ADVANCED REACTOR SAFEGUARDS

Gen-IV PR&PP

International Interfaces

PRESENTED BY

Lap Y. Cheng

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GIF PRPP Working Group

GIF is a framework for international cooperation in research and development for the next generation of nuclear energy systems.

- The working group is engaged with IAEA in safety, safeguards, and security (3S).
- It works with Gen-IV reactor designs to explore safeguards and security by design (SSBD)
- It studies emerging PRPP issues when transitioning from design to deployment
Progress Since Spring 2022

- Published three additional PRPP white papers (SCWR, GFR and VHTR) and a companion report on crosscutting issues.
- GIF Industry Forum - presented insights from the white papers
- IAEA Symposium on International Safeguards – poster on crosscut topics
- Annual meeting hosted by the IAEA – developed work plan and priorities for 2023-2025
- 3S collaboration – interfaces between safety, safeguards and security
Feedback from the GIF Industry Forum

- PR&PP aspects for SMRs and Microreactors
- Explore PR&PP considerations for various siting options (remote, coastal, city, industrial complex, etc.)
- Evaluation PR&PP for floating & transportable reactors (Gen-IV designs)
- Training the next generation (encourage more student, more interactions with university programs, interface with GIF ETWG)
- Collaborative work with EMWG, staffing costs (security and safeguards)
Key Takeaways from the GIF Industry Forum

- Reactor vendors in particular resonate with physical protection costs and the need to develop efficient, yet robust designs.
- There is a challenge to maintain work at the UUR level and suggested that vendors work with their national programs/labs to get into more detailed support for physical protection.
- PR&PP by Design continues to need to be promoted to help encourage an efficient design process.
- There is some confusion in the way terms are used: PR vs. Domestic MC&A vs. International Safeguards.
3S Collaboration for Gen-IV Reactors

• Collaboration among PRPPWG, Risk & Safety Working Group (RSWG) and the VHTR SSC

• Goals and timeline
  • Bottom-up approach
  • Focus on 3S interfaces
  • 2 years time frame

• System for the study – PBMR (an SMR of VHTR design)

• Remain cognizant of IAEA initiatives investigating 3S Interfaces and maintain interactions in Novel Advanced Reactors by some PRPPWG members
PRPP Work Plan 2023-2025

• Follow up interactions with the GIF System Steering Committee (SSC)
  • Consider prevalent or special PR&PP features for SMRs, micro-reactors, transportable cores, and non-electric applications of nuclear energy.
  • Consider various siting options for SMRs (coastal, remote, city, industrial complex) and effects on PR&PP

• Re-examine the PRPP Evaluation Methodology
  • Consider a training workshop to acquaint new members with the methodology
  • Develop guidance for designers, such as a template for reduced scope evaluation
  • Explore economic benefits of SBD
  • Investigate commonalities, synergies and conflicts between safety, safeguards and security (3S)

• Continue collaboration with the IAEA
Path Forward

• Direct effort to support industry in transitioning from design to deployment
• Many work plan activities reflect GIF Industry Forum requests:
  • PR&PP features for SMRs, microreactors, transportable cores, and non-electric applications of nuclear energy.
  • PR&PP aspects related to siting options for SMRs (coastal, remote, city, industrial complex)
• Collaborate with industry (through the VHTR SSC) on the 3S study
• Conduct special PRPP panel at the 2023 INMM/ESARDA Joint Annual Meeting
• Contribute to the Joint IAEA-GIF Workshop on the Safety of Non-Water-Cooled Reactors