



Regulatory Gap 5

Risk Considerations for a Production Facility Licensed Under 10 CFR Part 70

10 CFR Part 70

ISA requirements in 10 CFR Part 70 do not adequately address the increased risk a reprocessing facility poses relative to other fuel cycle facilities

- “high consequence” accidents to be made “highly unlikely” by applying IROFS
- “intermediate consequence” accidents to be made “unlikely” by applying IROFS
- Likelihood criteria on a per accident sequence basis recommended in NUREG-1520
 - High consequence: 10-5 per yr
 - Intermed consequence: 10-4 per yr

Receptor	Worker	Individual Outside Controlled Area (aka General Public)
Event		
High Consequence:	- > 100 rem (TEDE) - Endanger life of worker (chemical)	- > 25 rem - > 30 mg soluble U - Irreversible or serious, long-lasting health effects (chemical)
Intermediate Consequence:	- > 25 rem - Irreversible or serious long-lasting effect (chemical)	- > 5 rem - Mild transient health effects (chemical) - > 5000 x Table 2 Part 20, App B
(Low Consequence)	Mild transient health effects or less	Lesser effects

NEI Recommendation

- NEI White Paper – December 2008
 - Recommends an ISA approach supported by a quantitative assessment of the risk to a member of the public exposed to fission products to the extent practicable based on the availability of data

ACNW&M Recommendations

- ACNW&M White Paper – June 2008, NUREG 1909
 - NRC needs to consider modifying ISA requirements in 10 CFR Part 70 for reprocessing
 - Regulation that utilizes PRA insights is preferable to one based on ISA since the latter has significant limitations in treating dependent failures, human reliability, uncertainties, and aggregation of sequences
 - Need for ALARA requirements that establish design objectives
 - Effort to do an ISA or PRA to evaluate risks for a reprocessing facility is similar

Additional References

- Reactor Safety Goals and Objectives (51 FR 30028; August 21, 1986)
- “Risk-Informed Decision-Making for Nuclear Material and Waste Applications Rev. 1”, February 2008 (ML080720238)
- NRC’s PRA Policy Statement (60 FR 42622; August 16, 1995)

PRA Policy Statement - 1995

The Commission believes that an overall policy on the **use of PRA methods in nuclear regulatory activities should be established** so that the many potential applications of PRA can be implemented in a consistent and predictable manner **that would promote regulatory stability and efficiency.**

In addition, the Commission believes that the **use of PRA technology in NRC regulatory activities should be increased to the extent supported by the state-of-the-art in PRA methods and data and in a manner that complements the NRC's deterministic approach** and supports the NRC's traditional defense-in-depth philosophy.

Discussion Topics

- Assessment of aggregated risk to a member of the public from accidents?
- How should potential accidents that can have much higher source terms relative to existing fuel cycle facilities be best addressed?
- ISA vs PRA?