

State-of-the-Art Reactor Consequence Analyses

Briefing for Director, RES
March 15, 2010

Presentation Agenda

- Accomplishments
- Status
- Key Milestones
- Peer Review
- Communication
- Challenges

Accomplishments

- Last Commission TA briefing (08/13/2009)
- Provided Commission with updated Communication Plan reflecting updated schedule (01/28/10)
- Conducted 2nd and 3rd peer review meetings
 - Provided committee updated NUREGs including NRC responses to peer review comments (2/15/10)
 - Conducted 3rd peer review meeting on March 2-3, 2010
- SOARCA presentations
 - OECD meeting on SAMGs (10/26/09)
 - EPRI meeting of MAAP Users Group (1/21/10)

Status – *On Schedule*

- Currently working peer review comments from 3rd meeting
- Finalizing DRAFT NUREG/BR (Risk Communication Brochure) for concurrence
- Working SOARCA roll out and communication planning

Key Milestones

- Submit NUREG appendices to plant sites for Fact-Checks **Late March**
- Incorporate peer review, staff and plant comments into the NUREG **Mid-April**
- Conduct ACRS full committee meeting (1st opportunity for the public to see SOARCA results) **Mid-June**
- Release draft NUREG for public review and comment **Late July**
- Conduct public meeting(s) **Late August**
- Provide NUREG and recommendations to Commission **Oct. 28, 2010**

Peer Review

- Assessed SOARCA approach, methods, results, and conclusions to ensure study is best estimate and technically sound
- Received major comments prior to 3rd meeting
 - Scenario Selection
 - Accident Mitigation
 - Accident Progression Analysis
 - Offsite Consequence Analysis
 - Document Structure/Editorials
 - Uncertainty Study
- Held 3rd committee meeting on March 2-3, 2010
 - Response to peer review comments presented
 - ~230 comments – Most resolutions accepted by the peer reviewers
- Draft peer review committee report due end of April, final report by mid-May

Scenario Selection

- Completeness/scope of scenarios
 - NUREG needs a concise summary of events not considered and justification
 - Multi-unit accidents, low power and shutdown, extreme seismic events, spent fuel pool accidents, security events
 - Proposed resolution
 - Added summary text specifically addressing each type of event not included
 - Peer review reaction – positive

Scenario Selection

- Potential for containment foundation failure or substantial loss of containment integrity (leakage) due to seismic-induced soil liquefaction (for seismic events considered – up to 1g)
 - Providing additional information to peer review committee

Accident Mitigation

- Likelihood of mitigation
 - Discussed the need/benefits of quantitative (HRA) assessment
 - Acknowledged that the table-top exercises of mitigation provide qualitative assessment
 - General agreement that mitigation will occur for most/all scenarios but individual views on quantification persist
 - Awaiting final written comments

Accident Progression Analysis

- Need additional justification for timing and location of high temperature failure of RCS pressure boundary during core degradation
- Proposed resolution
 - Surry – performed sensitivity analysis with MELCOR and SCDAP/RELAP5
 - Peer review reaction – positive
 - Peach Bottom – performed sensitivity analysis
 - Peer review reaction – more analysis needed
 - Additional analysis ongoing (has potential to delay completion of SOARCA)

Accident Progression Analysis

- Need additional justification for hydrogen combustion assumptions for Surry SBO
 - Proposed resolution
 - Performed sensitivity analysis
 - Peer review reaction – positive
 - Mistake found in results provided at 3rd peer review committee meeting - additional analysis ongoing

Offsite Consequence Analysis

- Truncate results at 50 miles
- Proposed resolution
 - Revised result reporting of LCF risk – limited to 50 miles
 - Peer review reaction – positive but now require text to justify 50 miles
 - Staff developing additional text
 - Basis for 50 miles includes regulatory analysis guidelines, SAMA evaluations, and ingestion EPZ
- Additional comment received during March meeting
 - Discuss the potential for LCF risk dose thresholds as high as 4 rem based on A-bomb data

Document Structure/Editorials

- Documentation needs improvement
 - E.g., objectives and conclusions in Executive Summary need to be more succinct and visible
 - E.g., report needs significant overall editing
 - Proposed resolution
 - will correct issues

Uncertainty Study

- Details of uncertainty study need to be reviewed.
- Proposed resolution
 - Provided general approaches and parameters
 - Peer review reaction - progress to date does not permit significant peer review of this effort
 - Staff plans to provide additional material to peer review committee as uncertainty study progresses and solicit additional review and comments from the committee

Risk Communication

- Finalizing brochure for review and concurrence in April
 - Draft NUREG and final brochure can be accessed by the public in May
- Developing plans for public meeting(s) and/or webinars in August
 - Training SOARCA team members in risk communication
 - Early briefings for regional staff
- Updating SOARCA public website

Challenges

- Schedule integrity
 - Incorporation of peer review and internal comments
 - ACRS review
 - late summer public comment period
- Risk communication
- Potential Commission paper – LCF predictions limited to 50 vs. 100 miles
- Uncertainty analysis
- Additional sensitivity analysis to address comments