



Approach to Effective and Efficient Nuclear Power Regulation

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Principles of good regulation:

- Independence
- Openness
- Efficiency
- Clarity
- Reliability

Regulatory actions are

- Effective
- Realistic
- Timely

PRA Results:

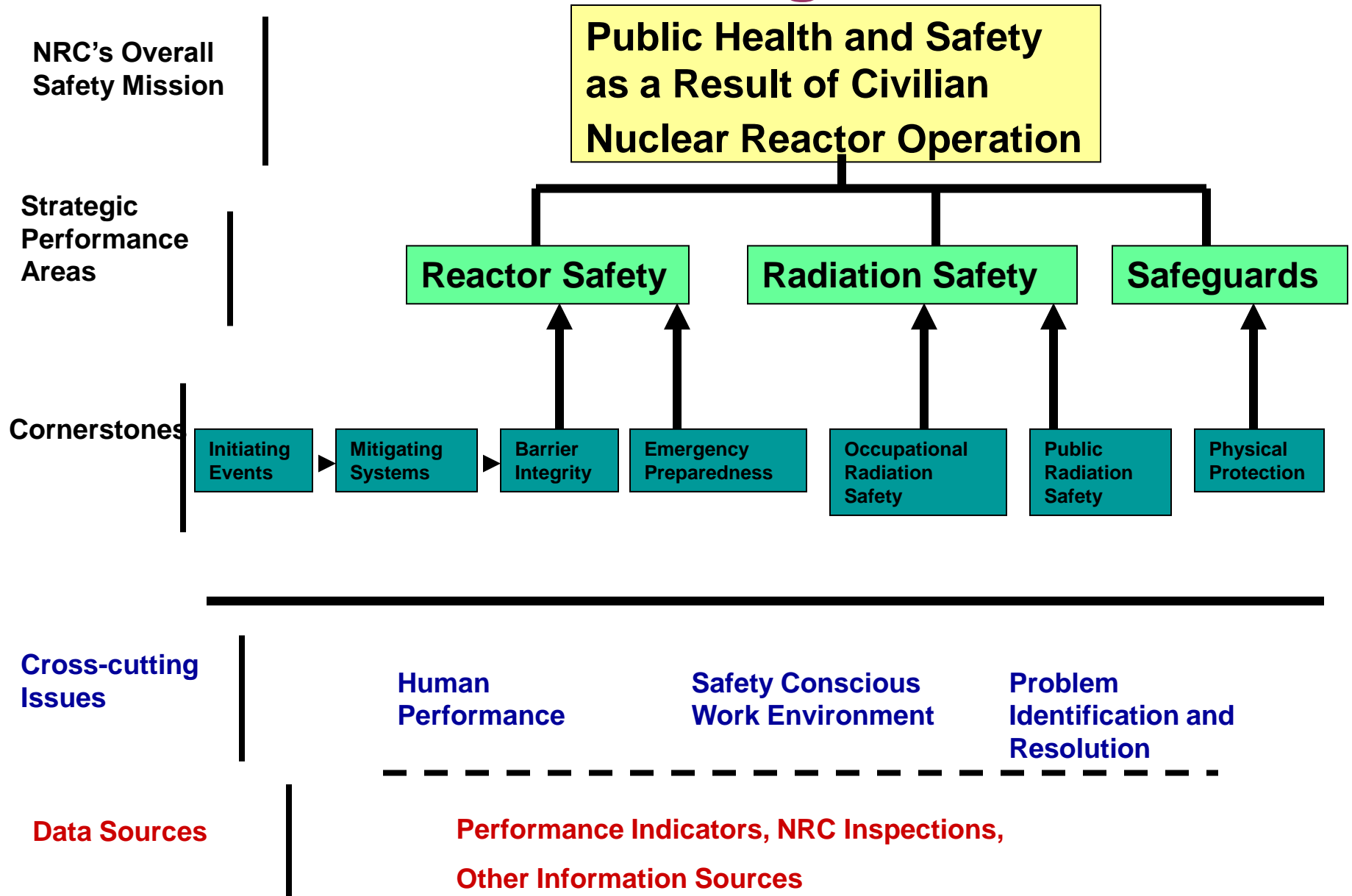
- Ranking of accident sequences according to frequency of occurrence
- Ranking of structures, systems, and components according to risk contributions (importance measures)

Benefits of using risk information

- Effectiveness by focusing on what is risk significant
- Openness

Unknown uncertainties (and tradition) lead to defense in depth.

Reactor Oversight Process



ASME BPVC Section XI Requirements

- Class 1 piping systems: 25% welds examined every 10-year interval
- Class 2 piping systems: 7.5% welds examined every 10-year interval
- Class 3 piping systems: Only pressure test for leakage every 10-year interval

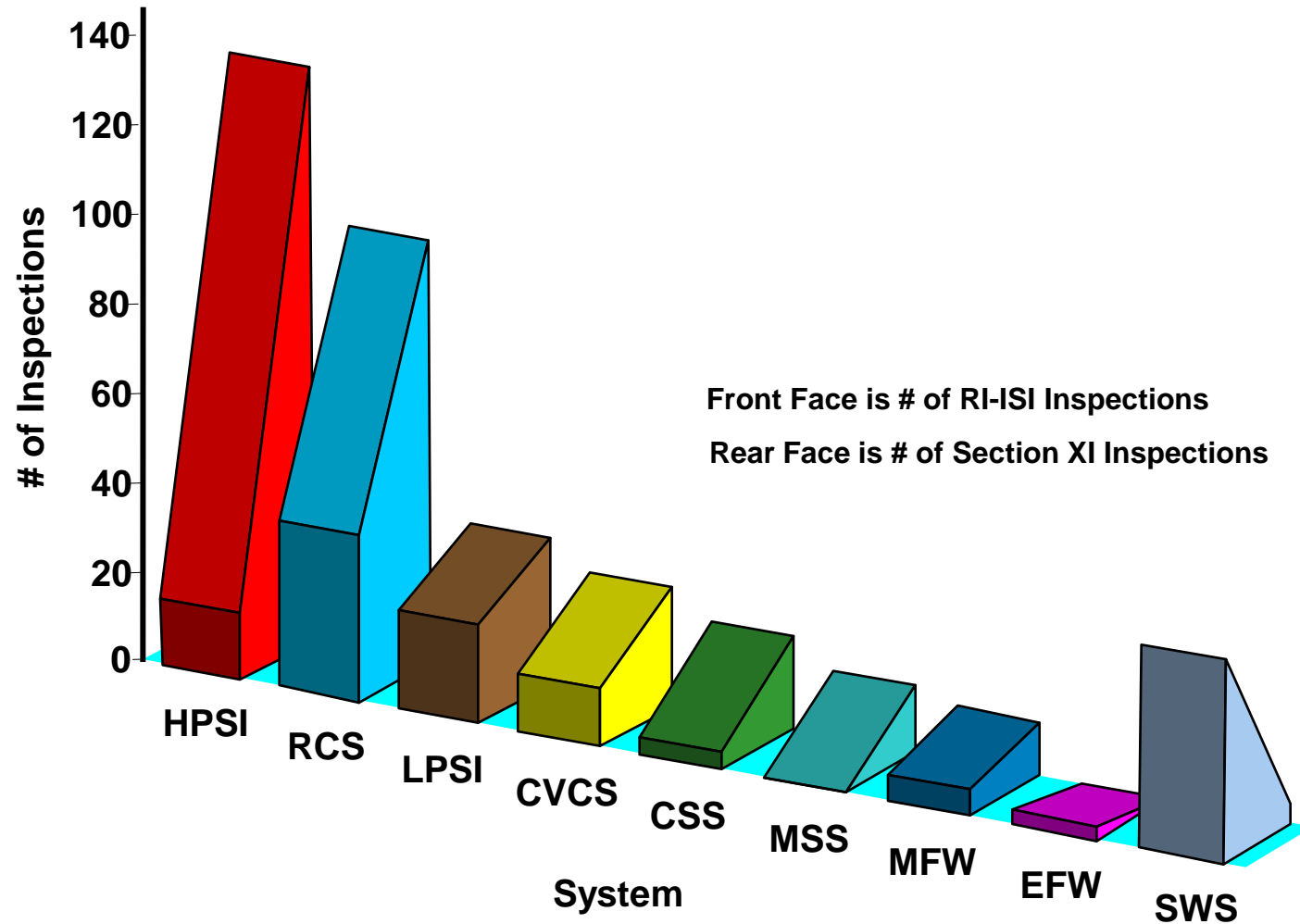
- Failures are not occurring at the design-based locations.
- Failures are occurring at locations where unanticipated and unusual operating conditions have developed, such as, thermal stratification in sloping pipe systems (e.g., the pressurizer surge line), flow-assisted corrosion, and stress corrosion cracking.

Risk Evaluation Matrix

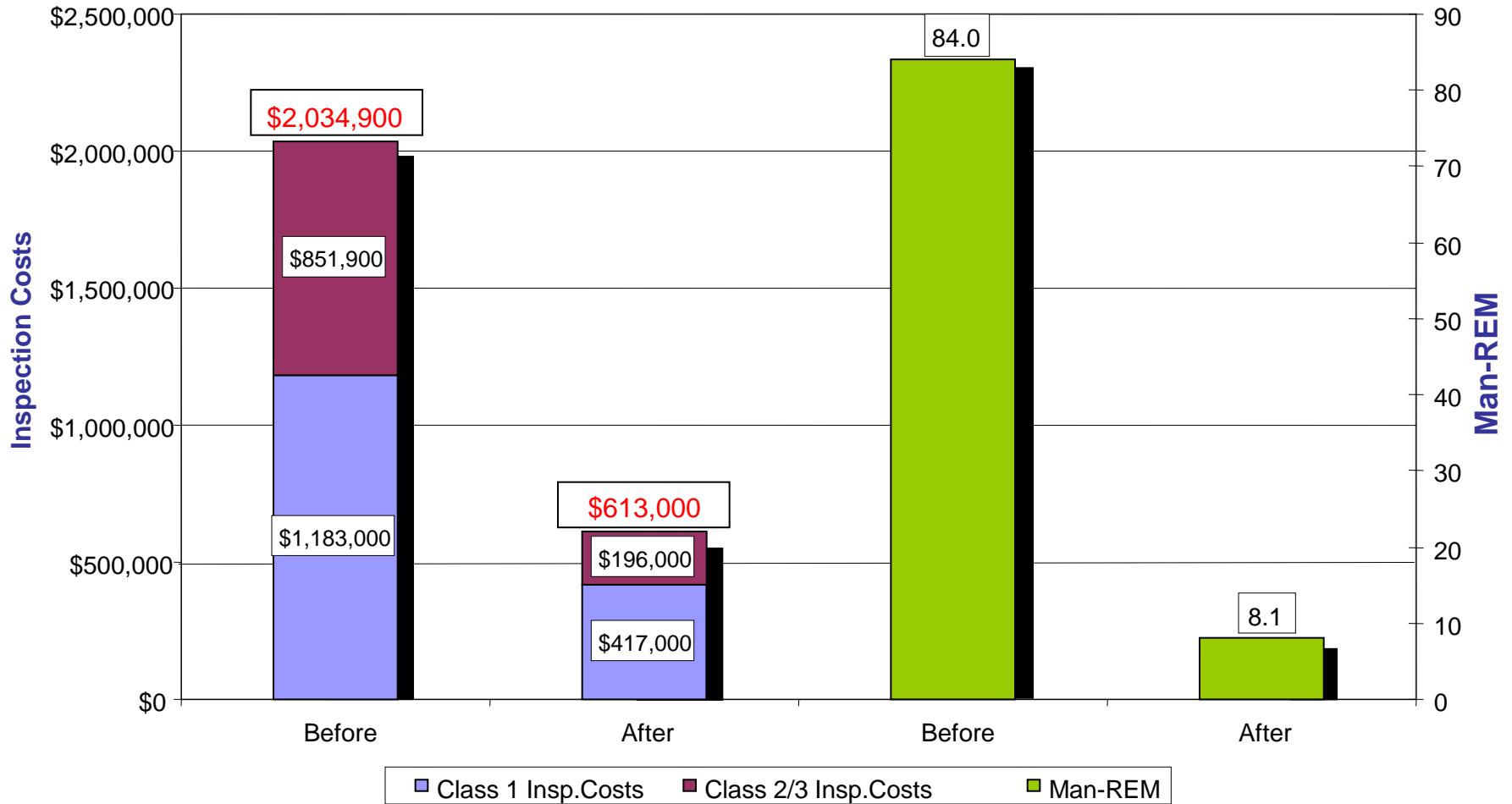
CONSEQUENCE CATEGORY (Safety Significance)

		CONSEQUENCE CATEGORY (Safety Significance)			
		<u>NONE</u>	<u>LOW</u>	<u>MEDIUM</u>	<u>HIGH</u>
DEGRADATION CATEGORY (Pipe Rupture Potential)	<u>HIGH</u>	LOW (Cat. 7)	MEDIUM (Cat. 5)	HIGH (Cat. 3)	HIGH (Cat. 1)
	<u>MEDIUM</u>	LOW (Cat. 7)	LOW (Cat. 6)	MEDIUM (Cat. 5)	HIGH (Cat. 2)
	<u>LOW</u>	LOW (Cat. 7)	LOW (Cat. 7)	LOW (Cat. 6)	MEDIUM (Cat. 4)

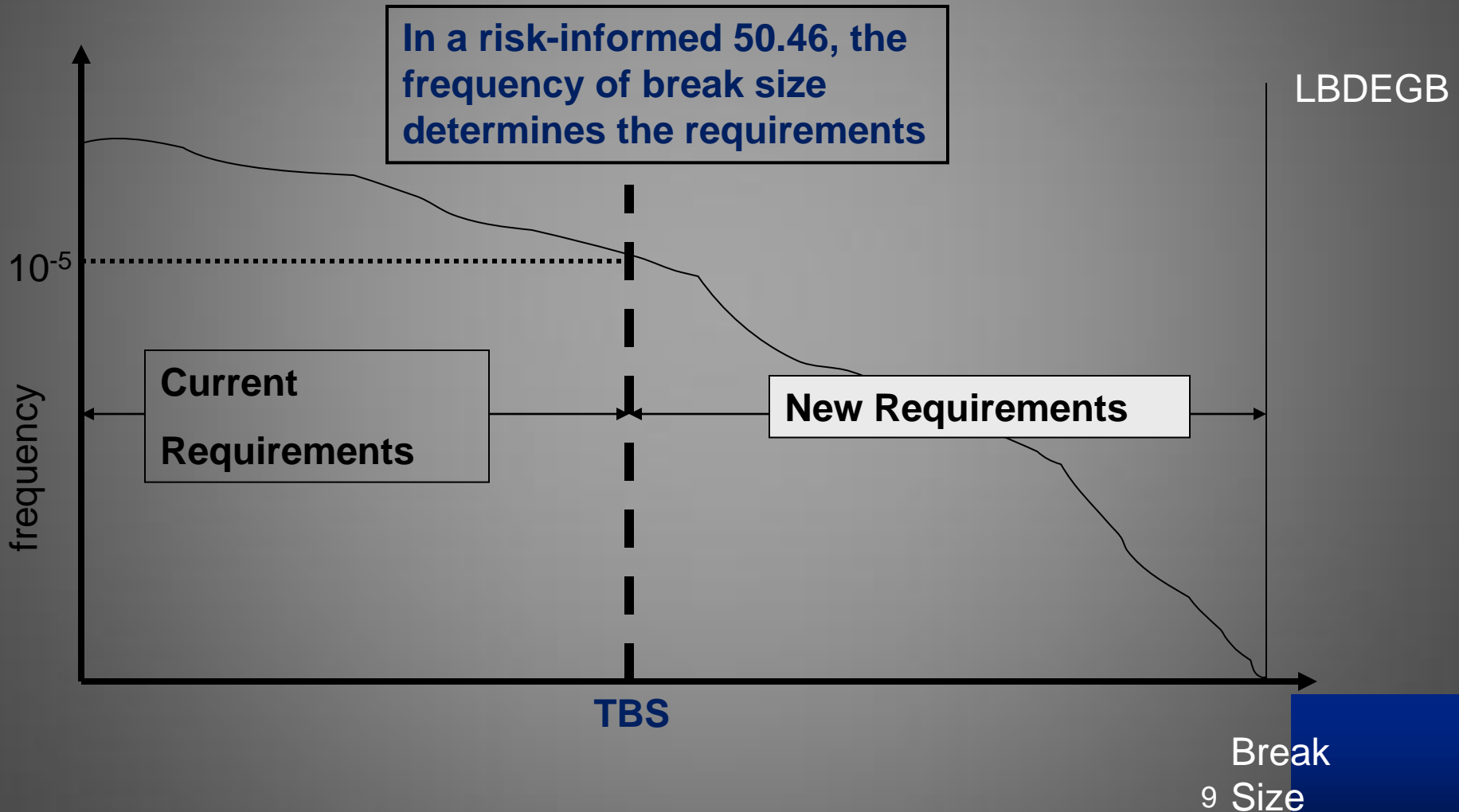
Plant X: Number of Inspections Before and After



Cost and Man-Rem Savings



Proposal for Risk-Informing 50.46



Transition Break Size (50.46a)

- A break of area equal to the cross-sectional area of the inside diameter of specified piping of a specific reactor.
- PWRs
 - Expert judgment: 4 to 7 inches.
 - The largest piping attached to the reactor coolant system (10-13 inches).
- BWRs
 - Expert judgment: 6 to 14 inches.
 - The larger of the feedwater line inside containment or the residual heat removal line inside containment (about 20 inches).