FY2019

# Summary of Countermeasures for the Accident at the Fukushima Nuclear Power Stations of Tokyo Electric Power Company (TEPCO) in Response to the Investigation Committee's Report

# Positioning of This Report

○ In terms of the measures taken by the Japanese government in response to the report issued by the Fukushima Nuclear Accident Independent Investigation Committee of the National Diet (hereinafter the "Investigation Committee"), the supplementary provision of the Diet Act stipulates that a report must be submitted to the National Diet every year until further notice.

## Diet Act (Act No. 79 of 1947)

**Supplementary Provision 11**

**Until further notice, the Cabinet must submit a report on the measures taken in response to the report published by the Investigation Committee on the Accident at Fukushima Nuclear Power Stations of Tokyo Electric Power Company to the Diet every year in accordance with the provisions of the Act (note: Act on the Investigation Committee on the Accident at Fukushima Nuclear Power Stations of Tokyo Electric Power Company) as set forth in the preceding paragraph.**

## Investigation Committee's Recommendations

**Recommendation 1: National Diet surveillance of the regulatory authorities**
**Recommendation 2: Review of the government's crisis management system**
**Recommendation 3: Government response to disaster victims**
**Recommendation 4: Observation of electric utilities**
**Recommendation 5: Requirements for a new regulatory organization**
**Recommendation 6: Reform of laws related to nuclear energy**
**Recommendation 7: Utilization of an independent investigation committee**

Note: Recommendation 1, part of Recommendation 4, and Recommendation 7 are recommendations aimed at the National Diet.

○ In light of the above recommendations, this report provides an outline of the main measures that had been taken by FY2018 and the main measures that have been taken to date as "basic measures." After that, it provides a summary of the main measures that were taken in FY2019 (including some of the measures taken on April 1, 2019).
○ This report also summarizes the efforts reported in the relevant white papers on Cabinet decisions in a form corresponding to each of the recommendations.
○ For the main measures in this summary document, descriptions related to future issues are underlined.

## Recommendation 2: Review of the government's crisis management system

**Conduct a drastic review of systems related to the government's crisis management system, including clarification of the roles and responsibilities of the government, local governments, and companies in the event of an emergency.**

### Basic Measures

- In September 2012, the Nuclear Emergency Response Headquarters was expanded and the Nuclear Emergency Preparedness Council was established. In October 2012, a system was established to implement the collection of information and decision-making to be centered on the Prime Minister's Office in the event of a nuclear disaster. In October 2014, a Cabinet Office Director General (for Nuclear Disaster Management) was appointed to centrally take charge of comprehensive coordination related to nuclear disaster prevention, and the nuclear disaster prevention system was strengthened dramatically.
- Through the activities of each Regional Committee for Nuclear Emergency Preparedness in the 13 regions, the implementation of regional disaster management plans and evacuation plans was supported. In March 2020, the "Emergency Response in the Onagawa Area" was formulated and its details were confirmed. The Nuclear Emergency Preparedness Council approved Emergency Responses in the Sendai area, Ikata area, Takahama area, Tomari area, Genkai area, and Ohi area. The plans will continue to be improved and strengthened. Nuclear Energy Disaster Prevention Drill were conducted based on the assumption of a complex disaster involving natural hazards.
- The NRA Guide for Emergency Preparedness and Response (NRA EPR Guide) was formulated, and the Emergency Planning Zone (PAZ: within approximately 5 km from the nuclear facility; UPZ: within approximately 30 km), the Emergency Action Level (EAL), and other such matters were specified in October 2012. Response measures at off-site, including the division of roles between the national and local governments, have been strengthened. The emergency radiation monitoring system and the medical treatment system in a nuclear disaster have been strengthened.

**Recommendation 2 1) Conduct a drastic review of the government's crisis management system. Institutionally establish a system with enforcement powers that can respond to emergencies as well as unified lines of authority.**

### Main Measures of FY2019

(Related white papers: White Paper on Disaster Management and NRA Annual Reports)

- From November 8 to 10, the FY2019 Nuclear Energy Disaster Prevention Drill for the Shimane Nuclear Power Station was carried out over the course of three days for the first time. In addition, the response and coordination for natural hazards were verified by, for example, holding a joint meeting between the Emergency Disaster Response Headquarters and the Nuclear Emergency Response Headquarters. To compile the "Emergency Response in Shimane Area" , step-by-step protective actions in accordance with the development of situation(or emergency) were implemented and verified based on the evacuation plans of the prefecture and cities, and their effectiveness was confirmed.
- To enhance the nuclear disaster response system, a two-shift system was introduced for the staff at the Nuclear Emergency Response Headquarters.

On March 30, 2020, based on the issues pointed out by the Integrated Regulatory Review Service

(IRRS) of the International Atomic Energy Agency (IAEA), the Nuclear Regulation Authority (NRA) developed a manual clarifying initial responses if a disaster occurs due to the land transportation of nuclear fuel materials, nuclear raw materials and radioisotopes. With regard to the development of medical treatment systems for a nuclear disaster, the NRA established close coordination with the National Institutes for Quantum and Radiological Science and Technology designated as the Core Advanced Radiation Emergency Medical Support Center in April, as well as with four universities which have been designated as the Advanced radiation emergency medical support center and the Nuclear Emergency Medical Support Center, and established a network among nuclear emergency medical care organizations.

- On July 3, the NRA revised the NRA EPR Guide and the "Distribution and Administration of Stable Iodine" were revised to explain the appropriate timing for taking stable iodine, and about considerations to the persons who should take them on a priority basis and it stipulated a provision for enabling their distribution also through pharmacies etc. employing a member of pharmacist association.
- After identifying issues to be addressed from the outcome of nuclear emergency response drills conducted by nuclear licensees in FY2018, the NRA organized them and decided to review the Emergency Action Level (EAL), which nuclear licensees use to determine whether a situation corresponds to an emergency classification. At the 61st FY2019 NRA Commission Meeting (February 5, 2020), the NRA decided to revise the NRA EPR Guide and related regulations.

**Recommendation 2 2) With the government and local governments playing a central role, off-site measures for responding to a release of radioactivity shall be implemented, putting the health and safety of residents first. The roles of the government and local governments shall be divided and implemented under the government's crisis management function.**

Main Measures of FY2019

(Related white papers: White Paper on Disaster Management and NRA Annual Reports)

**(Support for the formulation of regional disaster management plans and evacuation plans)**

- On March 25, 2020, the "Emergency Response in the Onagawa Area" was formulated and its details were confirmed by the Onagawa Regional Committee for Nuclear Emergency Preparedness.
- In the UPZ, taking into consideration the burden involved in receiving stable iodine if they were urgently distributed, a decision was taken to promote efforts to distribute these iodine in advance at the discretion of the local government for residents who were expected to evacuate more smoothly in the event of prior distribution.
- The "Basic Policy on Economic and Fiscal Management and Reform 2019" (Cabinet decision taken on June 21, 2019) states the following: "For a nuclear disaster, the government will consolidate and reinforce the disaster management system by promoting the evacuation plan, developing human resource through training, securing evacuation routes by road improvement and maintenance, smoothing the evacuation through experimental evacuation models, developing the radiological protection facilities, and improving quality of nuclear disaster medicine." Based on this, the relevant ministries and agencies will work together to continuously enhance and strengthen the disaster management system. Under the first supplementary budget for FY2019, projects such as radiation protection measures were carried out. Under the FY2020 budget, materials and equipment such as radiation measuring instruments and protective clothing necessary for disaster prevention activities conducted by

local governments will be provisioned. And, support will be provided for evacuation facilitation measures in a nuclear disaster.

**(Strengthening of exercise and training related to phased protective actions for residents and prolonged disaster response)**

- Co-sponsored by Hokkaido, a non-scenario-based exercise was conducted based on the assumption that an accident had occurred at the Tomari Nuclear Power Station of Hokkaido Electric Power Co., Inc. during a snow disaster.
- In terms of human resource development related to nuclear disaster management, various training sessions were conducted for national and local government employees, such as basic training, training for human resources who would play a key role at the response headquarters etc. of the national and local governments, and training for local government practitioners, in order to systematically promote human resource development.
- To prepare for the unlikely occurrence of a nuclear disaster and a prolonged disaster response, the extraction of various issues and other matters related to the provision of support for nuclear disaster victims is being promoted in cooperation with related ministries and agencies, with training for a prolonged disaster response being conducted in December 2019 and other training sessions being conducted in February 2020.

**(Enhancement and strengthening of emergency radiation monitoring system)**

- In various training sessions, operations were improved by utilizing the Emergency Radiation Monitoring Information Sharing and Announcement System, which can integrate emergency radiation monitoring results and quickly share and announce them among concerned related parties.

**Recommendation 2 3) In the event of an accident, the on-site response (stopping, cooling, or confining) shall primarily be the responsibility of the nuclear operator and a mechanism shall be introduced to prevent the issuing of erratic instructions and interventions by politicians.**

(Related white papers: NRA Annual Reports)

## Recommendation 3: Government response to disaster victims

**To protect the health and safety of residents and restore their livelihoods while continuously monitoring the environment of the disaster area over the long term, the measures described below shall be implemented under the responsibility of the government as soon as possible.**

### Basic Measures

- The national government contributed a grant to the "Fukushima Prefectural Health Management Fund," which was established by Fukushima Prefecture in FY2011, and Fukushima Prefecture used this fund to carry out activities such as prefectural health surveys and internal exposure dose inspections. The Ministry of the Environment provided support for the efforts of Fukushima Prefecture, identified trends in disease morbidity, implemented risk communication projects, and took other actions that met local needs. Monitoring was carried out in accordance with the "Comprehensive Radiation Monitoring Plan," and the results were announced by the NRA.

- The Ministry of the Environment mainly conducted decontamination works in Special Decontamination Areas (SDA), while the municipalities mainly implemented the works in Intensive Contamination Survey Areas (ICSA). The whole area decontamination works in two areas were completed in March 2018, except for in the Restricted area.

- In terms of the interim storage facility, the project was implemented in accordance with the "Revised Basic Guidelines for Reconstruction in Response to the Great East Japan Earthquake in the 'Reconstruction and Revitalization Period'" (Cabinet decision taken on March 8, 2019).

- The evacuation orders for all of the Preparation areas for lift of evacuation order and the Habitation restricted areas were lifted by March 2020. After the evacuation orders were lifted, the national and local governments worked together to further full-scale work for return and reconstruction in line with the requirements of the guidelines entitled "Toward Acceleration of Fukushima Reconstruction from the Nuclear Disaster (Revised)."

- Nuclear damage compensation was carried out by TEPCO based on the interim guidelines and other resources issued by the Dispute Reconciliation Committee for Nuclear Damage Compensation.

- The "Public-Private Fukushima Soso region Revitalization Joint Team" supported the resumption of businesses and other activities for disaster-affected businesses and farmers. The "Fukushima Innovation Coast Framework" and "The Fukushima Plan for a New Energy Society" were strongly promoted.

**Recommendation 3 1) To deal with long-term health hazards and health-related anxieties, continuous examinations and health checks to detect external and internal exposure shall be carried out at the expense of the national government. In addition, a medical care provision system shall be established. Putting the health and safety of the residents first rather than the convenience of the provider, the disclosure of information shall be promoted so that inhabitants can make their own decisions.**

### Main Measures of FY2019

(Related white papers: Environmental White Paper and Report on the Status of Recovery from the Great East Japan Earthquake)

**(Countermeasures for health controls and health-related anxieties)**

○ On April 12, a meeting of the "Task Force on the Nuclear Hazard's Influence Including the Negative Reputation Impact" was held to report on the status of efforts being made by related ministries and agencies and other such matters based on the "Radiation Risk Communication and Measures against Harmful Rumors" and examine the future direction to be taken. In addition, a document entitled "Basic Information on Radiation Risk," which summarizes basic information such as the level of radiation in Fukushima, knowledge and scientific knowledge required to consider the health risks of radiation, and international or professional thinking on radiation reduction, was updated in May and distributed to the municipalities and other institutions in Fukushima Prefecture.

**Recommendation 3 2) Radioactive materials that exist within wide areas, including forests and rivers, may increase depending on their location so, from the viewpoint of maintaining the living base of the inhabitants over the long term, continuous monitoring of the redispersion, precipitation, deposition, etc., of radioactive materials shall be conducted and measures to prevent the spread of contamination shall be implemented.**

Main Measures of FY2019

(Related white papers: NRA Annual Reports)

**(Radiation monitoring)**

○ Detailed monitoring was conducted for the Restricted area.

○ As a future policy related to the reviewing of locations for the real-time radiation dose rate measuring systems, a decision was provisionally taken at the 10th FY2019 NRA Commission Meeting (May 29, 2019) to basically keep these systems located in the municipalities where evacuation orders have not been issued in Fukushima Prefecture. For those that are concentrated in small areas, a decision was taken to optimize their placement with the understanding of the relevant municipalities.

**Recommendation 3 3) The government shall provide selection criteria and work schedules for decontamination areas and implement the necessary policies so that residents can make their own decisions about returning home, relocating, or being compensated.**

Main Measures of FY2019

(Related white papers: Energy White Paper, Environmental White Paper, and Report on the Status of Recovery from the Great East Japan Earthquake)

**(Decontamination)**

○ In terms of the development of the Specified Reconstruction and Revitalization Bases in the Restricted area, the "Reconstruction and Revitalization Plans for the Specified Reconstruction and Rehabilitation Bases" have been approved for Futaba Town, Okuma Town, Namie Town, Tomioka Town, Iitate Village, and Katsurao Village. Houses and other buildings are being demolished and the areas are being decontaminated according to the plans.

○ With regard to forests, 14 districts were selected as targets for the Satoyama Restoration Model Project based on the "Comprehensive Efforts toward Regeneration of Forests and Forestry in Fukushima" and an interim report on the results, issues, and other matters related to the model project was made in January 2020. The project has been completed in 11 districts by March 2020.

**(Interim storage)**

○ By the end of FY2019, the land acquisition required for the development of the interim storage facility had been steadily progressing. Contracts for about 1,164 ha of land were concluded with 1,759 people. In March 2020, the volume reduction facility for Futaba Town started operation, and the ash generated at the facility began to be stored in the waste storage facility. In terms of

the transportation of removed soil and other waste to the interim storage facility, a total of about 6.68 million $m^3$ was delivered by the end of the fiscal year.

- In January 2020, the following polices were announced as part of the "Policy on Interim Storage Facility Project in FY2020": (1) carry out the work while gaining the understanding of the region with safety first; (2) aim to complete the transportation of most of the removed soil and other waste that has been temporarily stored in the prefecture (excluding Restricted area) by FY2021; and (3) in line with the plan, transport the same amount of removed soil as the previous fiscal year with safety first in FY2020 while efforts are made to eliminate temporary storage areas near residential areas.
- With regard to efforts for the final disposal of the removed soil and other waste, efforts such as a recycling demonstration project are being promoted based on the "Technology Development Strategy for Volume Reduction/Recycling of the Removed Soil in the Interim Storage Facility" and the "Process Chart."

**(Review of area under evacuation orders)**

- All of the evacuation orders for the Preparation areas for lift of evacuation order and the Habitation restricted area were canceled by March 2020.
- With respect to Restricted area, return preparation activities such as infrastructure restoration, decontamination works, and the dismantling of houses and other buildings have been started comprehensively in the Specified Reconstruction and Rehabilitation Base Areas of Futaba Town, Okuma Town, Namie Town, Tomioka Town, Iitate Village, and Katsurao Village. In March 2020, the evacuation orders for some areas in the Specified Reconstruction and Rehabilitation Base Areas of Futaba Town, Okuma Town, and Tomioka Town were lifted for the first time as Restricted area. In response to this, operations were resumed on all JR Joban Lines.

**(Compensation)**

- TEPCO is providing compensation based on the interim guidelines and other resources formulated by the Dispute Reconciliation Committee for Nuclear Damage Compensation, and a cumulative total of approximately 9,483.6 billion yen had been paid as of March 31, 2020.
- Since the beginning of 2019, TEPCO and the JA Group Council of Fukushima Prefecture have held discussions on the provision of new compensation for damages and other losses suffered by agricultural and forestry businesses in area under evacuation orders, and it was decided that this new compensation would be implemented after 2020.
- For publicity related to the extinctive prescription of the right to claim damages, the relevant ministries and agencies cooperated in the distribution of leaflets to local governments in Fukushima Prefecture and the provision of notifications via means such as government public relations radio.

**(Reconstruction support)**

- Approximately 1.6 billion yen was allocated as the budget for FY2019 in order to continue various support projects, such as promoting the independence of disaster-affected businesses in the 12 affected municipalities, restoring town functions and promoting the independence of new establishments. In addition, support was provided in affected municipalities to promote community development. The "Public-Private Fukushima Soso region Revitalization Joint Team" had made individual visits to about 5,400 businesses and about 1,900 farmers by the end of March 2020.
- Looking ahead to the reconstruction and revitalization period, the Reconstruction Agency, the Ministry of Economy, Trade and Industry, and Fukushima Prefecture formulated the "Blueprint of Industrial Development Placing the Fukushima Innovation Coast Framework at the Core" in December. This blueprint shows the ideal form of independent and sustainable industrial development that Hamadori and other regions aim to achieve, and the direction of efforts that national, prefectural, municipal, and other related organizations will need to take to realize this.

- Concrete efforts to implement the Fukushima Innovation Coast Framework are underway, with the Fukushima Robot Test Field, which forms the core of the framework, and the Fukushima Hydrogen Energy Research Field, the world's largest renewable energy-derived hydrogen production facility, having been fully opened in March 2020. A total of 6.9 billion yen was appropriated as its budget for FY2020.
- As a related budget based on the Fukushima Plan for a New Energy Society, a total of 67.3 billion yen was allocated in the FY2019 budget and a total of 62.8 billion yen was appropriated in the FY2020 budget.

## Recommendation 4: Observation of electric utilities

**As an electric utility, TEPCO has interfered with the decision-making process of regulatory authorities such as the Nuclear and Industrial Safety Agency (NISA) through the Federation of Electric Power Companies of Japan, based on its close relationship with the Ministry of Economy, Trade and Industry. In addition to the surveillance and supervision of the regulatory authorities as stipulated in Recommendation 1, the Diet shall monitor electric utilities closely to prevent them from exerting undue pressure on the regulators.**

### Basic Measures

- The NRA has established rules for interviews with regulated parties and other stakeholders and is committed to the full disclosure of information. The Japan Nuclear Safety Institute (JANSI), which was established by nuclear operators and other bodies in 2012, has established a mutual radiation monitoring system between operators.
- To strengthen cooperation in the nuclear industry and link the safety of nuclear power stations to a higher standard, the Atomic Energy Association (ATENA) was established in 2018 as an organization that includes manufacturers and related organizations in addition to nuclear operators.
- TEPCO is promoting the restructuring of its governance system by taking actions such as organizational restructuring to facilitate implementation based on the special business plan and other strategies jointly created with the Nuclear Damage Compensation and Decommissioning Facilitation Corporation. Efforts that have been made to live up to the responsibility for Fukushima include monitoring and supervision by the Nuclear Reform Monitoring Committee for the crisis management efforts of the Nuclear Reform Special Task Force and disclosure of all data related to radiation.
- The structure for the implementation of decommissioning and contaminated water countermeasures was strengthened. Together with the electric utilities, the national government will continue to take measures in the forefront. In addition, multi-layered preventive measures are being implemented to deal with contaminated water. In May 2014, decommissioning support work for accident reactors was added to the role of the Nuclear Damage Compensation and Decommissioning Facilitation Corporation to enable decommissioning to proceed steadily. The Naraha Center for Remote Control Technology Development (NARREC) (Naraha Town) started operation in April 2016, and the Okuma Analysis and Research Center (Okuma Town) started operation in March 2018.
- With respect to exposure dose management for radiation workers, TEPCO and other parties are requested to implement effective exposure dose reduction measures and other initiatives. The labor standards inspection organization checks the implementation status and provides necessary guidance.

**Recommendation 4　1) The government shall set rules concerning contact with electric utilities and require information disclosure in accordance with these rules.**

### Main Measures of FY2019

(Related white papers: NRA Annual Reports)

**(Exchange of opinions on improving safety with regulated parties)**

- In October 2014, the NRA established a venue for exchanging opinions with the executive managers of businesses that own major nuclear facilities in order to hear opinions on the basic concept of efforts to improve the safety of nuclear operators and receive proposals and other information related to improving the current regulatory system for the continuous improvement of safety. In FY2019, opinions were exchanged with 11 business operators, with the primary

focus on efforts related to matters such as safety improvements and proposals for improvement items.

- Based on discussions held concerning the basic concept of disclosing meetings and interviews with regulated parties and other stakeholders, the full-scale operation of automatic transcription for interviews with regulated parties began in February 2020.

**Recommendation 4 2) A mutual surveillance system shall be established among electric utilities to review advanced case studies related to nuclear safety and encourage constant efforts to achieve nuclear safety.**

Main Measures of FY2019

(Related white papers: Energy White Paper)

**(Utilization of risk information)**

- The Nuclear Risk Research Center (NRRC) carried out the following activities: (1) support for activities related to the utilization and practice of probabilistic risk assessment (PRA) methods in the field; (2) PRA review by overseas experts on pilot plant projects (Ikata Nuclear Power Station Unit 3 and Kashiwazaki-Kariwa Nuclear Power Station Units 6 and 7) for the advancement of PRA methods and an examination of the method for responding to the comments obtained; and (3) advancement of tsunami PRAs that utilize data from Hamaoka Nuclear Power Station Unit 4.

**(Efforts of self-regulatory organizations)**

- JANSI carried out the following activities: (1) peer reviews at the Kashiwazaki-Kariwa Nuclear Power Station, the Shika Nuclear Power Station, and the Ohi Nuclear Power Station; (2) rating of these power stations based on their operational performance and index data related to safety improvement activities and peer reviews and reflection of these results in JANSI membership fees; and (3) awards for power station activities that have contributed significantly to improving the safety of the nuclear industry.

**(Strengthening efforts in the nuclear industry)**

- ATENA carried out the following activities: (1) conclusion of a technical cooperation agreement with the Nuclear Energy Institute (NEI), publication of "Guidelines for Safety Performance Indicators (PIs) to Be Used in Nuclear Regulatory Audits"; (2) publication of the "Voluntary Guide to the Introduction of Cyber Security Measures"; (3) publication of "Trends in Emergency Diesel Generator Failures and Improvement Measures at Domestic Nuclear Power Stations"; and (4) hosting of ATENA Forum 2020.

**Recommendation 4 3) Encourage TEPCO to rebuild its governance system, crisis management system, information disclosure system, and other relevant systems and to implement continuous self-reform with the aim of meeting higher safety goals.**

Main Measures of FY2019

(Related white papers: Energy White Paper and NRA Annual Reports)

**(Measures for decommissioning and contaminated water countermeasures)**

- As countermeasures for contaminated water, multi-layered preventive measures were steadily implemented in line with three basic policies (keeping water away from the contamination source, preventing leakage of contaminated water, and removing the contamination source).

- As measures designed to keep water away from the contamination source, frozen soil walls situated on the land side, sub-drains and the other measures are functioning. At the same time, a water level management system that stably controls the groundwater level and keeps the most of groundwater away from the building continues to function.

- As a measure to prevent leakage of contaminated water, a switch from flange-type tanks to highly reliable welded-type tanks was completed in March 2019. Just in case there is a leak, double weirs have been installed around the tanks and activities such as patrols are carried out multiple times a day to prevent any leaked water from flowing out into the external environment.
- As a measure designed to remove the contamination source, purification treatment is carried out using facilities such as the Advanced Liquid Processing System (ALPS). Based on the February 2020 report published by the Subcommittee on Handling of the ALPS Treated Water, which was established by the Ministry of Economy, Trade and Industry, the government planned to hold meetings to hear the opinions of a wide range of parties concerned, including local government representatives and agriculture, forestry and fishery workers, in order to decide on a government policy for handling the ALPS treated water from April.
- In an effort to remove fuel from the spent fuel pool, actions such as the removal of rubbles from the north side of first implementing Unit were begun in January 2018. At Unit 2, actions such as the removal and clean-up of objects left on the operating floor were promoted. At Unit 3, fuel removal began in April 2019, with 119 of the total 566 fuels having been removed as of March 31, 2020.
- The retrieval of fuel debris is a difficult undertaking that has no precedence anywhere in the world, but the Mid-and-Long-Term Roadmap that was revised in December 2019 stipulated the method to be used for the retrieval of fuel debris from first implementing Unit. It was stated that a trial retrieval would be started at Unit 2 during 2021 and that the scale of the retrieval would then be gradually expanded.
- Based on the progress made in the implementation of TEPCO's decommissioning and contaminated water countermeasures, the NRA has approved 21 changes to the implementation plan. The NRA monitors TEPCO's efforts while checking its compliance with the plan. In FY2019, the TEPCO’s policy concerning removal of spent fuel and other waste from the spent fuel pools of Units 1 and 2 was decided. Furthermore, it was confirmed that the residual water removal and treatment from the Unit 1 waste treatment building and the priority removal and treatment of the stagnant water in the Unit 4 turbine building and other measures had been completed. In addition, the "Target Map for Reducing Mid-Term Risks at TEPCO's Fukushima Daiichi NPS" were revised and the 10-year vision was set in March 2020. The key risk reduction goals that would need to be achieved over the course of about three years to realize this vision were presented.

## Recommendation 5: Requirements for a new regulatory organization

Viewing this accident as a turning point, the regulatory organization shall prioritize the health and safety of the public and make drastic changes to become an organization that constantly evolves to improve safety. This new regulatory organization shall meet the requirements described below.

### Basic Measures

- In September 2012, the NRA was established as a committee in accordance with Article 3 of the National Government Organization Act by integrating the nuclear regulation functions and other such activities that were carried out by the relevant administrative organ. In the final compilation published by the Three-Year Investigative Review Team in September 2015 concerning the administrative organization related to the safety of nuclear energy utilization, it was concluded that it is difficult to confirm any need for a transfer to the Cabinet Office in order to improve independence and neutrality.
- Transparency in decision-making is ensured and interviews with the electric utilities are disclosed in accordance with the rules. Every year, the NRA Annual Report is submitted to the Diet and published.
- The NRA will endeavor to hire private sector professionals with practical experience, young staff, and other suitable personnel. The NRA Human Resource Development Center was established in March 2014. The dispatching of staff to international organizations is proactively performed. The operational policy for the no-return rule was decided at the NRA Commission Meeting held in September 2015.
- Self-reform is implemented based on the recommendations from the IAEA's IRRS and the International Physical Protection Advisory Service (IPPAS) as well as the advice and other information provided by commissioned international advisors. The Management System Office was established in April 2016 at the NRA Secretariat to provide internal audits, business improvement guidance, and the like.

**Recommendation 5 1) A high degree of independence shall be established: (1) independence from promotional organization within the government; (2) independence from business operators; and (3) independence from politics. In addition, a line of authority, responsibility and authority as well as the related business processes shall be established to strengthen the supervisory function.**

(Related white papers: NRA Annual Reports)

### Main Measures of FY2019

**(Ensuring independence)**

- The NRA continues to hold public discussions based on one of its organizational philosophies, which states that "we shall make decisions independently, based on the latest scientific and technological information, free from any outside pressure or bias," while attempting to ensure transparency and made fair, neutral, and independent decisions from a scientific and technical standpoint.
- In accordance with the "Policy on Commissioners' Visits of Nuclear Facilities and Exchanges of Opinions with Local Parties," which was agreed at the FY2017 NRA Commission Meeting (November 15, 2017), the chairman and members of the NRA carried out an on-site inspection and exchanged opinions with local stakeholders and other parties.
- As part of this initiative, the NRA chairman and members visited the Ikata Nuclear Power Station, which is operated by Shikoku Electric Power Co., Inc., in April for an on-site inspection and

exchanged opinions with local stakeholders such as the Governor of Ehime Prefecture, the Mayor of Ikata, and the Mayor of Yawatahama at the Ehime Prefecture Off-site Center. In February 2020, the NRA chairman and members visited the Sendai Nuclear Power Station, which is operated by Kyushu Electric Power Co., Inc., for an on-site inspection and exchanged opinions with local stakeholders such as the Governor of Kagoshima Prefecture, the Mayor of Satsumasendai, the Mayor of Akune, and the Mayor of Hioki at the Kagoshima Prefectural Nuclear Emergency Preparedness Center.

**Recommendation 5 2) Transparency: (1) disclose the decision-making process, including information about various advisory groups, and eliminate the involvement of stakeholders, such as electric utilities, from the process; (2) impose an obligation to report to the Diet regularly on all matters related to decision-making processes, decision-making participants, policy implementation, and the like; (3) in principle, keep and disclose minutes of negotiations and other forms of discussion with promotional organization, business operators, and politicians; and (4) establish a transparent committee member selection process in which a third-party organization selects a considerable number of candidates and the Diet then makes the final decision on these appointments as personnel agreed by the Diet.**

Main Measures of FY2019

(Related white papers: NRA Annual Reports)

**(Ensuring transparency)**

- In an effort to improve the transparency of reviews, the NRA started the trial operation in April 2019 of a process for disclosing the results of the automatic transcription of interviews with regulated parties. The full-scale operation, which expanded the scale of interviews and other exchanges that are subject to disclosure, started in February 2020. In FY2019, 486 sets of minutes created by automatic transcription were posted on the website.
- The NRA has issued instructions concerning the preservation of the accident site to allow the continuous investigation and analysis of the accident at TEPCO's Fukushima Daiichi Nuclear Power Station (NPS) as well as instructions concerning decommissioning work. To avoid these instructions confusing or hindering TEPCO working on-site, the NRA decided to share and confirm the work policies and implementation plans of both parties while ensuring transparency and to align each instruction based on a unified understanding by holding open liaison and coordination meetings with the Agency for Natural Resources and Energy, the Nuclear Damage Compensation and Decommissioning Facilitation Corporation, TEPCO Holdings, the Japan Atomic Energy Agency and other related organizations as necessary.

**Recommendation 5 3) Professional ability and sense of responsibility toward duties: (1) train the human resources of the new regulatory organization at an early stage to achieve a world-class standard and implement global human resource exchanges, education, and training in the field of nuclear regulation to facilitate the recruitment and training of these human resources; (2) establish an advisory organization that includes foreign experts to obtain advice on the operation of regulatory authorities, the handling of human resources, and the setting of necessary requirements, such as the ideal conditions; and (3) apply the "no return rule" without exception from the beginning in order to focus on human resources who have a sense of responsibility toward their duties as members of the new organization.**

Main Measures of FY2019

(Related white papers: NRA Annual Reports)

**(Securing and Developing human resources for the NRA)**

- Having hired 33 people with practical experience of working for a private company and 22 new hires, the NRA had 1,008 employees as of March 31, 2020, so the proportion of vacancies filled was 95.4% (capacity: 1,056).
- To facilitate the widespread securement and development of human resources for positions related to nuclear safety and nuclear regulation, 17 projects have been implemented in collaboration with universities and other institutions as part of a nuclear regulation human resource development project that has been underway since FY2016.
- Education and training courses have been continuously implemented since FY2018 to enable staff to acquire the basic qualifications from among the inspector qualifications for five fields: nuclear inspection, nuclear safety review, safeguard inspection, emergency preparedness, and radiation regulation.
- To facilitate the full-scale operation of the new inspection system that was launched in April 2020, the NRA has enhanced its training to enable staff to develop a basic understanding of regulatory operations in general. Furthermore, for staff who are currently working as inspectors or in other such positions, the NRA has conducted the training and tests necessary for the enforcement of the new inspection system, awarded nuclear inspection qualifications, and secured the necessary inspectors.

**Recommendation 5 4) Centralization: Effectively unify the organizational structure, especially in relation to prompt information sharing, decision-making, and the demonstration of leadership in an emergency.**

Main Measures of FY2019

(Related white papers: NRA Annual Reports and White Paper on Disaster Management)

**(Government crisis management organization and strengthening of government nuclear disaster prevention system) (reposted; see "Recommendation 2 1)" on page 2)**

- From November 8 to 10, the FY2019 Nuclear Emergency Response Drill for the Shimane Nuclear Power Station was carried out over the course of three days for the first time. In addition, the response and coordination for natural disasters were verified by, for example, holding a joint meeting between the Emergency Disaster Response Headquarters and the Nuclear Emergency Response Headquarters. To compile the "Emergency Response in Shimane Area," step-by-step protective actions were implemented and verified based on the evacuation plans of the prefecture and cities in accordance with the turn of events and their effectiveness was confirmed.

**Recommendation 5 5) Autonomy: To ensure the health and safety of the public, the organization shall be required to review and self-reform while constantly incorporating the latest knowledge. The Diet shall monitor the progress made.**

Main Measures of FY2019

(Related white papers: NRA Annual Reports)

**(Full-scale operation and improvement of the management system)**

- The NRA carried out its tasks based on the "NRA Management Rules," the "Statement on Nuclear Safety Culture," and the "Regulatory Guides for Activity on Nuclear Security Culture" and in line with other resources, such as the "Mid-Term Goals for the First Term of the NRA" (from April 2015 to March 2020) and the "Annual Strategic Plan for FY2019." No internal notifications were made by the NRA staff in FY2019.
- At the 49th FY2019 NRA Commission Meeting (December 18, 2019), all of the NRA Management Rules were revised in response to the IRRS recommendation conducted in 2016. These revisions included the addition of provisions to regularly review the rules and guides, the incorporation of the latest IAEA standards, and the clarification of the relationship between management and the Administration Act on General Rules, etc.
- At the 61st FY2019 NRA Commission Meeting (February 5, 2020), the "Mid-Term Goals for the Second Term of the NRA" (April 2020 to March 2025), which include goals related to matters that need to be prepared over the next five fiscal years as well as goals related to activities that are to be executed securely and continuously, were formulated based on activities related to the "Mid-Term Goals for the First Term of the NRA."

**(Hosting of IRRS follow-up mission)**

- In January 2020, the NRA Secretariat hosted the IRRS follow-up mission, which is being conducted to re-evaluate the status of efforts related to the recommendations, suggestions, and other guidance provided through the IRRS mission conducted in 2016.
- Prior to hosting the IRRS follow-up mission, the NRA decided to additionally undertake a review related to the regulation of the land transportation of radioactive materials. Details of the NRA's efforts in response to the recommendations, suggestions, and other guidance provided through the IRRS mission conducted in 2016 and the report evaluating compliance with the IAEA safety standards for the land transportation of radioactive materials were compiled and submitted to the IAEA Secretariat.
- As a result of the IRRS follow-up mission, it was confirmed that major progress had been made in relation to the 13 recommendations and 13 suggestions provided through the IRRS mission conducted in 2016, such as the completion of responses to 10 recommendations and 12 suggestions by the implementation of measures such as introduction of new inspection system. In addition, a decision was taken to continue efforts related to the integrated management system and other such initiatives going forward.

**(Reception of IPPAS follow-up mission report)**

- In April, the government received a follow-up mission report to confirm the status of compliance with the recommendations and suggestions provided through the IPPAS mission conducted by the IAEA in FY2014. The report stated the following: "The team saw significant enhancements since the previous mission, observing that the nuclear security regime in Japan is robust and well-established, and incorporates the fundamental principles of the Amendment to the Convention on the Physical Protection of Nuclear Material."

## Recommendation 6: Reform of laws related to nuclear energy

Nuclear laws and regulations need to be thoroughly reviewed, including those detailed below.

### Basic Measures

- The Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (hereinafter the "Reactor Regulation Act") was revised and the world's strictest new regulations were introduced. In 2013, new regulatory standards were established, including those related to strengthening measures against severe accidents and the introduction of back fitting systems. These standards are continuously reviewed based on the latest scientific and technical knowledge, etc.
- Having established a study group, the NRA published the "Analysis of TEPCO's Fukushima Daiichi NPS Accidents Interim Report" in October 2014 and disseminated it to the rest of the international community.
- Through the hosting of missions conducted by organizations such as the IRRS, the attendance of various meetings held by international organizations, the implementation of a framework for bilateral cooperation with overseas organizations, and the undertaking of other such activities, the knowledge and lessons learned from the accident at TEPCO's Fukushima Daiichi NPS were shared with the international community.
- A decision was taken to ensure greater safety by taking the following measures. Following the revision of the Nuclear Reactor Regulation Act in April 2017, the inspection system was reviewed and the primary responsibility of the licensee to assure safety was thoroughly enforced. Based on the comprehensive monitoring/evaluation and inspection results conducted by regulatory body, the evaluation results for each nuclear facility were reflected in the continuation or strengthening of subsequent monitoring and inspection, etc.

**Recommendation 6 1) Based on the world's latest technical knowledge and other resources, reconstruct a unified legal system that puts the health and safety of the public first.**

### Main Measures of FY2019

(Related white papers: NRA Annual Reports)

**(Reform of inspection system)**

- To facilitate the enforcement of the new inspection system starting from FY2020, government ordinances, related rules, internal regulations, etc. were revised and enacted. In addition, with respect to the trial operation that started in October 2018, the concept of conducting risk-informed inspections—including priority evaluations of items identified in the inspections, comprehensive evaluations of plants, etc.—was shared by both the regulatory body and the licensees at all nuclear facilities from October 2019. In line with the activities described above, final preparations were carried out, such as confirming the operation of the entire system, and the new inspection system began full-scale operation following the enforcement of the law on April 1, 2020.

**Recommendation 6 2) Clarify the division of roles between the business operators, who have primary responsibility for ensuring safety, and the parties who handle other accidents and support the business operators in the event of a nuclear disaster.**

Main Measures of FY2019

(Related white papers: NRA Annual Reports)

**(Strengthening emergency response capabilities of nuclear operators)**

- To strengthen the emergency response capabilities of operators, evaluations of nuclear operator emergency response drills have been started for the nuclear fuel facilities in addition to those for commercial power reactors.
- Based on the FY2019 training policies, trainings for improving the judging ability of nuclear operators and trainings for enhancing on-site response ability were conducted.

**Recommendation 6 3) To ensure that nuclear-related laws and regulations reflect the lessons learned from domestic and foreign accidents, trends in global safety standards, and the latest technical knowledge and other resources, the regulatory authorities shall be required to review these laws and regulations constantly and promptly and a mechanism shall be established to monitor their implementation.**

Main Measures of FY2019

(Related white papers: NRA Annual Reports)

**(Reflecting the latest technical knowledge in nuclear regulations)**

- Based on a review of the eruptive volume of Daisen-Namatake Tephra from Daisen Volcano and other such studies, the NRA decided that the setting for the maximum thickness of falling pyroclastic materials at licensed nuclear power stations was inadequate. As a result, the NRA ordered Kansai Electric Power Co., Inc. in April to apply for permission to make changes to reactor installations for Ohi Nuclear Power Station (NPS) Units 3 and 4, Takahama NPS Units 1 to 4, and Mihama NPS Unit 3. In September, the applications for permission to make changes to reactor installations were received from Kansai Electric Power Co., Inc. and they were reviewed.
- For the tsunami caused by an offshore landslide in the Oki Trough, which may not be accompanied by tsunami warning, the NRA decided in July that it was necessary for Kansai Electric Power Co., Inc. to apply for permission to make changes to reactor installations for Takahama NPS Units 1 to 4 since it is necessary to select the standard tsunami setting when the tide gate for the water intake canal is open. In September, the applications for permission to make changes to reactor installations were received from Kansai Electric Power Co., Inc. and they were reviewed.
- The NRA received a report on the results of a study team's evaluation of ground motions without identification of seismic sources, and a decision was taken to incorporate the standard response spectra, which were compiled in a document entitled "Ground Motions without Identification of Seismic Sources (Commonly-Usable)," into the regulations in August. After that, in March 2020, basic policies such as the method of reviewing the standard response spectra, the target nuclear facilities, and the period of interim measures were decided, and instructions were issued for the preparation of a revised draft of the "Installation Permit Criteria and Evaluation Guide."
- Regarding the policy of requesting the suspension of nuclear reactors whose Specialized Safety Facilities have not been completed by the statutory deadline, the NRA approved a policy in October of not reordering the suspension of nuclear reactors that are clearly out of service with solid evidence due to regular inspections that were conducted on the expiration date. Kyushu Electric Power Co., Inc. and Kansai Electric Power Co., Inc. have submitted documents that

clearly indicate the suspension of Sendai NPS Units 1 and 2 and Takahama NPS Units 3 and 4, respectively.

**(Reflecting information and other resources concerning domestic and international accidents and problems in regulations)**

- The NRA Secretariat collected and organized information and other resources concerning domestic and international accidents and problems, screened the information and resources, and then held five Technical Information Committee meetings to discuss whether the events extracted through this screening process required regulatory action. It was confirmed that none of the events discussed at the meetings during FY2019 required regulatory action.

**(Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee)**

- The NRA Secretariat submitted a report to the Reactor Safety Examination Committee and the Nuclear Fuel Safety Examination Committee on July 5 and December 23 regarding the screening results for information and other resources related to accidents and problems in Japan and overseas, after which it received advice from both committees.

**(Radiation Council)**

- The Council discussed how to incorporate the 2007 Recommendations of ICRP into the domestic systems and drew up the “Interim Report on How to Proceed with Future Deliberations on the Dose Limit and Measurement Frequency for Female Radiation Workers (Including a Dose Limit for Pregnant Radiation Workers)” and the“Interim Report on How to Proceed with Future Deliberations on an Effective Dose Coefficient, a Concentration Limit in Exhaust Gas, Air, Effluent or Discharged Water and an Effective Dose.”

**(Participation in international meetings and other events)**

- The NRA attended various meetings hosted by organizations such as the IAEA, the Organization for Economic Co-operation and Development (OECD), and the Nuclear Energy Agency (NEA) and dispatched experts. Furthermore, the NRA has incorporated overseas knowledge by attending bilateral meetings with overseas nuclear regulatory authorities and through the framework of events such as those held by the International Nuclear Regulators Association (INRA) on May 21 and 22 and on September 17 as well as those held by the Western European Nuclear Regulators Association (WENRA) on April 10 and 11 and on October 15 and 16.
- The 12th Top Regulators' Meeting on Nuclear Safety among China, Japan, and Korea (TRM) was held on November 28 in Beijing. It was attended by Commissioner Nobuhiko Ban, a member of the NRA.

**(Promotion of nuclear safety research)**

- The NRA Secretariat has carried out 24 safety research projects in 13 research fields, including safety research related to evaluations of the integrity of materials irradiated in LWRs and evaluations of the long-term integrity of polymeric materials used in electric and instrumentation systems. NRA Technical Notes were established as a new section of the report.
- NRA Secretariat staff published 2 NRA Technical Reports, 1 NRA Technical Note, 19 journal papers, and 3 proceedings for international conferences and gave 34 academic conference presentations. In addition, they received four awards from academic societies for achievements in safety research.

**(Analysis of TEPCO's Fukushima Daiichi NPS Accident)**

- Due to improvements to the site environment, progress made in the decommissioning work, and other such developments, it has become possible to conduct the on-site investigations necessary for accident analysis. As part of an ongoing effort to investigate the cause of the accident, a decision was taken at the 28th FY2019 NRA Commission Meeting (September 11,

2019) to reorganize the implementation policy and system for accident analysis and compile an interim report to be published by the end of 2020.

○ Based on information and other resources obtained from 18 on-site investigations conducted by the NRA Secretariat, a study on the leakage route for radioactive materials, etc., through the pressure-resistant vent line for the reactor containment vessel was conducted by the "Committee on Analysis of TEPCO's Fukushima Daiichi NPS Accident."

○ To align work related to accident analysis with the decommissioning work, a decision was taken to hold liaison and coordination meetings from FY2019 with the participation of the NRA Secretariat, the Agency for Natural Resources and Energy, the Nuclear Damage Compensation and Decommissioning Facilitation Corporation, TEPCO, and other such organizations. These meetings were held three times in FY2019, and the necessary coordination and other tasks were conducted.

**Recommendation 6 4) In principle, the new rules shall be applied retroactively to existing reactors (such action being known as "back fitting"). To avoid the means, such as limits on rule revisions, being mistaken for the end, the criteria for determining whether a reactor should be decommissioned or whether suboptimal measures are allowed shall be clarified.**

Main Measures of FY2019

(Related white papers: NRA Annual Reports)

**(Strict and appropriate implementation of regulations related to nuclear facilities, etc.)**

○ The NRA has implemented the following measures for commercial power reactors.

- Permission to make changes to reactor installations in order to comply with the new regulatory standards for the Onagawa NPS
- Permission to make changes to reactor installations in relation to the Specialized Safety Facilities of Genkai NPS Units 3 and 4
- Permission to make changes to reactor installations in relation to the Specialized Safety Facilities of Ohi NPS Units 3 and 4
- Permission for all NPSs that have applied to make changes to reactor installations in relation to the confinement function of fuel cladding against radioactive material under seismic conditions
- Permission for all NPSs that have applied to make changes to reactor installations in relation to measures for the prevention of leakages to outside of the controlled areas due to internal flooding
- Approval for the decommissioning plans of Ohi NPS Units 1 and 2

○ The NRA received the following reports from the NRA Secretariat regarding nuclear fuel facilities, etc.

- Missing application for fire extinguishing facilities in the approval of the design and construction methods related to conformity to the new regulatory requirements that apply to the Nuclear Safety Research Reactor (NSRR) at the Nuclear Science Research Institute of the Japan Atomic Energy Agency (JAEA)
- Measures to prevent a recurrence of missing applications and to streamline the examination process for approval of the design and construction method, etc. at research and test reactors

○ At the 64th FY2019 NRA Commission Meeting (February 19, 2020), the NRA approved improvement measures for the overall examination of nuclear facilities.

**(Enhancement of nuclear security measures)**

- In April, the government received a follow-up mission report to confirm the status of compliance with the recommendations and suggestions provided through the IPPAS mission conducted by the IAEA in FY2014. (Reposted)
- The report was disclosed in December 2019, and the status of compliance with the recommendations and other guidance provided in the IPPAS follow-up mission report was reported at the 48th FY2019 NRA Commission Meeting (December 16, 2019).

## Reference: Recommendations to the Diet

Recommendation 1: National Diet surveillance of the regulatory authorities

To protect the health and safety of the public, a permanent committee for dealing with nuclear issues shall be set up in the Diet for the purpose of supervising the regulatory authorities.

1) This committee shall listen to explanations from the regulatory authorities, hear opinions from stakeholders, academic experts, and other relevant parties, and conduct other investigations on a regular basis.
2) This committee shall establish an advisory organ consisting of experts who have a global perspective and are independent of the business operators and administrative organs to ensure that they can respond to safety issues based on the latest knowledge.
3) This committee shall conduct continuous monitoring activities concerning the implementation and improvement status of the many problems identified in the relevant accident verification.
4) Based on this accident investigation report, the committee shall supervise the future performance status of the government and request regular reports.

Recommendation 4: Surveillance of electric utilities

As an electric utility, TEPCO has interfered with the decision-making process of regulatory authorities such as the Nuclear and Industrial Safety Agency (NISA) through the Federation of Electric Power Companies of Japan, based on its close relationship with the Ministry of Economy, Trade and Industry. In addition to the surveillance and supervision of the regulatory authorities as stipulated in Recommendation 1, the Diet shall monitor electric utilities closely to prevent them from exerting undue pressure on the regulators.

4) To ensure the effectiveness of measures 1) to 3), the Diet shall take the initiative to establish an audit system with on-site inspection rights for the purpose of monitoring the electric utilities' soundness of governance and the observance status for safety standards, safety measures, etc.

Recommendation 7: Utilization of an independent investigation committee

To investigate and discuss subjects such as the following that have a significant impact on people's lives, the Diet shall establish a third-party organization called the Extraordinary Nuclear Investigation Committee (tentative name): investigating the causes of the unexplained aspects of the accident, developing a process for dealing with the accident, preventing the spread of damage, addressing the decommissioning plan not covered in this report, and resolving the spent nuclear fuel problem. This committee shall consist of experts centered on the private sector who are independent of nuclear operators and administrative organs. In addition, the Diet shall establish such an independent investigation committee for each issue as a mechanism while continuing to investigate and examine the subjects without being bound by conventional ideas.