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Goals of Technical Meeting

**Phenomenology and Technologies Relevant to
In-Vessel Melt Retention and Ex-Vessel Corium
Cooling**

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Background (1/2)

- At the time of the Fukushima Daiichi accident, there was an **extensive R&D database** for severe accidents, and the information was very **useful for predicting and understanding the accident progression**.
- However, the accident **highlighted some areas** where the knowledge and understanding could be strengthened to enhance nuclear safety.
- The IAEA held the International Experts' Meeting (IEM) on R&D, February 2015, in order to **facilitate the exchange of information on R&D activities** and to **further strengthen international collaboration** among Member States and international organizations.

Background (2/2)

- The IAEA also organized Technical Meeting (TM) on Post-Fukushima R&D Strategies and Priorities, December 2015, to **exchange perspectives and information on strategies and priorities** for R&D.
- It has been highlighted during the IEM and confirmed at the TM that:
 - the R&D area regarding **in-vessel melt retention and ex-vessel corium cooling** is one of the highest priority areas; and
 - **more phenomenological knowledge** should be gained for the strategic and technological development of the countermeasures to cope with severe accidents at water-cooled reactor.

Purpose of Technical Meeting

- The purpose of the Technical Meeting is to provide a platform for detailed presentations and technical discussions on recent progress in R&D activities on in-vessel melt retention (IVMR) and ex-vessel corium cooling (EVCC) during severe accidents at water-cooled reactors (WCRs).

Goals of Technical Meeting

- The Technical Meeting (TM) aims to:
 - facilitate the exchange of relevant R&D results;
 - foster worldwide collaboration in R&D activities;
 - enhance communication between industry, regulatory bodies and research organizations; and
 - discuss and update scientific and engineering knowledge.

Objectives of Technical Meeting



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- The TM has the following main objectives with an emphasis on phenomenology and technologies relevant to IVMR&EVCC:
 - To discuss recent progress in the strategies;
 - To exchange information on technologies for cooling the core melt and corium during severe accidents;
 - To collect information on fundamental research that can help to understand corium melt progression; and
 - To discuss possible international collaboration.

Overall Structure of Meeting

- The Technical Meeting will consist of the following sessions:
 - Opening Session;
 - 6 Technical Sessions for detailed technical presentations and discussion;
 - 2 Discussion Sessions for general discussion on IVMR and EVCC;
 - 2 Summary Sessions to summarize the consensus of the participants; and
 - Closing Session.

Technical Sessions

- Each Technical Session consists of:
 - 2-7 technical presentations followed by Q&A (30 minutes including 5-minute Q&A); and
 - Technical discussion on the session topic (30 minutes).
- In total, 33 presentations will be given and discussed at 6 Technical Sessions.

Topics of Technical Sessions

Topic 1: In-Vessel Melt Retention (IVMR) Strategy and Related Technologies;

Technical Session 1A: General Considerations on IVMR Strategy

Technical Session 1B: External Reactor Vessel Cooling

Technical Session 1C: Molten Pool Behaviours and Structural Integrity of Reactor Vessel

Technical Session 1D: Application of IVMR Strategy to Specific Reactor Designs

Topic 2: Ex-Vessel Corium Cooling (EVCC) Strategy and Related Technologies;

Technical Session 2A: General considerations on EVCC Strategy and Containment integrity

Technical Session 2B: Application of EVCC Strategy to Specific Reactor Designs

Discussion Sessions

- Two Discussion Sessions will be devoted to general discussion on IVMR and EVCC, respectively.
- Discussion topics include:
 - Current Status and Recent Progress of R&D;
 - Remaining Challenges and Open issues; and
 - Proposals for International Cooperation.
- Expected output is a summary and consensus of the current status of phenomenology and technologies relevant to IVMR.
- The allotted time is 60 minutes each.

Summary Sessions

- Summary Session-1 will be devoted to:
 - Clarify and confirm the highlights from Technical and Discussion Sessions; and
 - Explore consensus of major meeting outcomes.
- Summary Session-2 will discuss:
 - Possible international cooperation in future activities on IVMR&EVCC; and
 - Expected IAEA roles for the activities.

Expected Outcomes

- Exchange of information on completed, on-going and planned programmes on IVMR&EVCC.
- Shared review results of the current status of phenomenology and technologies relevant to IVMR&EVCC.
- Proposals for possible international collaboration in activities related to IVMR&EVCC.

Expected Outputs

1. Meeting Webpage

- ✓ To introduce the meeting to experts in Member States on the IAEA website.
- ✓ Presentations and major outcomes to be uploaded after the Technical Meeting.

2. Meeting Report

- ✓ A draft report to be prepared by the Scientific Secretaries and expected to be reviewed by the participants.

3. IAEA Technical Document (TECDOC)

- ✓ Basically proceedings of the Technical Meeting.



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Thank you for your attention!