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Potential Impact of Recommended Improvement Initiatives on Operating Nuclear Power Plants

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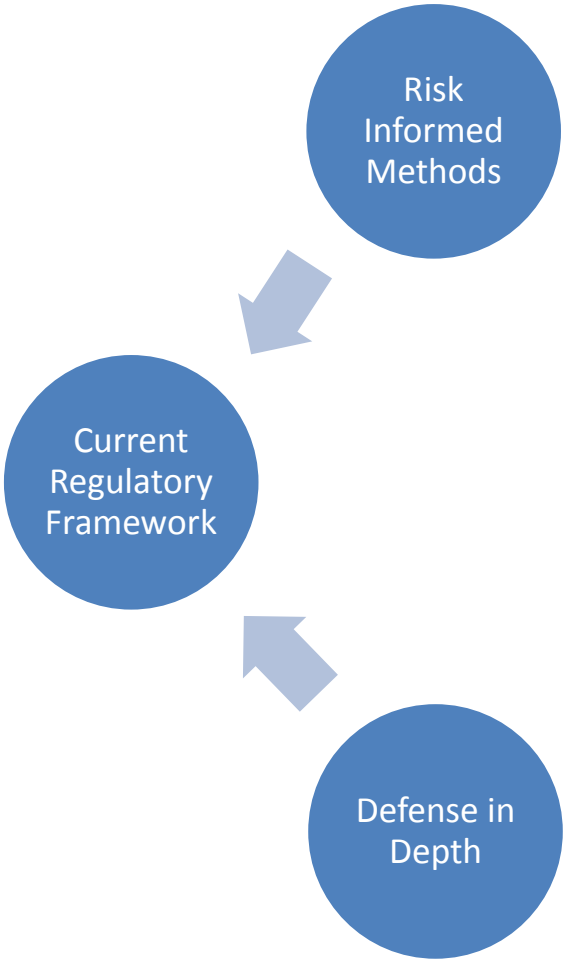
PWR Owners Group Perspective

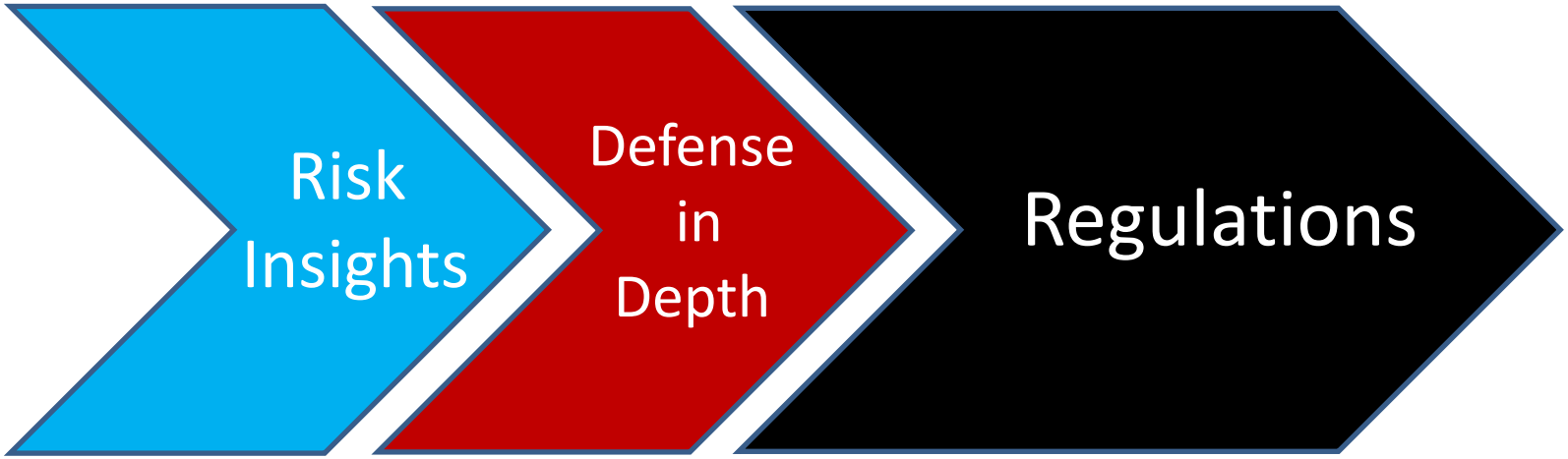
Recommendation 1 Concept	• A well implemented risk-informed regulatory framework will provide the greatest safety benefits
Current Recommendation 1 Proposal	• Seeks to establish a risk-informed method but not clear on how risk insights will be used to inform design basis extension or defense in depth

Current Framework



The current regulatory framework uses Risk Informed and defense in depth concepts independently with the most conservative position typically being used in the final decision

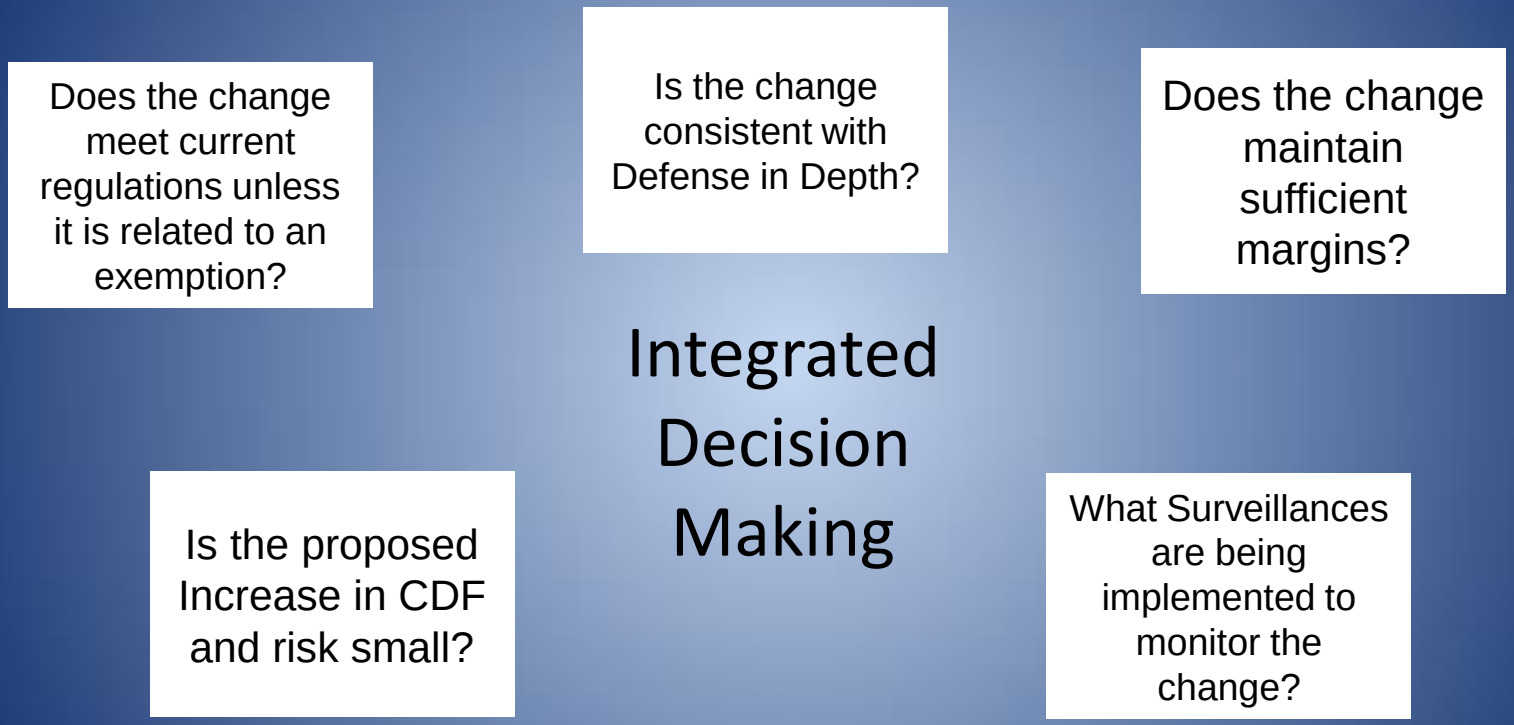
Risk Informed Framework



To appropriately risk inform regulatory activities, risk insights need to be integrated into defense-depth concepts

Risk Informed Framework

A Risk informed Regulatory needs to be built on the basic principles outlined in Regulatory Guide 1.174



Impact of Improvement Activity 1

Design Basis Extension Category

Only Applies to New Regulations	Only Uses Generic Risk Insights	Requirement to Develop Full Scope PRAs	Certain Terms Need to be Better Defined
• To be valuable this category needs to apply to existing and new regulations	• Plant Specific insights should be incorporated so important safety enhancements are not overlooked	• This requirement only increases the resource burdens on the plants • If implemented appropriately plants should see building PRA models as cost effective	• "Significant safety concern" and "adequate protection" need to be defined to ensure consistency in decision making

Impact of Improvement Activity 2

Expectations of Defense-in-Depth

The Need for Full Scope PRA Models

- Although there is no written requirement in this activity for a full scope PRA model, it is inherently necessary for realistic implementation
- Though the purpose of recommendation 1 is to work with plant resource limitations to maximize safety, this necessity will only increase the resource burdens on plants

Risk Aggregation and Quantitative Criteria

- Levels of uncertainty vary widely between internal and external events model which leads to an unrealistic single aggregate value and ultimately ineffective identification of safety improvements
- Relative risk contributions from each hazard should be evaluated to provide better risk insights
- Estakeholder engagement is requested for any quantitative criteria development to identify potential issues

Impact of Improvement Activity 3

Role of Voluntary Initiatives

The RMSC supports the NEI recommendation that there is no need for any NRC initiative regarding voluntary initiatives.

- The NRC has *not identified any systematic, industry-wide problem that would suggest that the industry as a whole is not following through on its commitments to implement these voluntary safety enhancements.*

Costs of Developing Full Scope PRA Models

PRA Full Scope [a]	Development Cost [b]	Maintenance Cost [c]
Internal Events	$1500K	$150K
Internal Flood	$500K	$100K
Fire	$5000K	$500K
Seismic	$3000K	$300K
Other External Events	$500K	$50K
LPSD Internal Events & Flood	$1000K	$200K
LPSD Seismic & Other External Events	$500K	$50K
LPSD Fire	$2000K	$200K
Spent Fuel Pool	$500K	$50K
Level 2 PRA	$1000K	$100K
TOTAL	$15,500K	$1,700K

(a) LPSD, SFP, and Level 2 are not currently part of the PRA Standard (ASME/ANS PRA Standard RA-Sa-2009). For these technical areas, Standards have been drafted or are being considered.
(b) Development Costs: estimated costs for the "average" PRA, assuming starting from scratch.
(c) Maintenance Costs: estimated 10-year costs, assuming 3 Internal Events PRA updates of data and plant changes and 1 update of all other PRAs over 10 years.

Conclusions

The existing regulatory structure provides an adequate level of safety but is overly conservative with regard to some safety issues and for some plants

Risk-Informed regulation should be applied to both current and future regulations

Risk-Informed regulation should use generic risk insights to focus regulatory control

Allow a plant-specific option for PRA-specific insights to prioritize safety issues. This would allow utilities to leverage the large cost of developing and maintaining full scope PRAs

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