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Innovations in Nuclear Decontamination and Decommissioning: Global Support to Fukushima Challenges

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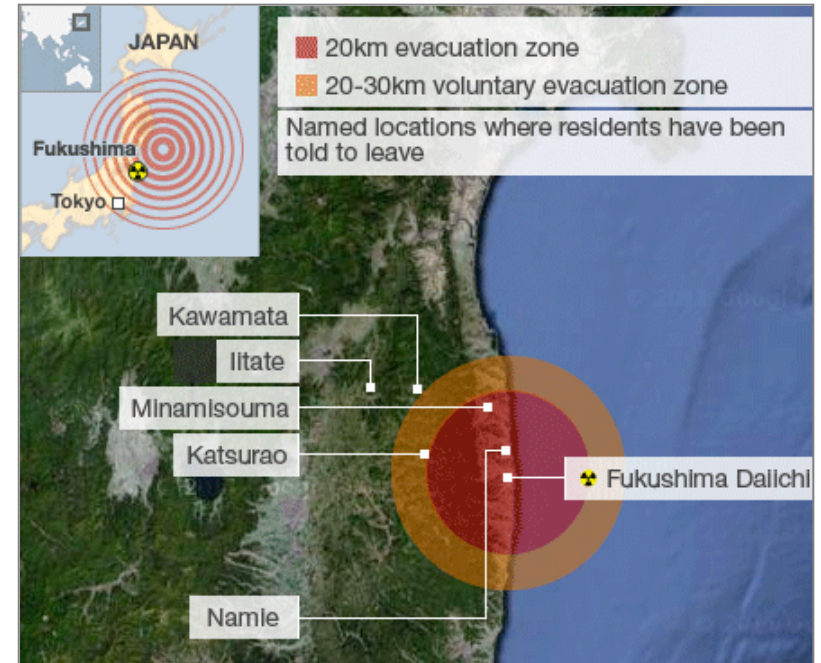
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Fukushima Circumstances Unprecedented

- Unlike Chernobyl, the reactor meltdowns occurred immediately following a pair of catastrophic natural disasters.
- Unlike TMI, the radioactive contamination was dispersed widely.



Prompt, practical application of innovation and technology is imperative to address the recognized challenges and identify what is still unknown.

Technical Clean-up Challenges Vast and Complex

- Both on- and off-site from Fukushima Daiichi NPP
- Examples:
 - Waste Management Needs
 - Identification of methodologies to support waste forecasting and integration
 - Assistance in identification of key radionuclides affecting storage, treatment, and disposition
 - Decision criteria on treatment and disposition options
 - Grouting Technology Needs
 - Strategies to reduce leakage
 - Grouting technology experience, material properties, placement, testing and remote sensors



Debris Removal from Unit 4



Fukushima Daiichi NPS Tank Farms

U. S. DOE/ Global Support to Japan Efforts

- **Development of Mid-and-long-Term Roadmap towards the Decommissioning of Fukushima Daiichi Nuclear Power Units 1-4**
 - Drawn up by Government of Japan and Tokyo Electric Power Company (TEPCO) in December 2011. Revised in July 2012.
 - Focuses on fuel debris removal; building dismantlement will be addressed in future.
- **Formal collaboration between U. S. National Laboratory partnership and TEPCO (September 2012-present)**
 - Under formal Work-for-Others Agreements, SRNL /PNNL integrated team is assisting TEPCO in addressing the technical challenges of the Fukushima on-site clean-up
 - SRNL/PNNL team delivered Feasibility Study regarding TEPCO Items of Interest
 - Performing follow-on technical scopes-of-work
- **Mission of U. S. Embassy Science Fellows (February-March 2013)**
 - Three U. S. experts (EPA, PNNL, SRNL) in decontamination in Japan for two months under the U. S. State Department's ESF program directly supporting the Japan Ministry of the Environment responsible for decontamination of the lands off-site
 - ESF report describes a framework for identifying and addressing decontamination issues and makes recommendations as to expedient approaches and technologies for Fukushima
- **Interface with the International Research Institute for Nuclear Decommissioning**
 - "The revised roadmap...highlights...the necessity of a centralized administrative organization for research and development efforts based on the wisdom collected from both within and outside Japan." (Message from the President, IRID)
 - RFIs for Contaminated Water Issues and Innovative Approach for Fuel Debris Retrieval
 - *Provided international experts to review the responses to the contaminated-water RFI (U. S. representative from SRNL)*



Benefit of Global Support

- Broad base of credible approaches
- Portfolio of innovative technologies
- Experience in deploying innovation in challenging environments
- International engagement benefits the global community