Putting the "Reasonable" Back in "Reasonable Assurance of Adequate Protection"

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Nuclear Energy Innovation

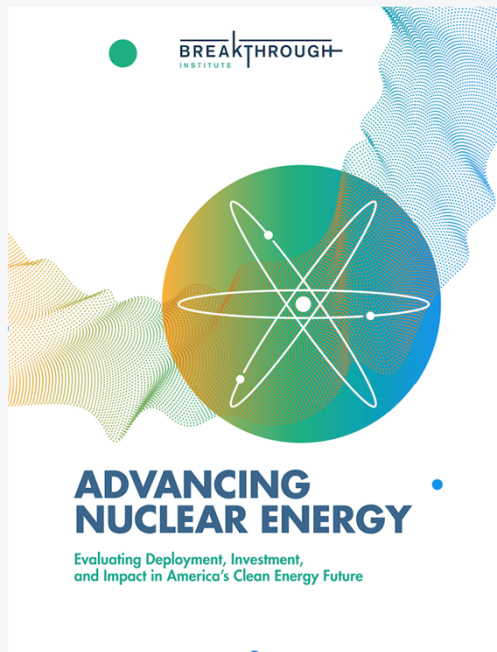March 16, 2023

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Key Messages

- Nuclear energy is crucial to public health and safety

- NRC's mission is to enable the safe civilian use of nuclear materials

- The Agency faces a new crisis

- Regulation of nuclear security is a cultural challenge

- NRC must modernize to keep pace with innovation

- NRC has exhibited some flexibility in nuclear security for advanced reactors

- Current NRC staff positions and practices present legacy challenges for the next generation

- Putting the "reasonable" back into nuclear security is key

Importance of Nuclear Innovation

- Why is nuclear energy crucial to public health and safety?

  - Alternatives are often dirty and harmful to people and the environment

- Why is NRC's mission to enable the safe civilian use of nuclear materials?

  - The *Atomic Energy Act of 1954* declared "the development, use, and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare… improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise."

  - The *Energy Reorganization Act of 1974* declared "the general welfare and the common defense and security require effective action to develop… all energy sources to meet the needs of present and future generations, to increase the productivity of the national economy and strengthen its position in regard to international trade, to make the Nation self-sufficient in energy, to advance the goals of restoring, protecting, and enhancing environmental quality, and assure public health and safety."

History Repeats Itself in 2023?

- ## What crisis does NRC face, and why?
  - Long history of being reactive, not proactive
  - Risk-averse and resistant to change
  - Another looming the "Near-death Experience"?

- ## Why is regulation of security a cultural challenge?
  - Early history of security inspection and oversight
    - 1998: 3 FTE in HQ and $90K in contractor support
  - Transition to Reactor Oversight Process (ROP) in 2000
  - NSIR was established in 2002, and today's security personnel comprises:
    - Division of Physical and Cyber Security Policy (3 branches)
    - Division of Security Operations (4 branches)
    - Contractor support ($$$)

Photo of Diablo Canyon by Michael A. Mariant, AP

SRM-SECY-98-144 and NEIMA of 2019

- Why and how must NRC modernize to keep pace with innovation?
  - To satisfy NEIMA, NRC must complete the work it began in the late 1990s
  - Modernization means applying risk-informed and performance-based principles to regulatory decision-making, including rules and guidance
  - This translates to embracing a culture of realism and regulatory discipline
- What flexibility is NRC offering in nuclear security for advanced reactors?
  - An appropriately sized protective force
  - A generic reasonable assurance of protection time (RAPT) of 8 hours or less
    - More realistic response times in site-specific applications may be needed
  - Remote secondary alarm systems that would effectively service multiple new sites
  - Open consideration of physical barriers using novel technologies and materials

Legacy Challenges for Advanced Reactors

- What NRC staff positions and practices present legacy challenges for the next generation, and why?
  - Perpetuation of "high assurance" language in draft rule language, guidance and other regulatory products defies prior Commission direction.

    In implementing the NRC's regulatory program, either in developing new regulations, inspecting licensee compliance with regulations, or executing the FOF program… "high assurance" of adequate protection… is equivalent to "reasonable assurance"… The NRC should not be applying a "zero risk" mentality to security any more than we should be doing so with respect to safety. The staff should operate under this paradigm and eliminate ambiguity on this point in its guidance documents or other internal directives, instructions, or training materials, to the extent such ambiguity exists. (SRM-SECY-16-0073, ML16279A345)
  - This defiance is a persistent cultural problem that only strong leadership can solve

Regulatory Encroachment Today is a Threat

- High assurance footnote to legitimize defiance of Commission direction
  - Limited-scope revision of Part 73 adopts the "high assurance" standard
    - SECY-18-0076, "Options and Recommendations for Physical Security for Advanced Reactors"
  - Regulatory Issue Summary (RIS), "Personnel Access Authorization Requirements for Non-Immigrant Foreign Nationals Working at Nuclear Power Plants"
    - Enforcement Guidance Memorandum (EGM) 2020-001, "Enforcement Discretion Not to Cite Certain Violations of 10 CFR 73.56 Requirements
  - Reg Guide 5.71, "Cybersecurity Programs for Nuclear Power Reactors"
    - High assurance appears 40 times, reasonable assurance appears 3 times
- "High assurance" drives a culture of "win versus lose" and "us versus them" vice objective assessment of protective strategy and performance

Putting the "Reasonable" Back into Security

- Footnotes are neither durable nor effective for meeting Commission direction
- NRC should proactively correct Part 73 and replace "high assurance" with "reasonable assurance" under the limited-scope rule change
  - Regulatory basis already exists in SRM-SECY-16-0073
- Congress should revise the Energy Policy Act of 2005 to reduce FoF frequency
  - Risk-informed frequency consistent with the Efficiency principle of good regulation
- Top NRC leadership should take steps to:
  - Correct a regulatory culture in nuclear security that results in excessive operational costs
  - Reign in current NRC staff practices that impose undue regulatory burden
  - Conduct more efficient exercises that appropriately focus on licensee performance rather than "winning"