

Comment Response Matrix Chapter 4

Comment # (Affiliation: NuScale Power, LLC)	DSRS Section	Paragraph, Item, or Page	Comment / Basis	Commenter Recommendation	NRC Staff Technical Resolution
205	Chapter 4	General comment for all of Chapter 4	There are multiple references to DNBR [departure from nucleate boiling ratio] and CPR [critical power ratio]. That should be changed to CHF [critical heat flux rate] or mCHF [minimum critical heat flux rate]. NuScale's thermal margin is measured using a correlation based on critical heat flux [CHF]. CHF is a more appropriate measure for a [pressurized water reactor] PWR natural circulation reactor than DNBR.	Change these references to CHF or mCHF and delete reference to CPR and DNBR.	DSRS has been updated to replace references to DNB with more generalized language including CHF and boiling crisis.
206	4.2, 4.4	General	Acceptance criteria should be stated for [anticipated operational occurrences] AOs, Infrequent Events [IE] and Accidents rather than	NuScale recommends that the acceptance criteria are revised to address NuScale specific event categories of AOO, IE and Accident.	Regarding DSRS Section 4.2: See footnote 1 ¹ Regarding DSRS Section 4.4: There are only two major types of

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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			the present reference to AOOs and postulated accidents. The discussion of DSRS acceptance criteria refers to AOOs and Postulated accidents in numerous places.		transients in the regulations: AOOs and postulated accidents. Infrequent event is a sub-category of a postulated accident (i.e., limited fuel failures). Therefore, no revision to the DSRS is necessary.
207	4.2	General comment for 4.2	“NuScale™” is used in several instances and should be replaced with “NuScale”.	Replace all instances of NuScale™ with NuScale.	See footnote 1
208	4.2	Review Interfaces	There is no explanation of the interface requirements between this DSRS and SRRS 4.6 This DSRS states: “Review of the control rod drive mechanism design in SRP Section 3.9.4 and the reactor internals design under SRP Section 3.9.5”	NuScale recommends that a bullet is added to explain the interface review responsibilities for DSRS 4.6 and the review.	See footnote 1
209	4.2	Technical Rationale, Item 2, p 4.2-19	Staff guidance should be provided as clarification for evaluating “site suitability source term for multiple modules” and how the site suitability source term is different from the accident source term to demonstrate that Part 100 limits are met.	NuScale recommends that clarification is provided as to how this would be different from the source term used for site suitability for existing multi-unit sites.	See footnote 1

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210	4.2	VI. References, References 55 to 59	None of these references are referred to in the text and they are not relevant to CH 4.2	Remove references 55 to 59	See footnote 1
211	4.3	III. Review Procedures, Item 10, p 4.3- 16+C15	The DSRS does not provide any guidance regarding [containment vessel] CNV fluence predictive capability. CNV vessel fluence should be addressed.	NuScale recommends that the rationale for either review of containment embrittlement or for exclusion from review is provided in the DSRS discussion.	See footnote 1
212	4.4	I. Areas of Review, Item 6p 4.4-2.	NuScale is using mCHFR rather than DNB as a measure of adequate local cooling conditions. The analysis methods to be addressed include core thermal- hydraulic calculations to establish local coolant conditions, departure from nucleate boiling (DNB).The analysis methods to be addressed include core thermal-hydraulic calculations to establish local coolant conditions, departure from nucleate boiling (DNB) boiling transition and thermal-hydraulic stability.	<i>Change: The analysis methods to be addressed include core thermal-hydraulic calculations to establish local coolant conditions, departure from nucleate boiling (DNB), and thermal- hydraulic stability evaluation.</i> To: The analysis methods to be addressed include core thermal-hydraulic calculations to establish local coolant conditions, CHF, and thermal-hydraulic stability evaluation.	The staff has addressed this in the resolution to NuScale Power, LLC, Comment 205.

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213	4.4	DSRS Acceptance Criteria, Item 1 and, 1A p 4.4-4.	One criterion provides assurance that there be at least a 95-percent probability at the 95-percent confidence level that the hot fuel rod in the core does not experience a DNB condition during normal operation or AOOs.	<p>Change reference to thermal margin from DNB to CHF. Change: “DSRS Section 4.2 specifies the acceptance criteria for the evaluation of fuel design limits. One criterion provides assurance that there be at least a 95-percent probability at the 95-percent confidence level that the hot fuel rod in the core does not experience a DNB condition during normal operation or AOOs.”</p> <p>To: “DSRS Section 4.2 specifies the acceptance criteria for the evaluation of fuel design limits. One criterion provides assurance that there be at least a 95-percent probability at the 95-percent confidence level that the hot fuel rod in the core does not experience a DNB CHF condition during normal operation or AOOs.”</p>	The staff has addressed this in the resolution to NuScale Power, LLC, Comment 205.
214	4.4	DSRS Acceptance Criteria, Item 8, p 4.4-5.	The DSRS criterion specifies a 3% drop in coolant flow and a 24 hour monitoring frequency. These values are NuScale specific. The values in SRP 4.4 are appropriate for forced flow plants.	NuScale recommends a revision to the acceptance criterion to state that process monitoring provisions should assure the capability to detect a drop in the reactor coolant flow that exceeds the limits established for	The intent of this DSRS acceptance criterion is to detect degradation of RCS flow. DSRS was revised to, “Process monitoring provisions should assure the capability to detect a degradation in the reactor coolant

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				FQ(Z) . The flow should be monitored every 24 hours."	flow. The flow should be monitored every 24 hours."
215	4.5.2	I. Areas of Review	The second to the last sentence states that the Riser is either a part of the [reactor coolant pump boundary] RCPB or reactivity control system. It serves neither of those roles.	NuScale recommends removal of the word "riser" from this sentence.	See footnote 1
216	4.6	I. Areas of Review, first paragraph, page 4.6-1	The change from SRP "control rod drive system (CRDS)" to "control rod drive mechanism (CRDM) system" is incorrect. NuScale uses CRDS. The title of 4.6 has the correct wording.	Change wording back to "control rod drive system (CRDS)".	See footnote 1
217	4.6	III. Review Procedures §3 on page 4.6-9	Incomplete first sentence "The reviewer evaluates the CRDM design with respect to."	Complete sentence e.g. to current SRP section statement "(...) the reviewer examines descriptions and drawings to determine that the systems meet the design requirements."	See footnote 1
218	4.6	Entire document	The changes from SRP "CRDS" to "CRDM" are incorrect. NuScale uses CRDS	Replace "CRDM" with original "CRDS"	See footnote 1

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219	4.6	I. Areas of Review, 2. C., page 4.6-1 and Review Interfaces 5., page 4.6-2	The list of operations is incomplete. The current includes "rod insertion, withdrawal, and scram operation"	Add "remote disconnection" to the list of operations (on both pages)	See footnote 1
220	4.6	Several	Typos - search for "the the" (second paragraph in I.), "fuel rodt rupture" (in Technical Rationale 6.)	Fix typos	See footnote 1
221	4.6	II. Acceptance Criteria, Technical Rationale Item 7	The second sentence lists "loss of power to all reactor coolant pumps..." NuScale is a natural circulation reactor and has no reactor coolant pumps.	NuScale recommends removal of the reference to reactor coolant pumps.	See footnote 1