WM2017 Conference Panel Report

PANEL SESSION 35: Fukushima Daiichi NPP - Focus on Offsite Cleanup and International Collaboration-(5/8)

Co-Chairs: **Mark Gilbertson,** *US DOE*

Mamoru Numata, *Veolia Nuclear Solutions*

Panel Reporter: Jeffrey Livley, *Amec Foster Wheeler*

Panelists:

1. **Kazuo Yamada,** *Senior Researcher, National Institute for Environmental Studies (Japan)*
2. **Yashiro Uezu,** *Japan Atomic Energy Agency (JAEA) (Japan)*
3. **Haru Hashizume,** *General Manager, Obayashi Corporation (Japan)*
4. **Steve Rima,** *Vice President, Radiological Service & Engineering, Environmental & Infrastructure, Amec Foster Wheeler*
5. **Atsuo Suzuki,** *Custom Solution Manager, Characterization Division Mirion Technologies (Canberra) (Japan)*
6. **Miles Denham,** *Fellow Scientist, Savannah River National Laboratory (SRNL)*

Summary of Presentations

Kazuo Yamada Volume reduction and decontamination by heat-treatment of relatively highly contaminated soil and incineration ashes was the topic of Yamada's discussion. Yamada estimated that they have an estimated 22 million cubic meters of waste, but not much room to dispose of this waste.

Incineration is commonly used for reduction of combustible household waste. Many efforts are underway to reduce volume, reuse, and clean this waste stream. Heat treatments, incineration, calcination (clinkering) and melting are also used. Distribution of radioactive cesium in fly ash v. bottom ash varies greatly between waste stream types. Calcination seems to produce the greatest sequestration of Cs. Adjustment of chemical composition improves the probability that Cs will remain in the bottom ash and can also allow melting. A pilot plant has been built in Fukushima prefecture. It is creating a volume reduction 1/20, with Cs capture at approximately100%. It is likely with these good results that clearance levels will be met.

Yashiro Uezu discussed the challenges for enhancing Fukushima environmental remediation

Great Japan Earthquake (March 11th) and accompanying tsunami, created a reactor emergency, and increased air dose through March 18th. JAEA dispatched special vehicles and an expert team to measure air dose and airborne radioactivity. Other teams were dispatched to the plant and to the hospital, other to the medical college. Aerial monitoring was conducted at 300m height, and from 300-600m for Cs-137 and Cs-134. The air dose rate has now decreased by 50% since the accident.

JAEA has helped to evaluate many methods of waste volume reduction and has developed human resources that could effectively communicate with the public. Harmonization between science and communication is a major effort and very important.

Haru Hashizume Discussed the topic of Fukushima Remediation-Soil Transport and Storage.

Challenges exist because ~20,000 people have evacuated. Work must be balanced against the degree of separation required vs. the urgency of remedial actions. Temporary local storage of remediation wastes has been created. More than 2000 such temp storage areas exist. More than 20million one cubic meter bags of waste is expected to be generated. **Hashizume** discussed the role of interim storage, which is expected to be needed over a 30-year period. Transport of bags from temporary storage to an Interim Storage Facility (ISF) is crucial. The urgency of an ISF process Vs land acquisition process is being debated. One consideration is that the reclamation of the West Japan airport could provide for storage. Trip controls are implemented for every bag. Gate scanning and sorting performed by (Canberra), is followed by core sorting by (AFW).

Steve Rima Challenges Working in Japan's Special Decontamination Area

Intensive Contamination Survey Area was not evacuated. Municipalities take on the task of decontamination. 1300 square Km were evacuated and must be cleaned to allow residents to repatriate. Challenges doing business in Japan. Relationships are important. Teaming with Japanese companies is advised. Understand Japanese employment and labor laws. Understand the culture. Don't try to be the "preeminent expert" as this is not well received.

Atsuo Suzuki Radiation Measurement Situation for Decontaminated(removed) Soil and so on Around Fukushima Nuclear Power Station

Many 1 m3 bags of contaminated soil have been generated. MEXT publishes Radiation monitoring manual (Blue Book) for soil removal (MoE)and for food (MHLW). Hand surveys are expensive and very uncertain. Typically, these surveys have a high bias >30%. It is difficult to calibrate large volume measurement techniques with standard sources. Controlling uncertainty in measurements is very important. Calibration of simulation methods are very important.

Miles Denham Radioiodine speciation and Immobilization at the Savanah River Site, Hanford Site, and Fukushima Prefecture

I-129 has a long half-life and lurks in the environment following release. It can exist in a sample in three different chemical species. Its biological effectiveness and fate and transport are highly dependent upon the chemical speciation. Radio-iodine accounts for about 13% of the dose to public offsite via thyroid accumulation. In Fukushima, the organo-iodide species dominates, different from either Hanford or SRS. There was discussion about the media specific environmental parameters that control the speciation and fate and transport of radioiodine. Environment al decisions must be informed by knowledge and understanding of the radioiodine species involved.