

US NRC PRA Use and Development: 2018 Update

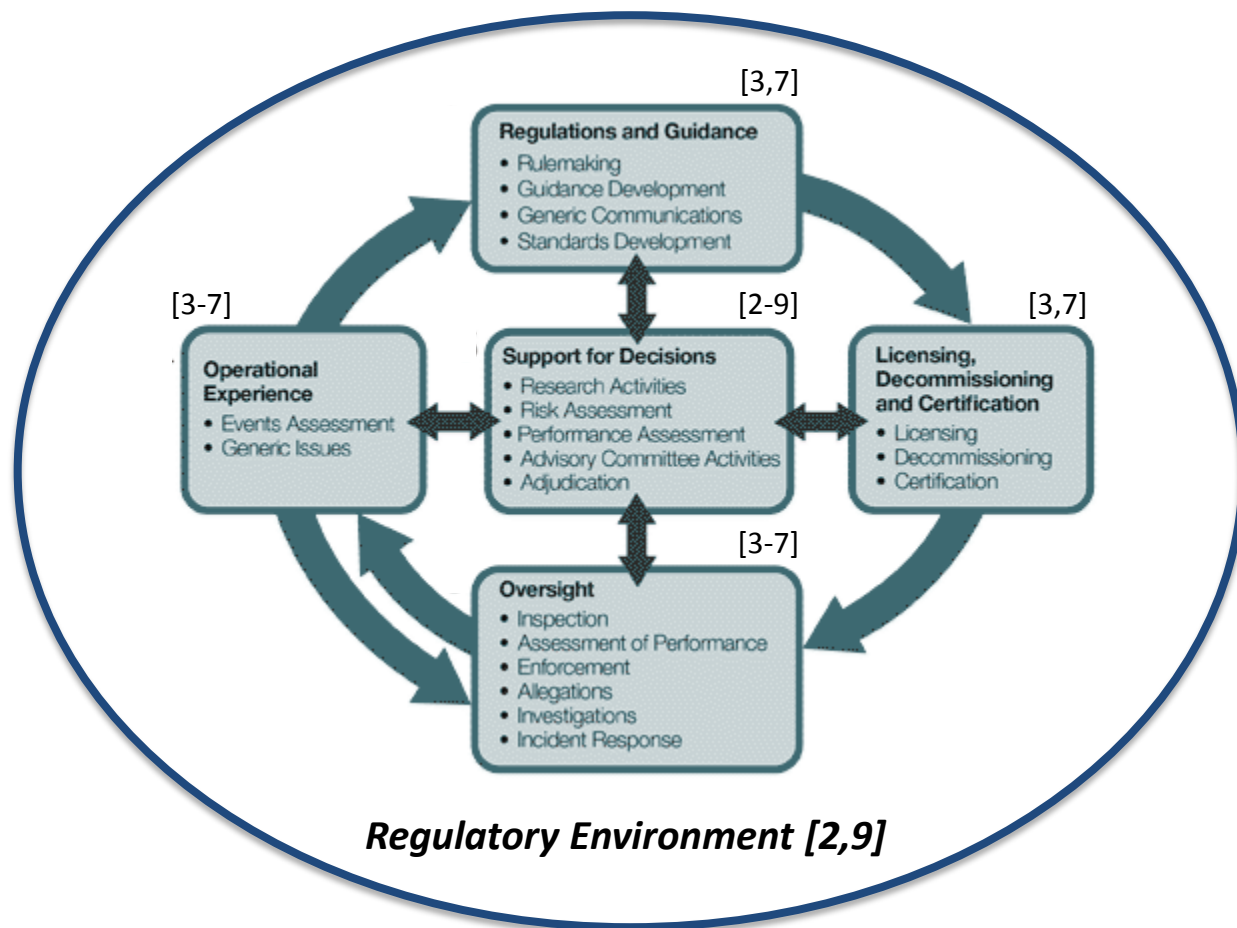
19th Annual WGRISK Meeting

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U.S. Nuclear Regulatory Commission

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NRC Regulatory Process and Components



PSA Use and Development Report Chapters

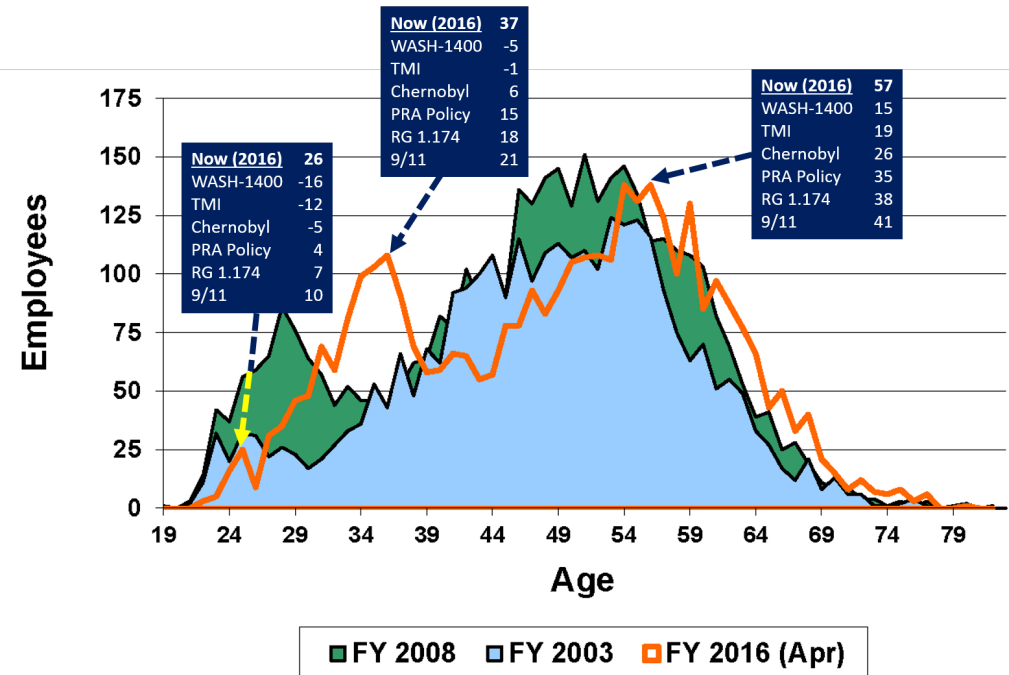
2. Framework and Environment
3. Numerical Safety Criteria
4. Status and Scope of Studies
5. Methodology and Data
6. Notable Results
7. Applications and Decision Making
8. Future Developments and Research
9. International Activities

Regulatory Environment

“...the agency focuses on continuous improvement of its activities and processes and demonstrates a commitment to effectiveness, efficiency, and innovation in all its regulatory activities.”

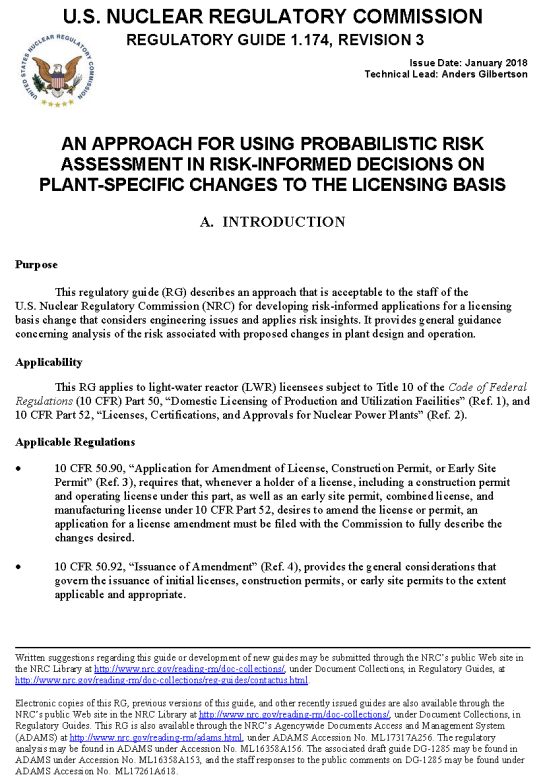
- NUREG-1614, Vol. 7

- Trends include
 - Staff
 - Budget
 - Information and IT
- Solutions include
 - RIDM, PRA “realism”
 - Leveraging resources
 - Transformation and Innovation Initiatives



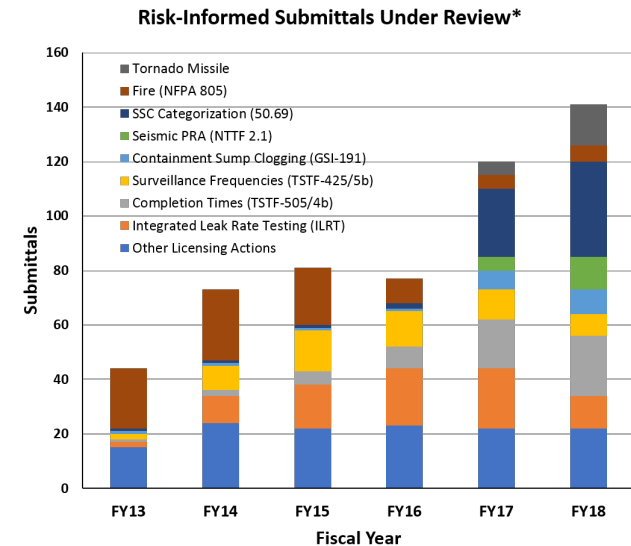
Risk-Informed Regulations and Guidance

- RG 1.174, Rev. 3 (2018)
 - “Fuzzified” boundaries
 - Defense-in-depth
- NUREG-1855, Rev. 1 (2017)
 - Risk aggregation
- ASME/ANS PRA Standard (ongoing)
 - External hazards
- Probabilistic Flood Hazard Assessment (PFHA) – basis for probabilistic approach



Risk-Informed Licensing, Oversight, and Operational Experience

- Growing number of applications
- “Routine” activities
 - Reactor Oversight Program (ROP)
 - Accident Sequence Precursor (ASP) Program
 - Generic Issues Program
- Post-Fukushima activities
 - Implementation of Orders
 - Seismic and flooding reevaluations
- Challenges, initiatives
 - New methods
 - PRA realism (fire, ROP, FLEX)
 - SSC classification (10 CFR 50.69)
 - Tornado missiles



*As of April, 2017; estimates subject to change.

Technical Support

Ongoing

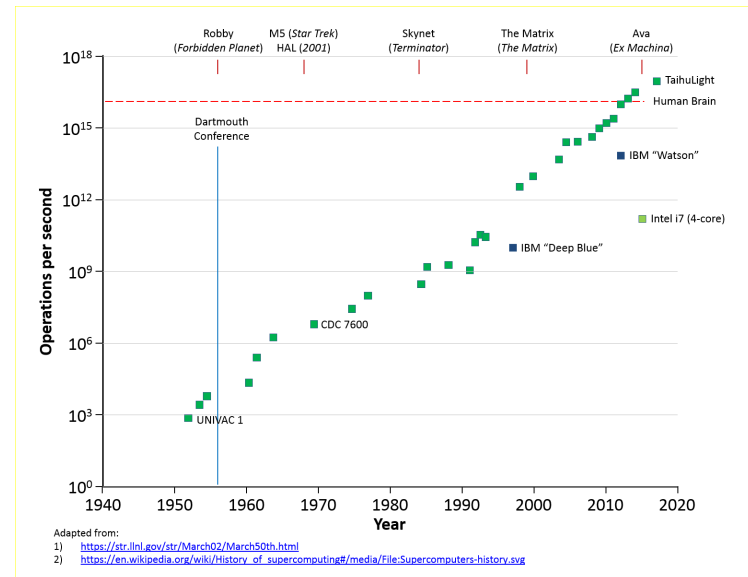
- SPAR models
- Industry trends
- Integrated Site PRA
- Fire research (e.g., HEAF) and PRA
- Flooding PRA (PFHA+)
- HRA (IDHEAS, SACADA)
- RIDM (Risk Aggregation)

Knowledge Management

- Seminars (e.g., WASH-1400, UCS, Safety Goals)
- NUREG/KMs
- Training, mentoring, etc.

Looking Forward

- Advanced PRA methods (e.g., dynamic PRA)
- Expanded scope (organizational factors? “Level 0”/enterprise risk?)
- Knowledge engineering (e.g., “Big Data,” AI)



Some Recent General Resources

- “Strategic Plan: Fiscal Years 2018-2022,” NUREG-1614, Vol. 7, 2017.
- “2017-2018 Information Digest,” NUREG-1350, Vol. 29, 2017.
- “NRC’s High-Value Datasets,” <https://www.nrc.gov/data/>
- “Commission Meetings, Agendas, Slides, Transcripts, Meeting SRMs, and Full Written Explanation for Closed Meetings,” <https://www.nrc.gov/reading-rm/doc-collections/commission/tr/>
- “Japan Lessons Learned,” <https://www.nrc.gov/reactors/operating/ops-experience/japan-dashboard.html>
- “Research Activities: FY 2015-FY2017,” NUREG-1925, Vol. 3, 2016.
- “Research Activities,” <https://www.nrc.gov/about-nrc/regulatory/research.html>
- “Review and Evaluation of the Nuclear Regulatory Commission Safety Research Program,” NUREG-1635, Vol. 12, 2016.
- “Biennial Review and Evaluation of the NRC Safety Research Program,” USNRC Advisory Committee on Reactor Safeguards, February 26, 2018. (ML18057B139)
- “NRC Webcast Portal,” <https://video.nrc.gov/#archives-main>

Some Recent PRA and RIDM Resources

- “Risk-Informed Activities,” <https://www.nrc.gov/about-nrc/regulatory/risk-informed/rpp.html>
- “An Approach for Using Probabilistic Risk Assessment in Risk-informed Decisions on Plant-Specific Changes to the Licensing Basis,” Regulatory Guide 1.174, Rev. 3, 2018.
- “Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking,” NUREG-1855, Rev. 1, 2017.
- “U.S. Nuclear Regulatory Commission Accident Sequence Precursor Program: 2016 Annual Report,” 2017. ML17153A366