Risk-Informing 10 CFR 50 Option 3

Status Report to the Commission

June 20, 2000

Briefing Overview

- Objectives:
  - Provide status of OPTION 3 effort (SECY-00-0086)
  - Provide early identification of issues
- Key Elements
- Status:
  - Scope and approach
  - Work to date
  - Stakeholder interactions
  - Future Plans
- Potential Implementation Issues
  - Policy
  - Technical

Key Elements

- Key elements to the success of OPTION 3:
  - Integration of defense-in-depth and risk considerations
    - Use of risk guidelines derived from the reactor Safety Goals (which define how safe is safe enough)
    - Prevention and mitigation (including late containment failure)
  - Role of the backfit rule and adequate protection
  - Integration of recommended changes
- PRA quality is also key:
  - Consistency with OPTION 2
  - Treatment of uncertainties

Scope and Approach

- Scope
  - Focus is on risk-informing technical requirements (rules, DBAs, R.Gs., SRP)
- Approach:
  - Utilize reactor cornerstone framework
  - Establish general guidelines for defense-in-depth (DID) and safety margins (SM):
    - DID - prevention and mitigation
    - SM - best estimate calculations with margin in acceptance criteria
    - Treatment of uncertainties
  - General guidelines for risk
    - Core damage prevention
    - Containment performance
  - Use performance-based approach, where practical

Work to Date

- Developed framework document for review of requirements
- Initial screening of regulations
  - 10 CFR 50.44 and 50.46 identified as highest priority
  - Anticipated operational occurrences not limiting and have not been identified by stakeholders as high priority
- Developing options for risk-informing 10 CFR 50.44 (combustible gas) and its implementing guidance
- Initiated review of:
  - 10 CFR 50.46 (ECCS) and its implementing guidance
  - Special treatment requirements and their implementing guidance
- Initiated identification of other potential risk significant concerns not currently covered by the regulations
- Coordination with OPTION 2

Review of 10 CFR 50.44 - Status

- Risk-significant threats from combustible gas:
  - Mark III and Ice Condenser containments-scenarios where ignitors are not available (i.e., SBO)
- Requirements being considered for change:
  - Eliminate safety classification of H_2 monitoring
  - Elimination need for post LOCA H_2 control
  - Require H_2 control measures in Mark III and Ice Condenser containments be operable in SBO or reduce SBO frequency

Stakeholder Interactions

- Workshops:
  - Sept. 1999 - overall plan and approach
  - Feb. 2000 - framework
- Public Meetings:
  - March 2000 - 10 CFR 50.46
    - ACRS
  - May 2000 - 10 CFR 50.44
    - 10 CFR 50.46

- Website
- Stakeholder Feedback
  - Priorities for which regulations to risk-inform
  - Comments on proposed framework
  - Comments on risk-informed regulation, in general

Future Plans

- Complete evaluation of 10 CFR 50.44 and provide recommendations to Commission in August 2000, including any policy issues
- Continue evaluation of 10 CFR 50.46 and special treatment requirements and conduct workshop (Sept. 2000)
- Report to Commission in December 2000
- Recommend priority and schedule for remaining evaluations

Potential Implementation Issues

- Policy:
  - Selective implementation
  - Role of the backfit rule
  - Application of risk-informed guidelines

- Technical:
  - Treatment of long term containment performance
  - Guidelines for application of:
    - Defense-in-depth
    - Safety Margins
    - Risk

Risk-Informing NRC Technical Requirements

Ralph Beedle
Nuclear Energy Institute

Proposed NRC Framework

- **Thoughtful effort by NRC staff and contractors to quantify all elements of regulatory structure**
- **However, proposed approach is more risk-based than risk-informed**
- **Risk quantification should not become sole basis for regulation**

NRC Proposals

- **Proposed approach would establish regulation to the safety goal subsidiary objectives on individual plant basis**
  - Establishment of quantitative licensing basis is radical departure from current approach
  - Suggested consideration of large late releases is inconsistent with current risk-informed initiatives

Preferred approach

- **Pragmatic versus theoretical**
- **Use generic risk insights to improve current requirements**
  - Example: design basis accident assumptions
- **Preserve existing risk-informed philosophy**
  - Integrated consideration of risk insights, traditional engineering approaches, safety margin
- **Emphasis on ensuring safety significant functions -- not on what to do with low significant functions**

Industry Priorities

- **Complete ongoing efforts**
  - Hydrogen control (§50.44)
  - Fire protection (§50.48, Appendix R)
- **Focus on areas of greatest potential benefit**
  - Codes and standards (§50.55a)
  - Large Break LOCA (§50.46)
- **Further activities based on demonstrated success with above**

Conclusion

- **NRC framework provides starting point to define the quantitative end of the spectrum**
- **Industry will continue interactions to develop more pragmatic approach**
- **Rulemaking on hydrogen control and NRC action on the South Texas Project exemption under Option 2 will stimulate further interest by the industry**

Public Citizen

Buyers Up • Congress Watch • Critical Mass • Global Trade Watch • Health Research Group • Litigation Group
Joan Claybrook, President

Statement of James P. Riccio

Public Citizen's Critical Mass Energy Project
Before
The U.S. Nuclear Regulatory Commission

June 20, 2000

The Deregulation of Nuclear Safety Standards Otherwise Known As "Risk-Informing the Technical Requirements of 10 CFR Part 50"

Public Citizen is opposed to the deregulation of nuclear safety standards being conducted by the NRC under the guise of "risk -informed" regulation. This deregulatory effort has come about because the nuclear industry has come to the realization that if forced to comply with the regulations that are currently on the books their nuclear reactors will be unable to compete in a newly deregulated electricity market place. NRC's efforts to "risk inform" the nuclear safety regulations contained in 10 CFR part 50 is yet another in a series of attempts by the agency and industry to deregulate safety standards based not upon safety but upon cost. "Risk-informed" regulation means that the public is exposed to more risk while the nuclear industry is exposed to less regulation.

We have already witnessed the whittling away of safety margins through the NRC's Reduction of Requirements Marginal to Safety, Cost Beneficial Licensing Actions, the use of Enforcement Discretion to avoid shutdowns and allow restarts and the "New and Improved" Technical Specifications that reduced the limiting conditions of operation by 40%. The NRC and the NEI have now turned their sights onto the heart of regulation contained in 10 CFR Part 50.

However, it is important to note at the outset why this deregulatory effort is voluntary. The NRC and the nuclear industry can not justify it from a cost benefit analysis as required under the NRC's back fit rule. The back fit rule requires that any imposition of regulation result in a net safety benefit commensurate with the costs imposed on the licensee. Even if "Risk-informing" Part 50 is implemented perfectly by this industry, there will be NO SAFETY BENEFIT TO THE PUBLIC!

According to former NRC Chairman Shirley Jackson, risk informed regulation was supposed to be a double-edged sword. Risk insights were supposedly going to be used not only to reduce regulatory burden but also impose new requirements if warranted. However, the NRC's bias is clear. Its is permissible for the NRC & the nuclear industry to deregulate safety standards but if the NRC were to impose regulations they would have to meet a stringent cost/benefit analysis. So much for the double edged sword!

The list of regulations that the nuclear industry wishes to subject to "risk-informed" regulation is instructive. According to NEI's letter, the NRC and NEI have already begun to "risk inform" the regulations that govern Fire Protection, Technical Specifications and Nuclear Reactor Security. The NRC's rewrite of the technical specifications has already resulted in a 40% reduction in limiting conditions of operation (LCO's) imposed upon licensees. The regulations governing fire protection and reactor security have been a constant source of embarrassment to the industry and the agency.

Technical Specifications

Last week, PECO's Corbin McNeil was before the Congress touting the improved efficiency of the nuclear industry. The Nuclear industry is not operating better. The NRC is just regulating less. NEI and NRC have already wiped out 40% of the reason to shut down a reactor and now they want to risk-inform the other 60% that remain. The NRC staff has acknowledged that the industry can expect little regulatory relief due to the previous re-write of the tech specs yet efforts to deregulate these requirements persist.

Fire Protection

After the 1975 fire at TVA's Browns Ferry in Alabama, the NRC promulgated more rigorous fire safety regulations. But the NRC failed to enforce those regulations. Instead, the agency granted more than a thousand exemptions and waivers. In 1992, the NRC testified to Congress that reactor owners would use temporary measures for about six months until their fire safety problems could be fixed. Eight years later, those "temporary" measures are still being used at US nuclear plants instead of meeting the minimum standards. Now the industry and agency wish to "risk-inform" regulations that the NRC has never really enforced.

Reactor Security

Reactor Security has been another source of embarrassment for the nuclear industry and this agency. The OSRE (Operational Safeguards Response Evaluation) Program has continually identified significant physical protection vulnerabilities at U.S. nuclear power plants. As of the summer 1998, mock adversaries were able to defeat security 40 times, demonstrating the potential for terrorists to cause "significant core damage" at nearly half the plants tested. Similar results have been recorded since that date and "significant vulnerabilities" continue to be identified. Many licensees failed their OSRE evaluations despite the fact that they had many months of advance warning and had increased the sizes of their security forces by an average of 80% over the numbers they had committed

to in their security plans. Yet reactor security regulations are slated for risk-informed treatment by the agency and the industry.

Before the NEI and the NRC begin to deregulate fire protection and reactor security, Public Citizen would like to see NRC first enforce the regulations. No regulation can have a safety benefit if the nuclear industry does not to implement it and the NRC fails enforce it.

Deregulating for Dollars

The NEI letter attached to NRC's Secy-paper 00-0086 makes no qualms about the amount of money that the nuclear industry hopes to save:

10 CFR 50.46	LOCA & ECCS Analysis	$25,000 - $3,000,000/reactor/yr
10CFR 50.49	Environmental Qualification	$100,000 - $300,000/reactor/yr
10 CFR 50.55a	Codes & Standards	$200,000 - $500,000/reactor/yr
10 CFR 50.44	Combustible Gas Control	$200,000/reactor/yr
GDC 19,	Control Room Ventilation	$100,000 - $250,000/reactor/yr
GDC 17	Electric Power Systems	$300,000/reactor/yr

Additionally, NEI has identified a trove of regulations that would save the nuclear industry less than $50,000/reactor/yr:

10 CFR 50.62	Anticipated Transient Without Scram (ATWS)
10 CFR 50.34	Contents of applications
10 CFR 50.71	Maintenance of records, making of reports
10 CFR 50.54	Conditions of licenses
10 CFR 50.59,	Changes, tests and experiments
10 CFR 50.72 & 50.73,	Reporting Requirements

However, it's not just the deregulation by dollar amount that disturbs us. What the NEI and the NRC fail to acknowledge is that many of these regulatory requirements have a substantial impact on safety. NRC and NEI are no longer just whittling away at requirements that they consider "marginal to safety", this deregulatory effort is aimed at cutting out the heart of NRC's reactor safety regulations.

In 1993, NRC conducted a review of its regulations. For each regulation NRC asked, "what is the contribution of the rule to safety?" According to the NRC's review, the top four regulatory requirements that NEI identified as "Prime Candidates" for deregulation all had a substantial impact on safety:

10 CFR 50.46	LOCA & ECCS Analysis	Substantial
10 CFR 50.49	Environmental Qualification	Substantial
10 CFR 50.55a	Codes & Standards	Substantial
10 CFR 50.44	Combustible Gas Control	Substantial

The Nuclear Energy Institute testified before the senate oversight committee that deregulation of 10 CFR Part 50 safety standards was possible because of the improved safety record of the nuclear industry. However, the fact that the U.S. nuclear industry has not melted down a nuclear reactor in the last 20 years is not a sufficient reason for deregulating those requirements that helped achieve that record.

Unfortunately, NRC's "risk-informed" regulations are not being used to improve safety at nuclear reactors; but to improve the economics of this failed technology by waiving inspections, shortening maintenance outages and avoiding shutdowns. That is why Public Citizen has concluded that "risk-informed" regulation means that the public is exposed to more risk while the nuclear industry is exposed to less regulation.

I thank the Commission for the opportunity to present our views and I'd be happy to answer any question you may have.