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Comment On: NRC-2022-0075-0001
Draft Interim Staff Guidance: Advanced Reactor Content of Application Project Chapter 2, "Site Information"

Document: NRC-2022-0075-DRAFT-0004
Comment on FR Doc # 2023-11182

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General Comment

See attached file(s)

Attachments

2023-XE-NRC-025 X-energy Comments on ARCAP ISGs

9 August 2023

2023-XE-NRC-025

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Submittal of X Energy, LLC (X-energy) Comments on the Advanced Reactor Content of Application (ARCAP) Interim Staff Guidance

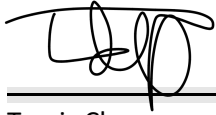
REFERENCES:

- 1) NRC-2022-0073 Draft Regulatory Guide: Guidance for a Technology-Inclusive Content of Application Methodology To Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non- Light-Water Reactors
- 2) NRC-2022-0074 through NRC-2022-0082 Draft Interim Staff Guidance: Various Advanced Reactor Content of Application Project guides

X Energy, LLC (X-energy) has prepared the enclosed set of comments related to the subject draft Regulatory Guide (DG-1404) and draft Interim Staff Guidance (ISG) documents provided by the U.S. Nuclear Regulatory Commission (NRC) under docket numbers NRC-2022-0073 through NRC-2022-0082. As early adopters of the risk-informed, performance-based, technology-inclusive guidance in Nuclear Energy Institute's NEI 18-04 and NEI 21-07, X-energy has been actively following and implementing the approaches and formats described in the industry-led guidance with full consideration of the NRC staff's draft versions of these interim staff guides (ISGs). The formation of our initial Preliminary Safety Analysis Report of the Xe-100 reactor technology for a Construction Permit application under the Department of Energy's Advanced Reactor Demonstration Program is based on this progressive guidance development activity. We appreciate the opportunity to provide feedback in this critical time for advanced reactor projects.

Enclosure 1 provides comments on key aspects of these ISGs that we believe are significant to address for those organizations choosing to develop within the NEI 18-04 and 21-07 framework. We have also provided comment and feedback on responses for these ISGs from the Nuclear Energy Institute and Technology Inclusive Content of Application (TICAP) working groups, and while there is overlap, the comments in this enclosure provide our organizational perspectives. To support efficient collection, this enclosure provides all comments in table format with the associated guidance document identified; these comments apply to docket numbers NRC-2022-0073 through NRC-2022-0082 inclusively.

If you have any questions or require additional information, please contact Drew Nigh at anigh@x-energy.com.



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Enclosure:

- 1) X Energy, LLC Comments on the Advanced Reactor Content of Application Interim Staff Guidance

Enclosure 1: X-energy Comments on ARCAP Guidance

Cmt #	Document	Section	Comment	Proposed Revision
1	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	C.2.e	<p>X-energy has concerns with both the letter and the spirit of Addition C.2.e, which would levy substantial documentation requirements that are largely not applicable to non- LWRs, thereby complicating the development of an application and the subsequent staff review.</p> <p>With respect to Item (1), generic safety issues, unresolved safety issues, and TMI action items are largely LWR-centric and not applicable to advanced non-LWRs; there should be no presumption to the contrary. There is no regulatory requirement that applicants address LWR GSIs and USIs in the SAR. The regulatory requirement to address TMI requirements in 10 CFR 50.34(f) is applicable only to LWRs. 10 CFR 52.47(a)(8) invokes most of the TMI requirements in 10 CFR 50.34(f) to the extent they are “technically relevant.” This term, as well as the terms "technically applicable to the design" and “directly applicable to the design” used in DG-1404 Addition C.2.3, are undefined and subjective, and will be fertile ground for interpretation disagreements between applicant and regulator. At most, the TMI requirements should be applied only to Part 52</p>	<p>Please delete Addition C.2.e.</p> <p>However, if the addition is retained, to the extent the NRC uses terms like “technically relevant” and “directly applicable to the design,” clarify that the NRC does not presume applicability of LWR regulatory guidance to non-LWRs following the NEI 18-04 methodology.</p> <p>Furthermore, if the NRC insists that applicants provide lists of documents in Chapter 1 (e.g., regulatory guides and/or codes and standards), make it clear that those lists are simply catalogs of material addressed elsewhere in the SAR.</p>



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			<p>applicants. NRC expectations from LWR licensing experience should not be applied blindly to advanced reactors following NEI 18-04 guidance. In fact, applying LWR GSIs, USIs, and TMI action requirements to non-LWR advanced reactors stands the concept of risk-informed, performance-based regulation on its head. It adds an unnecessary backward-looking deterministic framework on top of the systematic evaluation of safety provided by NEI 18-04.</p> <p>With respect to Item (2), regulatory guides are not regulatory requirements and most were developed for light water reactors. There should be no presumption that regulatory guides are to be applied to non-LWRs, and the NRC should be clear on that point in its guidance. The NEI 18-04 approach to demonstrating safety is not centered around a deterministic checklist approach of following prescriptive guidance. If the NRC insists on including a requirement that the applicant catalog items like Reg Guides in Chapter 1 of the SAR, that guidance should make it clear that the Chapter 1 material is simply a list of items included by the applicant in subsequent sections of the SAR.</p> <p>The discussion relative to Item 3 (codes and standards) is similar. Codes and standards will be addressed in</p>	



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			appropriate sections of the SAR. If the NRC insists on including lists of codes and standards in Chapter 1 of the SAR, it should be with the understanding that any substantive information is reserved for later chapters.	
2	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	C.9, Page 27	Chapter 8 of a SAR that uses the guidance in NEI 21-07 addresses plant programs, including Human Factors Engineering. The NRC Staff’s position (Staff Position C.9) states this an acceptable method for developing information related to Plant Programs. However, DANU-ISG-2022-05 provides guidance for Human Factors and Human-System Considerations to be included in Chapter 11 of a SAR. Which chapter would the NRC prefer to have the HFE program addressed?	Where there is duplicate guidance, such as HFE in Chapter 8 and HFE in Chapter 11, provide clarification on where the NRC staff prefers to see certain plant programs in the SAR.
3	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	pg. 26	<p>The last two sentences of the first paragraph of DG-1404 Section 8 are confusing and do not convey appropriate guidance to the applicant.</p> <p>The penultimate sentence requests a discussion of how the applicant intends to confirm, at the OL stage, that the reliability and capability performance targets have been met. NEI 21-07 Section C.6.2 already addresses reliability and capability targets, including plant programs used to maintain them. It is not envisioned that all targets be fully confirmed at the CP stage, or even provided on a preliminary basis. The penultimate sentence could be interpreted as meaning that the</p>	Please delete the last two sentences of the first paragraph of DG- 1404 Section 8.



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			<p>applicant must provide an SSC by SSC discussion of each target at the CP stage, which we hope was not the intention.</p> <p>The last sentence of the first paragraph in DG-1404 Section 8 is confusing because it convolves inappropriately special treatments with testing and validation. Testing and validation are types of special treatments</p>	
4	<p>DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs</p>	pg. 22	<p>Addition C.5.b requests detailed information underpinning the PRA calculations addressing QHOs in Section 4.1. X-energy believes the guidance goes well beyond what is needed for a SAR. The PRA methods would be addressed in the PRA peer review, and the detailed information would be available for NRC to inspect in an audit.</p> <p>Furthermore, it is not clear NRC appreciates the scope of this requirement. The requests are quite broad – e.g., “(5) key modelling assumptions.” Because these are integrated analyses, the requirements pertain to each and every PRA realization that involves an offsite dose. Another specific concern is “(8) uncertainty/sensitivity analysis performed.” No definition is provided as to what is intended. Depending on the interpretation, the amount of information required to satisfy this desire for</p>	Please delete Addition C.5.b.



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			<p>each and every part of the integrated analyses could be huge. The approach prescribed in NEI 18-04 and NEI 21-07 is to rely on conformance with the non-LWR PRA Standard, provide general descriptive PRA information in the SAR, and encourage regulatory audits to address details of the analyses if necessary. Literal compliance with the expectations laid out by the NRC in Addition C.5.b could result in levels of detail on the order of those seen in SAR Chapter 19 of advanced light water reactors licensed under Part 52 – a level of detail which, it was thought, all parties agreed was excessive and inappropriate.</p>	
5	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	pg. 22	<p>Addition C.5.d would require that the applicant provide a change control process for DID in the SAR. This requirement is inappropriate for a SAR, and there is no precedent for it. Change control is an operational issue. Moreover, industry is working with the NRC on change control for licensees who followed NEI 18-04. Specifically, the Technology Inclusive Risk Informed Change Evaluation (TIRICE) Project and draft NEI Guidance Document NEI 22-05 should address the issue.</p>	<p>Please delete Addition C.5.d.</p> <p>Additionally, consider adding NEI 22-05 to the list of guidance being developed in Appendix A of the NRC Reg Guide</p>
6	DG-1404 (RG 1.253 Rev 0) Guidance on	pg. 6	<p>"The applicant is also responsible for demonstrating compliance with all applicable regulations and may request exemptions, as appropriate, to establish the licensing basis</p>	None



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	TICAP for Non-LWRs		for the design." Is NRC making a determination on the acceptability of the "affirmative safety case" concept?	
7	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	p. 23	<p>Addition C.6.b addresses fuel qualification. X-energy considers this additional guidance to be unnecessary and, as proposed, inappropriate, and counter-productive. The issue was essentially absent from the NRC’s draft additions, clarifications, and exceptions that formed the basis for detailed interactions during the fall and winter of 2021, prior to submittal of NEI 21-07 Rev. 1 for endorsement.</p> <p>First, fuel qualification should essentially be done at the time of a license application, with the possible exception of some confirmatory items. The emphasis for fuel qualification should be during pre-application interactions as is discussed in DANU-ISG- 2022-01, Appendix A. The NRC proposal to address fuel qualification expectations in the SAR, as reflected in this proposed addition, is wholly out of sequence and unnecessary, and it detracts from the guidance overall.</p> <p>Second, the document states “The reactor core and its fuel are generally classified as SR” as if that point justifies this special deterministic carve out of SAR documentation requirements for fuel. It does not. NEI 18-04 provides a systematic means of identifying safety related structures, systems, and components, based on the approach taken to</p>	Please delete Addition C.6.b.



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			<p>satisfy Required Safety Functions. Provisions are already in place to address safety-related SSCs in Chapter 6. It is certainly expected that fuel performance will be particularly important to some advanced reactor designs, and if so the SAR documentation related to fuel will be more extensive than other SSCs, but there is no need to arbitrarily address fuel in a special way as proposed in the text.</p> <p>Third, there is no rationale for addressing fuel qualification in SAR Chapter 5, as proposed herein. Chapter 5 covers safety functions, design criteria, and SSC classification, but the document proposes to use it as a repository for additional information on one particular SSC (fuel).</p> <p>In summary, the fuel qualification guidance for SAR Chapter 5 should be reconsidered.</p>	
8	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	13	Chapter 1 should not list radionuclide inventories, it is more appropriately covered in Chapter 3 as alluded to in C.3 d.	Please clarify if the requested information should be included in Chapter 1 or Chapter 3.
9	DG-1404 (RG 1.253 Rev 0) Guidance on	13	Addition C.7.b(2) is unnecessary and inappropriate. The addition imposes an additional SAR documentation requirement to justify the use of codes and standards. This	Please delete Addition C.7.b(2)



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	TICAP for Non-LWRs		requirement goes beyond standard practice for light water reactors.	
10	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	Var.	Some guidance should include clarification that it is not required for Construction Permit applicants: NSRST SSC performance (C.8.a), NSRST I&C Special treatments, MBDBE (C.4.c.(2)), uncertainties and sensitivities for cumulative risk metrics (C.5.b.(8)), change evaluation process (C.5.d).	Please include clarification of which information is necessary for those requesting design finality versus those 10 CFR 50 Construction Permit applicants who are not requesting design finality.
11	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	25	Related to Clarification and Addition C.7.a, there appears to be an inconsistency between the guidance in NEI 21-07 and DG-1404, compared to DANU-ISG-2022-01 (ARCAP Roadmap). Pages 12-13 of the ARCAP roadmap indicates that the information related to translation of DBHLs to loads (and evaluation of those loads) would be placed in SAR Chapters 5 and 6, while NEI 21-07 and DG-1404 would put that information in Chapter 2 or in external reports referenced in the SAR.	Please review and resolve the discrepancy.
12	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	35	X-energy is interested in the draft ISG on consequence uncertainty referenced in Appendix A.	none
13	DG-1404 (RG 1.253 Rev 0) Guidance on	pg. 26 & 27	Sections C.7.b(1) and C.8.a(1) are identified as additions to the associated Sections C.6 and C.7 of NEI 21-07, Rev. 1. What is the purpose of the focus on I&C SSCs? And, what is the addition? The DG-1404 guidance reiterates what is	Please provide additional clarification.



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	TICAP for Non-LWRs		required by NEI 21-07, namely descriptions of special treatments for SR and NSRST I&C SSCs and analyses of capabilities of SR and NSRST I&C SSCs. If the intent is simply to identify the Design Review Guide (DRG), "Instrumentation and Controls for Non-Light-Water Reactor (non-LWR) Reviews," as providing additional guidance for content and review of this material, the addition should state this and cite the DRG; as written, it suggests the NRC is imposing additional requirements beyond what is required by NEI 21-07.	
14	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	pg. 26	Footnote 11 on Page 26 should be Footnote 12.	Please update the footnote.
15	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	27	Chapter 8 of a SAR following NEI 21-07 addresses plant programs, including Human Factors Engineering. The NRC Staff's position (Staff Position C.9) states this an acceptable method for developing information related to Plant Programs. However, DANU-ISG-2022-05 provides guidance for Human Factors and Human-System Considerations to be included in Chapter 11 of a SAR. Would the NRC prefer to have the HFE program addressed in a specific chapter, or left to the applicant to decide?	Please provide specific guidance.



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16	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs		DANU-ISG-2022-07 acknowledges the development of the ASME OM-2 code and states that the ISG assumes that applicants following the ISG will implement IST programs utilizing previously endorsed codes. The ISG later requires that construction permit applications include what standards are going to be followed at the operating license stage.	Please clarify the requirements for applicants who expect to follow an endorsed OM-2 code at the point of Operating License issuance who will be requesting Construction Permits prior to OM-2 code endorsement.
17	DG-1404 (RG 1.253 Rev 0) Guidance on TICAP for Non-LWRs	pg. 31	Reference 14 cites ML1025210405, which should be ML102510405.	Please update the reference.
18	DANU-ISG-2022-01 Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications— Roadmap	page 15 of 56	"The NRC also considers this approach to be appropriate for developing proposed PDCs for those design functions and features of the facility that are SR and NSRST and not informed by the LMP process (e.g., normal operations)." Does this sentence imply that we could have SSCs classified as SR and NSRST that are not informed by NEI 18-04? I don't think the SR and NSRST classifications have specific meaning outside the context of NEI 18-04. We may have requirements for SSCs that are not classified as SR or NSRST with the purpose of meeting regulatory requirements (e.g., security systems). Just because a system has requirements driven by regulations doesn't make it SR or NSRST.	Please modify the wording. Proposed wording: "The NRC also considers this approach to be appropriate for developing proposed PDCs for those design functions and features of the facility that are classified as NST by the LMP process (e.g., normal operations)."



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19	DANU-ISG-2022-01 Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications— Roadmap	Appendix A, page 8	The sentence "A prospective applicant should identify any novel design features through white papers or meetings during the pre-application review...Under 10 CFR 50.43(e), the performance of each safety feature must be demonstrated..." reads as if it applies to any novel design feature, whether it is safety-significant or non-special treatment (NST).	A prospective applicant should identify any novel safety design features. Please clarify if this sentence applies to novel design features that are non-special treatment (NST).
20	DANU-ISG-2022-01 Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications— Roadmap	Appendix A, page 8	The ISG states, "During pre-application interactions, a prospective applicant should use a white paper to identify and consensus codes and standards or code cases it intends to use and..." This guidance suggests an applicant can use a white paper to identify codes and standards. On the other hand, DG-1404 states that a listing of codes and standards should be included in Chapter 1. X-energy would prefer to list codes and standards in a white paper that is incorporated by reference into the SAR.	Please clarify if an applicant can provide the requested codes and standards information in a white paper that is incorporated by reference rather than in Chapter 1 of the SAR.
21	DANU-ISG-2022-01 Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications— Roadmap	Appendix B, page 22 of 28	The appendix contains a documentation error indicating "Bookmark not defined"	Please clarify what the bookmark intends to reference.



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22	DANU-ISG-2022-01 Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications— Roadmap	Appendix B, Attachment 1, page 3	(Editorial suggestion) There is an error: need space between against and NUREG-0800	Incorporate the editorial suggestion
23	DANU-ISG-2022-01 Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications— Roadmap	Pages 12-13	Appendix C, pages 12 and 13 address Emergency Planning (EP) for a Construction Permit application for an advanced reactor. The guidance only references regulations that are applicable to light water reactors, there is no mention of using 10 CFR 50.160 and its accompanying RG 1.242, which is written specifically for advanced reactors. Is the NRC staff expecting advanced reactor PSARs and FSARs to follow the current light water reactor regulations for EP? Will the staff consider the new rule making effort for advanced reactor EP in order to minimize the regulatory burden of reviewing exemptions for emergency planning zones, Emergency Response Organizations, and Emergency Action Levels?	Add clarification or additional information to address EP for advanced reactors. Using only the current light water reactor guidance will result in unnecessary and costly exemptions.
24	DANU-ISG-2022-02 ARCAP Chapter 2 Site Information	Page 2	(Editorial suggestion) need space between a and non-LWR	Incorporate the editorial suggestion



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25	DANU-ISG-2022-02 ARCAP Chapter 2 Site Information	2.7.2	Additional guidance (or a more standardized approach) for screening external hazards could help streamline the process and minimize the number/extent of pre-engagement discussions necessary.	Consider developing a standardized approach detailing the elements that are required for an external hazard screening flow chart acceptable to the NRC.
26	DANU-ISG-2022-02 ARCAP Chapter 2 Site Information	2.3.1	"Each hazard that could result in an event sequence with an estimated frequency of occurrence greater than 5 in 10 million per year should be evaluated for its potential to cause a radiological release exceeding the dose guidelines of 10 CFR 50.34(a) or 10 CFR 52.79(a)(1)(iv)." This seems like a DBHL set at 5E-7, which might be OK for military and industrial hazards, but does not align with NEI 18-04 generally. I know design basis wind also goes down to about this level.	Please remove the quoted text. Current Regulatory Guides already provide approaches for complying with the quoted regulations (e.g., RG 1.76). This sentence implies requirements that exceed current requirements for evaluating external hazard events, such as the Appendix S requirements for evaluating the seismic hazard.
27	DANU-ISG-2022-05 ARCAP Chapter 11 Organization and Human-System Considerations	Page 4	The NRC staff expects to see staffing plans for the construction pre-op testing, fuel load, and startup and power ascension testing. The NRC staff also expects to see the preliminary plans for the operating organization, including a staffing plan for operations for the CPA. The safety features and technologies of advanced reactors warrant fewer staffing levels than the current LWRs. What level of detail is the NRC expecting for these plans? What RG/NUREG will the NRC be using to verify staffing methodology, as the methodology should and will be different than the current LWR fleet? Since these are	Please clarify the level of detail expected for the CPA. For example, would the NRC like a list of proposed staff or do the eligibility requirements with justification need to be provided?



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			supposed to be preliminary, does a technical basis need to be provided for the Construction Permit Application (CPA)?	
28	DANU-ISG-2022-05 ARCAP Chapter 11 Organization and Human-System Considerations	Page 16	The requirement for engineering expertise on shift is based on LWR operating experience (Three Mile Island), comes from a Commission Policy statement (not a regulation), and may not be relevant to advanced reactor technologies. Is the NRC staff considering crediting the training program content, which is tailored to train plant staff to safely operate that specific technology, as required engineering expertise? This should be especially considered if the training program teaches engineering fundamentals and principles required to operate that specific technology.	Please clarify how a site can meet the requirement for engineering expertise. Examples: can a site credit the training program if the safety features of the plant do not warrant engineering expertise? If transients are slow moving, can the engineering expertise be on-call or part of a licensee's Emergency Response Organization? Can the engineering expertise be remote? Please provide flexibility for advancements in nuclear safety instead of arbitrarily propagating requirements based on LWR technology.
29	DANU-ISG-2022-06 ARCAP Chapter 12 Post-construction Inspection, Testing, and Analysis Program	pg. 6	The last sentence of the first paragraph on page 6 of DANU-ISG-2022-06 states, "If the application is for a CP, the PITAP description can be limited to the Phase 1 (described below) inspection, testing, and verification that would be required by 10 CFR Part 50, Appendix B, along with a description of the scope, objectives, and programmatic controls associated with the pre-operational test program (prior to initial fuel loading)." This implies requirements that go beyond the quality assurance program descriptions required in 10 CFR 50.34(a)(7) and does not appear to be	Please remove the last sentence from the first paragraph of page 6.



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			consistent with the first sentence of the second paragraph of the application guidance on page 5 which specifically refers to "...program elements required by the quality assurance program under § 50.34(a)(7)." Can the staff confirm that this ISG is not adding additional requirements beyond what is required to be provided in a construction permit application per 10 CFR 50.34(a)(7)?	
30	DANU-ISG-2022-06 ARCAP Chapter 12 Post-construction Inspection, Testing, and Analysis Program	Sections A-E	It is unclear in sections A-E which portions are required to be described in a construction permit application and which portions are required for an operating license application, for those licensing under 10 CFR 50.	Provide a list in the guidance of which items apply for construction permit applications.
31	DANU-ISG-2022-06 ARCAP Chapter 12 Post-construction Inspection, Testing, and Analysis Program	Sections A-E	Some of the items in sections A-E imply that 10 CFR 52 processes should be applied for 10 CFR 50 licenses, for example D.6 requires establishing a plant review committee to review, evaluate, and disposition verification results.	Please clarify the items in A-E apply to different license application types. Specifically, please list which items apply to 10 CFR 50 licenses.
32	DANU-ISG-2022-06 ARCAP Chapter 12 Post-construction	Sections A-E	Some of the items in sections A-E do not appear to be regulatory requirements or aligned with RG 1.70 or RG 1.206.	Please remove items from sections A-E which go beyond what is required in 10 CFR 50 and existing guidance.



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	Inspection, Testing, and Analysis Program			
33	DANU-ISG-2022-07 ARCAP Risk-Informed ISI and IST Programs for Non-LWRs	pg. 3	DANU-ISG-2022-07 acknowledges the development of the ASME OM-2 code and states that the ISG assumes that applicants following the ISG will implement IST programs utilizing previously endorsed codes. The ISG later requires that construction permit applications include what standards are going to be followed at the operating license stage. Can the staff please clarify what the requirements are for applicants who expect to follow an endorsed OM-2 code at the point of operating license issuance who will be requesting construction permits prior to OM-2 code endorsement?	Please add guidance stating that applicants may follow the ISG and provide plans to follow codes not yet endorsed "at risk" in the construction permit application.
34	DANU-ISG-2022-08 ARCAP Risk-Informed Technical Specifications	Pages 13-16 of 20	For the surveillance requirements, design features, and administrative controls sections of the Preliminary Safety Analysis Report (PSAR) technical specifications, what level of detail does the NRC staff expect to see in the PSAR?	Please provide clarification on the level of detail expected for the PSAR technical specifications.
35	DANU-ISG-2022-08 ARCAP Risk-Informed Technical Specifications	Page 17 of 20	Item (8) mentions that Technical Specifications (TS) are to meet the regulations in 10 CFR 50.36, which are the TS requirements for LWRs. Is 50.36 going to be revised to reflect NEI 18-04 methodology, or will every advanced reactor applicant require exemptions from 50.36?	Please clarify if exemptions will be needed from 50.36 or provide a revision to 50.36 to reflect this ISG and NEI 18-04 to avoid lengthy and costly exemptions.



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36	DANU-ISG-2022-08 ARCAP Risk-Informed Technical Specifications	Page 13 of 20	The guidance states, "RG 1.177, position 2.3.4, references the risk metrics of core damage frequency and large early release frequency based on LWRs as factors in determining completion times. Advanced reactor applicants should use other risk metrics, such as those described in NEI 18-04, for determining completion times." The NEI 18-04 approach involves direct quantification of risk metrics for comparison to the Quantitative Health Objectives (QHOs): latent cancer fatalities and early fatalities. RG 1.177, Section 2.4, "Acceptance Guidelines for Technical Specification Changes" provides quantitative acceptance criteria for technical specification changes in terms of CDF and LERF. X-energy is interested in NRC development of similar acceptance criteria for the NEI 18-04 latent cancer fatality and early fatality integrated risk metrics.	Please provide additional clarification about how the acceptance criteria for CDF and LERF metrics in RG 1.177 should be interpreted with respect to the NEI 18-04 integrated risk metrics. For example, should a licensee interpret the incremental conditional core damage probability (ICCDP) metric in RG 1.177 as directly interchangeable with an incremental conditional latent cancer fatality risk metric?
37	DANU-ISG-2022-09 ARCAP RIPB Fire Protection Program for Operations	General	This guidance describes the advanced reactor fire protection program as an operational program. What is the NRC expecting to see, if anything, in regards to plant fire protection content for a 10 CFR 50 Construction Permit application versus and Operating License application?	Please provide guidance for 10 CFR 50 Construction Permit applicants who are not requesting design finality.
38	DANU-ISG-2022-09 ARCAP RIPB Fire Protection Program for Operations	Page 5 of 13	Is the NRC considering endorsing NFPA 804?	No change suggested, however, X-energy is interested in further engagements to explore the possibility of endorsing NFPA 804 for advanced reactors.



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39	DANU-ISG-2022-09 ARCAP RIPB Fire Protection Program for Operations	Pages 6-11 of 13	The guidance that a plant should have a five man fire brigade is based on the design basis fire causing a radioactive release to the public, and the manual suppression from the fire brigade mitigates the consequences of the design basis fire. The new ARCAP guidance continues to mention fire brigade should be addressed in the fire protection program. Advanced reactors following the NEI 18-04 process may demonstrate the fire design basis hazard levels (DBHLs) do not cause a radiation release to the public and environment that exceed the limits of 50.34. Therefore, is the NRC staff considering relaxing or rewording fire brigade requirements if manual suppression is not required for nuclear safety, in order to prevent exemption requests? Is the NRC considering adding to the guidance in RG 1.189 or revising the guidance in RG 1.189 to relax fire brigade requirements for advanced reactor technologies that do not require manual suppression?	Please provide updated guidance or relaxation for fire brigades at advanced reactors that demonstrate a fire cannot impact safe shutdown and cannot violate offsite dose releases in 50.34.