

RIC 2005
Research Activities PRA
Session G2

**PRA Research and
Development Needs for
Regulatory Decision-Making**

Gareth Parry
Senior Advisor for PRA
Division of Systems Safety and Analysis
NRR
March 8, 2005



Risk-Informed Decision-making

- A PRA has to be of sufficient quality to support the decision
- Need consistency between regulatory decisions
- Need to deal with uncertainties

PRA Quality

- Defined in RG 1.174 and 1.200 in terms of:
 - Scope
 - Level of detail
 - Technical adequacy
- The Commission's expectations are addressed in the plan for the Phased Approach to PRA quality

Use of PRA Standards

- PRA Standards provide a level of consistency at the level of ‘what to do’
- Non-prescriptive nature of Standards allows variability in assumptions and models leading to uncertainty in PRA results

Role of Research to Support Regulatory Decision-Making

- Primary role should be to address those uncertainties that impact decisions
- Research can:
 - Identify weaknesses in current methods
 - Lead to new or more detailed modeling approaches to address weaknesses or new applications
 - Lead to an appropriate characterization of uncertainty
 - Provide approaches to dealing with uncertainty in decision-making

Examples of Areas of Uncertainty

- The modeling of human performance in the context of PRA (HRA)
- Analysis of external initiating events (including internal fires)
- Modeling low power and shutdown accidents including transition
- Modeling degradation/aging effects
- Modeling Digital I&C

Alternative Approaches to Dealing with Uncertainty

- Remove from consideration by adopting a consensus approach (e.g., RCP seal LOCA for Westinghouse plants)
- Recognize it and modify the decision to circumvent the uncertainty

Challenges

- Determining whether the issue is amenable to a probabilistic approach (e.g., digital I&C, degradation)
- Determining when the models are good enough to make good safety decisions (e.g., do we need to develop a more detailed HRA method for calculating HEPs)