

## Summary of the 12th Technical Advisory Committee (TAC) Meeting

Date:	November 11 – 14, 2019
Place:	Nuclear Risk Research Center (NRRC), Central Research Institute of Electric Power Industry
Participants:	
TAC:	Mr. Stetkar (Chair), Mr. Afzali, Dr. Chokshi, Mr. Miraucourt, Prof. Takada, Prof. Yamaguchi
NRRC:	Dr. Apostolakis (Head), Experts of the Nuclear Risk Research Center
Industry:	Experts of TEPCO Holdings, Shikoku EPCO for respective topics

### Proceedings

All the topics were discussed in full session. In addition, open discussion sessions took place on research for “How to improve the technical basis and assess the benefit of regulatory requirements for severe accidents”, “How to improve the technical basis and assess the benefit of regulatory requirements for external natural events”, and “Prioritization of research projects.”

### November 11 (Mon.)

#### Topic 1: Research Program for FY2020 of RIDM Promotion

- NRRC presented “Research Program for FY2020 on RIDM Promotion”.
- The following are TAC member comments on the research program. Both issues were discussed in more detail on Nov. 13<sup>th</sup>.
  - I would like to know the specific status of decision-making using risk information such as PRA.
  - Some initiatives in the Phase 2 action plan require changes to regulatory requirements, such as on-line maintenance. TAC members would like to know the current status of the changes to regulatory requirements in Japan.

#### Topic 2: Research Program for FY2020 of Risk Assessment

- NRRC presented “Research Program for FY2020 of Risk Assessment”.
- TAC members commented as follows:
  - NRRC should discuss the need for research on low power and shutdown PRA and spent fuel storage PRA.
  - From the viewpoints of effective use of research resources and demonstrating how to develop a technically-integrated PRA, the KK7 and Ikata 3 pilot plant projects should be used as Level 2 PRA model plants, since they have been assured of having high quality Level 1 PRAs through overseas expert reviews.

- The research activities for fire protection programs and fire PRA, including development of fire modeling codes, should be prioritized according to the needs of the fire hazard research strategy.
- Multi-unit PRA research should be performed considering Level 2 PRA research elements from the beginning.

### **Topic 3: Research Program for FY2020 of External Natural Events**

- NRRC presented “Research Program for FY2020 of External Natural Events”.
- TAC members commented as follows:
  - Different model plants are proposed to demonstrate PRA studies for internal events, seismic events and tsunamis. Basically, it is better to demonstrate internal event PRA and external event PRA for the same nuclear power plant. From the viewpoints of effective use of research resources and demonstrating how to develop a technically-integrated PRA, the KK7 or Ikata 3 pilot plant project should be used as the seismic PRA model plant, since they have been assured of having high quality internal event PRAs through overseas expert reviews. Ikata 3 may be preferred, because its seismic hazard has been derived through application of the SSHAC process.
  - A multiple hazard assessment method for superposition of earthquakes and tsunamis is currently under development. It will also be necessary to examine fragility assessment method for the multiple events in the future. TAC members noted that PRA modeling techniques for combined hazards are complex and are not well-developed in international practice. Therefore, this activity should include a model plant PRA demonstration.

**November 12 (Tue.)**

### **Topic 4: Ikata SSHAC Project**

- NRRC presented “Ikata SSHAC Project - Summary of final PSHA results, lessons learned from Ikata SSHAC project including plans for SSHAC applications at other sites”.
- TAC members commented as follows:
  - Ikata SSHAC executive summary will be released in English. In addition, an English version of the final report should be prepared. The SSHAC project report for nuclear power plants with a high level of seismic hazard is a valuable achievement worldwide and should be published internationally.
  - In order to facilitate the development of seismic hazard assessments at other NPPs, it is desirable to classify the results and lessons learned from the Ikata SSHAC project in three categories: Site-specific, regional and general.

### **Topic 5: Improvement of quantification technique of containment event trees (CETs) and source term with PRD methodology**

- NRRC presented “Improvement of quantification technique of containment event trees (CETs) and source term with PRD methodology”.
- TAC members commented as follows:
  - Consider correlations among phenomena in the uncertainty evaluation.
  - The research team should compare the results from a PRD evaluation of the cesium releases for the Surry short-term station blackout (STSBO) scenario with the US NRC State-of-the-Art Reactor Consequence Analysis (SOARCA) draft uncertainty analysis results for that scenario.

### **Topic 6: HRA Guide**

- NRRC presented “HRA Guide - Current status, summary of changes, expected reviews”
- TAC members commented as follows:
  - In the evaluation example of watertight door inadvertently left open, when developing a timeline, NRRC should consider it only within a range to meet PRA success criteria.

### **Topic 7: Fire PRA Guide**

- NRRC presented “Fire PRA Guide - Status of the practical interpretation by Japanese industries”.
- TAC members commented as follows:
  - As it seems that the NRRC’s fire PRA guide is well documented by referring to the latest knowledge obtained from US experience, the objective of the gap analysis should be clearly addressed.

### **November 13 (Wed.)**

#### **Topic 8: PRA KK 7 Pilot Project**

- NRRC presented “PRA KK 7 Pilot Project”.
- TAC members commented as follows:
  - Although it is appreciated that BWR shift supervisor experience has been added to the KK Project team, it is more desirable to involve those who have experienced KK7 operation in the construction of the PRA model.
  - I want you to think carefully about the meaning of “perfect” in the summary of the expert review comments. There is no “perfect” PRA as a realistic model. It is important that matters necessary for decision-making according to the purpose of the PRA are covered.

- TAC is interested in shutdown PRA in Japan. We hope that you report at the next TAC meeting the results of the December expert review of the Level 1 shutdown PRA and subsequent actions.

**Topic 9: Risk-Informed Decision Making Promotion**

- NRRC presented “Risk-Informed Decision Making Promotion - The first specific near-term risk-informed applications to be developed by the industry”.
- TAC members commented as follows:
  - The TAC provides technical advice to the NRRC’s activities and does not advise you on how the Japanese industry should introduce the applications. However, if the industry decides to introduce a specific application, we may be able to advise you on what risk information is needed for that application, and how it can be used as technical support for decisions.

**November 14 (Thu.)**

**Topic 10: Exit Meeting**

TAC and NRRC had a discussion on how to organize future meetings.