

# **Treatment of Uncertainties for Novel Aspects of Risk Analyses**

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**Mehdi Reisi Fard**

Office of Nuclear Regulatory Research  
U.S. Nuclear Regulatory Commission

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# Goal of The Proposed CAPS

- Assess how members currently **treat uncertainties** especially in **risk analyses and risk-informed decision-making** for **new and advanced reactor designs**, and to **survey** member views as to potential improvements in treatment considering the **relative lack of operational experience**.
- While it is anticipated to observe more instances of challenges related to the lack of operational experience in the treatment of uncertainties for new and advanced reactors, **unique or novel aspects of risk analyses or risk-informed decision-making for the traditional reactor designs and operations** are included in the scope of this task.

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# Objectives

- **Develop an overview of ongoing activities** (tools, research, or applications) related to the treatment of uncertainties in PSAs and risk-informed decision;
- **Identify decision-making cases** where the specific methods for treatment of uncertainties provided **additional insights** to a decision or the lack of methods posed **challenges to decision-making**;
- **Identify the practical challenges** related to various aspects of uncertainties in risk-informed decision making and potential means for addressing these challenges.
- Develop a preliminary **outline of an application (technical analyses and decision-making)** benchmark as groundwork for a potential follow-on task

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# Justification

- Most **current reactor designs** have a **significant base of experience** in design, operation and analysis.
- **New and advanced reactors** have significantly different design and operational features and a **much smaller base of experience** in treating uncertainties in PSAs. Because of this, there is likely more uncertainty in these PSAs, and this uncertainty is likely to derive from different areas.
- The established tools to treat uncertainty in PSAs may need to be re-evaluated and enhanced for new and advanced reactor designs or for novel aspects of risk analyses for the traditional reactor designs .
- **WGRISK**, whose members represent a wide range of views, is well-suited for **facilitating discussions** of current practice, **identifying follow-on activities**, and thereby preparing member countries for the future.

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# Scope

- The proposed activity will consider **all scopes of nuclear power plant PSA**, the associated nuclear safety issues and the **diverse decisions** made by stakeholders including licensees and regulatory bodies. This includes the consideration of uncertainty in **Level 1/2/3 PSA**, any plant operational modes, **internal events and external hazards**, as well as diverse specific concerns such as spent fuel pools, equipment recovery, portable equipment deployment, accident management, and site-level risk.
- The conclusions will be mainly based on the results of a **survey** and **follow-on workshop**.
- Achieving objectives will require inputs from **PSA experts** and **decision-makers**.

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# Milestones

- Phase 1 (18 months duration):
  - Initial formation of a task core group
  - Preparation of an annotated report outline (providing the structure for the member survey and literature review)
  - Preparation and distribution of a survey and corresponding report structure
  - Collection of survey responses
  - Literature review and analysis of survey results
  - WGRISK Technical Note summarizing survey results
  - Task meeting
- Phase 2 (duration 24 months):
  - Task meeting – survey findings and preparation of the second phase
  - Workshop preparation
  - Conducting workshop including identification of issues for further enhancements and extensions
  - Preparation of draft Task Report
  - Task meeting
  - Documentation (final Task Report) for approval