

## 16.0 TECHNICAL SPECIFICATIONS

### 16.1 Introduction

Technical specifications (TS) impose limits, operating conditions, and other requirements upon reactor facility operation for the protection of public health and safety. The North Anna Unit 3 plant-specific TS (PTS) are derived from the analyses and evaluations in the Economic Simplified Boiling-Water Reactor (ESBWR) design control document (DCD) and the North Anna Unit 3 Final Safety Analysis Report (FSAR). In accordance with 10 CFR 50.36, 10 CFR 50.36a, and 10 CFR 52.79(a)(30), Dominion Virginia Power (Dominion) provided PTS and bases for the North Anna Unit 3 in Chapter 16, "Technical Specifications" of Part 2 "Final Safety Analysis Report" and Part 4, "Technical Specifications" of the combined license (COL) application.

### 16.2 Summary of Application

Chapter 16 of the North Anna Unit 3 COL FSAR, Revision 1, incorporates by reference Chapters 16 and 16B (the generic technical specifications [GTS] and bases) of the ESBWR DCD, Revision 5.

In addition, in FSAR Chapter 16, Dominion provided the following:

#### COL Items

- STD COL 16.0-1-A COL Applicant Bracketed Items

The applicant provided additional information in Part 4 of the COL application of the North Anna Unit 3 COL application to address DCD COL Item 16.0-1-A. The applicant replaced information denoted by brackets in the GTS with the site-specific information.

- STD COL 16.0-2-H COL Holder Bracketed Items

The applicant provided additional information in Part 4 of the COL application of the North Anna Unit 3 COL application to address DCD COL Item 16.0-2-H. The applicant replaced information denoted by brackets in the GTS with the site-specific information.

#### Supplemental Information

- STD SUP 16.0-1

The applicant provided the following supplemental information. The applicant states that the PTS and PTS bases are maintained as separate documents.

In the North Anna Unit 3 COL application, Dominion references the design certification (DC) application for the ESBWR. In accordance with the DC application, the PTS consist of the ESBWR GTS and site-specific information. Dominion also proposed bases for the PTS, which consist of the GTS bases and site-specific information.

The ESBWR GTS contain items regarding site-specific information that a COL applicant must provide with the PTS to complete a particular GTS provision (e.g., incorporation of an NRC-approved methodology into a plant's licensing basis). Detailed design information, equipment selection, instrumentation settings, or other information not available at the time of DC, are

necessary to establish the values or information included in the PTS. The ESBWR GTS and bases denote each preliminary or missing information item with brackets and a COL item number. The ESBWR DCD Revision 5 grouped this preliminary or missing information into COL items 16.0-1-A and 16.0-2-H. Except for the completion of these COL items and two exemptions, the PTS and bases are identical to the GTS and bases.

### Exemptions

Dominion proposed two exemptions from the ESBWR GTS and bases in the PTS and bases. These exemptions would omit a value for control rod scram accumulator nominal pressure in the bases for PTS 3.1.5 (associated with COL Item 3.1.5-1), and add justification for the bounding value for the control room habitability area heating and ventilation system (CRHAVS) emergency filtration unit (EFU) differential pressure acceptance criterion to the bases for PTS surveillance requirement (SR) 3.7.2.3 (associated with COL Item 5.5.13-1).

### Proposed COL Items

Table 16.1 lists the GTS requirements and associated bases that contain placeholders for preliminary or missing information associated with COL items. The COL applicant must finalize these items to complete the PTS and bases. This table also lists Dominion's disposition of each COL item for completing the PTS and bases. The disposition of each item includes:

- Dominion's chosen resolution method (RM) for the item (Option 1, 2, or 3).
- The status of the item (pending or resolved) is based on whether Dominion has provided, in docketed correspondence, information that is acceptable to NRC staff for finalizing the item and is consistent with the chosen RM.
- If the staff has requested additional information regarding the site-specific information provided by Dominion, the item status is marked "unresolved."
- The status of staff verification (yes or no) that the PTS has been updated to reflect the staff-accepted resolution of the item.

The listed RM for each COL item is based on Dominion's letter dated December 1, 2008, which addressed the staff request for additional information (RAI) 16-1. In this RAI, the staff asked Dominion to revise its proposed resolution of COL items in accordance with interim staff guidance (ISG) DC/COL-ISG-08, "Necessary Content of Plant-Specific Technical Specifications When a Combined License Is Issued." This ISG lists three acceptable RMs for resolving COL items and finalizing the PTS. For each COL item, the applicant must provide

- a site-specific value or site-specific information (Option 1);
- a useable value or useable information that is bounding to the site-specific value or information (Option 2); or
- a staff-approved administrative control TS for the use of an NRC-approved methodology to determine the site-specific value or information and establish a document for recording the site-specific value or information (Option 3).

RAI 16-1 remains open because some items are denoted as pending because Dominion has not yet provided final information. The GTS contains bracketed optional provisions that provide operational flexibility, but adopting that flexibility in PTS requires a site-specific justification in accordance with the reviewer's notes in Tables 16.0-1-A and 16.0-2-H of the ESBWR DCD. In most cases, Dominion has not adopted this flexibility in the North Anna Unit 3 PTS. The RM for such items is listed as Option 1 in the Table 16.1 disposition column because finalizing bracketed information, where the brackets provide for operational flexibility, is equivalent to providing site-specific information. For all COL items listed in the table, the NRC staff must verify that the PTS and bases have been properly updated in accordance with the stated RM. The table disposition column also indicates whether there is a completed and verified PTS update for each COL item.

**Table 16.1 Site Specific Information to Resolve COL Items 16.0-1-A and 16.0-2-H**

COL Item Group	COL Item Number	GTS Reference	Information Needing Finalization (see description in Revision 5 of ESBWR DCD, Section 16.0 and Dominion's response to RAI 16-1)	Disposition	
				RM:	Status: Verified:
16.0-2-H	1.1-1	GTS 1.1	Pressure Temperature Limits Report (PTLR) definition. (Dominion plans to submit the PTLR during the second quarter of calendar year 2009.)	RM: Option 1	Status: Pending Verified: No
16.0-1-A	3.1.3-1	GTS 3.1.3 Required Action A.1 and bases	Stuck control rod separation requirements between "slow" control rod(s). (Operational flexibility not adopted.)	RM: Option 1	Status: Resolved Verified: Yes
16.0-1-A	3.1.3-2	SR 3.1.3.4 and bases	Maximum scram time limits for operable control rods. If adopting slow control rod optional allowance, the SR should state: "Verify each control rod scram time from fully withdrawn to [60]% rod insertion is ≤ [ ] seconds." Otherwise, the SR should state: "Perform applicable SRs of LCO 3.1.4." (Operational flexibility not adopted.)	RM: Option 1	Status: Resolved Verified: Yes
16.0-1-A	3.1.4-1	GTS 3.1.4 and bases; LCO 3.1.4, and bases; Action A and bases; Table 3.1.4-1 Notes and bases; bases Applicable Safety Analyses (ASA) discussion; bases for SR 3.1.4.2 and SR 3.1.4.3.	"Slow" control rod optional allowance. (Operational flexibility not adopted.) Dominion removed the bracketed provisions for "slow" scram times in the GTS and bases.	RM: Option 1	Status: Resolved Verified: Yes
16.0-2-H	3.1.5-1	SR 3.1.5.1 and bases	Minimum and nominal control rod scram accumulator pressure. (Note that Dominion requested an exemption from the GTS bases to not include the nominal pressure.)	RM: Option 2	Status: Pending Verified: No

COL Item Group	COL Item Number	GTS Reference	Information Needing Finalization (see description in Revision 5 of ESBWR DCD, Section 16.0 and Dominion's response to RAI 16-1)	Disposition	
				RM:	Status: Verified:
16.0-1-A	3.1.7-1	GTS 3.1.7 Required Action A.1 and bases	Alternative Action for sodium pentaborate concentration not within limits. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-2-H	3.1.7-1 (note duplicate number)	SR 3.1.7.8	Allowable value for accumulator level.	RM:	Option 3 Status: Pending Verified: No
16.0-2-H	3.3.1.1-1	SR 3.3.1.1.3	Allowable Values for RPS instrumentation channel trip settings for Functions 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16.	RM:	Option 3 Status: Pending Verified: No
16.0-1-A	3.3.1.1-2	Bases for SR 3.3.1.1.4	Allowance to exclude certain sensors or other instrumentation components from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	3.3.1.2-1	Bases for SR 3.3.1.2.4	Allowance to exclude certain portions of the actuation circuitry from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-2-H	3.3.1.4-1	SR 3.3.1.4.5	Allowable Values for NMS instrumentation channel trip settings for Functions 1.a, 1.b, 2.a, 2.b, and 2.c.	RM:	Option 3 Status: Pending Verified: No
16.0-1-A	3.3.1.4-2	Bases for SR 3.3.1.4.7	Allowance to exclude certain sensors or other instrumentation components from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-2-H	3.3.1.5-1	Not applicable	Not used	Not applicable	
16.0-1-A	3.3.1.5-2	Bases for SR 3.3.1.5.4	Allowance to exclude certain portions of the actuation circuitry from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-2-H	3.3.1.6-1	SR 3.3.1.6.3	Minimum startup range neutron monitoring count rate.	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	3.3.3.2-1	GTS 3.3.3.2 and bases	Post Accident Monitoring (PAM) Instrumentation. (Availability Control Manual will contain PAM instrumentation requirements.)	RM:	Option 1 Status: Resolved Verified: Yes

COL Item Group	COL Item Number	GTS Reference	Information Needing Finalization (see description in Revision 5 of ESBWR DCD, Section 16.0 and Dominion's response to RAI 16-1)	Disposition	
				RM:	Status: Verified:
16.0-2-H	3.3.5.1-1	SR 3.3.5.1.3	Allowable Values for emergency core cooling system instrumentation channel trip settings for Functions 1 and 2.	RM:	Option 3 Status: Pending Verified: No
16.0-1-A	3.3.5.1-2	Bases for SR 3.3.5.1.4	Allowance to exclude certain sensors or other instrumentation components from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	3.3.5.2-1	Bases for SR 3.3.5.2.4	Allowance to exclude certain portions of the actuation circuitry from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-2-H	3.3.5.3-1	SR 3.3.5.3.3	Allowable Values for isolation condenser system instrumentation channel trip settings for Functions 1, 2, 3, 4, and 5.	RM:	Option 3 Status: Pending Verified: No
16.0-1-A	3.3.5.3-2	Bases for SR 3.3.5.3.4	Allowance to exclude certain sensors or other instrumentation components from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	3.3.5.4-1	Bases for SR 3.3.5.4.4	Allowance to exclude certain portions of the actuation circuitry from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-2-H	3.3.6.1-1	SR 3.3.6.1.3	Allowable Values for Main Steam Isolation Valve (MSIV) instrumentation channel trip settings for Functions 1, 2, 3, 4, 5, 6 and 7.	RM:	Option 3 Status: Pending Verified: No
16.0-1-A	3.3.6.1-2	Bases for SR 3.3.6.1.4	Allowance to exclude certain sensors or other instrumentation components from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	3.3.6.2-1	Bases for SR 3.3.6.2.4	Allowance to exclude certain portions of the actuation circuitry from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-2-H	3.3.6.3-1	SR 3.3.6.3.3	Allowable values for isolation instrumentation channel trip settings for Functions 1 through 12.	RM:	Option 3 Status: Pending Verified: No
16.0-1-A	3.3.6.3-2	Bases for SR 3.3.6.3.4	Allowance to exclude certain sensors or other instrumentation components from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes

COL Item Group	COL Item Number	GTS Reference	Information Needing Finalization (see description in Revision 5 of ESBWR DCD, Section 16.0 and Dominion's response to RAI 16-1)	Disposition	
				RM:	Status: Verified:
16.0-1-A	3.3.6.4-1	Bases for SR 3.3.6.4.4	Allowance to exclude certain portions of the actuation circuitry from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-2-H	3.3.7.1-1	SR 3.3.7.1.3	Allowable Values for CRHAVS instrumentation channel trip settings for Functions 1 and 2.	RM:	Option 3 Status: Pending Verified: No
16.0-1-A	3.3.7.1-2	Bases Background for GTS 3.3.7.1	CRHA option for design features to protect occupant exposures to hazardous chemicals. (Not adopted, however FSAR Section 6.4.5. is still pending resolution of related RAI 02.02.03-7)	RM:	Option 1 Status: Pending Verified: No
16.0-1-A	3.3.7.1-3	Bases for SR 3.3.7.1.4	Allowance to exclude certain sensors or other instrumentation components from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	3.3.7.2-1	Bases Background for GTS 3.3.7.2	CRHA option for design features to protect occupant exposures to hazardous chemicals. (Not adopted, however FSAR Section 6.4.5. is still pending resolution of related RAI 02.02.03-7)	RM:	Option 1 Status: Pending Verified: No
16.0-1-A	3.3.7.2-2	Bases for SR 3.3.7.2.4	Allowance to exclude certain portions of the actuation circuitry from Response Time Testing. (Operational flexibility not adopted.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-2-H	3.3.8.1-1	SR 3.3.8.1.3	Allowable Values for diverse protection system instrumentation channel trip settings for Functions 1, 2, 3 and 4.	RM:	Option 3 Status: Pending Verified: No
16.0-1-A	3.4.4-1	LCO 3.4.4 and bases; SRs 3.4.4.1, 2, 3, 4, and 5, and bases; bases Background	Reference to PTLR or plant-specific PT curves as figures in TS 3.4.4. (Dominion plans to submit the PTLR during the second quarter of CY 2009.)	RM:	Option 1 Status: Pending Verified: No
16.0-1-A	3.4.4-2	Notes to SR 3.4.4.4, and SR 3.4.4.5 and bases	Temperature for applicability of verification that reactor vessel flange and head flange temperatures are within limits. (Dominion plans to submit the PTLR during the second quarter of CY 2009.)	RM:	Option 1 Status: Pending Verified: No

COL Item Group	COL Item Number	GTS Reference	Information Needing Finalization (see description in Revision 5 of ESBWR DCD, Section 16.0 and Dominion's response to RAI 16-1)	Disposition
				RM: Status: Verified:
16.0-1-A	3.4.4-3	Bases References for GTS 3.4.4	Topical report(s) providing the methodology for determining the PT limits. (Dominion plans to submit the PTLR during the second quarter of CY 2009.)	RM: Option 1 Status: Pending Verified: No
16.0-2-H	3.5.1-1 (not listed in ESBWR DCD)	Bases for SR 3.5.1.5 (deleted)	Not used (SRV manual actuation test conditions). This SR was deleted based on ESBWR DC RAI 3.9-168 Supplement 2 resolution. [Ref. 16-1 ML081400339 MFN 08-458.]	Not applicable
16.0-2-H	3.7.1-1	SR 3.7.1.9	Allowable Values for IC/PCC expansion pool level instrumentation channel trip setting.	RM: Option 3 Status: Pending Verified: No
16.0-1-A	3.7.2-1 (related to COL Item 6.4-2-A)	GTS 3.7.2 Required Action B.2 and bases; bases Background discussion; bases ASA discussion; bases for LCO 3.7.2; bases for SR 3.7.2.7	CRHA option for design features to protect occupant exposure to hazardous chemicals. (Not adopted, however FSAR Section 6.4.5. is still pending resolution of related RAI 02.02.03-7)	RM: Option 1 Status: Pending Verified: No
16.0-2-H	3.7.2-2	SR 3.7.2.6	Allowable value for CRHAVS main control room temperature instrumentation channel trip setting.	RM: Option 3 Status: Pending Verified: No
16.0-1-A	3.7.4-1	LCO 3.7.4 and bases; bases ASA discussion; bases for Required Action A.1	LCO 3.7.4 alternative to requiring the Main Turbine Bypass System to be operable. The alternative LCO is to make applicable the LCO 3.2.2, "Minimum Critical Power Ratio (MCPR)," limits for an inoperable Main Turbine Bypass System, as specified in the Core Operating Limits Report (COLR). (Operational flexibility not adopted.)	RM: Option 1 Status: Resolved Verified: Yes
16.0-1-A	3.7.4-2	SR 3.7.4.1 Frequency and bases	Surveillance interval for cycling a turbine bypass valve. (Retained 31-day Frequency. Operational flexibility not adopted.)	RM: Option 1 Status: Resolved Verified: Yes

COL Item Group	COL Item Number	GTS Reference	Information Needing Finalization (see description in Revision 5 of ESBWR DCD, Section 16.0 and Dominion's response to RAI 16-1)	Disposition	
				RM:	Status: Verified:
16.0-1-A	3.7.6-1	LCO 3.7.6 and bases; bases ASA discussion; bases for Required Action A.1	LCO 3.7.6 alternative to requiring all Selected Control Rod Run-In (SCRRI) and Select Rod Insert (SRI) functions to be operable. The alternative LCO is to make applicable the LCO 3.2.2, "Minimum Critical Power Ratio (MCPR)," limits for an inoperable SCRRI and/or SRI function, as specified in the COLR. (Operational flexibility not adopted.)	RM:	Option 1 Resolved
16.0-2-H	3.7.6-2	SR 3.7.6.6	Allowable Value for SCRRI/SRI loss-of-feedwater-heating temperature instrumentation channel trip setting.	RM:	Option 3 Pending
16.0-2-H	3.8.1-1	SR 3.8.1.2 and bases	Acceptance criteria for battery charger testing (minimum duration of test in hours) consistent with battery size. (Manufacturer's recommendations are basis for bounding value for test duration.)	RM:	Option 2 Pending
16.0-2-H	3.8.1-2	Bases for GTS 3.8.1 Required Action A.2	Acceptance criteria for verification that battery is fully charged consistent with manufacturer recommendations. (Manufacturer's recommendations are basis for site-specific values and the battery type to be chosen is pending)	RM:	Option 1 Pending
16.0-2-H	3.8.1-3	SR 3.8.1.3 Note and bases	Option to use a modified performance test for verification of battery capacity consistent with manufacturer's recommendations. (Operational flexibility not adopted.)	RM:	Option 1 Pending
16.0-2-H	3.8.1-4	Bases for SR 3.8.1.1	Battery cell parameters consistent with manufacturer's specifications.	RM:	Option 1 Pending
16.0-2-H	3.8.1-5	Bases Background for GTS 3.8.1, and bases for SR 3.8.1.1	Battery margin for aging factor and state of charge uncertainty (from expected battery life).	RM:	Option 1 Pending
16.0-2-H	3.8.3-1	SR 3.8.3.1 and bases; bases for Required Action B.2	Acceptance criteria for verification that battery is fully charged [stabilized charging current or float current within limits] consistent with manufacturer's recommendations. (Manufacturer's recommendations are the basis for site-specific values and the battery type to be chosen is pending.)	RM:	Option 1 Pending

COL Item Group	COL Item Number	GTS Reference	Information Needing Finalization (see description in Revision 5 of ESBWR DCD, Section 16.0 and Dominion's response to RAI 16-1)	Disposition	
				RM:	Status: Verified:
16.0-2-H	3.8.3-2	SR 3.8.3.6 and bases	Option to use a modified performance test for verification of battery capacity consistent with manufacturer's recommendations. (Operational flexibility not adopted.)	RM:	Option 1 Status: Pending Verified: No
16.0-2-H	3.8.3-3	GTS 3.8.3: Actions A and F and SR 3.8.3.5; SR 3.8.3.2; bases Background; bases for Actions A, B, and F; bases for SRs 3.8.3.2 and 3.8.3.5	Battery cell parameters consistent with manufacturer's specifications.  Minimum connected cell float voltage. Minimum pilot cell float voltage.  (Manufacturer's recommendations are basis for site-specific values and the battery type to be chosen is pending.)	RM:	Option 1 Status: Pending Verified: No
16.0-2-H	3.8.3-4	SR 3.8.3.6 Frequency and bases	Battery margin for aging factor and state of charge uncertainty (Manufacturer's recommendations are basis for site-specific values.)	RM:	Option 1 Status: Pending Verified: No
16.0-2-H	3.9.5-1	SR 3.9.5.2 and bases; bases for LCO 3.9.5	Minimum control rod drive scram accumulator pressure.	RM:	Option 2 Status: Pending Verified: No
16.0-1-A	4.1-1	GTS 4.1	Plant-specific description of site location.	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	5.2.2-1	GTS 5.2.2	Non-licensed operator manning requirements for multi-unit site (Not applicable; North Anna Unit 3 is a single unit facility.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	5.3.1-1	GTS 5.3.1	Unit staff qualifications requirements.	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	5.4.1-1	GTS 5.4.1.a	Guidance documents for written procedures	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	5.4.1-2	GTS 5.4.1.b	Guidance documents for emergency operating procedures	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	5.5.6-1	GTS 5.5.6	Outdoor Liquid Storage Tank Radioactivity Monitoring Program. (Not applicable to North Anna Unit 3.)	RM:	Option 1 Status: Resolved Verified: Yes

COL Item Group	COL Item Number	GTS Reference	Information Needing Finalization (see description in Revision 5 of ESBWR DCD, Section 16.0 and Dominion's response to RAI 16-1)	Disposition	
				RM:	Status: Verified:
16.0-1-A	5.5.9-1	GTS 5.5.9	Containment Leakage Rate Testing Program plant-specific exceptions to Regulatory Guide 1.163 (Dominion requested no additional plant-specific exceptions.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-2-H	5.5.10-1	GTS 5.5.10.a	Battery cell parameters consistent with manufacturer specifications. Minimum connected cell float voltage. (Manufacturer's recommendations are basis for site-specific values and the battery type to be chosen is pending)	RM:	Option 1 Status: Pending Verified: No
16.0-2-H	5.5.11-1	GTS 5.5.11	Setpoint Control Program references to NRC staff-approved setpoint methodology and the associated NRC SER.	RM:	Option 3 Status: Pending Verified: No
16.0-1-A	5.5.12-1	GTS 5.5.12	CRHA Boundary Program requirements for hazardous chemical releases. (FSAR Section 6.4.5. is still pending resolution of related RAI 02.02.03-7)	RM:	Option 1 Status: Pending Verified: No
16.0-2-H	5.5.13-1	GTS 5.5.13.d and bases for SR 3.7.2.3	Ventilation Filter Test Program requirement for CRHA heating, ventilation, and air conditioning subsystem (CRHAVS) EFU differential pressure acceptance criteria (EFU includes high efficiency particulate air filters, prefilters, and carbon adsorbers). (Note that Dominion requested an exemption from the GTS to add justification for bounding value in the bases for SR 3.7.2.3.)	RM:	Option 2 Status: Pending Verified: No
16.0-1-A	5.6.1-1	GTS 5.6.1	Applicant to determine if allowance for multiple unit stations is applicable to PTS. If applicable, a single Annual Radiological Environmental Operating Report may be prepared. (Allowance applies because North Anna Units 1, 2, and 3 are on same site.)	RM:	Option 1 Status: Resolved Verified: Yes
16.0-1-A	5.6.1-2	GTS 5.6.1	Applicant to determine format of Annual Radiological Environmental Operating Report. (Multi-unit format applies.)	RM:	Option 1 Status: Resolved Verified: Yes

COL Item Group	COL Item Number	GTS Reference	Information Needing Finalization (see description in Revision 5 of ESBWR DCD, Section 16.0 and Dominion's response to RAI 16-1)	Disposition	
				RM:	Status: Verified:
16.0-1-A	5.6.2-1	GTS 5.6.2	Applicant to determine if allowance for multiple unit stations is applicable to PTS. If applicable, a single Radioactive Effluent Release Report, with content required for a multiple unit report, may be prepared. (Allowance applies because North Anna Units 1, 2, and 3 are on same site.)	RM: Option 1 Status: Resolved Verified: Yes	
16.0-1-A	5.6.3-1	GTS 5.6.3	COLR reference to Specification 3.7.4, "Main Turbine Bypass System" (see COL item 3.7.4-1). (Operational flexibility not adopted.)	RM: Option 1 Status: Resolved Verified: Yes	
16.0-1-A	5.6.3-2 (part 1)	GTS 5.6.3.a	Reference in TS 5.6.3 to any additional individual specifications that address core operating limits.	RM: Option 1 Status: Resolved Verified: Yes	
16.0-1-A	5.6.3-2 (part 2)	GTS 5.6.3.b	Reference in TS 5.6.3.b to the associated NRC staff-approved methods used to determine the core operating limits.	RM: Option 1 Status: Resolved Verified: Yes	
16.0-2-H	5.6.4-1	GTS 5.6.4	Applicant to add listing of analytical methods used to determine the RCS pressure and temperature limits in Specification for PTLR, if PTLR adopted in PTS. (Dominion plans to submit the PTLR during the second quarter of CY 2009.) In lieu of a PTLR, the applicant may insert its plant-specific PT curves as figures in PTS 3.4.4 and omit PTS 5.6.4.	RM: Option 1 Status: Pending Verified: No	
16.0-1-A	5.6.5-1	GTS 5.6.5	Post-Accident Monitoring Report (Availability Control Manual will contain PAM requirements.)	RM: Option 1 Status: Resolved Verified: Yes	

The above COL items are listed in Revision 5 of ESBWR DCD Table 16.0-1-A and Table 16.0-2-H. These DCD tables provide the COL applicant guidance for providing the necessary site-specific information for each item.

### 16.3 Regulatory Basis

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

In addition, the relevant requirements of Commission regulations for TS and associated acceptance criteria are given in Section 16 of NUREG-0800.

The applicable regulatory requirements for TS are as follows:

- 10 CFR 50.36 and 50.36a
- 10 CFR 52.79(a)(30)

Section 182a of the Atomic Energy Act requires that applicants for nuclear power plant operating licenses will state

Such technical specifications, including information of the amount, kind, and source of special nuclear material required, the place of the use, the specific characteristics of the facility, and such other information as the Commission may, by rule or regulation, deem necessary in order to enable it to find that the utilization...of special nuclear material will be in accord with the common defense and security and will provide adequate protection to the health and safety of the public. Such technical specifications shall be a part of any license issued.

In 10 CFR 50.36, the Commission established the regulatory requirements related to the TS content. In doing so, the Commission emphasized matters related to the prevention of accidents and the mitigation of the consequences from accidents. As recorded in the Statements of Consideration, "Technical Specifications for Facility Licenses; Safety Analysis Reports," (33 FR 18610, December 17, 1968), the Commission noted that applicants were expected to incorporate into their TS "those items that are directly related to maintaining the integrity of the physical barriers designed to contain radioactivity." 10 CFR 50.36(c) requires the TS to contain (1) safety limits, limiting safety system settings, and limiting control settings, (2) limiting conditions for operation, (3) surveillance requirements, (4) design features, and (5) administrative controls.

10 CFR 50.36(c)(2)(ii) requires the TS to include an LCO for each item meeting one or more of the following four criteria:

- Criterion 1—installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary
- Criterion 2—a process variable, design feature, or operating restriction that is an initial condition of a design-basis accident (DBA) or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier
- Criterion 3—a structure, system, or component (SSC) that is part of the primary success path and which functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier
- Criterion 4—an SSC which operating experience or probabilistic risk assessment has shown to be significant to public health and safety

## Regulatory Guidance

In 1992, the NRC issued standard technical specifications (STS) to clarify the content and format of requirements necessary to ensure the safe operation of nuclear power plants. These STS were developed from the results of the TS improvement program in accordance with 10 CFR 50.36 and SECY-93-067, "Final Policy Statement on TS Improvements for Nuclear Power Reactors," published on July 22, 1993. Major revisions to the STS were published in 1995 (Revision 1), 2001 (Revision 2), and 2004 (Revision 3).

The STS for boiling-water reactors are contained in two NRC documents. For each document, Volume 1 contains the TS and Volume 2 contains the associated TS bases. The STS include bases for safety limits, limiting safety system settings, limiting conditions for operation and associated action and surveillance requirements. The documents are:

- NUREG-1433, "Standard Technical Specifications General Electric Plants, BWR/4"
- NUREG-1434, "Standard Technical Specifications General Electric Plants, BWR/6"

The STS reflect the results of a detailed review of the application of Interim Policy Statement criteria to generic system functions, which were published in a "Split Report" issued to the nuclear steam supply system vendor owner groups in May 1988. STS also reflect the results of extensive discussions concerning various drafts of STS to ensure that the application of TS criteria will consistently reflect detailed system configurations and operating characteristics for all reactor designs. Therefore, the STS bases provide an abundance of information regarding the extent to which the STS present requirements that are necessary to protect public health and safety.

In the Final Policy Statement, the Commission expressed the view that satisfying the guidance in the policy statement also satisfies Section 182a of the Act and 10 CFR 50.36. The Final Policy Statement describes the safety benefits of the STS. It also encourages licensees to use the STS as the basis for license amendments to partially or completely convert existing TS requirements to improved TS based on the STS.

The format and content of the PTS and bases in a COL application referencing a certified design should be based on the GTS and bases for the certified design. PTS and bases may include appropriate plant-specific departures from the referenced certified GTS and bases when warranted.

### **16.4 Technical Evaluation**

NRC staff reviewed the PTS and bases, which are contained in Part 4 of the North Anna Unit 3 COL application. FSAR Chapter 16, which is in Part 2 of the COL application, incorporates by reference the latest revision to ESBWR DCD Section 16.0, "Introduction." This DCD section contains guidance (reviewer's notes) for providing site-specific information to resolve the COL items, which are denoted by brackets in DCD Chapters 16 and 16B, the GTS and bases, and listed in Section 16.2, Table 16.1 of this SER. Part 4 of the COL application incorporates by reference the latest revision of the GTS and bases into the PTS and bases, and provides site-specific information in accordance with COL Items 16.0-1-A and 16.0-2-H. The site-specific information was inserted into the GTS and bases to form a complete set of PTS and bases for staff review and approval. Part 4 also describes and justifies the proposed resolution method for each COL item.

The staff confirmed that the PTS and bases, as presented in Part 4 of the COL application, incorporated the GTS and bases with two departures for which Dominion has requested exemptions. The staff also reviewed the site-specific information in the PTS and bases, which Dominion provided in accordance with COL Items 16.0-1-A and 16.0-2-H, and which is listed in Section 16.2, Table 16.1 of this SER. The staff focused the review on the completion of the COL items and the departures from the GTS bases associated with the two exemption requests.

#### Completion of the ESBWR design certification rule

The GTS and bases are being reviewed separately by the staff on Docket No. 052-010 as part of the ESBWR DC review. The staff's review of the GTS and bases will be documented in Chapter 16 of the ESBWR DC SER. The staff's DC review of the GTS and bases applies to the PTS and bases except for noted exemptions. The staff did not review information in the PTS and bases that is identical to information in the GTS and bases.

NRC staff cannot complete the review of the PTS and bases until after the approval and certification of the ESBWR design and the publication of the ESBWR design certification rule (DCR). Consequently, the staff must verify that the PTS and bases are identical to the GTS and bases that receive final approval, except for COL items and approved exemptions. The staff will thereby incorporate the resolution of all GTS and bases issues remaining open at the time of the North Anna Unit 3 COL application. The staff recognizes that in the future, Dominion may propose a departure from the information in the GTS or bases resulting from the resolution of ESBWR DC issues.

One of the proposed exemptions would omit a value for control rod scram accumulator nominal pressure in the bases for PTS 3.1.5 (associated with COL Item 3.1.5-1). The other proposed exemption (associated with COL Item 5.5.13-1) would add discussion to the PTS bases to justify the bounding value for the CRHAVS EFU differential pressure acceptance criterion for SR 3.7.2.3 (perform required CRHAVS filter testing in accordance with the Ventilation Filter Testing Program) in PTS 5.5.13.d. NRC staff approval of the exemptions is contingent on the completion of the ESBWR DCR.

#### Resolution of COL Items listed in Table 16.1

Dominion proposed to resolve each of the COL items using one of the three options permitted by DC/COL-ISG-08: Option 1, a site-specific value or site-specific information; Option 2, a useable value or useable information that is bounding to the site-specific value or information; or Option 3, a staff-approved administrative control TS requiring the use of an NRC-approved methodology to determine the site-specific value or information and the establishment of a document for recording the site-specific value or information.

Option 1 The staff determines whether the site-specific information provided under Option 1 is acceptable by verifying the information is accurate and useable for unit operation by comparing the information with the FSAR and the conditions in the associated reviewer's note in DCD Section 16.0, and reviewing the justification included in the COL application. The following are the COL items resolved using Option 1:

- Optional provisions that would provide additional operational flexibility. The associated reviewer's notes for such COL items require the COL applicant to provide additional site-specific justification in order to incorporate the operational flexibility in the PTS. These COL

- Action and surveillance requirements for slow control rods (COL Items 3.1.3-1 and 3.1.3-2);
- Action requirements for out of limit sodium pentaborate concentration in standby liquid control (SLC) system accumulator (COL Item 3.1.7-1);
- Exclusion of instrumentation components from response time testing (COL Items 3.3.1.1-2, 3.3.2.1-1, 3.3.1.4-2, 3.3.1.5-2, 3.3.5.1-2, 3.3.5.2-1, 3.3.5.3-2, 3.3.5.4-1, 3.3.6.1-2, 3.3.6.2-1, 3.3.6.3-2, 3.3.6.4-1, 3.3.7.1-3, and 3.3.7.2-2);
- Specifying an MCPR penalty in lieu of requiring an operable main turbine bypass system (COL Items 3.7.4-1 and 5.6.3-1);
- Specifying a surveillance frequency > 31 days for cycling turbine bypass valves (COL Item 3.7.4-2);
- Specifying an MCPR penalty in lieu of requiring operable SCRR/SRI functions (COL Item 3.7.6-1);

For these COL items, Dominion elected to omit these provisions from the PTS. In each case, the resulting specification is more restrictive on unit operation than would be allowed by the omitted provision. Therefore, the resolution of these COL items is acceptable.

- Minimum count rate for startup range neutron monitor (SRNM) in Modes 3, 4, 5, and 6 (COL Item 3.3.1.6-1) in GTS 3.3.1.6. Dominion provided the plant specific value in PTS 3.3.1.6 by removing the brackets from the GTS value of “3.0 cps.” This value is a historically accepted SRNM minimum count rate that is appropriate to support ESBWR shutdown operations in Modes 3, 4, 5, and 6, by ensuring that the detectors are indicating count rates indicative of neutron flux levels within the core. Therefore, the resolution of this COL item is acceptable.
- Post-accident monitoring (PAM) instrumentation related bracketed information in GTS 3.3.3.2 and associated bases (COL Item 3.3.3.2-1) and GTS 5.6.5 (COL Item 5.6.5-1). Dominion resolved these items by omitting the bracketed PAM specification GTS 3.3.3.2 and bases and bracketed PAM reporting specification GTS 5.6.5 from the PTS and bases. These requirements, which address PAM Type A instrumentation, are not applicable to the ESBWR design because no operator actions are required for the first 72 hours following a design basis accident. Omitting PAM requirements from the PTS is consistent with the reviewer’s notes for these COL items in GTS Table 16.0-1-A. In addition, consistent with DCD Chapter 19, Appendix 19ACM, which is incorporated by reference in FSAR Chapter 19, Dominion has included the PAM requirements in GTS 3.3.3.2 in the Availability Controls (ACs) Manual as AC 3.3.4. Therefore, the resolution of these COL items is acceptable.
- Unit staff minimum qualification standards (COL Item 5.3.1-1) in GTS 5.3.1. Dominion resolved this item in accordance with the reviewer’s note in DCD Section 16.0 by specifying use of an overall qualification statement referencing an ANSI Standard acceptable to the NRC staff, as follows:

GTS 5.3.1      Each member of the unit staff shall meet or exceed the minimum qualifications of [Regulatory Guide 1.8, Revision 3, 2000, or more recent revisions, or ANSI Standard acceptable to the NRC staff]. [The staff not covered by Regulatory Guide 1.8 shall meet or exceed the minimum

qualifications of Regulations, Regulatory Guides, or ANSI Standards acceptable to NRC staff].

PTS 5.3.1 Each member of the unit staff shall meet or exceed the minimum qualifications of Regulatory Guide 1.8, Revision 3, 2000, with the following exception:

- a. During cold license operator training prior to Commercial Operation, the Regulatory Position C.1.b of Regulatory Guide 1.8, Revision 2, 1987, applies. Cold license operator candidates meet the training elements defined in ANS/ANSI 3.1-1993 but are exempt from the experience requirements defined in ANS/ANSI 3.1-1993.

The proposed minimum qualification standards reference Regulatory Guide 1.8, Revision 3, 2000, and ANS/ANSI 3.1-1993, which are acceptable to the NRC staff. North Anna Unit 3 will have no staff not covered by Regulatory Guide 1.8; so the second bracketed sentence is omitted. Therefore, the resolution of this COL item is acceptable.

- Guidance documents for written procedures (COL Items, 5.4.1-1 and 5.4.1-2) in GTS 5.4.1. In PTS 5.4.1, Dominion retained the GTS bracketed references, Regulatory Guide 1.33, Revision 2, Appendix A, February 1978, and Generic Letter 82-33, which are appropriate for North Anna Unit 3. Therefore, the resolution of this COL item is acceptable.
- Containment leakage rate testing program exceptions to Regulatory Guide 1.163 (COL Item 5.5.9-1) in GTS 5.5.9.a. In PTS 5.5.9.a, Dominion omitted the GTS 5.5.9.a bracketed placeholder for exceptions, since no exceptions were proposed for North Anna Unit 3. Therefore, the resolution of this COL item is acceptable.
- Annual Radiological Environmental Operating Report allowance for multiple unit stations to submit a single report (COL Item 5.6.1-1) and report format (COL Item 5.6.1-2) in GTS 5.6.1. In accordance with the reviewer's note in DCD Section 16.0, in PTS 5.6.1 Dominion retained (without the brackets) the GTS bracketed note allowing a single report to be made for a multiple unit station. Dominion also retained (without the brackets) the GTS bracketed phrase on report format, "[in the format of the table in the Radiological Assessment Branch Technical Position, Revision 1, November 1979]." This information applies to North Anna Unit 3 and is acceptable to the staff. Therefore, the resolution of this COL item is acceptable.
- Radioactive Effluent Release Report allowance for multiple unit stations to submit a single report (COL Item 5.6.2-1) in GTS 5.6.2. In accordance with the reviewer's note in DCD Section 16.0, in PTS 5.6.2 Dominion retained (without the brackets) the GTS bracketed note allowing a single report to be made for a multiple unit station. This information applies to North Anna Unit 3 and is acceptable to the staff. Therefore, the resolution of this COL item is acceptable.
- References to any additional individual specifications that address core operating limits (COL Item 5.6.3-2) in GTS 5.6.3. Dominion omitted the GTS bracketed placeholder in PTS 5.6.3 since no additional plant-specific specifications address core operating limits. Therefore, the resolution of this COL item is acceptable.
- Description of site location (COL Item 4.1-1) in GTS 4.1. The staff verified that the PTS 4.1 descriptions of the North Anna Unit 3 site location and exclusion area are accurate. Therefore, the resolution of this COL item is acceptable.
- Non-licensed operator manning requirements (COL Item 5.2.2-1) in GTS 5.2.2. The reviewer's note in DCD Section 16.0 requires the COL applicant to determine if the unit will

- Outdoor liquid storage tank radioactivity monitoring program (COL Item 5.5.6-1). GTS 5.5.6, “Explosive Gas and[ Storage Tank] Radioactivity Monitoring Program,” contains bracketed requirements and a surveillance program for unprotected outdoor liquid radioactive waste storage tanks. The reviewer’s note in DCD Section 16.0 requires that the COL applicant incorporate the GTS 5.5.6 bracketed requirements in PTS 5.5.6 if the site design includes such storage tanks. Since North Anna Unit 3 does not include such storage tanks, PTS 5.5.6 omits these bracketed requirements. Therefore, the resolution of this COL item is acceptable.

The following COL items proposed for resolution using Option 1 are still pending because the site-specific information has either not yet been provided, or is still being reviewed by the staff.

- Requirements related to the reactor coolant system (RCS) pressure and temperature limits report (PTLR) (COL Items 1.1-1, 3.4.4-1, 3.4.4-2, 3.4.4-3, and 5.6.4-1) (Information has not yet been provided);
- Requirements related to protecting against hazardous chemicals (COL Items 3.3.7.1-2, 3.3.7.2-1, 3.7.2-1, and 5.5.12-1) (Staff review is pending resolution of RAI 02.02.03-7);
- Allowing use of a modified performance discharge test to verify battery capacity for operational flexibility (COL Items 3.8.1-3 and 3.8.3-2) (Information has not yet been provided); and
- Battery operability criteria (COL Items 3.8.1-2, 3.8.1-4, 3.8.1-5, 3.8.3-1, 3.8.3-3, 3.8.3-4, and 5.5.10-1) (Information has not yet been provided);

Option 2 The staff determines whether the site-specific information provided under Option 2 is acceptable by verifying the information is bounding and useable for unit operation by comparing the information with the FSAR and the conditions in the associated reviewer’s note in DCD Section 16.0, and reviewing the justification included in the COL application, including how the bounding value was determined. The following COL items have been proposed for resolution using Option 2, but are pending because the site-specific bounding information has not yet been provided.

- Minimum control rod drive scram accumulator pressure (COL Items 3.1.5-1 and 3.9.5-1);
- Battery charger surveillance test duration (COL Item 3.8.1-1); and
- CRHAVS EFU differential pressure surveillance acceptance criterion (COL Item 5.513-1)

Option 3 The staff determines whether the site-specific information provided under Option 3 is acceptable by verifying the PTS administrative program for controlling the relocated information (1) conforms to the GTS, if the GTS contains such a program, or evaluating the proposed administrative controls program for conformance to applicable regulatory requirements; (2) specifies using an NRC-approved methodology for determining site-specific information to be maintained outside of the PTS; (3) specifies establishing a document to record the most recent version of the relocated information; (4) specifies controlling changes to the specified document in accordance with 10 CFR 50.59 and the specified NRC-approved methodology; and (5)

specifies the schedule for providing the NRC with updates to the specified document. The staff also verifies that the PTS includes appropriate references to the proposed PTS administrative program, as needed to establish a connection between the relocated information and the associated individual PTS requirements.

Dominion proposed using Option 3 to resolve COL items for providing instrumentation allowable values by (1) removing all instrumentation settings from PTS, and (2) specifying a setpoint control program (SCP) meeting the above stated acceptance criteria for a PTS administrative program under Option 3. All GTS COL items proposed for resolution using Option 3 are pending because the staff has not completed reviewing the ESBWR setpoint methodology (Refs. 16-2 and 16-3) and GTS 5.5.11, "Setpoint Control Program," upon which PTS 5.5.11 is based. These COL items are 3.1.7-1, 3.3.1.1-1, 3.3.1.4-1, 3.3.5.1-1, 3.3.5.3-1, 3.3.6.1-1, 3.3.6.3-1, 3.3.7.1-1, 3.3.8.1-1, 3.7.1-1, 3.7.2-2, 3.7.6-2, and 5.5.11-1.

The staff determined that the North Anna Unit 3 COL application contains no Tier 1 or Tier 2 departures from the ESBWR DCD that affect the PTS and bases. The COL application also contains no issues concerning information outside of the DCD, other than the PTLR and the ESBWR setpoint methodology, that need to be resolved before completing the review of the PTS and bases.

The review of the PTS and bases is not complete because the staff must first confirm the resolution of the two exemption requests, all of the COL items listed in Section 16.2, and the incorporation of ESBWR certified design GTS and bases. These items must first be resolved and verified to conclude that the PTS and bases are complete and acceptable. These items are designated as Open Item 16-1.

#### **16.5 Post Combined License Activities**

There are no post COL activities related to this chapter.

#### **16.6 Conclusion**

NRC staff concluded that the information pertaining to the North Anna Unit 3 PTS and bases has adequately incorporated the ESBWR GTS.

The NRC staff is currently reviewing Chapters 16 and 16B of the ESBWR DCD on Docket No. 52-010. The staff's technical evaluation of the GTS and bases, which are incorporated by reference into the PTS and bases, will be documented in the SER on the DC application for the ESBWR. Completion of the SER on the ESBWR GTS and bases is being tracked as part of Open Item [1-1]. The staff will update this chapter in the SER to reflect the final approved version of the ESBWR GTS and bases and the associated final SER.

In addition, the staff compared the additional COL site-specific information in the application to the relevant NRC regulations, the acceptance criteria defined in NUREG-0800 Section 16.0, and other guidance. However, because of Open Item 16-1, the staff cannot complete its review regarding the PTS and bases against the requirements of 10 CFR 50.36 and 50.36a and 10 CFR 52.79(a)(30).

## REFERENCES

- 16-1 MFN 08-458 *Response to Portion of NRC Request for Additional Information Letter No. 166 Related to ESBWR Design Certification Application – Design of Structures, Components, Equipment, and Systems – RAI Number 3.9-168 Supplement 2*, dated May 14, 2008
- 16-2 MFN 08-898 NEDE-33304P, "GEH ABWR/ESBWR Setpoint Methodology," Revision 1, dated November 2008 - GEH Proprietary Information
- 16-3 MFN 08-742 *Response to Portion of NRC Request for Additional Information Letter No. 251 Related to ESBWR Design Certification Application*, RAI Number 7.1-102, dated October 17, 2008