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Review of Risk-Informed, Technology Inclusive Advanced Reactor Applications - Roadmap

Comment On: NRC-2022-0074-0001

Draft Interim Staff Guidance: Review of Risk-Informed, Technology Inclusive Advanced Reactor Applications—Roadmap

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Comment on FR Doc # 2023-11186

Comment (3)

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General Comment

Please see the attached letter from Hybrid Power Technologies LLC

Attachments

Hybrid PWR to NRC July 17 2023 ARCAP

Michael F. Keller
President
Hybrid Power Technologies LLC



July 17, 2023
Regulations.gov NRC-2022-0074 thru 0082

Mr. John W. Lubinski
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Hybrid Power Technologies LLC Input; DANU-ISG-2022-01 (NRC-2022-0074)
Advanced Reactor Applications Roadmap

Mr. Lubinski:

The NRC recently (June 21, 2023) issued revised due dates (to August 10, 2023) for Federal Register notices soliciting comments on various draft Interim Staff Guidance (ISG) documents involving advanced reactors. This letter provides general and specific comments.

As a general remark, we are of the opinion that the Nuclear Modernization Act of 2019 (ACT) clearly reinforces earlier Congressional direction that industry codes and standards are lawful mechanisms for compliance with Code of Federal Regulations (CFR) considerations involving the design, construction, and operation of advanced nuclear power plants in this country. These codes and standards reflect the collective wisdom of thousands of professionals, typically over the course of over ½ century. These codes and standards, which in general are quite extensive, are developed in a free and open manner, with all issues openly resolved. The NRC staff has been a part of these development activities. The collective expertise and wisdom of many lies embedded in the industry codes/standards.

In light of the ACT, remains unclear why the staff insists that codes/standards must be staff endorsed (there are legions of unendorsed codes and standards used with nuclear power plants). There is no unambiguous support for such an endorsement claim in the CFRs. Requiring applicants justify the use of industry consensus codes/standards is an open ended stipulation as there is no way to satisfy implicit staff claims that the use of the codes/standards must a priori adversely impact the public's risk. The fact that the codes/standards are consensus based points in exactly the opposite direction.

The staff should not state "staff endorsement" is needed unless the codes/standards have been clearly shown by the staff to be materially defective relative to Safety-Related considerations. Risk-Significant codes/standards alleged to contain material defects are of a reduced stature. Staff disagreements associated with code/standard content must rise to a serious level.

In general, ISGs should identify key topic areas and require the applicant generally identify how applicable industry codes/standards implement the topic. The ISG should clearly state that staff reviews must be based on the applicants' conformance with the identified industry codes/standards. The depth of the staff reviews must be commiserate with the level of risk determined by the applicant using industry codes/standards. The primary emphasis must be on Safety-Related items. If summary information from code/standard elements are considered necessary for inclusion in licensing submittals, then such needs should be succinctly and clearly identified in the guidance documents, with the requested content being commiserate with the associated level of risk.

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There are areas where licensing application process/content considerations are outside the realm of industry codes/standards. However, the extent of licensing submittal requirements must be commiserate with the level of risk, as required by the ACT. For instance Safety-Related items carry considerably more weight than say plant items involving the routine processing of radioactive effluents.

The subject ISG contains references to well over a hundred regulatory guidance documents of various types. The ISG states that *“Additional guidance documents referred to in this DG may provide useful information to applicants, the NRC staff, or both.”* Based on the written text and historical precedence, the logical conclusion is that the staff will use these guidance documents (works out to be thousands of pages) to impose requirements on the applicant or require the applicant to justify not conforming to the extensive levels of staff guidance. Unclear how this approach complies with the Code of Federal Regulations and points to a fundamental dichotomy between past staff practice and the ACT. Congress clearly expects the licensing process to be simplified through modernization while the staff apparently intends to continue prescriptively dictating how the advanced reactors are to be designed, constructed, and operated. The NRC would be wise to follow Congressional direction and intent. NRC lower tier regulatory documents such as the SRP’s represent guidance that cannot be used to coerce applicant compliance with staff desires that run counter to Congressional direction.

The staff appears to be manufacturing new licensee obligations based on reading into the CFR’s enhanced requirements that are not there or that are outside the ACT’s intent. The staff appears to have mischaracterized the need for ISGs in order to *“identify the information to be included in an application based on a technology-inclusive, risk-informed, and performance-based”*. In other words, the staff is using “risk-informed, performance based” as an excuse to add unwarranted new requirements. Also, citing the unapproved 10CFR53 or possible future revisions to CFR’s is inappropriate, including speculation on potential new requirements. At face value, such actions are in conflict with the ACT and Congress’s clear intent.

Attachment (1) provides specific comments on the proposed REF. [1] interim staff guidance ADVANCED REACTOR APPLICATIONS—ROADMAP, DANU-ISG-2022-01.

In our view, the ISG needs to be heavily rebuilt because of (1) inconsistencies involving risk significance, (2) major shortfalls involving codes/standards applicability and (3) apparent inappropriate creation of new requirements. These issues are at odds with the ACT.

Undue overregulation needlessly stifles advanced nuclear energy development while being a threat to the country’s long-term strategic need for energy independence. In passing, as a small business, we are particularly severely financially impacted by undue overregulation.¹

In general, we question the validity of the staff’s proposed approach. However, legal challenges are obviously counterproductive for all parties, at this time.

In closing, the staff needs to seriously consider the Congressional direction of the Modernization Act and move away from the highly prescriptive regulatory methods of the past. Simplify the process.

Michael F. Keller
President
Hybrid Power Technologies LLC

July 17, 2023
Regulations.gov NRC-2022-0074 thru 0082



Regards,

Michael F Keller

Michael F. Keller Professional Engineer – State of Kansas
President
Hybrid Power Technologies LLC

A small business of the state of Kansas developing patented advanced reactor energy plants.

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References

[1] Regulations.gov docket NRC-2022-0074

Attachments:

(1) HybridPwr Comments (rev 0) on DANU-ISG-2022-01.

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1. DOE “cost share” requirements for grants are financially lethal to small businesses, unlike larger firms able to easily secure the needed matching funds. As such, overregulation is particularly damaging to small businesses that are more-or-less financially on their own. In passing, we note small U.S. businesses, the engines of innovation in this country, are effectively excluded from nuclear energy innovation and development.
 2. As a general remark, within DANU-ISG-2022-01, the staff analyzed (using simple tables) the applicability of the existing sections of 10CFR50 and 52 to advanced reactors. The information is very helpful. However, this same information could have been used as the backbone of the proposed 10CFR53, with amplifying clarifications provided as necessary. This very simple approach (advocated by many early on) could have been quickly deployed years ago and avoided the acrimony that has erupted throughout the industry as a result of the stunningly complicated proposed 10CFR53 of 2023. It is not too late to change course.

Comment #, Ref. Section	Comment	Basis
(1) P6 Rationale	Delete, replace with rationale grounded in the Code of Federal Regulations	Simply state “10CFR50/52 are partially directed towards LWRs and as such modified regulatory information is necessary to support advanced reactors license applications”. This factual statement avoids the numerous serious issues associated with coercive use of guidance documents.
(2) P9 Guidance Documents that are Referenced in DG-1404	Clearly state conformance with these informational regulatory guidance documents is not required and that industry codes/standards take precedence.	Unclear whether or not: (1) if the staff intends to force the applicant to employ the cited regulatory guidance documents; and (2) if the staff will use the numerous elements in the regulatory guides as a basis for requirements. The statement ...”may provide useful information to applicants, the NRC staff ...” is more or less an open-ended, while strongly implying (based on the historical record) that the documents will serve as a basis for staff requirements well removed from the CFR. In passing, basic CFR requirements tend to be more topical in nature, as opposed to being heavily prescriptive.
(3) P11 Site Evaluation Guidance	Identify key hazard topics, require applicant to identify codes/standard/regulatory documents used to identify and then evaluate the hazards. Provide a general methodology summary used to characterize the identified hazards.	Codes/standards have more weight than regulatory guidance. The applicant should be able to use industry codes/standards and/or regulatory guidance. There are a number of industry codes/standards (e.g. ANS) on the topic In passing, the 10CFR100.20 is quite general in discussing factors to be considered in evaluating reactor sites. The SAR chapters should not require evaluation details, as that information can be reviewed through an audit process
(4) P11 & 12 Guidance Documents	Clearly state conformance with these informational regulatory guidance documents is not required and that industry codes/standards take precedence.	Unclear whether or not: (1) the staff intends to force the applicant to employ these documents, particularly the cited regulatory guidance documents; and (2) if the staff will use the numerous elements in the regulatory guides as a basis for requirements well removed from CFR. The statement ...”may provide useful information to applicants, the NRC staff ...” is more or less an open-ended, while strongly implying (based on the historical record) that the documents will serve as a basis for staff requirements well removed from the CFR. In passing, basic CFR requirements tend to be more topical in nature, as opposed to being heavily prescriptive.
(5) pp 12 & 13 Design of Structures, Components, Equipment, and Systems	Delete last sentence p12 and 3 bulleted items at the top of the page 13.	Such detail is unnecessary for a SAR while being overly complicated to explain. Simply require the applicant identify the hazards for which design measures have been implemented to protect key safety-related systems/structures, which should be listed.
(7) p14, last two paragraphs	Delete	Appears to be a fishing expedition on the part of the staff to justify adding new requirements. The collective elements of the CFR provide for the protection of the public from radiation hazards. Unclear of the ramifications of: <i>“In addition to the requirement to propose PDC in an application, the NRC has also determined that the requirement to propose PDC includes a requirement to</i>

Comment #, Ref. Section	Comment	Basis
		<i>address the full scope of PDCs described in the regulations which includes..."design, fabrication, construction, testing and performance requirements for structures, system, and components important to safety."</i> "Full scope" is open ended and essentially impossible to meet by an applicant.
(8) P16, Guidance Documents	Clearly state conformance with these informational regulatory guidance documents is not required and that industry codes/standards take precedence.	Unclear whether or not: (1) the staff intends to force the applicant to employ the regulatory guidance documents; and (2) if the staff will use the numerous elements in the regulatory guides as a basis for requirements. The statement ..."may provide useful information to applicants, the NRC staff ..." is more or less open-ended, while strongly implying (based on the historical record) that the documents will serve as a basis for staff requirements well removed from the requirements of the CFR. In passing, basic CFR requirements tend to be more topical in nature, as opposed to being heavily prescriptive.
(9) p17 Guidance Documents	Clearly state conformance with these informational regulatory guidance documents is not required and that industry codes/standards take precedence.	Unclear whether or not: (1) the staff intends to force the applicant to employ the regulatory guidance documents; and (2) if the staff will use the numerous elements in the regulatory guides as a basis for requirements. The statement ..."may provide useful information to applicants, the NRC staff ..." is more or less open-ended, while strongly implying (based on the historical record) that the documents will serve as a basis for staff requirements well removed from the requirements of the CFR. In passing, basic CFR requirements tend to be more topical in nature, as opposed to being heavily prescriptive.
(10) p17 Chapter 11 – Organization and Human-Systems Considerations	Delete chapter 12, in its entirety	An unwarranted and impractical fishing expedition involving wildly divergent considerations that are well removed from protecting the public from hazardous radiation. The relationship with safety-related considerations is tenuous, casting doubt on whether or not the chapter is meaningfully risk significance. See our formal letter on DANU-ISG-2022-05 submitted thru regulations.gov, docket NRC-2022-0078.
(11) p18 Guidance Documents	Clearly state conformance with these informational regulatory guidance documents is not required and that industry codes/standards take precedence.	Unclear whether or not: (1) the staff intends to force the applicant to employ the regulatory guidance documents; and (2) if the staff will use the numerous elements in the regulatory guides as a basis for requirements well removed from the CFR.
(12) p19 Chapter 12 – Post Construction Inspection, Testing, and Analysis Program	Add sentence that industry codes/standards must be identified by applicant, including a summary discussion of how the codes/standards are used.	This chapter involves in-service testing in the context of the ASME Code. ANS codes are also involved (e.g. criticality). The list of guidance documents needs to be expanded. Also see recurring comment on Guidance Documents.

Comment #, Ref. Section	Comment	Basis
(13) p 19 Technical Specifications.	Might be easier to paraphrase 10CFR50.36 and simply require applicant to identify (i) safety-related systems for which technical specifications are used (ii) Safety Related systems for which limiting conditions of operation are employed. A summary of the basis for selection of these systems should be provided as well as a general summary of methods to control set-points values.	SARs do not need to contain specific set points or specific instruments/components. The analyses used to generate the set points can be audited by the staff, as can be the list of the specific components/instruments/items. Specific limiting conditions can be similarly managed. A similar approach could be used for safety-significant items. As long as the applicant has a process to properly control set-points and changes, there is no need for the NRC to authorize such changes. The process can be periodically audited. The suggested approach complies with the Modernization Act. Also see recurring comment on Guidance Documents.
(14) p 23 Quality Assurance Plan,	Prominently cite 10CFR50 Appendix B Move fuel related discussions to an Appendix	Applies to all reactor types, with specific elements based on PDC for fuel. Unclear why this specific fuel type is in a generalized section. Also see recurring comment on Guidance Documents
(15) Fire Protection Program (Design)	Applicant must identify the various NFPA standards used and the basis for their use as well as identify areas in plant for which fire detection, suppression, and mitigation features are employed to protect safety-related items, and potentially risk-significant items.	Industry codes/standards are more than adequate. In passing, GDC 3 is not prescriptive and is general in nature, in contrast to the heavily over prescriptive regulatory guidance documents. The SAR should not go into detail on specific measures (“need-to-know” from a security standpoint) Unclear why a specific reactor types are discussed in a generalized section. Should be in Appendix. Also see recurring comment on Guidance Documents
(16) p28 Security Plans	Suggest that this be kept very broad and general.	“Need-to-know” from a security standpoint. Details can be obtained through appropriate channels
(17) Fire Protection Program (Operational)	Various NFPA and industry codes/standards apply	See our formal letter on DANU-ISG-2022-09 submitted thru regulations.gov, docket NRC-2022-0082. Also see recurring comment on Guidance Documents
(18) p34 In-service Inspection (ISI)/In-service Testing (IST) P35 Guidance Documents	Primarily involves Safety-Related items. List key topic areas, require applicant identify pertinent codes/standards and generally how these codes/standards implement the topic. Identify systems/major components subject to the testing and general tests to be implemented.	See our formal letter on DANU-ISG-2022-07 submitted thru regulations.gov, docket NRC-2022-0080. See recurring comment on Guidance Documents

Comment #, Ref. Section	Comment	Basis
(19) p39 Inspections, Tests, Analysis, and Acceptance Criteria (ITAAC)	Primarily involves Safety-Related items. List key topic areas, require applicant identify pertinent codes/standards and generally how these codes/standards implement the topic. Identify systems/major components subject to the testing and general tests to be implemented.	<p>The referenced regulatory guidance document (NUREG 800) is significantly overly prescriptive, particularly for the purposes of a SAR and, at face value, inconsistent with the Modernization Act.</p> <p>Avoid inferred migration of ITAAC into items well removed from the protection of the public from hazardous migration.</p> <p>Specific test procedures and acceptance criteria can be reviewed through audit of test procedures, including the results. This approach is consistent with the “risk significant” theme of the Modernization Act.</p> <p>See recurring comment on Guidance Documents</p>
(21) p41 Overview – Application Guidance	Replace with: “Applicant must: (1) Identify Safety-Related features relied upon to protect the public from hazardous radiation; (2) identify method (analysis, testing, experience, or combination thereof) to demonstrate that these Safety-Related features will perform as designed, (3); identify methods (analysis, testing, experience, or combination thereof) to demonstrate the acceptability of interdependent effects involving these Safety-Related features; (4) identify general data needs for analytical tools used in conjunction with (1) thru (3)”.	<p>Simpler way to clearly establish expectations.</p>
Pp 41 & 42 Staff Review Guidance	Delete in entirety. Replace with “Staff to audit analyses and testing as appropriate”	<p>The staff guidance is open ended and replete with all manner of likely new requirements. Citing a five year old roadmap is puzzling. The ISG staff guidance is likely at odds with the Modernization Act</p>
(22) p44 BACKFITTING AND ISSUE FINALITY DISCUSSION		<p>The entire document appears to be the epitome of back fitting while being at odds with the Modernization Act and Congress’ clear intent. We reserve te right to remedy the situation if the ISG remains unchanged.</p>

Comment #, Ref. Section	Comment	Basis
(23) P46 References	Clearly state conformance with these informational regulatory guidance documents is not required and that industry codes/standards take precedence.	There are about 115 regulatory guidance documents identified encompassing several hundred pages of content. Unclear whether or not: (1) the staff intends to force the applicant to employ these guidance document, (2) if the staff intends to use the numerous elements in the regulatory guides as a basis for requirements well removed from the Code of Federal Regulations.
(24) Appendix B	<p>As a general remark, the staff has analyzed the applicability of the existing sections of 10CFR50 and 52 for advanced reactors. The information is very helpful.</p> <p>However, the strikes us that the Appendix B tables could have been used as the backbone of 10CFR53, with amplifying clarifications provided as necessary. This very simple approach (advocated by many early on) could have been quickly deployed years ago and avoided the acrimony that has erupted throughout the industry as a result of the stunningly complicated proposed 10CFR53 of 2023.</p>	
(25) Appendix D Documents Under Development	These documents should be released to the public for review and comment using regulations.gov. Absent such a mechanism, the public is excluded from rulemaking activities, which would likely create legal issues.	