

# PUBLIC SUBMISSION

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RULES AND REGULATIONS  
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## General Comment

See attached file(s)

## Attachments

Question 4 Response (Pri)

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Add = C. Luei (CXL)

#### **4. What are the key characteristics for a holistic risk management regulatory structure for reactors, materials, waste, fuel cycle, and security?**

A holistic risk management approach could be beneficial in ensuring a balanced regulatory framework for each element of the nuclear power industry and the collective contribution to public risk. The current (discrete) regulatory approach largely regulates each element of the nuclear power infrastructure separately, setting goals and specific rules for reactors, another set of rules for fuel facilities, a third set of rules for waste facilities, etc.

In a holistic approach, we recommend to step back and set specific high level goals for each part of the nuclear infrastructure in the context of the overall goals for the industry as a whole. Then we would work with the stakeholders in each of these segments of the industry to define and implement more detailed goals and requirements necessary to meet the overall higher level goals established for that industry segment within the overall holistic approach. The resulting detailed regulatory framework would typically include both risk and deterministic components. But a top-level risk management approach is required to guide the overall process and establish specific top-level goals for each segment which will drive to a balanced overall risk profile.

Obviously the process of establishing overall goals for the whole industry and the subsequent goals for each segment of the industry (power plants, fuel cycle facilities, waste, etc.) involves high level prioritization of risk and energy strategy considerations beyond traditional regulatory considerations. This requires the involvement of multiple stakeholders using modern risk management techniques in a systems framework. The required stakeholders must include facility designers, facility operators, energy policy regulators, etc.

From the perspective of the new reactor concepts the following paragraphs provide some additional perspective on the potential stakeholder interaction with the reactor design organization, since in any holistic approach, the approach to reactor risk management will be a significant consideration in balancing overall risk.

One important characteristic of a holistic risk management regulatory structure is a collaborative environment among all stakeholders when developing the risk-based framework for plant design assessment. The regulator's role is to establish top level acceptance criteria for the protection of the health and safety of the public and the environment from the potential adverse consequences of the regulated activity – in this case operation of a nuclear power plant. At this high level, such acceptance criteria must be design independent, e.g. a dose consequence metric. That is, they must not impose particular design solutions on the plant by virtue of the wording of the regulation.

The designers role is to provide experience-based insights on the top level acceptance criteria and propose alternate criteria, where warranted, that provide equivalent protection for the public and the environment while affording the opportunities for enhanced design flexibility. In this way an optimized set of top level acceptance criteria can be developed that meets the regulators duty of public and environmental protection and the designer's goal of an economic, operationally efficient reactor design.

The designer should then be free to design systems, structures and components that form a design that meets the high level acceptance criteria. The specifics of the design can then be reviewed (accepted or rejected) based on the technical merits of the design and the supporting R&D that justifies the designer's claims of meeting the acceptance criteria.

Although "precedent" is an important element of our current regulatory structure, it has little value when a new design is being reviewed and in fact may have the opposite consequence, i.e. lead the design toward an unsafe, or less safe, direction. As such, existing design rules or features that are desired for consideration for application to new designs must be explicitly evaluated during the development of the top level acceptance criteria and shown to be beneficial by the risk-based assessment process.

Therefore, the focus of a holistic risk management regulatory structure should be on establishing design independent top level acceptance criteria and reviewing of design specifics to ascertain whether they can meet the acceptance criteria.