

# PUBLIC SUBMISSION

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**Docket:** NRC-2019-0062

10 CFR Part 53: Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors

**Comment On:** NRC-2019-0062-0012

Preliminary Proposed Rule Language: Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors

**Document:** NRC-2019-0062-DRAFT-0181

Comment on FR Doc # 2020-24387

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## Submitter Information

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**Organization:** Hybrid Power Technologies LLC

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## General Comment

Attached is our letter of November 4, 2021 concerning 10CFR5X/10CFR53 alternative language

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## Attachments

Hybrid Pwr to NRC ltr Nov 4 2021 re 10CFR5x

Michael F. Keller  
President  
Hybrid Power Technologies LLC



November 4, 2021  
10CFR53: 10CFR50.X Alternative Language

Mr. John Tappert  
Director, Division of Rulemaking, Environmental, and Financial Support  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: Hybrid Power Technologies LLC Input on the NRC Rulemaking Plan on, Risk-Informed, Technology-Inclusive Regulatory Framework; Proposed 10CFR53.

Mr. Tappert:

The recent October 28, 2021 public meeting included discussions on REF. (1) that involves alternative language for Commercial Reactors.

The NRC staff cannot engage in rule making for 10CFR50 and 52 without following 10CFR2 Rulemaking requirements. Our comments are directed at the case assuming the material is intended for 10CFR53.

1. 50.220 Definitions: Safety-Related. There is no precedent in the Code of Federal Regulations for the proposed new definition that vastly expands the applicability of the existing term. The NRC staff is engaged in regulatory overreach on a stunning scale. Specifically, we are referring to expanding the term to include Anticipated Operational Occurrences (AOO). The NRC staff appears to be blatantly defying the risk-informed considerations of the REF. (2) law. Use the existing 10CFR50 safety-related definition as is.
2. 50.230 Single Failure Proof. The term is already largely reasonably defined in Appendix A to 10CFR50. The NRC staff is unquestionably creating massive and unwarranted new requirements that have no counterpart in the existing CFR. The NRC staff appears to be blatantly defying the risk-informed considerations of the REF. (2) law. Replace the section with the single-failure definition of the ATTACHMENT to this letter. The definition augments the existing definition found in Appendix A to 10CFR50 to include passive safety-related systems.
3. 50.240 Principal Design Criteria. Appendix G to the REF. 3 book provides an example of a practical application of principal design criteria for an advanced reactor.
4. 50.230, 50.250, 50.270, 50.280. Delete in their entirety. The NRC staff is unquestionably engaging in the creation of massive and unwarranted new requirements that have no counterpart in the existing CFR. The NRC staff appears to be blatantly defying the risk-informed considerations of the REF. (2) law. Replace the sections with the **Requirements for Design Basis Events and Accidents** (derived directly from 10CFR50.34) of the ATTACHMENT to this letter
5. 50.260 Beyond Design Basis Events and 270 Severe Accidents. Delete in their entirety. The NRC staff is unquestionably engaging in the creation of massive and unwarranted

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new requirements that have no counterpart in the existing CFR. Attempting to prescriptively provide detailed requirements for a wide variety of advanced reactor types is not remotely realistic. Rather, put the onus on the designer/licensee to identify the plant features and programs that robustly support the plant's ability to effectively deal with general types of major emergencies (e.g. unexpected fires, explosions and allied events that are difficult to quantify) that lie beyond the analytically derived Design Basis Events/Accidents. Basic analyses concerning the depth of such robustness would be a reasonable approach that is independent of the type of advanced reactor. High fidelity analyses (including event probabilities and event radiation releases) are unnecessary and of doubtful practical value. This approach assumes the advanced reactor is essentially passively failsafe.

The NRC staff needs to employ the high-level approach historically used with Title 10 of the Code of Federal Regulations and stop proposing highly prescriptive how-to verbiage that only serves to create confusion while opening the door for a vast armada of new unwarranted and unprecedented requirements. To be blunt, look at the bigger picture and stop trying to analytically micromanage.

In closing, we doubt that a proper 10CFR53 will ever be the end result of the NRC staff's painfully complex and unilateral development efforts. The NRC staff has unquestionably seized upon the 10CFR53 development effort as a means to add long-held wishes, desires and guidance. This unfolding debacle is assuming increasingly nightmarish proportions.

Regards,

*Michael F Keller*

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

**References:**

- (1) [ML21270A005](#) - Rulemaking: Discussion Table for Preliminary Rule Language for the Part 53 Rulemaking: Part 5X - "Technology-Inclusive Alternative Requirements For Commercial Nuclear Plants.
- (2) Nuclear Energy and Modernization Act, S512 enacted into law.
- (3) Hybrid Nuclear Energy Systems, A sustainable solution for the 21<sup>st</sup> century; available from Academic Press, ©2021 Elsevier.

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**ATTACHMENT.**

**Single Failure** [*Adapted from Appendix A of 10CFR50*]

A single failure means an occurrence which results in the loss of capability of a component to perform its intended *Safety-Related* ~~safety~~ function(s). Multiple failures resulting from a single occurrence are considered to be a single failure. *Safety-Related* fluid and *Safety-Related* electric systems are considered to be designed against an assumed single failure if neither (1) a single failure of any active component (assuming passive components function properly) nor (2) a single failure of a passive component (assuming active *Safety-Related* components function properly), results in a loss of the capability of the system to perform its *Safety-Related* function(s). A *safety-related passive system is assumed to be single failure proof if failure of a key single component or element still allows the passive system (or allied passive systems) to accomplish their requisite nuclear safety-related function (s).*

**Requirements for Design Basis Events and Accidents** [*Adapted from 10CFR50.34*]

*The applicant must identify the safety-related features that are to be engineered into the facility and those barriers that must be breached as a result of limiting Design Basis Events and accidents before a release of radioactive material to the environment can occur. Special attention must be directed to plant safety-related design features intended to mitigate radiological consequences of events and accidents. In performing this assessment, an applicant shall assume a fission product radioactive product release<sup>6</sup> from core fissile and associated materials into the containment assuming that the facility is operated at the ultimate power level contemplated. The applicant shall perform an evaluation and analysis of the postulated fission product release, using the expected demonstrable facility containment-leak rate(s) and any safety-related fission product cleanup systems intended to mitigate the radiological consequences of the accidents, together with applicable site characteristics, including site meteorology, to evaluate the offsite radiological consequences and Site characteristics must comply with part 100 of this chapter.*

The evaluation must determine that:

- (1) An individual located at any point on the boundary of the exclusion area for any 2 hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 25 rem<sup>7</sup> total effective dose equivalent (TEDE).
- (2) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose in excess of 25 rem total effective dose equivalent (TEDE).

*The evaluation shall include the use of suitable Probabilistic Risk Assessment(s) to correlate limiting event/accident offsite doses and associated event frequencies.*