

Comment Response Matrix Chapter 10

Comment # <i>(Affiliation: NuScale Power, LLC)</i>	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
430	10.2.3	DSRS Acceptance Criteria Section 5 paragraph 3	"And high-pressure rotors" - there is no high pressure turbine in the NuScale system.	NuScale recommends the NRC remove this term.	The staff does not agree with the comment. Turbines typically have low and high pressure rotors. Therefore, the acceptance criteria will be applicable to both high and low pressure rotors. If a turbine that will used by the applicant or licensee does not have a high pressure rotor, then this acceptance criteria does not apply. Since there are various turbines that a potential licensee can use based on business decisions, this criteria should remain.
431	10.3	Areas of Review Page 10.3-1 First paragraph	Designation of MSSS for main steam supply system is currently MSS	NuScale recommends the NRC change the main steam supply system acronym to MSS for use for all documentation on the SMR system.	No revisions were made to the DSRS. The MSSS designation for the main steam supply system used in the DSRS is consistent with the system abbreviation in NUREG-0544, "NRC Collection of Abbreviations." It is also the abbreviation used in NUREG- 0800, Standard Review Plan, Section 10.3, "Main Steam Supply System." The DSRS system abbreviation does not prevent NuScale from using a different system abbreviation in its documents.

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432	10.3	Areas of Review Page 10.3-1 First paragraph	The MSS is not connected to the DHR system as this is within the piping scope upstream of the MSIVs providing containment. The MSS may assist the DHRS in heat removal only downstream of MSIVs.	NuScale recommends the NRC replace "interfaces" with "may assist"	No revisions were made to the DSRS. The staff's review of the MSSS will start from the connections to the secondary side of the steam generator (SG) up to and including the turbine stop valves. Since DHRS piping connects directly to MSSS piping, the term "interfaces" is appropriate.
433	10.3	Areas of Review Page 10.3-1 Second paragraph	Main Steam Safety Valves (MSSV) are provided. Relief valves are currently not in the system.	NuScale recommends the NRC remove relief valve in scoping section	The staff agrees with the comment because NuScale will not be using relief valves and will only rely on steam safety valves for pressure relief and control. The DSRS text has been revised accordingly.
434	10.3	Areas of Review Page 10.3-1 Third paragraph	The MSS does not include safety related piping. It only connects to it at the discharge of the MSIV	NuScale recommends the NRC delete second sentence	No revisions were made to the DSRS. The staff's review of the MSSS will start from the connections to the secondary side of the steam generator (SG) up to and including the turbine stop valves. There are some portions of the MSSS that are safety related; for example, the MSSS piping and components from the steam generator outlet to the MSIVs.
435	10.3	Areas of Review	Valves on MSS are safety valves	NuScale recommends the NRC rename "relief" to "safety"	The staff agrees with the comment because NuScale will not be using relief valves and will only rely on

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		Page 10.3-2 section 1.E.			steam safety valves for pressure relief and control. The DSRS text has been revised accordingly.
436	10.3	Review Interfaces Page 10.3-3 Paragraph 5 Page 10.3-4 Paragraph 13 Page 10.3-4 Paragraph 16	Delete paragraph as the MSS is not inside of the containment.	NuScale recommends the NRC delete the section/paragraph	No revisions were made to the DSRS. The staff does not have enough design detail information to eliminate the proposed paragraphs. By the time the application is received, the applicability of these paragraphs should be clear.
437	10.3	DSRS Acceptance Criteria Page 10.3-5 Paragraph 1	Delete "Position C.1 for safety-related portions and". Only Position C.2 is required as only non-safety related equipment is furnished.	NuScale recommends the NRC delete "Position C.1 for safety-related portions and"	No revision was made to this DSRS. See answer to Comment # 434.
438	10.3	DSRS Acceptance Criteria Page 10.3-5 Paragraph 2 second paragraph	Needs paragraph number.	NuScale recommends the NRC add a paragraph number and delete "In addition,"	No revisions were made to the DSRS. Item 2 identified in the DSRS Acceptance criteria section pertains to GDC 4. The second paragraph under item 2 is included to identify the need to address water (steam) hammer considerations as part of the review against GDC 4. The formatting used in the DSRS is the same as that used in the corresponding SRP section.

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439	10.3	DSRS Acceptance Criteria Page 10.3-5 Paragraph 2 second paragraph	rename relief to safety for valve discharge loads	NuScale recommends the NRC replace relief with safety	DSRS revised. Text was modified as indicated by commenter.
440	10.3	Review Procedures Page 10.3-8 Paragraph 4	Piping described is within the containment and not the main steam for the classification shown.	NuScale recommends the NRC change to Quality Group D Seismic category I and III	No revisions were made to the DSRS. The staff does not have enough design detail information to accept the comment. By the time the application is received, the applicability of these proposed changes should be clear. The staff considers the piping inside the NuScale containment as part of the MSSS. This piping should be either Seismic Category I or II. Therefore, Quality Group D is not acceptable.
441	10.3	Evaluation Findings Page 10.3- 11 Paragraph 2	Only piping within the containment is Quality group B; MSS is Quality Group D	NuScale recommends the NRC change Quality class.	No revisions were made to the DSRS. Paragraph 2 pertains to "essential portions of the MSSS" which includes the main steam lines from the steam generator to the containment isolation valves in PWR plants. Quality group B applies to these essential portions of the MSSS.

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442	10.3	Implementat ion Page 10.3-12 First paragraph.	Second sentence includes timing for activities included in technical portion of document. Required dates for activities should be listed in a project implementation section not in individual system location.	NuScale recommends the NRC delete the second sentence.	The staff does not agree with this comment. The Implementation subsection addresses regulations in 10 CFR that establish requirements for applications for ESPs, DCs, and COLs. The timing information is part of the NRC requirements; therefore, no change is necessary.
443	10.4.1	Multiple	Review of this Document is for non- safety portion of the document per the project Division of Responsibility for BOP.	Review of this Document is for non-safety portion of the document per the project Division of Responsibility for BOP.	See footnote 1 ¹
444	10.4.1	Throughout	System abbreviation describing the Main Condenser System appears incomplete	NuScale recommends the NRC revise "MC" to "MCS" throughout DSRS	See footnote 1

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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445	10.4.1	Areas of Review Page 1	The initial text does not fully describe the Main Condenser function.	NuScale recommends the NRC add a sentence at end of first paragraph "The main condenser uses cooling water supplied from the circulating water system (CWS) to create vacuum conditions during turbine operation."	See footnote 1
446	10.4.1	Areas of Review Page 1	The description should note the component of discussion - Main condenser - in the NuScale design.	NuScale recommends the NRC add word 'main' in the inserted sentence after first paragraph, to now read "The NuScale plant has one dedicated turbine and main condenser for each power module, and up to 12 modules per plant."	See footnote 1
447	10.4.1	Areas of Review Page 1	Qualify the NuScale specific design with respect to primary to secondary leakage.	NuScale recommends the NRC change text in third paragraph from "In a pressurized-water reactor (PWR) or integral pressurized water reactor (iPWR)" to "In the NuScale plant design"	See footnote 1
448	10.4.2	I. Areas of Review	Condenser Air Removal System does not transfer radioactive gases to the gaseous waste processing system or ventilation exhaust system. We simply monitor the effluent and will shut down and isolate the affected system if rad	NuScale recommends the NRC highlights the monitoring and controlling radiation aspect of the system. In addition, NuScale recommends the NRC state effluent is discharged to atmosphere at a safe location, not that it is routed to gaseous waste processing system.	See footnote 1

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			monitoring begins picking up radiation levels outside of specifications.		
449	10.4.2	DSRS Acceptance Criteria, Technical Rational	Third paragraph states "Design features are incorporated into the system to ensure that these radioactive materials are controlled and routed appropriately." Lines are not routed to any system that will "clean or process" them if there is a leak. System will have to be isolated and a portable radiation system will have to be used to transfer to the correct radwaste systems.	NuScale recommends the NRC remove "routed" appropriately. Add mention of ability to contain.	See footnote 1
450	10.4.2	DSRS Acceptance Criteria, Review Procedures	Point 3 says "release of gaseous wastes to the environment or other systems." See above comment.	NuScale recommends the NRC remove "other systems."	See footnote 1
451	10.4.2	II. Acceptance Criteria (various) IV. Evaluation Findings (various)	There is an apparent inconsistency in how GDCs 2 and 4 are applied in various sections of the SRP and DSRS. In Section 10.4.5 and other mPower DSRS sections that govern non-essential systems, the staff has added GDC 2 where the	NuScale recommends the NRC identifies where these GDCs will be applied.	See footnote 1 With respect to the broader point made by the comment the staff does not believe that there is an inconsistency in how GDCs 2 and 4 are applied. The applicability of GDC 2 and 4 to "non-essential

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			<p>current SRP section does not already specify it. This addition seems appropriate since the intent is to ensure that a failure of the non-essential system due to the effects of natural phenomena will not adversely impact essential SSCs.</p> <p>Accordingly, GDC 2 is applied in conjunction with GDC 4, the latter of which specifically addresses internal flooding or dynamic effects as a result of a postulated failure. For non-essential systems, the requirements of GDC 2 are met when the failure of the system due to natural phenomena will not adversely affect the functional performance capabilities of safety-related or risk-significant systems or components. Contrary to the approach taken in Section 10.4.5 where GDC 2 is added, other sections (e.g., Sections 10.4.1 and 10.4.4) do not specify GDC 2 to be applied in conjunction with GDC 4 to ensure that a failure of the non-essential system will not adversely</p>		<p>“systems was determined based on whether the failure of SSCs associated with the system could adversely affect systems important to safety.</p> <p>For example the main steam (DSRS 10.3) and the condensate and feedwater system (DSRS 10.4.7) both interface with DHRS, and are required to be isolated for DHRS operation which is important to safety. Both GDC 2 and GDC 4 apply to these systems. In the case of the circulating water system (CWS) GDC 2 and GDC 4 also apply since major SSCs such as cooling towers and pumps and pipes in the yard area can fail and potentially flood the SSCs important to safety.</p> <p>Systems that do not have safety functions such as the main condenser and the turbine bypass are evaluated for GDC 4 for effects of system failure, such as, flooding, on SSCs important to safety. However since there are no system components interfacing or in close proximity with SSCs important to safety GDC 2 is not</p>

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			<p>impact essential SSCs. It is recommended that GDCs 2 and 4 be consistently applied in both the mPower (and NuScale) DSRS. With the new division of requirement (DOR) between BOP and NSSS, a lot of these GDC (2 and 4 in this case) will only be required for safety-related SSCs. The CARS is non safety related, not risk significant, and being such should not be designed to withstand the effects of natural phenomena, furthermore, failure of the CARS does not hinder the ability to safely shutdown the reactor module. According to the NuScale design, GDC 2 and 4 will be satisfied by the containment isolation valve which will shut based on adverse conditions such as loss of feedwater or loss of condenser vacuum. Failure of the CARS will cause a loss of condenser pressure which will trigger the isolation of the reactor module. See similar comments on mPower DSRS Sections 10.4.1 and 10.4.4.</p>		<p>applied since design for protection against natural phenomena such as earthquakes is not needed.</p>

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452	10.4.5	Areas of Review I.	The NuScale design has 2 circulating water subsystems that each supply cooling water to the MCB condenser(s) of one turbine building. Also, the circulating water system does not remove heat from auxiliary systems or the site cooling water. The CWS's only responsibility is rejecting turbine heat to the environment.	NuScale recommends the NRC update the section to reflect NuScale CWS design.	See footnote 1
453	10.4.6	Title, p 1	The Gap Analysis noted that, because of the different design of the once through NuScale steam generator, some of the sampling requirements dictated by the referenced EPRI PWR Secondary Water Chemistry Guidelines and NEI 97-06 guidelines will require a different approach. NuScale recommended the creation of a "Feedwater Treatment System" DSRS section to address this issue. As the NRC did not issue a separate DSRS, recommend that the title reflect the two separate systems addressed.	NuScale recommends the NRC change title from "Condensate Cleanup system" to "Condensate Polishing and Feedwater Treatment Systems"	See footnote 1

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454	10.4.6	Areas of Review	Note the performance characteristics of each system	NuScale recommends the NRC replace Areas of Review 1 text "The staff will review the design of the condensate and feedwater system to ensure that chloride and other contaminant concentrations" with "The staff will review the design of the CPS and FTS to ensure that contaminant concentrations and water chemistry"	See footnote 1
455	10.4.6	throughout	Note incorrect system names throughout	NuScale recommends the NRC replace text "condensate cleanup system" with "CPS and FTS" Replace text "cleanup system" with "CPS and FTS"	See footnote 1
456	10.4.6	I. Areas of Review - Review Interfaces Item 4 and Item 5 p. 10.4.6-2	Shows incorrect abbreviation for condensate polishing system with regards to the radwaste and shielding items	Change text "CCS" to "CPS"	See footnote 1
457	10.4.7	Multiple	Shows abbreviation for condensate and feed water system as CFWS.	NuScale recommends the NRC use the correct abbreviation for condensate and feed water system or CWFS.	The staff has changed the abbreviation for condensate and feedwater system to CFS, which is consistent with NUREG-0544, "NRC Collection of Abbreviations." This is also the same abbreviation used in NUREG-0800, Standard Review Plan, Section 10.4.7,

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					"Condensate and Feedwater System."
458	10.4.7	Areas of Review First Para. First page.	Revise this sentence to the sentence as shown in the recommendation column: <i>Condensate is pumped from the main condenser hotwell by the condensate pumps, passes through the low- and intermediate- pressure feed water heaters to the feed water pumps, and then is pumped through the high- pressure feed water heaters into the tube side of the helical coil steam generator.</i>	NuScale recommends the NRC use this rewritten sentence: <i>Condensate is pumped from the main condenser hotwell by the condensate pumps, passes through the condensate polishing system (CPS), the gland steam condenser, the low- and intermediate- pressure feed water heaters to the feed water pumps, and then is pumped through the high- pressure feed water heaters into the tube side of the helical coil steam generator.</i>	Text was modified as indicated by commenter.
459	10.4.7	Areas of Review 2nd Para. First page.	Revise this sentence to the sentence as shown in the recommendation column: <i>The primary reviewer reviews the CFW from the condenser outlet up to the steam generator to ensure conformance to General Design Criteria (GDC) 2, 4, 5, 34, 44, 45, and 46. There are also interfaces with the secondary water makeup system, the decay heat removal system (DHRS) and the condensate cleanup system.</i>	NuScale recommends the NRC use this rewritten sentence: <i>The primary reviewer reviews the CFWS from the condenser outlet up to the steam generator to ensure conformance to applicable parts of General Design Criteria (GDC) 2, 4, 5, 34, 44, 45, and 46. There are also interfaces with the secondary water makeup system, the decay heat removal system (DHRS) and the CPS and feed water treatment system.</i>	Text was modified as indicated by commenter, except that we refer to the condensate and feedwater system as "CFS" instead of "CFWS."

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460	10.4.7	Areas of Review 2.C	Revise this sentence to the sentence as shown in the recommendation column: A. The interfaces of the CFW with secondary makeup and the condensate cleanup system with regard to functional design requirements and seismic design classification.	NuScale recommends the NRC use this rewritten sentence: A. The interfaces of the CFWS with secondary makeup and the CPS and FWS with regard to functional design requirements and seismic design classification.	Text was modified as indicated by commenter, except that we refer to the condensate and feedwater system as "CFS" instead of "CFWS."
461	10.4.7	Areas of Review 2.D	Revise this sentence to the sentence as shown in the recommendation column: D. The feed water system with regard to possible fluid flow instabilities (e.g., water hammer) during normal plant operation as well as during upset or accident conditions.	NuScale recommends the NRC use this rewritten sentence: D. The CFWS with regard to possible fluid flow instabilities (e.g., water hammer) during normal plant operation as well as during upset or accident conditions.	Text was modified as indicated by commenter, except that we refer to the condensate and feedwater system as "CFS" instead of "CFWS."