Comment Response Matrix
Chapter 5

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
222	DSRS Section 5.2.2, Over pressure Protection	Page 5.2.2-6 and Page 5.2.2-11	Requirements contained in GL 90-06 do not fully apply to NuScale. Only Enclosure B of the GL applies to NuScale.	NuScale recommends adding the words "Enclosure B" at the end of the sentence where GL 90-06 is mentioned and in all other places where the GL 90-06 is referenced.	See footnote 1[1]
223	DSRS Section 5.2.2, Over pressure Protection	Page 5.2.2-2, 5.2.2-9, 5.2.2-12	The NuScale design does not currently have secondary side safety valves for the piping between the feedwater isolation valve and the main steam isolation valve.	NuScale recommends removal of the reference to secondary side safety relief valves.	See footnote 1
224	DSRS Section 5.2.4	Page 5.2.4-6	Correct Typo in the paragraph for Relief Request/misspelled word.	Correct misspelling	The staff agrees with this comment and has revised the DSRS accordingly.

[1] The NRC Staff determined whether to develop a new DSRS section after considering whether significant differences in the functions, characteristics, or attributes of the NuScale design required major revision of the related SRP section guidance, or whether structures, systems, and components identified in the NuScale design are unique and not addressed by the current SRP. The Staff revisited these criteria after publishing 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 appropriate to perform the NRC safety review. Therefore, this DSRS section will not be issued as final and the related SRP section will be used for this portion of the NuScale review. Since this comment is on a Draft DSRS Section that is no longer being used, the staff will not provide a specific response to it. In deciding to use the related SRP section, the staff has not necessarily determined that the SRP section is wholly applicable without modification. For example, as the NRC staff gains greater understanding of the NuScale design or if the design changes during the review, the staff would assess whether different or supplemental review criteria are needed.

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225	DSRS Section 5.2.4	Page 5.2.4-7	GL 88-05 is not applicable to NuScale because NuScale has no carbon steel or low alloy steel RCPB components that will be exposed to concentrated boric acid solution or boric acid crystals formed by evaporation of water from the leaking reactor coolant. Because NuScale RXM is designed for immersion in borated water during operation or during refuel outage. RCPB components are either fabricated from corrosion resistant materials or cladded with corrosion resistant materials on both inside and outside surfaces.	NuScale recommends that the DSRS include a note that GL 88-05 is not applicable to the NuScale design.	The staff does not agree with this comment. The applicability of GL88-05 to the NuScale design cannot be determined at this time because the NuScale design has not been finalized and the applicable design details and materials specifications are subject to change. If an applicant believes that the issues related to GL88-05 are not applicable to the NuScale design then a justification should be provided for the staff's review as part of the application process.
226	DSRS Section 5.2.5	Item 7 on page 5.2.5-6	NuScale design does not include sumps inside containment.	NuScale recommends replacing "sumps" with "collection reservoir"	The staff agrees with this comment. The sentence was modified as indicated by commenter.
227	5.2.5	Pages 5.2.5-1, I(8) and 5.2.5- 8	This section specifies areas of review "(8) whether the system is used to support reactor coolant system leak-before-break (LBB)". NuScale will apply LBB to SG feedwater and main steam lines inside CNV (primary / secondary	NuScale recommends this item be revised to: "Whether the system is used to support primary/secondary system leak-before-break (LBB)."	Not accepted. DSRS Section 5.2.5 applies to RCS leakage detection only and does not address leakage from SG feedwater and main steam lines.

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			system). Therefore, NuScale is not limiting the use of LBB to only reactor coolant system.		
228	DSRS Section 5.3.1	DSRS Acceptance Criteria, Item 7 on Page 5.3.1-9	The stud and fastener material that the NRC recommends in item 7 is based on the Reg Guide 1.65 materials that may not be compatible with the requirements that will be specific to NuScale due to the Reactor and Containment Vessels being submerged in borated water. The NuScale Reactor studs will be subjected to submerged condition in borated water for 60 years and will utilize corrosion-resistant nickel-base alloy. Regulatory positions 1(a)(i) and 2(b) of RG 1.65 Rev 1 are not appropriate for the NuScale RPV closure studs.	NuScale recommends that NRC amend item 7.	The staff does not agree with the comment. The applicability of RG 1.65 to the NuScale design cannot be determined at this time because the NuScale design has not been finalized and the applicable design details and materials specifications are subject to change. The staff notes that regulatory guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions that differ from those set forth in regulatory guides will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission. As such, if an applicant believes that certain regulatory positions of RG 1.65 are not appropriate for the NuScale design, then a justification should be provided for the staff's review as part of the application process.

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229	5.3.2	Page 5.3.1-11	The DSRS states that "Appendix G to ASME Section XI specifies values for M_m". For locations with geometry discontinuity, the M_m calculation method may not be applicable. Numerically calculated M_m using FEA should also be acceptable.	NuScale recommends this discussion be extended to "Appendix G to ASME Section XI specifies values for M_m. M_m can also be calculated using finite element fracture mechanics analysis or other methods."	The staff does not have enough information on the methods used to develop P-T limits for the NuScale design to verify the commenter's claims regarding the applicability of ASME Section XI Appendix G calculation methods. However, the staff agrees that values for Mm can be calculated using FEA or other methods. A sentence was added to clarify this point.
230	5.3.2	Page 5.3.2-11	The method to calculate KI thermal in Appendix G to ASME Section XI assumes that inside surface defect is in tension during Cooldown, and outside surface defect is in tension during Heatup (G-2214.3(b)), which is proper for traditional large PWRs. NuScale design uses CNV flooding during reactor Cooldown which imposes tensile stress on RPV OD and decreases tensile stress on RPV ID during Cooldown. Therefore the equations are not applicable before G-2214.3(b) is revised or extended.	NuScale recommends that the following is added to the discussion on page 11: "KI thermal can also be calculated through finite element fracture mechanics analysis or other methods".	The staff does not have enough information on the methods used to develop P-T limits for the NuScale design to verify the commenter's claims regarding the applicability of ASME Section XI Appendix G calculation methods. However, the staff agrees that values for K1 thermal can be calculated using FEA or other methods. A sentence was added to clarify this point.

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231	DSRS Section 5.4	Areas of Review, Last paragraph at bottom of first page	The DSRS states that forged valve bodies are bolted directly to the reactor vessel and there is no piping between the valves and the vessel.	NuScale recommends revising this statement to state that the valves will be attached directly to the vessel, instead of stating that they are bolted.	See footnote 1
232	DSRS Section 5.4	Areas of Review, Once-through Helical Coil Steam Generators, item D.	Remove reference to steam generator relief or safety valve, in the statement "Increase in Feedwater Flow, Increase in Steam Flow, and Inadvertent Opening of a Steam Generator Relief or Safety Valve." The NuScale Steam Generators do not have relief or safety valves.	NuScale recommends this statement be revised to not state that there are relief or safety valves on the steam generator(s).	See footnote 1
233	DSRS Section 5.4	Areas of Review, Reactor Coolant System Piping and Valves (RVVs and RRVs)	The following statement is made: "assess materials of fabrication for RCS valves under SRP Section 10.3.6, "Steam and Feedwater System Materials." NuScale does not have Reactor Coolant Valves.	NuScale recommends removing references to reactor coolant valves.	See footnote 1
234	5.4	Page 8, Paragraph 1	"DSRSP" is not correct.	Change "… under DSRSP Section 15.1.5. to "… under DSRS Section 15.1.5."	See footnote 1

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235	5.4	Page 2, Last Paragraph	DSRS Section 15.0.3 is titled "DESIGN BASIS ACCIDENT RADIOLOGICAL CONSEQUENCE ANALYSES FOR NuScale SMR DESIGN"	Change "… Advanced Light Water Reactors." to "…NuScale SMR Design."	See footnote 1
236	DSRS Section 5.4.2.1	Item E on page 5.4.2.1-7.	This DSRS section contains the same issue as that on DSRS Section 5.3.1 with the stud materials for the Steam Generator Flanges on the RPV. These bolts will also be in a borated water environment.	NuScale recommends that Paragraph E includes a statement that RG 1.65 does not apply to the NuScale design.	The staff does not agree with the comment. The applicability of RG 1.65 to the NuScale design cannot be determined at this time because the NuScale design has not been finalized and the applicable design details and materials specifications are subject to change. The staff notes that regulatory guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions that differ from those set forth in regulatory guides will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission. As such, if an applicant believes that certain regulatory positions of RG 1.65 are not appropriate for the NuScale design, then a justification should be provided for the staff's review as part of the application process.

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237	DSRS Section 5.4.2.2	First Page	The DSRS includes the statement "The NuScale integral pressurized water reactor (iPWR) designed by B&W includes a single internal steam generator."	NuScale recommends removal of all reference to B&W	The staff agrees with this comment and has revised the DSRS accordingly.
238	DSRS Section 5.4.2.2	Item 13 on page 5.4.2.2-3, and Technical Rationale on page 7	The DSRS item 13 references the mPowerTM steam generator.	NuScale recommends removal of all reference to mPower in this section and throughout the DSRS.	The staff agrees with this comment and has revised the DSRS accordingly.
239	5.4.2.2	Areas of Review, Item 4 page 5.4.2.2-2	Item 4 in the DSRS makes reference to steam generator primary channel. This does not exist in the NuScale design.	NuScale recommends the text be changed from steam generator primary channel to steam and feed plenums.	The staff partially agrees with this comment. The staff agrees with deleting the reference to the primary channel head and revised the DSRS accordingly. However, the staff considers it unnecessary to add a new example. Because the NuScale design has not been submitted to the NRC staff for review and is still subject to change, if there are differences between the scope of the DSRS and the applicable design details then the staff will use the SRP for guidance.

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240	5.4.2.2	Review Interfaces, Item 6, page 5.4.2.2-2	There are no Class 2 or Class 3 components associated with the Steam Generator design.	NuScale recommends this item be deleted.	The staff does not agree with the comment. The applicability of Class 2 or 3 components cannot be determined at this time because the NuScale design has not been finalized and the applicable design details are subject to change. If an applicant believes that the issues related to Class 2 or 3 components are not applicable to the NuScale design then a justification should be provided for the staff's review as part of the application process.
241	5.4.2.2	Review Interfaces, Item 8, page 5.4.2.2-2	The SG does not provide an overpressure protection function for the RCPB.	NuScale recommends this item be deleted.	The staff has revised the DSRS accordingly. Because the NuScale design has not been submitted to the NRC staff for review and is still subject to change, if there are differences between the scope of the DSRS and the applicable design details then the staff will use the SRP for guidance.
242	5.4.2.2	Review Interfaces, Item 10, page 5.4.2.2-3	This is not SMR specific and it is not contained in the standard SRP.	NuScale recommends this item be deleted.	The staff agrees with this comment and has revised the DSRS accordingly. The staff acknowledges that SRP Section 5.4.2.2 does not interface with SRP Section 17.4. Furthermore, the staff acknowledges that having DSRS Section 5.4.2.2 interface with SRP Section 17.4 is not

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					specific to the NuScale design.
243	DSRS Section 5.4.2.2	Review Interfaces, Item 4 on Page 5.4.2.2-2	The following statement is made in Item 4: "The ISI and testing of other areas of the RCPB (e.g., steam generator primary channel head) are reviewed under DSRS Section 5.2.4." NuScale Steam Generators do not have primary channel head.	NuScale recommends removing reference to primary channel head.	The staff has revised the DSRS accordingly. Because the NuScale design has not been submitted to the NRC staff for review and is still subject to change, if there are differences between the scope of the DSRS and the applicable design details then the staff will use the SRP for guidance.
244	DSRS Section 5.4.7	Areas of Review, Note on Page 5.4.7-2	The note: "The RHR function is performed by RCI, and RCI is reviewed under DSRS 9.3.6. Additional review guidance is included in DCRS 9.3.6 “contains an inaccuracy. NuScale does not have a RCI system.	NuScale recommends removal of all reference to a reactor coolant injection system,	DSRS was revised. Reference to RCI has been deleted though the document.
245	5.4.7	I. Areas of Review, p 5.4.7-1	The DSRS statement "Routine residual heat removal (RHR) for the NuScale SMR is provided by the main condenser and feedwater system and, at a lower temperature and pressure, filling the containment with water." The normal feedwater system is	NuScale recommends a revision to the description to reflect that: Routine residual heat removal (RHR) for the NuScale reactor module is provided by the main condenser and feedwater system which can cool the RCS to cold conditions. For refueling operations, the containment is flooded using the Containment	DSRS was revised to reflect portions of the comment. Details associated with how the CFDS operates (i.e., opening the ECCS valves…) is not necessary for the DHRS DSRS.

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			used to cool the RCS down to less than 200 F. Flooding containment is not required to remove heat at lower temperatures and pressures. The Containment Flood and Drain System (CFDS) floods containment to increase reactor module inventory and ECCS valves are opened prior to disconnecting and moving the module.	Flood and Drain System (CFDS) prior to decoupling the reactor module. With containment flooded, ECCS valves are opened to equilibrate level and pressure between RCS and containment. With a flooded containment, heat is removed via conduction through the RPV and containment vessel walls using the reactor pool as a heat sink.	
246	5.4.7	I. Areas of Review, p 5.4.7-1	The DSRS statement "Reactor coolant system (RCS) cooldown is achieved by conduction and convection of heat between the reactor pressure vessel wall, the water inside containment and the reactor building pool." should be revised to clarify whether the context is cooldown using ECCS cooling or heat removal after flooding the containment for refueling. This mode of cooldown is relied on when ECCS is actuated. Heat removal and cooldown using the ECCS will be evaluated in Section 6.3. The reactor module will be at low pressures and	NuScale recommends revising the DSRS statement to clarify whether the context is “cooldown" using ECCS cooling, or "heat removal” after flooding the containment for refueling.	DSRS revised to clarify that context is related to heat removal after containment flooding.

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			temperatures when the containment is flooded using the Containment Flood and Drain System. After flooding containment heat will be removed by “conduction and convection of heat between the reactor pressure vessel wall, the water inside containment and the reactor building pool.”		
247	5.4.7	I. Areas of Review, p 5.4.7-1	The DSRS statement "The NuScale SMR safety-related RHR function is provided by the passive DHR" should be revised to reflect that the RHR function is also provided by the ECCS (1) when ECCS actuates for non-LOCAs after non safety-related backup power is depleted or lost, and (2) when inadvertently depressurizing the RCS.	NuScale recommends revising the DSRS statement to reflect that The RHR function is also provided using ECCS when ECCS is actuated for non-LOCA events. ECCS functionality and heat removal capability is reviewed in section 6.3. Heat removed using DHR or ECCS is rejected to the reactor pool which is the ultimate heat sink for safety related heat removal.	DSRS was revised to reflect comment.

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248	5.4.7	Review Interfaces, p 5.4.7-3	The DSRS statement "The NuScale passive RHR function is provided by the safety-related DHR system and filling containment with water should be revised. The principle interfaces with this DSRS are as follows." The RHR function is also provided by the ECCS (1) when ECCS actuates for non-LOCAs after non safety-related backup power is depleted or lost, and (2) when inadvertently depressurizing the RCS.	NuScale recommends a revision to this statement to reflect that the RHR function is also provided using ECCS when ECCS is actuated for non-LOCA events.	DSRS was revised to reflect comment.
249	5.4.7	Review Interfaces, Item 3, p5.4.7-3	The DSRS statement "….with respect to cooling down to the conditions permitting operation of the DHR system" should be revised. The RCS does not have to be cooled to permit operation of the DHR.	NuScale recommends a revision to the DSRS statement to reflect that the NuScale DHR design can be actuated at full RCS pressure.	The reference to cooling down to conditions permitting operation of DHR system has been deleted.
250	5.4.7	Review Interfaces, Item 3, p5.4.7-3	The DSRS statement "….. since an alternate approach to that normally used for cooldown may be specified (for example, filling containment with water as an alternate to the use of the	NuScale recommends a revision such that CFDS is not described as an alternate approach for cooldown.	The reference to CFDS has been deleted and replaced with ECCS as an alternative to reaching safe shutdown after the loss of dc power.

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			DHR system)" should be revised. The CFDS is not relied on as an alternative approach to cooldown.		
251	5.4.7	DSRS Acceptance Criteria, p 5.4.7-9	The DSRS statement "The specific areas of review for the safety-related functions of RCI are as listed below" should be revised. The list that follows includes the statement "RHR function" in some instances and in other instances refers to DHR. If RCI is replaced with the NuScale system that applies then the term RHR function would be redundant. It is not clear whether some of the items listed would apply to the DHR or the ECCS. For example, Acceptance Criterion 10 addresses LOCAs and would not apply to the DHR.	NuScale recommends removal of the term "RHR function" and suggests specifying the NuScale system that would be applicable to the acceptance criteria, Additionally, reference to RCI should be removed because the NuScale design does not include RCI.	The term RHR function has been removed and the section rewritten to focus on the DHR system. Decay heat removed by the ECCS for non-LOCA transients is addressed in DSRS Chapter 6.3.

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252	5.4.7	Technical Rationale, Item 3, p5.4.7-10	The DSRS statement "Heat transfer during postulated accident conditions for the plant is a function of the passive ECCS decay heat removal system" should be revised. This statement is correct, however, the RHR function is also provided by the ECCS (1) when ECCS actuates for non- LOCAs after non safety-related backup power is depleted or lost, and (2) when inadvertently depressurizing the RCS.	NuScale recommends this statement be revised to indicate that ECCS does not only perform a heat removal function during postulated accidents.	The sentence has been deleted as the focus of the review in DSRS 5.4.7 is on the DHR system and not the ECCS which is addressed in DSRS Chapter 6.3.
253	5.4.7	I. AREAS OF REVIEW, p 5.4.7-2and Requirements, Item 13, p 5.4.7-7	The DSRS includes a statement: "The reviewer will also evaluate the requirements for leakage detection and control identified in NUREG-0737, Item III.D.1.1."NUREG-0737, Item III.D.1.1 requires a program to reduce leakage from systems outside containment that would or could contain highly radioactive fluids during a serious transient or accident. The NuScale DHR system is connected to the secondary side which does not contain	NuScale recommends that reference to NUREG-0737, Item III.D.1.1 and 10 CFR 50.34(f)(2)(xxvi) be removed from this section.	Staff does not agree with the comment. The reference to NUREG-0737, Item III.D.1.1 and 10 CFR 50.34(f)(2)(xxvi) have been retained as a steam generator tube rupture (i.e., an accident) could lead to contaminated RCS fluid in the Decay Heat Removal System (DHRS) which is located outside of containment.

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			highly radioactive fluids. Therefore, Item III.D.1.1 is not applicable to the NuScale DHR system which does not contain reactor coolant.		
254	5.4.7	Technical Rationale, Item 1, p 5.4.7-10	The DSRS includes the following statement: "3) portions of the DHR can contain radioactive material in the event of an accident." The NuScale DHR system is a secondary side system which does not contain radioactive material in the event of an accident. Contrary to the current generation PWR RHR system, the NuScale DHR is not connected to the RCS and does not use reactor coolant as the working fluid.	NuScale recommends that this statement be deleted.	The statement: "3) portions of the DHR can contain radioactive material in the event of an accident," has been retained as a steam generator tube accident could lead to contaminated RCS water reaching the secondary side.

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255	5.4.7	Technical Rationale, Item 5, p 5.4.7-11	The proposed DSRS applies GDC 14 to steam generator tube integrity. SG tube integrity is addressed under DSRS 5.4.2.1. GDC 14 is specific to the reactor coolant pressure boundary. The NuScale DHR is a secondary side system, not connected to the RCPB. Therefore GDC 14, which applies to the RCPB, is not applicable to the NuScale DHR. Consistent with the implementation of GDC 14 for current generation plants, GDC 14 is not evaluated under Sections 5.4.7 and 10.4.9. GDC 14 should also not be repeated in DSRS 5.4.7 as it is already addressed under DSRS 5.4.2.1.	NuScale recommends that references to GDC 14 be deleted from the DSRS for DHR.	GDC 14 retained as the steam generator tubes of the DHR serve as the RCPB. Item 17 under Review Interfaces has been added to denote that DSRS 5.4.2.1 has the primary responsibility to review steam generator tube integrity. Retaining GDC 14 is consistent with other GDCs listed (e.g., GDCs 1, 2 and 19), which primary review responsibility is outside of DSRS 5.4.7.
256	DSRS Section 5.4.7	Second paragraph on the cover sheet	The NuScale SMR safety-related RHR function is provided by the passive DHR, an engineered safety feature (ESF) of the NuScale design.	NuScale recommends that after the DHR function has been stated that it is the equivalent of the RHR, then all further reference to RHR should be deleted from all the sections that follow. This may require enhancements to the discussion on the DHR performing the function of residual heat removal.	The DSRS was revised by replacing RHR with DHR in reference to the DHR safety system.

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257	5.4.7	I. AREAS OF REVIEW, p 5.4.7-2	DSRS statement "The reviewer will also evaluate the requirements for leakage detection and control identified in NUREG-0737, Item III.D.1.1." NUREG-0737, Item III.D.1.1 requires a program to reduce leakage from systems outside containment that would or could contain highly radioactive fluids during a serious transient or accident. Item III.D.1.1 is not applicable to the DHR system which does not contain reactor coolant.	NuScale recommends removal of reference to NUREG-0737, Item III.D.1.1.	Staff does not agree. See response to comment 253.
258	5.4.7	Review Interfaces, Item 3, p 5.4.7-3	DSRS statement "the organization responsible for the reactor thermal hydraulic systems reviews the tests and supporting analysis concerning the mixing of borated water and cooldown under natural circulation as required in BTP 5-1."Boron mixing is addressed in BTP 5-4 rather than BTP 5-1.	NuScale recommends referring to BTP 5- 4 rather than BTP 5-1.	DSRS was revised to reflect comment.

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259	5.4.7	Review Interfaces, p 5.4.7-4	DSRS statement "Additionally, the organization responsible for the review of reactor thermal hydraulic systems will coordinate evaluations of other reviewers that interface with the overall review of the DHR as follows." The items that follow also address ESF functions that are relevant to the ECCS rather than the DHR. For example -Item 1.A "Evaluates the containment heat removal capability and the reactor building pool designs as part of its review responsibility for DSRS Section 6.2.2". -Item 4 "Upon request, the organization responsible for the review of component integrity issues related to engineered safety features verifies the compatibility of the materials of construction with service conditions as part of its primary responsibility for DSRS Section 6.1.1". -Item 5.D "Review of the ECCS passive decay heat removal system to ensure that residual heat will be removed during accident	NuScale recommends the items relevant to the RHR function performed by the ECCS should be moved to section 6.3 or it should be clarified that these items apply to the ECCS rather than to the DHR.	Item 1A has been deleted as it refers to ECCS heat removal capability which is performed under DSRS 6.3. Item 4 has been retained as it refers to engineered safety features which includes the DHR. Per DSRS 6.1.1, "ESF systems include those systems that provide emergency core cooling, fission product containment, decay heat removal and containment heat removal." The DHR provides decay heat removal. Item 5D addresses the mechanical engineering review interface for the DHR system and hence the statement, “Review of the ECCS passive decay heat removal system to ensure that residual heat will be removed during accident conditions is coordinated and performed under DSRS Section 6.3” is not relevant and was deleted. The relationship between the reviews performed under DSRSs 5.4.7 and 6.3, which both involve decay heat removal, is addressed under DSRS 5.4.7 Review Interface Item 3.

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			conditions is coordinated and performed under DSRS Section 6.3." (Note that the ECCS is also used to perform a heat removal function for AOOs.)		
260	5.4.7	Review Interfaces, Item 2, p 5.4.7-4	DSRS statement "Flooding of the containment vessel from the reactor building pool is addressed under DSRS Section 9.1.3." It is not clear how flooding the containment vessel from the reactor building pool is relevant to overall review of the DHR.	NuScale recommends that clarification is provided to describe in what way flooding the containment vessel from the reactor building pool is an “interface with the overall review of the DHR".	The DSRS was revised to clarify that containment flooding is used for decay heat removal prior to the module being disconnected for refueling and is reviewed under DSRS Section 9.3.6. It was retained as an aid to the reviewer that DSRS 9.3.6 addresses decay heat removal during module transport to the refueling area.
261	5.4.7	Review Interfaces, Item 6.C, p 5.4.7-5	DSRS statement "Reviews cooling water systems that transfer decay heat from the DHR to atmosphere is performed under DSRS Section 9.2.2." Heat from the DHR is rejected to the reactor pool (UHS) and can be removed from the UHS to the atmosphere through evaporation without relying on the reactor pool cooling system.	NuScale recommends that clarification is provided for the aspects of reactor pool cooling system that are relevant to the overall review of the DHR.	This statement has been deleted.

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262	5.4.7	Requirements, Item 13, p 5.4.7-7	Item III.D.1.1 is not applicable to the DHR system which does not contain reactor coolant.	NuScale recommends removal of the reference to NUREG-0737 Task Action Plan Item III.D.1.1 and 10 CFR 50.34(f)(2)(xxvi).	Staff does not agree. See response to comment 253.
263	5.4.7	DSRS Acceptance Criteria, p 5.4.7-9	DSRS statement “The specific areas of review for the safety-related functions of RCI are as listed below." The NuScale design does not include a reactor coolant injection (RCI) system.	NuScale recommends removal of reference to RCI and replacement with the appropriate NuScale system.	The DSRS has been revised to reflect comment.
264	5.4.7	DSRS Acceptance Criteria, Item 6, 5.4.7-9	It appears that Acceptance Criterion 6 would be more appropriate to apply to DSRS sections in Chapter 7.	NuScale recommends addressing Item 6 in Chapter 7 DSRS sections.	No changes were made to the DSRS. The Chapter 7 reviewers also perform the digital instrumentation and control review against GDC 19. Maintaining GDC 19 in DSRS 5.4.7 is consistent with the current SRP 5.4.7.
265	5.4.7	Technical Rationale, Item 1, p5.4.7-10	DSRS statement "3) portions of the DHR can contain radioactive material in the event of an accident." It is not clear how portions of the DHR will contain radioactive material in the event of an accident. The DHR is not part of the RCS and does not use reactor coolant as the working fluid.	NuScale recommends clarifying under which conditions the DHRS would contain radioactive material in the event of an accident.	Staff disagrees with the recommendation to delete this statement. See Technical Resolution Comments 253 and 254.

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
266	5.4.7	5.4.7, I. Paragraph 3	The DSRS paragraph states that "...one DHR train is actuated by opening a pair of valves which are both located before (upstream of) the decay heat removal heat exchanger (DHRHX) "	NuScale recommends clarification or deletion of the sentence because both trains are actuated in response to any actuation signal. In addition to opening the DHRS actuation valves, the MSIV and FWIV must be close for DHRS actuation.	This statement has been rewritten to clarify that both DHRS trains are activated on an actuation signal and that the main steam and feedwater isolation valves must be closed.
267	5.4.7	5.4.7, I. Paragraph 4	This DSRS paragraph states that "The review of the RHR function must consider all conditions from shutdown at normal RCS power operating pressure and temperature to the cold depressurized condition.	NuScale recommends clarification or deletion of the sentence because as a passive design, the goal for the RHR function is the safe shutdown state. NuScale cannot progress to a cold (<200°F) and depressurized (<2 atm.) condition with only safety related equipment.	The DSRS has been revised and “cold depressurized conditions” has been changed to “safe shutdown conditions.”
268	5.4.7	5.4.7, I. Paragraph 5	This DSRS paragraph states that "The reactor pool cooling system maintains reactor building pool water temperature and transfers pool water to the containment via the containment evacuation system during shutdown."	NuScale recommends clarification or deletion of the sentence. The Containment flooding and drain system transfers pool water to the containment during shutdown	This sentence has been revised to state that the containment flooding and drain system transfers water to containment during shutdown.
269	5.4.7	5.4.7, III, 5	This DSRS section states that "From the system description and P&IDs, the reviewer determines that the isolation requirements of	NuScale recommends removal of this item. The DSRS version of BTP 5-4 does not contain isolation requirements. They are only applicable to systems	This statement has been deleted.

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			BTP 5-4 are satisfied."	connected to reactor coolant.	
270	5.4.7	5.4.7, III, 24	This DSRS section states that "The reviewer verifies that interlocks are in place to prevent DHR from activating with low reactor building pool water level.	NuScale recommends removal or clarification of purpose for the statement.	The statement regarding an interlock function has been deleted and replaced with Item 24 under III. REVIEW PROCEDURES, to ensure the reviewer checks that there is adequate control of the reactor building pool level (inventory) for the DHR to perform its safety function of adequate residual heat removal.
271	5.4.7	5.4.7, III, 25	The DSRS section states that "The reviewer verifies that provisions are provided to clean the heat exchanger fins which are in borated water"	NuScale recommends removal or clarification of the statement. The heat exchanger has no fins, and thus no provisions can exist to clean them.	The word "fins" is replaced with the word "tubes."
272	5.4.7	5.4.7, IV, Paragraph 3	The DSRS section states that "The DHR valves upstream of the DHRHX are opened and actuate the decay heat removal function via natural circulation around the DHR loop."	NuScale recommends removal or clarification of the statement. In addition to opening the actuation valves, the MFIV and FWIV must be closed.	The DSRS has been revised to reflect that the main steam and feedwater isolation valves are closed in addition to opening the DHR valves upstream of the DHRHX.
273	DSRS Branch Technical Position 5-4	BTP 5-4 pages 2, 3, and 4.	Pages have incorrect page number 15.4- 2, 15.4-3, 15.4-4	Correct page numbers.	Page numbers corrected

Comment # *(Affiliation: NuScale Power, LLC)*	**DSRS Section**	**Paragraph, Item, or Page**	**Comment / Basis**	**Commenter Recommendation**	**NRC Staff Technical Resolution**
274	DSRS Branch Technical Position 5-4	1. Functional Requirements for DHR, item A, on page 2	Standard Review Plan (SRP)	Correct TYPO	Typo corrected.
275	BTP 5-4	BTP 5-4	The BTP paragraph states that "The DHR system function is included as a safety-related passive system for use during normal operation…"	NuScale recommends removal or clarification of this sentence because there are no plans to use the DHR function during normal operation.	Reference to the DHR system as a normal means of decay heat removal has been deleted.
276	BTP 5-4	A. Background p BTP 15.4-2	DSRS includes a statement: "Additionally, the NuScale design utilizes a non-safety related active system in conjunction with containment flooding that serves as a backup and first line of defense to reduce challenges to the safety-related passive DHR system. It also operates under normal plant conditions." The containment flooding system does not provide a first line of defense to the passive DHR system. The containment flood system also does not provide a backup to the DHR system. Rather, the safety relief	NuScale recommends removing the statement that “containment flooding that serves as a backup and first line of defense to reduce challenges to the safety-related passive DHR system."	Sentence deleted as the active systems do not serve as a backup to safety-related DHR.

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			valves along with the ECCS provide a backup to the DHR system. CVCS provides a backup for the unlikely situation that DHR and ECCS fail.		
277	BTP 5-4	4. Operational Procedures, p BTP 15.4-3	DSRS includes a statement: "For NuScale, the operational procedures shall include specific procedures and information required for cooldown under natural circulation conditions. These natural circulation cooldown procedures and analyses should consider the potential for a voiding event in the reactor vessel head and incorporate appropriate controls to address such an occurrence (GL 92-02)." Because the RCS consists of a single vessel (the RPV) with the pressurizer, or void space, located at the top of the vessel, voiding does not challenge natural circulation flow. Therefore, voiding does not need to be prevented during cooldown using DHR.	NuScale recommends removing the statement "natural circulation cooldown procedures and analyses should consider the potential for a voiding event in the reactor vessel head and incorporate appropriate controls to address such an occurrence."	Statement deleted as any voiding in the NuScale design would occur at the top of the integral pressure vessel and would not interfere with the ability to establish and maintain natural circulation.