Comment Response Matrix
Chapter 8

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
343	8.1	DSRS section II. Acceptance Criteria Requirements, item 1.	The first sentence contains a typo for spelling the word reactor; i.e. "….integral pressurized-water reactor (iPWR)."	Editorial correction	The staff agrees with this comment and has revised the DSRS accordingly.
344	8.1	DSRS and SRP section VI. References, item 1.	Correct the typo in the title for Table 8-1; i.e. instead of "Design Specific Review Standard for mPower" re-label as "Design Specific Review Standard for NuScale" for both the DSRS and SRP Table 8-1 titles.	Editorial correction	The staff agrees with this comment and has revised the DSRS accordingly.
345	8.1	DSRS and SRP section III. Review Procedures, item 7.	The last sentence of this item refers to Table 8-2 which was eliminated in the provided DSRS and SRP sections, therefore, this last sentence "Table 8-2 provides the staff interpretation of GDC 17" should be deleted from the DSRS and SRP items.	Editorial correction	The staff agrees with this comment and has revised the DSRS accordingly.

ADAMS Accession No. ML16089A002

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
346	8.1	DSRS 8.1, Throughout section	SRP and DSRS Sections 8.1 incorporate Table 8-1, with references to Table 8-1 in Items 1 and 2 under "Requirements" in Section II; Item 5 under "Review Procedures;" Items 2 and 3 under Section IV, "Evaluation Findings;" and Reference 1 in Section VI, "References." Table 8-1 provides a matrix of the NRC requirements, guidance, and Commission policy documents, and industry codes and standards that will be applied as acceptance criteria and/or guidance to the review of the electrical systems described in Sections 8.2, 8.3.1, 8.3.2, and 8.4. Many of the documents listed in Table 8-1 are cited within SRP and DSRS Sections 8.2, 8.3.1, 8.3.2, and 8.4 as subtier documents. Some of these subtier documents are not relevant or are only partially relevant to the NuScale design. Based on the NuScale comments for Sections 8.2, 8.3.1, 8.3.2, and 8.4, it is anticipated that some of the subtier	Revise Table 8-1 of the NuScale DSRS Section 8.1 for consistency with the relevant requirements, as explained.	The staff agrees with this comment and clarifications have been made.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
			documents for Sections 8.2, 8.3.1, 8.3.2, and 8.4 will be revised (as compared to SRP and DSRS Sections 8.1) for the NuScale DSRS to reflect their relevance to the NuScale plant design. Thus, conforming changes will be necessary to Table 8-1 of the NuScale DSRS Section 8.1 for consistency with the relevant requirements and guidance that will be incorporated into NuScale DSRS Sections 8.2, 8.3.1, 8.3.2, and 8.4.		
347	8.2	III. Review Procedures Item 12	DSRS Section 8.2 refers to Regulatory Guide 1.182 in "Review Procedure" Item 12. Regulatory Guide 1.182 was withdrawn in November 2012 (77 FR 70846 dated November 27, 2012) based on its substantive content being incorporated into Regulatory Guide 1.160, Revision 3. Thus, recommend deleting reference to this regulatory guide in DSRS Sections 8.2.	Remove withdrawn RG1.182 and replace it with the contents of RG 1.160.	The staff agrees with this comment and has revised the DSRS by replacing the reference to RG 1.182 with RG 1.160.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
348	8.2	Throughout section	SRP and DSRS Sections 8.2 refer to a number of subtier guidance documents (e.g., regulatory guides), generic communications, and industry codes and standards. Some of these subtier documents are not relevant or are only partially relevant to the NuScale design. For example, SRP and DSRS Sections 8.2 refer to RG 1.204 and IEEE Std. 666- 1991 for acceptable guidelines for grounding systems and surge and lightning protection systems. As discussed in the NuScale gap analysis, the 1991 edition of IEEE Std 666, which is endorsed by RG 1.204, has been superseded by the 2007 edition. NuScale intends to use the current IEEE Std 666 2007, unless superseded by a future endorsed revision. As another example, SRP and DSRS Sections 8.2 refer to RG 1.204 and IEEE Std. 1050-1996 for acceptable guidelines for instrumentation and control system grounding. The 1996 edition of IEEE Std.	The NuScale DSRS and SRP Section 8.2 should reflect the relevance of these and other subtier documents to the NuScale plant design. Conforming changes will be necessary to Table 8-1 in NuScale DSRS Section 8.1.	The staff agrees with this comment and has revised the DSRS accordingly. Updates were made to RG 1.204 column within DSRS Section 8.1, Table 8-1 and revised with IEEE Std. 666-2007, and IEEE Std. 1050-2004. Since these versions are not endorsed by RG1.204, the staff reviewed and compared with the new versions of the standards and found there is no impact to SRP 8.2, DSRS 8.2, and RG 1.204 with respect to guidance and technical requirements. The newer version of IEEE 666 includes primarily editorial changes and minor technical changes. IEEE 1050 – 2004 is improved for terminology and certain clauses are elaborated for technical clarity. The staff will follow these versions as guidance for NuScale Design.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
			1050, which is endorsed by RG 1.204, has been superseded by the 2004 edition. NuScale intends to use the current IEEE Std 1050-2004, unless superseded by a future endorsed revision. This version is not endorsed by a regulatory guide but its use is not anticipated to result in deviation from the design philosophy otherwise stated in RG 1.204 (to be verified by code reconciliation). The NuScale DSRS Section 8.2 should reflect the relevance of these and other subtier documents to the NuScale plant design. Conforming changes will be necessary to Table 8-1 in NuScale DSRS Section 8.1.		
349	8.2	DSRS and SRP sections I. Areas of Review - Review Interfaces Item 3	DSRS and SRP item 3 refers, in part, to DSRS Section 5.4.7. This reference is not appropriate for the NuScale DSRS and SRP Section 8.2. Specifically, the NRC guidance of NUREG-0800 and Regulatory Guide 1.206 designates Section 5.4.7 for a description of the residual	Delete reference to Section 5.4.7 as recommended in DSRS and SRP.	The staff agrees with the comment. The NuScale design is fully passive and has no electrical loads used for removing residual heat. Heat removal is by natural circulation. DSRS text has been revised to delete the reference to DSRS Section 5.4.7.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
			heat removal (RHR) system. The NuScale advanced modular reactor design does not include an RHR system allied with the RCS as would be found at a large light water reactor (LWR). Thus, Section 5.4.7 is not relevant to the NuScale design certification or to combined license applicants referencing the NuScale certified design. The NuScale design incorporates systems that fulfill decay heat removal functions similar to those served by a typical RHR system. These systems are described in other portions of the DCD. NuScale DCD Section 5.4.7 will provide references to these other portions of the DCD, if/as appropriate. Thus, Item 3 should be revised in the NuScale DSRS and SRP Section 8.2 to reflect the above discussion.		

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
350	8.2	DSRS and SRP section I. Areas of Review - Review Interfaces Item 8	DSRS and SRP Item 8 refers, in part, to DSRS Section 9.3.6. This reference is not appropriate for the NuScale DSRS Section 8.2. It appears that DSRS Section 9.3.6 is a design-specific section that was related to the mPower reactor coolant inventory and purification system. This review interface in Item 8 should be revised for the NuScale DSRS Section 8.2 since the NuScale design does not have a reactor coolant inventory and purification system. The appropriate reference for the NuScale DSRS and SRP appears to be Section 9.3.4 instead of Section 9.3.6.	NuScale recommends that the reference to DSRS section 9.3.6 be changed to DSRS Section 9.3.4.	The staff agrees with this comment and has revised the DSRS by replacing DSRS Section 9.3.6 with DSRS Section 9.3.4.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
351	8.3.1	DSRS and SRP section II. Acceptance Criteria, DSRS Acceptance Criteria item 4.F	Acceptance Criterion 4.F and Review Procedure Item 4.F DSRS and SRP Section 8.3.1 specify RG 1.204 and IEEE Std. 666-1991 (see Reference 59 in Section VI of DSRS and Reference 58 in SRP Section 8.3.1) for acceptable guidelines related to lightning and surge protection for the onsite AC power system. As discussed in the NuScale gap analysis, the 1991 edition of IEEE Std 666, which is endorsed by RG 1.204, has been superseded by the 2007 edition. NuScale intends to use the current IEEE Std 666 2007, unless superseded by a future endorsed revision. The NuScale DSRS Section 8.3.1 should reflect the relevance of these and other subtier documents to the NuScale plant design, as documented in the NuScale gap analysis. Conforming changes will be necessary to Table 8-1 in NuScale DSRS Section 8.1.	Consider that NuScale intends to use the current IEEE Std 666 2007, unless superseded by a future endorsed revision.	The staff agrees with this comment and has revised the DSRS accordingly. Updates were made to RG 1.204 column within DSRS Section 8.1, Table 8-1 and revised with IEEE Std. 666-2007, and IEEE Std. 1050-2004. Since these versions are not endorsed by RG1.204, the staff reviewed and compared with the new versions of the standards and found there is no impact to SRP 8.2, DSRS 8.2, and RG 1.204 with respect to guidance and technical requirements. The newer version of IEEE 666 includes primarily editorial changes and minor technical changes. IEEE 1050 – 2004 is improved for terminology and certain clauses are elaborated for technical clarity. The staff will follow these versions as guidance for NuScale Design.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
352	8.3.1	I. Areas of Review Item 4	DSRS Section 8.3.1, Item 4 under Section I, "Areas of Review," relates to alternate AC power sources relied upon pursuant to 10 CFR 50.63(c)(2) to meet the station blackout (SBO) rule. The terminology "alternate AC power source" is not appropriate for or relevant to the NuScale design. Specifically, the NuScale passive plant design uses the AC-independent approach – as opposed to the alternate AC power source approach described in 10 CFR 50.63(c)(2) and Regulatory Guide 1.155 – to satisfy the SBO rule. Thus, consistent with SECY-94 084 and SECY 95 132, the alternate AC power source provisions (including diesel generators or gas turbine generators) are not applicable to the NuScale passive plant design. The standby diesel generators used in the NuScale plant design are not alternate AC power sources as contemplated by 10 CFR 50.63(c)(2) and Regulatory Guide 1.155. Rather, they	NuScale recommends that Item 4 be revised in the NuScale DSRS Section 8.3.1. The revisions should appropriately reflect the NuScale passive plant design's use of the AC-independent approach as opposed to the alternate AC power source approach described in 10 CFR 50.63(c)(2) and Regulatory Guide 1.155.	The staff does not agree with this comment because Item 4 is clear in that if alternate AC power source is not needed, as determined by staff review, it is not applicable.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
			are defense-in-depth nonsafety-related (RTNSS) standby power sources that are available in the unlikely event of an extended SBO condition (i.e., relied upon only for SSC monitoring and plant emergency lighting for the period beginning after the initial 72 hours and up to 7 days following SBO onset). Based on the above, NuScale recommends that Item 4 be revised in the NuScale DSRS Section 8.3.1. The revisions should appropriately reflect the NuScale passive plant design's use of the AC-independent approach as opposed to the alternate AC power source approach described in 10 CFR 50.63(c)(2) and Regulatory Guide 1.155. Examples where revision is warranted for the NuScale DSRS Section 8.3.1 include: • the first sentence of the first paragraph of Item 4, which states: "…design does not require an alternate power source to perform safety functions for 72 hours…."•		

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
			the first sentence of the second paragraph of Item 4, which states: “Design information and analyses demonstrating the suitability of the DGs or GTGs as alternate ac power supplies are reviewed….”		
353	8.3.1	I. Areas of Review Item 9.B	DSRS Section 8.3.1, Item 9.B under Section I, Areas of Review: "RTNSS components," such as alternate ac power sources (e.g., ancillary DGs/GTGs)….” The terminology “alternate AC power source” is not appropriate for or relevant to the NuScale design (since the NuScale design uses the AC-independent approach as opposed to the alternate AC power source approach).	NuScale recommends that item 9.B be revised in section 8.3.1 to eliminate the terminology "alternate AC power sources."	The staff does not agree with this comment because this item is clear in that if Alternate power source is not needed, as determined by staff review, it is not applicable.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
354	8.3.1	I. Areas of Review Item 9.C	DSRS Section 8.3.1, Item 9.C under Section I, "Areas of Review," specifies that the onsite AC power system and its components must be designed to withstand environmental conditions associated with normal operation, natural phenomena, and postulated accidents.	NuScale recommends that this item be revised to reflect its relevance only to safety-related and certain RTNSS (e.g., RTNSS Criterion B) portions of the onsite AC power system.	The staff agrees with this comment and has revised the DSRS accordingly by replacing "The system and its components" with "Any safety-related or RTNSS component."
355	8.3.1	I. Areas of Review (various)	DSRS Section 8.3.1, Item 1 under "Review Interfaces" states: "…the independence of the preferred power system and any alternate ac power sources provided for station blackout…." Throughout DSRS Section 8.3.1, Areas of Review, the terminology "alternate AC power source" is used. This terminology is not appropriate for or relevant to the NuScale design since the NuScale design uses the AC-independent approach as opposed to the alternate AC power source approach.	NuScale recommends the terminology "alternate AC power sources" be replaced with "onsite standby AC power sources" or similar terminology.	The staff does not agree with this comment. The terminology "alternate AC power sources" is specific to NRC guidance. If the NRC ultimately determines there is no need for such equipment, then it will be clear what does or does not apply in its review of the application.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
356	8.3.1	I. Areas of Review - Review Interfaces Item 9	Item 9 under "Review Interfaces," on Page 8.3.1-6 of mPower™ DSRS Section 8.3.1 refers, in part, to DSRS Section 9.3.6. This reference is not appropriate for the NuScale DSRS Section 8.3.1.It appears that the mPower™ DSRS Section 9.3.6 is a design-specific section that will govern the review of the mPower™ reactor coolant inventory and purification system. This review interface in Item 9 should be revised for the NuScale DSRS Section 8.3.1. Specifically, the NuScale design does not have a reactor coolant inventory and purification system. The appropriate reference for the NuScale DSRS appears to be Section 9.3.4 instead of Section 9.3.6.	NuScale recommends that the reference to DSRS section 9.3.6 be changed to DSRS Section 9.3.4.	The staff agrees with this comment and has revised the DSRS by replacing DSRS Section 9.3.6 with DSRS Section 9.3.4.
357	8.3.1	III. Review Procedure Item 10 and 10.A	Item 10 (and 10.A) under Section III, "Review Procedures," of DSRS Section 8.3.1 is entitled "Reliability Program for Emergency Onsite AC Power Sources." The NuScale advanced passive	NuScale recommends that for the NuScale DSRS Section 8.3.1, Item 10 under Section III, "Review Procedures," be revised to eliminate Item 10.A, or otherwise to reflect that a reliability program for emergency onsite ac power sources and the	The staff agrees with this comment and has revised the DSRS accordingly. The language in Item 10 was modified for clarity and the reference to RG 1.9 in Item 10.A was deleted.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
			plant neither requires nor uses safety-related emergency AC power sources.	provisions of RG 1.9 are not applicable.	
358	8.3.1	II. Acceptance Criteria 3.A	Draft Acceptance Criterion II.3.A implies that RG 1.32 includes an exception to the IEEE 308-2001 provisions for sharing of AC power systems. The RG 1.32 exception to the sharing provisions of IEEE 308-2001 does not pertain to AC power systems; rather, the RG 1.32 exception to IEEE Std. 308-2001 is specific to Class 1E DC power systems. Contrary to draft Acceptance Criterion II.3.B, RG 1.81, Position C.2, is not applicable to new reactor designs.	Recommend clarifying this guidance to reflect the above. Recommend deleting reference to Position C.2 of RG 1.81.	The staff agrees with this comment and has revised the DSRS accordingly.
359	8.3.2	I. Areas of Review, Review Interfaces Item 10	Item 10 under "Review Interfaces," DSRS Section 8.3.2 refers, in part, to DSRS Section 5.4.7. This reference is not appropriate for the NuScale DSRS Section 8.3.2. Specifically, the NRC guidance of NUREG 0800 and Regulatory Guide 1.206 designates Section 5.4.7 for	Revise item 10 as recommended.	The staff agrees with this comment and has revised the DSRS accordingly. In DSRS 8.3.2, DSRS 5.4.7 is retained as may be applicable for passive reactor.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
			a description of the residual heat removal (RHR) system. The NuScale advanced modular reactor design does not include an RHR system allied with the RCS as would be found at a large light water reactor (LWR). Thus, Section 5.4.7 is not relevant to the NuScale design certification or to combined license applicants referencing the NuScale certified design. The NuScale design incorporates systems that fulfill decay heat removal functions similar to those served by a typical RHR system. These systems are described in other portions of the DCD. NuScale DCD Section 5.4.7 will provide references to these other portions of the DCD, if/as appropriate. Thus, Item 10 should be revised in the NuScale DSRS Section 8.3.2 to reflect the above discussion.		

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
360	8.3.2	III. Review Procedures VI. References	These sections reference several IEEE standards. NuScale is planning to utilize Valve-Regulated Lead-Acid (VRLA) Batteries. The applicable IEEE Standards for VRLA Batteries are: IEEE Standard 1187-2013, "Recommended Practice for Installation Design and Installation of Valve-Regulated Lead- Acid Batteries for Stationary Applications," and IEEE Standard 1188- 2005 (R2010), "Recommended Practice for Maintenance, Testing, and Replacement of Valve-Regulated Lead- Acid (VRLA) Batteries for Stationary Applications."	Add IEEE-1187 and IEEE-1188 to Sections III and VI.	The staff agrees with this comment and has revised the DSRS by adding references to IEEE-1187 and IEEE-1188 to the DSRS.
361	8.3.2	I. Areas of Review, Review Interfaces Item 8	Item 8 under "Review Interfaces," DSRS Section 8.3.2 refers, in part, to DSRS Section 9.3.6. This reference is not appropriate for the NuScale DSRS Section 8.3.2. It appears that for the mPower™ DSRS Section 9.3.6 is a design-specific section that will govern the review of the mPower™ reactor coolant inventory and purification	NuScale recommends that the reference to DSRS section 9.3.6 be changed to DSRS Section 9.3.4.	The staff agrees with this comment and has revised the DSRS accordingly by replacing the reference to DSRS 9.3.6 with a reference to DSRS 9.3.4.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
			system. This review interface in Item 8 should be revised for the NuScale DSRS Section 8.3.2. Specifically, the NuScale design does not have a reactor coolant inventory and purification system. The appropriate reference for the NuScale DSRS appears to be Section 9.3.4 instead of Section 9.3.6.		
362	8.3.2	I. Areas of Review, Review Interfaces Item 9	Item 9 under "Review Interfaces," DSRS Section 8.3.2 refers, in part, to DSRS Section 6.2.2 for review of the adequacy of containment ventilation systems. It appears that the appropriate review guidance for containment ventilation systems may be DSRS Section 6.5.1 rather than DSRS Section 6.2.2 (containment heat removal). The discussion of containment ventilation systems and the reference to DSRS Section 6.2.2 for the reviews of such systems are not relevant to the NuScale design.	NuScale recommends that Item 9 be revised in the NuScale DSRS Section 8.3.2 to reflect the discussion that the NuScale design neither relies upon nor uses ventilation systems to maintain a controlled environment for safety-related electrical equipment inside the containment vessel. (The NuScale design does include a containment vessel evacuation system used to establish the partial vacuum condition inside the containment vessel prior to reactor startup; this system is anticipated to be described in DCD Section 9.3.6, and accordingly would be reviewed under new NuScale DSRS Section 9.3.6.).	The staff has added DSRS Section 9.3.6 in Item 9, in accordance with this comment. The DSRS Section 6.2.2 interface item came from the corresponding SRP Section and was included in the original draft of the DSRS as the exact NuScale design was not fully known at that time. It has become clear that the NuScale design does not have any Class 1E equipment inside containment and therefore there are no Chapter 8-based interface requirements for ventilation. Accordingly, the staff has removed this interface item from the DSRS.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
363	8.3.2	I. Areas of Review, 3. Power Supplies	Paragraph states that, "… plus charging capacity to restore the battery from the design minimum charge state to the **fully charged** state within the time stated in the design basis, regardless of the status of the plant when these demands occur". Per Section 5.2 of IEEE 946-2004, "Standard float or equalize charging of the battery, following a discharge, results in an exponential return of charge. Full charge may not be completed for days". The standard also provides a charger sizing formula that would ensure the charger restores its battery to 95% state of charge within a specified time period. The DC power system (EDNS and EDSS) design has incorporated this IEEE guidance by sizing chargers such that they are capable of restoring their batteries from a minimum charge state to 95% state of charge within 24-hours.	NuScale recommends that the DSRS requirement is revised to "… from the design minimum charge state to **95% state of charge** within the time stated in the design basis, regardless of the status of the plant when these demands occur".	The staff agrees with this comment and has revised the DSRS accordingly by replacing "fully-charged" with "95-percent-charged."

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
364	8.4	I. Areas of Review, fourth paragraph	Correct the typo In the fourth paragraph, first sentence; "The NuScale design, as presented to the staff in public familiarization meetings …" should instead be "The NuScale design, as presented to the staff in **p**ublic familiarization meetings ..."	Editorial correction	The staff agrees with this comment and has revised the DSRS accordingly.
365	8.4	SRP Section I. Areas of Review, fourth paragraph	The first sentence of this fourth paragraph states that "The NuScale design, as presented to the staff in oublic familiarization meetings …" should instead be "The NuScale design, as presented to the staff in **p**ublic familiarization meetings ..."	Editorial correction	The staff agrees with this comment as noted in Comment 364 and has revised the DSRS accordingly; however, reference to the "SRP Section" in the paragraph column is not applicable because a DSRS section was developed for 8.4 with specific guidance for NuScale. Changes to the SRP are not necessary.
366	8.4	SRP section III. Review Procedures Item 8	Item 8 for AAC Power Sources refers to SECY-94-084 and SECY-95-132 as References 25 and 26 respectively; however, those SECY documents are actually reference items 24 and 25 respectively as listed in Section VI. References.	Editorial correction	The staff agrees with this comment and has revised the DSRS accordingly; however, reference to the "SRP Section" in the paragraph column is not applicable because a DSRS section was developed for 8.4 with specific guidance for NuScale. Changes to the SRP are not necessary.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
367	8.4	III. Review Procedures Item 7.E VI. References Item 14	NuScale recommends that Item 7.E in Section III, Review Procedures, be revised to reflect updated industry and regulatory guidance related to sizing station batteries. Item 7.E currently refers to "Institute for Electrical and Electronics Engineers (IEEE) Standard (Std.) 485 (Reference 14)". IEEE Std. 485-1987 has been superseded by IEEE Std. 485-1997 as the industry standard currently endorsed by NRC guidance (i.e., RG 1.212 dated November 2008). Thus, it is recommended that RG 1.212 and IEEE Std. 485-1997 be added to Item 7.E in Section III, Review Procedures, and added as additional references in Section VI. Also recommend that these guidance documents, added to Section VI, be referenced from Item 7.E in Section III.	Add RG 1.212 and IEEE Std. 485-1997 to Item 7.E in Section III, "Review Procedures," and as additional references in Section VI, as described.	The staff agrees with this comment and has revised the DSRS accordingly.
368	8.4	I. Areas of Review Item 3. Procedures and Training	Item 3 directs the reviewer to determine that procedures and training conform to the guidance provided in Regulatory Positions C.1.3, C.2, and C.3.4 of RG 1.155.	Clarify the relevance and applicability of the regulations, as described.	The staff agrees with this comment and has revised the DSRS by revising the language to state "…conform to the guidance in Sections C.1.3, C.2, and C.3.4 and Appendix B to RG 1.155 (as

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
			The provisions of Regulatory Position C.1.3 are directed towards the restoration of emergency AC power sources. As such, this guidance is not directly relevant to the NuScale nonsafety-related standby diesel generators. However, consistent with the intent of Regulatory Position C.1.3, guidelines and procedures for actions to restore standby AC power when the standby diesel generator system is unavailable will be integrated with plant- specific technical guidelines and emergency operating procedures. Based on the above, NuScale recommends that for NuScale DSRS Section 8.4, the wording of Item 3 be clarified, such that "…conform to the guidance in Sections C.1.3, C.2, and C.3.4 of RG 1.155" instead reads as "…conforms to the guidance provided in Regulatory Positions C.1.3, C.2, and C.3.4 of RG 1.155 that is relevant to passive plants."		applicable to passive plants)."

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
369	8.4	I. Areas of Review, Review Interfaces Item 3	Item 3 refers, in part, to DSRS Sections 5.4.7 and 9.3.6. These references are not appropriate for the NuScale DSRS Section 8.4. Specifically, the NRC guidance of NUREG 0800 and RG 1.206 designates Section 5.4.7 for a description of the residual heat removal (RHR) system. The NuScale advanced modular reactor design does not include an RHR system allied with the RCS as would be found at a large light water reactor (LWR). Thus, Section 5.4.7 is not relevant to the NuScale design certification or to combined license applicants referencing the NuScale certified design. The NuScale design incorporates systems that fulfill decay heat removal functions similar to those served by a typical RHR system. These systems are described in other portions of the DCD. NuScale DCD Section 5.4.7 will provide references to these other portions of the DCD, if/as appropriate. Thus, Item 3 should be	References to DSRS Sections 5.4.7 and 9.3.6 are not appropriate for the NuScale DSRS Section 8.4. Clarify as described.	The staff agrees with this comment and has revised the DSRS, by deleting the references to DSRS Sections 5.4.7 and 9.3.6 from item 3 as not relevant, and adding DSRS 9.3.4 in item 4

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
			revised in the NuScale DSRS Section 8.4 to reflect the above discussion. It appears that mPower DSRS Section 9.3.6 is a new mPower design-specific section that will govern the review of the mPower reactor coolant inventory and purification system. This review interface in Item 3 should be revised for the NuScale DSRS Section 8.4. Specifically, the NuScale design does not have a reactor coolant inventory and purification system, but it appears that the NuScale chemical and volume control system may serve similar functions. If this is the case, the appropriate reference for the NuScale DSRS would be Section 9.3.4 instead of Section 9.3.6.		

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
370	8.4	III. Review Procedures Item 6.A	The last sentence of item 6.A. SBO Coping Duration references SECY-90-016 and SECY-94-084 as References 23 and 25 respectively, however, section VI References lists them as items 22 and 24 respectively.	Editorial correction	The staff agrees with this comment and has revised the DSRS accordingly.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
371	8.4	III. Review Procedures Item 6.B	Item 6.B directs the reviewer to determine that the capability to achieve and maintain adequate core cooling and containment integrity during an SBO conforms to the guidance provided in Regulatory Position C.3.2 of RG 1.155. As detailed in Comment 2 the NuScale comment on mPower DSRS Section 8.4, Item 2 under "Areas of Review" on Page 8.4-2 above, certain aspects of Regulatory Position C.3.2 of RG 1.155 are not relevant to the NuScale passive plant design. Thus, NuScale recommends that for NuScale DSRS Section 8.4, the wording of Item 6.B be clarified, such that "…conforms to the guidance in Section C.3.2 of RG 1.155" instead reads as "…conforms to the guidance provided in Regulatory Position C.3.2 of RG 1.155 that is relevant to passive plants."	Recommend that the wording of Item 6.B be clarified, as proposed.	The staff agrees with this comment and has revised the DSRS accordingly, to reflect "as applicable" to account for passive design.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
372	8.4	III. Review Procedures Item 7.G	NuScale recommends that Item 7.G be revised for consistency with language in 10 CFR 50.63 and SBO guidance. Specifically, it is recommended that the phrase "…provide core cooling and decay heat removal following an SBO…" be replaced with "…provide core cooling and ensure containment integrity following an SBO…."	Replace the phrase as recommended.	The staff agrees with this comment and has revised the DSRS accordingly by replacing "decay heat removal" with "ensure containment integrity."
373	8.4	III. Review Procedures Item 9	Item 9 directs the reviewer to determine that procedures and training conform to the guidance provided in Regulatory Positions C.1.3, C.2, and C.3.4 and Appendix B of RG 1.155. Regulatory Position C.1.3 is not directly relevant to the NuScale nonsafety-related standby diesel generators. Certain systems and equipment listed in Appendix B of RG 1.155 are not relied upon for station blackout in the NuScale plant design. Based on the above, NuScale recommends that for NuScale DSRS Section 8.4, the wording of Item 9 be clarified, such that	Recommend that the wording of Item 9 be clarified, as discussed.	The staff agrees with this comment and has revised the DSRS by revising the language to state "…conform to the guidance in Sections C.1.3, C.2, and C.3.4 and Appendix B to RG 1.155 (as applicable to passive plants)".

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
			"…conform to the guidance in Sections C.1.3, C.2, and C.3.4 and Appendix B of RG 1.155" instead reads as "…conforms to the guidance provided in Regulatory Positions C.1.3, C.2, and C.3.4 and Appendix B of RG 1.155 that is relevant to passive plants."		
374	8.4	III. Review Procedures Item 11	Item 11 directs the reviewer to determine that QA activities and specifications for nonsafety-related equipment used to meet SBO requirements conform to the guidance provided in Regulatory Position C.3.5 and Appendices A and B of RG 1.155. The NuScale plant design conforms to the provisions of Regulatory Position C.3.5 of RG 1.155, except for portions that govern systems and equipment that are not relevant to the NuScale passive plant. Specifically, certain systems and equipment listed in Appendix B of RG 1.155 are not relied upon for station blackout in the NuScale plant design. For such systems and	Recommend that the wording of Item 11 be clarified to indicate conformance to the portions of Regulatory Position C.3.5 and Appendices A and B of RG 1.155 that are relevant to passive plant designs.	The staff agrees with this comment and has revised the DSRS by revising the language to state "…conform to the recommendations in Section C.3.5 and Appendix A to RG 1.155 (as applicable to passive plants)."

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
			equipment, this guidance is not relevant to the NuScale plant design. Based on the above, NuScale recommends that for NuScale DSRS Section 8.4, the wording of Item 11 be clarified to indicate conformance to the portions of Regulatory Position C.3.5 and Appendices A and B of RG 1.155 that are relevant to passive plant designs.		
375	8.4	IV. Evaluation Findings paragraph 1	NuScale recommends that the first paragraph be revised to replace "…has appropriately evaluated the facility against the guidelines of RG 1.155…" with "…has appropriately evaluated the facility against the relevant guidelines of RG 1.155…." This recommendation is based on the fact that portions of RG 1.155 are not relevant to passive plant designs such as the NuScale design.	Revise the phrase as recommended.	The staff agrees with this comment and has revised the DSRS accordingly.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
376	8.4	VI. References Item 31	Section 8.4 includes Volume II of the EPRI Utility Requirements Document (URD) as Reference 31 of Section VI, "References." EPRI URD Volume II is for "Evolutionary Plants." The NuScale passive design will use EPRI URD Volume III, which is specific to "Passive Plants." Thus, it is recommended that Reference 31 be revised in the NuScale DSRS Section 8.4 to reflect EPRI URD Volume III.	Recommend that Reference 31 be revised to reflect EPRI URD Volume III.	The staff agrees with this comment and has revised the DSRS accordingly.
377	8.4	III. Review Procedures, Item 8	Item 8 for AAC Power Sources refers to SECY-94-084 and SECY-95-132 as References 25 and 26 respectively; however, those SECY documents are actually reference items 24 and 25 respectively as listed in Section VI. References.	Editorial correction	The staff agrees with this comment and has revised the DSRS accordingly.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
378	8.4	II. Acceptance Criteria, DSRS Acceptance Criteria, item 2	Item 2 references SECY-90-016 and SECY-94-084 as References 23 and 25 respectively, however, section VI References lists these SECY documents as items 22 and 24 respectively.	Editorial correction	The staff agrees with this comment and has revised the DSRS accordingly.
379	8.4	I. Areas of Review, fifth paragraph and section VI References item 39	The last sentence of the fifth paragraph in Section I refers to the use of the mPower DSRS if additional guidance is needed by the staff's reviewer. Since the mPower and NuScale designs have some very different design attributes the use of the mPower DSRS for additional guidance when reviewing the NuScale application could potentially lead to confusion. It is therefore recommended that this last sentence of the fifth paragraph for Section I be deleted, as well as Reference 39 in Section VI References.	Revise this item as recommended.	The staff agrees with this comment and has revised the DSRS accordingly. The DSRS was revised to refer back to SRP not to mPower DSRS.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
380	8.4	SRP Section I. Areas of Review, fifth paragraph and section VI References item 39	The last sentence of the fifth paragraph in Section I refers to the use of the mPower DSRS if additional guidance is needed by the staff's reviewer. Since the mPower and NuScale designs have some very different design attributes the use of the mPower DSRS for additional guidance when reviewing the NuScale application could potentially lead to confusion. It is therefore recommended that this last sentence of the fifth paragraph for Section I be deleted, as well as Reference 39 on Section VI References.	Revise this item as recommended.	The staff agrees with this comment and has revised the DSRS accordingly; however, reference to the "SRP Section" in the paragraph column is not applicable because a DSRS section was developed for 8.4 with specific guidance for NuScale. Changes to the SRP are not necessary. The DSRS was revised to refer back to the SRP for additional information not to mPower DSRS.
381	8.4	SRP section II. Acceptance Criteria, DSRS Acceptance Criteria, item 2	Item 2 references SECY-90-016 and SECY-94-084 as References 23 and 25 respectively, however, section VI References lists these SECY documents as items 22 and 24 respectively.	Editorial correction	The staff agrees with this comment and has revised the DSRS accordingly; however, reference to the "SRP Section" in the paragraph column is not applicable because a DSRS section was developed for 8.4 with specific guidance for NuScale. Changes to the SRP are not necessary.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
382	8.4	SRP section III. Review Procedures, item 6.A.	The last sentence of item 6.A. SBO Coping Duration references SECY-90- 016 and SECY-94-084 as References 23 and 25 respectively, however, section VI References lists them as items 22 and 24 respectively.	Editorial correction	The staff agrees with this comment and has revised the DSRS accordingly; however, reference to the "SRP Section" in the paragraph column is not applicable because a DSRS section was developed for 8.4 with specific guidance for NuScale. Changes to the SRP are not necessary.
383	8.4	SRP section III. Review Procedures Item 7.E	NuScale recommends that Item 7.E in Section III, Review Procedures, be revised to reflect updated industry and regulatory guidance related to sizing station batteries. Item 7.E currently refers to "Institute for Electrical and Electronics Engineers (IEEE) Standard (Std.) 485 (Reference 14)". IEEE Std. 485-1987 has been superseded by IEEE Std. 485-1997 as the industry standard currently endorsed by NRC guidance (i.e., RG 1.212 dated November 2008). Thus, it is recommended that RG 1.212 and IEEE Std. 485-1997 be added to Item 7.E in Section III, Review Procedures, and added as additional references in Section VI.	Add RG 1.212 and IEEE Std. 485-1997 to Item 7.E in Section III, "Review Procedures," and as additional references in Section VI, as described.	The staff agrees with this comment and has revised the DSRS accordingly; however, reference to the "SRP Section" in the paragraph column is not applicable because a DSRS section was developed for 8.4 with specific guidance for NuScale. Changes to the SRP are not necessary.

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
			Also recommend that these guidance documents, added to Section VI, be referenced from Item 7.E in Section III.		
384	BTP 8-6	DSRS and SRP Technical Position B.1	The second sentence of DSRS and SRP BTP 8-6, Technical Position B.1, refers to the battery chargers "...in a back- biased state...." This implies use of a blocking diode. The NuScale design will include features to prevent the battery chargers from becoming a load on the battery in the event of a degraded AC voltage condition. However, these features may not involve the use of a blocking diode. Based on the above, NuScale recommends that the second sentence of Technical Position B.1 be revised for the NuScale DSRS and SRP to state that the battery chargers will include features to prevent the battery chargers from becoming a load on the battery in the event of a degraded AC voltage condition. The second sentence of Position B.1 also	Clarify/correct the contradictory statement in the NuScale DSRS and SRP sections as described.	The NRC Staff determined whether to develop a new DSRS section considering whether significant differences in the functions, characteristics, or attributes of the NuScale design required major revision of the related SRP section guidance, and whether structures, systems, and components identified in the NuScale design were unique and not addressed by the current SRP. The Staff revisited this criteria following review of the public comments on the Draft version of this DSRS section (Issued in June 2015) and determined, based on the most recent NuScale design, that the related SRP section is sufficient and appropriate to perform the NRC safety review. Therefore, this DSRS section will not be issued final and the related SRP will be used for this portion of the NuScale review.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
			has seemingly contradictory language related to the batteries supplying DC loads without drawing down the batteries. Clarification/correction of this language is recommended.		
385	BTP 8-6	DSRS and SRP Section C. References items 4 and 5	References C.4 and C.5 of DSRS and SRP BTP 8-6 cite IEEE Std. 279-1971 and IEEE Std. 603-1991 as references for this guidance. However, IEEE Std. 279-1971 and IEEE Std. 603-1991 are not cited in the body of DSRS BTP 8 6, and thus it is not clear the context in which these are appropriate references for BTP 8-6. Notwithstanding this observation, per 10 CFR 50.55a(h), the standards of IEEE Std. 603-1991 – rather than IEEE Std. 279 1971 – are the applicable criteria to be applied to the NuScale design of safety systems. Thus, NuScale recommends that IEEE Std. 279-1971 be eliminated as a reference in the NuScale DSRS and SRP BTP 8-6.	Revise these DSRS and SRP BTP sections to eliminate IEEE Std. 279-1971.	The NRC Staff determined whether to develop a new DSRS section considering whether significant differences in the functions, characteristics, or attributes of the NuScale design required major revision of the related SRP section guidance, and whether structures, systems, and components identified in the NuScale design were unique and not addressed by the current SRP. The Staff revisited this criteria following review of the public comments on the Draft version of this DSRS section (Issued in June 2015) and determined, based on the most recent NuScale design, that the related SRP section is sufficient and appropriate to perform the NRC safety review. Therefore, this DSRS section will not be issued final and the related SRP will be used for this portion of the NuScale review.