

13 CONDUCT OF OPERATIONS

This chapter of the safety evaluation report (SER) documents the U.S. Nuclear Regulatory Commission (NRC) staff's (hereinafter referred to as the staff) review of Chapter 13, "Conduct of Operations," of the NuScale Power, LLC (hereinafter referred to as the applicant) Design Certification Application (DCA), Part 2, "Final Safety Analysis Report [FSAR]," (DCA Part 2). The Phase 2 SER for this chapter (ML18233A533) identified two Open Items (OIs), both of which the applicant addressed through information submitted on the docket. Rather than discuss the individual OIs in this SER chapter, the staff has directly evaluated the adequacy of the information submitted on the docket to address them, which is included in the current version of the DCA. All the OIs have been satisfactorily closed. The staff's regulatory findings documented in this SER are based on the latest version of the application on the docket.

13.1 Organizational Structure

13.1.1 Introduction

A combined license (COL) applicant's organizational structure includes the corporate-level management and technical support organization and the onsite operating organization. The management and technical support organization includes the corporate or home office offsite organization; associated functions, activities, and responsibilities; and the approximate number and qualifications of offsite personnel necessary to ensure that sufficient technical resources have been, are being, and will continue to be provided to accomplish the safe design, construction, testing, and operation of the nuclear plant. The onsite operating organization includes the structure, functions, activities, responsibilities, and the approximate number and qualifications of onsite personnel necessary to safely operate and maintain the facility.

The staff reviewed the DCA to evaluate the COL information items that pertain to (1) COL applicant descriptions of the corporate-level management and technical support organization and (2) COL applicant descriptions of the onsite operating organization.

13.1.2 Summary of Application

DCA Part 2 Tier 1: There is no Tier 1 information associated with this section.

DCA Part 2 Tier 2: The plans for a corporate-level, technical, and onsite organizational structure to support, design, construct, test, operate, and maintain the nuclear plant are not within the scope of the NuScale DCA. This responsibility resides with the COL applicant. In DCA Part 2 Tier 2, Revision 3, Section 13.1, "Organizational Structure," the applicant specified COL information items for the COL applicant to describe the corporate-level management and technical support organization and the onsite operating organization.

ITAAC: The applicant has not proposed any ITAAC related to this area of review.

Technical Specifications: There are no technical specifications (TS) for this area of review.

Technical Reports: There are no technical reports (TRs) associated with this area of review.

13.1.3 Regulatory Basis

Section 13.1.1, “Management and Technical Support Organization,” and Section 13.1.2 – 13.1.3, “Operating Organization,” of NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition” (SRP), identifies, in part, the relevant NRC regulatory requirements for organizational structure and the associated acceptance criteria.

The applicable regulatory requirements for the organizational structure are as follows:

- 10 CFR 50.34(f)(3)(vii), as it pertains to requirements related to lessons learned from the accident at Three Mile Island (TMI) for the applicant to describe the management plan for design and construction activities of the proposed plant.
- 10 CFR 50.40(b), which requires the COL applicant to be technically qualified to engage in activities associated with the design, construction, and operation of a nuclear power plant.
- 10 CFR 50.48(a)(1)(ii), as it pertains to information that must be included in the fire protection plan of the holder of a COL under 10 CFR Part 52, specifically, the identification of the various positions within the licensee’s organization that are responsible for the program.
- 10 CFR 50.54(i), (j), (k), (l), and (m), as they pertain to the organizational staffing requirements for, and responsibilities of, operators and senior operators licensed under 10 CFR Part 55, “Operators’ Licenses.”
- 10 CFR Part 50, Appendix B, as it pertains to organizational responsibilities for the establishment and execution of the quality assurance program.
- Sections 52.79(a)(26)–(28) and (29)(i) of 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants”, as they pertain to information that must be included in the FSAR that is submitted as part of the application for a COL, specifically:
 - (1) the applicant’s organizational structure, allocations or responsibilities and authorities, and personnel qualifications requirements for operation;
 - (2) managerial and administrative controls to be used to assure safe operation as established in 10 CFR Part 50, Appendix B;
 - (3) plans for preoperational testing and initial operations; and
 - (4) plans for the conduct of normal operations.

The related acceptance criteria are as follows:

- Section III, “Acceptance Criteria,” of SRP Section 13.1.1, Revision 6, issued August 2016.
- Section III of SRP Section 13.1.2 – 13.1.3, Revision 7, issued August 2016.

- Review Criterion 6.4(2) in Section 6, “Staffing and Qualifications,” of NUREG-0711, “Human Factors Engineering Program Review Model,” Revision 3, issued November 2012.
- NUREG-1791, “Guidance for Assessing Exemption Requests from the Nuclear Power Plant Licensed Operator Staffing Requirements Specified in 10 CFR 50.54(m),” issued July 2005.
- NUREG/CR-6838, “Technical Basis for Regulatory Guidance for Assessing Exemption Requests from the Nuclear Power Plant Licensed Operator Staffing Requirements Specified in 10 CFR 50.54(m),” issued February 2004.

13.1.4 Technical Evaluation

The COL applicant is responsible for describing the corporate-level management and technical support organization and the onsite operating organization. This section presents the staff’s evaluation of the COL information items that pertain to the COL applicant’s organizational structures.

13.1.4.1 Combined License Information Items

The NRC regulations require a COL applicant that references the NuScale certified design to address the site-specific information described in the COL information items at the COL stage.

13.1.4.1.1 Management and Technical Support Organization

The SRP Section 13.1.1 states that for the management and technical support organization, the COL applicant’s Safety Analysis Report (SAR) should:

- (1) describe the qualification requirements for each identified position or class of positions that provide technical support to the onsite operating organization, and
- (2) specify the qualification requirements for individuals holding management and supervisory positions in organizational units that provide support to the onsite operating organization.

In DCA Part 2 Tier 2, Section 13.1.1, “Management and Technical Support Organization,” the applicant specified COL Item 13.1-1, which directs the COL applicant to describe the corporate-level or home office management and technical support organization and specify the necessary qualification requirements for positions within the management and technical support organization that provide technical support to the onsite operating organization. The staff finds that COL Item 13.1-1 appropriately addresses the information that the COL applicant should provide for corporate-level management and technical-support organizations.

13.1.4.1.2 Operating Organization

The SRP Section 13.1.2 – 13.1.3 states that the COL applicant’s SAR should describe (1) the structure, functions, and responsibilities of the onsite operating organization established to operate and maintain the plant and (2) any alternatives to the requirements involving the

number of licensed personnel, as specified in 10 CFR 50.54(m). Consistent with the SRP, in DCA Part 2 Tier 2, Section 13.1.2, “Operating Organization,” COL Information Item 13.1-2 directs the COL applicant to describe the onsite operating organization, including the structure, functions, and responsibilities. In addition, COL Item 13.1-2 specifies that the proposed operating staff shall be consistent with the minimum licensed operator staffing requirements in DCA Part 2 Tier 2, Section 18.5, “Staffing and Qualification.” In DCA Part 2 Tier 2, Section 18.5, the applicant describes a staffing level and qualifications analysis that is an alternative to the requirements of 10 CFR 50.54(m). Within the context of the Chapter 13 review, the staff concludes that it is acceptable for the COL Item to reference the discussion in DCA Part 2 Tier 2, Section 18.5. Accordingly, the staff determined that COL Item 13.1-2 appropriately identifies information the COL applicant needs to provide for the onsite operating organization. SER Chapter 18 describes the staff’s evaluation of the staffing and qualification element of the NuScale human factors engineering program.

The SRP Section 13.1.2 –13.1.3 states that the COL applicant’s SAR should describe the education, training, and experience requirements (qualification requirements) that the applicant established to fill each management, operating, technical, and maintenance position category in the operating organization. In DCA Part 2 Tier 2, Revision 3, Section 13.1.3, COL Item 13.1-3 directs the COL applicant to describe the qualification requirements for each of the identified position categories for the operating organization. Accordingly, the staff determined that COL Item 13.1-3 appropriately identifies information the COL applicant needs to provide regarding the qualification requirements for the operating organization.

13.1.5 Combined License Information Items

Table 13.1-5 lists COL information items related to the organizational structure from DCA Part 2 Tier 2, Table 1.8-2, “Combined License Information Items.” The staff verified that DCA Part 2 Tier 2, Revision 3, adequately reflects the COL information items presented in Table 13.1-5.

Table 13.1-5 NuScale COL Information Items related to Section 13.1

| Item No. | Description | DCA Part 2 Tier 2 Section |
|-----------------|---|---------------------------|
| COL Item 13.1-1 | A COL applicant that references the NuScale Power Plant design certification will provide a description of the corporate or home office management and technical support organization, including a description of the qualification requirements for (1) each identified position or class of positions that provide technical support to the onsite operating organization, and (2) individuals holding management and supervisory positions in organizational units providing technical support to the onsite operating organization. | 13.1.1 |
| COL Item 13.1-2 | A COL applicant that references the NuScale Power Plant design certification will provide a description of the proposed structure, functions, and responsibilities of the onsite organization necessary to operate and maintain the plant. The proposed operating staff shall be consistent with the minimum licensed operator staffing requirements in Section 18.5. | 13.1.2 |
| COL Item 13.1-3 | A COL applicant that references the NuScale Power Plant design certification will provide a description of the qualification requirements for | 13.1.3 |

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| | each management, operating, technical, and maintenance position described in the operating organization. | |
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13.1.6 Conclusion

For the reasons given above, the staff concludes that the COL information items specified in Table 13.1-5 and included in DCA Part 2 Tier 2, Revision 3, are sufficient to identify information that the COL applicant needs to provide to meet the applicable requirements of 10 CFR 50.34(f)(3)(vii); 10 CFR 50.40(b); 10 CFR 50.48(a)(1)(ii); 10 CFR 50.54(i), (j), (k), and (l); 10 CFR Part 50, Appendix B; 10 CFR 52.79 (a)(26)-(28), and (29)(i); and the NuScale-specific minimum licensed operator staffing requirements in lieu of 10 CFR 50.54(m).

13.2 Training

13.2.1 Introduction

A COL applicant's training program should include (1) the initial license training program for reactor operators and senior reactor operators, (2) the licensed operator requalification program, and (3) the non-licensed plant staff training program, which consists of initial training, periodic retraining, and qualification(s) for non-licensed operators, shift supervisors, shift technical advisors, instrumentation and control (I&C) technicians, electrical maintenance personnel, mechanical maintenance personnel, radiological protection technicians, chemistry technicians, and engineering support personnel.

The staff reviewed the DCA to evaluate the COL information items that pertain to the COL applicant's description of, and schedule for, (1) the licensed operator training program for reactor operators and senior reactor operators, including the licensed operator requalification program, and (2) the training program for the non-licensed plant staff.

13.2.2 Summary of Application

DCA Part 2 Tier 1: There is no Tier 1 information associated with this section.

DCA Part 2 Tier 2: The development of site-specific training programs is not within the scope of the NuScale DCA. This responsibility resides with the COL applicant. In DCA Part 2 Revision 3, Tier 2, Section 13.2, "Training," the applicant specified two COL information items that direct the COL applicant to describe the initial license training program, the licensed operator requalification program, and the nonlicensed plant staff training program and to provide schedules for these programs.

ITAAC: The applicant has not proposed any ITAAC related to this area of review.

Technical Specifications: There are no TS for this area of review.

Technical Reports: There are no TRs associated with this area of review.

13.2.3 Regulatory Basis

The SRP Section 13.2.1, "Reactor Operator Requalification Program; Reactor Operator Training," and SRP Section 13.2.2, "Non-Licensed Plant Staff Training," identify, in part, the relevant NRC regulatory requirements for training and the associated acceptance criteria.

The applicable regulatory requirements for training are as follows:

- 10 CFR 19.12, "Instruction to workers," as it pertains to instructions provided to workers regarding protection of personnel from exposure to radiation or radioactive material.
- 10 CFR 26.29, "Training," as it pertains to employee training associated with the fitness-for-duty program.
- 10 CFR 50.34(f)(2)(ii), as it pertains to the TMI-related requirement for applicants to establish a program to begin during construction and to follow into operation for assessing and improving plant procedures applicable to operator training.
- 10 CFR 50.40(a) and (b), as they pertain to the issuance of a COL under 10 CFR Part 52 based on considerations of whether the applicant (1) is technically qualified to engage in activities associated with the design, construction, and operation of a nuclear power plant and (2) has established the licensed and non-licensed plant staff training programs necessary to provide reasonable assurance that the nuclear power plant can be safely operated.
- 10 CFR 50.54 (i-1), as it pertains to requirements for the establishment of a licensed operator requalification training program within 3 months after the date that the Commission makes the finding under 10 CFR Part 52.103(g) that the acceptance criteria in the COL are met.
- 10 CFR 50.120(b)(1)–(3), as they pertain to requirements for the establishment, implementation, and maintenance of training programs derived from a systems approach to training as defined in 10 CFR 55.4, "Definitions," for specific categories of nuclear power plant personnel.
- 10 CFR Part 50, Appendix B, as it pertains to the training and technical qualifications of personnel who perform activities that affect the quality of structures, systems, and components (SSCs) that are covered by the quality assurance program.
- 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," as it pertains to the requirements for emergency preparedness training of employees and other persons whose assistance may be needed in the event of a radiological emergency (e.g., local emergency services and law enforcement personnel), including participation in drill and exercise scenarios to provide performance opportunities to develop, maintain, and demonstrate key skills.

- 10 CFR 52.79(a)(26)–(28) and (29)(i), as they pertain to information to be included in the COL FSAR, specifically:
 - (1) the qualification requirements of licensed and non-licensed plant personnel to engage in activities associated with operation of the nuclear power plant,
 - (2) the controls associated with the training of personnel who perform activities that affect the quality of SSCs that are covered by the quality assurance program as established in 10 CFR Part 50, Appendix B,
 - (3) plans for licensing personnel and training non-licensed plant staff before criticality to support preoperational testing activities and initial operations, and
 - (4) plans for licensed and non-licensed plant staff to receive the technical and administrative training required to operate, test, and maintain the nuclear power plant during the conduct of normal operations.
- 10 CFR 52.79(a)(14), (21), (33), (34), (36), (39), (40) and (44), as they pertain to information that must be included in the FSAR that an applicant submits as part of the application for a COL, specifically, descriptions of (1) licensed operator training required by 10 CFR Part 55 and (2) training required by 10 CFR 50.120, “Training and qualification of nuclear power plant personnel,” for specific categories of nuclear power plant personnel, and (3) non-licensed plant staff training associated with security procedures, radiological emergency plans, radiation protection, fire protection, and fitness for duty.
- 10 CFR 55.4, as it pertains to Commission-approved training programs that are based on a “systems approach to training.”
- 10 CFR 55.31(a)(4)–(5), as they pertain to the documentation requirements associated with successful completion by an applicant for an operator license of a facility licensee’s training program, when the facility licensee requests administration of the licensing exam (i.e., written examination and operating test).
- 10 CFR 55.41, “Written examination: Operators,” as it pertains to requirements associated with the content and makeup of the NRC’s written examination for operators.
- 10 CFR 55.43, “Written examination: Senior operators,” as it pertains to requirements associated with the content and makeup of the NRC’s written examination for senior operators.
- 10 CFR 55.45, “Operating tests,” as it pertains to requirements associated with (1) the content and makeup of the NRC’s operating test for operators and senior operators and (2) the use of a Commission approved simulation facility, a plant-referenced simulator, or the physical plant for administration of the operating test.
- 10 CFR 55.46, “Simulation Facilities,” as it pertains to requirements for the use of simulation facilities in the administration of the NRC operating test.

- 10 CFR 55.59, "Requalification," as it pertains to requirements associated with licensed operator requalification training programs.

The related acceptance criteria are as follows:

- Section III of SRP Section 13.2.1, Revision 4, issued August 2016.
- Section III of SRP Section 13.2.2, Revision 4, issued August 2016.
- Regulatory Guide (RG) 1.8, "Qualification and Training of Personnel for Nuclear Power Plants," Revision 3, issued May 2000.
- RG 1.149, "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations," Revision 4, issued April 2011.
- NUREG-0711, Revision 3.
- NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 11, issued February 2017.
- NUREG-1220, "Training Review Criteria and Procedures," Revision 1, issued January 1993.

13.2.4 Technical Evaluation

The COL applicant is responsible for the development of site-specific training programs. This section presents an evaluation of the COL information items that pertain to training programs for licensed and non-licensed plant staff.

13.2.4.1 Combined License Information Items

The NRC regulations require the COL applicant that references the NuScale certified design to address the site-specific information described in COL information items at the COL stage.

13.2.4.1.1 Licensed and Non-licensed Plant Staff Training Programs

The SRP Section 13.2.1 states that the COL applicant should describe the description and scheduling of the licensed operator training program for reactor operators and senior reactor operators, including the licensed operator requalification program. SRP Section 13.2.2 states that the COL applicant's non-licensed plant staff training program should include the initial training, periodic retraining, and qualification that are required for non-licensed plant staff. The staff reviewed DCA Part 2 Tier 2, Section 13.2, COL Item 13.2-1 and found that it specifies the appropriate and necessary information for licensed plant staff. The staff reviewed DCA Part 2 Tier 2, Section 13.2, COL Item 13.2-2, and found that it specifies the appropriate and necessary information for non-licensed plant staff training programs. The staff also verified that Revision 3 of the DCA Part 2 Tier 2 adequately incorporates the COL information items presented in Table 13.2-5.

13.2.5 Combined License Information Items

Table 13.2-5 lists COL information item numbers and descriptions related to training from DCA Part 2 Tier 2, Table 1.8-2. Revision 3 of the DCA reflects the COL information items presented in Table 13.2-5.

Table 13.2-5 NuScale COL Information Items related to Section 13.2

| Item No. | Description | DCA Part 2 Tier 2 Section |
|-----------------|--|---------------------------|
| COL Item 13.2-1 | A COL applicant that references the NuScale Power Plant design certification will provide a description and schedule of the initial training and qualification as well as requalification programs for reactor operators and senior reactor operators. | 13.2 |
| COL Item 13.2-2 | A COL applicant that references the NuScale Power Plant design certification will provide a description and schedule of the non-licensed plant staff training programs, including initial training, periodic retraining, and qualification requirements. | 13.2 |

13.2.6 Conclusion

For the reasons given above, the staff concludes that the COL information items specified in Table 13.2-5 of this SER and included in DCA Part 2 Tier 2, Revision 3, are sufficient to identify information the COL applicant needs to provide to meet the applicable requirements of 10 CFR 19.12; 10 CFR 26.29; 10 CFR 50.34; 10 CFR 50.40; 10 CFR 50.54; 10 CFR 50.120; 10 CFR Part 50, Appendix B; 10 CFR Part 50, Appendix E; 10 CFR 52.79; and 10 CFR Part 55.

13.3 Emergency Planning

13.3.1 Introduction

The NRC staff conducts its review of emergency planning (EP) in the DCA in accordance with the requirements in 10 CFR 52.47 and 10 CFR 52.48, "Standards for review of applications." The review addresses those design features, facilities, functions, and equipment that are technically relevant to the design, that are not site specific, and that affect some aspect of EP or the capability of a licensee to cope with plant emergencies. In addition, the review addresses design facilities such as a habitable technical support center (TSC) with adequate space, data retrieval capabilities, and dedicated communications equipment and an operational support center (OSC) with adequate communications. There is no minimum level of design-related EP that an application must address. The applicant may choose the extent to which the application includes EP features to be reviewed as part of the design certification.

The NRC staff conducted the review of design information and COL information items (designated as COL items) related to EP and documented the results in this section of Chapter 13. The COL items are listed in SER Section 13.3.5.

13.3.2 Summary of Application

The NuScale DCA contains DCA Part 2, which is divided into two tiers (Tier 1 and Tier 2). The sections below summarize the information submitted in Tier 1 and Tier 2.

DCA Part 2 Tier 1: DCA Part 2 Tier 1, Section 3.2, “Normal Control Room Heating Ventilation and Air Conditioning System,” describes the normal control room heating, ventilation, and air conditioning (HVAC) system, which is also referred to as the control room ventilation system (CRVS). The CRVS serves the entire control building (CRB), which includes the TSC, and the access tunnel between the CRB and the reactor building (RXB). The CRVS is not related to safety. DCA Part 2 Tier 1, Table 3.2-2, “Normal Control Room Heating Ventilation and Air Conditioning Inspections, Tests, Analyses, and Acceptance Criteria,” includes the ITAAC associated with the CRVS. SER Section 14.3 evaluates these ITAAC.

DCA Part 2 Tier 2: In DCA Part 2 Tier 2, Section 13.3, “Emergency Planning,” the applicant stated that the NuScale design includes, “[d]esign features, facilities, and equipment that are usable for up to 12 NuScale Power Modules to support emergency response functions.” DCA Part 2 Tier 2, Section 13.3, describes that the TSC is located on the 30.48-meter (m) (100-foot (ft)) elevation of the CRB. Additionally, the TSC design ensures that TSC personnel are protected from radiological hazards during accident conditions (i.e., radiation dose is limited to 5 roentgen equivalent man (rem) total effective dose equivalent (TEDE) for the duration of the accident).

In the event of a loss of CRVS or if the TSC becomes otherwise uninhabitable, personnel are evacuated and the TSC functions are transferred to an alternate location. Although EP is, for the most part, the responsibility of the COL applicant, the design bases for the standard plant include design features, facilities, functions, and equipment necessary for EP. The COL applicant is responsible for the interfaces of these features with site-specific parameters. In DCA Part 2 Tier 2, Section 13.3, the applicant stated that “[i]n the event of a loss of ventilation, or if the TSC becomes otherwise uninhabitable, personnel are evacuated and the TSC functions are transferred to a location designated by the emergency plan (COL Item 13.3-3).”

The design bases for the standard plant include the following EP features:

- TSC

A Technical Support Center (TSC) is an onsite facility that provides plant management and technical support to the plant operations personnel during emergency conditions.

- emergency response data system

An emergency response data system (ERDS) is a direct near-real-time electronic data transmission system linked to the NRC Headquarters Operation Center that provides plant parameters from the onsite computer system. It allows the NRC to assess plant conditions and provide advice and support to the licensee and to Federal, State, and local authorities.

- OSC

An Operations Support Center (OSC) is a facility for emergency maintenance and other support personnel to gather as a ready resource to support actions initiated by the control room during an emergency. The applicant has identified COL Item 13.3-1, which directs the COL applicant to describe the onsite OSC.

- emergency operations facility

An emergency operations facility (EOF) is a support facility for the management of overall licensee emergency response (including coordination with Federal, State, and local officials), coordination of radiological and environmental assessments, and determination of recommended public protective actions. The applicant has identified COL Item 13.3-2, which directs the COL applicant to describe the site-specific EOF.

- TSC engineering workstations

The TSC engineering workstations are part of the module control system (MCS) and plant control system (PCS), which provide monitoring functionality to plant processes and equipment. DCA Part 2 Tier 2, Section 7.2.13.7, "Other Information Systems," further describes the TSC engineering workstations, and the corresponding section of this SER evaluates these workstations.

- decontamination facilities

Decontamination facilities, located in the annex building, are provided to remove or reduce radioactive contaminants from plant equipment, protective clothing, and personnel. DCA Part 2 Tier 2, Section 12.1.2.3, "Facility Layout General Design Considerations for Maintaining Radiation Exposures ALARA," includes more information on the decontamination facilities, and the corresponding section of this SER evaluates these facilities.

The following DCA Part 2 Tier 2 sections describe the design features with an interface to EP:

- Section 2.3, "Meteorology"
- Section 6.4, "Control Room Habitability"
- Section 7.2.13.7, "Other Information Systems"
- Section 9.3.2, "Process Sampling System"
- Section 9.4.1, "Control Room Area Ventilation System"
- Section 9.5.2, "Communication System"
- Section 12.1.2.3, "Facility Layout General Design Considerations for Maintaining Radiation Exposures ALARA"
- Section 12.3, "Radiation Protection Design Features"

- Section 12.4, “Dose Assessment”
- Section 12.5, “Operational Radiation Protection Program”
- Section 15.0.3, “Design Basis Accident Radiological Consequence Analyses for Advanced Light Water Reactors”
- Section 18.0, “Human Factors Engineering”

The respective sections of this SER address the staff’s evaluation of these additional DCA Part 2 sections.

ITAAC: The COL applicant will provide proposed ITAAC to support the facility’s EP, as appropriate considering site-specific information (see COL Item 14.3-1).

13.3.3 Regulatory Basis

The following NRC regulations contain the relevant requirements for this review:

- 10 CFR 52.79(a)(21) requires a COL application to include emergency plans complying with 10 CFR 50.47, “Emergency plans,” and 10 CFR Part 50, Appendix E. Although a DCA is not required to provide this information, any EP-related information a design certification applicant requests be certified to support a future COL application must comply with these COL regulations.
- 10 CFR 50.47;
- 10 CFR 100.1, “Purpose”; 10 CFR 100.3, “Definitions”; 10 CFR 100.20, “Factors to be considered when evaluating sites”; and 10 CFR 100.21(g), as they relate to EP and emergency preparedness.
- 10 CFR Part 50, Appendix E, as it relates to EP and the ERDS.
- 10 CFR 52.48, as it relates to EP information in 10 CFR 50.47 submitted in a standard DCA.
- 10 CFR 52.47(b)(1), which requires that a DCA include the proposed ITAAC that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a facility that incorporates the design certification has been constructed and will be operated in accordance with the design certification; the provisions of the Atomic Energy Act of 1954, as amended; and the NRC’s rules and regulations.

The following guidance documents provide criteria relevant to this review and are used to confirm that the above requirements have been adequately addressed:

- SRP Section 13.3 lists the acceptance criteria that are adequate to meet the above requirements and the review interfaces with other SRP sections.

- NUREG-0654 contains specific acceptance criteria that the NRC has determined provide an acceptable means of complying with the standards in 10 CFR 50.47.
- NUREG-0696, "Functional Criteria for Emergency Response Facilities," issued February 1981, describes the facilities and systems that nuclear power plant licensees will use to improve responses to emergencies.
- NUREG-0737, Supplement 1, describes post-TMI requirements for emergency response capabilities that have been approved for implementation.
- The NRC Office of Nuclear Security and Incident Response (NSIR)/Division of Preparedness and Response (DPR) Interim Staff Guidance (ISG) document, NSIR/DPR-ISG-01, "Interim Staff Guidance—Emergency Planning for Nuclear Power Plants," issued November 2011, provides updated guidance for addressing EP requirements for nuclear power plants based on changes to emergency preparedness regulations in 10 CFR 50.47 and 10 CFR Part 50, Appendix E, that the NRC published in the *Federal Register* on November 23, 2011 (Volume 76 of the *Federal Register* (FR), page 72560 (76 FR 72560)).

13.3.4 Technical Evaluation

13.3.4.1 Technical Support Center

The staff reviewed the information in DCA Part 2 for conformance with the applicable standards and requirements identified in SRP Section 13.3. DCA Part 2 Tier 2, Section 13.3, "Emergency Planning," and other DCA Part 2 chapters listed in SER Section 13.3.2 describe the design features of the TSC for the NuScale standard design.

The TSC is an onsite facility that provides plant management and technical support to the plant operations personnel during emergency conditions. DCA Part 2 Tier 2, Section 13.3, describes the physical location and size of the TSC. DCA Part 2 Tier 2, Section 13.3, notes that the TSC is located on the 100-foot elevation of the control building, which is a seismic Category I structure below the 120-foot elevation, as discussed in DCA Part 2 Tier 2, Section 3.8.4.1.2, "Control Building." (For reference, see staff's request for additional information (RAI) No. 8925, Question 13.03-2, as well as the applicant's response, in ADAMS Accession No. ML17264B172).

The TSC is sized to provide working space of 75 square feet per person to avoid crowding and is designed to accommodate at least 25 people, including 5 NRC staff members and 20 utility staff members. This is consistent with the specific space and personnel accommodation criteria in NUREG-0696, Section 2.4, and is acceptable. The TSC includes 2,500 square feet for a technical evaluation room and an additional 1,000 square feet for storage, three offices, and two conference rooms.

The TSC is equipped with voice communications systems, which provide communications between the TSC and the following locations: the plant, local, and offsite emergency response facilities; the NRC; and local and State operations centers. DCA Part 2 Tier 2, Section 9.5.2.2, "System Description," provides additional information on the TSC's voice communications systems. The associated SER Section 9.5.2, "Communication Systems," documents the staff's evaluation and finding that the communications systems are acceptable.

DCA Part 2 Tier 2, Section 8.3.1.1.2, states that the backup power supply system (BPSS) is designed to provide electrical power to the NuScale power plant when normal alternating current (ac) power is not available and that it includes two redundant backup diesel generators and an auxiliary ac power source. The associated SER Chapter 8 sections document the staff's evaluation of the capability of the normal and backup power systems. (For reference, see staff's RAI 8925, Question 13.03-3, Part ii, as well as the applicant's response, in ADAMS Accession No. ML17264B172).

Section 2.8 of NUREG-0696 states that the TSC must contain primary and backup power in order to maintain continuity of TSC functions and to immediately resume data acquisition, storage, and display of TSC data in the event of a loss of power. The applicant's description of the normal and backup power sources to the TSC equipment show that the TSC has an adequate source of reliable power from a normal and backup system to maintain continuity of TSC functions including data acquisition, storage, and display.

The TSC has the purpose of protecting personnel from direct, airborne, in-plant radiological hazards under accident conditions. DCA Part 2 Tier 2, Section 13.3, states, in part, "The design ensures that personnel are protected from radiological hazards, including direct radiation and airborne radioactivity from in-plant sources under accident conditions (i.e., maximum of 5 rem TEDE for the duration of the accident)."

Section 2.6, "Habitability," of NUREG-0696 states that the purpose of the TSC is to provide direct management and technical support to the control room during an accident. Section II.B.2, "Design Review of Plant Shielding and Environmental Qualification of Equipment for Spaces/Systems Which May Be Used in Postaccident Operations," of NUREG-0737 states that any area that will, or may, require occupancy to permit an operator to aid in the mitigation of, or recovery from, an accident is designated as a "vital area." The control room and TSC must be included among those areas to which access is considered vital after an accident. Further, the design dose rate for personnel in a vital area should be such that doses do not exceed the requirements of General Design Criterion (GDC) 19, "Control room," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, during an accident. GDC 19 requires that radiation protection be adequate to ensure that radiation exposure to personnel does not exceed 0.05-sievert (Sv) (5-rem) TEDE for the duration of the accident. In addition, NUREG-0737, Supplement 1, Section 8.2.1.f, states that the TSC will be provided with radiological protection and monitoring equipment necessary to assure that radiation exposure to any person working in the TSC would not exceed 0.05-Sv (5-rem) whole body or its equivalent to any part of the body for the duration of the accident (after NUREG-0737, Supplement 1, was published, the NRC revised GDC 2 so that the applicable dose for the DCA is 5-rem TEDE). These requirements and associated guidelines form the basic radiological habitability criteria for the TSC.

The SER Section 9.4.1 provides the staff's evaluation of the control room ventilation system (CRVS), which serves the main control room and TSC. The staff's evaluation of the radiological habitability of the TSC is addressed in SER Sections 6.4.4.7.5, "TSC Habitability," and 15.0.3.4.3, "Design Basis Accident Radiological Consequence Analyses." (For reference, see staff's RAI 8925, Question 13.03-2, Part ii, as well as the applicant's response, in ADAMS Accession No. ML17264B172).

The guidance in NUREG-0696, Section 2.6, "Habitability," addresses the potential need to move the TSC functions if the TSC becomes uninhabitable. The staff notes that as part of COL Item 13.3-3, the applicant has included a provision in the DCA for a future COL applicant to address

the need to designate a location in the COL application emergency plan for the transfer of TSC functions in the event of the loss of ventilation to the TSC, or if the TSC otherwise becomes uninhabitable. This is consistent with the guidance provided in NUREG-0696, Section 2.6, and is acceptable.

The staff concludes that for the matters reviewed in this section, the information provided in the application is consistent with the guidance identified in NUREG-0696, Supplement 1 to NUREG-0737, and the SRP. Since the information is consistent with the applicable guidance it is sufficient to meet the associated regulatory requirements. Therefore, the staff determined that the information reviewed in this section meets the applicable requirements of 10 CFR 50.47(b)(8) and (11), and Subsection IV.E.3 and IV.E.8 of Appendix E to 10 CFR Part 50.

13.3.4.2 Operational Support Center

The applicant has identified COL Item 13.3-1, which directs the COL applicant to describe the onsite OSC. The staff finds that the inclusion of a COL information item associated with the OSC is acceptable because the COL applicant must describe the OSC to comply with 10 CFR 50.47(b)(8). The NRC will evaluate the acceptability of a future COL applicant's proposed OSC as part of the COL application process.

13.3.4.3 Emergency Operations Facility

The applicant has identified COL Item 13.3-2, which directs the COL applicant to describe the site-specific EOF. The staff finds that the inclusion of a COL information item associated with the EOF is acceptable because the COL applicant must describe the EOF to comply with 10 CFR 50.47(b)(8) and 10 CFR Part 50, Appendix E. The NRC will evaluate the acceptability of a future COL applicant's proposed EOF as part of the COL application process.

13.3.4.4 Technical Support Center Engineering Workstations

In DCA Part 2 Tier 2, Section 13.3, the applicant noted that the TSC includes engineering workstations as described in DCA Part 2 Tier 2, Section 7.2.13.7.

The guidance in NUREG-0696, Section 2.8, "Instrumentation, Data System Equipment, and Power Supplies," calls for the TSC to have equipment to gather, store, and display data needed in the TSC to analyze plant conditions. The system which provides this capability is generically referred to as the safety parameter display system (SPDS). The applicant has explained that a TSC engineering workstation is provided which serves the same function as the generic SPDS. The TSC engineering workstation, which is part of the PCS, receives information from MCS and PAM, and has the capability to gather, store, and display data needed in the TSC. The staff finds that the TSC engineering workstations satisfy the guidance in NUREG-0696 and provide for equipment capable of gathering, storing, and displaying data needed in the TSC to analyze plant conditions. For this reason, the staff determined that this information meets the applicable requirements of 10 CFR 50.47(b)(8) and 10 CFR Part 50, Appendix E, Section IV.E.8.a(i). (For reference, see staff's RAI 8925, Question 13.03-3, as well as the applicant's response, in ADAMS Accession No. ML17264B172).

13.3.4.5 Emergency Response Data System

In DCA Part 2 Tier 2, Section 13.3, the applicant stated,

An emergency response data system compliant with Section VI of 10 CFR [Part] 50, Appendix E, provides a direct near-real-time electronic data link of selected parameters between the onsite computer system and the NRC Operations Center in the event of an emergency.

In consideration of COL Item 13.3-3, the NRC staff finds it acceptable for a future COL applicant to address the specific data transmitted through the ERDS as part of its emergency plan. (For reference, see staff's RAI 8925, Question 13.03-3, Part i, as well as the applicant's response, in ADAMS Accession No. ML17264B172).

The staff concludes that the application has provided an adequate description of a direct near real-time electronic data link between the onsite computer system and the NRC's ERDS that provides for the automated transmission of a limited data set of selected parameters. This meets the requirements in Section VI, "Emergency Response Data System," of Appendix E to 10 CFR Part 50 to have a connection to the ERDS.

13.3.4.6 Decontamination Facilities

Decontamination facilities are provided to remove or reduce radioactive contaminants from plant equipment, protective clothing, and personnel. As described in DCA Part 2 Tier 2, Section 12.1.2.3, and the associated section of the SER, personnel and equipment decontamination areas are located in the annex building.

The staff finds that the information provided in the application on the decontamination rooms is consistent with the guidance in Section II.K, "Radiological Exposure Control," of NUREG-0654 that such a facility should be provided. For this reason, the staff determined that this information meets the applicable requirements of 10 CFR 50.47(b)(8) and 10 CFR Part 50, Appendix E, Section IV.E.3.

13.3.4.7 Inspections, Tests, Analyses, and Acceptance Criteria

The applicant did not provide EP-specific ITAAC for the design and specified COL Item 14.3-1 for a future COL applicant to address ITAAC, as listed in SER Section 13.3.5. The NRC will evaluate the acceptability of a future COL applicant's proposed ITAAC as part of the COL application process. SER Section 14.3.10 also mentions the COL item.

13.3.5 Combined License Information Items

Table 13.3-5 lists COL information items related to EP, as provided in DCA Part 2 Tier 2, Sections 13.3 and 14.3. DCA Part 2 Tier 2, Section 13.3, provides information related to those aspects of EP that are nonsite-specific EP features and that are technically relevant to the design (i.e., facilities and equipment). However, the COL applicant that references the NuScale certified design is responsible for the programmatic aspects of EP and emergency preparedness. The NRC staff reviewed COL Information Items 13.3-1 through 13.3-3 and found them to be consistent with the regulatory standards in 10 CFR 50.47(b) and 10 CFR Part 52 and with the guidance in the SRP. Therefore, the staff finds that the proposed COL information items are sufficient in identifying information the COL applicant needs to provide to address the applicable requirements.

Table 13.3-5 NuScale COL Information Items related to Sections 13.3 and 14.3

| Item No. | Description | DCA Part 2 Tier 2 Section |
|-----------------|---|----------------------------------|
| COL Item 13.3-1 | A COL applicant that references the NuScale Power Plant design certification will provide a description of the onsite operational support center (OSC) including the direct communication system or systems between the OSC and the control room. | 13.3 |
| COL Item 13.3-2 | A COL applicant that references the NuScale Power Plant design certification will provide a description of an emergency operations facility for management of overall licensee emergency response. The facility will meet the requirements of 10 CFR 50.47(b)(8) and Section IV.E, "Emergency Facilities and Equipment," of Appendix E to 10 CFR Part 50. | 13.3 |
| COL Item 13.3-3 | A COL applicant that references the NuScale Power Plant design certification will provide a comprehensive emergency plan in accordance with 10 CFR 50.47, 10 CFR 50, Appendix E, 10 CFR 52.48, and 10 CFR 52.79(a)(21). | 13.3 |
| COL Item 14.3-1 | A COL applicant that references the NuScale Power Plant design certification will provide the site-specific selection methodology and Inspections, Tests, Analyses, and Acceptance Criteria for emergency planning. | 14.3 |

13.3.6 Conclusion

The staff concludes, on the basis of its review as described above, that the applicant has adequately addressed the EP design-related features for the NuScale power plant design. Therefore, the information is acceptable and meets the applicable requirements listed in SER Section 13.3.3.

13.4 Operational Programs

13.4.1 Introduction

A COL applicant is required by 10 CFR 52.79 to describe operational programs, but similar requirements do not exist for DCAs. NuScale provided a COL item describing a future COL applicant's obligation to provide operational program information. Staff evaluated this section using Draft Revision 4 of SRP 13.4, which was published in September 2018.

13.4.2 Summary of Application

In DCA Part 2 Tier 2, Section 13.4, "Operational Programs," the applicant provided COL information item 13.4-1 which states that a COL applicant that references the NuScale power plant design certification will provide site-specific information, including an implementation schedule, for the listed operational programs.

DCA Part 2 Tier 1: There is no Tier 1 information for the operational programs.

DCA Part 2 Tier 2: DCA Part 2 Tier 2, Section 13.4, provides the applicant's COL information item on operational programs.

ITAAC: There are no ITAAC associated with the operational programs.

Technical Specifications: There are no TS associated with the operational programs.

Technical Reports: There is no TR associated with the operational programs.

13.4.3 Regulatory Basis

There are no regulatory requirements regarding operational programs for a design certification applicant. A DC applicant is required to have a quality assurance program meeting the requirements of 10 CFR Part 50, Appendix B. Chapter 17 of this SER describes how the applicant meets that requirement. Similarly, Section 13.6 of this SER describes how the applicant meets the information security requirements of 10 CFR Part 73.

13.4.4 Technical Evaluation

The staff compared the list of operational programs in COL Item 13.4-1 with the recommended list in SRP Section 13.4. Staff found that the applicant's list included all of the programs the SRP recommended.

13.4.5 Combined License Information Items

Table 13.4-5 lists a COL information item related to Operational Programs, from DCA Part 2 Tier 2, Table 1.8-2: "Combined License Information Items."

Table 13.4-5 NuScale COL Information Items related to Section 13.4

| Item No. | Description | DCA Part 2 Tier 2 Section |
|-----------------|--|---------------------------|
| COL Item 13.4-1 | <p>A COL applicant that references the NuScale Power Plant design certification will provide site-specific information, including implementation schedule, for operational programs:</p> <ul style="list-style-type: none">• Inservice inspection programs (refer to Section 5.2, Section 5.4, and Section 6.6)• Inservice testing programs (refer to Section 3.9 and Section 5.2)• Environmental qualification program (refer to Section 3.11)• Pre-service inspection program (refer to Section 5.2 and Section 5.4)• Reactor vessel material surveillance program (refer to Section 5.3)• Pre-service testing program (refer to Section 3.9.6, Section 5.2, and Section 6.6)• Containment leakage rate testing program (refer to Section 6.2)• Fire protection program (refer to Section 9.5)• Process and effluent monitoring and sampling program (refer to Section 11.5) | 13.4 |

| Item No. | Description | DCA Part 2 Tier 2 Section |
|----------|---|---------------------------|
| | <ul style="list-style-type: none"> • Radiation protection program (refer to Section 12.5) • Non-licensed plant staff training program (refer to Section 13.2) • Reactor operator training program (refer to Section 13.2) • Reactor operator requalification program (refer to Section 13.2) • Emergency planning (refer to Section 13.3) • Process control program (PCP) (refer to Section 11.4) • Security (refer to Section 13.6) • Quality assurance program (refer to Section 17.5) • Maintenance rule (refer to Section 17.6) • Motor-operated valve testing (refer to Section 3.9) • Initial test program (refer to Section 14.2) | |

13.4.6 Conclusion

The staff determined that the COL item listed above is acceptable because the applicant appropriately directs the COL applicant to develop operational programs, consistent with the list provided in SRP Section 13.4, draft Revision 4.

13.5 Plant Procedures

13.5.1 Introduction

A COL holder's plant procedures include: (1) administrative procedures that provide for administrative control over safety-related activities for the operation of the facility, (2) operating procedures and Emergency Operating Procedures (EOPs) used to ensure that routine operating, off-normal (i.e., abnormal), and emergency activities are conducted in a safe manner, and (3) procedures for other safety-related plant operating activities, including related maintenance activities, that the operating program or EOP program does not cover.

The staff reviewed the DCA to evaluate the COL information items for plant procedures. The staff also reviewed Revision 1 of the NuScale Generic Technical Guidelines (GTGs). The staff did not make a regulatory finding on the technical content of Revision 1 of the NuScale GTGs because the staff reviews the COL applicant's program for developing and implementing the plant procedures. The staff will review the technical content of the generic guidance used to develop plant specific technical guidelines (P-STGs), when a procedure generation package is submitted by a COL applicant.

13.5.2 Summary of Application

DCA Part 2 Tier 1: There is no Tier 1 information associated with this section.

DCA Part 2 Tier 2: Procedure development is not within the scope of the NuScale DCA. This responsibility resides with the COL applicant. DCA Part 2 Tier 2, Revision 3, Section 13.5, “Plant Procedures,” specifies COL information items for the COL applicant to describe the administrative, operating, and maintenance procedures.

ITAAC: The applicant has not proposed any ITAAC related to this area of review.

Technical Specifications: There are no TS for this area of review.

Technical Reports: There is one TR for this area of review:

- TR-1117-57216, “NuScale Generic Technical Guidelines,” Revision 1, issued May 31, 2019 (ADAMS Accession No. ML19151A810).

13.5.3 Regulatory Basis

The SRP Section 13.5.1.1, “Administrative Procedures—General,” and SRP Section 13.5.2.1, “Operating and Emergency Operating Procedures,” identify, in part, the relevant NRC regulatory requirements for plant procedures and the associated acceptance criteria.

The applicable regulatory requirements for plant procedures are as follows:

- 10 CFR 50.34(f)(2)(ii), as it pertains to the TMI-related requirement for applicants to establish a program to begin during construction and to follow into operation for assessing and improving plant emergency procedures.
- 10 CFR 50.34(f)(3)(i), as it pertains to the TMI-related requirement to provide administrative procedures that evaluate and provide feedback on operating experience, design experience, and construction experience.
- 10 CFR 50.40(a), as it pertains to the issuance of a COL under 10 CFR Part 52 based on considerations of whether the applicant has developed operating procedures that are sufficient to provide reasonable assurance that the nuclear power plant can be safely operated.
- 10 CFR Part 50, Appendix B, as it pertains to the establishment of criteria for the development, approval, and control of procedures for all activities affecting quality.
- 10 CFR 52.79(a)(27), (29)(i), and (29)(ii), as they pertain to information that must be included in the FSAR submitted as part of the application for a COL, specifically, (1) the managerial and administrative controls associated with procedures used to perform activities that affect the quality of SSCs covered under the quality assurance program, as established in 10 CFR Part 50, Appendix B, and (2) plans for the development and implementation of plant procedures used for emergency operations (other than emergency planning) and the conduct of normal operations, including maintenance, surveillance, and periodic testing of SSCs.

The related acceptance criteria are as follows:

- RG 1.33, “Quality Assurance Program Requirements (Operation),” Revision 3, issued June 2013.
- Appendix A, “Typical Procedures for Pressurized Water Reactors and Boiling Water Reactors,” to American National Standards Institute (ANSI)/American Nuclear Society (ANS) 3.2-2012, “Managerial, Administrative, and Quality Assurance Controls for Operational Phase of Nuclear Power Plants.”
- Section III of SRP Section 13.5.1.1, Revision 2, issued August 2016.
- SRP Section 13.5.2.1, Revision 2, issued March 2007.
- Section I.C.1, “Guidance for the Evaluation and Development of Procedures for Transients and Accidents,” of NUREG-0737, issued November 1980.
- Section 7, “Upgrade Emergency Operating Procedures,” of Supplement 1 to NUREG-0737, issued January 1983.
- NUREG-0899, “Guidelines for the Preparation of Emergency Operating Procedures—Resolution of Comments on NUREG-0799,” issued August 1982.

13.5.4 Technical Evaluation

The DCA Part 2 Tier 2, Section 13.5, identifies procedure development as the COL applicant's responsibility. This section evaluates the adequacy of the COL information items for plant procedures.

13.5.4.1 Combined License Information Items

The NRC requires a COL applicant that references the NuScale certified design to address the site-specific information described in the COL information items at the COL stage.

13.5.4.1.1 Administrative Procedures

SRP Section 13.5.1.1 describes administrative procedures as those that provide for administrative control over safety-related activities for the operation of the facility. The staff's review of the NuScale DCA using SRP Section 13.5.1.1 focused on the evaluation of COL information items pertaining to administrative procedures. COL Item 13.5-1 in DCA Part 2 Tier 2, Section 13.5.1, “Administrative Procedures,” directs the COL applicant to describe site-specific procedures that provide administrative control for activities that are important for the safe operation of the facility consistent with the guidance in RG 1.33, Revision 3, which endorses ANSI/ANS 3.2-2012. Accordingly, the staff determined that COL Item 13.5-1 identifies information the COL applicant needs to provide for administrative procedures.

SRP Section 13.5.1.1 provides the technical rationale for applying SRP acceptance criteria to the establishment of a program for the development and implementation of administrative procedures. DCA Part 2 Tier 2, Section 13.5.1, COL Item 13.5-4, directs the COL applicant to provide a program for the development and implementation of the administrative procedures and a plan for the development, implementation, and control of administrative procedures, including preliminary schedules for preparation and target completion dates. Additionally, the COL applicant will identify the group within the operating organization responsible for

maintaining these procedures. The staff determined that COL Item 13.5-4 is consistent with provisions in SRP Section 13.5.1.1.

13.5.4.1.2 Operating and Maintenance Procedures

SRP Section 13.5.2.1 states that the applicant's SAR should describe the different classifications of procedures that the operators will use in the control room and locally in the plant for plant operations. DCA Part 2 Tier 2, Section 13.5.2, "Operating and Emergency Operating Procedures," COL Item 13.5-2, directs the COL applicant to describe the site-specific procedures that operators use in the MCR and locally in the plant, including normal operating procedures, abnormal operating procedures, and EOPs. The COL applicant will also describe the classification system for these procedures and the general format and content of the different classifications. The staff determined that COL Item 13.5-2 appropriately directs the COL applicant to describe the different classifications of the site-specific procedures that licensed operators and non-licensed operators perform.

The SRP Section 13.5.2.1 states that the applicant's SAR should describe plant procedures that will be used by the operating organization (i.e., plant staff). DCA Part 2 Tier 2, Section 13.5.2.2, COL Item 13.5-3, directs a COL applicant to describe the site-specific program for developing maintenance and other operating procedures. It also requires COL applicants to describe how these procedures are classified, including the general format and content of the different classifications. This COL information item includes a list of the categories of procedures to be included. The staff determined that COL Item 13.5-3 appropriately directs the COL applicant to describe the different classifications of procedures for developing maintenance and other operating procedures (i.e., procedures for activities not procedurally covered under the operating procedures or EOPs identified in Section I.1 of SRP Section 13.5.2.1).

The SRP Section 13.5.2.1 provides the technical rationale for applying SRP acceptance criteria to the establishment of programs for the development and implementation of operating and maintenance procedures. Thus, the applicant should include COL information items that direct the COL applicant to provide programs for development and implementation of the operating and maintenance procedures. DCA Part 2 Tier 2, Section 13.5.2, "Operating and Maintenance Procedures," COL Item 13.5-5, directs a COL applicant to provide a plan for the development, implementation, and control of operating procedures, including preliminary schedules for preparation and target completion dates. Additionally, the COL applicant will identify the group within the operating organization responsible for maintaining these procedures. COL Item 13.5-7 directs a COL applicant to provide a plan for the development, implementation, and control of EOPs, including preliminary schedules for preparation and target completion dates. In its submittal, the COL applicant is to include the procedures generation package, which comprises the P-STGs, a plant-specific writer's guide for preparing EOPs based on the P-STGs, a description of the program for verification and validation of the EOPs, and a description of the program for training operators on the EOPs. Additionally, the COL applicant will identify the group within the operating organization responsible for maintaining these procedures. COL Item 13.5-8 directs a COL applicant to provide a plan for the development, implementation, and control of maintenance and other operating procedures, including preliminary schedules for preparation and target completion dates. Additionally, the COL applicant will identify the group or groups within the operating organization that will be responsible for maintaining and following these procedures. The staff concludes that COL Items 13.5-5, 13.5-7, and 13.5-8 appropriately require the COL applicant to provide programs for the development, implementation, and control of operating and maintenance procedures.

13.5.4.2 *NuScale Generic Technical Guidelines*

The SRP Section 13.5.2.1 states that COL applicants can use design-specific GTGs to develop P-STGs from which they will develop their EOPs. DCA Part 2 Tier 2, COL Item 13.5-7 directs the COL applicant to submit P-STGs based on analysis of transients and accidents that are specific to the COL applicant's plant design and operating philosophy as part of the Procedures Generation Package. SRP Section 13.5.2.1 says that the staff will review the COL applicant's program for development and implementation of the EOPs. The COL applicant's Procedure Generation Package submittal should include the P-STGs, a plant-specific writer's guide that details the specific methods to be used by the COL applicant in preparing EOPs based on P-STGs, a description of the program for verifying and validating the EOPs, and a description of the program for training operators on the EOPs. Prior to plant startup, the staff uses Inspection Procedure (IP) 42454, "Part 52, Emergency Operating Procedures," to inspect a sample of EOPs at the plant. To support development of P-STGs, the applicant developed design specific generic technical guidelines.

The staff reviewed the general scope and format of the GTGs. The staff observed that the scope includes transients and accidents analyzed in DCA Part 2 Tier 2, Chapters 7, 15, 19, and 20. The staff also observed that the GTGs identify operator actions that are discussed in these analyses, such as human actions credited in the probabilistic risk assessment described in DCA Part 2 Tier 2, Chapter 19. The GTGs also identify operator actions to be performed if automatic actuations of safety systems fail to respond as designed. Such actions are relevant for inclusion in emergency operating procedures. Additionally, the staff observed that the GTGs use a symptom-based approach such that plant indications are organized by the critical safety functions. As discussed in NUREG-0737, Section I.C.1., "Guidance for the Evaluation and Development of Procedures for Transients and Accidents," the use of human-factored, function-oriented procedures helps to improve human reliability and the ability to mitigate the consequences of a broad range of initiating events and subsequent multiple failures or operator errors. During the June 2019 audit of validation and verification activities (ADAMS Accession No. ML19175A067), the staff observed portions of the applicant's GTG validation activities, which are discussed in Section 6.0, "Validation," of the GTGs. The applicant tested each GTG logic path as either part of the integrated systems validation (ISV) test, which is discussed in Section 18.10.1.3, "Integrated System Validation," of this FSER, or by conducting table-top walkthroughs. Feedback from the application of the GTGs during the ISV and the table-top walkthroughs was identified and incorporated into the GTGs. The staff's observation of ISV testing indicated that operators were able to implement the logic paths in the GTGs to perform actions expected in the ISV scenarios. As such, the staff concludes that the validation testing provided proof of concept for the NuScale GTGs.

The staff is not making a finding on the technical adequacy of the GTGs; rather, in accordance with the review procedures in SRP 13.5.2.1, the staff will review the P-STGs to determine whether acceptable analyses of accidents and transients and development of technical guidelines for operator actions applicable to the plant have been completed, and whether the COL applicant has an acceptable process for identifying operator information and control needs to be included in plant procedures.

13.5.5 Combined License Information Items

Table 13.5-5 below lists COL information item numbers and descriptions related to plant procedures from DCA Part 2 Tier 2, Table 1.8-2, "Combined License Information Items."

Note that the applicant deleted COL Information Item 13.5-6, which separately addressed the application and usage of site-specific EOPs, from the original application. The staff agrees with not using COL Item 13.5-6 because the content it initially contained exists in COL Item 13.5-2. Accordingly, as indicated in Table 13.5-5, COL Item 13.5-6 is not used.

Table 13.5-5 NuScale COL Information Items related to Section 13.5

| Item No. | Description | DCA Part 2 Tier 2 Section |
|-----------------|--|------------------------------|
| COL Item 13.5-1 | A COL applicant that references the NuScale Power Plant design certification will describe the site-specific procedures that provide administrative control for activities that are important for the safe operation of the facility consistent with the guidance provided in RG 1.33, Revision 3. | 13.5.1 |
| COL Item 13.5-2 | A COL applicant that references the NuScale Power Plant design certification will describe the site-specific procedures that operators use in the main control room and locally in the plant, including normal operating procedures, abnormal operating procedures, and emergency operating procedures (EOPs). The COL applicant will describe the classification system for these procedures, and the general format and content of the different classifications. | 13.5.2.1 |
| COL Item 13.5-3 | <p>A COL applicant that references the NuScale Power Plant design certification will describe the site-specific maintenance and other operating procedures, including how these procedures are classified, and the general format and content of the different classifications. The categories of procedures listed below should be included:</p> <ul style="list-style-type: none"> • plant radiation protection procedures; • emergency preparedness procedures; • calibration and test procedures; • chemical-radiochemical control procedures; • radioactive waste management procedures; • maintenance and modification procedures; • material control procedures; and • plant security procedures. | 13.5.2.2 |
| COL Item 13.5-4 | A COL applicant that references the NuScale Power Plant design certification will provide a plan for the development, implementation, and control of administrative procedures, including preliminary schedules for preparation and target dates for completion. Additionally, the COL applicant will identify the group within the operating organization responsible for maintaining these procedures. | 13.5.1 |
| COL Item 13.5-5 | A COL applicant that references the NuScale Power Plant design certification will provide a plan for the development, implementation, and control of operating procedures, including preliminary schedules for | 13.5.2.1 |

| Item No. | Description | DCA Part 2 Tier 2 Section |
|-----------------|--|------------------------------|
| | preparation and target dates for completion. Additionally, the COL applicant will identify the group within the operating organization responsible for maintaining these procedures. | |
| COL Item 13.5-6 | Not used. | N/A |
| COL Item 13.5-7 | <p>A COL applicant that references the NuScale Power Plant design certification will provide a plan for the development, implementation, and control of EOPs, including preliminary schedules for preparation and target dates for completion. Included in the submittal is the Procedures Generation Package, consisting of the following:</p> <ul style="list-style-type: none"> • Plant Specific Technical Guidelines, which are guidelines based on analysis of transients and accidents that are specific to the COL applicant's plant design and operating philosophy. • A plant-specific writer's guide that details the specific methods to be used by the COL applicant in preparing EOPs based on the Plant Specific Technical Guidelines. • A description of the program for verification and validation of the EOPs. • A description of the program for training operators on the EOPs. <p>Additionally, the COL applicant will identify the group within the operating organization responsible for maintaining these procedures.</p> | 13.5.2.1 |
| COL Item 13.5-8 | A COL applicant that references the NuScale Power Plant design certification will provide a plan for the development, implementation, and control of maintenance and other operating procedures, including preliminary schedules for preparation and target dates for completion. Additionally, the COL applicant will identify what group or groups within the operating organization have the responsibility for maintaining and following these procedures. | 13.5.2.2 |

13.5.6 Conclusion

The COL applicant is responsible for the development of plant procedures. In its review of DCA Part 2 Tier 2, Section 13.5, the staff evaluated seven COL information items. The staff determined that the seven COL information items are sufficient to identify information the COL applicant needs to provide to address the applicable requirements for plant procedures.

The staff concludes that the COL information items specified in Table 13.5-5 above are sufficient to identify information that the COL applicant needs to provide to address the applicable requirements of 10 CFR 50.34; 10 CFR 50.40; 10 CFR Part 50, Appendix B; and 10 CFR 52.79.