Environmental Remediation in Affected Areas in Japan

December, 2018

Ministry of the Environment, Japan
Result and Effect of the Whole Area Decontamination

Interim Storage Facility

Disposal of the Specified Waste

Communication to the Public and International Societies
Decontamination and Waste Treatment based on the “Act on Special Measures”

**Measures on decontamination of soil contaminated by radioactive materials**

1. **Special Decontamination Area (SDA)**
   - Designation of SDA by the Minister of the Environment
   - Development of the decontamination implementation plan in the SDA by the Minister of the Environment
   - Decontamination implementation by the National Government

2. **Intensive Contamination Survey Area (ICSA)**
   - Designation of the ICSA by the Minister of the Environment (The areas with more than 0.23μSv/h)
     ※0.23μSv/h is not the decontamination target, but designation criteria for the ICSA
   - If the area is more than 0.23μSv/h, after the monitoring survey by municipality mayors
   - Development of Decontamination Implementation Plan by the municipality mayors
   - Implementation of decontamination by municipality mayors based on the plan (the national government allocates the budget)

**Management of waste contaminated by radioactive materials**

**Specified waste**

1. **Waste within the countermeasure area**
   - Designation of contaminated waste management area※ by the Minister of the Environment
     ※Designated areas which meet requirements to be contaminated by radioactive materials at certain level necessary to manage waste under special management
   - Survey on sewerage sludge, incinerated ash, etc. (obligatory)
   - Report to the Minister of the Environment

2. **Designated waste**
   - Designated as “designated waste” by the Minister of the Environment
     ※ Contaminated waste above certain level (8,000Bq/kg)
   - Survey on waste other than that specified in the left box (voluntary basis)
   - Implemented by the national government

**Specified domestic waste and specified industrial waste**

- It is stipulated by MOE’s ordinance that the waste applied for waste treatment law, but might be contaminated by radioactive materials diffused from the NPS accident. It is managed based on treatment criteria of the waste treatment law and special treatment criteria on the Act on Special Measures

- Removed soil generated by decontamination work inside NPS, is implemented by the relevant nuclear producer, TEPCO
Whole area decontamination based on the Act on Special Measures was completed on March 19, 2018, excluding the Areas where Returning is Difficult (ARD)

* In ARD, “Reconstruction Hubs” will be set in each municipality, where decontamination and infrastructure construction will be implemented in an integrated way.

<table>
<thead>
<tr>
<th>Municipalities completed whole area decontamination</th>
<th>SDA (11)</th>
<th>ICSA (93)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within Fukushima Pref.</td>
<td>43</td>
<td>11</td>
</tr>
<tr>
<td>Outside Fukushima Pref. (7 Pref.)</td>
<td>57</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>Completed in March 2017</td>
</tr>
</tbody>
</table>

※ There are both SDA and ICSA areas in Minamisoma, Tamura, Kawamata, and Kawauchi
Effects of Decontamination in SDA

【Air dose rate at the height of 1m from the ground / Transition according to land category】

(Air dose rate (μSv/h))

3.00
2.00
1.00
0.00

Air dose rate in residential areas has been decreased 60% by the decontamination and it is confirmed that effect of the whole area decontamination is maintained.

Residential areas (n=258,687)
Farmland (n=82,503)
Forests (n=69,063)
Roads (n=62,026)

Before decontamination
After decontamination
Post-decontamination monitoring

The chart shows the air dose rate average in each category (aggregated data of measuring points).

Residential areas include schools, parks, cemeteries, and large-sized facilities, farmland includes orchard, and forests include slopes, grassland and lawn.

Post-decontamination monitoring was implemented after 6 months to a year after the decontamination work. The latest result of post decontamination monitoring in municipalities were summarized (the first or the second).

**Prospects on Export of Removed Soil and Restoration of Land in Temporary Storage Sites (TSS) <Estimation>**

By early 2020, max. 60% of the removed soil from approx. 1,300 TSS*\(^1\) will be transported to the ISF, and up to 40% of land restoration will be completed, according to estimation based on prospect*\(^1\) of the transportation to the ISF and achievement in the land restoration*\(^2\).

### Image of export and land restoration

![Image of export and land restoration]

*\(^1\) The accumulative number of TSS as of the end of FY2016

*\(^2\) Aiming to transport 1.8 m\(^3\) in FY2018, and 4mil. m\(^3\) in FY2019

### Number of TSS where export and restoration will be completed (Estimation)

<table>
<thead>
<tr>
<th>Decontamination</th>
<th>Number of TSS</th>
<th>Approx.</th>
<th>Storage</th>
<th>Export completed</th>
<th>Land restoration completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICSA SDA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decontamination achieved in FY2016</td>
<td>58</td>
<td>320</td>
<td>Ca.120</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>Decontamination achieved in FY2017</td>
<td>124</td>
<td>130</td>
<td>Ca.320</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Decontamination in FY2018</td>
<td>192</td>
<td>130</td>
<td>Ca.320</td>
<td>165</td>
<td></td>
</tr>
<tr>
<td>Decontamination In FY2019</td>
<td>390</td>
<td>560</td>
<td>Ca.540</td>
<td>230</td>
<td></td>
</tr>
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<td>ICSA ICSA</td>
<td></td>
<td></td>
<td></td>
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</table>
◆ The MOE has budgeted approx. JPY 2.9 trillion (= USD 27 billion) for decontamination until FY2018.
◆ 17mil.㎥ (among which approx. 16.5mil.㎥ were from Fukushima Prefecture) of contaminated soil and wastes were removed until the end of FY2017.
◆ MOE published "Decontamination Project Report" to leave a record behind of the experiences, knowledge and lessons learned through decontamination works.

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Decontamination in SDA

- Total number of labor: approx. 13,700,000 workers
  ※as of the end of March 2018

- Budget: approx. JPY 1.5 trillion
  ※ MOE's budget until FY2018

- Volume of the generated soil: approx. 9,100,000㎥
  ※Estimation as of the end of March 2018

- Transported volume of soil from TSS*: approx. 1,900,000㎥
  (ISF: approx. 280,000㎥, Volume Reduction Facility: approx. 1,620,000㎥)
  ※Estimation as of the end of 2018

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Decontamination in ICSA

- Total number of labor: approx. over 18,400,000 workers
  ※ estimated from interviews with relevant municipalities as of the end of March 2018

- Budget: approx. JPY 1.4 trillion
  (within Fukushima Pref.: approx. JPY 1.4 trillion, outside Fukushima Pref.: approx. JPY 40 billion)
  ※MOE's budget until FY2018

- Volume of the generated soil: approx. 7,900,000㎥ (estimation)
  (within Fukushima Pref.: approx. 7,400,000㎥, outside Fukushima Pref.: approx. 500,000㎥, both are estimation as of March 2018)

- Transported volume of soil from TSS: approx. 1,700,000㎥
  (ISF: approx. 500,000㎥, Volume Reduction Facility: approx. 1,200,000㎥)
  ※Estimation as of the end of March 2018

※Considered 1US$ =JPY107
Plans of Specified Reconstruction and Revitalization Base in ARD (as of November 22, 2018)

By revision of the Act on Special Measures for the Reconstruction and Revitalization of Fukushima” (May 2017), the municipalities can make plans to construct “Specified Reconstruction and Revitalization Base” (SRRB), aiming at lifting evacuation orders and allowing the residents to return.

The government approved the plans of 6 municipalities and decontamination and dismantlement started in all 6 municipalities.

- **Futaba** (approved on September 15, 2017)
  - Decontamination work started

- **Okuma** (approved on November 10, 2017)
  - Decontamination work started

- **Namie** (approved on December 22, 2017)
  - Decontamination work completed on a part of the road

- **Tomioka** (approved on March 9, 2018)
  - Decontamination work completed around JR station

- **Iitate** (approved on April 20, 2018)
  - Decontamination work started

- **Katsurao** (approved on May 11, 2018)
  - Decontamination work started

*Note: SRRB in the pictures stands for “Specified Reconstruction and Revitalization Base”*
Result and Effect of the Whole Area Decontamination

Interim Storage Facility

Disposal of the Specified Waste

Communication to the Public and International Societies
What is the Interim Storage Facility?

- In Fukushima Prefecture, large quantities of removed soil and waste have been generated from decontamination works. It is estimated that the volume will be approx. 16 ~22 mil. m³ after incineration of combustibles.
- The Interim Storage Facility is necessary to safely and intensively manage and store the soil and waste until final disposal.
- Removed soil, waste, and incinerated ash (> 100,000 Bq/kg) are stored.

Process of the ISF Project

- Land acquisition
- Construction of facilities
- Transportation of soil and waste
- Processing and storage of soil and waste

Design in Nov. 2017
### Progress of Land Acquisition of the ISF

**As of the end of November 2018**

<table>
<thead>
<tr>
<th>Whole Area</th>
<th>Item</th>
<th>Ratio to the whole area</th>
<th>Ratio and the number of people registered to whole registration record (2,360 pers.※1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ca. 1,600ha</td>
<td>Landowners with contact information</td>
<td>Ca. 1,550ha ※1 96.9%</td>
<td>Ca. 1,940 pers. ※1 82.2%</td>
</tr>
</tbody>
</table>

**Private land**

- Ca. 1,270ha (Ca. 79%)
- Ca. 1,024ha (66.3%)
- Ca. 1,060ha (66.3%)
- Ca. 1,024ha (66.3%)

**Contracted**

- Private land out of contracted land
  - Ca. 1,024ha
- Public land out of contracted land
  - Ca. 36ha

**Other public land**

- Ca. 294ha (18.4%)

**National/Municipality land**

- Ca. 330ha (Ca. 21%)
- Ca. 1,354ha (84.6%)

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※1 Including National/Municipality institutions

※2 Private landowner: 1,631 pers.
Public land: 2pers.

**Land Acquisition Progress**

- Ratio to 1,940 pers. landowners with contact information: 84.2%
- 1,633 pers. 69.2%
◆ Soil storage facility started the operation in October 2017 in Okuma and in December 2017 in Futaba

Soil Storage Facility

- Unloading equipment
- Equipment for container bag opener
- Equipment for separation
- Container bag opener
- Sieving machine
- Container bag residue
- Sieving machine
- Separated removed soil
- Plant
- Materials to improve the property of soil
- Separated soil
- Storage
- Conveyer belt w/roof
- Bulldozer
- Transport
- Seepage control
- Leachate collection pipe
- Leachate treatment
- Retained water, etc.
- Outfall

Reception / Separation Facility
Operational Status of the ISF

◆ Construction of the facility started in November 2016
◆ The operation of Reception/Separation Facilities started in June 2017 in Futaba, and in August 2017 in Okuma
◆ The storage of the removed soil started in October 2017 in Okuma and in December 2017 in Futaba after the completion of the soil storage facilities
Transportation to the ISF

- By July 4, 2018, accumulative total of 1,000,000 m³ of removed soil was transported
- In FY2018, about 1,800,000 m³ will be transported
- Safe and secure transportation will be sequentially conducted managing whole numbers of transport objects, managing traffic of trucks, and implementing environmental monitoring, and etc.

<Actual achievement>
As of December 6, 2018

- **Stored volume:** 1,032,390 m³ in FY2018
  (1,791,055 m³ in TTL)
  * Calculated on the assumption that the volume of a large bag is 1 m³
- **Total number of trucks used:** 155,889 in FY2018
  (281,565 in TTL)
  * 6 m³ (6 bags) of removed soil is lوردed on each truck

A truck transporting removed soil
Transport volume expected to be largely increased in future and traffic measures has been conducting accordingly.

Transport Volume (million m³)

- Volume already transported
- Planned volume to be transported

Prospect for the volume of cumulative transportation (max.)
- 6mil. m³
- 2mil. m³
- Approx. 4mil. m³ (target)
- Approx. 1.8mil. m³ (planned)

Volume of cumulative transportation
- 758,665m³ (as of the end of FY2017)

Prospect for the volume of cumulative transportation (min.)
- 8.5mil. m³ (as of the end of FY2020)

Prospect for the volume of cumulative transportation
- 12.5mil. m³ (as of the end of FY2020)

Actual volume
- FY2015: 45,382m³
- FY2016: 183,734m³
- FY2017: 529,549m³
- FY2018: 6mil. m³
- FY2019: 2mil. m³
- FY2020: 6mil. m³
- FY•••

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- FY•••
8 Steps towards the Final Disposal outside Fukushima Prefecture within 30 years from the Start of the ISF

- MOE conducts R&D to examine how the final disposal to be implemented taking into account the effect of radioactive decay and the potential of volume reduction and recycling
- MOE shares the information with the public to build the consensus for recycling of lower contaminated soil and the final disposal outside Fukushima Prefecture

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP 1</strong></td>
<td>Comprehension of trends in R&amp;D domestically and internationally</td>
</tr>
<tr>
<td><strong>STEP 2</strong></td>
<td>Studying the direction of future R&amp;D</td>
</tr>
<tr>
<td><strong>STEP 3</strong></td>
<td>Furthering R&amp;D</td>
</tr>
<tr>
<td><strong>STEP 4</strong></td>
<td>Studying the direction of the final disposal, taking into account studies of possibilities of volume reduction and recycling</td>
</tr>
<tr>
<td><strong>STEP 5</strong></td>
<td>Investigation, review and adjustment concerning final disposal sites</td>
</tr>
<tr>
<td><strong>STEP 6</strong></td>
<td>Land preparation of final disposal sites</td>
</tr>
<tr>
<td><strong>STEP 7</strong></td>
<td>Installation of waste to final disposal sites</td>
</tr>
<tr>
<td><strong>STEP 8</strong></td>
<td>Completion of final disposal</td>
</tr>
</tbody>
</table>

Timeline:

- **Start of ISF**
- **30 years from the start of ISF**

**Development of public understanding of final disposal outside Fukushima Prefecture**

**Taking soil and waste out of the facility through volume reduction and recycling**
Technology Development Strategy for Volume Reduction & Recycling of the Removed Soil

- Towards the final disposal of the removed soil outside Fukushima Pref., MOE will promote recycling of the soil after volume reduction technology as much as possible, which consequently would lead to reduce the volume of soil for the final disposal.
- After clarifying the objectives and priority of technology development and volume reduction & recycling, basic technology development is planned to be completed within 10 years, then move onto a phase of treatment.
- On the premise of securing safety, MOE will try to realize the recycling in the possible field, building public understandings for the safety.
- Based on technology development and prospect of recycling in the future, MOE would propose some options for structure and necessary dimension of the final disposal.

Process management of strategy

1. Technology development / verification
   - Precedence and verification of classification technology development
   - Study on other technology verification except classification
   - Transition to actual project

2. Study on the final disposal
   - Study on combination of technologies for volume reduction
   - Select a technology / Study on method for the final disposal
   - Realize the method for the final disposal

3. Promotion for recycling
   - Summarize the basic concept of recycling / Implement model demonstration / Study on policy and promotion / Publish a guidance
   - Embody where to use recycled materials / Full-scale promotion for recycling

4. Building the public understandings
   - Implementing information dissemination measures (face to face dialog, consensus building activities, etc.) / Establish necessary systems (cooperation with relevant ministries and human resource development)
Concepts on Safe Use of the Removed Soil after Recycling (June 2016)

【Basic Concept】
The removed soil should be used mainly for public projects with a responsible management system for the controlled materials (with a radioactivity level below 8,000Bq/kg in principle and set according to purpose) after necessary treatment, e.g. removal of debris, classification treatment. The use will be limited, such as the basic structure material of an embankment which is not assumed to change shape artificially, and be managed appropriately.

Limited use

- The use will be limited to the material which is not assumed to change shape artificially for a long time period, e.g. basic structure material of banking for coastal levees or seaside protection forests, embankment materials for roads, cover soil for waste disposal sites, landfill materials and basic structure for farms of flowers and energy crops.

Appropriate management

- The projects will be mainly public projects with a responsible management system.
- The radioactive cesium concentration in the removed soil should be limited in order to confine the additional exposure dose. The additional exposure dose should be below 1mSv/y during the construction and below 0.01mSv/y at the time of service.
- Covering soil should be installed, scatter and leakage should be prevented, ground form change should be observed, and the data should be recorded.

How to proceed recycling

As the environmental improvement towards the practical recycling of the removed soil, demonstration projects and model projects based on the above concepts should be implemented keeping the safety against radiation, studying specific verification of the management method and building stakeholders’ and public understanding.

The thickness of cover soil should be designed to ensure the necessary thickness to confine the additional exposure dose, even when the general maintenance for the construction is conducted.
Demonstration Project for Recycling in Minamisoma City

Demonstration project is currently being implemented in Minamisoma City, studying specifically on handling radiation during the procedure of recycling and ensuring the quality of the recycled soil as construction material in order to promote safe recycling and reuse of the removed soil in a step by step manner.

1. Preliminary treatment / quality control process (April 2017-)
   1. Open sandbags and remove large stones and debris
   2. Further eliminate smaller debris
   3. Classify soil by concentration
   4. Control quality

2. Test embankment process (May 2017-)
   5. Construct test embankment / Monitoring

- Total amount of soil in embankment: approx. 4,000 tons
- Recycled soil out of total soil: approx. 700 tons
- Average of radioactive concentration: 771Bq/kg

Air dose rate was not much changed before and after opening of sandbags of the removed soil

Since the test embankment was constructed, radioactive materials have not been detected in the leachate

【Result of council of advisers】
- Confirmed safety in this method for recycling demonstration
- To accumulate data continuously conducting demonstration project

Check the air dose rate

Prepare and keep records on site

Check the radioactive concentration of leachate
Result and Effect of the Whole Area
Decontamination

Interim Storage Facility

Disposal of the Specified Waste

Communication to the Public and International Societies
Transportation of disaster waste to the TSS has completed 1.99mil. tons as of the end of August 2018 (of which 380,000 tons were incinerated, 1,190,000 tons were recycled and 8,200 tons were reclaimed.)

Transported disaster waste has been recycling as large as possible

**< Status of disaster waste by category >**

1. **Disaster waste disposal generated by Tsunami**
   - All the debris excluding that from Areas where Returning is Difficult (ARD) has been removed and transported to the TSS as of March 2016

2. **Dismantling and removal of collapsed houses**
   - It is under operation to take application for dismantling and investigation, then conduct dismantling and removal
   - Application for dismantling and removal of which 14,500 cases were registered, already announced dismantling work, 14,200 cases, among which 10,600 cases were removed

3. **Treatment of household waste**
   - Pick-up service at garbage stations or door-to-door visit
   - Door-to-door retrieval is conducted after adjusting the schedule of the owner

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*Including the treated amount without transporting to the TSS*
To promote ‘Waste disposal across municipalities’: city/town/village hosting TIFs accept waste from other cities.

Katsurao village and Nihonmatsu city will start ‘Waste disposal across municipalities’ at the TIFs in FY2018.

**Nihonmatsu city (120t/day) [planned]**
- Agricultural waste, waste generated by decontamination from Adachi area (Nihonmatsu city, Motomiya city, Otama village)

**Date city (130t/day) [operating]**
- Waste generated by decontamination from Date area (Date city, Kunimi town, Kori town, Kawamata town)

**Katsurao village (200t/day) [operating]**
- Waste generated by decontamination, disaster waste in the village
  - From Tamura city, Miharu town, Kawauchi village

**Tamura city, Kawauchi village (60t/day) [operating]**
- Agricultural waste from 24 municipalities, such as Kenchu, Kennan, Iwaki, kawauchi village, Aizu Kennan

**Iitate village (Warabidaira district) (240t/day) [operating]**
- Waste generated by decontamination, disaster waste in the village
  - Sewage sludge, agricultural waste from outside village (Fukushima city, Date city, Kunimi town, Kawamata town, Minamisoma city)

**Namie town (300t/day) [Planned]**
- Waste generated by decontamination, disaster waste in the town
- Waste generated by decontamination, disaster waste in Tomioka town
- Buried livestock in Futaba town

**Countermeasure area**
- **TIFs managed by the government**
- **TIF by municipalities in Date district**
Disposal Project utilizing Existing Controlled Landfill Site

- As for Landfill disposal project for specified waste, the transportation to the site started on Nov. 17, 2017
- 30,214 container bags of waste mostly from Tomioka and Naraha Towns were transported (as of the end of July)
- Monitoring survey result before and after transportation shows no significant increase of air dose rate

Outline of the facility

- To use existing controlled landfill site (formerly Fukushima Eco Tech Clean Center)
- To locate it in Tomioka (access from Naraha)
- The facility has been nationalized after local coordination
- Positioning as the final disposal site

Target object for landfill / Transport period

- Waste within the countermeasure areas (less than 100,000Bq/kg of radioactive concentration) [about 440,000m$^3$] – about 6 years
- Designated waste (less than 100,000Bq/kg of radioactive concentration) [about 180,000m$^3$] – about 6 years
- General waste from houses – about 10 years in 8 municipalities in Futaba
- Waste with more than 100,000Bq/kg of radioactive concentration will be delivered to the ISF

Schematic of the site

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Disposal of the Specified Waste

Communication to the Public and International Societies
Established as “Decontamination Information Plaza” in January 2012 (Changed the name in July 2017)

MOE and Fukushima Prefecture cooperate to operate as a station to convey information concerning environmental recovery such as reconstruction of Fukushima, radiation, and ISF

*Main activities*

- The facility is located close to JR Fukushima station, where exhibitions and seminars are held, and advice or answers are provided for any questions
- The explanation with panels and videos in events (“Moving Exhibitions”) are held
- Experts are dispatched to municipalities, town meetings and schools

Exhibition space
Number of visitors: 25,633 (February 2012-January 2018)

Moving exhibitions / Experts dispatch
Moving exhibitions: 555 halls, Number of attendants 59,627 (July 2012-January 2018)
Experts’ dispatch: 1,340 cases, Number of attendants 70,594 (January 2012-January 2018)

Event (Kurumaza Café)
Attendants share information and experiences at the event: Number of attendants 738 (June 2013-January 2018)
Ministry of the Environment, Japan (MOEJ) released an English booklet in August 2017. English web-site, “Environmental Remediation” was also renewed and two TV shows are now available on MOE’s web site.

**A comic style booklet, “Nasubi no Gimon” was released in August 2017, explaining radiation measures for food, etc.**


**“Fukushima Diaries” by Discovery Channel:** In this 30-minutes show, three famous bloggers from overseas visited different destinations in Fukushima Pref. with their own interests. They showed the viewers what is really going on in Fukushima [http://josen.env.go.jp/en/movie_publication/cooperation_index.html](http://josen.env.go.jp/en/movie_publication/cooperation_index.html)

**Channel Japan/CNBC ASIA:** CNBC broadcasted 15-minutes program 4times in a row. Each program showed you the key persons in Fukushima how hard they work to fight against misconceptions and to revitalize Fukushima. Each content is as follows;

#1 The story of Mr. McMichael, who tries to help widely communicate correct information on Fukushima to international communities

#2 The story of two young people who are eager to revitalize their hometown, Fukushima

#3 The story of small factories that tackle on the development of robots for decommission.

#4 The story of Dr. Hayano, who teaches what is radiation from academic point of views.
Dec. 5, 2016
The 4th Meeting of Japan-Ukraine Joint Committee for the cooperation to advance aftermath response to accidents at nuclear power stations (@Tokyo)

Apr. 17-21, 2017
The 3rd IAEA-MOE Experts Meeting on Environment Remediation of Off-Site areas after the Fukushima Dai-ichi Nuclear Power Station Accident (@Tokyo)

Oct. 26-27, 2017
The 6th Annual Japan-UK Nuclear Dialogue (@London)

Nov. 6-10, 2017
The 4th IAEA-MOE Experts Meeting on Environment Remediation of Off-Site areas after the Fukushima Dai-ichi Nuclear Power Station Accident (@Tokyo)

Nov. 21, 2017
The 7th Meeting of the Japan-France Nuclear Cooperation Committee (@Tokyo)

Nov. 27, 2017
The 5th Meeting of Japan-Ukraine Joint Committee for the cooperation to advance aftermath response to accidents at nuclear power stations (@Kiev)

Aug. 8, 2018
The 5th Meeting of US-Japan Bilateral Commission on Civil Nuclear Cooperation (@Tokyo)

Oct. 25, 2018
The 7th Annual Japan-UK Nuclear Dialogue (@Tokyo)

Nov. 21, 2018
The 8th meeting of the Japan-France Nuclear Cooperation Committee (@Paris)