



Status of GIF Risk and Safety Working Group Evaluation Methodology

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Purpose of the RSWG

- ***“Promote a consistent approach on safety, risk, and regulatory issues between Generation IV systems”***
- ***Advise and assist the Experts Group and the Policy Group particularly on matters of:***
 - ***Generation IV safety goals and evaluation methodologies to be considered in the design***
 - ***Interactions with the nuclear safety regulatory community, the IAEA, and relevant stakeholder***

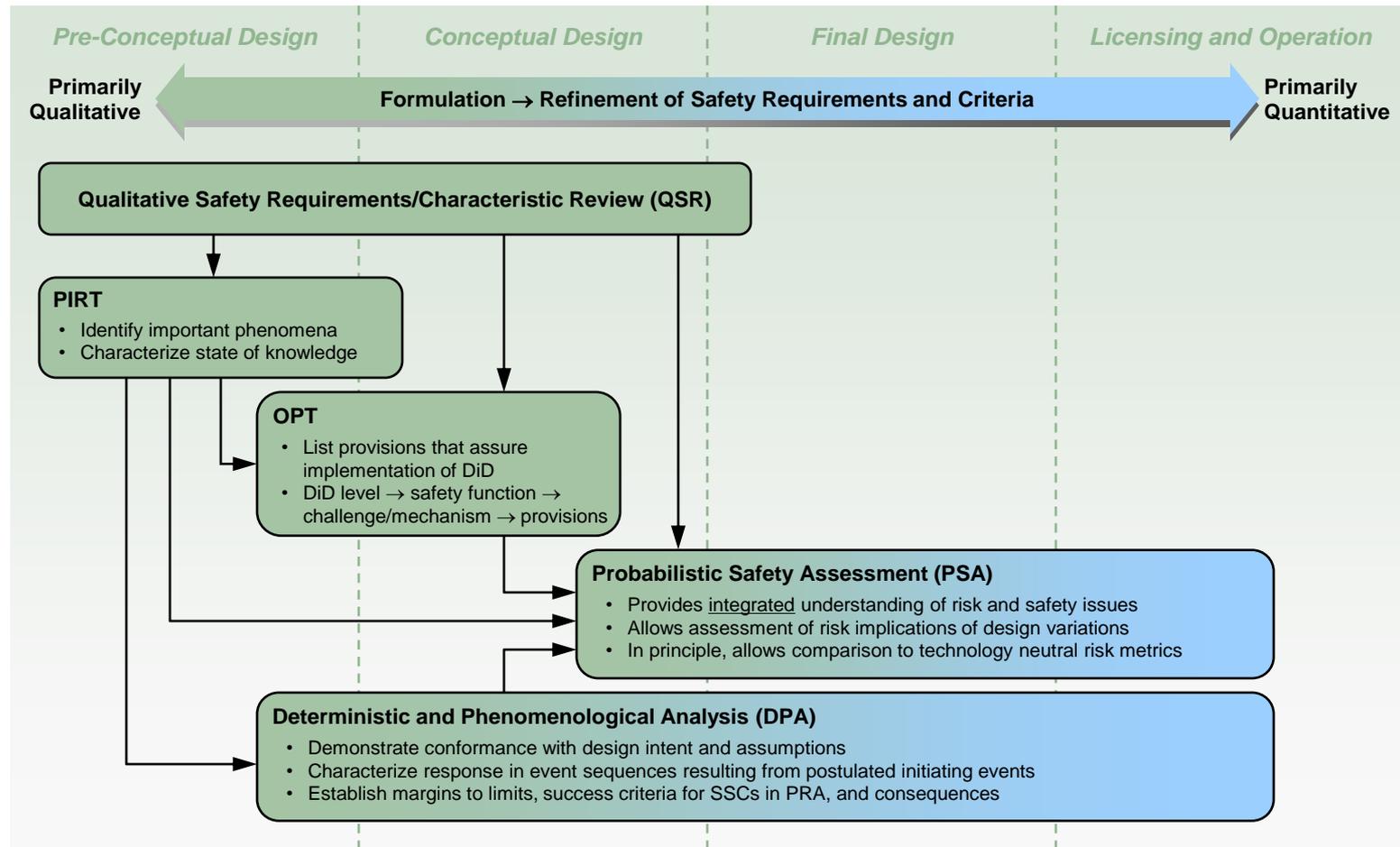
A Viable Assessment Methodology Must Fulfill Multiple Purposes

- ***Commensurate with design maturity, yields a complete and detailed understanding of relevant risk and safety issues***
- ***Within a given concept or design:***
 - ***guides the design process based on a detailed understanding of risk and safety***
 - ***helps identify areas for additional research and data collection***
- ***Promotes understanding of differences between concepts and designs based on risk and safety issues***
- ***Allow evaluation of a concept or design relative to various safety metrics or “figures of merit”***
- ***Support licensing and regulatory processes***

Desirable Characteristics of an Assessment Methodology

- ***Consists of, or is largely based on, existing tools that are widely accepted for their validity. Minimizes need for development of new techniques.***
- ***Practical and flexible - allows for graded approach to technical issues of varying complexity and importance. Offers analysis tools tailored to appropriate stage of design***
- ***Identifies vulnerabilities and relative contributions to risk***
- ***Allows for explicit consideration and characterization of uncertainty***
- ***Supports integration of multidisciplinary inputs***
- ***Combines probabilistic and deterministic perspectives***
- ***Consistent with RSWG safety philosophy, PRPP methodology, and other relevant work (NUREG-1860, TECDOC-1570, etc)***

Generation IV Integrated Safety Assessment Methodology (ISAM)



ISAM as a “Design Driver”

- ***From earliest phases, developers must strive to reduce or eliminate vulnerabilities. Beginning in the “pre-conceptual” development phase, ISAM provides the systematic means to identify vulnerabilities and their magnitudes***
- ***Uncertainties imply need for added safety margin***
- ***ISAM can be used to assess effectiveness of design provisions - safety and cost optimization***
- ***As design matures, ISAM is iteratively updated in a way that both reflects and guides (“drives”) the evolving design***
- ***Methodologically consistent with the notion that, in Gen IV systems, safety must be “built-in, not added-on”***

Validation of ISAM Approach

- ***Representatives of US NRC, other national regulators, international nuclear industry, and IAEA have participated in ISAM development or commented on its appropriateness and utility***
- ***Feedback has been strongly and quite consistently positive***
- ***Limited applications of methodology elements to Japanese and French SFR concepts confirm value and “usability”***
- ***More formal interactions with SSCs have commenced***

RSWG Engagement with SSCs is Key to Ensure Relevance

- ***RSWG/SSC Workshop - Joint Research Center, Petten NL
12-13 April 2010***
- ***Workshop included excellent participation by
representatives of all six SSCs***
- ***Purposes of the workshop:***
 - ***To provide detailed information regarding the ISAM
and the elements that comprise it***
 - ***To discuss the ISAM and its elements, and to obtain
informal feedback from the SSCs regarding
usefulness, appropriateness, and practicality***
 - ***Briefings on the status of each system development
activity with focus on primary safety issues and
challenges***

Workshop Outcomes

- ***Representatives of all six SSCs gained a much fuller understanding of the ISAM, its purposes, and its application***
- ***Overall, all six SSC representatives expressed strong support for ISAM and endorsed its value and practicality***
 - ***Clear consensus to begin using it on a trial basis***
 - ***At least two development teams are already doing so***
- ***The only significant concern expressed by the SSCs related to resource requirements and expertise needed to apply the ISAM***
- ***Draft ISAM document includes comments and perspectives discussed at the workshop***

ISAM - Next Steps

- ***As proposed by GIF Chair Sagayama, work with SFR SSC to use RSWG guidance in defining SFR design criteria***
- ***Finalize Methodology Document in 2011***
- ***More systematic, detailed applications (and evaluation) of ISAM by “volunteer” SSCs***
- ***Definition of RSWG role in supporting SSCs for ISAM application and documentation***
- ***Proposed formal “pilot” of ISAM methodology for selected system(s) to be led by system development team with assistance from RSWG***
- ***Continued interface with IAEA, INPRO, MDEP, PRPP, and others***