

Session 13: Global Support for Fukushima Decontamination and Decommissioning and Clean up Efforts

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OFFICE OF ENVIRONMENTAL MANAGEMENT

Safe cleanup of the environmental legacy created after six decades of nuclear weapons production and federal government-sponsored nuclear science research and technology development



The Hanford Reach
White Bluffs Overlooking the Columbia River

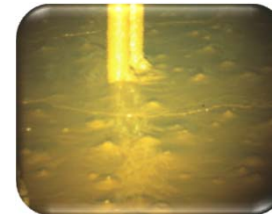
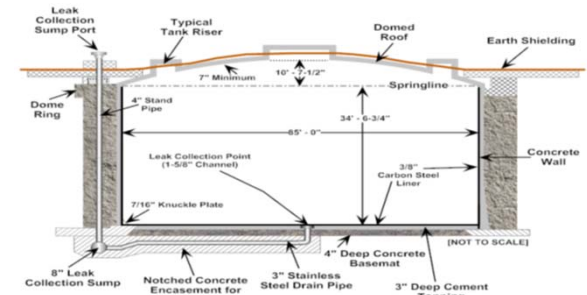
- Nuclear Facility Decommissioning



- Soil and Water Cleanup



- Liquid Radioactive Waste Processing & Disposition



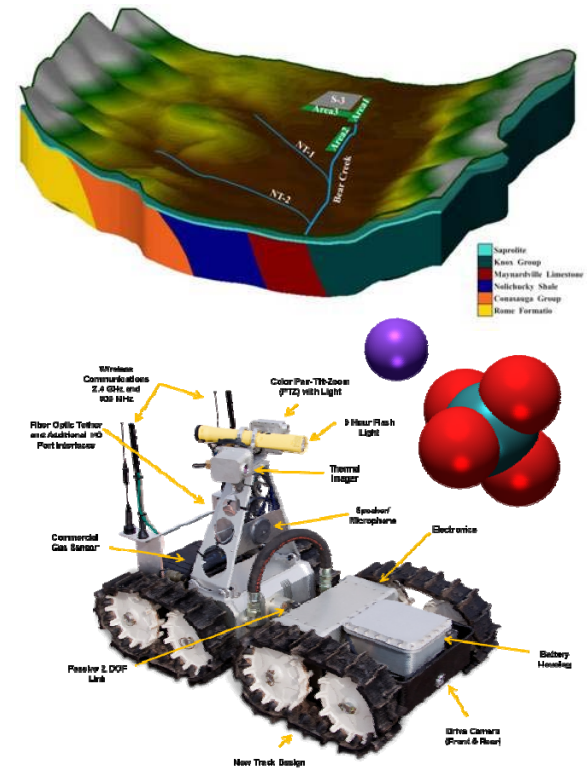
- Solid Radioactive Waste Treatment, Storage & Disposal



- Nuclear Materials & Spent Nuclear Fuel Management



- Science & Technology



- US-Japan Bilateral Commission on Civil Nuclear Cooperation
 - Decommissioning and Environmental Management Working Group (DEMWG)
 - National Laboratory Fukushima Support Network
- USDOE National Laboratory direct support
 - TEPCO, NDF, IRID, others
- JAEA Collaborative Laboratories for Advanced Decommissioning Sciences
 - DOE Technical Advisors and Subject Matter Experts participation
- DOE International technical collaboration
 - NEUP Joint US/Japan Sponsored Research



Bilateral Commission on Civil Nuclear Cooperation

Co-Chairs: U.S. Deputy Secretary of Energy and Deputy Foreign Minister of Japan

Civil Nuclear Energy R&D Working Group

Co-Chairs: DOE-NE, MEXT/METI

Cooperative R&D into:

- Advanced Reactors
- Fuel Cycle Technologies
- LWR Sustainability.
- Safe and secure operation of existing plants.
- Fuel Cycle Management
- Waste Treatment and Disposal

Decommissioning and Environmental Management Working Group

Co-Chairs: DOE-EM/EPA, METI/MOE

Bilateral cooperation on consequences from Fukushima Daiichi:

- Facility Decommissioning
- Spent Fuel Storage and Decontamination
- Long-Term Consequence Management

Emergency Management Working Group

Co-Chairs: NNSA, CAS

Bilateral engagement on incident response and emergency management:

- Emergency Preparedness
- Emergency and Crisis Preparedness
- Search Capabilities
- Consequence Management

Nuclear Security Working Group

Co-Chairs: NSC, MOFA

Engagement on nuclear security and nonproliferation:

- Physical Protection
- Transportation Security
- Safeguards Implementation
- Nuclear Security Summit
- Road-Map Implementation

Safety and Regulatory Issues Group

Co-Chairs: NRC, NRA

Engagement on national and international safety and regulator issues:

- Legal and regulatory frameworks
- Impact of Radiation
- Safety Culture
- Radiation Protection
- Seismic Safety and Design
- Risk Assessment
- Emergency Preparedness

Acronyms: CAS – Cabinet Secretariat (Japan)
DOE-NE – Office of Nuclear Energy
DOE-EM – Office of Environmental Management
EPA – U.S. Environmental Protection Agency
JAEA – Japan Atomic Energy Agency

METI – Ministry of Economy, Trade, and Industry (Japan)
MEXT – Ministry of Education, Culture, Sports, Science, and Technology (Japan)
MOE – Ministry of the Environment (Japan)
MOFA – Ministry of Foreign Affairs (Japan)
NNSA – National Nuclear Security Administration

NRC – U.S. Nuclear Regulatory Commission
NSC – National Security Council

Purpose of Working Group:

Address the long-term consequences of the Fukushima accident, including facility decommissioning, spent fuel storage, decontamination, and remediation of contaminated areas.

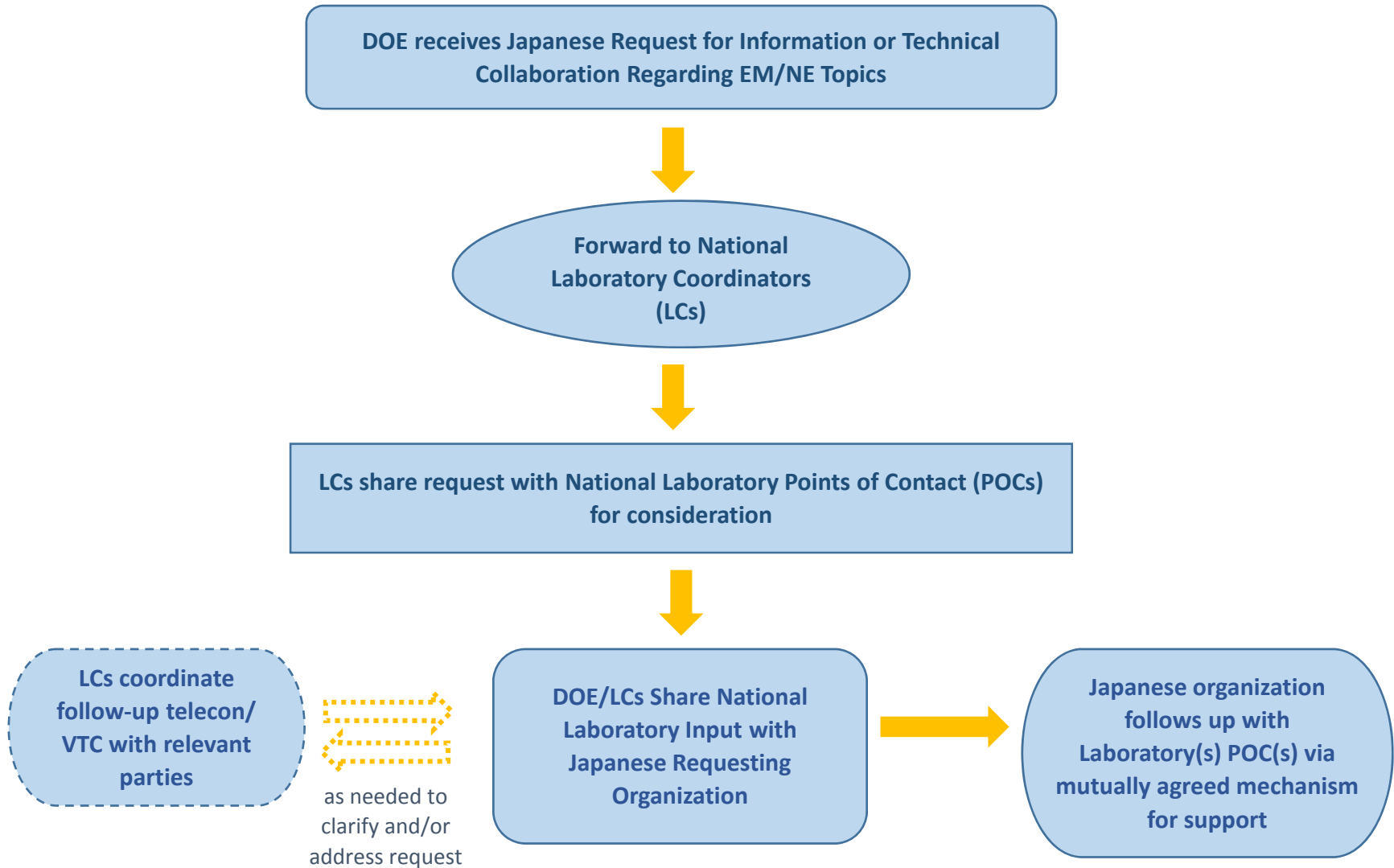
Working Group Chaired by:

- U.S. - Department of Energy (DOE) – Environmental Management (EM) & Environmental Protection Agency (EPA) – Office of International and Tribal Affairs
- Japan - Ministry of Economy, Trade and Industry (METI) & Ministry of Environment (MOE)

Institutions also Involved in Work Group Activities:

- U.S. – DOE national laboratories and EPA laboratories
 - Savannah River National Laboratory (SRNL), Pacific Northwest National Laboratory (PNNL), Idaho National Laboratory (INL), and Lawrence Berkeley National Laboratory (LBNL)
- Japan – Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan Atomic Energy Agency (JAEA), National Institute for Environmental Studies (NIES), Tokyo Electric Power Company (TEPCO), International Research Institute for Nuclear Decommissioning (IRID), Mitsubishi Research Institute (MRI), and Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF)

U.S. National Laboratory Fukushima Support Network





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Key Activities to Date

- **Technical support based on prior BLC meetings:**
 - SRNL expert review of Mitsubishi Research Institute development of a Request for Proposal for groundwater remediation projects and detritiation projects
 - The SRNL-PNNL team has completed several activities under the existing Umbrella WFO contract with TEPCO in the following areas:
 - ❖ Grout Sealing Technologies, Advanced Liquid Processing System (ALPS) Waste Stream Support, U.S. Experience in Decommissioning, Contaminant Source Mitigation, Creation of a Frozen Barrier Wall, Site Characterization, Reactive Transport Modeling



*Decommissioning
SRS Heavy Water
Components Test
Reactor*

*Technical Support
for Frozen Barrier
Wall Project*



Key Activities to Date

- **Provided expertise and lessons-learned in several technical areas relevant to Fukushima decommissioning including:**
 - Three Mile Island (TMI)-2 experience (DOE-NE)
 - Cocooning of production reactors at Hanford
 - Spent nuclear fuel drying and sludge removal at K-Basins in Hanford
 - *In situ* decommissioning of production reactors at Savannah River Site



In situ decommissioning of
SRS P-Reactor



In situ decommissioning of
SRS R-Reactor

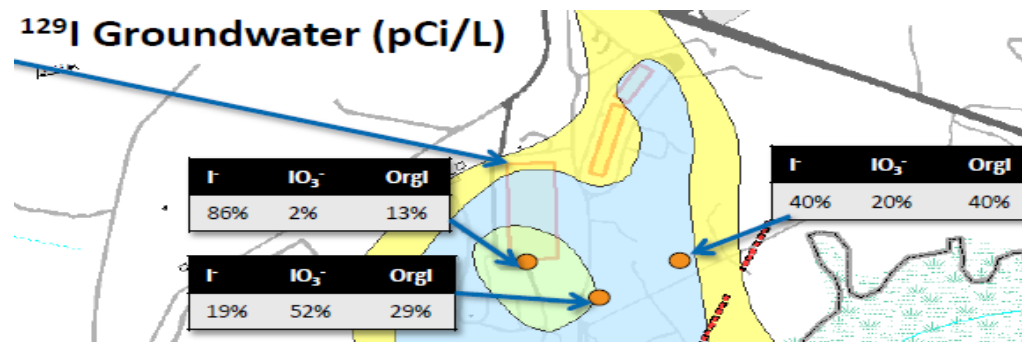
Key Activities to Date

Established cooperation on research on environmental technologies and decommissioning science and shared best practices on public outreach to support Fukushima cleanup

- Initiated cooperative research project on environmental technologies and decommissioning science with MEXT that is mutually beneficial for Fukushima and DOE
 - ❖ EM and MEXT agreed to sponsor university-led R&D on topics of joint interest through the US DOE Office of Nuclear Energy University Program and comparable university program in Japan
- Shared DOE's experience in working with stakeholders to obtain their support on cleanup objectives and end-states

US/Japan Radioiodine Immobilization Collaboration

- *Using Radioiodine Speciation to Address Environmental Remediation and Waste Stream Sequestration Problems at the FDNPP and DOE Sites*
- *Partners: SRNL, Texas A&M, JAEA, Tokyo Institute of Technology, and Kyushu University*



Key Activities to Date

- Supported the 1st International Fukushima Decommissioning Forum in April 2016 whose goal is to enhance and collect knowledge and experience of the international community on decommissioning of Fukushima Daiichi.
 - Assistant Secretary for Environmental Management served in the Organizing Committee along with principals from UK, France, IAEA, and Japan



Key Activities to Date

- Supported the 2nd International Symposium for Resilient Communities in April 2016 at Koriyama City whose goal is to minimize the impact of sudden or long-term changes induced by human actions or nature such as the accident at Fukushima Daiichi Nuclear Power Plant with an eye on revitalization of the area.



Key Activities to Date

- Initiated collaboration with Japan in robotics (April 2016)

*Tohoku
University*



*JAEA's Naraha
Remote
Technology
Development
Center*



*International Research Institute for
Nuclear Decommissioning*



Kyoto University

- U.S. and Japan have been working closely together and applying technical expertise, lessons-learned, and best practices to address the short-term and long-term decommissioning and environmental cleanup challenges from Fukushima accident.
- While significant progress has been made, many more challenges remain.
- U.S. and Japan will continue to work together to further strengthen and establish a long-term strategic relationship on collaboration in environmental cleanup and decommissioning.

