WGRisk Task on Low Power and Shutdown (LPSD) Update

WGRisk Task 2007-1

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Objectives

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  - Focus on lessons and insights gained on selected LPSD PSA aspects since earlier WGRisk and COOPRA efforts
  - Subtask 1: Create an information base ("InfoBase") for LPSD initiating events (NRC, USA lead)
  - Subtask 2: Collect and share information on analytical issues encountered in LPSD PSAs (GRS, Germany lead)
  - Subtask 3: Collect and share information on how inadvertent human actions that result in initiating events are considered in LPSD PSAs (NRI, Czech Republic lead)

Approach

- Compile information and input provided by responses to questionnaires for each subtask and discussions held during the meetings. The following countries responded to questionnaires:

Czech Republic
Finland
France
Germany
Hungary
Japan
Mexico
Slovakia
Slovenia
Spain
United States

Meetings Held
WGRisk Task 2007-1

- October 2007 – Members discussed subtasks and schedule

  Planning meeting participants
  France
  Germany
  Mexico
  OECD
  United States

- June 2008 – Members reviewed questionnaire responses

  Working meeting participants
  Czech Republic
  France
  Germany
  Japan
  Slovenia
  United States

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Where We Are

- September 2008 – report on subtasks 1, 2, and 3 submitted to WGRisk
- March 2009 – WGRisk comments on final report addressed
  - Executive summary added
  - Report edited

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Subtask Findings/Recommendations

- Subtask 1: Create LPSD InfoBase
  - The InfoBase structure was created; 7 events from 4 countries were contributed
  - The InfoBase on LPSD initiating events would be useful for qualitative PSA purposes
- Subtask 2: Analytical Issues in LPSD PSA
  - Focused on Overpressurization, Criticality Events, Level 2 Analysis, Fire, Flooding, Earthquake, and Heavy Drop loads.
    - Further information exchange would benefit supporting analyses, guidance, and methods for LPSD PSA applications, including events assessment
    - Establishment of good practices for LPSD risk analysis is recognized and recommended
- Subtask 3: Human-Induced IEs
  - Although the subtask focused in human-induced IEs, the more general topic of existing capability to reflect the role of humans in LPSD was also discussed as part of both Subtask 2 and Subtask 3
  - The need to improve the modeling and evaluation of human actions in a LPSD PSA, including that of human-induced IEs is identified
  - The need to establish good practices for the modeling of human actions in a LPSD PSA and in particular for modeling human-induced initiating events is recognized and recommended

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Overall Findings/Recommendations

- LPSD risk is recognized as being important
- Unlike full-power risk, LPSD risk is not as well understood
- Adopting full-power PSA practices/approaches may not always be appropriate; for example
  - The use of an outage "average risk" metric may not be appropriate for some risk-informed decisions
    - Consideration of the instantaneous risk in the decision
  - Estimation of IE frequencies for LPSD
    - Potential need to model human-induced IEs separately from failure related IEs
      - » Human-induced IEs have a greater impact on diagnosing and recovering the IE during LPSD than at full power
    - Treatment of demand-based IEs in LPSD similar to frequency-based IEs in full-power
- Recommend a LPSD technical workshop as a forum of technical exchange on topics identified in the report
- Establishment of good practices for performing LPSD PSA
- Member countries should contribute operational events to the InfoBase to create a LPSD event repository

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Next Steps

- Review and approval of final report
  - Final draft distributed on March 18
  - Need expedited review
- Follow-up on report recommendations