Country Report of Japan

The 22nd FNCA Ministerial Level Meeting

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Atomic Energy Commission of Japan

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Special Report "10 Years after the Accident of TEPCO*1's FDNPS*2" (1/3)

*1 Tokyo Electric Power Company Holdings, *2 Fukushima Daiichi Nuclear Power Station

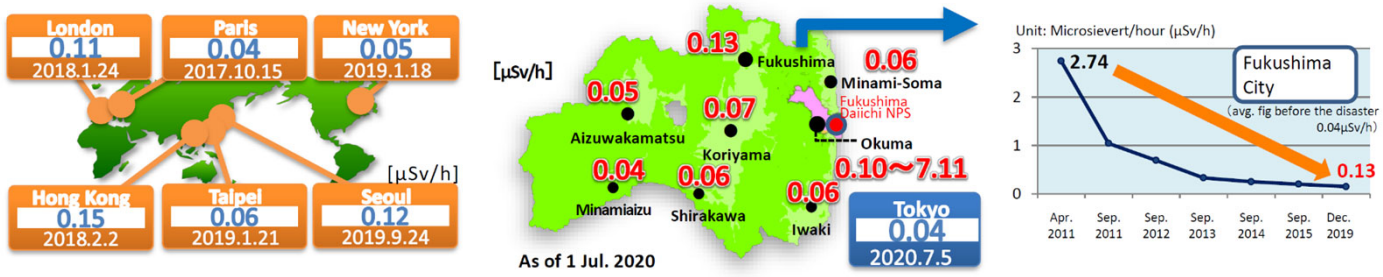
Fukushima Today: Efforts made off the premises of FDNPS

1. Recovery and reconstruction of Fukushima steadily moving forward

- ✓ The air dose rates in major cities of Fukushima prefecture as of September 2020 are largely on par with those in major cities abroad.
- ✓ Except for the Restricted Area, decontamination work was completed by 2018, and the evacuation orders were lifted by March 2020.
- ✓ In the Specified Reconstruction and Revitalization Bases in the Restricted Area, decontamination work and development of social infrastructure are proceeding.
- ✓ Radiation-associated health effects were unlikely to be discernible among Fukushima residents.
- ✓ Excluding a handful of mushrooms, wild edible plants and fisheries products, no items exceeding the limits have been found since FY2018.
- ✓ The living environment for returnees to the areas where evacuation orders were lifted has greatly improved.
- ✓ The initiative of "Fukushima Innovation Coast Framework" was launched with the aim to build fresh industrial bases and hubs.

2. Recovery and Reconstruction of Fukushima is still on the way

- ✓ As of March 2021, approximately 36,000 residents of Fukushima are still forced to live away from home.
- ✓ The government has not been able to announce a concrete plan for lifting the evacuation orders in the Restricted Area (excluding the Specified Reconstruction and Revitalization Bases).
- ✓ The market value of agricultural products in Fukushima has not recovered to the pre-disaster level.
- ✓ The agriculture, forestry, fisheries, tourism and other sectors continue to suffer from ungrounded rumor and reputational damages.
- ✓ In addition to the specific problems above, difficult issues such as serious depopulation and the declining birthrate and aging population are revealed.



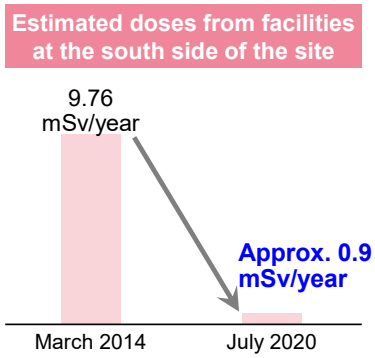
Air dose rates in major cities in Fukushima and overseas

Special Report "10 Years after the Accident of TEPCO's FDNPS" (2/3)

Fukushima Today: Efforts made on the premises of FDNPS

1. Significant improvements of the environments in and around the NPS

- ✓ The average temperatures inside the reactors are stably maintained at 15 to 35 degrees Celsius.
- ✓ Ordinary working clothes are used in about 96% of on-site areas.



2. Still a long way to go toward the completion of decommissioning

- ✓ The fuel debris have kept high dose levels inside and in the vicinity of the Units 1 to 3.
- ✓ The government of Japan and TEPCO have joined hands in the decommissioning of FDNPS with the target completion date being 30 to 40 years.
- ✓ There still remains much to be done for investigating and analyzing the cause of accident.

Efforts in the areas of organizational culture and frameworks

1. Improvements made based on recommendations and lessons raised by accident investigation commissions

- ✓ NRA and its supporting secretariat were established.
- ✓ The New regulatory standards took effect in 2013, and the operation of a nuclear regulatory inspection program was introduced in 2020.
- ✓ The government has conducted reviews on nuclear emergency preparedness.
- ✓ As voluntary safety improvements by the operators, the Japan Nuclear Safety Institute (JANSI) and the Atomic Energy Association (ATENA) were established in 2012 and 2018 respectively.

2. Issues remaining to be addressed

- ✓ Concern about a new safety myth to be created by people's complacency that unparalleled safety requirements will lead a perfect safety if it is complied.
- ✓ Over time, important lessons may slip from our minds, and these lessons forgotten may increase the risk of repeating the same mistakes.

Special Report "10 Years after the Accident of TEPCO's FDNPS" (3/3)

Fukushima Today: Efforts made off the premises of FDNPS

Fukushima Today: Efforts made on the premises of FDNPS

Efforts in the areas of organizational culture and frameworks

All people concerned with nuclear energy must never forget the following

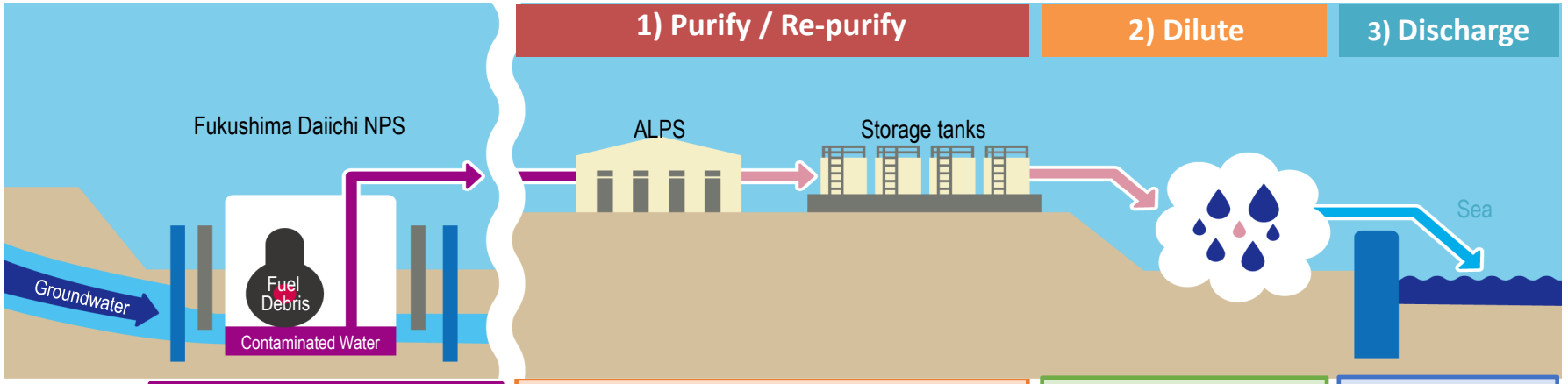
- ✓ There still remain people displaced and areas in which evacuation orders have not been lifted because of the accident.
- ✓ Negative reputation resulting from the accident still remains and the people in Fukushima are being inflicted continuously.
- ✓ Not to repeat any similar accident by keeping the memories and the lessens learnt.
- ✓ It's a never ending journey of securing safety and building trust and confidence of the public.

All people concerned with nuclear energy must redouble their effort and collaboratively tackle the following

- ✓ Being engaged in the recovery and reconstruction of Fukushima until such time when people of Fukushima regain their pride and confidence at their homeland.
- ✓ Ensuring safety and building trust continuously.
- ✓ Solving the fundamental issues ingrained in nuclear energy-related organizations.
- ✓ Keeping the memories and lessens associated with the FDNPS disaster and pass them onto future generations.
- ✓ Providing necessary support to ensure that future generation can acquire scientifically accurate knowledge about nuclear energy and radiation, which enable them to evaluate the significance of nuclear energy and radiation in the society.

Basic Policy on handling of ALPS treated water (April 2021)

- The discharge will be implemented only when TEPCO complies with the regulatory standards set based on the recommendations of ICRP, and implementation of the discharge will be in line with international practice.
- Measures to minimize adverse impacts on reputation are thoroughly implemented.
- The IAEA conducts reviews of the safety aspects of discharge of ALPS treated water.



Contaminated Water is generated when groundwater touched the damaged reactors and debris.

Remove almost all kinds of nuclides other than tritium to the maximum extent, and meet the national regulatory standards set based on the ICRP recommendations

ALPS Treated Water

Dilute more than **100 times to make tritium to at the most 1/40th of the national regulatory standards (1,500Bq/L)**

Subject to the approval of NRA, discharge will be started (envisaged after two years)

Strategic Energy Plan -Overview-

- We published **the new Strategic Energy Plan** in this October for achieving **carbon neutrality in 2050 and a new GHG reduction target for 2030**.

Priniciple:

S+3Es (Safety + Energy Security, Economic Efficiency, Environment)

~2030

- maximum introduction of renewable energy as major power sources
- Thorough energy efficiency
- Restart of **nuclear power**
- R&D to accelerate **innovation**.

2030~2050

- **Electricity sector ➔ Decarbonized power source**
- **Industry/ transport/ consumer sector ➔ use of hydrogen/ CCUS**
- **Implementation/scaling up** of **innovation** such as **hydrogen** and **CCUS/ Carbon Recycling**.

Points of policy towards 2030[Nuclear]

- **Sincere regrets for the accident of TEPCO's Fukushima Daiichi Nuclear Power Station** is the start point of nuclear policy

  - On the premise that **safety comes before everything else**
  - **Restart of nuclear power:** only with the new regulatory requirements, the most stringent level in the world
  - Continuous efforts to correspond to the back-end problems
  - **Considering long-term operation with secured safety**
  - **Public understanding:** interactive dialogue including regions where electricity is consumed; and easy-to-understand polite public relations/public hearing

- **Building up trustful relationship** with local community where the nuclear plant locate
  - polite dialogue with local community

- Promotion of R & D
  - **Fast reactor**: participating international cooperation (e.g. US and France etc.)
  - **SMR(small modular reactor):** demonstration program through international cooperation(e.g. US and Canada etc.)
  - **High temperature gas-cooled reactor:** research on component technologies for manufacturing hydrogen
  - **Nuclear fusion** : international collaboration project such as ITER Project

Nuclear Energy X Innovation Promotion (NEXIP)

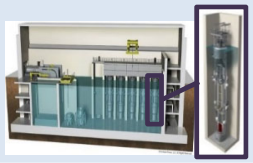
METI and MEXT collaborate to build integrated support from business sector, academia and public institutions.

METI supports various types of nuclear reactor technologies.

Small Modular LWR

- Smaller size, modular type
- Passive safety

➡ ✓ Affordable capital cost
✓ Smaller EPZ



Fast Reactor

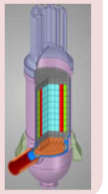
- Sodium-cooled reactor
- Fast neutrons

➡ ✓ Effective use of resources
✓ HLW management

High Temperature Gas-cooled Reactor

- Helium gas-cooled reactor (chemically stable)
- Coated particle fuel
- Very high temperature

➡ ✓ Heat/hydrogen use
✓ Smaller EPZ

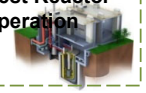


International Cooperation

France
Fast reactor R&D cooperation based on simulations and experiment

U.K.
High-temperature Gas-cooled Reactor

U.S.
Versatile Test Reactor (VTR) cooperation



JAEA's Facilities

Joyo:
Experimental Fast Reactor

HTTR:
Experimental HTGR

Innovative Nuclear Research and Development Program

- MEXT supports basic research mainly in the modeling and simulation.
- Through this program, MEXT encourages collaboration between industry and academia and promotion of young researchers.

<Categories for research proposals>

Collaboration and Innovation	Bottleneck Technologies	New and Innovative Ideas

Applications of Radioisotopes

Follow-up on the Growth Strategy(06/2021)

Attempt on Radioisotope Production by utilizing research reactors and the like

Establishment of Advisory Committee on Producing and Utilizing Radioisotopes for Medical Use and Others

- "The Advisory Committee for Medical Radioisotope Production and Utilization" has been formed on November 16, 2021 (Tuesday) in order to carry out the necessary studies related to the promotion of production and utilization of Radioisotopes for medical use. It has been established under the Atomic Energy Commission.

- The committee will formulate action plans related to Radioisotope manufacturing and utilization for medical use, etc.

The 65th IAEA General Conference Side Event

Title: The Development of Alpha-emitting radiopharmaceuticals and the Supply of the Isotopes:
^{225}Ac and the possible role of the international organization
Date: 20 September 2021

- IAEA executives, a large pharmaceutical company, national organizations promoting advanced efforts in manufacturing Ac-225, Japanese institutions conducting R&D related to Ac-225, a researcher from an emerging country presented the current situation, issues, and expectations for the future.

Dr. Misturu Uesaka
Chairman, Japan Atomic Energy Commission (JAEC) at the 65th IAEA General Conference Side Event

Dr. Melissa DENECKE, Director
Division of Physical and Chemical Sciences at IAEA General Conference Side Event

Thank you