



U.S. DEPARTMENT OF
ENERGY

Office of
Nuclear Energy

Overview of U.S. – Japan Bilateral Civil Nuclear Collaboration



March 6, 2017
WM 2017 Conference, Phoenix, AZ, U.S.A.

U.S.-Japan Bilateral Commission (BLC)

- The BLC was launched on April 30, 2012 as a senior-level, standing forum in the area of civil nuclear cooperation
- The first BLC meeting was held in Tokyo on July 24, 2012 and five working groups were formed to coordinate cooperative activities
 - Nuclear security
 - Safety and regulatory issues
 - Emergency management
 - Decommissioning and environmental management
 - Civil nuclear energy research and development

Civil Nuclear Energy Research and Development Working Group (CNWG)

- The purpose of the CNWG is to enhance coordination of U.S.-Japan civil nuclear R&D efforts
- The CNWG collaborates through 3 Sub-Working Groups:
 - Advanced Reactor R&D
 - Light-Water Reactor R&D
 - Fuel Cycle R&D and Waste Management
- The CNWG identifies potential activities for near term, intermediate term and long term cooperation



Oarai Research and Development Center

Advanced Reactor R&D Sub-Working Group

- **Fast Reactor Materials**
 - Improve key design evaluation methodologies, such as creep-fatigue mechanisms to enhance understanding of design margins
- **Metal Fuel Core**
 - Comparative benchmark studies of U.S. and Japan fast reactor core designs to further enhance confidence of the design and safety basis
- **Advanced Reactor Modeling and Simulation**
 - Develop advanced simulation tools to accurately predict behavior and further improve safety, performance and economic competitiveness
- **High Temperature Reactors**
 - Use data from integral test facilities in the U.S. and Japan to develop and validate HTR simulation methods



Fuel element for the HTTR - INL and JAEA collaborating to develop validated models for high temperature reactors



Light-Water Reactor R&D Sub-Working Group

- **Light-Water Reactor Sustainability**
 - Understand irradiation and material degradation effects on reactor pressure vessels and core internal materials
- **Probabilistic Risk Assessment**
 - High Performance Computing to analyze structural response to seismic events and develop Seismic Probabilistic Risk Assessment methods
- **Severe Accident Code Assessment**
 - Comparative analysis of Fukushima Daiichi Units 1-3 using various severe accident codes to examine consistency and improve model fidelity
- **Accident Tolerant Fuels**
 - Information exchange and R&D activities of accident tolerant fuel concepts and materials
- **Examination of Fukushima Daiichi (1F) Reactors for Safety**
 - Obtain relevant 1F data to further enhance safety and lay the groundwork for a potential multinational project

Fuel Cycle R&D and Waste Management Sub-Working Group

- **Advanced Fuels Properties, Performance and Analysis**
 - Development and validation of high performance fuel analysis codes for minor actinide bearing mixed oxide fuels
- **Borosilicate Glass Dissolution Studies**
 - Improve mechanistic understanding of glass dissolution in various geologies
 - Create a robust and defensible model for assessing long-term radionuclide releases
- **Extraction of Uranium from Seawater**
 - Develop advanced adsorbent materials and conduct marine testing to inform uranium resource recovery costs
- **Aqueous Separations from Oxide Fuels**
 - Develop advanced aqueous separation methods for the treatment of oxide fuels

Conclusion

- Nuclear safety is paramount to the long-term sustainability of nuclear energy
- Based on technical progress to date, activities have been extended and expanded
- Collaborative activities are effectively leveraging unique expertise and facilities available in both countries
- Next joint meeting will be held in Idaho Falls, ID – May 2017



4th Meeting of the Civil Nuclear Energy Research and Development Working Group of the Bilateral Commission on Civil Nuclear Cooperation

Jan 28, 2016 Tokyo, Japan