

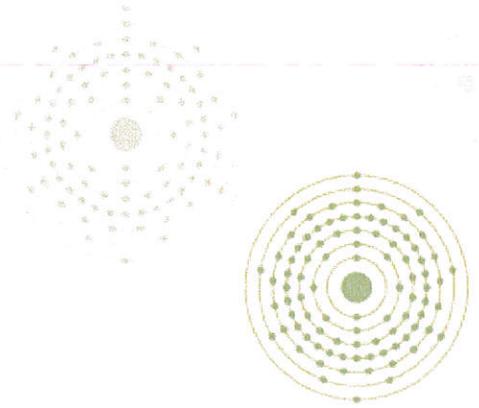
From: [Pete Gaillard](#)
To: [AdvancedRxDCComments Resource](#)
Subject: [External_Sender] TerraPower Comments on Draft Advanced Non-Light Water Reactor Design Criteria
Date: Wednesday, June 08, 2016 7:35:34 PM
Attachments: [Comments to NRC on Draft ARDC.pdf](#)
[TerraPower Ltr to NRC TWR-LIC-LET-0001 160608.pdf](#)

TerraPower is pleased to submit the attached comments on NRC's Draft Advanced Reactor Design Criteria (ARDC). Detailed comments on specific SFR-DC are provided in the attached Table.

We look forward to working with the staff as NRC addresses and finalizes the ARDC, SFR-DC and mHGTR-DC. If you have any questions concerning TerraPower's comments, please contact me (425-324-2732; pgaillard@terrapower.com) or Mike Garrett (425-495-8607; mgarrett@terrapower.com)

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June 08, 2016

TWR-LIC-LET-0001

Mr. Michael E. Mayfield
Director
Division of Engineering, Infrastructure, and Advanced Reactors
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: TerraPower Comments on Draft Advanced Non-Light Water Reactor Design Criteria

Dear Mr. Mayfield:

TerraPower is pleased to submit the attached comments on NRC's Draft Advanced Reactor Design Criteria (ARDC). Current regulations in 10 CFR Part 50, Appendix A, recognize that different requirements may be necessary for non-LWR designs. The preliminary draft of the ARDC as developed by the NRC staff provided stakeholders with insight into the staff's current views on how the General Design Criteria (GDC) could be interpreted to address non-light water reactor design features.

TerraPower has developed Principal Design Criteria (PDC) for the Traveling Wave Reactor (TWR) using the GDC, advanced non-LWR design criteria, and other design criteria as the foundation. The PDC are high level safety criteria that establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety.

The NRC provided the current GDC's, draft ARDC's including rationale for any adaptations from the current GDC, draft Sodium Fast Reactor Design Criteria (SFR-DC), and draft design criteria for modular high temperature gas reactors. TerraPower reviewed the draft ARDC's and the SFR-DC and compared these requirements against the TWR PDC.

A substantial number of the proposed PDC requirements use the same or very similar wording as found in 10 CFR 50 Appendix A. However, a number of the proposed requirements are different or new and are based on the fundamentals of a liquid metal reactor plant design, the proposed ARDC and associated sodium fast reactor design criteria. Detailed comments on specific SFR-DC are provided in the attached Table 1 including the basis for the comment and recommendations

specific to that SFR-DC. The recommendations are based on overall industry experience as well as experience developing and designing the TWR. Comments of particular importance from the attachment table include:

- In SFR-DC-17, NRC should adopt the DOE-proposed ARDC 17 language without modification, in order to accomplish the goal of being risk-informed and performance-based in its focus on ensuring that capability is provided to assure that safety-related functions are maintained. The NRC wording is overly conservative for advanced reactor designs including the TWR. If the proposed NRC ARDC language is retained, it is anticipated that advanced reactor designs will seek exemptions to ARDC 17 in their applications for NRC approval.
- As currently written SFR-DC-35 is redundant to SFR-DC-34. Both requirements currently address core cooling during accident conditions. SFR-DC-35 was deleted from the DOE ARDC because it was assessed to be a design feature that, for some SFR designs, might not be needed to meet safety requirements or may not be the preferred approach for some designs. If SFR-DC-35 is added back in, the redundant requirements in SFR-DC-34 should be removed.

We look forward to working with the staff as NRC addresses and finalizes the ARDC, SFR-DC and mHGTR-DC. If you have any questions concerning TerraPower's comments, please contact me (425-324-2732; pgaillard@terrapower.com) or Mike Garrett (425-495-8607; mgarrett@terrapower.com)

Sincerely,



Peter C. Gaillard
Manager, Licensing

Attachment

cc: Ms. Diane T. Jackson, NRO/DEIA/ARPB, NRC
Ms. Jan M. Mazza, NRO/DEIA/ARPB, NRC
NRC Document Control Desk

TerraPower Comments on Advanced Non-Light Water Reactor Design Criteria

Table 1

Affected Section	Comment / Basis / Observation	Recommendation
1. SFR-DC 3, Fire protection	The ARDC used the phrase “with safety-related equipment or structures, systems, and or components important to safety“. Safety-related” is a subset of “important to safety“. The distinction between safety-related and important to safety does not need to be made nor does a distinction need to be made between equipment (safety-related) and SSC’s (important to safety).	Replace the phrase “with safety-related equipment or structures, systems, and or components important to safety” with “locations with structures, systems, and components important to safety“. Revising the wording as suggested assures all SSCs important to safety are addressed.
2. SFR-DC 13, Instrumentation and control	<p>GDC 13 contains the phrase “for accident conditions <u>as appropriate</u> to assure adequate safety” but the phrase “as appropriate” was removed from the ARDC. It is not apparent why removal of “as appropriate” is necessary for a non-LWR reactor design?</p> <p>The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.</p>	<p>Retain the wording “as appropriate” in the ARDC to maintain consistency with previous versions of the GDC.</p> <p>Replace “primary coolant boundary” with “primary system boundary”.</p>
3. SFR-DC-14, Primary coolant boundary	The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.	Replace “primary coolant boundary” with “primary system boundary”.
4. SFR-DC-15, Primary coolant system design	The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms	Replace “primary coolant boundary” with “primary system boundary”.

Affected Section	Comment / Basis / Observation	Recommendation
	<p>are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.</p>	<p>Replace “primary coolant system” with “primary system”.</p>
<p>5. SFR-DC-16, Containment design</p>	<p>“Pressure retaining” was added to the GDC. The containment function is not to retain pressure. Containment function is to “control the release of radioactivity” as stated in GDC.</p> <p>Why does containment need to surround “its [reactor] cooling systems” to achieve its safety function? What is the scope of “its [reactor] cooling systems”? Is a steam generator part of “its cooling system”?</p> <p>Several reviewers commented that the statement “the containment leakage shall be restricted to be less than that needed to meet the acceptable onsite and offsite dose consequence limits as specified for postulated accidents” created questions on the design-specificity of onsite and offsite dose limits. The Rationale included in the NRC paper emphasizes that containment leakage would not need to meet the “essentially leak-tight” statement in the GDC. Leakage is still restricted to meet acceptable onsite and offsite dose consequence limits.</p>	<p>Recommend deleting the phrase “pressure retaining”.</p> <p>The phrase “... and its cooling system ...” should be deleted.</p> <p>An alternate revision to SFR-DC 16 that addresses and incorporates the above comments that might be considered for inclusion is, “A reactor containment consisting of a low leakage structure surrounding the reactor, shall be provided to control the release of radioactivity to the environment and to assure that the reactor containment design conditions important to safety are not exceeded for as long as postulated accident conditions require.”</p> <p>Retain the statement “The containment leakage shall be restricted to be less than that needed to meet the acceptable onsite and offsite dose consequence limits as specified for postulated accidents.”</p>
<p>6. SFR-DC-17, Electric power systems</p>	<p>The proposed NRC ARDC are essentially the same as Appendix A GDC. The NRC wording is overly conservative for advanced reactor designs including the TWR. If the proposed NRC ARDC language is retained, it is</p>	<p>NRC should adopt the DOE-proposed ARDC 17 language without modification, in order to accomplish the goal of being risk-informed and performance-based in its focus</p>

Affected Section	Comment / Basis / Observation	Recommendation
7. SFR-DC-18, Inspection and testing of electric power systems	Revisions to this requirement reflect the NRC changes to ARDC-17 including transfer of power requirements.	If proposed revisions to ARDC-17 are made to adopt the DOE-proposed ARDC 17 language, change ARDC 18 to ensure consistency.
8. SFR-DC-26, Reactivity control system redundancy and capability	The GDC states "Two independent reactivity control systems". The revised ARDC states "At least two". This change is not necessary for a non-LWR reactor design. The requirement is that the control system used to shut down the reactor is different from the control system used for normal operation reactivity control. Two systems are sufficient to accomplish this. If the NRC requires additional reactivity shutdown systems, those should be addresses under 10CFR50.62 (ATWS).	Retain the current wording that states "Two independent reactivity control systems"
9. SFR-DC-28, Reactivity limits	The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.	Replace "primary coolant boundary" with "primary system boundary".
10. SFR-DC-30, Quality of primary coolant boundary	The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.	Replace "primary coolant boundary" with "primary system boundary".
11. SFR-DC-31, Fracture prevention of primary coolant boundary	The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.	Replace "primary coolant boundary" with "primary system boundary".
12. SFR-DC-32, Inspection of primary coolant boundary	The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and	Replace "primary coolant boundary" with "primary system boundary".

Affected Section	Comment / Basis / Observation	Recommendation
	<p>recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.</p>	
<p>13. SFR-DC-33, Primary coolant inventory maintenance</p>	<p>The goal of GDC 33 is that the cooling function of the primary heat removal system shall not be impacted <u>during normal operation</u> by primary coolant inventory loss due to leakage from the primary coolant boundary and rupture of small piping or other small components which are part of the boundary. For SFRs specifically, the primary concern is ensuring primary coolant inventory is sufficient to maintain the cooling function for the primary heat removal system. This ensures specified acceptable fuel design limits are not exceeded.</p> <p>The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.</p>	<p>Revise SFR-DC-33 to read, “A system to maintain primary coolant inventory during normal reactor operation shall be provided as necessary to assure that the cooling function of the primary heat removal system is not impacted as a result of primary coolant inventory loss due to leakage from the primary coolant boundary and rupture of small piping or other small components which are part of the boundary. The system shall be designed to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished using the piping, pumps, and valves used to maintain primary coolant inventory during normal reactor operation.</p> <p>To eliminate redundancy, delete the phrase “for protection against small breaks in the primary coolant boundary”.</p> <p>If the last sentence is removed as result of GDC 17 discussions, the phrase “... during normal reactor operation” Should be added to the first sentence.</p> <p>Replace “primary coolant boundary” with “primary system boundary”.</p>
<p>14. SFR-DC-34, Residual heat removal</p>	<p>Precluding sodium boiling is not a requirement for postulated accidents. Protecting fuel limits, primary coolant boundary limits, and maintaining coolable</p>	<p>Remove the statement “sodium boiling is precluded”.</p>

Affected Section	Comment / Basis / Observation	Recommendation
	<p>geometry may be achieved, depending on the design, even if local/limited sodium boiling occurs.</p> <p>The 4th paragraph describes in part that “the working fluid of residual heat removal system shall be at a higher pressure than the primary coolant system.” During industry review/comment on the draft of this requirement, these words were removed because this statement came across as a design feature that, for some SFR designs, might not be needed to meet safety requirements or may not be the preferred approach for some designs. In addition to this text being added back into SFR-DC-34 after having previously been removed, SFR-DC-35 is also being added to address accident conditions. Because of these two changes, TerraPower recommends a slight revision to SFR-DC-34 (see Recommendation) that defines when the requirement is needed (i.e., during normal operations only because accident conditions are addressed in SFR-DC-35).</p> <p>SFR-DC-35 provides requirements to provide continuous core cooling during accident conditions. As a result, the 2nd paragraph of the proposed SFR-DC is not required and may be deleted.</p> <p>The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.</p>	<p>In the 4th paragraph add the phrase “during normal operation” so that the last sentence reads “In addition, the working fluid of residual heat removal system shall be at a higher pressure than the primary coolant system during normal operations”.</p> <p>Remove the 2nd paragraph from SFR-DC-34 (During postulated accidents, etc.). This requirement will be covered by SFR-DC-35.</p> <p>Replace “primary coolant boundary” with “primary system boundary”.</p> <p>Replace “primary coolant system” with “primary system”.</p>
15. SFR-DC-35, Emergency core cooling	For the TWR, the residual heat removal system may be all that is required to provide protection for postulated accidents. As a result, the wording for SFR-DC-35 should be revised as described in the Recommendation section.	Because the residual heat removal may be all that is required for the TWR design to remove residual heat for both normal and accident conditions, the following revised wording is recommended for SFR-DC-35, “The

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	<p>The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.</p>	<p>residual heat removal system, or an additional system if necessary, shall provide abundant emergency core cooling during postulated accidents. The system safety function shall be to transfer heat from the reactor core following any postulated accident at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) the design conditions of the primary system boundary are not exceeded.”</p> <p>Replace “reactor coolant boundary” with “primary system boundary”.</p> <p>Replace “reactor coolant” with “primary coolant”.</p>
<p>16. SFR-DC-36, Inspection of residual heat removal system cooling</p>		<p>The title for this DC should be changed to “Inspection of Residual Heat Removal and Emergency Core Cooling Systems”</p>
<p>17. SFR-DC-37, Testing of residual heat removal system</p>	<p>The NRC retained the terms “pressure and” plus “and leaktight” in the ARDC based on future advanced design systems possibly employing pressure retaining RHR designs. NRC also noted that if future designs are not pressure retaining then “periodic pressure testing” and leaktight integrity” could be removed in the specific design criteria. Both DOE and TWR-P removed these phrases, as does NRC in other DC.</p> <p>NRC added text similar to GDC that DOE and TWRP had removed; “including operation of applicable portions of the protection system, the transfer between normal and emergency power sources, and the operation of the associated cooling water system.”</p>	<p>Recommend removing the phrases “pressure and” and “and leaktight” to be consistent with changes from GDCs in other SFR-DC (e.g., 16, 40, 43, 46). RHR designs could be effective without being pressurized or leaktight.</p> <p>If proposed revisions to ARDC-17 are made to adopt the DOE-proposed ARDC 17 language, change ARDC 37 to ensure consistency.</p>

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		<p>If SFR-DC 35 is added, recommend revising title to “Inspection of residual heat removal and emergency core cooling systems”.</p> <p>Editorial comment – remove second “including” in the phrase “including operation of associated systems and interfaces with an ultimate heat sink, including operation of applicable portions of the protection system”.</p>
18. SFR-DC-38, Containment heat removal	NRC added text to address their GDC 17 revision.	If proposed revisions to ARDC-17 are made to adopt the DOE-proposed ARDC 17 language, change ARDC 38 to ensure consistency.
19. SFR-DC-40, Testing of containment heat removal	NRC added text to reflect their GDC 17 revision.	If proposed revisions to ARDC-17 are made to adopt the DOE-proposed ARDC 17 language, change ARDC 40 to ensure consistency.
20. SFR-DC-41, Containment atmosphere cleanup	NRC added text to reflect their GDC 17 revision.	If proposed revisions to ARDC-17 are made to adopt the DOE-proposed ARDC 17 language, change ARDC 41 to ensure consistency.
21. SFR-DC-43, Testing of containment atmosphere cleanup systems	NRC added text to reflect their GDC 17 revision.	If proposed revisions to ARDC-17 are made to adopt the DOE-proposed ARDC 17 language, change ARDC 43 to ensure consistency.
22. SFR-DC-44, Structural and equipment cooling	NRC added text to reflect their GDC 17 revision.	If proposed revisions to ARDC-17 are made to adopt the DOE-proposed ARDC 17 language, change ARDC 44 to ensure consistency.
23. SFR-DC-46, Testing of structural and equipment cooling systems	NRC added text to reflect their GDC 17 revision.	If proposed revisions to ARDC-17 are made to adopt the DOE-proposed ARDC 17 language, change ARDC 46 to ensure consistency.
24. SFR-DC-51, Fracture prevention of containment pressure boundary	NRC kept the term “pressure” in the title – “containment pressure boundary”.	Change title to “containment pressure boundary” consistent with criterion wording and with other SFR-DCs.
25. SFR-DC-55, Primary coolant boundary penetrating containment	<p>Changed “reactor primary coolant boundary” to “primary coolant boundary”.</p> <p>The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and</p>	Replace “primary coolant boundary” with “primary system boundary”.

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	<p>recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.</p> <p>GDC 55 contains the phrase “shall be provided <u>as necessary</u> to assure”. The phrase “as necessary” was removed.</p>	<p>Retain the phrase “as necessary” as contained in the GDC.</p>
<p>26. SFR-DC-57, Closed system isolation valves</p>	<p>The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.</p>	<p>Replace “primary coolant boundary” with “primary system boundary”.</p>
<p>27. SFR-DC-64, Monitoring radioactive releases</p>	<p>The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.</p>	<p>Replace “primary system sodium and cover gas” with “primary system”.</p>
<p>28. SFR-DC-70, Intermediate cooling system</p>	<p>Intermediate “coolant” system and intermediate “cooling” system are both used.</p> <p>The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.</p>	<p>Recommend using “cooling” to be consistent.</p> <p>Replace “primary coolant system” with “primary system”.</p>
<p>29. SFR-DC-71, Primary coolant & cover gas purity control</p>	<p>The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and</p>	<p>Replace “primary coolant and cover gas” with “primary system”.</p>

Affected Section	Comment / Basis / Observation	Recommendation
	recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.	
30. SFR-DC-72, Sodium heating systems	The terminology used in the ARDC is not consistent. Table 1 (attached) provides a summary of terms used inconsistently, identifies the ARDC in which the terms are used, describes the meaning of the terms, and recommends terms to use for consistency. See the Recommendation column of this table for specific recommendations for each applicable SFR-DC.	Replace “primary coolant and cover gas” with “primary system”.
31. SFR-DC 70, Intermediate coolant system	<p>The phrase “intermediate cooling system” is used in this SFR-DC which is inconsistent with the SFR-DC title.</p> <p>The SFR requires a single passive barrier to separate primary and intermediate coolant. It also requires “at least a single passive barrier” between intermediate coolant and energy conversion system coolant stated? Isn’t it a given that there would have to be at least one passive barrier for these systems?</p> <p>The SFR states “A pressure differential shall be maintained across the primary to intermediate barrier such that any coolant barrier leakage would flow from the intermediate coolant system to the primary coolant system.” Similar to SFR-DC-34, this requirement seems like a design solution that may not be needed to meet safety requirements for some designs or may not be the preferred approach (leakage into the reactor vessel has potential negative aspects) for some designs.</p> <p>If the above statement is retained, under what conditions (normal operation, AOO, DBA) must the requirement be met?</p>	<p>Change “intermediate cooling system” to “intermediate coolant system” for consistency with SFR-DC title.</p> <p>No recommendation</p> <p>Delete the sentence “A pressure differential shall be maintained across the primary to intermediate barrier such that any coolant barrier leakage would flow from the intermediate coolant system to the primary coolant system.”</p> <p>If not deleted, clarify range of applicability of requirement to maintain pressure differential (normal operation, AOO, DBA).</p>
32. SFR-DC 71, Primary coolant and cover gas purity control.		
33. SFR-DC 72, Sodium heating systems.	As currently worded, the first sentence might cause confusion. It could be revised to add clarity.	Change first sentence to “Structures, systems, and components which contain or could contain sodium and

Affected Section	Comment / Basis / Observation	Recommendation
		that are important to safety shall be provided with heating systems if necessary to ensure the safety functions are accomplished.”
34. SFR-DC 73, Sodium leakage detection and reaction prevention and mitigation.	The first sentence states “Means to detect sodium leakage and to limit and control the extent of sodium-air and sodium-concrete reactions <u>and to extinguish fires</u> ”. Fire protection requirements are already covered in GDC3.	Delete the phrase “and to extinguish fires resulting from these sodium-air and sodium-concrete reactions” as this is already covered.
35. SFR-DC 74, Sodium/water reaction prevention/mitigation.	The SFR states in part that “....the sodium-steam generator system shall be designed to, as well as to extinguish a fire....”	Delete the phrase “as well as to extinguish a fire as a result of such reactions”. The SG system is not designed to extinguish a fire. Fire protection systems as address in SFR-DC-3 already address fire control.
36. SFR-DC 75, Quality of the intermediate coolant boundary.	The requirement is not necessary as the intermediate coolant loop is not safety-related unless it is part of the RHR (in which case the requirements for RHR are applicable).	Delete SFR-DC-75
37. SFR-DC 76, Fracture prevention of the intermediate coolant boundary.	The requirement is not necessary as the intermediate coolant loop is not safety-related unless it is part of the RHR (in which case the requirements for RHR are applicable).	Delete SFR-DC-76.
38. SFR-DC 77, Inspection of the intermediate coolant boundary.	The requirement is not necessary as the intermediate coolant loop is not safety-related unless it is part of the RHR (in which case the requirements for RHR are applicable).	Delete SFR-DC-77.

Table 2

Terms used in ARDC	Used in ARDC #	Meaning in ARDC	Recommended Term
Primary coolant boundary	13, 14, 15, 17, 28, 30, 31, 32, 33, 34, 55, 57	Primary coolant boundary and cover gas boundary	Primary system boundary
Reactor coolant boundary	35	Not consistent with other ARDC (primary coolant boundary)	Primary system boundary
Reactor coolant	35	Not consistent with other ARDC (primary coolant) – Appears to mean primary sodium	Primary coolant

Primary coolant system	15, 34, 70	Appears to mean primary sodium and primary cover gas	Primary system
Primary system sodium and cover gas	64	Means primary sodium coolant and primary cover gas	Primary system
Primary coolant and cover gas	71	Means primary sodium coolant and primary cover gas	Primary system

Table 2

Recommended Terms	Meaning of Recommended Terms
Primary system boundary	Physical boundary (vessel, wall, pipe, valve) around primary coolant [sodium] and primary cover gas
Primary system	Systems involving both primary/reactor coolant and cover gas systems.
Primary coolant	Coolant [sodium] flowing through the core and providing direct cooling for the fuel.