



**EPRI** | ELECTRIC POWER RESEARCH INSTITUTE

## WHY RISK?

Regulatory Information Conference  
March 2009

**Ken Canavan**  
Senior Program Manager

---

---

---

---

---

---

---

---

### Risk and Safety Analysis – Plus / Deltas

<p><b><u>SAFETY ANALYSIS</u></b></p> <ul style="list-style-type: none"> <li>• <b>Pluses</b> <ul style="list-style-type: none"> <li>– Clear criteria</li> <li>– Easily communicated</li> <li>– Easily enforced</li> </ul> </li> <li>• <b>Deltas</b> <ul style="list-style-type: none"> <li>– Lacks perspective</li> <li>– High cost</li> </ul> </li> </ul>	<p><b><u>RISK ANALYSIS</u></b></p> <ul style="list-style-type: none"> <li>• <b>Pluses</b> <ul style="list-style-type: none"> <li>– Provides “safety” perspective</li> <li>– Resources focused</li> </ul> </li> <li>• <b>Deltas</b> <ul style="list-style-type: none"> <li>– Some subjectivity</li> <li>– Difficult to communicate</li> <li>– Can be misused</li> </ul> </li> </ul>
---	--

**Challenges**

© 2009 Electric Power Research Institute, Inc. All rights reserved. 2

---

---

---

---

---

---

---

---

### Comparison of Risk and Safety Analysis

Phase	Safety Analysis	Risk Analysis
Initiating Events	“Credible” and pre-selected	Complete spectrum
Accident Sequence	“Single Failure” criterion, other intuitive sequences	All sequences, including multiple failures
Probability Evaluation	All scenarios treated equally	Mean values with uncertainty
Consequence Evaluation	Upper bound values No uncertainty assessed Assumptions conservative	Mean values Uncertainties assessed Assumptions realistic
Safety Significance	Based on rules (e.g., safety-related)	Established quantitatively

© 2009 Electric Power Research Institute, Inc. All rights reserved. 3

---

---

---

---

---

---

---

---

### Risk-Informed Performance-Based Approaches

- Risk-Informed Regulation is a blended approach that combines both safety and risk analysis
- Performance-Based Regulation focuses on results as the primary means of regulatory oversight, and has:
  - Measurable parameters to monitor performance
  - Objective criteria to assess performance
  - Flexibility to determine how to meet criteria

© 2009 Electric Power Research Institute, Inc. All rights reserved.

4



---

---

---

---

---

---

---

---

### Risk-Informed Performance-Based Approaches

- Risk-Informed Performance-Based approaches are the best option for all stakeholders - why?
  - The current regulatory structure is not optimized from either safety or resource & economic perspective
  - Conflict exists between risk insights and design bases
  - Performance monitoring is a useful tool and has wide support across many industries
  - Resources considerations forcing reconsideration of existing processes

© 2009 Electric Power Research Institute, Inc. All rights reserved.

5



---

---

---

---

---

---

---

---

### Risk-Informed Performance-Based – What's in it for the stakeholders?

- For the Regulator:
  - **Increased Safety** with the focus on risk significant equipment and issues (including "non-safety" related equipment)
  - **Targeted Resource Allocation** with the focus on poor performing equipment and licensees
- For the Plant Operators:
  - **Increased Safety** with focus on safety significant equipment and issues (including non-safety equipment)
  - **Reduced resources** for low risk significant equipment and issues
- For the Public:
  - **Safer Operation** at
  - **Reduced Costs**

© 2009 Electric Power Research Institute, Inc. All rights reserved.

6



---

---

---

---

---

---

---

---

### Risk Technology – Misuse on the rise

- As with any tool, risk technology has specific uses and can be misapplied or misused
- Typical misapplications
  - Risk based versus risk informed
  - Application to completely unknown phenomena
  - “Design basing” the risk analysis
  - Conservatism
- **Realism is both the power of risk technology and its greatest challenge**

© 2009 Electric Power Research Institute, Inc. All rights reserved.

7




---

---

---

---

---

---

---

---

### Risk Technology – Status

- Risk technology is “newer” than safety analysis
  - Some areas mature
  - Other areas are still evolving
  - Not widely understood
- Safety analysis is mature and socialized
- Socialization of risk technology is desirable to foster appropriate application
  - Use of risk-informed versus risk based
  - Use where risk results are fully understood
  - Use of appropriate tool, e.g., detail and conservatism

© 2009 Electric Power Research Institute, Inc. All rights reserved.

8




---

---

---

---

---

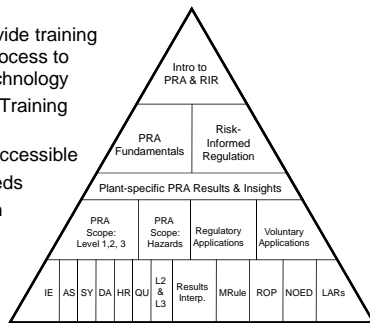
---

---

---

### Risk Technology Socialization

- Concept is to provide training that begins the process to “socialize” risk technology
- Computer Based Training (CBT)
  - Portable and accessible
  - Tailored to needs
  - User discretion
    - Time
    - Pace
    - Depth



© 2009 Electric Power Research Institute, Inc. All rights reserved.

9




---

---

---

---

---

---

---

---