Summary of Session 5

IEM on

"Strengthening R&D Effectiveness in the Light of the Accident at the Fukushima Daiichi NPP"

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Session 5
Post-Accident Recovery

Presentations:

Keynote Speech: *Rebuilding the Strategy for the Decommissioning of the Fukushima Daiichi NPP (Recent Situation of NDF's New Approach)*
Hajimu Yamana (NDF, Japan)

Invited Speech: *R&D Activities Related to the Fuel Debris Retrieval From the Fukushima Daiichi NPS*
Takashi Satoh (IRID, Japan)

Technical Presentation: *Post-Fukushima Environmental Research Programme Performed Within the Framework of the Franco-Japanese Collaboration*
Jean-Christophe Gariel (IRSN, France)

Technical Presentation: *Feasibility Study of Pyrochemical Treatment on Fuel debris by Performing Uranium and Zirconium electrochemistry in LiCl-KCl Molten Salt*
Supathorn Phongikaroon (Virginia Commonwealth University, USA)

Key Points from Presentations

Rebuilding the Strategy for the Decommissioning of the Fukushima Daiichi NPP (Recent Situation of NDF's New Approach) **Hajimu Yamana (NDF, Japan)**

Decommissioning the Fukushima Daiichi NPP's poses major challenges. Some examples are the difficulty with human access and lack of in-core information – giving huge uncertainties. The new strategy is different from the earlier approach - it is a risk-based approach.

Key Points from Discussion

Regarding the possibility of reaching the goal of 2021 for beginning the actual work with decommissioning the Fukushima Daiichi NPPs, and also the meaning of the word “speedy” which is used in the guiding principles, there was discussed:

- Still little information on the situation inside the vessels. At the same time we know that the buildings will decay and become less stable with time. So there is the dilemma of 1) gathering more information in order to make sound decisions, which takes time and therefore involves risks and 2) acting earlier and maybe not having enough information to make good decisions, and the risks associated with that.

Key Points from Presentations

R&D Activities Related to the Fuel Debris Retrieval From the Fukushima Daiichi NPS

Takashi Satoh (IRID, Japan)

Retrieving fuel debris from Fukushima Daiichi is expected to be more difficult than TMI-2. It is therefore necessary to gather knowledge and information domestically and internationally for developing an overall strategy for retrieving fuel debris.

Key Points from Presentations

Post-Fukushima Environmental Research Programme Performed Within the Framework of the Franco-Japanese Collaboration

Jean-Christophe Gariel (IRSN, France)

Large parts of the environment affected by the discharges from Fukushima were forests and sea. To predict the evolution over time of the contamination in key compartments of the environment, research is being conducted to understand and derive parameters that govern transfers of radionuclides in the environment in Japan.

Key Issues and Areas to be Addressed in Future R&D

The need for environmental remediation of large areas triggered the research on long term evolution of the contamination in different compartments of the environment like in forests and sea. These are long term studies, to improve knowledge and understanding of radionuclide transfer to the environment and improve the predicting models for emergency and post-accidental situations. Reference to earlier studies provides a starting point.

Key Points from Discussion and Recommendations for Further International Collaborative Work

Environmental research program within the framework of the Franco-Japanese collaboration

The European approach to post-accidental management of food and goods was discussed, and that the new management requirements that the EU has adopted could be shared with the Japanese authorities. The EU programmes are based on years of research in the aftermath of the Chernobyl accident and the Japanese may be able to benefit from these findings. Particular programs of interest such as the French CODIRPA and the EU FP7 PREPARE project (post-accident and contaminated goods management)

Key Points from Presentations

Feasibility Study of Pyrochemical Treatment on Fuel debris by Performing Uranium and Zirconium electrochemistry in LiCl-KCl Molten Salt

Supathorn Phongikaroon (Virginia Commonwealth University, USA)

Fundamental studies using electrochemistry are being conducted to determine the feasibility of treating the fuel debris for toxicity reduction and efficient separation of U and Zr, mitigating its effects.

Key Points from Discussion and Key Issues and Areas to be Addressed in Future R&D

Decommissioning of damaged reactors and removal of spent fuel and fuel debris requires innovative engineering approaches, methods and equipment that operate under extreme and severe conditions. R&D on fuel debris includes development of technologies for fuel debris detecting, removal, packaging, transfer and storing. Another direction of R&D is related to pyrochemical treatment of fuel debris for toxicity reduction and efficient separation of U and Zr.

Session 5
Post-Accident Recovery

Related Posters

Toru Kitagaki (JAEA Japan): *Research approach of MCCI Products Characterization for Debris removal*

Masahide Takano (JAEA Japan): *Preparation and Caracterization of Simulated Fuel Debris Specific to the Fukushima Accident*

Seiji Takeda (JAEA, Japan): *Establishing Criteria for Reuse of Disaster Wastes Contaminated by the Fukushima Daiichi NPP Accident*

Voytech Brynych (UJV Rez, a.s., Czech Republic): *Design of Treatment Procedure for Reprocessing of Large Volume of Highly Radioactive Liquid Waste After Severe Accident on VVER Reactor*

Martin Listjak (VUJE, Inc., Slovakia): *Treatment and Radiological Characterisation of Contaminated Soil at NPP A1 Slovakia*

Leanid Maskalchuk (National Academy of Sciences, Belarus): *Radioactive Contamination of Japanese Soils and Possible ways of their Rehabilitation*

Terry Hamilton (LLNL, USA): *Time Evolution of Radiological Conditions in the Marshall Islands: Experiences and Lessons Learned in Relation to Fukushima*

Key Points from Posters

- Research initiatives that have been presented in posters addressed issues related to the mitigation and possible reuse of contaminated disaster wastes and soils and processing of large volumes of highly contaminated liquid waste.
- The Fukushima Daichi accident demonstrated that having an apparatus prepared for treatment of contaminated waters that are generated during a severe accident mitigation is a robust preparation technique. Therefore UJV in cooperation with Slovenske elektrarne power plant has started to review the concept and design of radioactive water treatment apparatus, which started development in the aftermath of Chernobyl accident, and will be including new experiences and requirements based on the Fukushima accident.

Key Points from Posters

The Marshall Islands experience teaches us that nuclear events and accidents can extend far beyond the hard facts of radiation. Recover can only be achieved on the premise of building public trust and developing a strong foundation in basic science. Remediation and resettlement support activities should be conducted in combination with public radiological monitoring programs, and providing open access to data and information. Changing and inconsistent cleanup standards and levels of authority across different U.S. agencies have tended to hinder resettlement efforts in the Marshall Islands but we are moving closer to a successful outcome.

Lessons Learned with regard to Session Topic

Most of the research areas in post-accident recovery that have been presented are very challenging and require long time periods for investigation and development. They are also resource intensive and require knowledge and expertise from different areas. Collaboration and regular exchange of information and knowledge is therefore important for the success of this R&D work.

…Thank you for your attention!