

**From:** [Beasley, Benjamin](#)  
**To:** [peebles@kairospower.com](mailto:peebles@kairospower.com)  
**Cc:** [Cuadrado de Jesus, Samuel](#); [Helvenston, Edward](#); [gardner@kairospower.com](mailto:gardner@kairospower.com); [Martin Bryan](#); [Le, Tuan](#); [Schmidt, Jeffrey](#)  
**Subject:** General Audit Question on Load Combinations  
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Drew,

Below is a follow-up question on structural load combinations. We are glad to schedule an audit discussion if needed when you are ready.

Regards,  
Ben

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Benjamin Beasley  
Senior Project Manager  
Advanced Reactor Licensing Branch 1  
Office of Nuclear Reactor Regulation  
301-415-2062  
[Benjamin.Beasley@nrc.gov](mailto:Benjamin.Beasley@nrc.gov)



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#### Question 4.7-1

Principal Design Criterion (PDC) 1 from the Kairos topical report states:

Structures, systems, and components which are safety significant shall be designed, fabricated, erected, and tested to quality standards commensurate with the safety significance of the functions to be performed. Where generally recognized codes and standards are used, they shall be identified and evaluated to determine their applicability, adequacy, and sufficiency and shall be supplemented or modified as necessary to assure a quality product in keeping with the required safety function.

Neither Section 4.3 "Reactor Vessel System" nor Section 4.7 "Reactor Vessel Support System" of the Hermes PSAR include design information for load combination methodology. The load combination information is needed to provide reasonable assurance that structures and components will remain intact such that the reactor can be shut down and maintained in a safe condition and that PDC 1 will be satisfied. Additionally, the load combination information will also support PDC 2, "Design Bases for Protection Against Natural Phenomena," and PDC 4, "Environmental and Dynamic Effects Design Bases." The NRC staff requests that Kairos include the methodologies of load combination in either Section 4.3 or Section 4.7 of the Hermes PSAR. The methodologies of load combination can be tabulated in a manner similar to Table 3 of RG 1.143 "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants". Another example may be found in Section 3.4.2.5 (page 3-28) of the SHINE facility PSAR (ML15258A371).