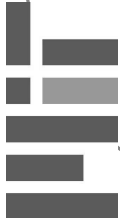




Risk Assessment and Nuclear War

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Historical Perspective

- Nuclear Reactors

- 1972 prevailing view: It cannot be done
- Safety relies on deterministic measures
- Congress demands a study
- NRC's massive Reactor Safety Study completed in 1975
- Unexpected results
 - ✓ Human errors significant contributors; Small loss-of-coolant accidents dominate; Core Damage Frequency higher than previously thought
- 1980s: Industry-sponsored PRAs

- Nuclear War &

- Terrorism

- Prevailing view: It cannot be done
- Prevention relies on deterministic measures, e.g., treaties
- Congress demands a feasibility study
- Research papers are published but no study similar to the Reactor Safety Study
- Unexpected results
???

✓ Fires and EQs dominate risk



Comments on PRA

- **What I have in mind is scenario development via event/fault trees with possible support from other methods, such as Bayesian networks**
- **PRA does not “predict” anything.**
- **It reveals our current state of knowledge and increases our understanding of the relevant risks**
- **It is based on hard evidence and the extensive use of expert judgments**
- **An independent and detailed peer review is essential**
- **Its greatest value is scenario identification although numbers are very important also**



Decision Making

- PRA is almost never the sole basis for decision making
- Risk-informed decision making (RIDM) is based on both deterministic requirements and PRA insights
- The deterministic requirements must be well understood before and during the performance of the PRA
- RIDM is subjective (no formal rules) and done by senior people depending on the significance of the issue
- As a rule, the greater the PRA uncertainties (especially due to the models themselves), the greater the reliance on existing or new deterministic requirements



My View

- **A Federal agency with enough clout should sponsor a well-defined study involving decision makers, risk analysts, subject matter experts, and other relevant disciplines.**
- **National laboratories and private industry should be involved.**
- **Independent peer review is essential.**
- **Such a study would determine “whether a risk assessment framework is applicable to determining the potential risks of nuclear terrorism and nuclear war.”**