WGRISK and PSA: Past, Present, and Future

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INTRODUCTION

- The Committee on the Safety of Nuclear Installations (CSNI) Working Group on Risk Assessment (WGRisk) carries out the main body of work in PSA within the OECD Nuclear Energy Agency (NEA) . The WGRisk participants are about 50 PSA specialists representing 35 different countries.

- The main mission of the WGRisk is to advance the understanding and utilisation of PSA in ensuring continued safety of nuclear installations and in improving the effectiveness of regulatory practices in Member countries.

- The WGRisk work program covers a wide range of PSA and PSA related topics. Work was initially concentrated on Level 1 PSA methodology, but in recent years, the focus has shifted into specific PSA methodologies modelling issues and risk informed applications.

WGRisk products

- **Exchange of information**
- **State-of-the-Art Reports (SOARs)**
- **Workshops**
- **Technical Opinion Papers (TOPs)**
- **Technical notes**

  – *Over the past 25 years, WGRisk has produced over 40 technical reports, held over 25 international workshops and has issued several important consensus statements and opinion papers on specific aspects of PSA.*

Recent Activities

- International Use and Development of PSA
  - This important report, based on the exchange of information during the WGRisk annual meetings complemented by a detailed questionnaire, is a large overview of the PSA situation in member countries in 2006, relating to all PSA aspects (safety criteria, standards, PSA programs and status, methods and data, results, developments….). Moreover a summary report was also prepared as a Technical Note.
  - *The conclusions underline the growing role of PSA worldwide for improving nuclear power plant safety in a risk-informed approach, the high level of work on-going for developing, up-dating and improving PSA, and some tendency towards harmonisation.*
- Level 2 PSA and Severe Accident Management
  - Based on a previous SOAR and on two CSNI workshops, a new report and a TOP were issued in 2007, presenting recent advances relating to level 2 PSA (methods, results, applications, notably treatment of Severe Accident Management).

Recent Activities

- Seismic PSA
  - Following a CSNI workshop held in Korea, the meeting proceedings cover several aspects of seismic PSA, including advances in methodology, results and practical applications, as well as issues for further research.
- Software-Based System Reliability
  - Although presently there is no consensus regarding how digital I&C should be addressed in a PSA, WGRisk prepared and issued a Technical note in order to provide useful existing information on the topic.
- Role of PSA in Nuclear Power Plant Safety
  - In parallel with the survey report described above, WGRISK issued a technical note discussing the most important PSA topics and providing a (very positive) view on the increasing role of PSA in Nuclear Power Plant Safety.

Current Program

- HRA data needs
  - The objective of this task is to review HRA data needs and relevant good practices, and to develop recommendations for future international cooperation. In particular the interest of simulator data is underlined.
- Non-Seismic External Events
  - In recent PSAs, non-seismic external events could be important contributors: based on a questionnaire, a review is in progress concerning relevant methods, results and insights.
- Probabilistic Risk Criteria
  - The objective of this task is to review and to understand the definition, technical basis, status and application of Risk Criteria in different member countries (High or technical level? Guidance? Orientation?...)

Current Program

- Low Power and Shutdown PSA (LPSD)
  - As indicated in the past common CSNI/COOPRA Report, LPSD PSA has still difficult aspects, leading to difficulties when LPSD and Full-Power PSA results have to be compared in a decision making process. In order to go further with this important question, 3 specific points were identified for deeper investigation: initiating events during LPSD, special LPSD issues (for example specific physical problems), and particular human intervention (especially inadvertent actions and dependent actions).
- Digital I&C Reliability
  - To go further with this important and difficult question, a task group was established with the objective of making recommendations regarding methods and information sources used for quantitative evaluation of digital I&C reliability for PSA applications. Needs for near and long-term developments will be identified.

Future Activities

- Integrated plan
  - The WGRisk produced (in 2003) an integrated plan providing an extensive discussion of WGRisk strategic goals, work process, current status and program of work. The integrated plan presented also an assessment of importance and priority of PSA topics.
  - Regarding future activities, the working group has updated its integrated plan. The updated plan is less detailed and directly addresses future challenges and associated issues identified by the CSNI, thereby ensuring that the WGRISK program appropriately addresses user needs.
  - Moreover the integrated plan introduces a new element which aims to identify an appropriate feedback mechanism for assessing the value of WGRisk products to users.

Future directions
CSNI SITs

- **CSNI Main Challenges and Safety Issues and Topics**

  - Shrinking nuclear infrastructure
  - Increased public expectation on safety in use of nuclear energy
  - Industry initiatives to improve economics and safety performance
  - Necessity to ensure safety over plant lifecycle
  - New reactors and new technology

WGRisk Cooperations

- Over the years WGRisk has maintained close relationships and cooperations with the other AEN Working Groups and projects and with the major international organisations (IAEA, EC…), leading to common Reports, Workshops or TOPs
- In relation to international organisations, close co-ordination is considered essential. It is necessary for WGRisk as well as the other players to keep vigilant in their efforts to co-ordinate and not duplicate work.

Summary

- WGRisk has provided many State-of-the-Art reports and other products of high quality, relying on the active participation of its members.
- WGRisk works (and will continue to work) with other AEN/CSNI working groups or projects and with other international organisations (e.g., IAEA) to co-ordinate its work on PSA issues and improve international efficiency.
- WGRISK has, and will continue to provide, a forum for the exchange of information useful to member countries in their efforts to make improved use of PSA in risk-informed regulation and safety management. In order to strengthen the basis for future success, the working group is planning to develop a feedback program aimed at assessing the value of its activities and products.