

Perspectives on Assurance of Safety and Research Needs

Ian Jung, Chief
Instrumentation, Controls, and Electrical Engineering Branch
Division of Engineering
Office of Nuclear Regulatory Research

- **The NRC's regulations ...**
designed to protect the public and workers from radiation hazards resulting from regulated activities.
- **Its licensees and certificate holders ...** responsible for the safety and security of radioactive materials

Mission ...to protect public health and safety, promote the common defense and security, and protect the environment

Vision A trusted, independent, transparent, and effective nuclear regulator

- **Goal 1: Ensure the safe use of radioactive materials.**

Minimizing the likelihood of accidents and reducing the consequences of an accident (should one occur)

- **Goal 2: Ensure the secure use of radioactive materials.**

Protecting nuclear facilities and radioactive materials

Safety

- Adequate protection - no undue risk
- Reasonable assurance
- Commensurate with risk/safety significance

Compliance

- Meeting applicable regulatory requirements
- Adequate protection is presumptively assured by compliance

- ... a level of information sufficient to enable the Commission to reach a final conclusion on all safety matters...

I&C Regulatory Framework



- A collection of regulations, guidance, and standards
- Various roles of designers, licensees, regulators, and other stakeholders
- Various programs and processes
 - Licensing, oversight/inspection, operating experience, enforcement...
- Multi-disciplines

Mission of Research



... provide technical advice, tools, and information to identify potential safety issues and resolve them as appropriate, make regulatory decisions, and issue regulatory requirements and guidance...

Experiences – DI&C



- Successes and challenges
- Many factors contributing to the challenges
 - Complex technical issues
 - Complexity of design
 - Novelty of design or approach
 - Lack of guidance or standards
 - Lack of experience and knowledge in processes and requirements
 - Quality and completeness of design and application

- Commission direction (SRM-SECY-16-0070)
 - Modernize the regulatory infrastructure for I&C to facilitate the digital technology
 - Integrated Action Plan
 - Working Groups
 - Tactical (upgrades) and strategic (broader assessment and implementation)

Strategic

- Holistic approach
- Broad assessment including evaluation of international, non-nuclear practices (... safety cases) ... hazards analysis
- Performance-based, technology neutral, risk-informed...
- More detailed plan with options and priorities

Halden Workshop



Four questions (in Invitation)

1. Challenges related to safety assurance
2. Reasoning-based organization of safety analysis information
3. Experiences from the application of 2.
4. How can Halden research help?

General NRC Perspectives



- Issue identification
- Practical applicability and usefulness
- Alignment with the agency's priority and integrated action plan
- Collaboration with other Halden members