of emergency procedures. The staff reviewed paragraph 13.5.2.1.4 and determined that it addressed the development of emergency procedures.

NUREG-0800, Section 13.5.2.1, states that the procedures generation package (PGP) should include a description of the process used to develop plant-specific technical guidelines (P-STGs) from the generic technical guidelines (GTGs), the identification of significant deviations from the generic guidelines, and a description of the process used for identifying operator information and control requirements; a plant-specific writer's guide; a description of the program for verification and validation (V&V) of EOPs; and a description of the program for training operators on EOPs. In FSAR Section 13.5.2.1.4, the applicant stated that the PGP would include the identification of significant deviations from the generic guidelines, and a description of the process used for identifying operator information and control requirements; a generic writer's guide; a description of the program for V&V of EOPs; and a description of the program for training operators on EOPs. The PGP did not include a description of the process used to develop P-STGs from the GTGs or a plant-specific writer's guide. The staff concluded that the applicant-provided added paragraph did not meet the criteria in NUREG-0800, Section 13.5.2.1. The staff issued RAI 13.05.02.01-3 and 13.05.02.01-4 requesting Dominion to address the missing P-STG development process description and plant-specific writer's guide. The applicant has responded to RAI 13.05.02.01, 13.05.02.01-3, and 13.05.02.01-4. The staff determined that these responses are acceptable and are incorporated into Revision 1 of the RCOL.

NUREG-0800, Section 13.5.2.1, states that the applicant should address COL information items. The staff could not conclude whether the applicant had appropriately addressed the COL information item. The staff issued RAI 13.05.02.01-2, requesting Dominion to identify the group within the operating organization that was responsible for maintaining the operating procedures. RAI 13.05.02.01-3, asked Dominion to provide a description of the process that is planned to be used to develop P-STGs from the GTGs. RAI 13.05.02.01-4 asked Dominion to provide a plant-specific writers' guide (P-SWG) that details the specific methods that are planned to be used by Dominion in preparation of EOPs. In a letter dated September 11, 2008, Dominion addressed these RAIs. To address RAI 13.05.02.01-2), Dominion stated that the Supervisor of Operations Support is responsible for the maintenance of the operating procedures. To address RAI 13.05.02.01-3, Dominion stated that the PGP will be revised to include a description of the process to develop P-STGs from the generic guidelines. To address RAI 13.05.02.01-4,

Dominion stated that the PGP will include a P-SWG that details the specific methods to be used in preparing the EOPs that are based on P-STGs. The staff determined that these responses are acceptable, because they meet the guidance of NUREG-0800, Chapter 13.2.1. The applicant has responded to RAI 13.05.02.01, 13.05.02.01-2, 13.05.01-3, and 13.05.01-4. The responses are acceptable and are incorporated into Revision 1 of the RCOL.

- STD COL 13.5-4-A Implementation of the Plant Procedures Plan

STD COL item 13.5-4-A replaces the fifth paragraph to supplement the DCD with the following:

> A Plant Operations Procedures Development Plan is established in accordance with Section 13.5.2.1.

DCD, Section 13.5.2, stated that the applicant will develop a plant operating procedures development plan (PDP). In FSAR Section 13.5.2, the applicant stated that new paragraph 13.5.2.1 was added to address the establishment of a PDP. The staff reviewed paragraph 13.5.2.1 and determined that it addressed the establishment of a PDP.

NUREG-0800, Section 13.5.2.1, states that the applicant must address COL information items. The staff concluded that the applicant had appropriately addressed the COL information item. The staff determined that this addition is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD COL 13.5-5-A Procedures Included in Scope of Plan

STD COL Item 13.5-5-A replaces the second paragraph to supplement the DCD with the following:

> The scope of procedures in the Plant Operating Procedures Development Plan is addressed in Section 13.5.2.1.

DCD Section 13.5.2 stated that the applicant will include procedures for handling heavy loads in the scope of the PDP. In FSAR Section 13.5.2, the applicant stated that new paragraph 13.5.2.1 was added to address the scope of the PDP. The staff reviewed paragraph 13.5.2.1 and determined that it included procedures for handling of heavy loads within the scope of the PDP.

NUREG-0800, Section 13.5.2.1, states that the applicant must address COL information items. The staff concluded that the applicant had appropriately addressed the COL information item. The staff determined that this information is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD COL 13.5-6-H Procedures for Calibration, Inspection, and Testing

STD COL Item 13.5-6-H replaces the second sentence of “Procedures for Calibration, Inspection and Testing” to supplement the DCD with the following:

> Surveillance procedures that cover safety-related logic circuitry are addressed in Section 13.5.2.2.6.3.

DCD Section 13.5.2 stated that the applicant will ensure that all safety-related logic circuitry is covered within surveillance procedures, as described in GL 96-01, "Testing of Safety Related Logic Circuits." In FSAR Section 13.5.2, the applicant stated that new paragraph 13.5.2.2.6.3 was added to address that surveillance procedures cover safety-related logic circuitry. The staff reviewed paragraph 13.5.2.2.6.3 and determined that it required surveillance testing procedures to be written in a manner that adequately tested all portions of safety-related logic circuitry as described in Generic Letter 96-01.

NUREG-0800, Section 13.5.2.1, states that the applicant must address COL information items. The staff concluded that the applicant had appropriately addressed the COL information item. The staff determined that this information is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

Supplemental Information

- STD SUP 13.5-17 Operating and Maintenance Procedures

STD SUP 13.5-17 states the following:

> In FSAR Section 13.5.2, "Operating and Maintenance Procedures," the applicant incorporates the 5 information items that add new paragraphs or portions of paragraphs to the information to supplement the DCD. The staff will address the acceptability of this supplemental item below, under each information item.

- STD SUP 13.5-18 Classifications of Operating Procedures

STD SUP 13.5-18 states the following:

> The classifications of operating procedures are System Operating Procedures, General Operating Procedures, Abnormal (Off-Normal) Operating Procedures, Emergency Operating Procedures, and Alarm Response Procedures.

NUREG-0800, Section 13.5.2.1, states that the applicant should identify the different classifications of procedures (e.g., system procedures, general plant procedures, abnormal procedures, emergency operating procedures, and alarm procedures) that the operators will use in the control room and locally in the plant for plant operations. In FSAR Section 13.5.2, the applicant stated that the classifications of operating procedures are system operating procedures, general operating procedures, abnormal (off-normal) operating procedures, emergency operating procedures, and alarm response procedures. The staff concluded that the applicant-provided procedure classification information meets the criteria in NUREG-0800, Section 13.5.2.1. The staff determined that this information is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-19 System Operating Procedures

STD SUP 13.5-19 states the following:

> Section 13.5.2.1.1, "System Operating Procedures," provides instructions for energizing, filling, venting, draining, starting up, shutting down, changing modes of operation, returning to service following testing or maintenance (if not contained in the applicable procedure), and other instructions appropriate for

operation of systems are delineated in system procedures. System procedures contain check-off lists, where appropriate, which are prepared in sufficient detail to provide an adequate verification of the status of the system.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures (e.g., system procedures) and the general format and content of the different classifications of procedures. In FSAR Section 13.5.2, the applicant added a new paragraph that described system operating procedures and their general format and content. The staff concluded that the applicant-provided system operating procedure descriptions meet the criteria in NUREG-0800, Section 13.5.2.1. The staff determined that these descriptions are acceptable because they meet the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-20 General Operating Procedures

STD SUP 13.5-20 states the following:

> Section 13.5.2.1.2, "General Operating Procedures," provides instructions for performing integrated plant operations involving multiple systems such as plant startup and shutdown. These procedures provide a coordinated means of integrating procedures together to change the mode of plant operation or achieve a major plant evolution. Check-off lists are used for the purpose of confirming completion of major steps in proper sequence.
>
> Typical types of general operating procedures are described as follows. Startup procedures provide instruction for starting the reactor from cold or hot conditions, establishing power operation, and recovery from reactor trips. Shutdown procedures guide operations during and following controlled shutdown or reactor trips, and include instructions for establishing or maintaining hot standby and safe or cold shutdown conditions, as applicable. Power operation and load changing procedures provide instruction for steady-state power operation and load changing.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures (e.g., general plant procedures) and the general format and content of the different classifications of procedures. In FSAR Section 13.5.2, the applicant added a new paragraph that described general operating procedures and their general format and content. The staff concluded that the applicant-provided general operating procedure descriptions meet the criteria in NUREG-0800, Section 13.5.2.1. The staff determined that this information is acceptable as because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-21 Abnormal Operating Procedures

STD SUP 13.5-21 states the following:

> Section 13.5.2.1.3, "Abnormal (Off-Normal) Operating Procedures," describes that abnormal operating procedures for correcting abnormal conditions are developed for those events where system complexity might lead to operator uncertainty. Abnormal operating procedures describe actions to be taken during other than routine operations, which, if continued, could lead to either material failure, personnel harm, or other unsafe conditions. Abnormal procedures are written so that a trained operator knows in advance the expected course of

events or indications that identify an abnormal situation and the immediate action to be taken.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures (e.g., abnormal procedures) and the general format and content of the different classifications of procedures. In FSAR Section 13.5.2, the applicant added a new paragraph that described abnormal (off-normal) procedures and their general format and content. The staff concluded that the applicant-provided abnormal procedure descriptions meet the criteria in NUREG-0800, Section 13.5.2.1. The staff determined that these descriptions are acceptable because they meet the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-22 Emergency Operating Procedures

STD SUP 13.5-22 states the following:

> Section 13.5.2.1.4, "Emergency Operating Procedures," describes procedures that direct actions necessary for the operators to mitigate the consequences of transients and accidents that cause plant parameters to exceed reactor protection system or ESF actuation setpoints. Emergency operating procedures include appropriate guidance for the operation of plant post-72-hour equipment, and are developed as appropriate per the guidance of NUREG-0737, "Clarification of TMI Action Plan Requirements," Items I.C.1 and I.C.9, and the QAPD.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures (e.g., emergency operating procedures) and the general format and content of the different classifications of procedures. In FSAR Section 13.5.2, the applicant added a new paragraph that described emergency operating procedures and their general format and content. The staff concluded that the applicant-provided emergency operating procedure descriptions meet the criteria in NUREG-0800, Section 13.5.2.1. The staff determined that this description is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-23 Alarm Response Procedures

STD SUP 13.5-23 states the following:

> Section 13.5.2.1.5, "Alarm Response Procedures," describes procedures for annunciators (alarm signals) identifying the proper operator response actions to be taken. Each of these procedures normally contains: a) the meaning of the annunciator or alarm, b) the source of the signal, c) any automatic plant responses, d) any immediate operator action, and e) the long range actions. When corrective actions are very detailed and/or lengthy, the alarm response may refer to another procedure.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures, (e.g., alarm procedures), and the general format and content of the different classifications of procedures. In FSAR, Section 13.5.2, the applicant added a new paragraph that described alarm response procedures and their general format and content. The staff concluded that the applicant-provided alarm response procedure descriptions meet the

criteria in NUREG-0800, Section 13.5.2.1. The staff determined that these descriptions are acceptable because they meet the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-24 Temporary Procedures

STD SUP 13.5-24 states the following:

> Section 13.5.2.1.6, "Temporary Procedures," describes procedures which are issued during the operational phase only when permanent procedures do not exist for the following activities: to direct operations during testing, refueling, maintenance, and modifications; to provide guidance in unusual situations not within the scope of the normal procedures; and to provide orderly and uniform operations for short periods when the plant, a system, or a component of a system is performing in a manner not covered by existing detailed procedures, or has been modified or extended in such a manner that portions of existing procedures do not apply. Temporary operating procedures are developed under established administrative guidelines. They include designation of the period of time during which they may be used and adhere to the QAPD and Technical Specifications, as applicable.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures and the general format and content of the different classifications of procedures. However, temporary procedures are not specifically required to be described. In FSAR Section 13.5.2, the applicant added a new paragraph that described temporary procedures and their general format and content. The staff concluded that the applicant-provided temporary procedure descriptions meet the criteria in NUREG-0800, Section 13.5.2.1. The staff determined that this description is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-25 Fuel Handling Procedures

STD SUP 13.5-25 states the following:

> Section 13.5.2.1.7, "Fuel Handling Procedures," indicates that fuel handling operations, including fuel receipt, identification, movement, storage, and shipment, are performed in accordance with written procedures. Fuel handling procedures address, for example, the status of plant systems required for refueling; inspection of replacement fuel and control rods; designation of proper tools; proper conditions for spent fuel movement and storage; proper conditions to prevent inadvertent criticality; proper conditions for fuel cask loading and movement; and status of interlocks, reactor trip circuits, and mode switches. These procedures provide instructions for use of refueling equipment, actions for core alterations, monitoring core criticality status, accountability of fuel, and partial or complete refueling operations.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures and the general format and content of the different classifications of procedures. However, fuel handling procedures are not specifically required to be described. In FSAR Section 13.5.2, the applicant added a new paragraph that described fuel handling procedures and their general format and content. The staff concluded that the applicant-provided fuel handling procedures descriptions meet the criteria found in NUREG-0800, Section

13.5.2.1. The staff determined that this description is acceptable, because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-26, Maintenance and Other Operating Procedures

STD SUP 13.5-26 states the following:

> Section 13.5.2.2, "Maintenance and Other Operating Procedures," provides guidance for procedural adherence.

The technical review for STD SUP 13.5-26 is addressed in Section 17.5 of this PSER.

- STD SUP 13.5-27 Plant Radiation Protection Procedures

STD SUP 13.5-27 states the following:

> Section 13.5.2.2.1, "Plant Radiation Protection Procedures," indicates that the plant RPP is contained in procedures. Procedures are developed and implemented for such things as: maintaining personnel exposures, plant contamination levels, and plant effluents ALARA; monitoring both external and internal exposures of workers, considering industry-accepted techniques; performing routine radiation surveys; performing environmental monitoring in the vicinity of the plant; monitoring radiation levels during maintenance and special work activities; evaluating radiation protection implications of proposed modifications; and maintaining radiation exposure records of workers and others.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures and the general format and content of the different classifications of procedures. However, radiation protection procedures are not specifically required to be described. In FSAR Section 13.5.2, the applicant added a new paragraph that described radiation protection procedures and their general format and content. The staff concluded that the applicant-provided plant radiation protection procedures meet the criteria found in NUREG-0800, Section 13.5.2.1. The staff determined that these procedures are acceptable because they meet the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-28 Emergency Preparedness Procedures

STD SUP 13.5-28 states the following:

> Section 13.5.2.2.2, "Emergency Preparedness Procedures," indicates that a discussion of emergency preparedness procedures can be found in the Emergency Plan. A list of implementing procedures is maintained in the Emergency Plan.

The technical review for STD SUP 13.5-28 is addressed in Section 13.3 of this SER.

- STD SUP 13.5-29 Instrument Calibration and Test Procedures

STD SUP 13.5-29 states the following:

> Section 13.5.2.2.3, “Instrument Calibration and Test Procedures,” indicates that the QAPD provides a description of procedural requirements for instrumentation calibration and testing.

The technical review for STD SUP 13.5-29 is addressed in Section 17.5 of this SER.

- STD SUP 13.5-30 Chemistry Procedures

STD SUP 13.5-30 states the following:

> Section 13.5.2.2.4, “Chemistry Procedures,” indicates that procedures provided for chemical and radiochemical control activities include the nature and frequency of sampling and analyses; instructions for maintaining fluid quality within prescribed limits; the use of control and diagnostic parameters; and limitations on concentrations of agents that could cause corrosive attack, foul heat transfer surfaces or become sources of radiation hazards due to activation. Procedures are also provided for the control, treatment, and management of radioactive wastes and control of radioactive calibration sources.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures and the general format and content of the different classifications of procedures. However, chemistry procedures are not specifically required to be described. In FSAR, Section 13.5.2, the applicant added a new paragraph that described chemistry procedures and their general format and content. The staff concluded that the applicant-provided chemistry procedures meet the criteria found in NUREG-0800, Section 13.5.2.1. The staff determined that this is acceptable, because it meets criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-31 Radioactive Waste Management Procedures

STD SUP 13.5-31 states the following:

> Section 13.5.2.2.5, “Radioactive Waste Management Procedures,” indicates that procedures for the operation of the radwaste processing systems provide for the control, treatment, and management of onsite radioactive wastes. These procedures are addressed in Section 13.5.2.1.1, System Operating Procedures.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures and the general format and content of the different classifications of procedures. As part of the review of FSAR Revision 0, Section 11.4, about procedures addressing the management of radioactive wastes, it was noted that although FSAR Subsection 13.5.2.2.1 provides a broad overview of illustrative functions that will be addressed by radiation protection procedures, the discussion fails to include in its listing the management of radioactive wastes for offsite shipment, disposal, and treatment. Accordingly, the applicant was requested in RAI 13.05.02.01-1 to update the listing of illustrative functions in FSAR Section 13.5.2.2.1 to include the management of radioactive wastes for offsite shipment, disposal, and treatment. In the response, the applicant revised FSAR Section 13.5.2.2.1 by adding the management of radioactive waste as another programmatic function of plant procedures. In FSAR Section 13.5.2, the applicant added a new paragraph that described the general format and content of

offsite radioactive waste management procedures. The staff concluded that the applicant-provided radioactive waste management procedures meet the criteria found in NUREG-0800, Section 13.5.2.1. In addition, the staff determined that this response is acceptable and therefore, this RAI is closed.

- STD SUP 13.5-32 Maintenance, Inspection, Surveillance, and Modification Procedures

STD SUP 13.5-32 states the following:

> Section 13.5.2.2.6.1, "Maintenance Procedures," describes maintenance planning and preparation activities. Maintenance procedures are developed considering the potential impact on the safety of the plant, license limits, availability of equipment required to be operable, and possible safety consequences of concurrent or sequential maintenance, testing, or operating activities.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures and the general format and content of the different classifications of procedures. However, maintenance procedures are not specifically required to be described. In FSAR, Section 13.5.2, the applicant added a new paragraph that described maintenance procedures and their general format and content. The staff concluded that the applicant-provided maintenance procedures meet the criteria found in NUREG-0800, Section 13.5.2.1. The staff determined that this is acceptable, because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-33 Inspection Procedures

STD SUP 13.5-33 states the following:

> Sections 13.5.2.2.6.2, "Inspection Procedures," and 13.5.2.2.6.3, "Surveillance Testing Procedures," indicate that the QAPD provides a description of procedural requirements for inspections and surveillance testing. Surveillance testing procedures are written in a manner that adequately tests all portions of safety-related logic circuitry as described in Generic Letter 96-01, "Testing of Safety Related Logic Circuits."

The technical review for STD SUP 13.5-33 is addressed in Section 17.5 of this SER.

- STD SUP 13.5-34 Modification Procedures

STD SUP 13.5-34 states the following:

> Section 13.5.2.2.6.4, "Modification Procedures," indicates that plant modifications and changes to setpoints are developed in accordance with approved procedures. These procedures control necessary activities associated with the modifications such that they are carried out in a planned, controlled, and orderly manner. For each modification, design documents such as drawings, equipment and material specifications, and appropriate design analyses are developed, or the as-built design documents are utilized. Separate reviews are conducted by

individuals knowledgeable in both technical and QA requirements to verify the adequacy of the design effort.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures and the general format and content of the different classifications of procedures. However, modification procedures are not specifically required to be described. In FSAR Section 13.5.2, the applicant added a new paragraph that described modification procedures and their general format and content. The staff concluded that the applicant-provided modification procedures meet the criteria found in NUREG-0800, Section 13.5.2.1. The staff determined that these procedures are acceptable because they meet the criteria of NUREG-0800, Chapter 13.5.2.1 are met.

- STD SUP 13.5-35 Heavy Load Handling Procedures

STD SUP 13.5-35 states the following:

> Section 13.5.2.2.6.5, " Heavy Load Handling Procedures," indicates that procedures to control handling of heavy loads are provided and meet the guidance of NUREG-0612, Section 5.1.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures and the general format and content of the different classifications of procedures. However, heavy-load handling procedures are not specifically required to be described. In FSAR Section 13.5.2, the applicant added a new paragraph that described heavy-load handling procedures and their general format and content. The staff concluded that the applicant-provided heavy-load handling procedures meet the criteria found in NUREG-0800, Section 13.5.2.1. The staff determined this information is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

- STD SUP 13.5-36 Material Control Procedures

STD SUP 13.5-36 states the following:

> Section 13.5.2.2.7, "Material Control Procedures," indicates that the QAPD provides a description of procedural requirements for material control.

The technical review for STD SUP 13.5-36 is addressed in Section 17.5 of this PSER.

- STD SUP 13.5-37 Security Procedures

STD SUP 13.5-37 states the following:

> Section 13.5.2.2.8, "Security Procedures," indicates that a discussion of security procedures is provided in the Security Plan.

The technical review for STD SUP 13.5-37 is addressed in Section 13.6 of this PSER.

- STD SUP 13.5-38 Refueling and Outage Planning Procedures

STD SUP 13.5-38 states the following:

> Section 13.5.2.2.9," Refueling and Outage Planning Procedures," provides guidance for the development of refueling and outage plans.

NUREG-0800, Section 13.5.2.1, states that the applicant should describe the different classifications of procedures and the general format and content of the different classifications of procedures. However, refueling and outage planning procedures are not specifically required to be described. In FSAR Section 13.5.2, the applicant added a new paragraph that described refueling and outage planning procedures and their general format and content. The staff concluded that the applicant-provided refueling and outage planning procedures meet the criteria in NUREG-0800, Section 13.5.2.1. The staff determined that this information is acceptable because it meets the criteria of NUREG-0800, Chapter 13.5.2.1.

13.5.2.5 *Post Combined License Activities*

There are no post COL activities related to this section.

13.5.2.6 *Conclusion*

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the relevant information relating to Operating and Maintenance Procedures and there is no outstanding information expected to be addressed in the COL FSAR related to this subsection.

The staff is reviewing the information in the DCD Section 13.5.2 on Docket No. 52-010. The results of the NRC's staff's technical evaluation of the information related to Operating and Maintenance Procedures incorporated by reference in the North Anna 3 COL FSAR will be documented in the staff safety evaluation report on the DC application for the ESBWR. The SER on the ESBWR is not yet complete and this is being tracked as part of Open Item [1-1]. The staff will update Section 13.5.2 of this SER to reflect the final disposition of the design certification application.

In addition, the staff has compared the additional COL and Supplemental information items in the application to the relevant NRC regulations; the acceptance criteria defined in NUREG-0800, Section 13.5; and other NRC RGs and concluded that the applicant is in compliance with the NRC regulations. COL Information Items STD COL 13.5-2-A, 13.5-3-A, 13.5-4-A, 13.5-5-A, and 13.5-6-H, and supplements STD SUP 13.5-17, 13.5-18, 13.5-19, 13.5-20, 13.5-21, 13.5-22, 13.5-23, 13.5-24, 13.5-25, 13.5-26, 13.5-27, 13.5-28, 13.5-29, 13.5-30, 13.5-31, 13.5-32, 13.5-33, 13.5-34, 13.5-35, 13.5-36, 13.5-37, and 13.5-38, relating to plant procedures, are adequately addressed by the applicant and can be considered closed**.**

In addition, the applicant responded to RAI 13.05.02.01. The responses are acceptable and are incorporated into Revision 1 of the COL FSAR. In conclusion, with the incorporation of the RAIs the applicant has provided sufficient information for satisfying the criteria of NUREG-0800.