Summary of the 6th Technical Advisory Committee (TAC) Meeting

Date:	November 7 – 11, 2016
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 Tokyo EPCO, TEPCO SYSTEMS, Shikoku EPCO for respective topics

Proceedings

All topics were discussed in full committee. In addition, two lectures were delivered by Mr. Stetkar and Mr. Afzali to share information on the current practice of Risk-Informed Decision Making (RIDM) in the US.

November 7 (Mon.)

Topic 1: Overview of Research Plan for FY2017

- NRRC presented an overview of the research plan for FY2017.
- TAC members commented as follows:
  - As R&D activities of NRRC progress, it will be crucial that the R&D results be put to applications by the utilities. We, the TAC, hope to discuss not only R&D but also practical applications.

(Handouts)

1-1-0. NRRC's Research Plan for FY2017

1-1-1. R&D plan for FY 2017 - Risk Assessment -

1-1-2. R&D plan for FY 2017 - External Natural Events -

Topic 2: External Natural Event Research

- NRRC presented the current R&D status of the "Senior Seismic Hazard Analysis Committee (SSHAC) Project", "Tsunami PRA", "Volcanic PRA", "Fault Displacement PRA" and "Superposed Seismic and Tsunami Hazards".
- TAC members commented as follows:
  - It is important that commonly applicable insights are identified and

extracted from the Ikata SSHAC project for later application at other NPP sites so that the PSHA in Japan will be improved through the SSHAC process.

- Use of the tsunami mean exceedance frequency for screening purposes may not provide the appropriate graded analyses. The team should reconsider how the screening criteria are applied.
- The evaluation of superposed seismic and tsunami hazards is not an easy challenge and is a state-of-the-art R&D project internationally. It can provide additional important insights into the safety improvement of the NPP sites along the Pacific Ocean, where the Japan Trench and the Nankai Trough are located.
- Analyses of seismically-induced tsunamis should not try to account for relative timing of the seismic event and the tsunami arrival. That issue is difficult to model, and it has very large uncertainties. Treatment of the timing should be considered only if it is important to site-specific risk.

(Handouts)

2-1. PSHA enhancement in Japan based on Ikata SSHAC level 3 project
2-2. Strategy of development of tsunami PRA
2-3. R&D related to Volcanic PRA
2-4. Fault displacement evaluation
2-5. Development of PRA Methodology for Superposed Seismic and Tsunami Hazards

November 8 (Tue.)

Topic 3: Risk-Informed Decision Making (RIDM) Promotion Team and Pilot Projects

- NRRC presented the organization/mission/role of the RIDM Promotion Team established in July of this year. Also, it presented the plan for the expert team review of the pilot projects and how the results will be presented to TAC for review.
- TEPCO and TEPCO SYSTEMS presented the current status of the Kashiwazaki-Kariwa (KK) 6/7 pilot project. Shikoku EPCO presented the current status of the Ikata 3 pilot project.
- TAC members commented as follows:
  - As to the KK 6/7 project, the PRA models for internal events and other hazards, such as internal fires, should not be developed separately, but should use the same model.

(Handouts)

3-1. Introduction of RIDM promotion team

3-2. Overview of KK-6 and -7 PRA pilot project plan and current status

3-3. Ikata Unit3 Project Status Update

November 9 (Wed.)

Topic 4: Risk Assessment Research

- NRRC presented the current R&D status of "Level-1 PRA R&D" (Data for the Frequency and Duration of Loss of Offsite Power Events, Treatment of CCF for Initiating Events, Human Reliability Database) and "HRA Guide" and also presented the research plans of "Level-2 PRA R&D" (Fission Product Behavior in Severe Accidents, Containment Vessel Temperature Evaluation under Severe Accidents), "Thermally Induced SG Tube Rupture" and "Fire PRA Guide".
- TAC members commented as follows:
  - Separate data should be developed for the frequency and duration of switchyard-related, grid-related, and weather-related offsite power failures. Switchyard-related data should also be developed separately for plant power operation and shutdown.
  - The HRA guidance should include evaluation of uncertainties in the time available and time required to perform an action. The guidance should also describe how those timing uncertainties contribute to the overall human error probability.
  - As to the HRA guide, NRRC should be aware that, if the methodology requires a massive effort by PRA practitioners at NPP sites, it will never be used.

(Handouts)

4-1. Data for the Frequency and Recovery Time of Loss of Offsite Power (LOOP) Events

4-2. "Treatment of Common Cause Failures for Plant-Specific Initiating Events" Research Plan

4-3. Current status on human reliability database

4-4. Research plan on Upgrading of Knowledge about Fission Product behavior in Severe Accident

4-5. Research plan on the containment vessel temperature evaluation under severe accident

4-6. Research Plan for Thermally Induced-SGTR

4-7. Development of Fire PRA Guide (Implementation Plan)
4-8. NRRC HRA Guide Combining the Narrative Approach and the EPRI HRA Calculator

November 10 (Thu.)

Topic 5: Other Topics

- NRRC presented on the direction of the research on "Comprehensive Fragility Evaluation".
- NRRC presented its progress on "White Paper on RIDM".

(Handouts)
5-1. Direction of comprehensive fragility evaluation
5-2. Progress on White Paper on RI-DM

Topic 6: Current Practice of Risk Management in the US

- Mr. Stetkar delivered a lecture titled "Selected Topics in Risk-Informed Decision Making". Mr. Afzali delivered a lecture titled "Risk-Informed Decision Making in Plant Operations".

(Handouts)
Selected Topics in Risk-Informed Decision Making
Risk-Informed Decision Making in Plant Operations

Topic 7: Exit Meeting

TAC and NRRC had an open discussion on the role of TAC and how to organize future meetings.

November 11 (Fri.)

Committee internal meeting.