

**FY 2020**

# **Annual Report**

Nuclear Regulation Authority

The Nuclear Regulation Authority reports the state of affairs under its jurisdiction to the Diet based on the provisions of Article 24 of the Act for Establishment of the Nuclear Regulation Authority (Act No. 47 of 2012).

## **Major Activities in Fiscal Year 2020**

### **(1) Rigorous and Proper Implementation of Regulations (Major Permissions, etc.) and Continuous Improvement of Regulatory Systems (Major Regulation Revisions)**

With regard to nuclear fuel cycle facilities, etc., the NRA granted permission for license modifications to conform to new regulatory requirements at Japan Nuclear Fuel Limited's reprocessing facilities, MOX fuel fabrication facility, and waste storage facilities, and the Recycle Fuel Storage Center of Recyclable-Fuel Storage Company, and granted permission to change reactor installation relating to conform to new regulatory requirements for the High -Temperature Engineering Test Reactor (HTTR) at the Japan Atomic Energy Agency (hereinafter referred to as "JAEA") Oarai Research and Development Institute (North Area). With regard to Special Facility for Severe Accident Management, permission was granted for a change in reactor installation at Unit 3 at the Mihama PS of Kansai Electric Power Co., Inc. Decommissioning plans were approved for Ikata NPS Unit 2 of Shikoku Electric Power Co., Inc., the uranium enrichment facility at the Ningyo-toge Environmental Engineering Center of the JAEA, the Japan Materials Testing Reactor (JMTR) at the JAEA's Oarai Research and Development Institute, and the tank-type critical assembly (TCA) of the Nuclear Science Research Institute.

As part of continuous improvement of regulatory requirements, steady progress has been made in revising and developing various standard systems, including: review of revision of standards relating to ground motions without identification of seismic sources, formulating assessment guidelines relating to human and organizational factors, revising rules to incorporate matters pointed out by the Integrated Regulatory Review Service (IRRS) follow-up mission and International Atomic Energy Agency (IAEA) rules for safe transportation of radioactive materials (2018 version), and summarizing requirements for development of regulatory requirements for mid-depth disposal.

(For details, see Sections 1 and 2 of Chapter 2)

### **(2) Full-scale Operation of New Inspection Program**

Regarding nuclear regulatory inspections, which are a new inspection program, full operations began in April 2020 based on trial operation conducted up to FY2019, and due to the effects of COVID-19 transmission, this was done through flexible operations such as changing the original inspection plan for the fiscal year.

The partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS, which came to light due to a report from TEPCO on January 27, 2021, was at a level with major impact on physical protection function or performance, and it was determined to have the potential of developing into a serious situation from the standpoint of nuclear security. A request was made to TEPCO to report, by September 2021, a plan for improvement measures/activities covering the case of unauthorized use of an ID card at the Kashiwazaki-Kariwa NPS, as occurred on September 20, 2020, and based on the Act on Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (Act. No. 166 of 1957; hereinafter referred to as the "Reactor Regulation Act"), a policy was adopted of issuing instructions to TEPCO to take corrective measures, and prohibiting movement of specified nuclear fuel materials<sup>1</sup> at the Kashiwazaki-Kariwa NPS until the effectiveness of improvements is evident. (Instructions to take corrective measures were subsequently issued on April 14, 2021.)

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<sup>1</sup>Of the radioactive materials contained in nuclear fuel (more specifically, fresh fuel and spent fuel) used at nuclear power stations, those specified in the Reactor Regulation Act such as plutonium (except Pu-238) and uranium-233.

To continually improve systems, views were exchanged on topics such as mechanisms of system improvement and techniques for assessing significance at nuclear fuel cycle facilities, etc., by holding an “Opinion Exchange Meeting on Inspection Programs” for exchange of views with external experts and nuclear operators.

To strengthen quality management systems in line with enforcement of nuclear regulatory inspections, measures were put into effect such as an “NRA Rule on Standards for Systems Necessary for Quality Management relating to Work to Ensure Safety of Nuclear Facilities,” and the shift to the new system is being made through review and processing of the accompanying approval for changes in operational safety programs.

(For details, see Section 3 of Chapter 2, and Section 1 of Chapter 3)

### **(3) Ensuring the Safety of Decommissioning of TEPCO’s Fukushima Daiichi NPS and Analyzing the Accident**

The NRA is overseeing TEPCO’s activities to comply with the approved “Implementation Plan Pertaining to Specified Nuclear Facilities at the Fukushima Daiichi NPS” through operational safety inspections, pre-service inspections, welding inspections, periodic facility inspections, security inspections, and daily inspection patrols by the nuclear operation inspectors stationed on the site.

In the Committee on Accident Analysis of the Fukushima Daiichi Nuclear Power Station (hereinafter referred to as the “Accident Analysis Committee Meeting”), established by the NRA, research and analysis have been carried out using the results of on-site investigations and the records from the time of the accident at TEPCO’s Fukushima Daiichi NPS, and based on those study results, an “Interim Report on Research and Analysis on the Accident at TEPCO’s Fukushima Daiichi NPS” was published in March 2021.

(For details, see Sections 1 and 2 of Chapter 4)

### **(4) Response to COVID-19 Transmission**

Meetings of the NRA Secretariat’s task force to cope with COVID-19 transmission were held 33 times, and due to circumstances such as the declaration of a state of emergency, measures were implemented to prevent transmission including banning general audiences and limiting the number of attendees at regular meetings of the NRA, and efforts were made to achieve balance with business continuity.

For reviews based on the Reactor Regulation Act, steps were taken to minimize the impact on review work while implementing measures to prevent COVID-19 transmission. With regard to nuclear regulatory inspections, daily inspections conducted primarily by NRA Regional Offices were performed basically according to the original plan, and team inspections conducted primarily by inspectors dispatched from the Secretariat were performed with changes to the inspection plan due to the effects of refraining from travel in light of the state of emergency at the start of the fiscal year.

Regarding safety activities conducted by nuclear operators based on the Reactor Regulation Act, flexible operations were carried out after considering the effects on nuclear facilities in terms of safety. Regarding notifications and inspections based on the Act on the Regulation of Radioisotopes, etc. (Act No. 167 of 1957; hereinafter referred to as the “Radioisotope Regulation Act”), flexible operations were carried out within a reasonable scope in terms of deadlines, periods, and frequencies.

(For details, see Section 4 of Chapter 1)

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**Chapter 1 Ensuring Independence, Impartiality and  
Transparency, and Improving the  
Organizational Structure/System**

## ○ Summary of Chapter 1

### **(Efforts for Ensuring Independence, Impartiality, and Transparency of Nuclear Regulatory Administration)**

Based on its organizational philosophy, the NRA has continued to strive to ensure transparency, including thorough public discussions, and made its decisions in an impartial, neutral and independent manner from the scientific and technological viewpoints.

The NRA met with 4 operators in FY2020 to exchange opinions with chief executive officers (CEOs) of major nuclear power facilities to promote communication with outside parties. An opinion exchange meeting was held with Chief Nuclear Officers (CNOs), and views were exchanged with nuclear operators (including the Atomic Energy Association (ATENA<sup>2</sup>)). In response to a request from ATENA, a working-level meeting to exchange technical views was held concerning aging deterioration management. In order to archive important information resources posted on the NRA website, and make those resources available more broadly to citizens, the NRA archive search system “N-ADRES” has been developed and opened to the general public.

### **(Enhancement of Infrastructure to Support Regulatory Operations)**

In light of the mid-term goals for the NRA’s second term (FY2020-2024) and the issues pointed out by the IRRS follow-up mission, the NRA worked to achieve continuous improvement of the NRA management system, newly formulated an “Action Plan on the Management System and Nuclear Safety Culture” aimed at cultivating and maintaining nuclear safety culture, and promoted activities to improve the management system and cultivate/maintain nuclear safety culture based on that action plan.

In terms of collaborating with the international community, it was decided for FY2020 to refrain from overseas travel, and postpone or suspend scheduled meetings due to the effects of the COVID-19 pandemic, but through the use of online conferencing systems to replace face-to-face meetings, new opportunities for communication were created, and numerous essential opinion exchanges and discussions were held.

### **(Securing and Developing Personnel Resources)**

In FY2020, the NRA adopted 29 new graduates, and employed 21 experienced persons.

To achieve human resource development of the NRA staff, the competence of staff was managed by awarding qualifications in 5 job fields, and this was reflected in their position and salary. Knowledge management activities, such as e-learning for transferring and sharing administrative experiences and technological knowledge, were continued.

<sup>2</sup> ATENA is an organization established by operators/manufacturers to address shared technical issues in the nuclear power industry through concerted efforts by the entire industry, as indicated below. The NRA has been exchanging opinions, including with ATENA on a trial basis, since opinion exchange meetings with CNOs in FY2019.

(1) Identifies shared technical issues, and determines countermeasures

(2) Represents the nuclear power industry, and engages in dialog with regulatory authorities

(3) Strives for communication with society about efforts to improve safety in the nuclear power industry

Starting from FY2018, the NRA has been providing education and training courses for basic qualifications to NRA staff in 5 job fields, in order to continually secure and develop human resources capable of handling regulatory work. To cope with increasing numbers of staff taking these education and training courses, the NRA has improved and bolstered courses by reviewing curricula and instructional methods.

Moreover, the NRA had its 50 research personnel engage in joint research projects (including simultaneous engagement in multiple projects) and dispatched 2 research personnel to the JAEA in order for them to exclusively engage in testing and research activities. The NRA accepted 1 JAEA staff member engaged in research-related work.

**(Response to COVID-19 Transmission)**

Meetings of the NRA Secretariat's task force to cope with COVID-19 transmission were held 33 times, and due to circumstances such as the declaration of a state of emergency, measures were implemented to prevent transmission including banning general audiences and limiting the number of attendees at regular meetings of the NRA.

For reviews based on the Reactor Regulation Act, steps were taken to minimize the impact on review work while implementing measures to prevent COVID-19 transmission. With regard to nuclear regulatory inspections, daily inspections conducted primarily by NRA Regional Offices were performed basically according to the original plan, and team inspections conducted primarily by inspectors dispatched from the Secretariat were performed with changes to the inspection plan due to the effects of refraining from travel in light of the state of emergency at the start of the fiscal year.

Regarding notifications and inspections under the Radioisotope Regulation Act, flexible operations were carried out within a reasonable scope in terms of deadlines, periods, and frequencies.

The oral test portion of the chief engineer of reactors test, administered in September 2020, was completed without any delay by taking appropriate measures to prevent COVID-19 transmission. The test for supervisors of radiation protection was postponed from the usual date in August to December, and then administered by taking appropriate measures to prevent COVID-19 transmission. Flexible operations with respect to deadlines were carried out regarding periodic training of supervisors of radiation protection under the Radioisotope Regulation Act.

## **Section 1 Implementation of Regulatory Activities that Embody the Core Values and Principles of the NRA**

### **1. Efforts for Ensuring Independence, Impartiality, and Transparency of Nuclear Regulatory Administration**

#### **(1) Ensuring Independence**

Independent decision-making is vital for effective regulation and is also emphasized by many global nuclear regulatory organizations as one of the most significant factors of their own organizational philosophy. The NRA, which was established as a highly independent Article 3 Authority, states that “we shall make decisions independently, based on the latest scientific and technological information, free from any outside pressure or bias” in “NRA’s Core Values and Principles.” While attempting to ensure transparency by thoroughly implementing public discussions and so on, the NRA is continuing to make decisions in an impartial, neutral, and independent manner from scientific and technological viewpoints. Independence of nuclear regulatory administration was ensured through thorough discussion and decision making from the scientific and technical point of view at 70 NRA Commission Meetings (on a total of 251 subjects) throughout the year in FY2020.

#### **(2) Ensuring Impartiality**

The NRA defined the “Code of Conduct related to Ethics for NRA Chairman and Commissioners” at the 1st FY2012 NRA Commission Meeting (September 19, 2012). The Code stipulates that the Chairman and the Commissioners must not receive donations from nuclear operators during their term of office and that they must disclose information on any donations which they received in the 3 years prior to assuming office. Further, they must disclose any situation involving their students finding jobs with nuclear operators. Information on 5 members appointed as of the end February 2021 has also been fully disclosed on the NRA website.

At the 4th FY2012 NRA Commission Meeting (October 10, 2012), the “Requirements for Ensuring Transparency and Impartiality when the NRA Takes Advice from External Experts as a Reference in Making a Decision on Nuclear Safety Regulations, etc. for Electric Utilities” were defined. These requirements stipulate thorough disclosure on the relationship between external experts and electric operators when the NRA asks views from external experts regarding nuclear regulations on electric operators and other issues. Furthermore, when asking external experts to review the safety of individual facilities or re-review early assessments of individual facilities, the NRA requires experts to confirm that they have not served as executives of the relevant electric operators in the previous 3 years, that they have not personally received 500,000 yen or more as remuneration during 1 fiscal year from relevant electric utilities, and that they have not been involved in earlier examinations of said facilities. The same requirements were established for the appointment of members of the Reactor Safety Examination Committee (RSEC), the Nuclear Fuel Safety Examination Committee (NFSEC), and the Radiation Council.

In FY2020, based on these requirements, the self-enumerated information from external experts belonging to various study groups was made public on the NRA website.

### (3) Ensuring Transparency

In accordance with the “Policy on Ensuring Operational Transparency of the NRA” established at the 1st FY2012 NRA Commission Meeting (September 19, 2012), and with the (i) building of an information disclosure system eliminating the need for disclosure requests, (ii) thorough public discussions, and (iii) thorough document-based administrative actions as basic policies, the NRA decided to open the Commission Meetings, Councils, and examination and study group meetings to the public, publicly disclose the minutes of meetings and the materials used in these meetings, and deliver the meetings live via Internet video sites<sup>3</sup>.

In accordance with the above policies, the NRA has to prepare summaries of all meetings regarding regulations which are attended by 3 or more Commissioners or interviews of nuclear operators by the NRA Chairman, Commissioners, or staff of the Secretariat of the NRA, and make them public together with the names of the participants and the reference materials used. In addition, the NRA has to make briefings about the important meetings at the NRA Commission Meetings. In FY2020, the NRA steadily implemented the efforts to ensure transparency such as the above, and made the materials used for these meetings available on its website simultaneously with the start of live delivery of those meetings on Internet video sites, for the convenience of viewers of those meetings.

As in the previous fiscal year, the regular press conferences by the NRA Chairman (hereinafter referred to as “Chairman’s press conferences”) were held once a week as a rule, and the regular briefings by the Secretariat of the NRA twice a week. However, a state of emergency was declared from April 8 to May 25, 2020 to prevent transmission of COVID-19, and therefore the Chairman’s press conferences were held once every 2 weeks during that period (a total of 136 Chairman’s press conferences and regular briefings by the Secretariat of the NRA were held in FY2020). Even after the state of emergency was lifted, the NRA helped to mitigate the COVID-19 pandemic by holding review meetings and study team meetings with nuclear operators using online conferencing systems (e.g., Webex) as a rule, and streaming (in some cases recording) those meetings. As a result, there was an increased need for online conferencing, and the frequency of review meetings and other meetings was maintained by improving equipment for online conferencing, e.g., through work to augment optical communications lines.

The minutes were posted on the NRA website within the next day whenever possible. The NRA Chairman and Commissioners also conducted interviews when conducting on-site investigations, on-site inspections, and on-site visits. In FY2020, 2 cases were handled.

Continued from the previous fiscal year, the NRA also worked to improve the transparency of examinations. Based on discussions about the basic concept of publishing the results of meetings, etc. with nuclear operators at the 38th and 45th FY2018 NRA Commission Meetings (October 31 and December 5, 2018), the results of automatic transcription of interviews with nuclear operators have been continuously published since April 2019. In FY2020, minutes of 374 meetings produced through automatic transcription were posted on the NRA website.

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<sup>3</sup>“YouTube” and “Niconico Channel”

In addition, it was decided to hold liaison and coordination meetings as needed, starting in FY2019, with the Agency of Natural Resources and Energy, the Nuclear Damage Compensation and Decommissioning Facilitation Corporation, TEPCO, and other relevant organizations to improve transparency of coordination, etc. required for proper work relating to accident analysis and decommissioning at TEPCO's Fukushima Daiichi NPS. In FY2020, liaison and coordination meetings were held 3 times in relation to the decommissioning and accident investigation at the Fukushima Daiichi NPS.

## **2. Enhancing External Communication**

### **(1) Enhancing Efforts on Diverse Communication**

The NRA has held visits of nuclear facilities by NRA Commissioners and exchanges of opinions with local parties in accordance with the "Policy on Commissioners' Visits of Nuclear Facilities and Exchanges of Opinions with Local Parties" decided at the 49th FY2017 NRA Commission Meeting (November 15, 2017).

In December of FY2020, Chairman Fuketa and Commissioner Ishiwatari visited the Nuclear Disaster Control Center in Kagoshima Prefecture, and exchanged views on regulatory problems pertaining to nuclear facilities with local parties including the Governor of Kagoshima Prefecture and the Mayor of Satsumasendai City. There was also a visit to a Special Facility for Severe Accident Management, the first to begin operations in Japan, at the Sendai NPS of Kyushu Electric Power Co., Inc.

Since October 2014, the NRA has been holding exchanges of opinions with chief executive officers (CEOs) of major nuclear power facilities to promote efforts fostering safety culture and enhancing safety and to hear nuclear operators' basic policy for safety improvement activities and perspectives on the current regulatory system. In FY2020, the NRA exchanged opinions with 4 nuclear operators mainly on the activities and further improvements related to the safety of their facilities. Aside from these exchanges of views, opinions were also exchanged with Kyushu Electric Power Co., Inc. regarding nuclear safety measures, including the Special Facility for Severe Accident Management, during the aforementioned exchange of opinions with local parties and visit to the Sendai NPS in Kagoshima Prefecture.

In addition, the NRA has been holding exchanges of opinions with chief nuclear officers (CNOs) since January 2017 to contribute to the smooth introduction of regulation and improvement and clarification of regulatory requirements and reviews for the purpose of enhancement of its predictability. One meeting was held in FY2020, and views were exchanged with nuclear operators (including ATENA).

At the 10th Opinion Exchange Meeting with CNOs, held in December 2019, ATENA expressed a desire for technical discussions with regulatory authorities regarding the efforts of ATENA in connection with aging deterioration management for safe and long operation, and after a decision by the NRA, the first working-level exchange of technical views concerning aging deterioration management was held on March 6, 2020.

Six meetings have been held since then, and on July 8, 2020 results were summarized in an “Overview of Understanding of Aging Deterioration during Long Shutdown Periods of Hard-to-Replace Devices and Structures in Nuclear Power Plants.”

In response, at the 18th FY2020 NRA Commission Meeting (July 29, 2020), the NRA decided on its “View on the Relationship between Review of Approval for Operation Period Extension and Aging Deterioration of Nuclear Power Plants During Long Shutdowns,” which reexamined the standpoint of the NRA regarding appropriate operation periods, and the basic approach to assessment of aging deterioration. (The full text is provided in section 1.10. of References.)

In addition to the exchange of technical views on aging deterioration management, the NRA also exchanged opinions with ATENA on topics such as guidelines for ergonomic design and development, and measures against common cause failure of digital safety protection systems.

The NRA is striving to enhance communication with nuclear operators through these activities.

## **(2) Efforts for Developing the Information Management System**

For the purpose of archiving, over the next few decades, important information resources currently posted on the website, such as the record of the meetings held at the NRA, the processes of examinations carried out with nuclear operators, and the record of discussions relating to regulations, and making that information widely available to citizens, the NRA has developed the NRA archive search system “N-ADRES” (a document database similar to ADAMS of the U.S. Nuclear Regulatory Commission) and opened it to the general public.

## **(3) Reinforcing the Transmission of Information on Activities of the NRA**

Efforts were made to reinforce the prompt and detailed information transmission to the public in response to the high levels of societal interest in nuclear regulations.

The NRA continued efforts to distribute summaries of discussions at NRA Commission Meetings that may be of high social interest through Twitter, and to post summary results of each agenda item on the NRA website.

Furthermore, the NRA continued cross-division cooperation relating to Accident Analysis Committee Meetings and response to media in related on-site investigations. Regarding efforts of high importance and social concern for accident analysis, particularly on-site investigation inside reactor buildings, the NRA publicly disclosed recorded video of the site. The NRA also made every effort to strengthen dissemination of information on analysis of the accidents at TEPCO’s Fukushima Daiichi NPS, including public disclosure of videos on the same day as the investigation using Twitter.

## **3. Allegation Process Regarding Safety Information on Nuclear Facilities**

In order to appear to be the illegal activities by nuclear operators at an early stage and prevent nuclear accidents, the Reactor Regulation Act provides for the “allegation process regarding safety information of nuclear facilities.” Under this system, the NRA investigates allegation cases responding to information provided by employees and any others on potential illegal activities committed by nuclear operators and, if necessary,

issues directives to the relevant nuclear operators or takes other corrective measures.

To ensure the impartiality and transparency of investigations by the NRA, the Nuclear Facility Safety Information Allegation Committee consisting of external experts was set up. Under the supervision of the Committee, the NRA will process allegations as promptly as possible while paying attention to privacy protection of the informant, and disclose the operational status of the allegation system. In FY2020, 5 cases were completed while none were pending.

## **Section 2 Enhancement of Infrastructure to Support Regulatory Operations**

### **1. Firm Establishment of Management System**

The NRA has been continuously improving its own management system, as a nuclear regulatory body, in line with the “Roadmap for Improvement of the NRA Management System” (adopted at the 45th FY2016 NRA Commission Meeting on November 22, 2016) formulated on the basis of the recommendations of the IRRS in 2016.

In terms of new efforts in FY2020, based on the mid-term goals for the NRA’s second term (adopted at the 61st FY2019 NRA Commission Meeting on February 5, 2020) and the issues pointed out in the IRRS follow-up mission received in January 2020, the NRA strove for continuous improvement of the management system, and newly formulated an “Action Plan on the Management System and Nuclear Safety Culture” (adopted at the 16th FY2020 NRA Commission Meeting on July 15, 2020) aimed at cultivating and maintaining nuclear safety culture, and started initiatives based on that action plan. More specifically, the NRA is determining the main processes covering the jurisdiction of the NRA, starting preparation of manuals for each of these main processes, and, in order to cultivate and maintain nuclear safety culture, engaging in dialog between commissioners and staff, and conducting questionnaire surveys and interviews of staff.

In operating the management system, the NRA conducted management system internal audits and management of issues requiring improvement based on the NRA Management Rules. Management system internal audits were carried out for 4 divisions, and 3 cases of good practice were identified. After that, the “NRA Annual Strategic Plan for FY2021” was determined at the 67th FY2020 NRA Commission Meeting (March 24, 2021) based on a management review carried out at the 61st FY2020 NRA Commission Meeting (March 3, 2021) and 63rd FY2020 NRA Commission Meeting (March 10, 2021).

### **2. Cooperation with International Organizations and Contribution to the International Community**

It was decided for FY2020 to refrain from overseas travel, and postpone or suspend scheduled meetings due to the effects of the COVID-19 pandemic, but through the use of online conferencing systems to replace face-to-face meetings, new opportunities for communication were created, and numerous essential opinion exchanges and discussions were held.



### **(1) Cooperation with International Organizations**

In collaborating with international organizations, the NRA continued to share findings and lessons learned from the accident at TEPCO's Fukushima Daiichi NPS with the international community and improved international nuclear safety through information dissemination and opinion exchange by attending meetings of and dispatching experts to the IAEA and the Organisation for Economic Co-operation and Development/Nuclear Energy Agency (OECD/NEA).

In particular, in FY2020 the NRA attended international meetings of the IAEA's Commission on Safety Standards (CSS), Nuclear Safety Standards Committee (NUSSC), Waste Safety Standards Committee (WASSC), Transport Safety Standards Committee (TRANSSC), Radiation Safety Standards Committee (RASSC), Emergency Preparedness and Response Standards Committee (EPreSC), Nuclear Security Guidance Committee (NSGC), and the International Commission on Radiological Protection (ICRP), and contributed to the formulation of international standards and the formation of common understanding through discussion based on the latest findings in Japan. (See Section 2 of Chapter 2 for information on joint research with international organizations.)

As a part of its international communication efforts, the NRA has continued to regularly release sea area monitoring results including those in the surrounding areas of TEPCO's Fukushima Daiichi NPS. In collaboration with the IAEA Environment Laboratories, the NRA jointly collected ocean samples from near TEPCO's Fukushima Daiichi NPS, and carried out inter-laboratory comparisons of the analysis results.

This collaborative collection and inter-laboratory comparison of analysis results have been done every year since FY2014, and in sample collection carried out in November 2020, independent Japanese experts in environmental radioactivity relegated from the IAEA participated instead of IAEA experts due to the COVID-19 pandemic, and they checked the status of sample collection etc.

Data on environmental radiation (air dose rate) from representative monitoring posts in Japan, gathered by the NRA, has been sent since February 2020 to the International Radiation Monitoring Information System (IRMIS) established by the IAEA as a framework for collecting and sharing environmental radiation monitoring information in each country.

Additionally, Japan has proactively contributed to the reinforcement of international safeguards by improving the technical capacity of the IAEA and other member states to implement safeguards through a framework that includes the Japan Support Programme for Agency Safeguards (JASPAS).

### **(2) Participation in Initiatives under Various International Conventions on Nuclear Safety**

Together with the relevant ministries and agencies, the NRA is participating in various international initiatives under the frameworks of the Convention on Nuclear Safety, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention), the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency, the Convention on the Physical Protection of Nuclear Material (CPPNM), the Amendment to the Convention on the Physical

Protection of Nuclear Material (A/CPPNM), and the International Convention for the Suppression of Acts of Nuclear Terrorism.

In particular, in October 2020, Japan's 7th national report was submitted for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, and peer review of national reports by the contracting countries has been started. However, review meetings have been postponed, just as with the Convention on Nuclear Safety, and therefore the 7th review cycle has also been extended.

### **(3) Cooperation with Overseas Nuclear Regulatory Authorities in the Multinational Framework**

From the viewpoint of improving nuclear safety, etc., the NRA is promoting information exchange with nuclear regulatory bodies in other countries as described below.

The International Nuclear Regulators Association (INRA), consisting of the heads of regulatory bodies in major countries having nuclear power stations, is a framework to exchange opinions twice a year, as a rule, on a wide range of issues of nuclear safety regulations. 9 countries are participating, Japan, the United States of America (U.S.A.), French Republic (France), the United Kingdom of Great Britain and Northern Ireland (U.K.), Federal Republic of Germany (Germany), Canada, Kingdom of Sweden (Sweden), Kingdom of Spain (Spain), and the Republic of Korea (Korea). In FY2020, the INRA meetings were held online rather than face-to-face due to the effects of the COVID-19 pandemic, and NRA Chairman FUKETA attended representing Japan to discuss nuclear regulations.

The Western European Nuclear Regulators Association (WENRA) is a framework comprising of the heads of nuclear regulatory bodies from mainly European countries and holds the plenary meetings twice a year, as a rule. The NRA participates in WENRA as an observer. The spring plenary meeting scheduled to be held in Liverpool (U.K.) in April 2020 was canceled due to the COVID-19 pandemic, but the NRA participated in the fall plenary meeting held online in November 2020 and attended the forum for hearing opinions from the participating observer countries.

The Top Regulators' Meeting on Nuclear Safety (TRM<sup>4</sup>) among the senior regulators of the 3 nuclear regulatory bodies of the People's Republic of China, Japan and the Republic of Korea. To improve nuclear safety and strengthen regional cooperation by sharing useful information for addressing shared issues and improving technology relating to nuclear safety, it has been annually held since 2008.

Although the NRA was the Chair for the 13th TRM scheduled for FY2020, it was agreed to postpone the meeting until the following year due to the COVID-19 pandemic. On the other hand, the 3 authorities held a video conference<sup>5</sup> to maintain information sharing.

### **(4) Cooperation with Overseas Nuclear Regulatory Authorities in the Bilateral Framework**

The NRA has cooperation arrangements with 9 countries (10 nuclear regulatory organizations) and in FY2020 exchanged information and opinions on nuclear regulations with foreign nuclear regulatory bodies through these bilateral cooperation

<sup>4</sup> Top Regulators' Meeting on Nuclear Safety among China, Japan, and Korea

<sup>5</sup> Trilateral Web-Based Information Exchange Meeting on Nuclear Safety among the People's Republic of China, Japan, and the Republic of Korea

frameworks.

The Japan-US Steering Committee Meeting was held online in October 2020 under the cooperation implementation arrangement with the U.S. NRC<sup>6</sup>. Opinions were exchanged at the meeting on such topics as the review of the inspection system by the change of the Reactor Regulation Act, status of licensing review of conformity to the new regulatory requirements and the latest status of TEPCO's Fukushima Daiichi NPS.

In November 2020, an online meeting was held between the Chairman of the Canadian Nuclear Safety Commission (CNSC), NRA Chairman Fuketa, and others, and they exchanged regulatory information on topics such as the current state of ALPS treated water from TEPCO's Fukushima Daiichi NPS, regulatory trends for small modular reactors (SMR), and common issues pertaining to waste management and clearance.

As another working level bilateral meeting, a regulatory information exchange meeting was held online with the Atomic Energy Council (AEC) of Taiwan in December 2020, and views were exchanged on the latest regulatory situation and nuclear security.

#### **(5) Opinion Exchange with International Advisors**

The NRA, with the aim of proactively incorporating the latest overseas knowledge concerning the safety of the use of nuclear energy, commissions foreign experts with abundant experience and advanced knowledge on nuclear regulation as international advisors in order to exchange opinions on issues such as expectations for nuclear regulatory systems and the organization of the NRA. In November 2020, the NRA exchanged opinions on permission of business permit for Japan Nuclear Fuel's Rokkasho Reprocessing Plant and on implementation of the new inspection program.

### **3. Response to Information Security Incident**

On October 26, 2020, unauthorized communication thought to be an attack from the outside was detected, and the results of investigation confirmed traces of intrusion into some servers of the NRA's network system. That information was immediately relayed to the National center of Incident readiness and Strategy for Cybersecurity (NISC), and steps were taken on October 27 to sever connection with the outside. The NRA is currently investigating and studying measures to prevent recurrence in collaboration with the NISC, etc. Information on physical protection of nuclear material is managed with independent systems not connected to the outside, so there are no concerns about leakage of confidential information. Normal operations were continued after the incident by using telephones, FAX, and alternate e-mail accounts. Efforts were made to minimize impacts on reviews and inspections, and a system enabling remote work during the state of emergency due to COVID-19 transmission was provisionally restarted on January 18, 2021.

### **4. Steady Response to Litigation Affairs and Administrative Appeal**

The NRA responded to the litigation affairs and provided legal support for the affairs under its jurisdiction in cooperation with relevant authorities. Specifically, the NRA has rapidly and appropriately taken actions, preparing briefs and responding to examinations

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<sup>6</sup> Nuclear Regulatory Commission

of witnesses in collaboration with the Ministry of Justice and related agencies with respect to 51 pending cases and 10 cases for which a judgment was made in FY2020 regarding the affairs under the jurisdiction of the NRA.

With respect to formal appeals of the dispositions about reactors and a nuclear fuel facility, 8 cases were examined, and 2 cases were rejected and 6 cases were dismissed.

### **5. Continuous Review and Improvement of Laws and Regulations**

The NRA constantly reviewed and improved the laws and regulations under its jurisdiction, by, for example, incorporating the latest scientific and technical knowledge into the regulatory requirements.

Specifically, regarding the transportation of nuclear materials, rules were revised to add consideration of changes over time as requirements in technical standards, thereby the safety requirements of the IAEA were incorporated rules and recommendations by the IRRS were also corresponded. In addition, rules on radiation regulations, were revised to request additional measures for ensuring reliable measurement of external radiation dosage, in order to respond to issues pointed out by the IRRS. Furthermore as a part of the entire government of regulatory reform for new modes of life, rules were revised to eliminate the need for stamps on applications submitted to the NRA. As for the fee, payment by transfer is permitted in addition to revenue stamps.

## **Section 3 Securing and Developing Personnel Resources**

### **1. Maintaining High Ethical Standards**

The core values and principles of the NRA require performance of duties with high ethical standards, and to fulfill the NRA's mission of protecting people and the environment, each staff member carries out his or her duties in accordance with 5 Guiding Principles for Activities.

To ensure this, the NRA distributes a card indicating the NRA's core values and principles to all new staff members, and provides training in ethics for public servants (once in April, and once in September).

During National Public Service Ethics Month in December, a message was distributed to all staff from the Ethics Supervisory Officer (Secretary-General of the NRA Secretariat). Efforts are being made to effectively inculcate ethical awareness by distributing awareness-raising posters, and having all staff undergo training in ethics for public servants through e-learning.

To ensure the work-life balance of staff, the NRA implemented a “maternity and childcare leave plan especially for men”, and encouraged employees to take a summer vacation and annual leave.

## 2. Securing Human Resources for Nuclear Regulation

### (1) Filling Personnel Positions

In order to attract large numbers of promising qualified personnel, the NRA actively carried out a campaign for recruitment including presentations on the activities/missions of the NRA to heighten interest in the organization.

For newly recruited staff members, the NRA employed candidates selected based on visits to government offices after passing the national civil service examination (career positions, general positions), implemented the “Nuclear Engineering Examination” (for general positions), which is the NRA Secretariat’s original examination intended to proactively employ graduates who majored in nuclear engineering, and at the same time, carried out open recruitment of new research staff in charge of technical research and surveys. In FY2020, the NRA conducting hiring for the first time of candidates who passed the general position employment exam (for high school graduates). The NRA adopted 29 personnel in FY2021 recruitment (2 for career positions, 13 for general positions (university graduates), 8 for general positions (high school graduates), 1 through a nuclear engineering exam and 5 through a research staff recruitment exam).

The NRA conducted open recruitment for experienced persons (who have worked in other sectors including the private sector) mainly in the areas of reviews/inspections for safety regulations, nuclear emergency preparedness, radiation hazard prevention, and public document management, and employed 21 people in FY2020.

As a result, the number of NRA staff has become 1,013, with the ratio of personnel to the prescribed number of personnel becoming 94.3%, as of January 1, 2021.

Table 1-1 Situation of securing human resources from FY2014 to 2020 (Unit: persons)

	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY 2020	Total
Experienced personnel*1	51	59	39	44	23	33	21	270
New graduates*2	22	19	19	25	29	22	29	165
Total	73	78	58	69	52	55	50	435

\*1: Number of personnel hired during the period from April 1 to March 31 in the relevant fiscal year

\*2: Number of personnel hired from the date of job offer in the relevant fiscal year to April 1 in the next fiscal year

### (2) Efforts concerning the Program of NRA Human Resource Development

In order to broadly secure personnel and develop human resources engaged in nuclear safety and regulations aiming at steadily improving nuclear regulations, the NRA launched the subsidy program for human resource development for nuclear regulations. This program has been carried out in collaboration with universities and other

institutions since FY2016. In FY2020, this program was applied in a total of 19 cases (11 cases adopted in FY2016, 4 cases in FY2017, and 4 cases in FY2020) implemented by universities and other institutions.

### **3. Developing Human Resources for Nuclear Regulation**

#### **(1) Personnel Career Paths**

In order to clarify the basic principles and general framework of measures for development of staff as human resources, the NRA established a “Basic Policy on Human Resource Development for NRA Staff” in FY2014, and set up career paths (in April 2015) to serve as models for the career advancement of staff, taking into account differences in the capabilities and roles demanded of technical administrative staff, office-related administrative staff, and research staff, while keeping in mind the operations required at the NRA. These paths are being reviewed as appropriate.

To provide personnel with appropriate career paths and ensure appropriate treatment, the NRA conducted a survey on satisfaction with post assignment in accordance with abilities, and the results showed 31% were satisfied, 10% were dissatisfied, and 59% were in the middle. These results will be used for reference in personnel management, and surveys will continue to be administered in the future.

#### **(2) Implementing and Improving Training**

In FY2020, the NRA provided training and OJT for 117 personnel to acquire job qualifications in 5 job fields, “nuclear inspection,” “nuclear safety review,” “safeguards inspection,” “emergency preparedness,” and “regulation for radiation” under the job qualification system introduced in FY2017.

Starting from FY2018, the NRA has been providing education and training courses for basic qualifications to NRA staff in 5 job fields, in order to continually secure and develop human resources capable of handling regulatory work. To cope with increasing numbers of staff taking these education and training courses, the NRA has improved and enriched courses by reviewing curricula and instructional methods. In FY2020, 17 personnel were selected for and started an “intensive course” intended for them to concentrate on the course without involvement in their daily jobs. And 8 personnel were selected for and took a “part-time course” intended for them to complete training while working. Seven personnel who had been taking the intensive course since 2019 completed the education and training course in August 2020.

Research and studies will be carried out regarding teaching methods and training evaluation techniques for improving training quality, and trials will begin in FY2021 based on the results.

Also in FY2020, the competence of the NRA staff was managed by bestowing qualifications in 5 job fields, and reflected their positions and salaries. Knowledge management activities, such as e-learning for transferring and sharing administrative experiences and technological knowledge, were continued.

In light of measures to prevent COVID-19 transmission, appropriate steps were taken, such as adopting online lectures and ensuring distancing between students during group training where applicable. In this way, training which could be done was appropriately carried out and although there were impacts due to the COVID-19 pandemic, a total of

approximately 2,600 staff received training during the year.

### **(3) Development of Human Resources for Research**

In FY2020, to promote human resource cultivation and personnel exchanges by utilizing joint research, the NRA had 50 staff members engage in joint research, which is a number exceeding that in the previous year, and, continuing from 2019, 2 staff members were dispatched to the Japan Atomic Energy Agency in order for them to exclusively engage in testing and research activities. The NRA also accepted staff members dispatched from the Japan Atomic Energy Agency. One of them worked in research-related jobs. The NRA actively published safety research results such as those by academic societies and endeavored to improve the abilities of its research staff by making them discuss with experts at academic meetings.

### **(4) Efforts Concerning Development and Securing of Global Human Resources**

The NRA is making efforts for the acquisition of staff having sufficient international experience; improving staff competence for international activities through education, training, research, and international cooperation; building up young staff members' experience in international activities; improving the working environment to encourage participation in international activities; and conducting training aimed at improving the international capabilities. Seven staff members are posted to international organizations such as the IAEA and OECD/NEA. The NRA has also provided its young and middle-aged staff members opportunities to have international experiences, for example, participation of directors and reviewers in the 7th Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, and has grown international human resources through the long-standing and continuous policy.

## **Section 4 Response to COVID-19 Transmission**

### **1. Maintaining and Strengthening Organizational Function**

On March 2, 2020, the NRA set up a task force to cope with COVID-19 transmission, led by the Deputy Secretary-General of the NRA Secretariat. Throughout FY2020, the task force held meetings 33 times, and coordinated on countermeasures for COVID-19 transmission at the NRA. At the task force meeting on March 27, 2020, it was decided to ban general audiences at the regular meetings of the NRA, and this was announced immediately.

On April 7, 2020, a state of emergency was declared due to COVID-19 transmission based on the Act on Special Measures against Novel Influenza, etc., and therefore at the 2nd FY2020 NRA Commission Meeting (April 8, 2020), it was decided to hold regular meetings of the NRA every other week, and continue holding review meetings basically through online and telephone conferencing, and transparency was ensured by public releasing meeting video and minutes. Based on requests from operators, it was decided to adopt flexible operations for nuclear regulatory inspections at the 3rd FY2020 NRA Commission Meeting (April 22, 2020), and for operations under the Radioisotope Regulation Act at an Extraordinary Meeting at the 4th FY2020 NRA Commission Meeting (April 24, 2020).

At the 7th FY2020 NRA Commission Meeting (May 28, 2020), the NRA decided to hold regular meetings of the NRA every week and readmit general audiences, based on nationwide lifting of the state of emergency on May 25, 2020, and review of the basic action policy of the government. In addition, at the 12th FY2020 NRA Commission Meeting (June 24, 2020), it was decided to resume face-to-face review meetings while taking measures to prevent COVID-19 transmission. At the 13th FY2020 NRA Commission Meeting (July 1, 2020), it was decided, regarding limits on attendance by NRA Secretariat staff and maintenance of the rotating shift by 2 groups for NRA Regional Office staff, which had continued since April in accordance with government policy, to raise NRA Secretariat staff to 50%, including remote work and off-peak commuting, and to return NRA Regional Office staff to a normal work attendance system.

Subsequently, in light of the declaration of a state of emergency and review of the government's basic action policy on January 7, 2021, the NRA decided at the 49th FY2020 NRA Commission Meeting (January 13, 2021) to hold weekly regular meetings of the NRA but not admit general audiences, and to strive to avoid attendance by 70% or more of office staff in regions under a state of emergency.

Based on the nationwide lifting of the state of emergency on March 21, 2021 and the basic action policy of the government, it was decided at the 67th FY2020 NRA Commission Meeting (March 24, 2021) to not continue with general audiences at regular meetings of the NRA based on the Tokyo local government's request for people to stay indoors. For staff at offices in regions where the declaration was lifted on March 21, it was decided to aim for avoidance of attendance by 70% of staff, and to gradually relax those restrictions.

At the 31st meeting of the task force to cope with COVID-19 transmission on April 24, 2020, the NRA promptly contributed 7,000 N95 masks and 1,560 Tyvek suits to the Ministry of Health, Labour and Welfare in response to the Prime Minister's instructions on material support for healthcare workers.

## **2. Steadfast Promotion of Review and Inspection Based on the Reactor Regulation Act**

For reviews, steps were taken to minimize the impact on review work while implementing measures to prevent COVID-19 transmission. This was done by flexibly reexamining implementation policy for review meetings and hearings. More specifically, the NRA steadily moved forward with reviews by conducting review meetings using online conferencing systems.

Reports were given on these efforts at the 2nd FY2020 NRA Commission Meeting (April 8, 2020), the 7th FY2020 NRA Commission Meeting (May 28, 2020), the 12th FY2020 NRA Commission Meeting (June 24, 2020), the 49th FY2020 NRA Commission Meeting (January 13, 2021), and the 67th FY2020 NRA Commission Meeting (March 24, 2021).



To maintain nuclear regulatory inspection functions despite the effects of COVID-19 transmission, inspections were carried out under a special work system that avoided personal contact through work from home and division into 2 groups. Daily inspections carried out primarily by NRA Regional Offices were conducted basically according to the original plan. On the other hand, team inspections carried out mainly by inspectors dispatched from the NRA Secretariat were conducted with changes in the inspection plan due to the impact of curtailing business trip in response to the declaration of a state of emergency at the start of the fiscal year.

At the 3rd FY2020 NRA Commission Meeting (April 22, 2020), the document “Operation of Nuclear Regulatory Inspections in Light of the Declaration of a State of Emergency due to COVID-19” was approved, and regarding safety activities conducted by nuclear operators, this made it possible to flexibly handle matters such as the timing and system for inspections at operator sites, while taking into account effects in terms of safety on nuclear facilities, when there are requests from operators regarding operation of safety activities. In response, there were 3 requests from installer and operators of nuclear fuel cycle facilities, etc., during the state of emergency at the start of the fiscal year. Review of patrol activity frequency was approved, and after the state of emergency was lifted, it was confirmed that safety activities quickly returned to normal. In addition, when a state of emergency was declared in January 2021, there was again a request from an installer regarding flexible operation of safety activities, and this was approved.

### **3. Flexible Operation of Reviews and Inspections under the Radioisotope Regulation Act**

In light of the declaration of a state of emergency due to COVID-19 transmission, the NRA decided, at an Extraordinary Meeting at the 4th FY2020 NRA Commission Meeting (April 24, 2020), to adopt flexible operations within a reasonable scope in terms of deadlines, periods, and frequencies for notifications and inspections under the Radioisotope Regulation Act. This flexible operation was continued at the 7th FY2020 NRA Commission Meeting (May 28, 2020), the 49th FY2020 NRA Commission Meeting (January 13, 2021), and the 67th FY2020 NRA Commission Meeting (March 24, 2021), and was ongoing at the end of FY2020.

### **4. Proper Implementation of National Examinations and Training**

#### **(1) Proper Implementation of National Examinations Based on the Reactor Regulation Act**

Due to the effects of COVID-19 transmission, announcements of results of the written portions of the 52nd examination for chief engineers of nuclear fuel and the 62nd examination for chief engineers of reactors, administered in March 2020, were delayed by 1-2 months, but notice was given beforehand on the NRA website, and the announcements were made without any undue confusion.

For the oral examination portion of the 62nd examination for chief engineers of reactors, administered in September 2020, gathering times for examinees were set in stages, as in a typical year, and confusion at the examination venue was avoided by limiting admission. In addition to measures such as taking temperatures, disinfecting hands, and wearing masks, an online conferencing system was used to allow some

examiners to participate remotely and avoid movement. Thus the examination was completed without any delay while taking appropriate measures to prevent COVID-19 transmission.

For the written portions of the 53rd examination for chief engineers of nuclear fuel and the 63rd examination for chief engineers of reactors, administered in March 2021, appropriate measures were taken to prevent COVID-19 transmission just as in FY2020, and the examinations were completed without delay.

## **(2) Proper Implementation of National Examinations and Periodic Training Based on the Radioisotope Regulation Act**

Due to the effects of COVID-19 transmission, the FY2020 examination for certification as a Radiation Protection Supervisor was postponed from the usual date in August to December, and then administered by taking appropriate measures to prevent COVID-19 transmission.

Periodic training for Radiation Protection Supervisors provided by a registered organization, was conducted by taking appropriate measures to prevent COVID-19 transmission. Regarding deadlines for undergoing this training, flexible operations are being carried out where exceeding a deadline is not treated as a problem if that is determined to be unavoidable for preventing COVID-19 transmission—provided that a record is kept, and the training is taken promptly after the situation returns to normal.

Periodic training for Specified Radioisotope Security Managers, provided by registered organizations, was conducted by taking appropriate measures to prevent COVID-19 transmission, such as introducing training via e-learning.

**Chapter 2 Implementation of Strict and Appropriate  
Nuclear Regulations and the Reinforcement  
of the Technology Base**

## ○ Summary of Chapter 2

### **(Implementation of regulations relating to the Reactor Regulation Act)**

The NRA is conducting scientifically and technically rigorous review—while ensuring transparency through default disclosure except when disclosure is impossible due to security issues, as in review of Special Facilities for Severe Accident Management—of nuclear operators’ applications for permission of change in basic design in light of the new regulatory requirements established based on the lessons learned from the accident at TEPCO’s Fukushima Daiichi NPS. For commercial power reactors in FY2020, the NRA approved a design and construction plan to conform to new regulatory requirements at Unit 7 of TEPCO’s Kashiwazaki-Kariwa NPS. Approval was granted to change operational safety programs to conform to new regulatory requirements at Unit 7 of TEPCO’s Kashiwazaki-Kariwa NPS, and to change operational safety programs to conform to new regulatory requirements at Units 1 and 2 of the Takahama PS of Kansai Electric Power Co., Inc. With regard to Special Facilities for Severe Accident Management, permission was granted for a change in reactor installation at Unit 3 of the Mihama PS of Kansai Electric Power Co., Inc. The NRA approved a design and construction plan for Units 3 and 4 of the Genkai NPS of Kyushu Electric Power Co., Inc., and a change in operational safety programs at Units 3 and 4 of the Takahama PS of Kansai Electric Power Co., Inc. Regarding changes in reactor installation at the Takahama PS of Kansai Electric Power Co., Inc. relating to countermeasures for tsunamis that may not be accompanied by a tsunami warning, permission was granted for the change in reactor installation, and approval was also given for a design and construction plan, and changes in operational safety programs. A decommissioning plan was approved for Unit 2 of Ikata PS, Shikoku Electric Power Co., Ltd.

To ensure transparency and predictability of review, reports for gaining an overview of progress in review of conformity with new regulatory requirements are consolidated and released once every quarter.

With regard to nuclear fuel cycle facilities, etc., the NRA carried out review and processing relating to permissions and approval, such as granting permission for license modifications at Japan Nuclear Fuel Ltd.’s reprocessing facilities, MOX fuel fabrication facility, and waste storage facilities, and the Recycle Fuel Storage Center of Recyclable-Fuel Storage Company, and granting permission for changes in reactor installation at the High Temperature Engineering Test Reactor (HTTR) at the JAEA’s Oarai Research and Development Institute (North Area). Regarding review of approval of design and construction plans, in FY2020 the NRA approved “Conducting Review of Approval of Design and Construction Plans, and Checking of Pre-Service Operator Inspections, relating to Reprocessing Facilities of Japan Nuclear Fuel Limited” and “Conducting Review of Approval of Design and Construction Plans, and Pre-Service Checking, relating to Research Reactor Facilities and Nuclear Fuel Cycle Facilities,” and review is being carried out based on these documents.

The NRA also took measures for decommissioning the JAEA’s prototype fast-breeder reactor Monju and for decommissioning the reprocessing plant of the JAEA’s Nuclear Fuel Cycle Engineering Laboratories (hereinafter referred to as the “Tokai Reprocessing Plant”).

Based on the revised Reactor Regulation Act, which took effect on April 1, 2020, the NRA is conducting nuclear regulatory inspections through daily inspections carried out mainly by inspectors stationed at NRA Regional Offices, and team inspections carried out mainly by inspectors with expertise from the NRA Secretariat. In nuclear regulatory inspections carried out in 2020, the NRA pointed out 27 findings and carried out 35 statutory confirmations. Pre-revision inspections (pre-service inspections, welding inspections, etc.) were carried out for 41 cases, based on Paragraph 1 of Article 7 of Supplementary Provisions of the revised Act.

### **(Proactive Promotion of Safety Research)**

In FY2020, the NRA conducted 21 safety research projects relating to 13 research areas. As achievements in safety research, NRA staff members published 2 NRA technical reports and 3 NRA technical notes, 20 papers in journals and 3 papers at international conferences, made 29 conference presentations and were awarded 2 academic prizes.

With regard to safety research assessments, the NRA carried out ex-post assessment of 8 safety research projects that ended in FY2019, and prior assessment of 8 safety research projects scheduled to start in FY2021.

As for a safety research policy, the NRA developed a guideline “Fields of and Policy on the Implementation of Safety Research to be Promoted (for Safety Research to be Conducted for and after FY2021).”

As international activities, the NRA conducted bilateral information exchanges and participated in 18 OECD/NEA international joint research projects and 11 OECD/NEA/CSNI meetings to collect technical findings including the latest trends in each research field.

In FY2020, the NRA conducted 16 joint research projects.

### **(Continuous Improvement of Regulatory Requirements)**

As part of continuous improvement of regulatory requirements, steady progress has been made in revising and developing various standard systems, including: review of revision of standards relating to ground motions without identification of seismic sources, formulating assessment guidelines relating to human and organizational factors, revising rules to incorporate matters pointed out by the IRRS follow-up mission and IAEA rules for safe transportation of radioactive materials (2018 version), and summarizing requirements for development of regulatory standards for intermediate-depth disposal. Regulatory requirements were revised to reflect review experience and past records, and studies relating to continuous safety improvement were also started.

The NRA is also conducting technical evaluation of private standards, and collecting and analyzing information on accidents, trouble, and natural phenomena inside Japan. To improve response to new findings relating to natural hazards, a Subcommittee of Earthquake/Tsunami Monitoring and a Subcommittee of Volcano Monitoring were newly established in the RSEC and NFSEC.

### **(Steadfast Implementation of the Revised Reactor Regulation Act)**

Regarding nuclear regulatory inspections, which are a new inspection program, full operations began in April 2020 based on trial operation conducted up to FY2019, and due to the effects of COVID-19 transmission, this was done through flexible operations such as changing the original inspection plan for the fiscal year. To continually improve systems, views were exchanged on topics such as mechanisms of system improvement and techniques for assessing significance at nuclear fuel cycle facilities, by holding an “Opinion Exchange Meeting on Inspection Programs” for exchange of views with external experts and nuclear operators.

To strengthen quality management systems in line with enforcement of the new inspection system, measures were put into effect such as an “NRA Rule on Standards for Systems Necessary for Quality Management relating to Work to Ensure Safety of Nuclear Facilities,” and the shift to the new system is being made through review and processing of the accompanying approval for changes in operational safety programs.

## **Section 1 Implementation of Regulations Relating to the Reactor Regulation Act**

### **1. Implementation of Conformity Review to New Regulatory Requirements relating to Commercial Power Reactors**

As for commercial power reactors, since the NRA enforced new regulatory requirements on July 8, 2013, 11 nuclear operators have submitted applications so far for permission to change reactor installation to conform to new regulatory requirements at 27 plants of 16 nuclear power stations. These applications are now reviewed strictly based on the policies approved by the NRA. In FY2020, review meetings were held 106 times. To ensure transparency and predictability of review, reports for gaining an overview of progress in review of conformity with new regulatory requirements are consolidated and released once every quarter.

#### **(1) Review of Main Facility**

Many discussions centered on issues such as design basis ground motion and design basis tsunami, basis preventive design against tornadoes, internal overflows and internal fire, the evaluation of effectiveness of measures for severe accidents such as preventing core damage and preventing breakage of containment vessels, and the preparation of procedures for serious accidents. For Unit 7 of TEPCO's Kashiwazaki-Kariwa NPS, the NRA reviewed applications for approval of design and construction plans, and changes in operational safety programs, to conform to new regulatory requirements. The design and construction plan was approved on October 14, 2020, and the changes in operational safety programs were approved on October 30, 2020. On February 15, 2021, approval was granted for a change in operational safety programs to conform to new regulatory requirements at Units 1 and 2 of the Takahama PS of Kansai Electric Power Co., Inc.

#### **(2) Review of Special Facilities for Severe Accident Management**

Applications for permission to change basic design were submitted by 8 nuclear operators for 18 plants at 11 nuclear power stations. In the review of these applications, the NRA has checked whether measures have been taken to ensure that necessary functions are not impaired in the event of large-scale incidents due to intentional large-aircraft crashes and other acts of terrorism. Permission was granted for a change in basic design at Unit 3 of the Mihama PS of Kansai Electric Power Co., Inc. at the 15th FY2020 NRA Commission Meeting (July 8, 2020).

Applications for approval of design and construction plans have so far been submitted from 3 nuclear operators for 6 nuclear power stations and 12 plants. The application for Unit 3 of the Mihama PS of Kansai Electric Power Co., Inc. was received on July 10, 2020, and the second phase application for the Ohi PS of Kansai Electric Power Co., Inc. was received on August 26, 2020. Permission was granted for the third phase application (third overall) for Units 3 and 4 of the Genkai NPS of Kyushu Electric Power Co., Inc., on August 26, 2020, and for the first phase application (second overall) for Units 3 and 4 of the Ohi PS of Kansai Electric Power Co., Inc. on December 22, 2020.

Applications for approval to change operational safety programs were submitted by 3 nuclear operators for 5 plants at 3 nuclear power stations. Applications were submitted for Units 3 and 4 of the Takahama PS of Kansai Electric Power Co., Inc. on April 17, 2020, and for Unit 3 of the Ikata PS of Shikoku Electric Power Co., Ltd. on November 27, 2020. Approval was granted for Units 3 and 4 of the Takahama PS of Kansai Electric Power Co., Inc. on October 7, 2020.

### **(3) Review of Protection Against Noxious Gases**

Applications for permission to change basic design to incorporate protection against noxious gases in main facilities have been submitted for 7 nuclear power stations of 4 operators so far, and in FY2020, permission was granted to 1 nuclear power station of 1 operator. With respect permission to change basic design to incorporate protection against noxious gases in special facilities for severe accident management, applications have been submitted for 7 nuclear power stations of 4 operators so far, and in FY2020, permission was granted to 2 nuclear power stations of 1 operator.

Applications for design and construction plans to incorporate protection against noxious gases in main facilities have been submitted for 6 nuclear power stations of 3 operators so far, and in FY2020, approval was granted to 2 nuclear power stations of 2 operators. Applications for design and construction plans to incorporate protection against noxious gases in special facilities for severe accident management have been submitted for 4 nuclear power stations of 3 operators so far, and in FY2020, approval was granted to 3 nuclear power stations of 2 operators.

Applications to change operational safety programs relating to protection against noxious gases in main facilities have been submitted for 6 nuclear power stations of 3 operators so far, and in FY2020, approval was granted to 4 nuclear power stations of 3 operators. With respect to changes in operational safety programs to incorporate protection against noxious gases in specialized safety facilities, applications have been submitted for 3 nuclear power stations of 3 operators so far, and in FY2020, permission was granted to 2 nuclear power stations of 2 operators.

### **(4) Actions in Response to Re-evaluation of Eruptive Volume of Daisen-Namatake Tephra from Daisen Volcano**

At the 47th FY2018 NRA Commission Meeting (December 12, 2018), it was decided, in line with the scale of eruption of Daisen-Namatake tephra (DNP) and evaluation results, to issue an instruction to Kansai Electric Power Co., Inc. to collect reports from all nuclear power stations regarding the maximum thickness of the ash fall layer on the ground in their premises. Later in March 29, 2019, Kansai Electric Power Co., Inc. submitted a report for the instruction to collect reports.

At the 4th FY2019 NRA Commission Meeting (April 17, 2019), the evaluation results at a meeting on the results of report collection regarding the eruptive volume of Daisen-Namatake tephra from Daisen Volcano (April 5, 2019), held for confirming the content of the report, were presented, and the review of regulatory measures was decided.

At the 10th FY2019 NRA Commission Meeting (May 29, 2019), the NRA found inadequacy in settings of the maximum thickness of falling pyroclastic materials in the sites of nuclear power stations of Kansai Electric Cp., Inc., to which permissions had already been granted, and decided to employ a policy of instructing the company to re-apply an application for permission of change in installation and giving an opportunity for justification based on the provisions of Article 43-3-23 (1) of the Reactor Regulation Act. The reply from Kansai Electric Power Co., Inc. indicated no objection for the instruction to apply an application for change on June 11, 2019.

At the 13th FY2019 NRA Commission Meeting (June 19, 2019), the NRA assumed the facts newly acknowledged at the 4th FY2019 NRA Commission Meeting (April 17, 2019) with respect to Kansai Electric Power Co., Inc. ((i) A DNP eruptive volume of 11km<sup>3</sup> can be expected, and (ii) It is not accepted that DKP (Daisen-Kurayoshi tephra) and DNP are a single large eruption, and DNP with the eruptive volume in (i) is a natural phenomenon which should be assumed in assessing impacts of volcanic activities), and decided to issue instructions based on the provisions in Paragraph 1 of Article 43-3-23 of the Reactor Regulation Act, to ensure that applications are submitted for permission to change basic design to conform to requirements in Item 4, Paragraph 1, Article 43-3-6 of the Reactor Regulation Act.

The NRA received applications for permission to change reactor installation from Kansai Electric Power Co., Inc. for Ohi PS Units 3 and 4, Takahama PS Units 1 to 4, and Mihama PS Unit 3 on September 26, 2019. Review was conducted at a review meeting relating to conformity to the new regulatory requirements for nuclear power stations, and at the 65th FY2020 NRA Commission Meeting (March 17, 2021), a draft of the review results on the application to change basic design was consolidated, and public comments were being solicited at the end of FY2020.

#### **(5) Countermeasures for Tsunamis that May Not Be Accompanied by Tsunami Warnings**

At Takahama Power Station Units 1 to 4 of Kansai Electric Power Co., Inc., tsunami height, runup areas and tsunami protection were not evaluated under the condition of an open tide gate of the water intake canal for tsunamis caused by “offshore landslide in the Oki Trough” with the tide gate open and probably not accompanied by tsunami warnings. At the 53rd FY2018 NRA Commission Meeting (January 16, 2019), the NRA decided to hear from Kansai Electric Power Co., Inc. at a public meeting to confirm the runup evaluation with the gate open, and the impacts on important equipment such as seawater pumps. On May 29, 2019, Kansai Electric Power Co., Inc. submitted a report concerning the tsunamis that may not be accompanied by tsunami warnings at Takahama Power Station.

Evaluation results of the report in the "Meeting for Hearing the Current Status of Responses to Tsunamis for which Warnings May Not Be Announced" (June 13, 2019), held to confirm the contents of the report, were presented at the 16th FY2019 NRA Commission Meeting (July 3, 2019), and the NRA decided that tsunamis caused by “offshore landslide in the Oki Trough” with the tide gate open and probably not accompanied by tsunami warnings must be recognized as design basis tsunamis, and applications for permission for basic design change must be submitted within an appropriate period. It was also decided to confirm the intention of Kansai Electric Power Co., Inc.

At the 20th FY2019 NRA Commission Meeting (July 31, 2019), it was reported that Kansai Electric Power Co., Inc. said it would submit applications for permission for basic design change by September 30, 2019 and not operate Takahama Power Station Units 1 to 4 at the same time until necessary measures were taken at the NRA Commission Meeting (July 16, 2019).



On September 26, 2019, an application was submitted by Kansai Electric Power Co., Inc. for permission for basic design change of Units 1 to 4 of the Takahama PS. Review was conducted at a review meeting relating to conformity to the new regulatory requirements for nuclear power stations. A draft of the review results on the application to change reactor installation was consolidated, and after solicitation of public comments, permission was granted at the 41st FY2020 NRA Commission Meeting (December 2, 2020).

On October 16, 2020, an application was submitted by Kansai Electric Power Co., Inc. for approval of a design and construction plan for Units 1 to 4 of the Takahama PS. Review was conducted at a review meeting relating to conformity to the new regulatory requirements for nuclear power stations, and the design and approval plan was approved on February 5, 2021. On October 16, 2020, a revision was submitted pertaining to the application for approval to change operational safety programs in relation to new regulatory requirements at Units 1 and 2 of the Takahama PS of Kansai Electric Power Co., Inc., including the specifics of permission relating to this matter. Review was conducted at a review meeting relating to conformity to the new regulatory requirements for nuclear power stations, and the change in operational safety programs was approved on February 15, 2021.

#### **(6) Status of Review Concerning Approval of Decommissioning Plans**

Applications for approval of decommissioning plans were submitted from 7 operators for 8 nuclear power stations and 15 plants from the launch of the NRA in 2012 up until now, and approval was granted to 1 operator for 1 nuclear power station and 1 plant in FY2020. This makes decommissioning plans of 6 operators for 7 nuclear power stations and 11 plants approved.

Table 2-1 Status of the Reviews and Inspections of Commercial Power Reactors Concerning Conformity to New Regulatory Requirements

○ Commercial power reactors							
No.	Applicant	Targeted power reactor		New Regulatory Requirements Conformity Review			Pre-service check, etc.
				Approval of Basic Design change permit	Approval of construction plan	Approval of operational safety program	
1	Japan Atomic Power Company	Tokai Daini NPS	BWR	Completed	Completed	Under review	Under inspection
2		Tsuruga NPS	Unit 2 PWR	Under review	Not applied	Under review	
3	Electric Power Development Co., Ltd	Ohma NPS	Under construction	Under review	Under review	Not applied	
4	Hokkaido Electric Power Co., Inc.	Tomari NPS	Unit 1 PWR	Under review	Under review	Under review	
5			Unit 2 PWR	Under review	Under review	Under review	
6			Unit 3 PWR	Under review	Under review	Under review	
7	Tohoku Electric Power Co., Inc.	Higashidori NPS	BWR	Under review	Under review	Under review	
8		Onagawa NPS	Unit 2 BWR	Completed	Under review	Under review	
9			Unit 3 BWR	Not applied	Not applied	Not applied	
10	TEPCO Holdings	Higashidori NPS	Under construction	Not applied	Not applied	Not applied	
11		Kashiwazaki-Kariwa NPS	Unit 1 BWR	Not applied	Not applied	Not applied	
12			Unit 2 BWR	Not applied	Not applied	Not applied	
13			Unit 3 BWR	Not applied	Not applied	Not applied	
14			Unit 4 BWR	Not applied	Not applied	Not applied	
15			Unit 5 BWR	Not applied	Not applied	Not applied	
16			Unit 6 BWR	Completed	Under review	Under review	
17	Unit 7 BWR	Completed	Completed	Completed	Under inspection		
18	Chubu Electric Power Co., Inc.	Hamaoka NPS	Unit 3 BWR	Under review	Not applied	Not applied	
19			Unit 4 BWR	Under review	Under review	Under review	
20			Unit 5 BWR	Not applied	Not applied	Not applied	
21	Hokuriku Electric Power Company	Shika NPS	Unit 1 BWR	Not applied	Not applied	Not applied	
22			Unit 2 BWR	Under review	Under review	Under review	
23	Kansai Electric Power Co., Inc.	Mihama NPS	Unit 3 PWR	Completed	Completed	Completed	Under inspection
24		Ohi NPS 1	Unit 3 PWR	Completed	Completed	Completed	Completed
25			Unit 4 PWR	Completed	Completed	Completed	Completed
26			Unit 1 PWR	Completed	Completed	Completed	Under inspection
27		Takahama NPS	Unit 2 PWR	Completed	Completed	Completed	Under inspection
28			Unit 3 PWR	Completed	Completed	Completed	Completed
29			Unit 4 PWR	Completed	Completed	Completed	Completed
30	Chugoku Electric Power Co., Inc.	Shimane NPS	Unit 2 BWR	Under review	Under review	Under review	
31			Unit 3 Under construction	Under review	Not applied	Not applied	
32	Shikoku Electric Power Co., Inc.	Ikata NPS	Unit 3 PWR	Completed	Completed	Completed	Completed
33	Kyushu Electric Power Co., Inc.	Genkai NPS	Unit 3 PWR	Completed	Completed	Completed	Completed
34			Unit 4 PWR	Completed	Completed	Completed	Completed
35		Sendai NPS	Unit 1 PWR	Completed	Completed	Completed	Completed
36	Unit 2 PWR		Completed	Completed	Completed	Completed	

(Notes) Power reactors, whose decommissioning plans have been approved or whose decommissioning has been announced by the nuclear operator, are excluded.

■ Nuclear power stations whose status changed in FY2020

Table 2-2 Status of the Reviews and Inspections of Commercial Power Reactors  
Concerning Conformity to New Regulatory Requirements  
Conformity to New Regulatory Requirements (Special Facilities for Severe  
Accident Management)

○ Commercial power reactors (Special Facilities for Severe Accident Management)									
No.	Applicant	Targeted power reactor		New Regulatory Requirements Conformity Review			Pre-service check, etc.		
				Approval of Basic Design change permit:	Approval of construction plan	Approval of operational safety program			
1	Hokai Power Development Co., Ltd. (J-Power)	Ohma NPS		Specialized Facilities	Under review				
2	Japan Atomic Power Company	Tokai Daini NPS		Specialized Facilities	Under review				
3	Hokkaido Electric Power Co., Inc.	Tomari NPS	Unit 3	Specialized Facilities	Under review				
4	TEPCO Holdings	Kashiwazaki-Kariwa NPS	Unit 6	Specialized Facilities	Under review				
5			Unit 7	Specialized Facilities	Under review				
6	Kansai Electric Power Co., Inc.	Mihama NPS	Unit 3	Specialized Facilities	Completed	Under review			
7		Ohi NPS	Unit 3	Specialized Facilities	Completed	1st time: Completed 2nd time: Under review	Under inspection		
8			Unit 4	Specialized Facilities	Completed	1st time: Completed 2nd time: Under review			
9		Takahama NPS		Unit 1	Specialized Facilities	Completed	Completed	Under inspection	
10				Unit 2	Specialized Facilities	Completed	Completed	Under inspection	
11				Unit 3	Specialized Facilities	Completed	Completed	Completed	Completed
12				Unit 4	Specialized Facilities	Completed	Completed	Completed	Under inspection
13		The Chugoku Electric Power Co., Inc.	Shimane NPS	Unit 2	Specialized Facilities	Under review			
14	Shikoku Electric Power Co., Inc.	Ikata NPS	Unit 3	Specialized Facilities	Completed	Completed	Under review	Under inspection	
15	Kyushu Electric Power Co., Inc.	Genkai NPS	Unit 3	Specialized Facilities	Completed	1st time: Completed 2nd time: Completed 3rd time: Completed	Under inspection		
16			Unit 4	Specialized Facilities	Completed	1st time: Completed 2nd time: Completed 3rd time: Completed	Under inspection		
17		Sendai NPS	Unit 1	Specialized Facilities	Completed	Completed	Completed	Completed	
18			Unit 2	Specialized Facilities	Completed	Completed	Completed	Completed	

(Notes) Power reactors, whose decommissioning plans have been approved or whose decommissioning has been announced by the nuclear operator, are excluded.

  Nuclear power stations whose status changed in FY2020

## **2. Implementation of Review of Aging Management System for Commercial Power Reactors**

The aging management system requires an assessment of degradation of equipment and structures and development of a long-term facility maintenance policy for commercial power reactor facilities that have been operated for more than 30 years. This takes place every 10 years and is reflected to the operational safety programs.

In terms of plants for which assessment is being conducted in FY2020 under the assumption of plant operation, an application was received on December 2, 2020 for approval to change operational safety programs relating to technical evaluation of aging management of Unit 3 of the Ohi PS of Kansai Electric Power Co., Inc. (30th year). In terms of plants for which assessment is being conducted under the assumption that the plant is maintained only in a state of cold shutdown, approval was granted to change operational safety programs of Unit 2 of the Kashiwazaki- Kariwa NPS of TEPCO (30th year) on August 28, 2020, and Unit 2 of the Tomari NPS of Hokkaido Electric Power Co., Inc. (30th year) on December 8, 2020.

## **3. Proper Implementation of a System for Evaluation of Safety Improvement**

In FY2020, notifications requesting evaluation of safety improvement were filed for the Ohi PS Unit 4 of Kansai Electric Power Co., Inc. (April 13, 2020), Sendai NPS Unit 1 of Kyushu Electric Power Co., Inc. (May 11, 2020), Genkai NPS Unit 4 of Kyushu Electric Power Co., Inc. (May 20, 2020), Sendai NPS Unit 2 of Kyushu Electric Power Co., Inc. (July 22, 2020), and Takahama PS Unit 4 of Kansai Electric Power Co., Inc. (August 27, 2020), and the NRA confirmed the specifics in these applications in accordance with the operational guidelines for the evaluation of safety improvement in commercial power reactors. At a meeting on continuous improvement of evaluation of safety improvement, the NRA heard opinions on and discussed efforts to continuously improve evaluation of safety improvement by operators.

## **4. Implementation of Conformity Review to New Regulatory Requirements and Inspections of Nuclear Fuel Cycle Facilities, etc.**

As for nuclear fuel cycle facilities, etc., since the enactment of new regulatory requirements in December 2013, applications for permission to change facility operations at 21 facilities have been submitted by 9 operators so far. Reviews have been conducted based on “Conducting Conformity Reviews of Facilities for Handling Nuclear Fuel Materials after the Enactment of New Regulatory Requirements” (adopted on December 25, 2013, and partially amended on June 1, 2016 and April 25, 2018). In FY2020, a total of 53 review meetings, attended as a rule by the NRA Commissioners, were held.

Regarding review of approval of design and construction plans, the NRA approved “Conducting Review of Approval of Design and Construction Plans, and Checking of Pre-Service Operator Inspections, relating to Reprocessing Facilities of Japan Nuclear Fuel Limited” at the 12th FY2020 NRA Commission Meeting (June 24, 2020) and “Conducting Review of Approval of Design and Construction Plans, and Pre-Service Checking, relating to Research Reactor Facilities and Nuclear Fuel Cycle Facilities” was approved at the 28th FY2020 NRA Commission Meeting (September 30, 2020). Review is being carried out based on these documents.

Among research reactor facilities, a draft of review results was consolidated at the 74th FY2019 NRA Commission Meeting (March 25, 2020) regarding the High Temperature Engineering Test Reactor (HTTR) at the JAEA's Oarai Research and Development Institute (North Area), and scientific and technical views concerning the review report draft addressing the technical capability of the operator and the structure and equipment of the reactor were collected as reference for comparison. Views of the AEC commissioners and Minister of MEXT were also collected pursuant to the provisions of the Reactor Regulation Act. Based on this, permission to change basic design was granted at the 8th FY2020 NRA Commission Meeting (June 3, 2020).

For the JRR-3 reactor facility of the Nuclear Science Research Institute of the JAEA, the NRA reviewed applications for approval of design and construction plans, and changes in operational safety programs, to conform to new regulatory requirements. The design and construction plan was approved on January 25, 2021, and the changes in operational safety programs were approved on February 9, 2021.

Aside from the above, review was still in progress at the end of FY2020 regarding the application for permission to change basic design to conform to new regulatory requirements relating to the Experimental Fast Reactor Facility (Joyo) at the JAEA's Oarai Research and Development Institute (South Area), and the applications for approval of design and construction plans and the applications for approval to change operational safety programs to conform to new regulatory requirements at the Static Experiment Critical Facility (STACY) at the JAEA's Nuclear Science Research Institute, common radioactive waste disposal facilities, and the waste storage facilities at the Oarai Research and Development Institute.

With regard to decommissioning, on September 28, 2018, there was an application for approval of the decommissioning plan for the uranium enrichment facility at the JAEA's Ningyo-toge Environmental Engineering Center, and approval was granted on January 20, 2021. Applications for approval of decommissioning plans were submitted for the Tank-type Critical Assembly (TCA) at the JAEA's Nuclear Science Research Institute on April 26, 2019, and the Japan Materials Test Reactor (JMTR) at the JAEA's Oarai Research and Development Institute on September 18, 2019. Approval was granted in both cases on March 17, 2021. Applications for approval of decommissioning plans were submitted for the Toshiba Nuclear Critical Assembly (NCA) at the Nuclear Engineering Laboratory of Toshiba Energy Systems & Solutions Corp. on December 23, 2019, and for the Fast Critical Assembly (FCA) at the Nuclear Science Research Institute of the JAEA on March 31, 2021, and review was still in progress at the end of FY2020.

Among nuclear fuel cycle facilities, permission was granted for license modifications relating to new regulatory requirements in 1 case each for spent fuel reprocessing facilities, waste storage facilities, spent fuel storage facility, and nuclear fuel fabrication facilities (MOX fuel fabrication facility).

For Japan Nuclear Fuel Limited's reprocessing facilities, a draft review report was consolidated at the 5th FY2020 NRA Commission Meeting (May 13, 2020), and based on replies to hearing opinions of the AEC commissioners and the Minister of METI, and public comment, permission was granted for license modifications at the 18th FY2020 NRA Commission Meeting (July 29, 2020).

For Japan Nuclear Fuel Limited's waste storage facilities, a draft review report was consolidated at the 18th FY2020 NRA Commission Meeting (July 29, 2020), and based on replies to hearing opinions of the Minister of METI, permission was granted for license modifications at the 20th FY2020 NRA Commission Meeting (August 26, 2020).

For the Recycle Fuel Storage Center of the Recyclable-Fuel Storage Company, a draft review report was consolidated at the 22nd FY2020 NRA Commission Meeting (September 2, 2020), and based on replies to hearing opinions of the AEC commissioners and the Minister of METI, and public comment, permission was granted for license modifications at the 37th FY2020 NRA Commission Meeting (November 11, 2020).

For Japan Nuclear Fuel Limited's MOX fuel fabrication facility, a draft review report was consolidated at the 31st FY2020 NRA Commission Meeting (October 7, 2020), and based on replies to hearing opinions of the AEC commissioners and Minister of METI, and public comment, permission was granted for license modifications at the 44th FY2020 NRA Commission Meeting (December 9, 2020).

For Japan Nuclear Fuel Limited's waste disposal facilities, discussions were held 2 times at NRA Commission Meetings regarding policies for review of evaluation of the radiation dose to the public after starting decommissioning of the facility, and the review policy was approved at the 31st FY2020 NRA Commission Meeting (October 7, 2020).

With regard to packaging design approval and packaging approval, and type certification and designation of type for design of specified containers for spent fuel storage facility, a total of 4 review meetings were held in FY2020 to discuss shipping containers and specified containers for spent fuel storage facility for the applications under review. In FY2020, there were 9 cases of packaging design approval, 4 cases of packaging approval, 9 cases of extension of period for nuclear fuel packaging design approval, and 4 cases of extension of period for packaging approval. Also, there were 2 cases of approval for type certification for design of specified containers for spent fuel storage facility.

Table 2-3 Status of Reviews and Inspections Concerning Conformity to New Regulatory Requirements (Nuclear fuel cycle facilities, etc.)

○ Nuclear fuel cycle facilities, etc.

No.	Applicant	Facility	New Regulatory Requirements Conformity Review (*1)			Pre-service check, etc.
			Permission of basic design change or permission for facility operation change	Approval of design and construction plan	Approval of operational safety program	
1	Japan Nuclear Fuel Ltd.	Reprocessing facility	Completed	Under review	Under review	
2		MOX fuel fabrication facility	Completed	Under review	Not applied	
3		Uranium Enrichment Facility	Completed	Under review	Under review	Under inspection
4		Waste Storage Facility	Completed	Not applied	Under review	
5		Waste Disposal Facility	Under review		Not applied	
6	Recyclable-Fuel Storage Company	Spent fuel storage facility	Completed	Under review	Not applied	
7	Mitsubishi Nuclear Fuel	Uranium Fuel Fabrication Facility	Completed	Under review	Under review	Under inspection
8	Japan Atomic Energy Agency	Waste Storage Facility	Completed	Under review	Under review	Under inspection
9		Research reactor facility (JRR-3)	Completed	Completed	Completed	Completed
10		Research reactor facility (HTTR)	Completed	Under review	Under review	Under inspection
11		Research reactor facility (Common radioactive waste disposal facility)	Completed	Under review	Under review	Under inspection
12		Research reactor facility (NSRR)	Completed	Completed	Completed	Completed
13		Research reactor facility (STACY)	Completed	Under review	Under review	Under inspection
14		Research reactor facility (Joyo)	Under review	Not applied	Under review	
15	Nuclear Fuel Industries, Ltd	Uranium Fuel Fabrication Facility (Tokai Works)	Completed	Under review	Under review	Under inspection
16		Uranium Fuel Fabrication Facility (Kumaton Works)	Completed	Under review	Under review	Under inspection
17	Global Nuclear Fuel Japan	Uranium Fuel Fabrication Facility	Completed	Under review	Under review	Under inspection
18	Kyoto University	Research reactor facility (KUR)	Completed	Completed	Completed	Completed
19		Research reactor facility (KUCA)	Completed	Completed	Completed	Completed
20	Kindai University	Research reactor facility (Kindai University Nuclear Reactor)	Completed	Completed	Completed	Completed
21	Japan Atomic Power Company	Category 2 waste disposal facility (trench disposal)	Under review		Not applied	

(Note) Nuclear fuel facilities, whose decommissioning plans have been approved or whose decommissioning has been announced by the nuclear operator, are excluded.  
 (\*1) This shall not preclude implementation of activities other than "those that greatly increase facility risk or that reduce facility risk" only for 5 five years. (Refer to "Policies on the Application of New Regulatory Requirements to Nuclear Fuel Facilities" enacted by the Secretariat of the NRA on November 6, 2013.)

**Completed** Nuclear power stations whose status changed in FY2020

## 5. Actions Taken for Decommissioning of the Prototype Fast Breeder Reactor Monju

In January 2017, the NRA set up the Safety Oversight Team for Prototype Fast Breeder Reactor Monju Decommissioning (hereinafter referred to as the "Oversight Team") to continuously check the state of Monju of JAEA and ensure the safety of decommissioning steps. Eight meetings of the Oversight Team were held in FY2020.

At the meetings of the Oversight Team, interviews were conducted to ascertain the state of study on problems to be solved for decommissioning of Monju, and the

application for approval of the decommissioning plan, which was submitted by JAEA on December 6, 2017, was reviewed. At the 75th FY2017 NRA Commission Meeting (March 28, 2018), the decommissioning plan was approved.

Since the work for removing fuel from the core, etc., as described in the approved decommissioning plan, started in August 2018, the state of progress of the work has been checked through interviews at the meetings of the Oversight Team and other opportunities. 246 fuel assemblies were taken out from the core to the ex-core fuel storage tank by March 31, 2021, and 260 fuel assemblies were moved from the tank to the fuel pond.

On May 29, 2020, the NRA approved the application for permission to change the decommissioning plan in connection with partial loading of the substitutive assembly for which an application dated July 22, 2019 was submitted.

## **6. Actions taken for Decommissioning of Tokai Reprocessing Plant**

The NRA oversees the status of implementation of vitrification for risk reduction at the Tokai Reprocessing Plant, safety of the facility, and ways to ensure safety for decommissioning. For that purpose, the NRA set up the Safety Oversight Team for Tokai Reprocessing Plant and Other Facilities in January 2016. At the 4th FY2019 NRA Commission Meeting (April 17, 2019), the JAEA Back-end Measure Oversight Team<sup>7</sup> was separated from the Safety Oversight Team. The issues concerning decommissioning of the Tokai Reprocessing Plant were continually checked by the reorganized Safety Oversight Team for the Tokai Reprocessing Plant (hereinafter referred to as the “Oversight Team”). 18 meetings of the Oversight Team were held in FY2020.

The Oversight Team reviewed the application for approval of the decommissioning plan submitted on June 30, 2017, and the NRA granted permission for the decommissioning plan at the 14th FY2018 NRA Commission Meeting (June 13, 2018).

The vitrification in FY2019 beginning on July 8 was temporarily suspended on and after July 29, 2019 due to the stoppage of glass flow. Accordingly, the Oversight Team checked the status of the activities to resume the work at meetings, etc., and requested JAEA to immediately make an application for the permission of change in the decommissioning plan on the safety measures for high-activity waste facilities to reduce the risk relating to highly radioactive waste fluid at an early stage.

At the Oversight Team meeting, the review team pointed out the insufficiency of technical information required for the application for approval for changes to the safety measures, which was submitted on December 19, 2019. The JAEA pledged to submit an amended application in January 2020, but later stated that corrections would be made around May 2020 as additional consideration was required.

Accordingly, NRA Chairman Fuketa requested the president of JAEA at the 65th FY2019 NRA Commission Meeting (February 19, 2020) in response to the discussions so far at the Oversight Team meeting that the amended application for safety measures should straightforwardly show technical justification required for discussion, such as tsunami run-up analysis and building response analysis, to promote discussions on safety measures step by step.

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<sup>7</sup> A team dealing with the comprehensive issues on the backend measures of JAEA.



After that, a revision was submitted by the JAEA, dated May 29, 2020 and additionally indicating the overall schedule of safety measures and the specifics of earthquake and tsunami countermeasures at high-activity waste storage facilities, and this was approved on July 10, 2020. In the overall schedule of safety measures given in the pertinent revision, the JAEA decided to divide the application for approval to change the decommissioning plan relating to safety measures into 5 applications, including the revision. In FY2020, applications for approval to change the decommissioning plan were submitted on August 7, 2020 (2nd application), October 30, 2020 (3rd application), and February 10, 2021 (4th application), and the NRA granted approval for the 2nd application on September 25, 2020, and for the 3rd application on January 14, 2021. The 4th application is under review as of the end of FY2020.

## **7. Implementation of Nuclear Regulatory Inspections of Commercial Power Reactors and Nuclear Fuel Cycle Facilities, etc.**

To ensure safety of commercial power reactors and nuclear fuel cycle facilities, etc., the NRA is conducting nuclear regulatory inspections based on the Reactor Regulation Act through daily inspections carried out mainly by inspectors stationed at NRA Regional Offices, and team inspections carried out mainly by inspectors with expertise from the NRA Secretariat. In FY2020, a review was carried out of the team inspection plan, in light of the fact that some team inspections were postponed to the second half of FY2020 or later due to the effects of COVID-19 transmission, but the inspections were generally conducted smoothly. For users of nuclear fuel materials not subject to Article 41 of the Cabinet Order of the Reactor Regulation Act<sup>8</sup>, nuclear regulatory inspections involving business travel were not conducted in the first quarter of FY2020 due to the effects of COVID-19, and thus the inspection plan was reviewed, and inspections were carried out for a total of 21 sites. In FY2020, the NRA carried out 35 statutory confirmations using the results of nuclear regulatory inspections, each time there was a check application, regarding pre-service operator inspections, wastes, vehicle transport, completion of decommissioning, and radiodensity.

In addition, 41 pre-service inspections were carried out as before, based on interim measures from the time of revision of the Reactor Regulation Act.

### **(1) Inspection Findings**

In nuclear regulatory inspections carried out in FY2020, there were 27 findings. Among these, there were 17 inspection findings relating to nuclear facility safety and radiation safety, and in all cases, significance<sup>9</sup> was determined to be green, i.e., the level where there is an impact on safety functions and performance, but it is extremely limited and small, and improvement measures by operators are likely to yield improvements. Severity<sup>10</sup> was determined to be SLIV, i.e., the level where the impact on nuclear safety is limited, or potentially limited. There were 10 inspection findings relating to physical

<sup>8</sup> Users of nuclear fuel materials and/or nuclear source materials, who have facilities not subject to any item of Article 41 of Cabinet Order of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material, and Reactors

<sup>9</sup>The degree of deterioration in the nuclear safety and nuclear security activities of operators is evaluated using 4 levels: red, yellow, white, and green. Red is the case where deterioration is the worst.

<sup>10</sup> SL (Severity Level) evaluates violation severity using 4 levels: SLI to IV. SLI is the most severe, i.e., the level where there is potential for a serious situation in terms of nuclear safety or nuclear security of nuclear material.

protection of nuclear material, and in 8 cases, they were determined to be green and SLIV, just as in the above cases. The significance in 1 case was white, i.e., the level where there is an impact on physical protection function and performance, and although the drop in safety margin is small, improvements must be made with regulatory involvement. Severity was determined to be SLIII, i.e., the level where a situation with a definite impact on physical protection was brought about, or potentially brought about. The significance in 1 case was red, i.e., the level where there is a major impact on physical protection function and performance, and use of facilities cannot be allowed. The severity was determined to be SLI, i.e., the level where a serious situation was brought about in terms of physical protection, or potentially brought about (For details, see Section 1 of Chapter 3).

## **(2) Actions Taken for Individual Issues**

### **(a) Cracking of Weld of Pressurizer Spray Line Pipe of Ohi PS Unit 3**

When ultrasonic testing (UT) was carried out on a weld of the pressurizer spray line pipe as part of the operator periodic inspection at Ohi PS Unit 3 of Kansai Electric Power Co., Inc. from August 31 to September 1, 2020, significant test results were obtained indicating the presence of a defect in the form of a crack running along the weld on the inner surface of the pipe, and it was conjectured that this crack is attributable to stress corrosion cracking (SCC).

In light of this situation, the actual UT was observed by a nuclear inspector through a nuclear regulatory inspection, and based on the fact that examples of SCC of SUS316 stainless steel are extremely unusual in pressurized water reactors (PWR), the NRA Secretariat checked the specifics through public meetings, and at a total of 11 meetings thus far, Kansai Electric Power Co., Inc. has been interviewed regarding the relevant facts, cause analysis results, and future response. Reports were given on these public meetings at the 33rd FY2020 NRA Commission Meeting (October 21, 2020), the 49th FY2020 NRA Commission Meeting (January 13, 2021), and the 59th FY2020 NRA Commission Meeting (February 24, 2021), and the direction for future action was approved. The NRA will continue checking through nuclear regulatory inspections, including public meetings, regarding analysis of the cause of cracking, and response by the operator.

### **(b) Investigation and Analysis of the Cause of Rewriting Boring Log Data for Tsuruga NPS Unit 2**

At the 833rd Review Meeting relating to Conformity to the New Regulatory Requirements for Nuclear Power Plants on February 7, 2020, an event (hereinafter referred to as “the event”) was confirmed wherein information in a boring log, for confirming validity of evaluation of continuity with the region directly below important facilities of a fault under the premises of Tsuruga NPS Unit 2 of the Japan Atomic Power Company, was deleted or changed without any explanation. At the 865th Review Meeting relating to Conformity to the New Regulatory Requirements for Nuclear Power Plants on June 4, 2020, the operator provided an explanation including the survey report by the survey company which provided the source data for the boring log, and the history of changes and transitions in the log. In response, the NRA requested the operator to check and clarify with the survey company whether the source data exists for the application draft prepared by the survey company, and submit documentation; clarify as the operator the data supposed to be incorporated into the application from the survey report of the survey company; report again on how rewriting occurred based on that; and conduct a deeper examination because there has been insufficient factor analysis relating to conformity management of data rewriting.

At the 916th Review Meeting relating to Conformity to the New Regulatory Requirements for Nuclear Power Plants on October 30, 2020, the source data for the boring log, needed for evaluation, was presented by the Japan Atomic Power Company, and since a direction was indicated of furnishing a boring log with the proper information in the future, it was decided to continue review of the under-premises fault.

On the other hand, it was decided at the 31st FY2020 NRA Commission Meeting (October 7, 2020) to use nuclear regulatory inspection to check the validity of the cause investigation and analysis carried out by the Japan Atomic Power Company.

On November 30, 2020, a public meeting was held regarding investigation and analysis of the cause of the event, and the Japan Atomic Power Company was interviewed regarding the facts and investigation/analysis of the cause. From December 14 to 15, 2020, a nuclear regulatory inspection was carried out at the head office of the Japan Atomic Power Company to check for relevant documents and records such as in-house rules. In previous inspections, there was a lack of understanding of the facts, and specifics of the investigation and analysis of the cause were insufficient. Validity has not been adequately confirmed, and thus the NRA is continuing its nuclear regulatory inspections.

## **8. Identification of Causes of Event and Confirmation of Corrective Actions in Nuclear Facilities**

Article 62-3 of the Reactor Regulation Act requires nuclear operators to report to the NRA events in nuclear facilities stipulated in the NRA Rule (hereinafter referred to as “incidents under obligation to report” in this paragraph and in Section 1(8) of Chapter 4 hereof).

In FY2019, there were 2 incidents under obligation to report - 1 out of the 2 events happened in commercial nuclear power reactors, and 1 event in nuclear fuel cycle facilities, etc. The NRA received reports on these events from the operators and has been strictly checking on the operator’s cause identification and measures to prevent

recurrence (Incidents under obligation to report related to Specified Nuclear Facility are listed in Section 1 (8) of Chapter 4 hereof).

In FY2020, 4 public meetings for hearing operators' progress of investigation of the events at nuclear facilities (hereinafter simply referred to as the "open meetings" in this paragraph) were held.

Incidents under obligation to report are subject to evaluations according to the International Nuclear and Radiological Event Scale (hereinafter referred to as "INES"<sup>11</sup>). Among the 2 events that occurred in FY2020, the event at Takahama PS Unit 4 of the Kansai Electric Power Co., Inc. on November 20, 2020 was evaluated as level zero (an event of no safety significance). The other event, which occurred at the International Research Center for Nuclear Materials Science, Institute for Materials Research, Tohoku University, was under evaluation at the end of FY2020. The event which occurred at Ikata PS Unit 3 of Shikoku Electric Power Co., Inc. in FY2019 and was under evaluation, the event which occurred at the JAEA's Oarai Research and Development Institute in FY2019 and was under evaluation, and the event which occurred at Takahama PS Unit 3 of the Kansai Electric Power Co., Inc. in FY2019 and was under evaluation were all evaluated as level zero (events of no safety significance).

Special Facilities for Severe Accident Management began operations on November 11, 2020. Therefore, there is a need to examine the best approach to statutory reporting for these facilities. At the 36th FY2020 NRA Commission Meeting (November 4, 2020), it was decided that, when an incident under obligation to report occurs at a special facilities for severe accident management, there is a risk of revealing plant vulnerabilities to terrorism if that information is released, so the information will be released after the vulnerability no longer exists.

### **(1) Response to Events which Occurred in FY2020**

#### **(a) Collapse of Exhaust Stack at the Research Building, International Research Center for Nuclear Materials Science, Institute for Materials Research, Tohoku University**

On April 13, 2020, collapse of an exhaust stack at the Research Building of the International Research Center for Nuclear Materials Science, Institute for Materials Research, was confirmed, and a report was received from Tohoku University for an incident under obligation to report.

There was then a report from Tohoku University dated July 15, 2020 on the cause of the incident and corrective action, and through an interview, the NRA is strictly checking the appropriateness of the cause investigation and measures to prevent recurrence at Tohoku University.

#### **(b) Wear on Steam Generator Tubes of Unit 4 of Takahama NPS**

On November 20, 2020, Kansai Electric Power Co., Inc. recognized that the following event should be reported to the NRA, the NRA received an above incidents report under obligation: signals were found out by Eddy Current Testing (ECT), implemented to the all 9,747 tubes (plugged tubes were not included) of the 3 steam

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<sup>11</sup> The International Nuclear and Radiological Event Scale

generators (SGs) during the periodic outage. The signals indicated a wear on a tube surface out of 3,244 tubes (plugged tubes were not included) of A-SG and wears on 3 of 3,256 heating tubes (plugged tubes were not included) of C-SG.

Then the NRA received a report dated January 25, 2021 on the cause of the event and corrective action from Kansai Electric Power Co., Inc. After that, the NRA had 2 meetings opened to public to hear the contents of the report from Kansai Electric Power Co., Inc. on February 5, 2021 and February 16, 2021. At the 56th FY2020 NRA Commission Meeting (February 10, 2021), the NRA Secretariat was instructed to report on the presumed cause of the event, and at the 59th FY2020 NRA Commission Meeting (February 24, 2021), the NRA Secretariat reported the details explained by Kansai Electric Power Co., Inc. at public meetings on February 5, 2021 and February 16, 2021. Subsequently, at the 61st FY2020 NRA Commission Meeting (March 3, 2021), the NRA Secretariat reported their assessment that the cause investigation and measures to prevent recurrence at Kansai Electric Power Co., Inc. were appropriate, and that assessment was accepted.

## **(2) Response to Events which Occurred in FY2019**

### **(a) Collapse of 2nd Cooling System's Cooling Tower in the Oarai R&D Institute's Japan Materials Testing Reactor**

On September 9, 2019, JAEA reported to the NRA that the cooling tower of the 2nd cooling system, which was subject to periodic facility self-inspection as specified in the reactor operational safety program, at the Oarai R&D Institute's Japan Materials Testing Reactor (JMTR) in preparation for decommissioning collapsed due to strong typhoon winds, and that this corresponded to an incident under obligation to report.

The NRA received a report from the JAEA dated December 20, 2019 on the cause of the incident and corrective action, as well as a revision of the report on February 27, 2020. At the 8th FY2020 NRA Commission Meeting (June 3, 2020), the NRA evaluated that the cause investigation and measures to prevent recurrence to be appropriate.

### **(b) Unintentional Rise of Control Rods during Lifting of the Upper Core Internals in Reactor Vessel in Unit 3 of Ikata Power Station**

On January 15, 2020, Shikoku Electric Power Co., Inc. recognized that the following event should be reported to the NRA under obligation; a control rod cluster unintentionally came out on January 12, together with lifting up of the upper core internal in the reactor vessel of Unit 3 of Ikata Power Station, which was under the periodic outage.

Then the NRA received a report dated March 17, 2020 on the cause of the event and corrective action from Shikoku Electric Power Co., Inc. , as well as a revision of the report dated April 3, 2020. After hearing about the cause and corrective actions from Shikoku Electric Power Co., Inc. at a public meeting on March 26, 2020, an evaluation was made determining the cause investigation and measures to prevent recurrence to be appropriate at the 2nd FY2020 NRA Commission Meeting (April 8, 2020).

### **(c) Wear on Steam Generator Tubes of Unit 3 of Takahama NPS**

On February 18, 2020, Kansai Electric Power Co., Inc. recognized that the following event should be reported to the NRA under obligation: signals were found out by ECT, implemented to the all 9,782 tubes (plugged tubes were not included) of 3 SGs during the periodic outage. The signals indicated a wear on a tube surface out of 3,248 tubes (plugged tubes were not included) of steam generator B (B-SG) and a wear on a tube surface out of 3,262 tubes (plugged tubes were not included) of C-SG.

from the NRA had a meeting opened to public to hear the progress in identifying the cause of the event from Kansai Electric Power Co., Inc. on July 22, 2020. After that, Kansai Electric Power Co., Inc. submitted a report on the cause of the event and corrective actions to the NRA on September 7, 2020. Furthermore the NRA had another meeting opened to public to hear the content of the report form Kansai Electric Power Co., Inc. on October 9, 2020, At the 32nd FY2020 NRA Commission Meeting (October 14, 2020) , the NRA Secretariat reported their assessment that the cause identification and corrective actions to prevent the recurrence reported by Kansai Electric Power Co., Inc. were appropriate, and that assessment was accepted by the NRA Commission.

## **Section 2 Promotion of Safety Research and Continuous Improvement of Regulatory Requirements**

### **1. Proactive Implementation of Safety Research**

#### **(1) Implementation of Safety Research and Publication of Results**

Based on the “Basic Policy on Safety Research in the NRA” (NRA decision on July 6, 2016) and the “Safety Research Field to be Promoted and its Enforcement Policy (for safety research to be conducted in and after FY2021)” (NRA decision on June 24, 2020), the NRA is conducting safety research projects. The NRA is working to publish safety research results through “NRA Technical Reports”, serving as a basis for regulatory standards/guides, reviews and inspections based on experimental data obtained through safety research, “NRA Technical Notes” compiling data and information obtained through investigation, as well as through journal articles and conference presentations. In FY2020, the NRA conducted 21 safety research projects including 5 new projects. (See Table 2-4)

Table 2-4 Safety Research Projects Conducted in FY2020

No.	Area	Project
1	External events	Research on more advanced techniques for seismic hazard assessment near seismic sources (2020-2023, New)
2		Research on reliability improvement for tsunami hazard assessment (2017-2020)
3		Study on evaluating the activity of faults (2020-2023, New)
4		Research for accumulating knowledge of large-scale eruption process (2019-2023)
5		Research on fragility of facilities and equipment related to earthquakes, tsunamis and other external events (2017-2020)
6	Fire protection	Research on fire hazard analysis for protection of nuclear power stations (2017-2020)
7	Human and organizational factors	Regulatory research for systematic analysis of human and organizational factors based on human factors engineering (2019-2022)
8	Risk evaluation	Development of PRA methods and their application to regulation (2017-2021)
9	Severe accident	Experiments for reduction on uncertainty of important physicochemical phenomena under severe accident conditions (2020-2025, New)
10		Development of simulation codes for physicochemical phenomena including large uncertainties under severe accident conditions (2017-2022)
11		Development of analysis methodologies for the containment failure and probabilistic risk assessment associated with severe accident conditions (2017-2022)
12	Nuclear and thermal-hydraulic characteristics	Study on best-estimate thermal-hydraulic evaluation for nuclear power plants (2019-2022)
13	Nuclear fuel	Research on fuel integrity for advancement of regulation (2007-2020)
14		Evaluation study on fuel failure impact on reactor core coolability under accident conditions (2019-2023)
15	Materials and structures	Research on ultimate endurance evaluation of containment in severe accident conditions (2017-2021)
16		Research on aging degradation assessment and verification using the equipment and materials used in nuclear power plants (2020-2024, New)
17	Specified nuclear facilities	Development of a database and evaluation methodology for criticality of fuel debris at Fukushima Daiichi Nuclear Power Plants (2014-2021)
18	Fuel cycle facilities	Study on Risk Assessment Methods for Internal Fire and Other Events in Nuclear Fuel Fabrication and Reprocessing Facilities (2017-2020)
19		Research on assessment methods relating to the latest analysis techniques in the areas of transportation and storage of spent fuel (2020-2023, New)
20	Radioactive waste disposal facilities	Study on survey methods for long-term natural phenomena influencing radioactive waste disposal and assessment methods for long-term evolution of barrier performance (2017-2020)
21	Decommissioning and clearance	Study on Activity Concentration Evaluation for Radioactive Wastes (2017-2020)

In terms of publication of safety research results, two NRA Technical Reports were published by the NRA staff in FY2020, as indicated by No. 1 and 2 in Table 2-5. No. 1 presented the results of the validation of a direct dating method for fault gouge in assessing most recent fault activity, based on measurement results employing optical/thermo-luminescence dating methods on fault gouges along the Nojima Fault. In No. 2, the sensitivity analysis of various influential factors and simulation analysis of seismic event are conducted, using a model of building in nuclear reactor facilities for a three-dimensional finite element method. Based on the results, precautions and technical evidence relating to modellings and analysis are summarized to contribute to precise evaluation of seismic safety of buildings. Three NRA Technical Notes were published, as indicated by No. 3-5 in Table 2-5.

Table 2-5 Publication of Safety Research Results (NRA Technical Reports and NRA Technical Notes)

No.	Category	Report title
1	NRA Technical Report	Validation of direct dating methods of a coseismic fault slip event using fault gouges along the Nojima Fault
2		Analysis of influential factors that contribute to precise evaluation of three-dimensional seismic behavior of buildings in nuclear reactor facilities and study on their modeling methods
3	NRA Technical Note	Viewpoints to evaluate the activities on fostering and sustaining a healthy safety culture
4		Oversea regulations relating to disposal and clearance of uranium wastes
5		Data on aircraft crash accidents (1999-2018)

In addition, the NRA staff published 20 articles in journals, presented three proceedings at international conferences, and made 29 conference presentations. As an effort to promote the publication of safety research results, there were three presentations by the NRA staff, in collaboration with the JAEA's Nuclear Safety Research Center, at Nuclear Safety Research Center Progress Meeting. Moreover, the NRA staff were awarded with two academic prizes because of their excellent academic achievements in safety research (one research article prize awarded by the Atomic Energy Society of Japan, and one achievement prize awarded by the Thermal-Hydraulics Division of the

same).

## **(2) Participation in Joint Research Activities**

The NRA has been participating in international joint research projects in collaboration with the Japan Atomic Energy Agency (JAEA)'s Nuclear Safety Research Center. As bilateral international activities in FY2020, the NRA exchanged information with the U.S. NRC and the French Institute for Radiological Protection and Nuclear Safety (IRSN<sup>12</sup>) and participated in 18 international joint research projects of the OECD/NEA, and 11 working groups and senior expert meetings that fall under the umbrella of the OECD/NEA/CSNI, to collect technical findings including the latest trends in each research field.

With regard to the research and investigation of the accident at TEPCO's Fukushima Daiichi NPS, the NRA participated in the research project (ARC-F) of OECD/NEA/CSNI, and reported the results of analyzing spread behavior of high-temperature molten material on a pedestal simulating Unit 1 of that NPS. This analysis was carried out using simulation codes for formation and cooling behavior of debris beds, currently being developed in the safety research project "Development of simulation codes for physicochemical phenomena including large uncertainties under severe accident of LWR." The NRA shared current status and issues of analysis for accident scenarios and associated transportation and dispersion of fission products with 12 countries (24 organizations).

On the other hand, with regard to joint research, which also contributes to the technological ability improvement of research staff, the NRA conducted 16 joint research projects (8 projects with the JAEA and 14 projects with universities (including overlap of the two)), which exceeds the number in the previous fiscal year.

These joint projects were carried out based on joint research enforcement provisions established in April 2017.

## **(3) Safety Research Assessment and Policy Development**

The 11th FY2020 NRA Commission Meeting (June 17, 2020) performed ex-post evaluations of eight safety research projects completed in FY2019 and the follow-up evaluations of 27 safety research projects finished during FY2015-2017.

Based on the "Basic Policy on Safety Research in the NRA," the NRA developed the "Safety Research Field to be Promoted and its Enforcement Policy (for safety research to be conducted for and after FY2021)" at the 12th FY2020 NRA Commission Meeting (June 24, 2020) for safety research in and after FY2021.

The 51st FY2020 NRA Commission Meeting (January 27, 2021) implemented prior to evaluations of eight safety research projects newly starting in FY2021.

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<sup>12</sup> Institut de Radioprotection et de Sûreté Nucléaire



## **2. Accumulation of the Latest Scientific and Technical Knowledge and Findings**

### **(1) Collection of the Latest Scientific and Technical Knowledge and Findings**

As an activity for continuously improving regulatory standards on the basis of the latest domestic and overseas scientific and technical knowledge, the NRA's Generic Issues Task Force has been organizing information on overseas regulatory trends, safety research, international standards and academic societies to extract information that require review in terms of our country's regulations and nuclear facility safety, on the basis of a process for reflecting the latest findings to regulations - process approved at the 45th FY2016 NRA Commission Meeting (November, 22, 2016). In FY2020, the NRA screened 10 cases and extracted 4 types of technical information requiring some sort of regulatory countermeasures. These 4 types of technical information were shared at a Technical Information Committee meeting.

### **(2) Utilization of Scientific and Technical Knowledge and Findings Obtained from Safety Research in Regulatory Operations**

In order to utilize the latest scientific and technical knowledge obtained through safety research, both domestic and overseas, in regulatory work such as review and inspection, the NRA Secretariat's Research Divisions provide the Nuclear Regulation Department with technical support such as providing information. In FY2020, the Research Divisions provided the Nuclear Regulation Department with 47 cases of technical support in the licensing review of conformity to new regulatory requirements, participation in team meetings, and so forth.

## **3. Continuous Improvement of Regulatory Requirements**

### **(1) The Reflection of the Latest Knowledge to Regulatory Standards**

#### **(a) Study of Development of Ground Motions without Identification of Seismic Sources**

The results compiled by the "Study Team on Evaluation of Ground Motions without Identification of Seismic Sources" were presented at the 24th FY2019 NRA Commission Meeting (August 28, 2019), and it was determined to include the standard response spectrum summarized as the Implementation of Ground Motions without Identification of Seismic Sources in the regulation (nationwide).

In FY2020, discussions on the direction of revisions of requirements were continued from FY2019 at the NRA. It was confirmed at the 16th FY2020 NRA Commission Meeting (July 15, 2020) that provisions relating to design basis ground motions will not be distinguished for each facility. At the 33rd FY2020 NRA Commission Meeting (October 21, 2020) and the 35th FY2020 NRA Commission Meeting (October 28, 2020), it was confirmed that provisions will not be established which exempt specific facilities.

Based on the previously discussed direction of revisions, draft revisions of rule interpretations were deliberated at the 50th FY2020 NRA Commission Meeting (January 20, 2021) and public comments were solicited. Revisions were subsequently decided at the 5th FY2021 NRA Commission Meeting (April 21, 2021).

#### **(b) Study on Seismic Isolation Structure of Buildings and Structures**

The “Study Team on Seismic Isolation of Buildings and Structures” was established at the 46th FY2019 NRA Commission Meeting (December 4, 2019), and 4 study team meetings were held by October 2020. The study team mainly discussed technical issues relating to seismic isolation (approaches to reviewing seismic isolation, design basis ground motion, fundamental matters relating to design, and quality management of seismic isolation devices), and the results by the study team were summarized.

At the 40th FY2020 NRA Commission Meeting (November 25, 2020), the results of discussion by the study team were reported. “Draft of Guidelines for Seismic Isolation of Buildings and Structures” were developed, and a direction was determined regarding revision of the current rule. According to discussions and the reflection of results in the study team, the NRA Secretariat added to the draft and the current rule about seismic isolation design policy, items not specified in the current rule targeting earthquake resistant design, formulated design basis ground motion applicable to seismic isolation, and studied improvement of description of current rule. During FY2021, the plan is to revise the relevant current interpretations and formulate the pertinent review guide.

#### **(c) Study on Formulation of Guidelines on Human and Organizational Factors**

Based on the necessity of considering human and organizational factors, pointed out by the IRRS mission in FY2015, the NRA decided to develop a guideline for assessing a reactor control room, a guideline relating to safety culture, and a guideline for cause analysis (assessments considering human and organization factors). At the 49th FY2020 NRA Commission Meeting (January 13, 2021), the NRA deliberated regarding review and inspection guidelines for ergonomic design development, formulated as a guide for assessing a reactor control room while taking into account human and organizational factors, and later solicited public comments. Going forward, the plan is to establish the guidelines based on the results of soliciting public comments.

A guideline relating to safety culture and a guideline for cause analysis were formulated in FY2019.

#### **(d) Study of Measures against Common Cause Failure of Digital Safety**

##### **Protection Circuits**

At the 73rd FY2019 NRA Commission Meeting (March 23, 2020), the NRA deliberated on the level to be satisfied for measures against a common cause failure, attributable to software, of digital safety protection circuits, based on the results of a study by the Study Team on Measures against Common Cause Failure of Digital Safety Protection Systems in Nuclear Power Reactor Facilities. At the 15th FY2020 NRA Commission Meeting (July 8, 2020), operators expressed their intention to make voluntary efforts regarding measures against a common cause failure of digital safety protection systems, and therefore it was decided to receive proposals at a public meeting relating to the details of voluntary efforts. At the 5th Study Team on Measures against Common Cause Failure of Digital Safety Protection Systems in Nuclear Power Reactor Facilities (October 6, 2020), the team heard the details of voluntary efforts from operators, and at the 33rd FY2020 NRA Commission Meeting (October 21, 2020), it was decided to continue checking the details of the voluntary efforts

carried out by operators in the future.

Mutual interference due to electromagnetic waves between equipment used in instrumentation and control facilities is a possible factor, in addition to software, in common cause failure of nuclear power reactor facilities, and thus the situation of the investigation of overseas regulatory trends regarding this point was reported at the 44th Technical Information Committee meeting (January 27, 2021), and at the 59th FY2020 NRA Commission Meeting (February 24, 2021), a report was received to the effect that a study will be conducted regarding the need for systemic reforms.

**(e) Incorporation of the 2018 Version of IAEA Transportation Rules and Review of Transportation Rules to Respond to the IRRS**

In order to incorporate the 2018 version of IAEA safety requirements relating to transportation of radioactive materials (IAEA transportation rules) and respond to findings of the IAEA's IRRS follow-up mission (January 2020), the NRA decided to revise rules, notifications, and guidelines relating to radioactive material transportation under the jurisdiction of the NRA, and at the 10th FY2020 NRA Commission Meeting (June 17, 2020), the NRA decided to request consideration of deterioration changes in the design of packaging, and decided on the response approach regarding to adoption of approval procedures relating to numerical values of nuclides not listed in tables in the IAEA transportation rules. In light of this, with regard to revision of the NRA Rules on the Shipment of Nuclear Fuel Material Outside of Factory or Power Reactor Facilities, and the Rules and Related Notifications pertaining to Use of Nuclear Fuel Material, the NRA deliberated on a draft revision of rules and solicited public comment at the 19th FY2020 NRA Commission Meeting (August 19, 2020), and then at the 32nd FY2020 NRA Commission Meeting (October 14, 2020) deliberated on the results of soliciting public comments, and decided to consult with the Radiation Council regarding technical standards for preventing radiation hazards as part of the draft revision. Due to the fact that consultation contents were reported to be valid at the 150th Radiation Council general meeting (October 23, 2020), the NRA decided to revise rules at the 38th FY2020 NRA Commission Meeting (November 18, 2020), and the revised rules were put into effect on January 1, 2021.

**(f) Development of Regulatory Requirements for Intermediate-depth Disposal**

At the 52nd FY2019 NRA Commission Meeting (January 15, 2020), the NRA closely examined an outline draft of regulatory requirements, etc. (rules, interpretations, review guidelines) relating to intermediate-depth disposal previously prepared by the NRA Secretariat, and based on that approved the approach of formulating a draft of regulatory requirements relating to intermediate-depth disposal.

The NRA Secretariat summarized draft requirements for regulatory requirements relating to intermediate-depth disposal. Regarding the specifics of these requirements, the NRA approved to solicit public comments of scientific and technical views for requirements not relating to faults at the 17th FY2020 NRA Commission Meeting (July 22, 2020) and for those relating to faults at the 56th FY2020 NRA Commission Meeting (February 10, 2021), and views were solicited for 30 days in each case.

Based on the results of this public comments, a plan has been adopted of formulating rules, interpretations, and review guidelines for intermediate-depth

disposal during FY2021.

**(g) Development of Standards to Release Sites**

As one of annual priority plans for FY2020, the NRA will develop judgment criteria relating to site release, which is also a recommendation of the IRRS mission (here, “site” indicates the site or building subject to decommissioning) (NRA Annual Strategic Plan for FY2020 (decided at the NRA Commission Meeting on March 30, 2020)).

At the 50th FY2020 NRA Commission Meeting (January 20, 2021), it was decided to examine more specific judgment criteria for, among the standards for confirming completion of decommissions, “the fact that soil relating to the site of the facility to be decommissioned and the facilities still remaining at the pertinent site are in a situation not requiring action to prevent harm due to radiation.” In light of these study results, the NRA has adopted a plan of incorporating these criteria, as necessary, into review standards for approval of decommissioning plans during FY2021.

**(h) Development of Regulatory Requirements for Clearance and Disposal of Uranium Waste**

As one of annual priority plans for FY2020, the NRA has developed regulatory requirements relating to clearance and disposal of uranium wastes (NRA Annual Priority Plan for FY2020 (decided at the NRA Commission Meeting on March 30, 2020)).

At the 7th FY2020 NRA Commission Meeting (May 28, 2020), the NRA discussed how to proceed with the study of regulation for clearance and disposal of uranium wastes, and identified issues and key points, including the following 3 points which are particularly important for developing regulatory requirements.

- Should uranium be handled as radionuclides of artificial origin, or as radionuclides of natural origin?
- Can consistency be achieved with the concepts of confinement and decay? (Is handling possible as category 2 waste disposal?)
- Should a period be specified for dose assessment of disposal?

The NRA discussed these issues and key points at a total of 3 NRA Commission Meetings (13th FY2020 NRA Commission Meeting (July 1, 2020), 36th FY2020 NRA Commission Meeting (November 4, 2020), and the 45th FY2020 NRA Commission Meeting (December 16, 2020), and after drafting the basic policy on regulation of the clearance and disposal of uranium waste, and solicitate public comments in scientific and technical points of view (For 30 days from December 17, 2020 to January 15, 2021). Based on the results of public comments, the NRA decided “Basic policy on regulation of the clearance and disposal of uranium waste” at the 63rd FY2020 NRA Commission Meeting (March 10, 2021). The NRA has adopted a plan of formulating rules relating to category 2 waste disposal in conjunction with intermediate-depts disposal during FY2021.

**(i) Broadening the Application of Clearance Rules**

Assuming that radioactivity concentrations of radioactive materials in materials used in nuclear facilities are not required measures to prevent harm due to radiation, receiving confirmation of the NRA (hereinafter referred to as “clearance”) has been

limited in application to only some nuclear facilities and items in the previous NRA rules (hereinafter referred to as “clearance rules”). In order to review these clearance rules, and develop new clearance rules expanding the range of applicable facilities and items, the NRA decided to additionally stipulate the 257 radioactive materials designated in the international standard and their clearance levels.

The NRA solicited public comments from March 12 to April 10, 2020 regarding the draft review of clearance rules and the draft revision of related review standards at the 69th FY2019 NRA Commission Meeting (March 11, 2020). At the 9th FY2020 NRA Commission Meeting (June 10, 2020), the NRA decided to consult with the Radiation Review Council regarding clearance rules based on the results of soliciting these views.

At the 149th Radiation Council general meeting held on July 17, 2020, there was discussion of the draft review of clearance rules on which consultation was done (dated June 10, 2020), and a report was received, dated July 17, 2020, stating that consultation by the NRA was valid.

At the 18th FY2020 NRA Commission Meeting (July 29, 2020), the NRA decided on the new clearance rules “Rules for Confirming that No Measures are Needed to Prevent Harm Due to Radiation Caused by Radioactivity Concentrations of Radioactive Materials Contained in Materials Used in Facilities and Other Items” and revised review standards. The new clearance rules and revised review standards were promulgated and took effect on August 13, 2020.

#### **(j) Revision of Rules on Review of Approval Standards for Decommissioning Plans**

In approval standards for decommissioning plans pertaining to research reactor facilities and nuclear material utilization facilities, standards have not been established corresponding to the case where spent fuel has been removed from the reactor core, as required at commercial power reactor facilities, and therefore the NRA decided to revise the relevant rules.

More specifically, at the 50th FY2017 NRA Commission Meeting (November 22, 2017), 31st FY2018 NRA Commission Meeting (September 19, 2018), and 68th FY2018 NRA Commission Meeting (March 27, 2019), the NRA moved forward with study of the direction for review of approval standards, and at the 26th FY2020 NRA Commission Meeting (September 16, 2020) decided to solicit public comments from September 17 to October 16, 2020 on the draft revision of the rules adding the requirement that use of nuclear materials be finished at nuclear material utilization facilities in the case where spent fuel has been removed from the reactor core as the standard for research reactor facilities, and in the case where there is no use of nuclear materials specified in each item of Article 41 of the Cabinet Order of the Reactor Regulation Act as the standard for nuclear material utilization facilities.

At the 44th FY2020 NRA Commission Meeting (December 9, 2020), the NRA decided to revise the rules based on the results of soliciting these views. The revised rules were promulgated and took effect on December 23, 2020.

### **(k) Continuous Improvement of Regulatory Requirements by Reflecting Review Experiences and Past Record**

With regard to commercial power reactors, for which there is extensive experience and past record acquired through conformity review, the NRA decided to further improve the concreteness and expression of requirement content stipulated by current regulatory requirements in order to improve ease of understanding, based on review experience and track record relating to cases where the NRA has already dealt with approval. In this regard, the NRA gathered opinions and proposals from within the NRA Secretariat, and also heard opinions and proposals from nuclear operators at the 12th Meeting on Hearing Opinions of Operators regarding New Regulatory Requirements (August 26, 2020). It was decided to formulate an implementation plan regarding this matter for FY2020 as a result of examining opinions and proposals obtained from within the NRA Secretariat and from operators, and deliberating how to proceed going forward, at the 27th FY2020 NRA Commission Meeting (September 23, 2020), and in that study, it was decided to hold a public meeting and exchange opinions in order to ensure transparency. Opinions on formulation of the implementation plan were exchanged at a meeting to improve specificity and expression of descriptions in regulatory requirements based on the record of the 1st review (October 8, 2020). The implementation plan for FY2020 was approved at the 35th FY2020 NRA Commission Meeting (October 28, 2020). At the 70th FY2020 NRA Commission Meeting (March 31, 2021), a draft revision based on the implementation plan for FY2020 was delivered, and the procedure for soliciting public comments was approved. Going forward, the plan is to decide on the draft revision based on the results of soliciting public comments.

### **(2) Study on Continuous Improvement of Safety**

It was decided to launch a study team on continuous improvement of safety at the 15th FY2020 NRA Commission Meeting (July 8, 2020). Study team meetings have been held 9 times thus far, and studies are being carried out to make efforts to continuously improve safety of nuclear facilities smoother and more effective.

### **(3) Review and Implementation of a Plan for the Technical Evaluation of Private Standards**

Based on the FY2019 Plan for the Technical Evaluation of Private Standards, the NRA held a meeting, continuing from FY2019, of the “Team for Reviewing the Technical Assessment of a Method for Checking the Fracture Toughness of a Reactor Pressure Vessel during an In-Service Period” and review was carried out (July 9, 2020), regarding the Japan Electric Association’s 2016 version “A Method of Checking the Fracture Toughness of a Reactor Pressure Vessel during an In-Service Period” and related 2015 version “A Method of Determining the Fracture Toughness Reference Temperature  $T_0$  of Ferrite Steel.” At the 23rd FY2020 NRA Commission Meeting (September 9, 2020), the NRA approved the technical evaluation report prepared based on discussions by the review team.

At the 2nd FY2020 NRA Commission Meeting (April 8, 2020), the NRA approved the FY2020 Plan for the Technical Evaluation of Private Standards.

At the 16th FY2020 NRA Commission Meeting (July 15, 2020), the NRA approved the launch of a “Team for Reviewing the Technical Assessment of Standards of the Japan

Electric Association relating to Eddy Current Flaw Testing, Ultrasonic Flaw Testing, and Leakage Rate Testing” for conducting technical assessment of the Japan Electric Association’s 2018 version “Guidelines for Eddy Current Flaw Testing of Equipment for Nuclear Power Generation,” 2016 version “Rules for Ultrasonic Flaw Testing in Inspection during the In-Service Period of Equipment for Light Water Nuclear Power Plants,” and 2017 version “Rules for Leakage Rate Testing of Reactor Containment Vessels.” Review team meetings have been held a total of 3 times thus far (on October 6, 2020, November 17, 2020, and January 13, 2021).

Moreover, in order to develop a 2021 plan for the technical evaluation of private standards, the NRA held its 15th Meeting on Hearing Opinions of Operators regarding New Regulatory Requirements (January 22, 2021) and heard from operators about standards for which technical evaluation is desired.

#### **(4) Collection and Analyses of Domestic and Overseas Accidents/Failures Information and Natural Phenomena**

A meeting of the Technical Information Committee, consisting of NRA Commissioners, NRA Secretariat division directors and others, is held approximately every month with the purpose of organizing and sharing information on accidents and failures that occurred at nuclear power plants in Japan and abroad as well as the latest scientific and technological knowledge and judging the necessity of reflecting them in the regulations.

In order to seek the advice of external experts with regard to collection and analysis of information on domestic and overseas natural phenomena, the NRA decided at the 28th FY2020 NRA Commission Meeting (September 30, 2020) to instruct the RSEC and NFSEC to investigate, deliberate, and provide advice on the need for a regulatory response to events such as volcanoes, earthquakes, and tsunamis, based on disasters that have occurred domestically or overseas and the results of collection and analysis of information on findings published by administrative bodies, and to instruct the NFSEC to investigate, deliberate, and provide advice on evaluation by the NRA of the results of volcano monitoring by nuclear fuel cycle facility operators. Accordingly, a Subcommittee on Earthquakes and Tsunamis and a Subcommittee on Volcanoes were newly established at the RSEC and NFSEC. (On December 15, 2020, the Subcommittee on Volcanoes of the RSEC had its name changed from the previous Subcommittee on Volcano Monitoring.)

#### **(a) Collection and Analyses of Domestic and Overseas Accidents/Failures Information**

In order to introduce the latest scientific and technical knowledge, the NRA is collecting and analyzing domestic and overseas information on accidents and failures and conducting two-stage screening on the basis of the necessity of regulatory intervention. In FY2020, the NRA conducted primary screening of 159 cases of publicly available information on domestic overseas accidents and failures as well as accidents and failures information collected through cooperation with international organizations and other countries. As a result, 155 cases were screened out through the primary screening, and 4 cases moved on to secondary screening. Aside from these, of the cases which finished secondary screening and were designated as technological

information to be considered, investigation was completed for 1 case for which further investigation was deemed necessary to determine whether a regulatory intervention is necessary. Preparation for regulatory intervention is ongoing for 2 cases.

Screening results were deliberated in 4 Technical Information Committee meetings in FY2020. In terms of overseas accident and failure information, information was updated regarding the case of “control rod stuck (fixated) due to the wear of thermal sleeve flange,” for which study has been continuing in the stage of secondary screening since FY2019, and additional information was reported. “Reactor shutdown and automatic system startup due to safety wall deterioration” and “deviation of pipe support painting” newly moved on to secondary screening from FY2020. The results of such screening concerning domestic and overseas accidents and failures were reported to the Reactor Safety Examination Committee and the Nuclear Fuel Safety Examination Committee, both of which consist of external experts, to obtain their advice (June 5 and December 15, 2020).

### **(b) Collection and Analysis of Information on Natural Phenomena Inside and Outside Japan**

The NRA’s staff participated in committee and academic meetings held by government organizations and research institutes to collect and analyze information on domestic and overseas natural phenomena. In the overview report of the “Review Meeting on Models of Massive Earthquakes along the Japan Trench and Kuril-Kamchatka Trench” (released on April 21, 2020), the Cabinet Office presented assumption of a maximal class earthquake and tsunami fault model in the pertinent sea area, and the results of estimating tsunami height and flooding areas on coastlines from Hokkaido to Chiba Prefecture, including sites of nuclear facilities. Based on this report, the NRA collected information, e.g., by requesting the Cabinet Office Secretariat to present detailed data, and examined whether regulatory intervention is needed. Also information was shared at a Technical Information Committee meeting “On Assumptions for Tsunami Flooding (released on October 30, 2020)” by Fukui Prefecture.

### **(c) Deliberation of RSEC Subcommittee on Volcano Monitoring relating to Volcano Monitoring Results**

The NRA Secretariat carried out evaluation using the report of the RSEC Subcommittee on Volcano Monitoring report (regarding “measure to judge significant changes in observation data” during volcano monitoring<sup>13</sup>) with respect to the results of monitoring evaluation of volcanic activity in FY2019 carried out by at the Kyushu Electric Power Co., Inc. for the Sendai NPS and Genkai NPS, and at the meeting of the Subcommittee on Volcano Monitoring on October 20, 2020, the evaluation results by the NRA Secretariat were confirmed, i.e., that the assessment by Kyushu Electric Power Co., Inc. that there is no change in the activity situation of the caldera volcano which is the target of monitoring is valid.

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<sup>13</sup>A document summarizing the criteria for determining that observation data from volcano monitoring has exhibited a major change relative to long-term past trends, and that the change is continuing. This was compiled at the March 6, 2020 meeting of the Subcommittee on Volcano Monitoring, and reported at the 72nd FY2019 NRA Commission Meeting (March 18, 2020).



### **Section 3 Steadfast Implementation of the Revised Reactor Regulation Act**

#### **1. Full-scale Operation and Continuous Program Improvement of the New Inspection Program**

Based on discussions by Study team on Oversight Program, which consists of NRA Commissioners, staff of the Secretariat of the NRA and experts, and trial operation of nuclear regulatory inspections carried out from FY2018 to FY2019, the NRA revised Cabinet Order and relevant rules, and prepared inspection guidelines, and then started nuclear regulatory inspection from April 2020. The results of nuclear regulatory inspections were reported for each quarter at the 19th FY2020 NRA Commission Meeting (August 19, 2020), 37th FY2020 NRA Commission Meeting (November 11, 2020), and 56th FY2020 NRA Commission Meeting (February 10, 2021).

Regarding efforts to achieve continuous improvement in nuclear regulatory inspections, a meeting to exchange opinions on the inspection program was established for exchanging opinions with external experts and nuclear operators based on discussion at the 9th FY2020 NRA Commission Meeting (June 10, 2020). This meeting was held 5 times in FY2020, and opinions were exchanged on the system for program improvement, inspection relating to crossover domains, expanded use of the PRA model, and the significance assessment method for nuclear cycle fuel facilities, etc. In light of these meetings, it has been decided to review the inspection guidelines as necessary going forward. As an initiative to improve the competence of inspectors, in FY2020 the NRA provided training and education necessary for acquiring inspector qualifications, and shared information on inspection practice and inspection results through inspector meetings. To prevent spread of COVID-19 transmission, initiatives involving movement of staff, such as visits by Secretariat management to inspection sites, were carried out within a scope with no negative impacts.

In addition, as an improvement midway through conduct of nuclear regulatory inspections in FY2020, an approach was adopted at the 31st FY2020 NRA Commission Meeting (October 7, 2020) of holding public meetings, as necessary, with the aim of operator participation, to confirm the facts of matters noticed in inspections, and more specifically, public meetings on significant instructions for welds of the pressurizer spray line pipe of Ohi Unit 3 were held 11 times. Regarding the process of hearing the opinions of operators on reports of inspection results, it was decided, based on a report of nuclear regulatory inspection results at the 37th FY2020 NRA Commission Meeting (November 11, 2020), to adopt an approach where a draft inspection report is shared before reporting the inspection report to the NRA, and if the operators wish to provide an opinion or other statement, then the NRA Secretariat will hear the opinion submitted in writing by the operators, and report the inspection results to the NRA together with the pertinent opinion. Regarding the case of unauthorized use of an ID card at TEPCO's Kashiwazaki-Kariwa NPS, if due to delay in the report from the NRA Secretariat, there is a possibility of this falling under an inspection finding, then this shall be promptly reported to the NRA Chairman and Commissioners, and the plan is to incorporate a provision to that effect in the inspection implementation procedures.

## 2. Reinforcement of Quality Management

To reinforce quality management systems based on the revised Reactor Regulation Act, an “Rule on Standards for Systems Necessary for Quality Management relating to Operations for Ensuring Safety of Nuclear Facilities” and interpretations of that rule were established at the 50th FY2019 NRA Commission Meeting (December 25, 2019), and these came into effect on April 1, 2020, at the same time as the new inspection system. Due to this step, in seeking permission for basic design or business, nuclear operators must develop systems needed for quality management relating to operations for ensuring safety of nuclear facilities, and carry out procedures relating to quality management systems before starting installation work, such as clearly indicating measures in safety programs and receiving approval, and the NRA is appropriately granting approval of safety programs and shifting to the new system.

In response to this, since April 1, 2020, the NRA has received notification of change in basic design permission due to this revision from 11 operators and 19 nuclear power plants with regard to commercial power reactors, and speedily confirmed its contents. The NRA also received applications for permission to change operational safety programs from these 11 operators and 19 nuclear power plants due to revision of the Reactor Regulation Act and related laws and regulations, and all of these were approved in FY2020. With regard to decommissioning plans, the NRA received applications for change approval from 7 operators and 9 nuclear power plants due to revision of the Reactor Regulation Act and related laws and regulations, and approval was granted in all cases in FY2020. For nuclear cycle fuel facilities, the NRA is speedily checking, in the same way, notifications of changes in business permission received from nuclear operators, reviewing and steadily approving applications for operational safety programs, and shifting to the new system.

# **Chapter 3 Promotion of Nuclear Security Measures and Steadfast Implementation of Safeguards**

○ **Summary of Chapter 3**

**(Promotion of Nuclear Security Measures)**

In order to enhance nuclear security, the NRA has steadfastly promoted, for nuclear facilities, enhancement of measures against insider threats (checking the trustworthiness of individuals and installing monitoring equipment in protected areas) and development of a system for continuously improving cyber security measures at nuclear operators, based on IAEA recommendations (INFCIRC/225/Rev.5).

In FY2020, the NRA received applications for approval to change security plans to enhance nuclear security at commercial power reactors and other nuclear facilities, and strict reviews were carried out despite the impacts of countermeasures against COVID-19. Regarding nuclear regulatory inspections too, the NRA strove for close contact and coordination with operators, despite the impacts of countermeasures against COVID-19. The inspection plan set in April 2020 was flexibly reviewed, and the originally planned inspection was carried out basically on schedule. Through implementation of on-site inspections relating to the security of specified radioisotopes, the NRA steadfastly carried out, and made effort to establish the base of regulation for the security of specified radioisotopes.

**(Steadfast Implementation of Safeguards)**

The IAEA's report regarding safeguards activities in Japan in 2019 concluded that all nuclear material remained in peaceful activities (Broader Conclusion).

Regarding TEPCO's Fukushima Daiichi NPS, Units 1 to 3, where normal inspections cannot be carried out, the NRA took necessary measures such as the verification activities of spent fuel transferred from the spent fuel pool of Unit 3 to the common spent fuel storage facility through continuous consultation with the IAEA, besides the additional measures it took by the previous fiscal year.

In response to the IAEA's efforts to maintain efficient and effective state level safeguards with limited resources, the NRA discussed and consulted with the IAEA regarding facility-type-specific safeguards approaches to be applied at each nuclear facility in Japan, and began applying them to some facilities. The NRA facilitated the international community's understanding of Japan's safeguards and contributed to strengthening and improving the efficiency of international safeguards through participating in international safeguards-related conferences and support for education of safeguards personnel and development of safeguards technologies. In particular, in light of the IAEA's policy of conducting inspections as planned despite the COVID-19 pandemic, the NRA coordinated with the relevant parties in order for the inspections to be carried out based on the IAEA notifications.

The NRA provided necessary guidance and supervision for the designated organization for information processing and implementing safeguards inspection, which plays an essential role in the National System of Safeguards of Japan, to ensure proper performance of its duties.

## Section 1 Promotion of Nuclear Security Measures

### 1. Rigorous and Proper Implementation of Regulations on Nuclear Security

#### (1) Rigorous and Proper Implementation of Regulations on Physical Protection

##### (a) Strict Implementation of Nuclear Regulatory Inspection relating to Physical Protection

In light of the annual plan for nuclear regulatory inspections established in April 2020 (revised on November 11, 2020), the NRA strictly conducted 79 nuclear regulatory inspections including the inspections of the operation of trustworthiness check system (system for determining the trustworthiness of individuals), initial responses in physical protection exercises, and the status of information system security measures.

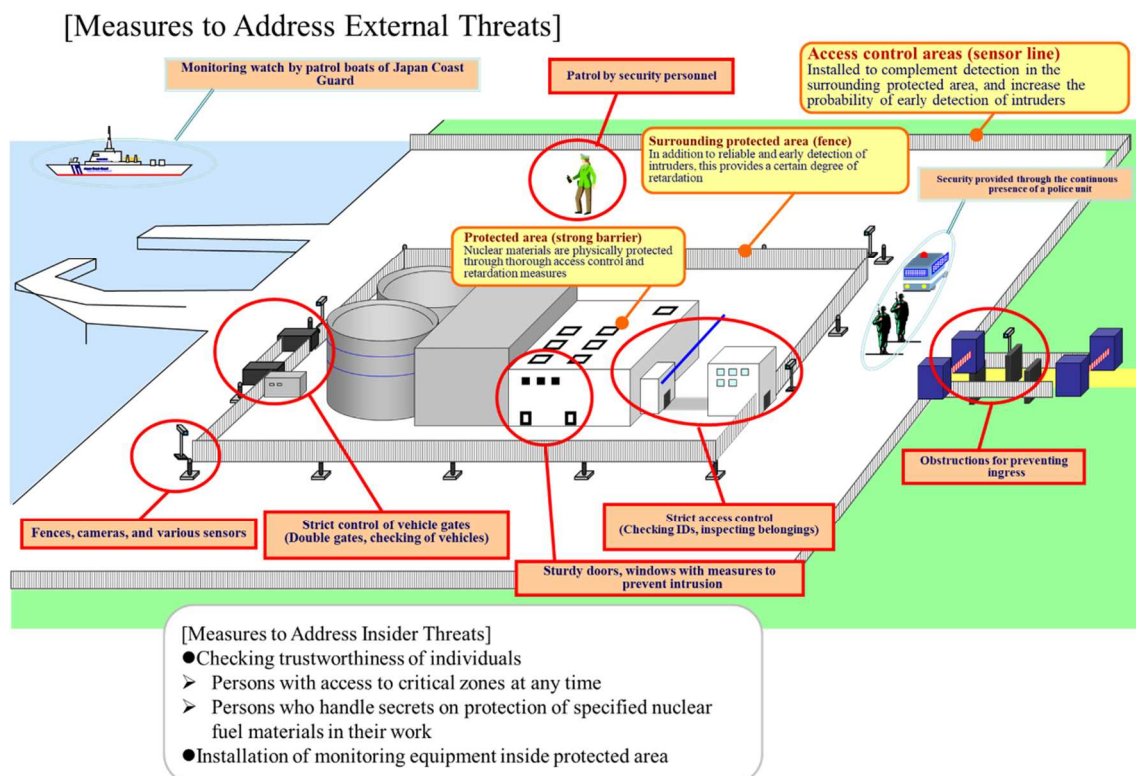


Figure 3-1 Overview of Protective Measures

Regarding the case of unauthorized use of an ID card at TEPCO's Kashiwazaki-Kariwa NPS which occurred on September 20, 2020, the NRA recognized, through nuclear regulatory inspection, deterioration in activities carried out by operators for physical protection, and a provisional evaluation was obtained with a level requiring improvement with regulatory involvement (significance "white") and severity "SLIII." Based on this, the NRA approved that provisional evaluation at an Extraordinary Meeting at the 54th FY2020 NRA Commission Meeting (February 8, 2021). Subsequently, the evaluation was finalized due to lack of objections from TEPCO to the provisional evaluation, and at an Extraordinary Meeting at the 55th FY2020 NRA Commission Meeting (February 9, 2021), a request was made to TEPCO to report on the plan for improvement measures/activities involving together with analysis of the fundamental cause, and the results of carrying out that plan, and the report was received on March 10, 2021.

Regarding the case of partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS, which came to light due to a report from TEPCO to the NRA Secretariat on January 27, 2021, the NRA approved, at an Extraordinary Meeting at the 64th FY2020 NRA Commission Meeting (March 16, 2021), a provisional evaluation of a level with major impact on nuclear material physical protection function or performance (significance "red") and severity "SLI," and TEPCO was notified of the result of provisional evaluation. Later on March 18, 2021, a response was received from TEPCO that they did not wish to make an opinion statement, and the evaluation results for that case were finalized. In line with this, the response category was changed from 2 to 4, and at an Extraordinary Meeting at the 66th FY2020 NRA Commission Meeting (March 23, 2021), it was decided to make a request to TEPCO for a report within 6 months on the plan for improvement measure activities relating to the case of unauthorized use of an ID card and the case of partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS, and TEPCO was notified. At the 67th FY2020 NRA Commission Meeting (March 24, 2021), it was decided, based on the Reactor Regulation Act, to issue an instruction for corrective measures to TEPCO, and a policy was adopted of prohibiting movement of specified nuclear fuel material at the Kashiwazaki-Kariwa NPS until effectiveness of the improvements has been ascertained. (Instructions to take corrective measures were subsequently issued on April 14, 2021.)

**(Reference 1) Overview of case of unauthorized use of ID card at TEPCO's Kashiwazaki-Kariwa NPS**

The case involved employee A at the TEPCO's Kashiwazaki-Kariwa NPS (working in the central control room) (hereinafter referred to as "Employee A"). On the morning of September 20 (Sunday), 2020, which was a work day for Employee A, Employee A could not find his ID card, which had been stored in his personal locker in the employees-only changing room, but he did not report this loss to the Physical Protection Group, and lost the opportunity to take action to invalidate the ID card.

Also, Employee A knew that NPS employee B (working in the central control room) (hereinafter referred to as "Employee B") was not working on that day, and because Employee B had left his personal locker unlocked, and there was imperfect ID card management, Employee B's ID card was removed from his locker without permission.

In response to a name check by contract security staff at the entrance/exit of the peripheral protected area, Employee A declared the name of Employee B. In response to Employee A's declaration, the security guard compared Employee A's face with the ID card a number of times, and despite some doubts, allowed Employee A to enter the peripheral protected area.

At the entrance/exit of the protected area, multiple authentication errors occurred, and an employee security guard (hereinafter referred to as "Protection Employee C") received an error warning. Through the monitor, Protection Employee C took steps like comparing with the stored face photograph, and while having some doubts about the difference, opened the entrance/exit door of the peripheral protected area without any further checking of the person's identify. (At this time, C recognized the pertinent person as Employee B.)

Although Protection Employee C was not in a managerial position relating to access control operations, he did not seek instructions from the person in the managerial position in the Physical Protection Group, and at his own discretion decided to accept the need for storing identification information of Employee A using the name of Employee B. More specifically, Protection Employee C instructed the contract security guard to store the identification information of Employee A, using the name of Employee B, for the ID card of Employee B, and that was done as instructed. At the time, the Kashiwazaki-Kariwa NPS had no rules relating to information storage due to occurrence of an identification information error.

In accordance with Protection Employee C's instructions, the contract security guard stored the identification information of Employee A, and Employee A passed through the entrance/exit door of the peripheral protected area using the ID card of Employee B. In that process, another contract security guard who remembered the face of employee A sensed something wrong and spoke up, but Employee A used the name of Employee B.

As a result of this series of dishonest actions, Employee A entered the central control room, which is a protected area.

On the evening of that day, after Employee A finished work, he found his own ID card. The card had fallen at the back of his personal locker in the employees-only changing room. He returned Employee B's ID card to Employee B's locker. When Employee B tried to enter the protected area for work on the morning of September 21, his ID card produced an error. Protection Employee C, who handled the problem with Employee B's ID card the previous day, thought it suspicious for the problem to recur 1 day later, and when Employee B was questioned about the situation, the series of actions by Employee A came to light. On that same day (September 21), the Physical Protection Group of the Kashiwazaki-Kariwa NPS reported the incident to the Division of Nuclear Security, NRA Secretariat.

### **(Reference 2) Overview of case of partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS**

At TEPCO's Kashiwazaki-Kariwa NPS, there was a partial loss of function of physical protection equipment, and effective alternative measures had not been taken. Therefore, in and after March 2020, the facility was in a condition where unauthorized intrusion could not be detected at a number of locations.

At the Kashiwazaki-Kariwa NPS, recovery took a long time, even though the organization recognized the need for recovery of physical protection equipment. Also, no improvements had been made, even though employee security guards at TEPCO recognized that the alternative measures were not effective. As a result, there were multiple locations where a condition continued for over 30 days where there was a possibility that an unauthorized intrusion could not be detected.

Recovery of physical protection equipment at these locations is finished. No unauthorized intrusions have been confirmed at the pertinent locations. Due to instructions from the NRA Secretariat, the system is now such that effective alternative measures are taken if a new loss of function occurs with physical protection equipment.

In the period from January 2018 to March 2020, partial loss of function of physical protection equipment occurred at multiple locations at the Kashiwazaki-Kariwa NPS, and recovery took a long time.

As indicated above, the Kashiwazaki-Kariwa NPS was in a situation where organizational management functions had declined. Over a long period, the effectiveness of protective measures had not been properly ascertained, and there was potential for a severe incident in terms of physical protection.

### **(b) Review of Security Plans related to Insider Threat Countermeasures**

In accordance with the Reactor Regulation Act, the NRA approves security plans which nuclear operators who handle specific nuclear fuel materials must comply with to protect those materials. The NRA also conducts nuclear regulatory inspections (physical protection inspections). In FY2020, the NRA granted approval in 72 cases for changes in security plans.

The IAEA's Nuclear Security Recommendations on Physical Protection of Nuclear Materials and Nuclear Facilities (INFCIRC/225/Rev.5 January 2011) call for the introduction of a trustworthiness check system as one of the insider threat countermeasures at nuclear facilities, which is a system to check the individuals' personal histories and other information on persons working in a nuclear facility before granting them access to critical zones on the basis of the check results. In response to these recommendations, the NRA revised relevant rules prior by March 2019 to strengthen insider threat countermeasures including a confirmation system of trustworthiness of individuals at commercial power reactor facilities and other nuclear facilities (test and research reactor facilities).

At the 21st FY2020 NRA Commission Meeting (August 31, 2020), the NRA decided to conduct deliberations regarding the review perspective in case of the application submitted by Kansai Electric Power Co., Inc. for approval to change the security plan at the Mihama PS due to conversion to digital of the reactor shutdown panels outside the central control room. It was also decided to check the review results by requesting a report from the NRA Secretariat, and approving the specifics of that based on an arbitrary decision by the Secretary-General of the NRA Secretariat.

After that, Kansai Electric Power Co., Ltd. submitted an application for approval to change the security plan at the Mihama PS, based on the provisions in Paragraph 1 of Article 43-3-27 of the Reactor Regulation Act, dated September 14, 2020 (with revisions dated October 8, 2020, November 4, 2020, and December 28, 2020), as well as a report evaluating the effectiveness of protection measures relating to cyberattacks for reactor shutdown equipment outside the central control room. At an Extraordinary Meetings at the 51st and 54th FY2020 NRA Commission Meetings (January 26, 2021 and February 8, 2021), the NRA received a report summarizing the review report from the NRA Secretariat, approved handling permission for the pertinent application through an arbitrary decision, and granted approval after the necessary procedure.

### **(c) Efforts for Improving Physical Protection Training**

Judgments in case of an event requiring information gathering or an alert-level event, countermeasures including evacuation instructions, and information sharing with the NRA's Secretariat and security organizations are all vital parts of an operator's initial response to a physical protection emergency. In FY2020, the NRA focused on checking levels of training in these areas in nuclear regulatory inspection. Technical guidance was provided by utilizing the NRA's Emergency Response Center (ERC) and participating



in physical protection training carried out by operators.

## (2) Steady Implementation and Establishment of Protection Regulations for Radioisotopes

On September 1, 2019, a new obligation was placed on operators who handle highly hazardous radioisotopes (hereinafter referred to as “specified radioisotopes”) to take security measures for preventing theft, based on the Radioisotope Regulation Act. Therefore, verification of security measure implementation is carried out through on-site inspection for specified radioisotopes operators. In FY2020, 57 on-site inspections were carried out relating to security of specified radioisotopes.

And also to develop specified radioisotope security managers, a specified radioisotope security manager development program was conducted in December 2020 by NRA. In addition in FY2020, periodical course for specified radioisotope security managers was provided 13 times by registered periodic training organizations for specified radioisotope security manager.

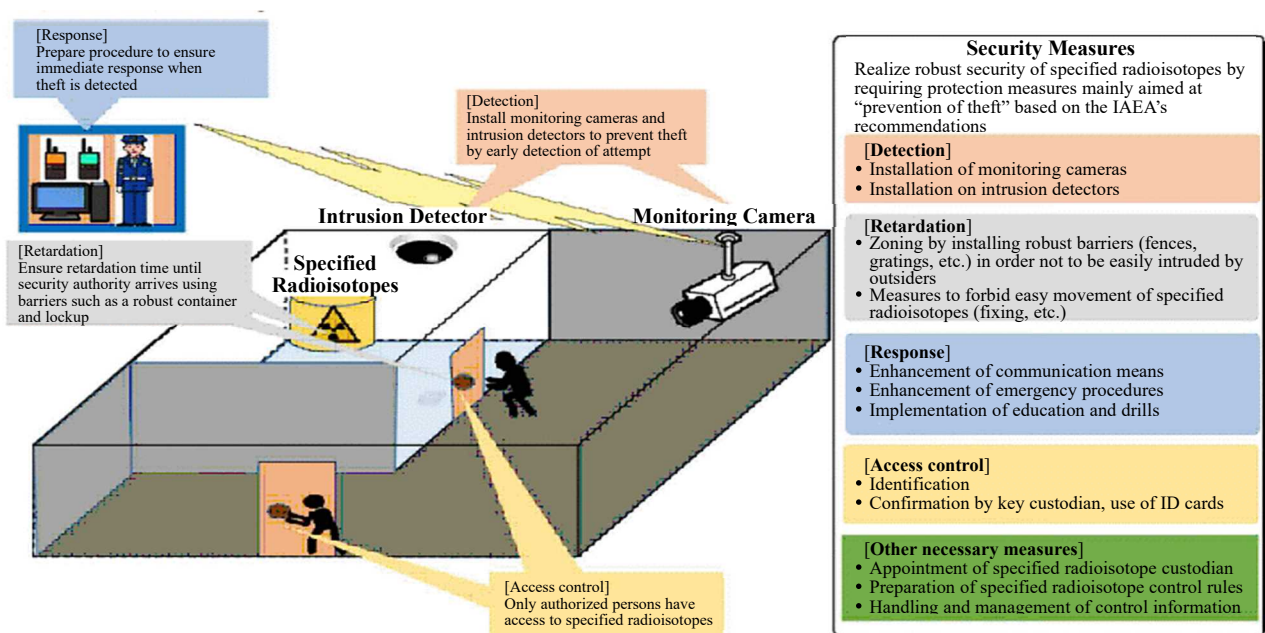


Figure 3-2 Security Measures for Specified Radioisotopes

## 2. Response to Nuclear Security Challenge

### (1) Steady Implementation to Foster Nuclear Security Culture of NRA Officials

In order to foster its nuclear security culture, the NRA formulated a “Code of Conduct on Nuclear Security Culture” in January 2015 based on the “Organizational Philosophy of the Nuclear Regulation Authority” developed in January 2013.

In FY2020, the NRA continued to implement training relating to nuclear security culture, targeting newly hired personnel and persons expected to take the post of inspector.

### **(2) Enhancement of Cyber Security Measures**

In nuclear regulatory inspections, the NRA focused on checking progress in improvement of security plans for information system taking account the “Guidelines for Security Measures for Nuclear Facility Information System” drawn up in March 2018 as reference materials for continuous improvement of cyber security measures by operators themselves. In light of the possible threats such as sabotage to information systems of nuclear facilities (formulated in October 2018), the NRA is conducting review of applications submitted by operators for approval to change security plans based on the revised Examination Standard for Security Plan (April 2019). In order to further strengthen cyber security countermeasures, the NRA provided nuclear operators with technical advice in their physical protection drills.

### **(3) Review of Nuclear Security Measures during Transportation**

The “NRA Rules on Off-Site Transportation of Nuclear Fuel Materials, etc.” requires the locking up and sealing of transportation containers in which specified nuclear fuel material is enclosed. The “NRA Rules on Off-Site Transportation of Nuclear Fuel Materials, etc.” requires that a person responsible for the transportation of such nuclear fuel material shall be clarified, that an agreement shall be concluded among related parties, and that the agreement shall be confirmed by the NRA before transportation begins.

In FY2020, the NRA conducted checking based on these relevant rules, and exchanged opinions on nuclear security measures during transportation with the relevant ministries and agencies.

## **3. Participation in International Conferences**

In order to continually improve its regulations relating to nuclear security measures, the NRA has decided to incorporate the latest knowledge relating to nuclear security, obtained through international conferences, into nuclear power plant regulations.

The NRA participated in conferences on nuclear security scheduled to be held by international organizations in FY2020 via an online conference system rather than face-to-face due to the effects of COVID-19 transmission, collected the latest knowledge relating to the physical protection of nuclear materials, and reflected Japan’s experiences and opinions in international discussions. The NRA contributed in particular to discussion on review on the IAEA Nuclear Security Fundamentals and Nuclear Security Recommendations. The Conference of the Parties to the Amendment to the Convention on the Physical Protection of Nuclear Material is scheduled to be held in order to review the convention’s implementation situation and its adequacy in 2021, 5 years after the convention went into effect. In preparation for holding the conference of the contracting countries, the NRA participated in discussions of the Preparatory Committee Meeting for the Conference of the Parties in December 2020.

## **Section 2 Steady Implementation of Safeguards**

### **1. Steady Implementation of Safeguards Activities in Japan**

In Japan, limiting the use of nuclear power to peaceful purposes is a fundamental policy manifested in the Atomic Energy Basic Act. Japan has accordingly signed the Treaty on the Non-Proliferation of Nuclear Weapons and also concluded a safeguards agreement (Japan-IAEA Safeguards Agreement<sup>14</sup>) and the Additional Protocol with the IAEA based on this treaty. Bilateral nuclear agreements to promote cooperation concerning the peaceful use of nuclear power have also been concluded with 14 countries and 1 international organization. By complying with these international commitments in good faith, Japan is demonstrating to the international community that it is limiting the use of nuclear power to peaceful purposes.

The NRA implements the prescribed regulatory controls in Japan and coordinates on operations with the IAEA and other organizations in Japan and overseas in order that Japan can fulfill its obligations under its international commitments and maintain the trust of Japan by the international community pertaining to the peaceful use of nuclear power.

### **(1) Fulfilling the Japan-IAEA Safeguards Agreement**

#### **(a) Permission for the Use of Internationally Controlled Material and Approval of Provisions for Examination of Accounting**

As a general rule under the Japan-IAEA Safeguards Agreement, all nuclear materials possessed in Japan are subject to this agreement. Thus, even if nuclear fuel materials not subject to safety controls are used, they will be subject to permission or approval to use as safeguarded material. In FY2020, there were 64 cases in which permission or approval to the use of internationally controlled material was granted and 427 cases in which a notification of change was submitted. In order to ensure proper accounting for and control of internationally controlled material in Japan, nuclear operators including the users of such materials (hereinafter referred to as “internationally controlled material users”) are obligated to stipulate their accounting provisions. In FY2020, permission or approval was granted to the accounting provisions in 64 cases and changes were permitted or approved in 194 cases.

#### **(b) Accounting Reports, providing Information of Facility Design, and Other Reporting, and Declarations Based on the Additional Protocol**

Nuclear material accounting is an important basic step in Safeguards. Internationally controlled material users are obligated to report the current and changes of inventory of nuclear materials to the NRA in accordance with the Reactor Regulation Act. The NRA compiles this submitted accounting information into an accounting report after processing by the public interest incorporated foundation, Nuclear Material Control Center (hereinafter referred to as the “Nuclear Material Control Center”), designated as the organization for information processing under the Reactor Regulation Act and submits it through the Ministry of Foreign Affairs to the IAEA on a timely basis. In September 2020, the NRA began submitting accounting reports to the IAEA using an electronic system of the IAEA called the State Declarations Portal (SDP). In FY2020, 2,125 individuals were required to submit accounting reports. The number of each type of submitted accounting report is shown in Table 3-1.

<sup>14</sup> An agreement concluded between the Japanese government and the IAEA to implement the provisions of Article 3(1) and (4) of the Treaty on the Non-Proliferation of Nuclear Weapons

In addition, the NRA provides design information relating to facilities subject to the Safeguards Agreement and other information required to implement safeguards, and submits a declaration based on the Additional Protocol to the IAEA through the Ministry of Foreign Affairs.

Table 3-1 Number of Accounting Reports for FY2020  
(April 1, 2020 - March 31, 2021)

Type	No. of cases
Inventory change reports	1,099
Material balance reports	384
Physical inventory listings	4,313
Nuclear fuel material management reports	3,571

### (c) Verification Activities

The IAEA conducts on-site verification activities, including inspections of facilities, based on information submitted by Japan. Of these on-site verification activities, inspections are carried out after going through communications and adjustments by the NRA and at the same time as Japan's safeguards inspections are carried out, in the presence of officials of the national government or of an organization designated by the NRA. Most of the safeguard inspections are conducted by the Nuclear Material Control Center, which has been designated as an organization for implementing safeguards inspection under the Reactor Regulation Act, according to instructions issued by the NRA. However, the IAEA's verification of facility design information is conducted together with on-site inspections conducted by the NRA itself, in the presence of NRA staff. The IAEA's complementary access under the Additional Protocol is attended by the staff of the NRA and the Ministry of Foreign Affairs. In light of the IAEA's policy of conducting inspections as planned despite the COVID-19 pandemic, the NRA coordinated with the relevant parties in order for the inspections to be carried out based on the IAEA notifications. Table 3-2 shows a record of on-site verification activities in FY2020.

Table 3-2 Record of On-site Verification Activities Carried Out in FY2020  
(April 1, 2020 - March 31, 2021)

Type	Nuclear Regulation Authority	Nuclear Material Control Center	Ministry of Foreign Affairs
Safeguards inspections	44 person-days	1,638 person-days	
Design information verification	89 person-days		
Complementary access	29 person-days		20 person-days

#### **(d) Coordination for Facilitating Implementation of Safeguards**

In order to facilitate the implementation of safeguards, the NRA has held meetings with the IAEA with the attendance of relevant domestic organizations for the purpose of sharing information on the state of facilities, investigating issues that arise when safeguards are implemented and making adjustments. Despite the difficulty of holding meetings as before due to the COVID-19 pandemic, a total of 3 working group meetings participated by the specified facility groups were held (1 held online) in FY2020 to review and adjust safeguards-related issues.

#### **(e) Treatment of Safeguards Equipment in Terms of Safety Regulations**

In order to prevent the occurrence of safety problems caused by safeguards equipment such as monitoring cameras installed in nuclear facilities in line with the implementation of the Japan- IAEA Safeguards Agreement, close coordination was made among the IAEA, nuclear operators, relevant NRA Secretariat departments and others.

#### **(f) IAEA's Safeguards Conclusions**

At the 7th FY2020 NRA Commission Meeting (May 28, 2020), the NRA received from its Secretariat the results of 2019 safeguards activities in Japan and reported the results to the IAEA to contribute to the IAEA's assessment of Japan's safeguards activities. The IAEA draws a conclusion on safeguards based on the evaluation of all information obtained through safeguards activities carried out every year by the contracting parties to the Safeguards Agreement, and reports it at the IAEA's Board of Governors meeting in June of the following year. For Japan, as a result of the safeguards activities, the IAEA found no indication of the diversion of declared nuclear material from peaceful nuclear activities and no indication of undeclared nuclear material or activities. On this basis, the IAEA also concluded in 2019 that all nuclear material remained in peaceful activities (Broader Conclusion). Accordingly, this Broader Conclusion has been adopted continuously for 17 years since the results of the implementation of safeguards in 2003 were obtained.

#### **(g) Response to Cases of Damage to Inspection Seals Used for Safeguards**

In March and August of 2020, a series of incidents occurred, at the uranium enrichment plant and reprocessing plant of Japan Nuclear Fuel Ltd., where there was damage to the inspection seals mounted to in order to monitor movement of internationally controlled materials by the IAEA and NRA as part of safeguards

activities based on international agreements. In the accounting provisions established by operators and approved by the NRA, it is clearly indicated that the operator must immediately notify the NRA if an inspection seal is damaged, but there was no provision mandating reporting of the inspection seal damage in current laws and regulations. Therefore, the NRA instructed the NRA Secretariat to take measures to ensure that reporting from the operator to the NRA Secretariat is always done when there is damage to an inspection seal, and study the response of the NRA in case a report is received (the 26th FY2020 NRA Commission Meeting (September 16, 2020)). At the 36th FY2020 NRA Commission Meeting (November 4, 2020), Regulation covering the Use of Internationally Controlled Materials (hereinafter referred to as the “International Rule”) was revised, and a response approach was approved mandating reporting to the NRA if damage occurs to an inspection seal or monitoring equipment. At the 45th FY2020 NRA Commission Meeting (December 16, 2020), the NRA deliberated on the draft revision of the International Rule, and decided to officially announce the revised International Rule, and put it into effect, on February 22, 2021 after public comments were solicited.

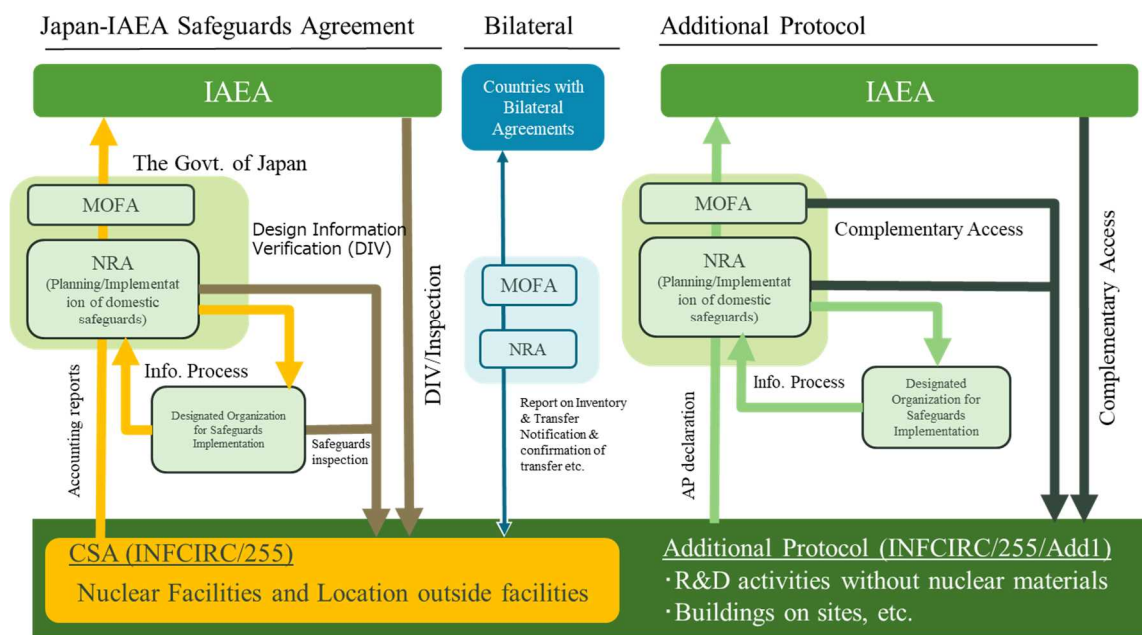


Figure 3-3 Safeguards Implementation Arrangement

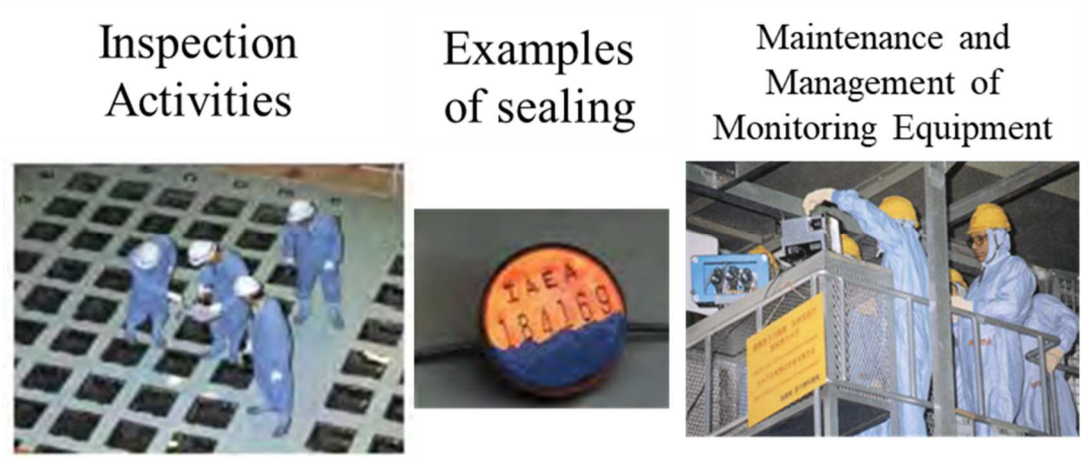


Figure 3-4 Safeguards-related Activities

Inventory and Inventory changes of Nuclear Material in Japan  
(Summarized results of accounting management at each facility)

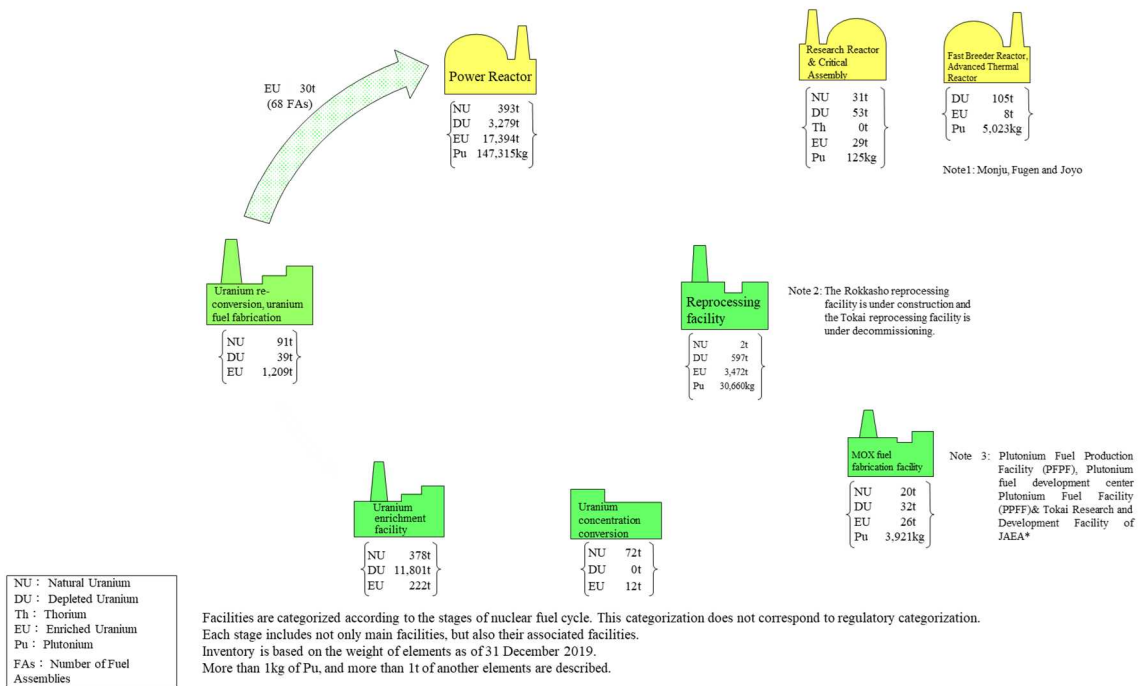


Figure 3-5 Amount of Nuclear Materials in Japan

## (2) Implementation of Procedures for Internationally Controlled Material on the Basis of Bilateral Nuclear Agreements

Japan has concluded bilateral nuclear agreements with 14 countries and 1 international organization, and has undertaken commitments to use nuclear source materials, nuclear fuel materials, and moderator materials which have been transferred under these agreements, and nuclear fuel materials produced as a result of using these transferred materials, for only peaceful purposes and to carry out procedures applicable to items subject to these agreements. In FY2020, in accordance with these agreements,

the NRA handled 2 cases of verification pertaining to the management of the country origin of the nuclear materials transferred from other contracting parties and 5 cases of verification pertaining to the management of the country origin of nuclear materials transferred to other contracting parties. In addition, with the support of the Nuclear Material Control Center, the NRA reported 14 inventory listings to the IAEA.

## **2. Safeguards at TEPCO's Fukushima Daiichi NPS**

Normal on-site verification activities have been carried out for all nuclear materials in reactors except Units 1 to 3 at Fukushima Daiichi NPS. Normal inspections cannot be carried out for Units 1 to 3 reactors, due to the difficulty of entering these reactors. Therefore, through consultations with the IAEA and relevant domestic organizations, the NRA has introduced a full-time monitoring system based on the use of surveillance cameras and radiation monitors and special additional verification activities specific only to this NPS site. Thus, the NRA established a framework to allow the IAEA to verify that no undeclared nuclear material has been moved within Units 1 to 3. In FY2020, the NRA carried out verification activities on the transfer of spent fuel from the Unit 3 spent fuel pool to the common spent fuel storage facility. In order to study the safeguard techniques applied to sampling of fuel debris at Unit 2, checking was done with the IAEA in November 2020 of the connection situation of primary containment vessel(PCV) penetration.

The Fukushima Task Force Meetings, normally held twice a year at the IAEA Headquarters, could not be held due to the spread of COVID-19, but Core Damage Subgroup Meetings were held in Japan in June and November 2020. There was discussion of safeguards equipment to be adopted at analysis facilities and storage facilities scheduled to be constructed on the site of the NPS, and examination of accounting method at these facilities, and information was shared on activities at the NPS site that are needed to implement safeguards.

Regarding special additional verification activities specific only to this NPS site, a proposal was received from the IAEA to the effect that they wish to implement these activities as complementary access. The implementation procedure was discussed, and an agreement was reached with the IAEA regarding implementation as complementary access starting from January 2021.

## **3. Examination of New Safeguards Inspections**

In order to maintain efficient and effective safeguards with limited resources while utilizing the experience of safeguards implementation and new techniques, the IAEA has formulated a "State Level Safeguards Approach" for each country taking into account the state of nuclear activities and technical capacities of each member state. Because the IAEA adopted the same approach also to Japan, the NRA, in continuation from FY2019, examined and discussed facility-type-specific inspection procedures based on that approach at working group meetings jointly held with the IAEA. During FY2020, agreement was reached with the IAEA regarding new inspection procedures based on the same techniques for the low enriched uranium fuel fabrication facilities, enrichment facilities, the Rokkasho Reprocessing Plant, and light water reactors, and use of those procedures was started.



The IAEA expressed its intention of enhancing verification activities for “locations outside facilities”<sup>15</sup> present at approximately 200 locations in Japan and is recommending Japan’s independent implementation of safeguards inspections to complement those verification activities. Therefore, in order to improve the quality of accounting control at “locations outside facilities” and the reliability of Japan’s safeguards activities, in FY2020 the NRA independently implemented safeguards inspections, separate from IAEA inspections (independent domestic safeguards inspections), at 6 “locations outside facilities,” based on the implementation guideline for domestic safeguards inspections (NRA decision on February 19, 2020).

#### **4. Information Transmission and Human Resource Development related to Japan’s Safeguards Activities**

##### **(1) Information Transmission through the Asia-Pacific Safeguards Network (APSN)**

The Annual Conference of the Asia-Pacific Safeguards Network (APSN) was held as an online conference on December 2, 2020, with the participation of 17 member countries, the IAEA, and the European Safeguards Research and Development Association (ESARDA). To help enhance safeguards arrangements in the Asia-Pacific region, the NRA reported on the impact of the COVID-19 pandemic on inspections in Japan and challenges for the future.

At the annual meeting of the Institute of Nuclear Materials Management Japan Chapter (INMMJ) held online in November 2020, the NRA made a presentation on safeguards implementation and challenges in Japan.

##### **(2) Support for the Implementation of Safeguards by the IAEA and Foreign Countries**

The technical development required for the implementation of safeguards by the IAEA has been conducted by the key IAEA member states. Japan has proactively contributed to the reinforcement of international safeguards. Specifically, Japan has helped to improve the technical capacity of the IAEA and other member states to implement safeguards through a framework that includes the Japan Support Programme for Agency Safeguards (JASPAS). The program covers a lot of ground, including participation in the IAEA Network Laboratories for Safeguards Analysis, which analyzes environmental samples obtained by the IAEA inspectors, and providing training opportunities to IAEA inspectors and officials of member states. The NRA has made overall coordination of the support program and provided the necessary funds. As of the end of March 2021, 29 projects are in progress. In an online regional training course for State System of Accounting for and Control of nuclear material jointly held by the Japan Atomic Energy Agency and the IAEA, the NRA presented Japan’s accumulated knowledge.

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<sup>15</sup> These mean structures or locations that do not fall under the IAEA safeguards categories of nuclear reactor facility, criticality facility, conversion plant, fabrication plant, reprocessing plant, isotope separation plant or independent storage facility and that normally use nuclear materials less than 1 effective kilogram. Particularly, “usage facilities” in regulatory classification in terms of the Nuclear Reactor Regulations Act correspond to the “locations outside facilities.”

## **5. Guidance and Supervision of the Designated Organization for Information Processing and for Implementing Safeguards Inspection under the Reactor Regulation Act**

As the designated organization for information processing and for implementing safeguards inspections and associated activities under the Reactor Regulation Act, the Nuclear Material Control Center is required to carry out its operations in an appropriate manner. To ensure the proper performance of the work by the Nuclear Material Control Center, the NRA periodically conducts onsite inspections based on the Reactor Regulation Act and checks compliance with provisions relating to the Act and information security reinforcement situations.

### **Section 3 Reinforcement of Interface for Nuclear Safety, Nuclear Security and Safeguards**

In order to achieve harmonization among nuclear safety, nuclear security and safeguards (3S) at a higher level, the NRA clarified the related issues and discussed the direction to head at the 5th FY2018 NRA Commission Meeting (April 25, 2018). Continuous study on this matter was intended.

If an application has been filed for permission about safety or nuclear security, the person in charge of examining the relevant measure checks adverse effects to other measures and shares the result with the sections responsible to eliminate mutually adverse effects as much as possible.

A local inspector who notices any matters about the nuclear security, and safeguards during the operation of nuclear regulatory inspection must share the information with the responsible section. A security or safeguard inspector who finds something in other measures must share the information with the responsible section as necessary. Coordination and checking were done regarding the flow and management of information relating to nuclear security between the Secretariat and Regional Offices. In this way, timely information sharing from the Secretariat to Directors of Regional Offices is being conducted as necessary with regard to inspection findings on physical protection for nuclear operators in nuclear regulatory inspections.

For those engaged in the work that requires harmonization of 3S, such as examinations and inspections related to nuclear safety, the reliability of officials dealing with secrets on physical protection has been checked sequentially to ensure appropriate access to documents related to secrets on physical protection based on the “Instructions on Confirmation.”

**Chapter 4 Ensuring the Safety of Decommissioning of  
TEPCO's Fukushima Daiichi NPS and  
Investigating the Causes of the Accident**

○ **Summary of Chapter 4**

**(Oversight of Efforts to Decommission Reactors of TEPCO's Fukushima Daiichi NPS)**

In FY2020, the NRA rigorously reviewed TEPCO's applications for change in the "Implementation Plan Pertaining to Specified Nuclear Facilities at the Fukushima Daiichi NPS" and approved 21 cases of change.

TEPCO's activities to comply with the approved Implementation Plan are being overseen through operational safety inspections, pre-service inspections, welding inspections, periodic facility inspections, physical protection inspections, and daily inspection patrols by nuclear operation inspectors stationed on the site.

**(Measures for Mid-term Risk Reduction)**

The NRA developed the "Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS," (hereinafter referred to as the "Risk Map") in February 2015 and has regularly revised it according to the progress of decommissioning. In FY2020, the NRA confirmed that it was possible to keep the buildings' floor exposed through stagnant water treatment other than Units 1 to 3's reactor buildings, process main building, and high-temperature incinerator building. Also, the NRA confirmed the completion of removal of fuel from the spent fuel pool of Unit 3. In addition, the NRA revised the "Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS (March 2021 version)" which sets forth the desired state to be achieved through key initiatives to be taken in the next 10 years to reduce risk, clarifies risks which may affect people and the environment at TEPCO's Fukushima Daiichi NPS, and reviews matters such as incorporating knowledge obtained through investigation and analysis of the accident.

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

The accident analysis is one of the important tasks of the NRA, and carrying out investigation and analysis from technical viewpoint. Due to improvements in the on-site environment and progress in decommissioning work, accessibility to the inside of reactor buildings has improved, and it has become possible to investigate the status of facility and collect samples, the NRA decided the additional investigation/analysis implementation policies and systems in September 2019. Accordingly, the Accident Analysis Study Committee established at the NRA has conducted investigation and analysis using the results of on-site investigations and records from the time of the accident at TEPCO's Fukushima Daiichi NPS.

In FY2020, the Accident Analysis Study Committee examined routes and points of release or leakage of radioactive materials from the reactor containment vessel, detailed analysis of hydrogen explosions in reactor buildings, and status of equipment which should cool the reactor. The study results were compiled as the "Interim Summary of Investigation and Analysis of TEPCO's Fukushima Daiichi NPS Accident." Furthermore, the NRA established the "Fukushima Daiichi NPS Decommissioning and Accident Investigation Liaison and Coordination Meeting" in which implementing bodies of accident analysis and the decommissioning work participates in order to coordinate the work related to accident analysis and the decommissioning work and necessary coordination was made in the meetings.

The NRA also actively participated in international conferences at the NRC and other overseas organizations, disseminated information on studies relating to analysis of the accident, provided overview explanation of investigation and analysis in the OECD/NEA/CSNI research project (ARC-F), and otherwise worked to share

information.

**(Monitoring after TEPCO’s Fukushima Daiichi NPS Accidents)**

According to the agenda of the “Comprehensive Radiation Monitoring Plan” (formulated at the Monitoring Coordination Meeting on August 2, 2011 and most recently revised on April 1, 2020), the NRA engaged in post-accident radiation monitoring of TEPCO’s Fukushima Daiichi NPS, including general environmental monitoring throughout Fukushima Prefecture and monitoring of the waters near TEPCO’s Fukushima Daiichi NPS and of Tokyo Bay.

## **Section 1 Oversight of Efforts to Decommission Reactors**

### **1. Approval and Inspection, etc. of the Implementation Plan pertaining to TEPCO's Fukushima Daiichi NPS**

In order to employ appropriate management methods in accordance with the state of the facility, the NRA designated the TEPCO's Fukushima Daiichi NPS a "Specified Nuclear Facility" in November 2012, and indicated to TEPCO measures which should be taken in order to secure the nuclear power reactor facilities and protect specified nuclear fuel material. An application for the approval of the Implementation Plan was received, and approval was granted in August 2013 with indicating some points of concern

In FY2020, 21 changes to the Implementation Plan were approved. Aside from operational safety inspections by regional safety inspectors, there were 27 pre-service inspections, and 8 welding inspections. Moreover, the NRA also oversaw TEPCO's activities by conducting periodic facility inspections, focusing on safety-significant equipment for maintaining the performance of the facility, and conducted physical protection inspections for matter pertaining to physical protection of nuclear fuel materials.

In terms of countermeasures for COVID-19 at TEPCO's Fukushima Daiichi NPS, the NRA received an explanation at the Commission on Oversight and Evaluation of the Specified Nuclear Facilities (hereinafter referred to as the "Oversight and Evaluation Commission") that efforts being made include consistent enforcement of measurement of temperature and wearing masks, refraining from travel across the border of Fukushima Prefecture, and separating traffic lines of on-duty staff and other workers, and verified through operation safety inspections regarding implementation of those measures. However, a few cases of COVID-19 were confirmed in December 2020, January 2021, and March 2021, did not result in large-scale spread of contagion, and confirmed to be no major delay in decommissioning work due to COVID-19 or measures to address it.

### **2. Oversight of Efforts to Address Liquid Radioactive Material**

#### **(1) Oversight of Efforts to Dry Up Turbine Building**

TEPCO's plan has been to treat stagnant water in buildings and expose the floor of the lowermost basement floor of turbine buildings of Unit 1 to 4, except for the Unit 1 to 3 reactor buildings, which circulative cooling is being done, the process main building, and the high-temperature incinerator building, by the end of FY2020. In December 2020, the NRA confirmed that by installing permanent pumps for the floor drain sumps at the lowermost basement floors, TEPCO made progress as planned in lowering the water level in each building, and has generally made it possible to keep the floor surface of the lowermost basement floors exposed. Regarding buildings with exposed floors, the NRA requested examination of the response to sludge deposited on the floor from the perspective of dust scattering due to drying, and requested to explain about the means and countermeasures for transferring water if the water level rises during heavy rain because rainwater and groundwater continue to flow into the buildings in the future. The NRA also requested a plan for lowering the water level in the Unit 1-3 reactor buildings, and the sub-drain water level, and examination of measures to remove  $\alpha$ -emitting radionuclides in stagnant water in the deep parts of the buildings which will have to be dealt with going forward.

Stagnant water transferred from inside buildings is subjected to purification using the Advanced Liquid Processing System (ALPS), and the post-treatment water (hereinafter referred to as “treated water”) is stored in tanks. Regarding the stored treated water, in initial ALPS operation, for the site-limit dose reduction, the operation was carried with a lower replacement frequency of adsorbent in order to treat contaminated water more quickly, and thus the total ratio to notification concentration limits of the 62 nuclides and carbon-14, which is the subject to removal with ALPS, exceeds 1 in approximately 70% of tanks. TEPCO has conducted secondary treatment using ALPS in bringing the total ratio to notification concentration limits to under 1 by testing of tanks where the total ratio to notification concentration limits is 100 or higher to check performance of secondary treatment using ALPS. Then NRA received an explanation of the results of checking performance of secondary processing at a meeting of the Oversight and Evaluation Commission, and checked whether analysis of nuclide concentration was performed correctly before and after secondary treatment. At the 85th Oversight and Evaluation Commission meeting (November 16, 2020), the NRA requested that evaluation to be done while properly examining and considering the uncertainty which arises in the various processes of analysis.

## **(2) Oversight of Efforts to Stop Reactor Water Injection**

The NRA requested TEPCO to switch from cooling through water injection to fuel debris to air cooling in the reactor containment vessels of Units 1 to 3 in order to suppress production of contaminated water, and checked activities to achieve that.

In FY2020, tests of stopping reactor water injection were conducted for 5 days at Unit 1 and 3 days at Unit 2. The Oversight and Evaluation Commission checked the results of those tests, evaluated and analyzed a temperature prediction model based on long-term stoppage, and requested to continue the examination of water injection stoppage testing for longer periods, and the issues involved in that.

## **3. Oversight of Efforts to Address Spent Fuel**

### **(1) Oversight of Efforts to Remove Fuel from Unit 3**

With regard to removal of fuel from the Unit 3 spent fuel pool, TEPCO has moved forward with work, aiming to finish at the end of FY2020, and the NRA has continuously overseen the work situation.

In FY2020, the NRA checked causes and countermeasures on incidents at Oversight and Evaluation Commission meetings regarding issues which occurred during fuel removal work, such as the mast cable breakage incident (September 2, 2020) and the problem with the crane main hoisting not rising (November 18, 2020). Thus far, the NRA has required procurement of spares to handle equipment malfunctions, and that response has moved forward smoothly, so there have been no longer term stoppages of work due to problems.

It has been confirmed that there are 18 fuel units with handles deformed due to the effects of debris falling during the accident, and of these 4 units are significantly deformed. These units cannot be handled with existing jigs for fuel handling equipment, and therefore a jig was prepared capable of handling fuel units with greater handle deformation, and it was confirmed that all 4 units can be hoisted with these jigs. Safety in design and handling of new jigs was checked in review of applications for approval to change implementation plans. Regarding fuel that was not hoisted due to interference

between fuel assemblies and debris between fuel racks, the interference with debris was resolved, and the hoisting load was increased. It was confirmed that these measures enabled hoisting.

Through interviews and Oversight and Evaluation Commission meetings, the NRA confirmed on February 28, 2021 that removal of fuel from Unit 3 was complete for a total of 566 fuel assemblies. The NRA required TEPCO to reflect on and summarize the problems in terms of operation and procurement management which occurred in the work of removing fuel from Unit 3, and requested that the lessons learned be used in decommissioning work planned for the future such as removal of fuel from Unit 2.

## **(2) Oversight of Efforts to Remove Fuel from Unit 2**

Regarding activities to remove fuel from the spent fuel pool at Unit 2, a method was indicated at the 76th Oversight and Evaluation Commission Meeting (November 18, 2019) where, in light of the fact that the dose is still high in the Unit 2 reactor building, a working platform for fuel removal will be installed on the south side of the reactor building, and fuel removed through an opening provided in the outer wall on the south side of the reactor building.

In FY2020, the NRA received an application (dated December 25, 2020) for approval to change the implementation plan from TEPCO, which is relating to installation of the working platform for fuel removal and fuel handling equipment, and regarding the specifics of the application, the NRA checked the review situation for measures to reduce dose such as shielding design and quality management relating to procurement of equipment at the 87th Oversight and Evaluation Commission Meeting (January 25, 2021). The NRA continue to review the application content through interviews.

## **4. Oversight of Efforts to Address Solid Radioactive Material**

### **(1) Oversight of Activities Aimed at Expanded Installation of Incineration Equipment**

In order to install new miscellaneous solid incineration equipment for incineratable debris and tree cuttings scattered around temporary storage areas, with the aim of resolving the issue of temporary storage areas on-premises, an application for approval to change the implementation plan was submitted by TEPCO, dated April 11, 2017, and the NRA granted approval on April 19, 2018. TEPCO was engaged in installation work aiming to start operations from April 2021.

However, in January 2021, it came to light that wear occurs due to eccentricity of the rotating shaft of the rotary kiln, and the NRA received a report that a design change would be necessary, so the time for starting operations would be reconsidered. At present, the NRA is checking, through operational safety inspection, issues and points for improvement in terms of procurement management, and examining whether this will have an impact on long-term waste management.



## **(2) Oversight of Efforts to Examine Stabilization Measures for Zeolite at the Main Process Building**

Regarding zeolite sandbags confirmed at the basement floor of the main process building and high-temperature incinerator building, stabilization treatment is necessary due to the extremely high dose and interference with stagnant water treatment work for exposing the floors of the pertinent buildings, and the NRA is overseeing review efforts for achieving stabilization.

In FY2020, at the 87th Oversight and Evaluation Committee Meeting (January 25, 2021), TEPCO presented 4 stabilization treatment technique patterns, honed down based on knowledge and past records inside and outside Japan, and presented an assessment that submerged recovery is the technique with the highest feasibility. The NRA requested that TEPCO identify likely issues and problems which may arise when conducting this treatment, and requested continuing studies that take responses to such issues into account.

## **(3) Oversight of Efforts to Investigate Inside the Containment Vessel of Unit 1**

In order to carry out an internal investigation of the reactor containment vessel with the purpose of ascertaining the distribution of fuel debris and status of existing structures, as part of preparations for removal of fuel debris still present in the reactor containment vessel, an application for approval to change the implementation plan was submitted by TEPCO, dated July 25, 2018, and the NRA granted approval on March 1, 2019. Subsequently, the NRA has monitored efforts to bore the X-2 penetration, and build access routes for investigation equipment.

In FY2020, the NRA checked the situation of cutting the X-2 penetration inner door, and removing obstructions inside the reactor containment vessel through interviews, and requested measures to prevent scattering of dust due to work, as well as investigation of the cause and implementation of countermeasures for any trouble arising in obstruction cutting work.

## **5. Oversight of Efforts to Address External Events**

### **(1) Oversight of Building Roof Repair Activities**

At the 84th Oversight and Evaluation Commission Meeting (October 19, 2020), the NRA checked rainwater countermeasures for the building roof of each unit, and also received a report about the completion of repair work for damaged part of the roof of the Unit 3 turbine building, that removal of debris, a dam to prevent influx of rainwater and a rainwater cover were installed, and with the installation of purification material and application of waterproof coating was finished on October 15, 2020.

Due to the progress in treatment of stagnant water in buildings, joining of water between buildings was eliminated, and thus it became possible to more accurately assess the amount of influx of rainwater and groundwater at each building. Therefore, at the 81st Oversight and Evaluation Commission Meeting (June 15, 2020), the NRA requested an explanation of the amount of influx of rainwater and groundwater at each building. However, the NRA received an explanation at the 84th Oversight and Evaluation Commission Meeting (October 19, 2020) due to low rainfall in 2020, it was not possible to obtain sufficient data for an accurate evaluation, and therefore the NRA requested that an accurate evaluation be carried out by continuing to supplement data.

## **(2) Oversight of Efforts to Dismantle the Upper Part of the Exhaust Stack for Units 1 and 2**

Regarding work to dismantle the upper part of the exhaust stack common for Units 1 and 2, the NRA has checked the work situation at Oversight and Evaluation Commission Meetings since FY2019. These checks have covered: prevention of dust scattering due to work, worker exposure dose management, and response to troubles with equipment, etc.

With completion of dismantling of all 23 blocks of the stack upper part and steel tower on April 29, 2020, and installation of a cap to prevent influx of rainwater at the top of stack (height: 59 m above ground) on May 1, 2020, the NRA confirmed that all work was finished relating to dismantling of the upper part of the exhaust stack for Units 1/2.

## **6. Oversight of Efforts to Address Important Points for Moving Forward with Decommissioning Work**

### **(1) Oversight of Efforts to Strengthen the Decommissioning Project and Quality Management System**

The NRA exchanged opinions with TEPCO's management at the 53rd FY2019 NRA Commission Meeting (January 16, 2020) and required TEPCO to reinforce the TEPCO system on decommissioning of Fukushima Daiichi NPS. On April 1, 2020, TEPCO reorganized the Fukushima Daiichi Decontamination and Decommissioning Engineering Company to reinforce project management functions and safety/quality, and as part of that, bolstered personnel at the Fukushima Daiichi NPP.

The NRA requested TEPCO to analyze the effectiveness of this reorganization, and at the 83rd Oversight and Evaluation Commission Meeting (September 14, 2020) received an explanation from TEPCO about the evaluation result that the goal of the reorganization, i.e., reinforcing project management functions relating to decommissioning has been generally achieved, and no major issues have arisen. On the other hand, in operational safety inspections for the 2nd quarter of FY2020, there were a series of nonconformities in terms of radiation management, operation management, and design management, and violations of the implementation plan (minor violations) were pointed out in connection with these 4 nonconformities, and at the 84th Oversight and Evaluation Commission Meeting (October 19, 2020), the NRA requested for TEPCO to analyze the effectiveness of the reorganization while also taking into account the 4 events pointed out in operational safety inspections. Later, at the 86th Oversight and Evaluation Commission Meeting (December 14, 2020), TEPCO explained that the main cause of the series of nonconformities was a problem with risk management, and to remedy the issue they will improve the competence of individuals and have managers observe the situation on-site. On the other hand, there was no analysis of fundamental issues from the standpoint of quality management. In response to this, the NRA requested analysis of the common factors involved in the nonconformities pointed out in inspection, while addressing whether there are any fundamental issues relating to quality management, and the results of that analysis and remedial measures were checked at the 88th Oversight and Evaluation Commission Meeting (February 22, 2021).

In a forum for exchange of opinions with management of TEPCO at the 46th FY2020 NRA Commission Meeting (December 21, 2020), the NRA exchanged views regarding staffing after the reorganization, and requested TEPCO as a whole to consider staffing necessary for decommissioning, and not leave everything up to the Fukushima Daiichi Decontamination and Decommissioning Engineering Company.

### **(2) Oversight of Efforts by Operators to Commence Facility Inspections**

The NRA requested TEPCO to formulate a long-term maintenance management plan for on-premises facilities and equipment, taking into account progression of aging degradation, and checked the situation regarding formulation of the plan and confirming of its appropriateness at Oversight and Evaluation Commission meetings. Full-scale operation commenced in the fourth quarter of FY2020, and in the continuing operational safety inspections and Oversight and Evaluation Commission meetings, the NRA is overseeing activities based on the plan.

### **(3) Oversight of Efforts to Continually Improve the Labor Safety and Health Environment**

On November 1, 2020, operation of the surrounding protected area and access control points for Units 1 to 4. Regarding this change in operation, in an on-site inspection by the Oversight and Evaluation Commission and the NRA (December 1, 2020), it was pointed out that there is crowding in some time slots at the on-premises bus stop and the personal protective equipment changing place inside the surrounding protected area for Units 1 to 4, and that waiting outside due to this crowding has an effect on workers due to unnecessary exposure to radiation, and the NRA requested examination of measures to ease crowding, and consideration of measures to reduce exposure while taking into account the views of workers at the site.

## **7. Revision of the Measures for Mid-term Risk Reduction**

The NRA developed the Risk Map in February 2015 for the purpose of setting a target related to measures at TEPCO's Fukushima Daiichi NPS, and reviewed in accordance with the progress of the decommissioning work.

As indicated in the items above, In FY2020, the NRA checked, regarding buildings other than Units 1 to 3's reactor buildings, process main building, and high-temperature incinerator building, that it was possible to maintain the exposed floors, and that removal of fuel from the spent fuel pool of Unit 3 was finished.

In March 2021, following the concept in the Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS (ver. March 2020), the NRA developed a revised "Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS (ver. March 2021)" which sets forth the desired state to be achieved through key initiatives to be taken in the next 10 years to reduce risk, clarifies risks which may affect people and the environment at the Fukushima Daiichi NPS, and reviews matters such as incorporating knowledge obtained through investigation and analysis of the accident. (From Figure 4-1 to Figure 4-7)

**Measures for Mid-term\* Risk Reduction at TEPCO's Fukushima Daiichi NPS (as of March 2021)**

March 3,2021

Nuclear Regulation Authority Japan

Issue	Issues for Risk Reduction and Major Measures
Liquid Radioactive Material	<ul style="list-style-type: none"> <li>•Progress the treatment of stagnant water containing <math>\alpha</math> nuclides in buildings and maintain as drainage completed area except for reactor buildings.</li> <li>•Decrease rainwater and groundwater flowing into buildings to prevent stagnant water in buildings from increasing and complete the treatment of all stagnant water.</li> <li>•Decrease water in S/C* of Unit 1 and 3 to the level at which the water will not leak out of the buildings</li> </ul> <p>Condition to be realized by taking the above measures : Treat all the liquid radioactive material including those remaining in tanks</p> <p><small>* Suppression Chamber</small></p>
Spent Fuel	<ul style="list-style-type: none"> <li>•Complete removing all fuels from spent fuel pools of Unit 1,2,3,5 and 6</li> <li>•Establish additional dry storage cask area and secure spent fuel storage</li> <li>•Store fuels which are stored in common pool, in dry storage casks as far as possible</li> </ul> <p>Condition to be realized by taking the above measures : Store all spent fuels in dry storage casks</p>
Solid Radioactive Material	<ul style="list-style-type: none"> <li>•Remove high-dose zeolite sandbags in Process Main Building, etc. and store stably</li> <li>•Store spent Cesium adsorption vessel stably in facilities, and stabilize ALPS slurry for storage</li> <li>•Proceed with reducing the volume and incineration of solid waste such as rubble to reduce the amount of solid waste and eliminate temporary storage outside</li> </ul> <p>Condition to be realized by taking the above measures : Store and manage the above and other solid radioactive materials in a safe condition by solidification, etc.</p> <ul style="list-style-type: none"> <li>•Install facility to analyze fuel debris and other solid radioactive materials and secure proper staffing and capacity</li> <li>•Take safety measures in removing fuel debris and store debris in stable status</li> </ul> <p>Condition to be realized by taking the above measures : Store fuel debris stably</p>
Countermeasures for External Events	<ul style="list-style-type: none"> <li>•Seal outer wall of buildings and restrain inflow of groundwater into buildings significantly</li> <li>•Repair damaged parts such as building roof to prevent rainwater inflow</li> <li>•Take measures such as blocking the openings of buildings and measures to control the inflow to prevent stagnant water from flowing out or increasing by tsunami</li> <li>•Take measures in accord with deterioration and damage level of building structures, etc.</li> </ul>
Important Issues to Progress Decommissioning	<ul style="list-style-type: none"> <li>•Reinforce structure to progress risk reduction swiftly and strengthen quality management</li> <li>•Reduce radiation doses by removal of high-dose radiation sources such as lower part of Exhaust stack of Unit 1 and 2 or shielding against them, and take measures for suppressing dust scattering during operation inside *R/B</li> <li>•Handle the ALPS treated water (e.g. Discharge into the sea)</li> <li>•Consider the effect of the contamination beneath the shield plugs to each decommissioning works</li> </ul> <p><small>* Reactor Building</small> <span style="float: right;"><small>*about 10 years later</small></span></p>

Figure 4-1 Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS (March 2021 Version) Areas and Main Activities of Risk Reduction

**Countermeasures for Risks which would have effects on the human and the environment**

- Treatment of Stagnant Water in Reactor Buildings etc.
- Removal and Stabilization of Zeolite Sandbags in basement floors of Process Main Building etc.
- Transfer and Stabilization of Sludge from Decontamination Equipment
- Measures to prevent structures from collapsing or being damaged by earthquake, tsunami, etc.
- Countermeasures for other Risks which should be paid attention to (Risks which effect on offsite are smaller than the above)
  - Stabilization of ALPS Slurry
  - Storage of spent Cesium adsorption vessel stably in facilities
  - Removal of Fuels from Spent Fuel Pools of Unit 1 and 2

Figure 4-2 Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS (March 2021 Version) Measures to Address Risks of Impacting People or the Environment

**Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS (Main Goals)**

Issue	Liquid Radioactive Material	Spent Fuel	Solid Radioactive Material		Countermeasures for External Events	Important Issues to Progress Decommissioning
Fiscal Year	Approach toward stopping water injection to reactor	Design of shielding related to fuel removal from Unit 2, etc.	Install large waste storage facility (Cs adsorption vessel)	Operate analysis facility on full-scale and build up structure for analysis	Block the openings of buildings, etc. 【tsunami】	Improve workplace environment continuously Reinforce quality management structure of Decommissioning Project
2021	Approach to decrease the water level in S/C of Unit 1 and 3	Start installation of additional dry storage casks		Investigate inside Unit 1 PCV	Widen the paving area around buildings 【rainwater】 (completed in FY2023)	Investigate and grasp the contamination around the shield/plugs Remove high-dose SGTS* pipes in lower part of exhaust stack of Unit 1 and 2, etc.
2022	Process untreated water in tanks (continues on and after 2023)	Provide shielding in Unit 2 R/B Operating Floor and suppress dust scattering (completed in FY2023)	Start fuel removal from Unit 6	Start operating additional incinerator	Retrieve fuel debris from Unit 2 experimentally and investigate inside PCV and analyze debris	Dose reduction under high-dose environment Take measures to suppress dust scattering from buildings, etc. Handle the ALPS treated water (e.g. Discharge into the sea)(Timing has not been decided) Consider the effect of the contamination beneath the shield/plugs to each decommissioning works
2023	Half the amount and treat stagnant water in R/B (Establish method to remove α nuclides by FY 2021)	Install Unit 1 R/B cover	Start removing Sludge from Decontamination Facility Safety measures for fuel debris retrieval (Timing has not been decided) Start removal of Zeolite etc. in Process Main Building, etc.(decide method by FY 2021)	Install ALPS slurry (*HIC) stabilization facility *High Integrity Container	Install volume reduction facility and solid waste storage facility (total of 10)	*Standby Gas Treatment System
Further future goals 2024 ~ 2032	Dry up Process Main Building, etc. Treat all stagnant water in R/B	Start fuel removal from Unit 5 Expand dry storage cask area to install additional dry casks Fuel removal from Unit 1 and 2 Fuel removal from spent fuel pool of all units	Install fuel debris analysis facility Remove rubble stored outside Control waste in safer and more stable state	Prevent deterioration and maintain soundness of buildings Seal outer wall of buildings 【groundwater】	Countermeasures for Risks which would have an effect on the human and the environment Countermeasures for Risks which effect on offsite is relatively small, but still should pay attention	

Figure 4-3 Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS  
(March 2021 Version) Main Targets

Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS (Other Tasks)

○Liquid Radioactive Material	Timing	○Important issues to progress decommissioning	Timing
To be conducted	Remove contaminated water in trenches, etc.(Unit 4 backwash pit)	Survey the contamination status inside the reactor buildings, etc. (nuclide analysis, etc.)	Continue After FY 2020
Timing has not been decided	Remove underground cisterns Treatment of sludge etc. remaining in dried up buildings	Grasp the properties and characteristics of the cooling water after the reactors have cooled down (nuclide analysis, etc.)	Continue After FY 2020
		Analyze the flow of contaminated water inside the reactor buildings, etc.	Continue After FY 2020
		Directly observe inside the containment vessel and pressure vessel	Continue After FY 2020
		Remove rubble around the buildings (South Side of Unit 3 R/B)	Within FY 2021
		Reduce concentration of radioactive materials in the water of drainages	Timing has not been decided
		Investigate contamination on the bottom and around Unit 1 and 2 common stack	
		Consider methods to improve the environment of ground level 2.5m, such as removal and decontamination of soil, purification of ground water, etc.	To be considered necessary or not
○Spent Fuel	Timing		
Timing has not been decided	Remove spent control rods		
○Countermeasures for external events	Timing		
To be conducted	Restrain the inflow of rainwater into radioactive waste treatment buildings of Unit 1 and 2		Within FY 2021
	Install tide embankment against Nihon-trench Tsunami		Within FY 2023

Figure 4-4 Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS  
(March 2021 Version) Other Items

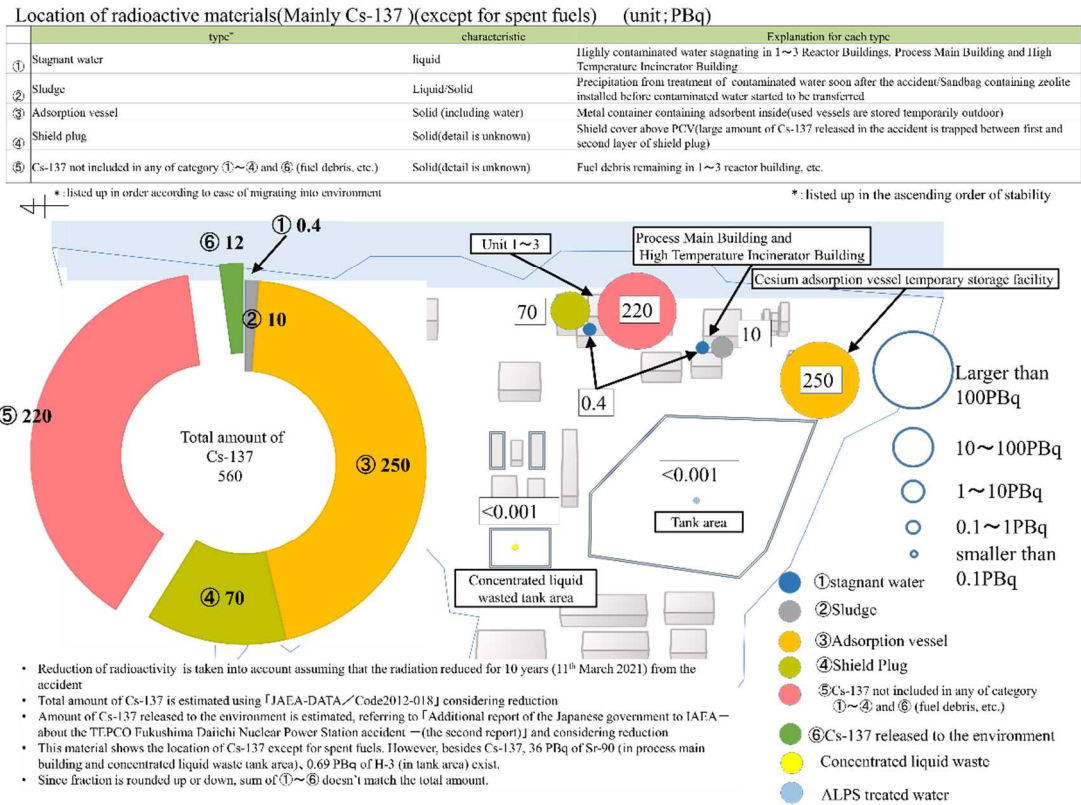


Figure 4-5 Measures for Mid-term Risk Reduction at TEPCO’s Fukushima Daiichi NPS (March 2021 Version) Radiological Spots (Mainly Cs-137) (Excluding Spent Fuel)

Location of Spent Fuels

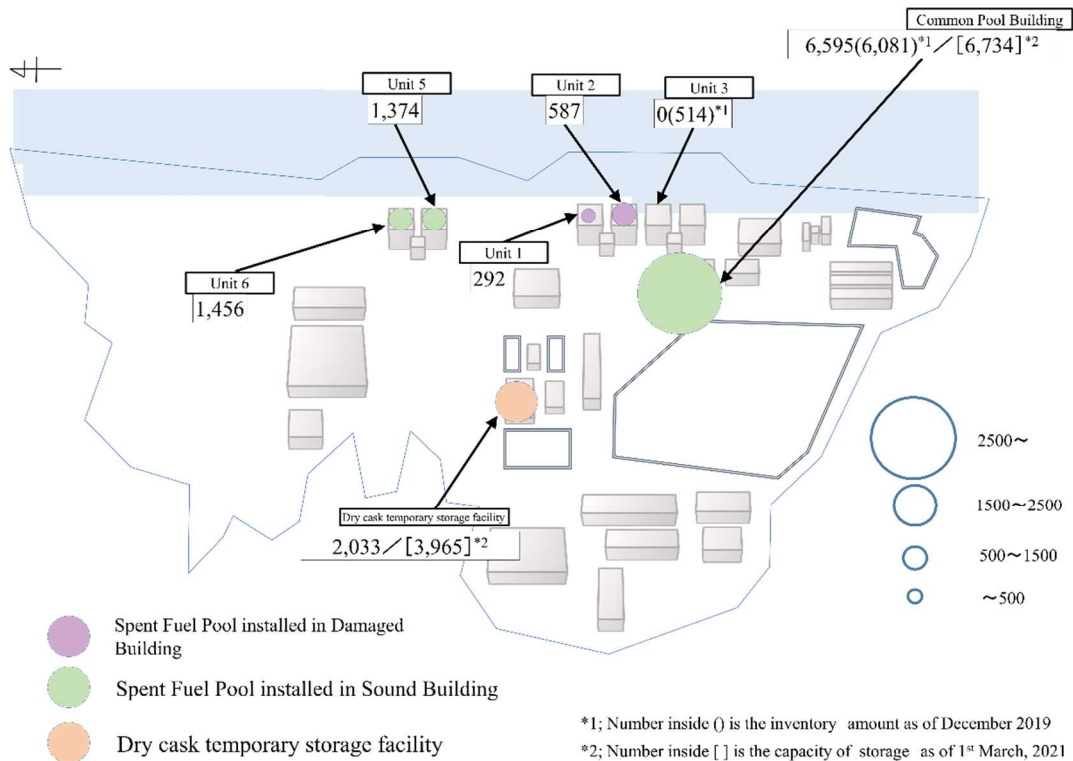


Figure 4-6 Measures for Mid-term Risk Reduction at TEPCO’s Fukushima Daiichi NPS (March 2021 Version) Spent Fuel Spots

### List of Major Inventory (Cs-137)

Existing in Buildings and Adsorption Vessels		Spent Fuel	
Location	Inventory (PBq)	Location	Inventory (PBq)
Stagnant water	0.4	Unit 1 Spent Fuel Pool	130
Sludge	10	Unit 2 Spent Fuel Pool	360
Adsorption vessel	250	Unit 3 Spent Fuel Pool	0
Shield Plug	70	Unit 4 Spent Fuel Pool	0
Cs-137 not included in any of category ①~④ and ⑥ (fuel debris, etc.)	220	Unit 5 Spent Fuel Pool	750
Cs-137 released to the environment	12	Unit 6 Spent Fuel Pool	790
Total amount	560	Spent Fuel Common Pool	3,600
		Dry Storage Cask	1,100
		Total amount	6,700

- ◆ Inventory inside the red frame should be taken measures in high priority
- ◆ Each value above has a large error, because they are evaluated indirectly such as from the balance of the amount of Cs-137 in stagnant water, extrapolation from single data, estimation from the average amount of Cs-137 inside 1 spent fuel assembly, etc.
- ◆ Since fraction is rounded up or down, sum of each inventory doesn't match the total amount

Figure 4-7 Measures for Mid-term Risk Reduction at TEPCO's Fukushima Daiichi NPS (March 2021 Version) List of Main Inventory (Cs-137)

## 8. Confirmation of the Causes and Countermeasures for Accidents and Failures that Occurred in TEPCO's Fukushima Daiichi NPS and Confirmation of Recurrence Prevention Measures

### (1) Incidents under Obligation to Report at TEPCO's Fukushima Daiichi NPS

On February 3, 2020, the NRA received reports on causes and remedies for the incident under obligation to report where there was breakage of the handle shaft for manual operation of the pressure suppression chamber suction valve in the residual heat removal system (System B) of Unit 6, reported on November 26, 2019, and the incident under obligation to report where there was leakage of nuclear fuel material, in the controlled area from drain sump pit of the exhaust stack for Units 1 and 2, reported on November 28, 2019, and for both cases, the NRA requested additional explanation for TEPCO at the 78th Oversight and Evaluation Commission Meeting (February 17, 2020). Regarding the incident of leakage from the drain sump pit of the exhaust stack for Units 1 and 2, the NRA received a revised report from February 3, 2020 on April 24, 2020. At the 80th Oversight and Evaluation Commission Meeting (April 27, 2020), TEPCO responded to the findings of the 78th Oversight and Evaluation Commission Meeting. The NRA determined that the report by TEPCO was appropriate, and oversaw the activities of TEPCO in operational safety inspections regarding items requiring continual improvement.

In FY2020, there were the following 2 incidents under obligation to report at

TEPCO's Fukushima Daiichi NPS in FY2020:

**(a) Deviations from LCO in Nitrogen Filling Equipment in the Reactor Containment Vessel**

On April 24, 2020, the NRA was notified by TEPCO that, in nitrogen filling equipment in the reactor containment vessel, there were determined to be deviations from limit conditions for operation (hereinafter referred to as "LCO") based on the implementation plan. This was because it was impossible to meet the requirement of confirming once every day that the concentration of nitrogen filled into the reactor containment vessel was 99% or higher. The results of subsequent investigations showed that recovery could not be achieved quickly because it was necessary for replacing consumable supplies and adjusting equipment, and thus a report was received on May 1, 2020 of an incident under obligation to report. The NRA later received a report on the causes of the event and measures taken on July 22, 2020.

**(b) Leakage of Nuclear Fuel Material in a Controlled Area of the Temporary Storage Area of the Fukushima Daiichi NPS**

On March 2, 2021, a high alarm occurred at a simple radiation detector (PSF monitor) installed in a wharf drainage channel. To identify the source of contamination, investigation was carried out for the area around the wharf drainage channel catchment. A substance in gel form with a comparatively high dose was found on the asphalt at the bottom of containers stored near the temporary storage area W2. Among the containers stored near the pertinent area, there was confirmed to be corrosion on the bottom part of the side of a container storing waste cloth, paper, and covering sheet produced during work after the earthquake disaster, and wastes from resin pipe covered in vinyl. There was determined to be a possibility that radioactive material stored inside the container leaked out of the container, and a report was received on March 25, 2021 of an incident under obligation to report.

The NRA will continue to check the relationship between the contamination discovered in the temporary storage area W2 and the high alarm which occurred at the PSF monitor of the wharf drainage channel, as well as the detailed investigation of the cause and measures to prevent recurrence, through operational safety inspections by nuclear operation inspectors stationed on the site.

**(2) Report on Declarations of Deviation from LCO at TEPCO'S Fukushima Daiichi NPS**

The NRA received reports from TEPCO regarding a declaration of deviation from the limiting condition of operation stipulated in the implementation plan (III-1) for the Specified Nuclear Facility as shown in Table 4-1. After receiving each report, the NRA checked that the necessary measures had been taken through operational safety inspections by nuclear operation inspectors stationed on the site.



Table 4-1 Report on Declarations of Deviation from LCO in FY2020

Date of Report Receipt	Overview
April 24	Due to a problem with the controller in the nitrogen gas separator (System B), the true value for nitrogen concentration was not indicated, and thus it was not possible to confirm whether required amount of nitrogen was filled for a certain period of time(once a day).
November 12	All exhaust fans of the reactor containment vessel gas management equipment for Unit 1 (System A and B) stopped, thus monitoring of radiation detectors became impossible for all systems (System A and B).

Recently, compared to the time immediately after the accident when LCO were set at TEPCO's Fukushima Daiichi NPS, there have been major changes in plant status, such as attenuation of decay heat of debris, and improved reliability of equipment due to equipment duplication, and yet the LCO have not been reviewed. Therefore, the NRA expressed concerns that the conditions are not appropriate in terms of correctly understanding plant status, requested TEPCO to review the conditions, and discussed approaches for that review at the 81st Oversight and Evaluation Commission Meeting (June 15, 2020). The NRA holds it necessary to continually examine the approach to setting LCO at TEPCO's Fukushima Daiichi NPS, based on the current plant status, and requested the prompt submission of an application for approval to change the implementation plan regarding LCO pertaining to the reactor water injection system, emergency water source, and the function for maintaining an inert atmosphere inside the containment vessel, for which draft reviews were presented as items for which the LCO clearly do not conform to the current plant status. This application for change approval was submitted by TEPCO on August 11, 2020, and approved by the NRA on January 22, 2021. Regarding the approach to setting LCO at the Fukushima Daiichi NPS, the NRA has requested TEPCO to submit various types of data on the current plant status, and examination of the approach is continuing.

## Section 2 Accident Analysis

### 1. Continuous Accident Analysis

The ongoing analysis of the accidents at TEPCO's Fukushima Daiichi NPS is a priority matter under the jurisdiction of the NRA, and it is carrying out in-depth investigation from technical viewpoints.

Due to improvements in the on-site environment and progress in decommissioning work, accessibility to the inside of reactor buildings has improved, and it has become possible to investigate the status of facility and collect samples, the NRA decided the additional investigation/analysis implementation policies and systems at the 28th FY2019 NRA Commission Meeting (September 11, 2019). Accordingly, the Accident Analysis Study Committee established at the NRA has conducted investigation and analysis using the results of on-site investigations, and records from the time of the accident at TEPCO's Fukushima Daiichi NPS.

In FY2020, a total of 11 on-site investigations were conducted including those open to the press and 8 Accident Analysis Study Committee meetings were held, and based on information obtained in the investigations, the NRA examined routes and points of release or leakage of radioactive materials from the reactor containment vessel, detailed analysis of hydrogen explosions in reactor buildings, and status of equipment which should cool the reactor. The study results were compiled at the 19th Accident Analysis and Study Committee Meeting (March 5, 2021) as the “Interim Summary of Investigation and Analysis of TEPCO’s Fukushima Daiichi NPS Accident,” and approved at the 63rd NRA Commission Meeting (March 10, 2021).

Furthermore, the NRA held the “Fukushima Daiichi NPS Decommissioning and Accident Investigation Liaison and Coordination Meeting” 3 times in FY2020, with the participation of the Agency of Natural Resources and Energy, Nuclear Damage Compensation and Decommissioning Facilitation Corporation, TEPCO, and the Secretariat of the NRA, and carried out the necessary organizing to coordinate the tasks relating to accident analysis and decommissioning work.

## **2. Efforts to Disseminate Information about Analysis of TEPCO’s Fukushima Daiichi NPS Accident**

The NRA disseminates information on the accident analysis at home and abroad.

On October 8, 2020, an on-site investigation of the contamination situation of the Unit 2 reactor building was carried out in a format open to the press to release the actual activities of investigation to various media outlets. In addition to video from the above investigation, videos of an on-site investigation in the Unit 3 reactor building (September 18, 2020) and an on-site investigation in the Unit 1 turbine building (October 9, 2020) were released on YouTube, and there were discussions in the Accident Analysis Study Committee using these videos

The NRA also actively participated in international conferences at the NRC, the DOE-NE Fukushima Expert Panel meeting, and other overseas organizations, and disseminated information on studies relating to analysis of the accident. Overview explanations were provided of the results of internal investigation of reactor buildings and analysis of accident progression in the OECD/NEA/CSNI research project (ARC-F), and efforts were made to share information with other participants (12 countries, 24 organizations).

## **Section 3 Radiation Monitoring**

### **1. Implementation of Radiation Monitoring of Land and Sea Areas in Response to TEPCO’s Fukushima Daiichi NPS Accident**

The NRA engaged in post-accident radiation monitoring of TEPCO’s Fukushima Daiichi NPS based on the “Comprehensive Radiation Monitoring Plan” (established at the Monitoring Coordination Meeting on August 2, 2011 and most recently revised on April 1, 2020) by carrying out general environmental monitoring throughout Fukushima Prefecture and monitoring of the waters around TEPCO’s Fukushima Daiichi NPS and of Tokyo Bay, and released the analysis results every quarter of the fiscal year.

The NRA is also conducting detailed monitoring in the difficult-to-return zones and making public the results.

**(1) Long-term Perspective on the Distribution of Radioactive Materials in Fukushima and Neighboring Prefectures**

The NRA implemented airborne monitoring in Fukushima and neighboring prefectures. In February 2021, the NRA published the air dose rate map as of October 2, 2020 in the 80 km zone from TEPCO’s Fukushima Daiichi NPS, as well as the map as of October 29, 2020, in Fukushima and its neighboring prefectures. The NRA also published the output report of the “Project of the Outsourcing Fee for the Measurement Investigation of Radioactive Materials in FY2019 (The Aggregation of Distribution Data of Radioactive Materials along with TEPCO’s Fukushima Daiichi NPS Accident)” in July 2020 and indicated the measurement results in this report, such as the distribution of air dose rate by vehicle-borne survey and the deposition amount of radioactive cesium in soil in Fukushima and neighboring prefectures.

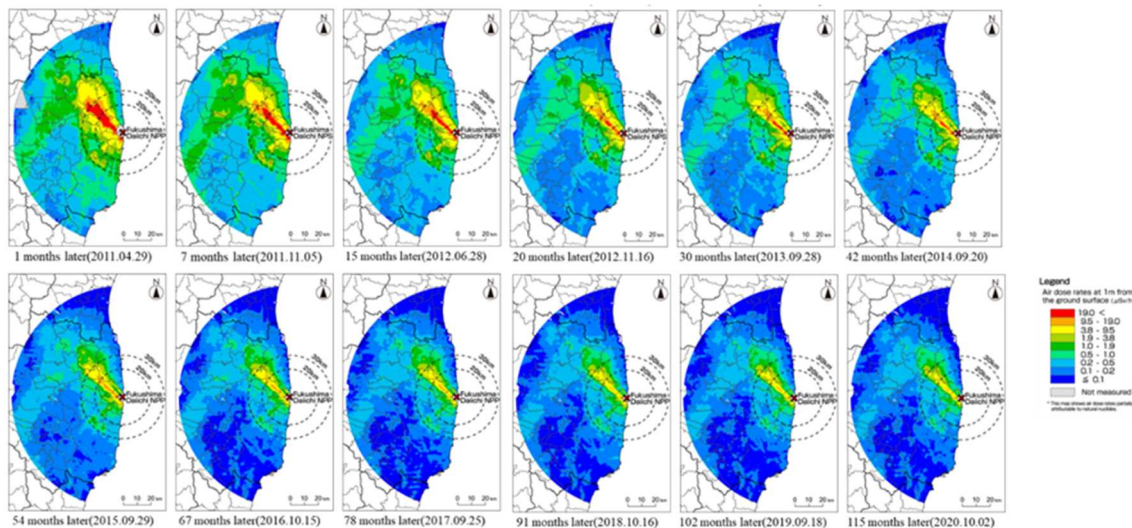


Figure 4-8 Changes in the Air Dose Rate Map within the 80 km Zone

**(2) Measuring the Air Dose Rates in Fukushima and Its Neighboring Prefectures by Monitoring Posts**

At the request of local governments, the air dose rates are measured continuously with about 700 units of Portable Monitoring Posts and about 3,000 units of Real-time Dose Measuring Systems installed at public locations, such as schools in Fukushima and its neighboring prefectures. The results are announced on the NRA website in real time.

**(3) Sea Area Monitoring**

Continuing from FY2019, relevant organizations cooperated to implement the monitoring based on the “Implementation Guides on Sea Area Monitoring,” which was a part of the Comprehensive Radiation Monitoring Plan. The NRA collected seawater and sediment from near, coast, offshore, and open ocean of TEPCO’s Fukushima Daiichi NPS and from Tokyo Bay, analyzed the radioactivity in those samples, and announced the results on the NRA website.

In cooperation with the IAEA Environment Laboratories, the NRA has conducted joint collection and comparison of analysis results for marine samples from near the Fukushima Daiichi NPS every year since FY2014, and for the sample collection carried out in November 2020, independent experts in environmental radioactivity from Japan, delegated by the IAEA, participated instead of IAEA experts due to the COVID-19 pandemic, and they checked the sample collection situation.

**Chapter 5 Appropriate Implementation of Radiation  
Protection Measures  
and Emergency Preparedness and  
Response**

## ○ Summary of Chapter 5

### **(Promotion of Radiation Protection Measures)**

The Radiation Council compiled reports in response to 6 consultations from relevant ministries. The council also drew up an “Interim Summary on How to Proceed with Future Deliberations on Medical Examinations for Radiation Workers,” and examined naturally occurring radioactive materials.

The NRA has been steadily carrying out the “Strategic Radiation Safety Research Promotion Project” initiated in FY2017. Part of the results of this Project were reported to the Radiation Council meeting, and contributed to discussions on the incorporation of the 2007 Recommendations of ICRP into domestic regulations.

### **(Rigorous and Proper Implementation of the Radioisotope Regulation Act)**

The NRA regulates the use, sale, lease, waste management, and other handling of radioisotopes, use of radiation generators, and other handling of radioactively contaminated objects, based on the Radioisotope Regulation Act. In light of the declaration of a state of emergency due to COVID-19 transmission, the NRA decided to adopt flexible operations within a reasonable scope in terms of deadlines, periods, and frequencies for notifications and inspections under the Radioisotope Regulation Act. There were a total of 3 incidents under obligation to report in FY2020.

### **(Continuous Improvement of Regulation pertaining to the Radioisotope Regulation Act)**

Activities carried out in this area included: development of guidelines for review of regulations based on the Radioisotope Regulation Act obligating ensuring reliability of radiation measurement based on recommendations of the IRRS, and incorporating IAEA safety requirements relating to transportation of radioactive materials.

### **(Continuous Improvement of the NRA Guide for Emergency Preparedness and Response (NRA EPR Guide))**

For the Emergency Action Level (EAL), used by nuclear operators to determine whether a situation corresponds to a classified emergency situation, a review of EALs for special facilities for severe accident management was carried out, and the NRA EPR Guide was revised on October 28, 2020.

A review was also initiated to further clarify, in the NRA EPR Guide, applicable persons who must evacuate at the site area emergency.

### **(Development and Operation of the Crisis Management System)**

In order to reinforce the emergency response capabilities of the NRA, the Nuclear Emergency Response Manual was revised on July 27, 2020, in light of revisions in the Basic Disaster Management Plan and lessons learned from the Nuclear Energy Disaster Prevention Drills which the NRA participated in in 2019. A review was conducted on the initial response system for the information collection situation and for alert-level event, and the Nuclear Emergency Initial Response Manual was revised on October 26, 2020.

To strengthen the emergency response capability of the NRA Secretariat staff, the NRA presented emergency response personnel with an annual training and instruction program to serve as a basis, and continued efforts from FY2019 to promote preparation of an ability enhancement sheet for each functional team and the reflection of this information in the sheets for personnel evaluation.

These reinforced the NRA’s manpower management system for its personnel. The NRA is formulating a Training Basic Policy (tentative name) for emergency response so that staff members of the NRA Secretariat can improve their emergency response capabilities in an organized, continuous manner.

In addition to these, the NRA identified problems through training and assessments and addressed them and reinforced its communication network equipment and system. To strengthen nuclear operators’ emergency response capability, the NRA assessed nuclear operator emergency drills for commercial nuclear power reactors and nuclear fuel facilities.

The Training Scenario Development Working Group continued conducting training for improving the nuclear operators’ decision-making and on-site response capabilities.

By developing various types of instruction relating to nuclear emergency medicine, a system was established, and changes were made to enable trainees to concentrate on their studies. A standard text for basic training was also developed to serve as an entry point for nuclear emergency medicine.

**(Implementation of and Technical Study on Radiation Monitoring)**

The “Radiation Monitoring Information Sharing and Publication System”—the next-version system of the “Emergency Radiation Monitoring Information Sharing and Announcement system” whose purpose was to facilitate information transfer to the public in case of an emergency—began operation on March 24, 2021, and the system development framework was strengthened to enable efficient aggregation and announcement of radiation monitoring results.

The NRA held 3 meetings in FY2020 of the “Technical Study Team on Environmental Radiation Monitoring,” and in September 2020 revised the Series of Environmental Radioactivity Measuring Methods No. 7 “Gamma-Ray Spectrometry Using Germanium Detector.”

## **Section 1: Promotion of Radiation Protection Measures**

### **1. Investigation and Deliberation by Radiation Council**

Established under the NRA, the Radiation Council is intended to uniform technical standards for preventing radiation hazards on the basis of the Act on Technical Standards for Prevention of Radiation Hazards.

In FY2020, the Radiation Council held 4 general meetings. In those meetings, of the recommended views on review of the equivalent dose limit for the lens of the eye, the council followed up on the response to the issue of a notification by the relevant ministries, which had decided to respond through notification with respect to matters concerning dose measurement and evaluation near the eye. In addition, it discussed on how to move forward with incorporating the medical examinations for radiation workers described in the 2007 ICRP Recommendations into domestic regulations, and drew up an “Interim Summary on How to Proceed with Future Deliberations on Medical Examinations for Radiation Workers.”

Regarding the approach to radiation protection against natural radionuclides such as the ones contained in rocks, the council investigated and analyzed the latest knowledge of international organizations pertaining to radiation protection, and there was a report on studies by the Subcommittee on Fundamentals of the Radiation Council relating to radiation protection against natural radionuclides when incorporating 1990 ICRP Recommendations into domestic laws and regulations. Furthermore, it was decided that there will be reports by external experts on the latest domestic information at Radiation Council meetings in the future.

The council deliberated on the following consultations, relating to technical standards for preventing radiation hazards, from the NRA and relevant ministries and agencies, and confirmed that consultations (1), (2), and (3) are valid, and that a revision of technical standard regarding consultation (4) is unnecessary.

- (1) Revision of technical standards relating to incorporation of equivalent dose limit for lens of eye (149th Radiation Council general meeting on July 17, 2020)
- (2) Revision of clearance rules (149th Radiation Council general meeting on July 17, 2020)
- (3) Incorporation of International Atomic Energy Agency (IAEA) rules for safe transportation of radioactive materials (2018 version) into domestic laws and regulations (150th Radiation Council general meeting on October 23, 2020)
- (4) Revision of relevant notifications of the Act on Regulation of Radioisotopes (152nd Radiation Council general meeting on February 26, 2021)

### **2. Promotion of Safety Research on Radiation Protection**

The NRA has been carrying out the “Radiation Safety Research Promotion Project” since FY2017, aiming to systematically and effectively promote investigations and research for ensuring safety through regulation of radiation sources and radiation protection measures.

This project is composed of the “Radiation Safety Research Program” and the “Radiation Protection Research Network Program”. For the “Radiation Safety Research Program” in FY2020, research applications were invited for 3 priority areas set up by the NRA “Dosimetric procedure in nuclear/radiation emergencies,” “Risk-benefit of protective actions during nuclear emergencies,” and “Technical issues in the application of international standards for radiation safety regulations” and consequently 3 research themes were newly adopted. Also, 8 themes were continued.



The Research Promotion Committee including external experts deliberated the selection of themes and progress management. The results of FY2020 research were evaluated by the external experts at the Research Evaluation Committee meeting in February 2021.

Regarding this project, some results of the problem-solving network and umbrella-type integrated platform formation project in the radiation protection research field, and the study project on approaches to medical examinations for radiation workers were reported at the 149th and 150th Radiation Council meetings, and these results were used in examining incorporation of 2007 ICRP Recommendations into domestic regulations.

In addition, 2 priority areas were set for FY2021, “Feasibility research for responding to mid-to-long term issues relating to radiation protection” and “Feasibility research on radiation monitoring/analysis technologies for nuclear disasters,” and preparations were made for FY2021 projects such as inviting research applications.

Regarding the implementation system for radiation safety research starting from FY2022, approval was granted at the 67th FY2020 NRA Commission Meeting (March 24, 2021) for conducting research in the Regulatory Standard and Research Department, moving forward through collaboration by the Regulatory Standard and Research Department and the Radiation Protection Group from FY2021 to prepare for that, and deciding on specific research topics for implementation in FY2022 after a process of deciding on the safety research implementation policy under the Regulatory Standard and Research Department.

## **Section 2 Implementation and Continuous Improvement of Regulations Relating to the Radioisotope Regulation Act**

### **1. Rigorous and Proper Implementation of Radioisotope Regulation Act**

To prevent radiation hazards due to the use of radioisotopes, and ensure public safety by protecting against specific radioisotopes, the NRA regulates the use, sale, lease, waste management, and other handling of radioisotopes, use of radiation generators, and other handling of radioactively contaminated objects, based on the Radioisotope Regulation Act.

In light of the declaration of a state of emergency due to COVID-19 transmission, the NRA decided, at an Extraordinary Meeting at the 4th FY2020 NRA Commission Meeting (April 24, 2020), to adopt flexible operations within a reasonable scope in terms of deadlines, periods, and frequencies for notifications and inspections under the Radioisotope Regulation Act. This flexible operation was continued through the 7th FY2020 NRA Commission Meeting (May 28, 2020), the 49th FY2020 NRA Commission Meeting (January 13, 2021), and the 67th FY2020 NRA Commission Meeting (March 24, 2021), and was ongoing at the end of FY2020. (Reprinted, see Sections 4(3) of Chapter 1)

The implementation status of regulations is shown below.

### **(1) Application/Notification**

In FY2020, there were 7181 applications and notifications based on the Radioisotope Regulation Act (for details, see Section 7.1 of References “Status of Reviews and Inspections under the Radioisotope Regulation Act”). Regarding applications for approval of rules on package confirmation work proposed by the Radiation Management Institute, Inc., a registered package confirmation organization, on July 13, 2020, the NRA granted approval at the 18th FY2020 NRA Commission Meeting (July 29, 2020).

The number of licenses granted for radiation protection supervisors in FY2020 were 195 for first-class, 17 for second-class, and 195 for third-class.

### **(2) On-site Inspections**

In light of the situation of COVID-19 transmission, and in order to prevent transmission and spread of the virus, the number of inspection was reduced compared to FY2020. Five on-site inspections for safety were carried out, and 57 on-site inspections for security of specific radioisotopes were carried out.

### **(3) Confirmation of the Causes and Recurrence Prevention Measures against Accidents and Failures Occurred in Sites Handling Radioisotopes, etc.**

If an incident falling under Article 31-2 of the Radioisotope Regulation Act (hereinafter referred to as an “incidents under obligation to report”) has occurred, reporting to the NRA is obligatory.

In FY2020, 3 such incidents were reported. However, there were none likely to cause radiation hazards to any employees or the general public.

The NRA conducts INES evaluation on an annual basis regarding problems at businesses handling radioisotopes, etc. Regarding the 7 events reported in FY2019, 1 event was evaluated as deviation level 1, and the other events were evaluated as level 0 (events of no safety significance) at the 10th FY2020 NRA Commission Meeting (June 17, 2020).

The incidents under obligation to report in FY2020 are shown below.

#### **(a) Disappearance of Radioisotopes at Sapporo Medical University Hospital**

On June 17, 2020, there was a report of an incident under obligation to report from Sapporo Medical University that a sealed source for medical treatment (iodine-125) disappeared from the hospital at Sapporo Medical University.

Regarding the cause, the university believes that, when the delivered radiation source was put into a storage box, one of the technicians in charge of storage was carrying out the work for the first time. Therefore, the person mistook the accessories packaged together in the cardboard box for the radiation source, and stored only the accessories. Also, when another technician in charge of storage checked the results, he did not do a visual check, and checked based only on records.

To prevent recurrence, visual checking of the radiation source itself has been included in the storage manual, and all involved persons will be instructed to abide by that procedure. Technicians in charge of medical treatment using the radiation source will also do double-checking of the storage situation on the date of storage.

(b) Unplanned Exposure of Radiation Workers at Fujimoto General Hospital of Fujimoto Medical System

On November 27, 2020, there was a report of an incident under obligation to report from Fujimoto Medical System that, at the Fujimoto General Hospital, a small bottle was dropped containing a radioisotope (carbon-11) during preparation of a PET drug, and due to leakage of the radioisotope into an indoor room, there was a risk of unplanned exposure of 1 radiation worker exceeding 5 mSv.

After that, a progress report was received from the company that, when the exposure dose of the worker was reevaluated in this case, it did not exceed 5 mSv.

As of the end of FY2020, the hospital was investigating the cause and examining measures to prevent recurrence.

(c) Disappearance of Radioisotopes at the Tokyo Operational Headquarters of Aiba Sangyo Co., Ltd.

On November 30, 2020, there was a report of an incident under obligation to report from Aiba Sangyo Co., Ltd. due to disappearance of a portable level meter containing a sealed source (cesium-137) at the company's Tokyo Operational Headquarters.

After that, a report was received from the company that the missing sealed source had been found.

As of the end of FY2020, the company was investigating the cause and examining measures to prevent recurrence.

## **2. Continuous Improvement of Regulation pertaining to the Radioisotope Regulation Act**

### **(1) Development of Guidelines for Review of Regulation of Radioisotopes, etc.**

The Radioisotope Regulation Act amended in 2017 has been sequentially put into force, the NRA promotes the development of guides for review and inspection, which are used as reference on judging the conformity to regulatory requirements stipulated in the Radioisotope Regulation Act. The NRA decided a policy at the 30th FY2019 NRA Commission Meeting (September 18, 2019) that, entries of draft guidelines which have been developed should be sequentially checked by the NRA, presented to nuclear operators under the Radioisotopes Regulation Act, and subject to public comment at public meetings. The NRA has called for public comment meetings twice in FY2020.

### **(2) Revision of Rules based on the Radioisotope Regulation Act**

#### **(a) Obligating Ensuring Reliability of Radiation Measurement**

After solicitation of public comments regarding partial revision of the rule for enforcing the Radioisotope Regulation Act, the NRA decided at the 22nd FY2020 NRA Commission Meeting (September 2, 2020), in light of recommendations by the IRRS, to add to the rule measures for ensuring reliability of measurements of external exposure dose, and an obligation to inspect and calibrate radiation measurement equipment for internal exposure dose and radiation at facilities.

### **(b) Incorporation of IAEA Safety Requirements relating to Transportation of Radioactive Materials**

To incorporate the 2018 version of the IAEA rules for safe transportation of radioactive materials (SSR-6 Rev. 1), and respond to the findings by the IRRS, the NRA made a decision at the 39th FY2020 NRA Commission Meeting (November 18, 2020) regarding partial revision of the rule for enforcing the Radioisotopes Regulation Act and partial revision of the Notification on Technical Details for Off-Site Transportation of Radioisotopes, etc., after soliciting public comments, and consulting with and reporting from the Radiation Council.

### **Section 3 Continuous Improvement of the NRA Guide for Emergency Preparedness and Response (NRA EPR Guide)**

Based on the Act on Special Measures Concerning Nuclear Emergency Preparedness (Act No. 156 of 1999; hereinafter referred to as “Nuclear Emergency Act”), the NRA has developed the NRA EPR Guide in order to ensure smooth implementation of nuclear emergency measures to be taken by nuclear operators, the national government, local governments, etc. The Guide is to be continuously improved based on newly acquired knowledge, status of efforts by local governments, and the results of nuclear emergency response drills.

Based on the future approach toward review of the Emergency Action Level (EAL), used by nuclear operators to determine whether a situation corresponds to an emergency classification, approved at the 75th FY2019 NRA Commission Meeting (March 30, 2020), “Meetings for Review of the Emergency Action Level” were held 3 times concerning special facilities for severe accident management, and opinions were exchanged with nuclear operators regarding review of EAL, while taking into account special facilities for severe accident management and diversity-expanded facilities. In light of the results of these meetings, it was decided to review the Guide and related rules at the 35th FY2020 NRA Commission Meeting (October 28, 2020).

Also, based on the actual situation of emergency preparedness and response plans in each region, including evacuation plans compiled by local nuclear disaster management councils, and the status of facilities where radiation protection measures have been taken, a review was initiated to further clarify, in the NRA EPR Guide, applicable persons who must evacuate at the site area emergency.

The NRA also began conducting studies by holding meetings of a “Study Team on Monitoring Thyroid Gland Exposure Dose in an Emergency,” with the aim of examining basic matters relating to thyroid gland exposure dose monitoring, which it is assumed, in the NRA Guide for Emergency Preparedness and Response, will be done as an emergency response measure in case of a nuclear emergency if there are concerns about internal exposure due to inhalation of radioactive iodine.

## **Section 4 Development and Operation of the Crisis Management System**

### **1. Reinforcement of Emergency Response Capabilities**

The NRA is tasked with the duty of ensuring safety in the utilization of nuclear energy to contribute to the protection of the lives, health and properties of the citizens, preservation of the environment and national security of Japan. To fulfill this duty, the NRA is tasked with protecting the people and environment even in the event of a nuclear disaster by utilizing its expertise and immediately responding in an organized manner.

#### **(1) Emergency Response**

At around 23:08 on February 13, 2021, an earthquake offshore from Fukushima Prefecture of seismic intensity 6 lower was observed in municipalities where nuclear facilities are located, namely: Ishinomaki City in Miyagi Prefecture, and the towns of Naraha, Okuma, and Futaba in Fukushima Prefecture. At 23:20 on that day, the NRA and the Cabinet Office determined this to be an alert-level event<sup>16</sup>. They established an NRA / Cabinet Office Nuclear Accident Joint Alert Headquarters, and convened an emergency meeting including the NRA Chairman and Commissioners. Immediately after the earthquake occurred, reports were received from operators that there were no abnormalities with equipment, and no changes in the values at surrounding monitoring posts, and there were confirmed to be no special problems. That information was shared with the relevant ministries and agencies, and disseminated by posting to the NRA website. The Alert Headquarters was abolished at 2:05 on the 14th of February. There was a report by the NRA Secretariat on this response at the 70th FY2020 NRA Commission Meeting (March 31, 2021), and going forward, the lessons learned from reflecting on the incident will be consolidated, and improvements will be made to enable more effective emergency response.

Aside from that, the NRA put in place an information gathering framework, speedily checked that there were no abnormalities with nuclear facilities, and disseminated information in response to natural disasters with major impact (a total of 5 incidents, including heavy snow on December 17, 2020).

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<sup>16</sup> In the NRA Guide for Emergency Preparedness and Response, an “alert-level event” is defined as: “a stage where, at the time, there are no effects on the general public due to radiation and no imminent risk of that occurring, but an abnormal event has occurred at a nuclear facility, or there is a risk of such an event, and thus it is necessary to start gathering information, preparing for emergency monitoring (i.e., environmental radiation monitoring performed when there is an abnormal release of radioactive material or radiation, or a risk of that happening), and preparing for protective actions such as evacuation of persons requiring evacuation in a facility site emergency.”

## **(2) Clarification and Systematization of Crisis Control System under Normal Conditions**

To strengthen the emergency response capability of the NRA Secretariat staff, which carries out emergency response, the NRA presented emergency response personnel with an annual training and instruction program to serve as a basis, and continued efforts from FY2019 to promote preparation of an ability enhancement sheet for each functional team and the reflection of this information in the sheets for personnel evaluation. These reinforced the NRA's manpower management system for its personnel.

## **(3) Formulation of a Training Basic Policy (Tentative Name) for Emergency Response**

The NRA is examining formulation of a Training Basic Policy (tentative name) for emergency response so that staff members of the NRA Secretariat can improve their emergency response capabilities in an organized, continuous manner, based on the legacy of lessons learned from accidents.

## **(4) Preparation for Crisis Management and Response Manuals**

As an NRA effort relating to crisis management, the Nuclear Emergency Response Manual was revised on July 27, 2020, in light of revisions in the Basic Disaster Management Plan and lessons learned from the Nuclear Energy Disaster Prevention Drills which the NRA participated in in 2019. A review was conducted of the information collection situation and the initial response system for an alert-level event, and the Nuclear Emergency Initial Response Manual was revised on October 26, 2020.

To respond to revision of the Reactor Regulation Act due to review of the inspection program, and achieve coordination with the Basic Disaster Management Plan, the "NRA Citizen Protection Plan" was changed on July 10, 2020.

Drills were carried out on February 15, 2021 to check effectiveness of the manual developed on March 30, 2020 to clarify the initial response in case of a disaster during the land transportation of radioactive materials, based on the issues pointed out by the IRRS follow-up mission.

In addition, the NRA reviewed and examined equipment and plans taking occasions of various exercises (such as on-foot gathering exercises in emergency, operation checks and exercises for emergency generators, and setting-up exercise of the Emergency Response Headquarters) to ameliorate effectiveness of the business continuity plans responding to emergency cases, such as a Tokyo Inland Earthquake and novel influenza.

## **(5) Functional Enhancement of Disaster Prevention Drills**

To enhance its emergency response capability, the NRA carried out tabletop exercises centering on emergency decision makers such as the NRA's Chairman and commissioners and its Secretariat's executives, and participated in some emergency drills by nuclear operators. The NRA examined issues identified in exercises thus far, and worked to improve content and thereby enable more practical exercises, e.g., by conducting collaborative exercises to cultivate the ability to decide on protective measures to be taken off-site in light of the plant situation (on-site).

The NRA conducted training in conjunction with nuclear operators' emergency drills to explore a method of smooth information sharing between the ERC plant team and nuclear operators' immediate response centers, thereby improving their emergency

response capability. In operator emergency drills at the Ohi NPS, in addition to the ERC plant team, each functional team also carried out training in connection with nuclear operators' emergency drills. Continuing on from FY2019, the NRA also carried out emergency communication training with the local governments of regions where nuclear facilities are present. Such training improved the abilities of personnel in charge of each functional team and contributed to the identification and resolution of problems.

As a measure to prevent COVID-19 transmission, the number of participants in each drill was limited, but efforts were made to improve response capability by increasing the number of drills.

#### **(6) Enhancement and Reinforcement of Medical Systems for a Nuclear Disaster**

With regard to the development of medical systems for a nuclear disaster, the NRA strived for close coordination, through the Secretary-General Conference of Support Centers, with the National Institutes for Quantum and Radiological Science and Technology designated as the Core Advanced Exposure Medical Support Center as well as with Hirosaki University, Fukushima Medical University, Hiroshima University and Nagasaki University which have been designated as Advanced Exposure Medical Support Centers and Nuclear Emergency Medical Support Centers, and established a network among nuclear emergency medical care organizations through a council for promoting regional nuclear emergency medical coordination. In addition, the NRA supported the development of facilities and equipment for the said 5 institutes and universities and developed an environment for accepting radiation-exposed patients and providing related education and training. More specifically, by developing various types of instruction relating to nuclear emergency medicine, a system was established, and changes were made to enable trainees to concentrate on their studies. A standard text for basic training was also developed to serve as an entry point for nuclear emergency medicine.

As a measure to prevent COVID-19 transmission, the NRA examined the content of training that can be done remotely, with a focus on the Core Advanced Exposure Medical Support Center, and carried out mock training on a trial basis.

Going forward, in order to maintain the nuclear emergency medicine system in a sustained fashion, it was decided to budget personnel expenses for securing and developing next-generation personnel in the nuclear emergency medicine field, primarily at the Core Advanced Exposure Medical Support Center, and reorganize tasks previously performed as commissioned projects as subsidized projects, and thereby shift toward projects which exploit the unique characteristics of the Support Center.

Regarding the current "facility requirements to institutions for nuclear emergency," FY2021 will mark 3 years since the previous review, and therefore, in FY2020, key points were organized relating to review for clarifying the role of the Core Advanced Exposure Medical Support Center which was newly designated at the time of the previous revision. With regard to topics regarded as issues for designation and operation of nuclear emergency core hospitals, the NRA conducted a questionnaire survey of relevant local governments and heard from operation managers at support centers in order to identify issues relating to nuclear emergency medicine.

## **2. Reinforcement of Nuclear Operators' Emergency Preparedness and Response**

### **(1) Enhancement of Evaluation of Emergency Drills by Nuclear Operators**

The NRA has been holding the Debriefing Session of Emergency Drills by Nuclear Operators and evaluating drills conducted by nuclear operators since FY2013.

The debriefing session was held on July 28, 2020, in which the NRA received a report from its Secretariat regarding the results of evaluating nuclear operators' emergency drills. For commercial power reactor facilities, some nuclear power plants were evaluated as requiring a further improvement in assessment indexes such as "certain notifications and communications" and "self-assessment and analysis of drill results" but other indexes indicated an overall enhancement in crisis response capability owing to improvement efforts. Based on the evaluation results during the past 5 years (FY2015 to FY2019), the NRA decided to continuously check the state of improvements by nuclear operators so that improvement efforts by every nuclear operator will take root.

Among nuclear fuel facilities, there were operation departments at the JAEA and Japan Nuclear Fuel Limited evaluated as requiring a further improvement in the assessment index "certain notification and communications." Efforts are being made to improve other indexes, and although there were centers evaluated as requiring continuing improvement, there was an overall enhancement in crisis response capability owing to improvement efforts. In order to coordinate emergency response capabilities between the response centers and between the operation departments going forward, the NRA decided to assess not only the response centers and operation departments but also the situation of overall organizational improvement. As for other nuclear fuel facility operators, in order to ensure the implementation of their new training that includes constant information sharing with the ERC, the NRA decided to take measures against the identified problems and tasks, and continue to check their effectiveness.

Moreover, the Training Scenario Development Working Group set up under the debriefing sessions since FY2017 is carrying out training for improving the judging ability of the commanders of nuclear power plants' emergency response centers and central control rooms and also training for enhancing on-site response ability. In FY2020, courses for commander judging ability for 8 nuclear operators and courses for response capabilities for 8 nuclear operators have been conducted based on training scenarios prepared in FY2019. In light of the results of these drills, the NRA prepared training scenarios based on training policies in FY2020.

On the other hand, at the 61st FY2019 NRA Commission Meeting (February 5, 2020), the NRA Secretariat was instructed to examine the best approach for emergency drills by nuclear operators at category 2 waste disposal facilities and nuclear facilities at the decommissioning stage where fuel has been taken out from the site. Subsequently, at the 19th FY2020 NRA Commission Meeting (August 19, 2020), there was a report from the NRA Secretariat that, for emergency drills by the Enrichment and Waste Disposal Divisions of Japan Nuclear Fuel (category 2 waste disposal facilities), trials will be conducted in a two-part format (Part 1: drills based on realistic scenarios, Part 2: drills for checking response of emergency response station and headquarters), and the review of ministerial rules and internal regulations will be examined based on the results.



○Record of Emergency Drills by Nuclear Operators at Commercial Power Reactors in FY2020

No	Implementation date	Place	
1	September 11, 2020	Tokyo Electric Power Company Holdings, Inc.	Fukushima Daiichi NPS Fukushima Daini NPS
2	October 2, 2020	Japan Atomic Power Company	Tsuruga NPS
3	October 16, 2020	Kansai Electric Power Co., Inc.	Ohi NPS
4	October 23, 2020	Tohoku Electric Power Co., Inc.	Onagawa NPS
5	November 20, 2020	The Chugoku Electric Power Co., Inc.	Shimane NPS
6	November 27, 2020	Hokkaido Electric Power Co., Inc.	Tomari NPS
7	December 11, 2020	Kyushu Electric Power Co., Inc.	Genkai NPS
8	December 25, 2020	Japan Atomic Power Company	Tokai NPS Tokai Daini NPS
9	January 15, 2021	Kansai Electric Power Co., Inc.	Mihama NPS
10	January 22, 2021	Hokuriku Electric Power Company	Shika NPS
11	January 29, 2021	Shikoku Electric Power Co., Inc.	Ikata NPS
12	February 18, 2021	Kyushu Electric Power Co., Inc.	Sendai NPS
13	February 26, 2021	Kansai Electric Power Co., Inc.	Takahama NPS
14	March 1, 2021	Chubu Electric Power Co., Inc.	Hamaoka NPS
15	March 5, 2021	Tohoku Electric Power Co., Inc.	Higashidori NPS
16	March 12, 2021	Tokyo Electric Power Company Holdings, Inc.	Kashiwazaki-Kariwa NPS

○FY2020 at Commercial Power Reactors  
Assessment indices for emergency drills by nuclear operators

Category	No	Index
Information sharing/notification	1	Flow information for information sharing
	2	Information sharing with ERC plant team (1) Accident/Plant situation, (2) Progression forecasting and accident response strategy, (3) Strategy progress
	3	Use of tools for information sharing (1) Use of plant information display system (drills using ERSS or SPDS), (2) Liaison activities, (3) Use of COP, (4) Use of documents kept by ERC
	4	Certain notification and communications (1) Accuracy of notification text, (3) Explanation of grounds for EAL judgment, (4) Response of Article 10 confirmation meeting, (5) Article 25 report
Efforts to improve emergency drills by nuclear operators	5	Formulation of drill implementation plan based on issues in previous drills
	6	Scenario diversification and difficulty
	7	Implementation of on-site field training
	8	Public relations activities (1) Press response linked with ERC public relations team, (2) Participation of players from outside company such as reporters, (3) Participation of players from outside company such as persons in charge of public relations at other nuclear operators, (4) Holding mock press conferences, (5) Dissemination of information to the outside using information dissemination tools
	9	Logistical support activities (1) Support activities between nuclear operators, (2) Linkage with disaster response support centers of nuclear operators, (3) Linkage with nuclear emergency support organizations
	10	Inspection of drills (1) Inspection of other nuclear operators, (2) Accepting inspections of one's own drills, (3) Acceptance of peer review, (4) Inspection of on-site field training of other nuclear operators
	11	Self-assessment and analysis of drill results (1) Identification of issues from problem points, (2) Analysis of causes, (3) Countermeasures based on cause analysis results

\* At each drill, NRA Secretariat staff participate as plant team personnel of the Prime Minister's office or Secretariat ERC/OFC, dispatched personnel from the Secretariat ERC at the operator's immediate response center, or as dispatched personnel for the emergency response station, and some personnel evaluate the situation of the operator drill. (In the drill at Ohi on October 16, personnel from other functional teams participated in addition to personnel from the Secretariat's ERC plant team.)

Table 5-1. Record of Emergency Drills by Nuclear Operators at Commercial Power Reactors in FY2020

○Record of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (Japan Atomic Energy Agency and Japan Nuclear Fuel Ltd.) in FY2020

No	Implementation date	Place	
1	September 8, 2020	Japan Atomic Energy Agency	Nuclear Fuel Cycle Engineering Laboratories
2	September 29, 2020	Japan Atomic Energy Agency	Ningyo-toke Environmental Engineering Center
3	October 13, 2020	Japan Atomic Energy Agency	Prototype Advanced Converter Reactor Fugen
4	November 10, 2020	Japan Atomic Energy Agency	Oarai Research and Development Institute
5	December 1, 2020	Japan Nuclear Fuel Limited	Reprocessing Facility, Enrichment and Waste Disposal Site, Enrichment Division / Waste Disposal Division
6	February 9, 2021	Japan Atomic Energy Agency	Prototype Fast Breeder Reactor Monju
7	March 18, 2021*	Japan Nuclear Fuel Limited	Enrichment and Waste Disposal Site, Waste Disposal Division (Department No. 2)
8	March 26, 2021	Japan Atomic Energy Agency	Nuclear Science Research Institute

\* Drill to check response of emergency response station and headquarters conducted according to the policy on drill trials (category 2 waste disposal facility) based on the realistic scenario indicated in Document 4 for the 19th NRA Commission Meeting (August 19, 2020)

○Evaluation Indices of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (Japan Atomic Energy Agency and Japan Nuclear Fuel Ltd.) in FY2020

Category	No	Index
Information sharing/notification	1	Flow information for information sharing
	2	Information sharing with ERC plant team (1) Accident/Plant situation, (2) Progression forecasting and accident response strategy, (3) Strategy progress
	3	Use of tools for information sharing (1) Use of plant information display system (drills using ERSS), (2) Liaison activities, (3) Use of COP, (4) Use of documents kept by ERC
	4	Certain notification and communications (1) Accuracy of notification text, (2) Explanation of grounds for EAL judgment, (3) Response of Article 10 confirmation meeting, (4) Article 25 report
Efforts to improve emergency drills by nuclear operators	5	Review of mid-term plan
	6	Formulation of drill implementation plan based on issues in previous drills
	7	Implementation of drills with no scenario indicated
	8	Scenario diversification and difficulty
	9	Public relations activities (1) Press response linked with ERC public relations team, (2) Participation of players from outside company such as reporters, (3) Holding mock press conferences, (4) Dissemination of information to the outside using information dissemination tools
	10	Logistical support activities (1) Support activities between nuclear operators, (2) Linkage with disaster response support centers of nuclear operators, (3) Linkage with nuclear emergency support organizations
	11	Inspection of drills (1) Inspection of other nuclear operators, (2) Accepting inspections of one's own drills, (3) Acceptance of peer review
Record of emergency drills by nuclear operators	12	Self-assessment and analysis of drill issues (1) Identification of issues from problem points, (2) Analysis of causes, (3) Countermeasures based on cause analysis results
	13	Drill participation rate of emergency response personnel (facility)
	14	Drill participation rate of emergency response personnel (immediate response center)

Table 5-2. Record of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (Japan Atomic Energy Agency and Japan Nuclear Fuel) in FY2020

○ Record of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (other than Japan Atomic Energy Agency and Japan Nuclear Fuel Ltd.) in FY2020

○ Evaluation Indices of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (Japan Atomic Energy Agency and Japan Nuclear Fuel Ltd.) in FY2020

No	Implementation date	Place	Category	No	Index	
1	October 6, 2020	Toshiba Energy Systems & Solutions Corporation, Nuclear Engineering Laboratory	Information sharing/notification	1	Information sharing with emergency response station and ERC plant team	
2	October 20, 2020	Nuclear Development Corporation		2	Certain notification and communications (1) Notification by FAX within 15 minutes, (2) Accuracy of notification text, (3) Explanation of grounds for EAL judgment, (4) Article 25 report	
3	October 27, 2020	Nuclear Material Control Center, Rokkasho Safeguards Center		3	Operation of communications equipment (operation of communications equipment for connecting with emergency response station and ERC plant team)	
4	November 17, 2020	Kindai University	Efforts to improve emergency drills by nuclear operators	4	Review of mid-term plan	
5	November 24, 2020	Institute for Integrated Radiation and Nuclear Science, Kyoto University		5	Formulation of drill implementation plan based on issues in previous drills	
6	December 8, 2020	Nuclear Material Control Center, Tokai Safeguards Center		6	Implementation of drills with no scenario indicated	
7	January 19, 2021	Nuclear Fuel Industries, Ltd, Tokai Works		7	Scenario diversification and difficulty	
8	February 16, 2021	Nuclear Fuel Industries, Ltd, Kumatori Works		8	Public relations activities (1) Press response linked with ERC public relations team, (2) Participation of players from outside company such as reporters (including persons in charge of public relations at other nuclear operators), (3) Holding mock press conferences, (4) Dissemination of information to the outside using information dissemination tools	
9	February 19, 2021	Nuclear Professional School, School of Engineering, the University of Tokyo		9	Logistical support activities (1) Support activities between nuclear operators, (2) Linkage with disaster response support centers of nuclear operators	
10	March 2, 2021	Nippon Nuclear Fuel Development Co., Ltd.		10	Inspection of drills (1) Inspection of other nuclear operators, (2) Accepting inspections of one's own drills, (3) Acceptance of peer review, (4) Inspection of drills at ERC	
11	March 19, 2021	Mitsubishi Nuclear Fuel Co., Ltd.		11	Self-assessment and analysis of drill issues (1) Identification of issues from problem points, (2) Analysis of causes, (3) Countermeasures based on cause analysis results	
12	From April 2021*	Global Nuclear Fuel-Japan Co., Ltd.		Record of emergency drills by nuclear operators	12	Drill participation rate of emergency response personnel (facility)

\*Postponed due to impact of COVID-19 transmission

Table 5-3. Record of Emergency Drills by Nuclear Operators at Nuclear Fuel Facilities (other than Japan Atomic Energy Agency and Japan Nuclear Fuel) in FY2020

## (2) Collaboration with Relevant Ministries and Agencies Pertaining to Nuclear Emergency Preparedness

Based on the provisions of the Basic Disaster Management Plan and in order to coordinate emergency responses and necessary support at nuclear sites, the NRA has been holding meetings of the Central Liaison Council for Nuclear Disasters, which consists of relevant ministries and agencies, nuclear operators and the Atomic Energy Association (ATENA). In FY2020, the NRA held 2 meetings of the Central Liaison Council for Nuclear Disasters, regarding the implementation status of training in cooperation with related organizations and efforts by nuclear operators. In regions where nuclear power plants are located, the NRA holds meetings of the Local Liaison Councils for Nuclear Disasters, which consist of local branch bureaus and departments of the member ministries and agencies of the Central Liaison Council located in a given area, the prefectural police headquarters responsible for the area (prefectural police headquarters of an area which becomes a wide-area evacuation site for the given area, as necessary), the fire department, the Regional Coast Guard Headquarters (Coast Guard Office responsible for the given area, as necessary), the SDF, and nuclear operators. However, in FY2020 this event could not be held due in part to the impact of COVID-19 transmission.

To establish measures for diversifying means of speedy and smooth transport to applicable sites of the remote-control equipment and special vehicles owned by the Mihama Nuclear Emergency Assistance Center, the Ministry of Defense was requested to conduct verification and periodic drills of loading and transport using helicopters and ships coordinated with nuclear operator emergency drills. The ministry responded that they would cooperate, and developed a cooperation system for transportation of emergency equipment.

### 3. Reinforcement of Communication Network Equipment and Systems

Regarding the integrated nuclear emergency preparedness network system, whose renewal was completed in FY2019, emphasis was placed on ensuring availability, and proper maintenance was carried out, such as periodic inspection and checking the function of equipment. As one effort in the “Three-Year Emergency Response Plan for Disaster Prevention, Disaster Mitigation, and Building National Resilience (December 14, 2018)”, the NRA carried out emergency response relating to fixed satellite communication equipment.

Regarding the Emergency Response Support System (ERSS), for which a system update was carried out in FY2019, the NRA planned and implemented system repairs in accordance with the equipment renewal plan of the nuclear operator, and appropriately performed system maintenance so that information on nuclear reactor facilities can always be provided.

Operation of the “Emergency Radiation Monitoring Information Sharing and Announcement System” was started in preparation for an emergency. Operation of the next-version system (“Radiation Monitoring Information Sharing and Publication System”) with strengthened data processing capability was started on March 24, 2021.

## **Section 5 Radiation Monitoring**

### **1. Enhancement of Emergency Monitoring Systems in Areas where Nuclear Facilities are Located**

The NRA EPR Guide stipulate that the level of emergency will be determined in accordance with the situation of the affected nuclear facility to implement preventive protective measures. Emergency measures at an early stage or measures after the release of radioactive materials, for instance, evacuation or temporary relocation, will be decided and conducted appropriately based on the actual measurement values of the emergency monitoring. Based on this guideline, the NRA developed an effective emergency monitoring system including the constant on-site stationing of senior specialists for radiation monitoring in order to command the monitoring of the vicinity of nuclear facilities during an emergency. The NRA also further improved and reinforced the measurement system through steps such as providing technical support to local governments engaged in installation and maintenance of measuring equipment such as monitoring posts.

### **2. Start of Operation of Next-Version System of Emergency Radiation Monitoring Information, Sharing and Announcement System**

Emergency monitoring results collected through the “Emergency Radiation Monitoring Information Sharing and Announcement System,” used to be announced on the NRA website at the stage of notification based on the Nuclear Emergency Act, Article 10, Paragraph 1. However, in order to facilitate information transfer to the public in case of emergency, it was decided to announce the measured values even at ordinary times through a new system which is planned to start its operation during FY2020. (67th FY2018 NRA Commission Meeting (March 20, 2019), 10th FY2019 NRA Commission Meeting (May 29, 2019))

In light of these steps, a new “Radiation Monitoring Information Sharing and Publication System” was developed, and operation of the system was started. (67th FY2020 NRA Commission Meeting (March 24, 2021))

### **3. Reinforcement of Emergency Response Capabilities through Training**

#### **Activities**

In FY2020, “Monitoring practical training” was conducted 27 times and “Monitoring drill for Emergency Monitoring Center” was conducted 11 times for local government staff to improve their effectiveness of emergency monitoring.

In FY2020 monitoring drills for emergency monitoring centers, efforts were made to strengthen emergency response capability with the “Emergency Radiation Monitoring Information Sharing and Announcement System,” which facilitates prompt collecting and sharing of monitoring information among the staff and the related organizations for the emergency, and publication of the results of emergency monitoring.

### **4. Radiation Monitoring of Nationwide Environment**

#### **(1) Environmental Radioactivity Level Research (Conducted since FY1957)**

In the 47 prefectures throughout Japan, the NRA collected environmental samples, such as atmospheric suspended dust, fallout, and soil for radioactivity analysis. The results of measurement were put into a database to be published. Furthermore, dose rate is continuously measured at 296 monitoring posts throughout Japan to open the measured data on the NRA website.

#### **(2) Oceanic Environmental Radioactivity Comprehensive Evaluation (Conducted since FY1983)**

In order to investigate radiation effects in the surrounding areas of nuclear power plants and nuclear fuel reprocessing plants as well as nationwide environmental radioactivity levels, the NRA continued the radiation analysis of sea water in 16 ocean areas. The measurement results for FY2019 were put into a database to be opened on the NRA website.

#### **(3) Radiation Monitoring in the Vicinity of Nuclear Power Plants (Subsidies Issued since FY1974)**

Financial support by the NRA was provided for the development of facilities necessary for radiation monitoring and radioactivity measurement implemented by prefectures where nuclear facilities are located or neighboring prefectures (24 prefectures). In addition, the measured results reported by those local governments were put into database sequentially to be published.

#### **(4) Monitoring of the Impact of Nuclear Events Overseas (Monitoring started in FY2018)**

With regard to the impact of radioactive substances on Japan when nuclear power related events occur abroad, the NRA installed monitoring posts in Tsushima and on Yonaguni Island so that the state of dose rate can be grasped more precisely. Also in FY2020 the NRA website announced the measurement results.

### **(5) Training for the Monitoring Personnel of Local Governments (Implemented since FY1990)**

The NRA carried out “training for environmental radiation analysis” 18 times, targeting environmental radiation monitoring personnel in each prefecture.

## **5. Reinforcement of Radiation Survey and Emergency Monitoring Systems at Ports of Call of Nuclear-Powered Warships**

### **(1) Radiation Survey concerning Ports of Call of Nuclear-Powered Warships**

The NRA periodically conducted radiological surveys in cooperation with related organizations such as the Japan Coast Guard at the 3 ports of Yokosuka, Sasebo and Kinnakagusuku, where the United States nuclear-powered warships make port calls, regardless of the presence or absence of such ships. Especially, during each nuclear-powered warship port call, the NRA organized a radiological survey team that measured radioactivity and analyzed sea water samples, and it was confirmed that the measurement results were of the same level as those before port calls. The NRA daily published the radiological survey results during both port entries and exits of nuclear-powered warships on its website and compiled past results into a database and made them publicly available.

### **(2) Reinforcement of Emergency Monitoring Systems**

To cope with the aging of monitoring facilities, renovation was completed at 1 facility and started at 1 facility at Sasebo Port, Nagasaki Prefecture. Renovation was completed at 1 facility and started at 1 facility at Kinnakagusuku Port, Okinawa Prefecture. As Sasebo Port, building repair work was completed at the Nuclear Warship Emergency Monitoring Center which will serve as a monitoring center in an emergency.

## **6. Investigation on Technical Matters Relating to Monitoring**

In July and December 2020, the NRA held a meeting of the “Technical Study Team on Environmental Radiation Monitoring” which is engaged in continuous studies on technical matters relating to monitoring, and did the following:

- Draft revision of the Series of Environmental Radioactivity Measuring Methods No. 7 “Gamma-ray Spectrometry using Germanium Detector”
- Draft of new tome of the Series of Environmental Radioactivity Measuring Methods “Method for sampling of Environmental Materials in Emergencies”
- Emergency monitoring around commercial power reactor facilities specified as sufficiently cooled by notification
- Revisions to “Ordinary Radiation Monitoring (supplementary reference materials for Nuclear Emergency Response Guideline)”
- Quality assurance in radiation monitoring

Based on studies by this team, the Series of Environmental Radioactivity Measuring Methods No. 7 “Gamma-ray Spectrometry using Germanium Detector” was revised in September 2020, and the latest knowledge was incorporated such as the technique for computing peak efficiency through numerical calculation method, and calculation of the detection lower limit based on ISO 11929.



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**Reference 1 Materials related to ensuring independence, impartiality and transparency, and improving the organizational structure/system (related to Chapter 1)**

**1. Members of NRA**

	September 19, 2012 to September 18, 2014	September 19, 2014 to September 18, 2015	September 19, 2015 to September 21, 2017	September 22, 2017 to
Chairman	Tanaka Shunichi	Tanaka Shunichi	Tanaka Shunichi	Fuketa Toyoshi
Commissioner (Substitute for the Chairman)	Shimazaki Kunihiko	Fuketa Toyoshi	Fuketa Toyoshi	Tanaka Satoru
Commissioner (Second substitute for the Chairman)	Fuketa Toyoshi	Tanaka Satoru	Tanaka Satoru	Yamanaka Shinsuke
Commissioner (Third substitute for the Chairman)	Nakamura Kayoko	Nakamura Kayoko	Ishiwatari Akira	Ban Nobuhiko
Commissioner (Fourth substitute for the Chairman)	Oshima Kenzo	Ishiwatari Akira	Ban Nobuhiko	Ishiwatari Akira

(As of March 31, 2021)

**2. Establishment of the NRA and Organizational Changes**

- September 19, 2012: NRA was established
- March 1, 2014: Japan Nuclear Energy Safety Organization (JNES) was abolished and integrated.
- October 14, 2014: Policy Director for Nuclear Emergency Preparedness was established in the Cabinet Office. Officials belonging to the NRA were primarily appointed as concurrent officials of the Office for the Nuclear Emergency Preparedness, Cabinet Office. To reinforce the nuclear emergency response system, changing the appointment scheme, full-time officials were assigned to the Cabinet Office.

**3. Breakdown of Budget of NRA (after revision in FY2020)**

	Budget section	Budget for FY2020 (after budget revision) (million yen)
General account	General and Administrative costs	4,478
	Costs of ensuring nuclear safety	5,862
	Radioactivity investigation and research costs	1,469
Special account for energy measures	Costs of power-usage measures	742
	Costs of nuclear safety regulatory measures	18,669
	Administrative handling costs	24,162
	Disbursements	0.27
	Reserve funds	100
Special account for reconstruction after the Great East Japan Earthquake	Costs of policies for environmental conservation and restoration	3,121
Total		58,603

## 4. Organization of the NRA

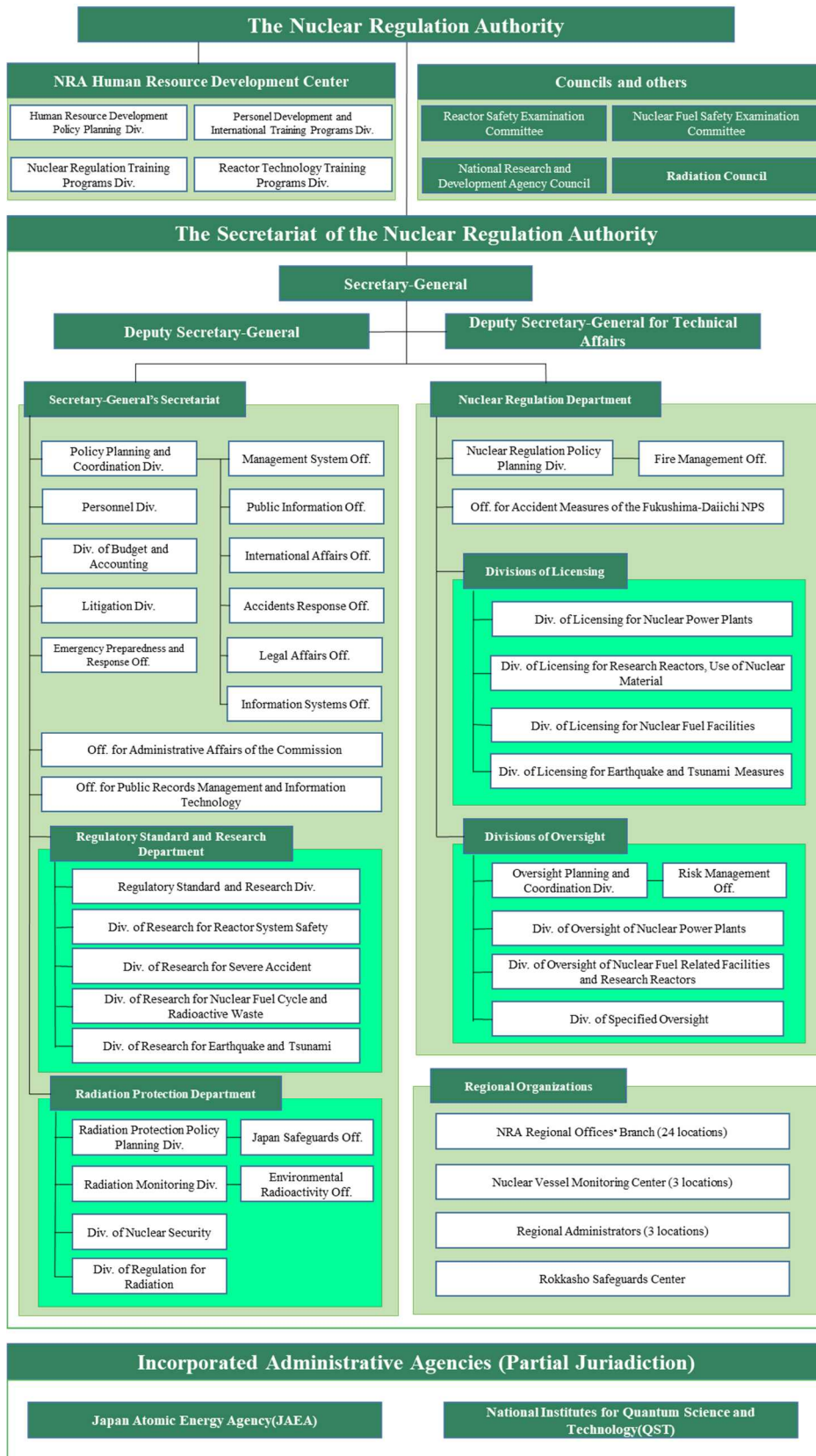
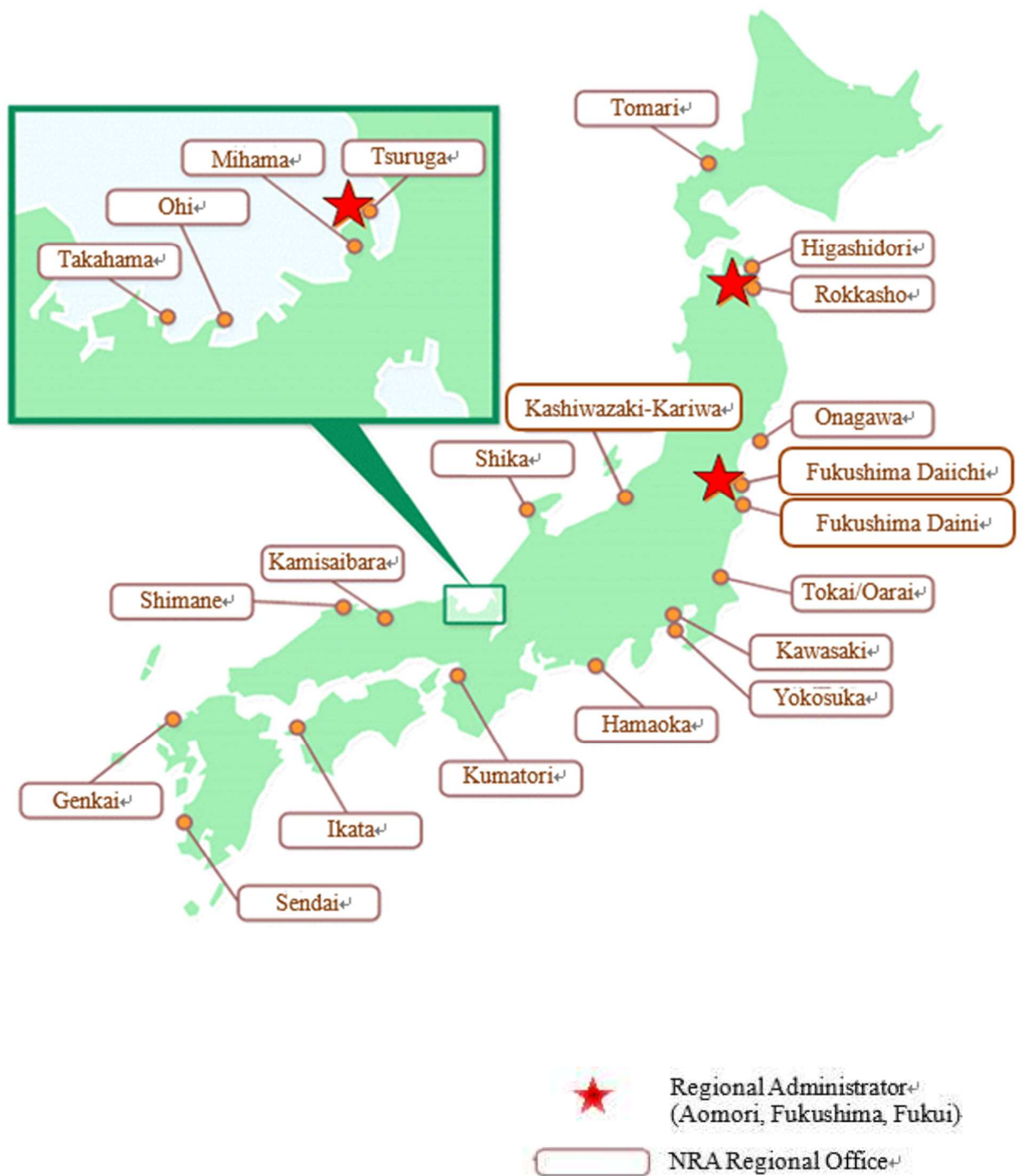


Figure i Organizational Structure of the NRA (April 2020 - March 2021)



**Figure ii Location of NRA Regional Offices and Stationing of Regional Administrators**

## 5. NRA's Core Values and Principles

(Determined on January 9, 2013 by the NRA)

Bearing in mind that:

- The NRA was established to learn from the Fukushima Daiichi nuclear accident of March 11, 2011;
- Nuclear accidents should never be allowed to happen again;
- Restoring public trust, in Japan and abroad, in the nation's nuclear regulatory organization is of utmost importance and;
- The nuclear safety system and management must be rebuilt on a solid basis, placing the highest priority on public safety and a genuine safety culture;

Determined that:

- Everyone involved in nuclear activities must have a high degree of responsibility and ethical values and seek to achieve the highest levels of global safety;

We hereby solemnly pledge our full commitment and unwavering efforts to the foregoing.

### **Mission**

Our fundamental mission is to protect the public and the environment through rigorous and reliable regulation of nuclear activities.

### **Guiding Principles for Activities**

We in the NRA and its supporting Secretariat shall perform our duties diligently acting in accordance with the following principles.

#### (1) Independent Decision Making

We shall make decisions independently, based on the latest scientific and technological information, free from any outside pressure or bias.

#### (2) Effective Actions

We shall discard the previous ineffective approach to regulatory work and stress the importance of a field-oriented approach to achieve genuinely effective regulations.

#### (3) Open and Transparent Organization

We shall ensure transparency and appropriate information disclosure on regulations, including the decision-making process. We shall be open to all opinions and advice from Japan and the international community and avoid both self-isolation and self-righteousness.

#### (4) Improvement and Commitment

We shall be diligent in learning and absorbing the latest regulatory know-how and best practices, enhancing individual capacity, and performing our duties, mindful of the highest ethical standards, a sense of mission, and rightful pride.

#### (5) Emergency Response

We shall be ready to swiftly respond to all emergencies, while ensuring that in 'normal' times a fully effective response system is always in place.

## 6. Code of Conduct on Nuclear Security Culture

(Determined on January 14, 2015 by the NRA)

The Nuclear Regulation Authority (NRA) recognizes that it is the responsibility of everyone involved in nuclear activities to establish and maintain a positive nuclear security culture.

The NRA has therefore decided to establish a code of conduct to foster and continually enhance its own nuclear security culture.

On this basis, the NRA is committed to take action to enhance nuclear security culture throughout Japan.

### **Code of Conduct**

#### **1. Recognizing Threat**

The NRA and its Secretariat shall recognize that nuclear security threats exist at all times and constantly keep the importance of nuclear security in mind.

#### **2. Interface with Safety**

Nuclear security and safety do not exist independently and measures for security and safety are mutually dependent on each other and could negatively affect one another. We shall make all possible efforts for the harmonization of both measures and senior management shall be responsible for providing the most appropriate solution in cases of conflicts.

#### **3. Responsibilities of Senior Management**

Senior management shall demonstrate their commitment to nuclear security and shall make an assessment on how a positive nuclear security culture is developed within the NRA. In addition, senior management shall continuously work to foster the positive culture through setting up concrete goals and measuring achievements.

#### **4. Capacity Building and Self-improvement**

Nurturing competent staff is the responsibility of an organization, and the NRA shall provide capacity building programs on nuclear security. We shall have a 'questioning attitude' towards nuclear security issues at all times and strive to improve our effectiveness.

#### **5. Confidentiality and Communication**

While strictly observing confidentiality of nuclear security information, we shall proactively communicate with relevant stakeholders, as necessary, with a view to fostering a positive nuclear security culture in Japan.

## 7. Statement on Nuclear Safety Culture

(Determined on May 27, 2015 by the NRA)

Safety shall be given the overriding priority in the utilization of nuclear energy. Safety culture is recognized as continued practices with mindful awareness of this principle. It is the duty of everyone involved in nuclear energy to foster safety culture.

Recognizing its importance, the Nuclear Regulation Authority (NRA) has developed the code of conduct on safety culture taking due account of the lessons learned from the accident at the Fukushima Daiichi Nuclear Power Station of Tokyo Electric Power Company, Inc. The NRA will take the initiative in acting based on it.

Thereby, the NRA will strive to raise awareness of the importance of safety culture among everyone involved in nuclear energy and hence contributing to fostering safety culture in Japan.

### Code of Conduct

#### 1. Priority on safety

In full recognition that absolute safety is not achievable and the possibility of a serious accident remains, the overriding priority shall be placed on safety for “protecting people and the environment”.

#### 2. Decision-making taking into account the risks

Decisions shall be made in an independent and objective manner taking due account of the risks. Anyone who makes a decision is responsible for logically explaining the rationale of the decision while clarifying its own roles, responsibilities, and authority.

#### 3. Fostering, sustaining and strengthening safety culture

Managers shall take the initiative in fostering the attitudes and actions that place the overriding priority on safety in their respective organizations. For sustaining and further strengthening safety culture, they shall also be vigilant to any early warning signs of decline in safety culture and shape and enhance the working environment so that the staff can maintain high morale.

#### 4. Maintaining high level of expertise and organizational learning

Recognizing the importance of scientific and technical expertise for safety, each organization shall collect and analyze the latest information in Japan and overseas on regulatory activities, operating experience, and others to utilize the findings in its activities. Managers shall shape and enhance the working environment to promote such organizational learning.

#### 5. Effective communication

Open and frank discussion in the workplace shall be the basis in the pursuit of safety. Managers shall create such a working environment and promote active discussion in their respective organizations. Adequate communication shall be pursued both within the organization and with stakeholders for enhancing transparency and building trust by taking the initiative in information disclosure and exchange of a wide range of opinions.

#### 6. Questioning attitude

All the personnel shall always have one’s own “questioning attitude” without complacency concerning any weaknesses that may affect safety, as well as whether there is any room for further improvement, and thereby identify safety issues.

#### 7. Rigorous and prudent decisions and agile actions

In response to any challenges to ensuring safety, all the staff shall make conservative decisions for safety taking into account even the worst-case scenario, and quickly take necessary actions.

#### 8. Harmonization with nuclear security

It is necessary to recognize that nuclear safety and security activities do not exist independently, they complement each other and interfere with each other. All the personnel involved in nuclear safety and security activities shall respect each other’s way of thinking and make efforts for harmonizing both activities. Senior managers shall take responsibility to select the most appropriate solution.

## 8. NRA Meetings (April 1, 2020 - March 31, 2021)

No.	Date	Deliberation Topic
1	4.1	<ul style="list-style-type: none"> <li>- Full-scale operation of the new inspection program (nuclear regulatory inspection)</li> <li>- The draft of the basic policy for the inspection plan at TEPCO's Fukushima Daiichi Nuclear Power Station in FY2020</li> <li>- Status of the review for compliance with the new regulatory requirements for nuclear power plants</li> <li>- Status of the review for compliance with the new regulatory requirements for nuclear fuel facilities, etc.</li> </ul>
2	4.8	<ul style="list-style-type: none"> <li>- Summary of the draft of the review report on application for change in reactor installation of units 6 and 7 at Kashiwazaki-Kariwa NPS (TEPCO Holdings) - changes in the new regulations on protection from toxic gases-</li> <li>- Regarding the incident that occurred at Shikoku Electric Power Company's Ikata Power Station in January 2020</li> <li>- Policy on preparation of the NRA annual report (draft)</li> <li>- How to proceed with the review meeting, etc. for the time being</li> <li>- Plan for the implementation of technical evaluation of private standards</li> </ul>
3	4.22	<ul style="list-style-type: none"> <li>- Operation of nuclear regulatory inspection, etc. in light of the declaration of emergency situation of Covid-19 (Draft)</li> <li>- Partial revision of regulation for Enforcement of the Radioisotope Regulation Act and requesting public opinions -Obligation to assure reliability of radiation measurements-</li> <li>- Review team for applications for type certification of design of specified equipment, etc. for NPS. -Review team for specified dual-use casks to be installed in NPS-</li> <li>- Changes in intensive education and training programs</li> <li>- Results of FY2019 on-site inspections for designated bodies for information processing and designated bodies for safeguards inspections</li> </ul>
4	4.24	<ul style="list-style-type: none"> <li>- Operation of the Radioisotope Regulation Act during the declaration of an emergency situation of new coronavirus infection</li> </ul>
5	5.13	<ul style="list-style-type: none"> <li>- Draft of the review report on application for change in reprocessing business of reprocessing facilities (Japan Nuclear Fuel Ltd.)</li> <li>- Permission for change in reactor installation of units 6 and 7 at Kashiwazaki-Kariwa NPS (Tokyo Electric Power Company Holdings, Inc.) (draft) -changes in light of the new regulations on toxic gas protection-</li> <li>- Operational safety inspections in the fourth quarter of FY2019</li> <li>- Results of nuclear material physical protection inspections in FY2019 and results of checking protective measures for nuclear fuel material transportation in FY2019</li> <li>- Results of the Technical Information Review Meeting on the "study on the giant earthquake model along the Japan Trench and the Kuril Islands Trench (summary report)" by the cabinet office</li> </ul>
6 *1	5.20	<ul style="list-style-type: none"> <li>- Draft review report on the application for change in reactor installation relating to the specialized safety facility of Mihama NPS units 3 of the Kansai Electric Power Co. (draft)</li> </ul>
7	5.28	<ul style="list-style-type: none"> <li>- NRA annual report for FY2019 (draft)</li> <li>- Status of review of the operational safety program for power reactor facilities at Kashiwazaki-Kariwa NPS of Tokyo Electric Power Company Holdings, Inc.</li> <li>- Requesting public opinions from operators (2nd) on development of guidelines (draft) for review of regulations based on the Act on the Regulation of Radioisotopes, etc.</li> <li>- Results of the implementation of safeguards activities in Japan in 2019</li> <li>- Matters to be investigated and deliberated in the future at the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee</li> </ul>



		<ul style="list-style-type: none"> <li>- How to proceed with the study on the regulation of clearance and burial of uranium waste</li> <li>- Status report on "response of domestic nuclear power plants to 1-phase open fault events"</li> <li>- The NRA's response to the lifting of the declaration of a state of emergency</li> </ul>
8	6.3	<ul style="list-style-type: none"> <li>- Draft of the review report on application for change in reactor installation of units 3 at Mihama NPS (Kansai Electric Power Company) (draft) -specialized safety facility and permanent DC power supply facility (third system) at the station-</li> <li>- Permission for change in reactor installation of the HTTR (High Temperature Engineering Test Reactor) at Oarai Research and Development Institute (north area) of the Japan Atomic Energy Agency (draft)</li> <li>- Evaluation and future responses to the three cases of reported accidental failures at TEPCO's Fukushima Daiichi Nuclear Power Station and the Japan Materials Testing Reactor (JMTR) of the Oarai Research and Development Institute of the Japan Atomic Energy Agency</li> </ul>
9	6.10	<ul style="list-style-type: none"> <li>- Matters to be investigated and deliberated at the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee (draft)</li> <li>- Results of requesting public comments on the draft of enactment of the clearance regulations and consultation to the Radiation Council</li> <li>- Future efforts for continuous improvement of nuclear regulatory inspection</li> <li>- Consideration of new approaches for continuous safety improvement</li> <li>- Status of discussions at working-level technical discussion meeting with ATENA on aging management (interim report)</li> <li>- Arbitrary decisions in the fourth quarter of FY2019</li> </ul>
10	6.17	<ul style="list-style-type: none"> <li>- Results of ex-post facto and follow-up evaluations for safety research (draft)</li> <li>- Into domestic regulations of the IAEA Regulations on the Safe Transport of Radioactive Materials 2018 and response to the recommendations by the IRRS.</li> <li>- Status of decommissioning of the Reprocessing Facility of Nuclear Fuel Cycle Engineering Laboratories at the Tokai Research and Development Center of JAEA ("Tokai Reprocessing Facility"), Prototype Fast Breeder Reactor Monju and Advanced Converter Reactor Fugen</li> <li>- Evaluation of Accidents and Failures at Radioisotope operators in FY2019</li> </ul>
11 *2	6.17	<ul style="list-style-type: none"> <li>- Approval of selection of the members of designated bodies for safeguards inspections (draft)</li> <li>- Selection of committee members of the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee</li> </ul>
12	6.24	<ul style="list-style-type: none"> <li>- Draft of the review report on application for change in reactor installation of unit 3 at Ikata NPS (Shikoku Electric Power Company) -installation of a dry storage facility spent fuel-</li> <li>- Areas of safety research that should be promoted in the future and their implementation policies (draft)</li> <li>- The process of approval of design and construction method of reprocessing facilities (Japan Nuclear Fuel Ltd.) and confirmation of pre-service inspection, etc.</li> </ul>
13	7.1	<ul style="list-style-type: none"> <li>- Radiation protection measures for the Difficult-to-Return Zones (land utilization outside the Specified Reconstruction and Revitalization Base)</li> <li>- Status of the review for compliance with the new regulatory requirements for nuclear power plants</li> <li>- The 1st study on the regulation of clearance and burial of uranium waste</li> <li>- Results of the on-site inspection of the registered inspection organizations based on the Radioisotope Regulation Act (FY2019)</li> <li>- Release of the 2019 Safeguards Statement by the International Atomic Energy Agency (IAEA)</li> </ul>

14 *3	7.1	- Permission for change in reactor installation and construction plan of Tokai No. 2 NPS (Japan Atomic Power Company) (draft), Decision concerning the request for review and petition for stay of execution related to the approval of modifications of operational safety program of Takahama and Ohi NPS (Kansai Electric Power Company) (Draft)
15	7.8	- Permission for change in reactor installation of Units 3 at Mihama NPS (Kansai Electric Power Company) (draft) -Specialized Safety Facility and permanent DC power supply facility (third system) at the station- - Draft of the review report on application for change in reactor installation of the Nuclear Science Research Institute of the Japan Atomic Energy Agency (draft) - changes to the STACY facility, changes to the method of spent fuel disposal at the TCA facility and partial changes to the site boundary of the Nuclear Science Research Institute- - Establishment of a study team for continuous safety improvement - Future efforts for the against a common cause failure of a digital safety protection system of nuclear power reactor facility
16	7.15	- Action plan on management system and nuclear safety culture (draft) - Technical evaluation of the standards of the Japan Electric Association for eddy current testing, ultrasonic testing and leakage testing (draft) - Requirements in the regulatory standards for mid-depth disposal - Result of hearing opinions from license regarding the study results of “study team on evaluation of ground motions without identification of seismic sources” and direction of revision of requirements based on the result (3rd) - Status of discussions in meeting of related to the reviewing the Emergency Action Level (EAL)
17	7.22	- Comments of external experts on NRA’s administrative review of FY2020 - Requesting scientific and technical opinions on the regarding formulation of regulatory requirements for mid-depth disposal - Results of working-level technical discussions with ATENA on aging management
18	7.29	- Permission for change in reprocessing business of reprocessing facilities (Japan Nuclear Fuel Ltd.) (draft) - Draft of the review report on application for change in waste disposal activities of reprocessing facilities (Japan Nuclear Fuel Ltd.) - Results of the consultation with the radiation council on the proposed enactment of the clearance rules and the enactment of the regulations, etc. (draft) - Approval of "Rules for Confirmation of Transportation of radioisotope" by Radiation Management Institute, Inc. (draft) - The NRA draft opinion based on the results of working-level technical discussions with ATENA on aging management
19	8.19	- Appointment of the Reactor Safety Examination Committee members and Nuclear Fuel Safety Examination Committee members (draft) - Adoption of IAEA safety standards for the transport of radioactive materials and NRA regulations response to the recommendations and suggestions by the IRRS, public notices, and guides and request for public opinion on them - Ex-post evaluation of the Radiation Safety Research Promotion Project - Report on the results of the Debriefing Session of Emergency Drills by operators and Policy for this year - Results of the nuclear regulatory inspection in the first quarter of FY2020

20	8.26	<ul style="list-style-type: none"> <li>- Radiation protection measures for residents who come and go in the area to be utilized</li> <li>- Permission for change in business of waste management at reprocessing facility (Japan Nuclear Fuel Ltd.) (draft)</li> <li>- Review policy for the assessment of radiation doses for public after of decommissioning in permission for change in the waste burial business of Japan Nuclear Fuel Ltd.</li> <li>- Preparation of the seventh national report of Japan for the convention on safety of spent fuel management and radioactive waste management (1st report)</li> <li>- Status of review of operational safety program and design and construction plans at Kashiwazaki-Kariwa NPS (Tokyo Electric Power Company Holdings, Inc.)</li> </ul>
21 *4	8.31	<ul style="list-style-type: none"> <li>- Protective measures for the digitalization of the reactor shutdown panel outside the main control room</li> <li>- Selection of the committee's members of the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee</li> </ul>
22	9.2	<ul style="list-style-type: none"> <li>- Draft of the review report on application for change in spent fuel storage business at Recyclable-Fuel Storage Center of Recyclable-Fuel Storage Company</li> <li>- Partial revision of the regulations relating to the Radioisotope Regulation Act and results of requesting public comments on that-obligation to ensure reliability of radiation measurements-</li> <li>- Preparation of the seventh national report of Japan for the convention on safety of spent fuel management and radioactive waste management (2nd report)</li> <li>- Solicitation of newly adopted projects for NRA human resource development program for FY2020</li> </ul>
23	9.9	<ul style="list-style-type: none"> <li>- Policy evaluation report of implementation measures in FY2019, pre-analysis table of implementation measures of policy evaluation report and ex-post evaluation of regulation report for FY2020 (draft)</li> <li>- Performance evaluation of the National Institutes for Quantum and Radiological Science and Technology in FY2019 (draft)</li> <li>- Performance evaluation (under co-management with the NRA) of JAEA in FY2019 (draft)</li> <li>- Technical evaluations of the Japan Electric Association's "method of checking the fracture toughness of a reactor pressure vessel during a in-service period" and "method of determining the fracture toughness reference temperature T0 of ferrite steel" (draft)</li> <li>- Arbitrary decisions in the first quarter of FY2020</li> </ul>
24	9.9	<ul style="list-style-type: none"> <li>- Opinion exchange between the NRA and the Kansai Electric Power Company's management</li> </ul>
25 *5	9.15	<ul style="list-style-type: none"> <li>- Status of the review of the application for change in reactor installation relating to the specialized safety facility of BWR plants (report)</li> </ul>
26	9.16	<ul style="list-style-type: none"> <li>- Permission for change in reactor installation of unit 3 at Ikata NPS (Shikoku Electric Power Company) (draft) -installation of a dry storage facility spent fuel -</li> <li>- Approval of operational safety program at MOX fuel fabrication facility (Japan Nuclear Fuel Ltd.), Oma NPS (Electric Power Development Co., Ltd. (J - Power)), Higashidori NPS (Tokyo Electric Power Company Holdings, Inc.) and spent fuel storage facilities at Recyclable-Fuel Storage Center (Recyclable-Fuel Storage Company) (draft) - amendment of The Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (put into effect on April 1, 2020) -</li> <li>- Partial revision of the NRA Commission's decisions on permission for concurrent officials of the chairman and committee members (draft)</li> <li>- Revision of the Regulations on Installation and Operation of Research Reactors (draft) related to revisions of the approval criteria for decommissioning plans and requesting public comments on these</li> <li>- Requesting public comments on the revisions of the Nuclear Emergency Response Guidelines and relevant rules (Revision of Emergency Action Level[EAL])</li> <li>- Defect of the IAEA's seal at the Rokkasho facility of the Japan Nuclear Fuel Ltd.</li> </ul>

27	9.23	<ul style="list-style-type: none"> <li>- Draft of the review report on application for change in reactor installation of units 1 and 2 at Sendai NPS (Kyushu Electric Power Company) (draft) -Installation of waste transportation facilities-</li> <li>- Status of review of operational safety program and design and construction plans at Kashiwazaki-Kariwa NPS (Tokyo Electric Power Company Holdings, Inc.) (2nd)</li> <li>- How to proceed with the study of "Guide for Ergonomic Design Evaluation (draft)".</li> <li>- Concretization of descriptions and improvement of expressions in regulatory standards, etc., based on review results -results of collecting comments and suggestions and how to proceed in the future-</li> </ul>
28	9.30	<ul style="list-style-type: none"> <li>- Addition of items for investigation and deliberation at the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee and appointment of committee members, etc.</li> <li>- Results of the 7th review meeting of the joint convention on the safety of spent fuel management and on the safety of radioactive waste management</li> <li>- Status of review of design and construction plans and pre-service inspection, etc. at nuclear fuel related facilities and research reactors</li> <li>- Review policy for the assessment of radiation doses for public after of decommissioning in permission for change in the waste burial business of Japan Nuclear Fuel Ltd. (2nd) -Settings for future human activities-</li> <li>- Handling of inspection findings in nuclear regulatory inspections</li> <li>- Status of implementation of investigation and analysis related to the accident at TEPCO's Fukushima Daiichi Nuclear Power Station</li> </ul>
29 *6	9.30	<ul style="list-style-type: none"> <li>- Status of the review of the application for change in reactor installation relating to the specialized safety facility of BWR plants (report) (2nd)</li> </ul>
30 *7	10.2	<ul style="list-style-type: none"> <li>- Judgment of the Sendai high court in a suit for national reparations, etc. due to the accident at TEPCO's Fukushima Daiichi Nuclear Power Station</li> </ul>
31	10.7	<ul style="list-style-type: none"> <li>- Draft of the review report on application for change in nuclear fuel material fabrication business at MOX fuel fabrication facility (Japan Nuclear Fuel Ltd.) (draft)</li> <li>- Approval of the decommissioning plan of Units 2 at Ikata NPS (Shikoku Electric Power Company) (draft)</li> <li>- Review policy for the assessment of radiation doses for public after of decommissioning in permission for change in the waste burial business of Japan Nuclear Fuel Ltd. (3rd) -Settings for future human activities-</li> <li>- Opinions from operators in nuclear regulatory inspections</li> <li>- Status of the review for compliance with the new regulatory requirements for nuclear power plants</li> <li>- Status of the review for compliance with the new regulatory requirements for nuclear fuel facilities, etc.</li> <li>- FY2021 NRA budget request and organization/capacity request</li> <li>- Status of actions related to the review of stamping, documents, and face-to-face meetings in administrative and internal procedures</li> </ul>
32	10.14	<ul style="list-style-type: none"> <li>- Draft of the review report on application for change in reactor installation of units 1, 2, 3 and 4 at Takahama NPS (Kansai Electric Power Company) (draft) -response to tsunami for which no tsunami warning, etc. may be issued-</li> <li>- Incorporating IAEA safety requirements for the transport of radioactive materials, the result of requesting public comments of the draft of partial revision of relevant NRA regulations, public notices, guides and internal rules for the recommendations and suggestions by the IAEA Integrated Regulatory Review Service (IRRS) mission and consultation with the radiation council</li> <li>- Evaluation and future response to the report from Kansai Electric Power Co., Inc. on the damage to the steam generator tube of Unit 3 at Takahama NPS (draft)</li> <li>- Revision of the NRA administrative document management guidelines (draft)</li> </ul>

33	10.21	<ul style="list-style-type: none"> <li>- Permission for change in reactor installation of units 1 and 2 at Sendai NPS (Kyushu Electric Power Company) (draft) -installation of a waste removal facility-</li> <li>- Result of hearing opinions from operator regarding the study results of “study team on evaluation of ground motions without identification of seismic sources” and direction of revision of requirements based on the result (4th)</li> <li>- Requesting public comments on amendment of regulations for review of stamp and documentation for application forms, etc., submitted by operators, etc.</li> <li>- Status of the public meeting regarding the substantial indication at the weld of the pressurizer spray line of unit 3 at Ohi NPS (Kansai Electric Power Co.)</li> <li>- Result of hearing opinions from operators regarding the study team on measures against common cause failure of digital safety protection systems in nuclear power reactor facilities (5th)</li> <li>- Impact of the new coronavirus infection on the progress of the FY2020 priority plan</li> </ul>
34 *8	10.21	<ul style="list-style-type: none"> <li>- Decision on the request for review of the summary of the results of the request for opinions on the review document for the permission for change in reactor installation at Onagawa NPS (Tohoku Electric Power Co.)</li> </ul>
35	10.28	<ul style="list-style-type: none"> <li>- Partial revision of regulations concerning technical standards for testing and research reactor</li> <li>- Results of requesting public comments on the partial revision of the Nuclear Emergency Response Guidelines and related rules (review of the Emergency Action Level [EAL])</li> <li>- Partial amendment of the public notice of the NRA concerning calculation of effective dose at the boundaries of facilities when handling radioactive isotopes at TEPCO's Fukushima Daiichi NPP and requesting public comments on these</li> <li>- Policy on revision of standards for earthquake ground motions without identification of seismic sources (5th)</li> <li>- Specifying and improving the wording of regulatory standards based on the results of reviews -establishment of an implementation plan for fiscal 2020 and future plans for the following fiscal year</li> <li>- Outline of the results of the 42nd Technical Information Committee</li> </ul>
36	11.4	<ul style="list-style-type: none"> <li>- The establishment of the events reported based on the act relating to the specialized safety facility (draft)</li> <li>- Policy on the response to the case of damaged inspection seals used for safeguards</li> <li>- The 2nd study on the regulation of clearance and burial of uranium waste</li> </ul>
37	11.11	<ul style="list-style-type: none"> <li>- Permission for change in spent fuel storage business at Recyclable-Fuel Storage Center of Recyclable-Fuel Storage Company (draft)</li> <li>- Improvement of the events reported based on the Nuclear Reactor Regulation Act</li> <li>- Results of the nuclear regulatory inspection in the second quarter of FY2020 and revision of the inspection plan</li> <li>- Draft of partial amendment of the public notice of the NRA concerning calculation of effective dose at the boundaries of facilities when handling radioactive isotopes at TEPCO's Fukushima Daiichi NPP and requesting public comments on these (2nd)</li> </ul>
38	11.18	<ul style="list-style-type: none"> <li>- The approval of design and construction method for modification of reactor facilities at the Nuclear Science Research Institute of the Japan Atomic Energy Agency [changes to the STACY facility (3rd application)] (draft)</li> <li>- Incorporating IAEA safety requirements for the transport of radioactive materials, report of the radiation council on the proposed partial amendments to the regulations, public notice, guide, and internal rules of the NRA to address the recommendations and suggestions by the IAEA Integrated Regulatory Review Service (IRRS) mission and these enactments</li> <li>- Requesting public opinions from operators (3rd and 4th) on development of guidelines (draft) for review of regulations based on the Act on the Regulation of Radioisotopes, etc.</li> </ul>

39	11.18	Opinion exchange between the NRA and the management of the Japan Nuclear Fuel Ltd.
40	11.25	<ul style="list-style-type: none"> <li>- The result of requesting scientific and technical opinions on the requirements in the regulatory standard for mid-depth disposal</li> <li>- The results of the study of “study team on seismic isolation of buildings and structures”</li> <li>- Reflection of the results of safety research on assessment of tsunami wave pressure on seawalls to the review guide</li> <li>- Outline of the results of the 43rd Technical Information Committee</li> </ul>
41	12.2	<ul style="list-style-type: none"> <li>- The NRA’s comments on “FY2020 Comprehensive Nuclear Emergency Response Drill” (draft)</li> <li>- Draft of the review report on application for change in reactor installation of units 3, 4 at Ohi NPS and unit 3 at Mihama NPS (Kansai Electric Power Company) (draft) -Changes based on regulations related to toxic gas protection-</li> <li>- Permission for change in reactor installation of units 1, 2, 3 and 4 at Takahama NPS (Kansai Electric Power Company) (draft) -response to tsunami for which no tsunami warning, etc. may be issued-</li> <li>- Public announcement of the results of the requesting public comments on the proposed enactment or amendment of regulations, etc. for the review of stamp and documents related to applications submitted to the NRA and the enactment or amendment of regulations, etc.</li> <li>- Establishment of basic training policy for emergency response (tentative name), etc.</li> <li>- Arbitrary decisions in the second quarter of FY2020</li> <li>- Exchange of views between international advisors for nuclear regulations and the NRA</li> </ul>
42	12.2	- Opinion exchange between the NRA and the Hokkaido Electric Power Company’s management
43 *9	12.8	- Judgment of the Osaka district court in the lawsuit for the revocation of the permission for change in reactor installation of the Ohi NPS of the Kansai Electric Power Co.
44	12.9	<ul style="list-style-type: none"> <li>- Draft of the application for change in nuclear fuel material fabrication business at MOX fuel fabrication facility (Japan Nuclear Fuel Ltd.)</li> <li>- Revision of the regulations on installation and operation of research reactors related to revisions of the approval criteria for decommissioning plans and results of requesting public comments on these</li> <li>- Setting of important themes of FY2021 Radiation Safety Research Promotion Project and public offering of new projects (draft)</li> </ul>
45	12.16	<ul style="list-style-type: none"> <li>- Requesting public comments on the partial revision of the rule on the use of Internationally Controlled Materials</li> <li>- The 3rd study on the regulation of clearance and burial of uranium waste</li> <li>- Review of the establishment of the basis ground motions</li> <li>- Situation of management of administrative documents (progress report)</li> </ul>
46	12.21	-Opinion exchange between the NRA and the management of the Tokyo Electric Power Company Holdings, Inc.
47	12.23	<ul style="list-style-type: none"> <li>- Draft of the review report on application for change in reactor installation of units 3, 4 at Ohi NPS and unit 3 at Mihama NPS (Kansai Electric Power Company) (draft) -changes based on regulations related to toxic gas protection-</li> <li>- Consideration of aging for spent fuel transported after storage</li> <li>- Response to the "investigation and analysis of TEPCO’s Fukushima Daiichi NPS accidents interim report (tentative name)"</li> <li>- Results of the selection for the human resource development project for nuclear regulation FY2020</li> <li>- NRA’s proposed third supplemental budget for FY2020, and proposed initial budget and plan for organization and the number of agency personnel for FY2021</li> </ul>

48	1.6	<ul style="list-style-type: none"> <li>- Status of the review for compliance with the new regulatory requirements for nuclear power plants</li> <li>- Status of the study at "study team for continuous safety improvement"</li> </ul>
49	1.13	<ul style="list-style-type: none"> <li>- Requesting public comments on the review and inspection guide (draft) for ergonomics design and development</li> <li>- Revision of education and training courses for qualified personnel, etc.</li> <li>- Revision of basic policy of development of NRA officials</li> <li>- Status of the investigation of a crack in the pressurizer spray line of unit 3 at Ohi NPS (Kansai Electric Power Co.)</li> <li>- The NRA's response to the declaration of a state of emergency</li> </ul>
50	1.20	<ul style="list-style-type: none"> <li>- Approval of the decommissioning plan of the fabrication business at the JAEA's Ningyo-toge Environmental Engineering Center (draft)</li> <li>- Study on the decision criteria, etc. for confirmation of the termination of decommissioning of nuclear facilities</li> <li>- Partial revision of the interpretation of regulations on the standards for the position, structure and equipment of commercial nuclear power reactors and associated facilities (draft) and requesting public comments -incorporation of standard response spectrum into regulations-</li> <li>- Report on the status of discussions at the 21st Reactor Safety Examination Committee and the 27th Nuclear Fuel Safety Examination Committee</li> </ul>
51 *10	1.26	<ul style="list-style-type: none"> <li>- Summary of the review report on the application for approval of changes in the security plans due to digitalization the reactor shutdown panel outside the main control room</li> <li>- Decision on objection to disposition of permission for nuclear fuel material fabrication business at MOX fuel fabrication facility (Japan Nuclear Fuel Ltd.) (draft)</li> </ul>
52	1.27	<ul style="list-style-type: none"> <li>- Draft of evaluation results of safety research (prior evaluation)</li> <li>- Results of study on requirements for faults in mid-depth disposal</li> <li>- "Investigation and analysis of TEPCO's Fukushima Daiichi NPS accidents interim report(draft)"</li> <li>- Formulation of basic training policy for emergency response (tentative name) and how to proceed with subsequent training and education</li> </ul>
53	2.3	<ul style="list-style-type: none"> <li>- Results of requesting public comments on draft of partial amendment to the notification of the NRA concerning calculation of effective doses at the site boundary for handling radioisotopes at TEPCO's Fukushima Daiichi NPS and consultation to the Radiation Council</li> <li>- Legal provisions on personal dose control and regulation of radiation sources</li> <li>- Establishment of the study team on thyroid dose monitoring in emergencies</li> <li>- Response to the disposal of radioactive waste containing heavy metals and other hazardous materials in burial</li> <li>- Specific examples of consideration of uncertainties in the review of the establishment of the basis ground motions</li> </ul>
54 *11	2.8	<ul style="list-style-type: none"> <li>- Summary of the review report on the application for approval of changes in the security plans due to digitalization the reactor shutdown panel outside the main control room (No. 2)</li> <li>- Results of the preliminary SERP (Significance and Enforcement Review Panel) regarding the illegal use of ID cards at TEPCO's Kashiwazaki-Kariwa NPS</li> </ul>
55 *12	2.9	<ul style="list-style-type: none"> <li>- Results of the preliminary SERP (Significance and Enforcement Review Panel) regarding the illegal use of ID cards at TEPCO's Kashiwazaki-Kariwa NPS (No. 2)</li> </ul>
56	2.10	<ul style="list-style-type: none"> <li>- Result of requesting public comments of the draft of the partial revision of the rule on the use of Internationally Controlled Materials</li> <li>- Revision of the measures for mid-term risk reduction ("Risk Map") at TEPCO's Fukushima Daiichi NPS</li> <li>- Requesting scientific and technical opinions on the requirements for faults in the regulatory standards for mid-depth disposal</li> </ul>

		<ul style="list-style-type: none"> <li>- Results of the nuclear regulatory inspection in the third quarter of FY2020 and revision of the inspection plan</li> <li>- Confirmation of the appropriateness of the operator's probabilistic risk assessment (PRA) model used in nuclear regulatory inspections</li> </ul>
57	2.17	<ul style="list-style-type: none"> <li>- Draft of the review report on application for change in reactor installation of Kyoto University's Institute for Integrated Radiation and Nuclear Science (modification of critical assembly)</li> <li>- Revision of basic policy of development of NRA officials (draft)</li> <li>- Next mid- and long-term goals of Japan Atomic Energy Agency</li> </ul>
58 *13	2.18	<ul style="list-style-type: none"> <li>- Report on issues related to the physical protection of nuclear materials</li> </ul>
59	2.24	<ul style="list-style-type: none"> <li>- Response to the based on the investigation of a crack in the pressurizer spray line of unit 3 at Ohi NPS (Kansai Electric Power Co.)</li> <li>- Details of the report from Kansai Electric Power Co., Inc. on the damage to the steam generator tube of Unit 4 at Takahama NPS</li> <li>- Outline of the results of the 44th Technical Information Committee</li> <li>-Arbitrary decisions in the third quarter of FY2020</li> </ul>
60 *14	3.1	<ul style="list-style-type: none"> <li>- Results of the nuclear regulatory inspection regarding a physical protection accident at TEPCO's Kashiwazaki-Kariwa NPS</li> </ul>
61	3.3	<ul style="list-style-type: none"> <li>- Release of the NRA's initiatives (March 11 report) (draft)</li> <li>- Management review for FY2020</li> <li>- Revision of the measures for mid-term risk reduction ("Risk Map") at TEPCO's Fukushima Daiichi NPS (2nd)</li> <li>- Specifying and improving the wording of regulatory standards based on the results of reviews -requesting public comments based on the implementation plan for fiscal 2020</li> <li>- Evaluation and future response to the report from Kansai Electric Power Co., Inc. on the damage to the steam generator tube of unit 4 at Takahama NPS</li> </ul>
62 *15	3.4	<ul style="list-style-type: none"> <li>- Development of the future evaluations regarding a physical protection accident at TEPCO's Kashiwazaki-Kariwa NPS</li> </ul>
63	3.10	<ul style="list-style-type: none"> <li>- Release of the NRA's initiatives (March 11 report) (draft) (2nd)</li> <li>- Management review for FY2020 (2nd)</li> <li>- The 4th study on the regulation of clearance and burial of uranium waste</li> <li>- Summary of the "Investigation and Analysis of TEPCO's Fukushima Daiichi NPS Accidents Interim Report" and results of requesting public comments on that</li> <li>- Report of the Radiation Council on the revision of the notification of the NRA concerning calculation of effective doses for radiation facilities within the site of TEPCO's Fukushima Daiichi NPP and future plans</li> </ul>
64 *16	3.16	<ul style="list-style-type: none"> <li>- The report submitted by TEPCO (root cause analysis and corrective actions regarding the illegal use of ID cards by employees of Kashiwazaki-Kariwa NPS (March 10, 2021))</li> <li>- Results of the preliminary SERP (Significance and Enforcement Review Panel) regarding the partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS</li> </ul>
65	3.17	<ul style="list-style-type: none"> <li>- Handling of future applications from TEPCO in response to the physical protection issues at TEPCO's Kashiwazaki-Kariwa NPS</li> <li>- Draft of the review report on application for change in reactor installation of unit 3 at Mihama NPS, units 3, 4 at Ohi NPS and units 1,2,3,4 at Takahama (Kansai Electric Power Company) (draft) -response to the revision of the eruptive scale of Daisen-Namatake Tephra from Daisen volcano-</li> <li>- The purpose of the review guides and process for developing them</li> <li>- Draft of the review report on application for change in reactor installation of units 3 and 4 at Genkai NPS (Kyushu Electric Power Company) -installation of a dry storage facility spent fuel-</li> <li>- Approval of the decommissioning plan of the Japan Materials Testing Reactor</li> </ul>



		(JMTR) at JAEA's Oarai Research and Development Institute (draft) - Approval of the decommissioning plan of the Tank-type Critical Assembly (TCA) at JAEA's Nuclear Science Research Institute (draft) - Revision of the NRA Organization Regulation
66 *17	3.23	- Change in the level of NRA response regarding the partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS and enforcement actions
67	3.24	- The NRA's response to the lifting of the declaration of a state of emergency - Operation of the "radiation monitoring information sharing and announcement system" of the NRA - Report on the results of the annual evaluation of the underway projects for FY2020 and the determination of the adopted projects for FY2021 in Radiation Safety Research Promotion Project - Implementation system of radiation safety research programs after FY2022 - FY2021 policy evaluation implementation plan, etc. (draft) - FY2021 NRA Priority Plan (draft) - Enforcement actions regarding the partial loss of function of physical protection equipment at TEPCO's Kashiwazaki-Kariwa NPS
68 *18	3.25	- Selection of the Radiation Council members - Selection of the immediate emergency response members - Selection of the committee's members of the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee - Decision concerning the petition for review and petition for stay of execution related to the permission for change in reactor installation (change in the reactor facilities for units 3 and 4) for Genkai NPS of Kyushu Electric Power Company
69 *19	3.30	- Revision of the review criteria for physical protection measures for nuclear facilities - Status of nuclear regulatory inspection in the physical protection area
70	3.31	- Giving an opportunity for justification based on the provisions of Article 43-3-23 (2) of the Reactor Regulation Act - Specifying and improving the wording of regulatory standards based on the results of reviews -requesting public comments based on the implementation plan for fiscal 2020 (2nd) - Response to the "Investigation and Analysis of TEPCO's Fukushima Daiichi NPS Accidents Interim Report" (1st) - The draft of the basic policy for the inspection plan at TEPCO's Fukushima Daiichi Nuclear Power Station in FY2021 - Response to the earthquake that occurred offshore of Fukushima Prefecture at approximately 23:08 on February 13, 2021

\*1 The 6th meeting in FY2020 was closed to the public for security reasons because it handled the review process of the Specialized Safety Facilities.

\*2 The 11th meeting in FY2020 was closed to the public because the selection of personnel for the said corporation and the Examination Committee is to be conducted, because there is a risk of harm to the rights and interests of individuals if this information and deliberations are made public, and because there is a risk of hindrance to ensuring fair and smooth personnel management in the affairs pertaining to the personnel management of the said corporation and the Examination Committee.

\*3 The 14th meeting in FY2020 was closed to the public because the meeting examined suitability and propriety of disposition implemented by NRA themselves. Opening of examination to the public could disturb hearing of honest opinions from the persons involved in the disposition, and as a result, the original function of formal objection that performs fair and neutral decision through simple procedures might be obstructed.

\*4 The 21st meeting in FY2020 was closed to the public because the first item of the deliberations deals with information on the physical protection of nuclear materials, and there is a risk of harm to public safety if this information and deliberations become public and are known to those who plan to sabotage nuclear facilities. The second is the selection of the members of the Committee, etc., and there is a risk of harm to the rights and interests of individuals if this information and deliberations become public, as well as a risk of hindering the securing of fair and smooth personnel affairs related to the personnel management of the Committee, etc.

\*5 The 25th meeting in FY2020 was closed to the public for security reasons because it handled the review process of the Specialized Safety Facilities.

- \*6 The 29th meeting in FY2020 was closed to the public for security reasons because it handled the review process of the Specialized Safety Facilities.
- \*7 The 30th meeting in FY2020 was closed to the public because it dealt with the policy for handling lawsuits related to the affairs under the jurisdiction of NRA.
- \*8 The 34th meeting in FY2020 was closed to the public because the meeting examined suitability and propriety of disposition implemented by NRA themselves. Opening of examination to the public could disturb hearing of honest opinions from the persons involved in the disposition, and as a result, the original function of formal objection that performs fair and neutral decision through simple procedures might be obstructed.
- \*9 The 43rd meeting in FY2020 was closed to the public because it dealt with the policy for handling lawsuits related to the affairs under the jurisdiction of NRA.
- \*10 The 51st meeting in FY2020 was closed to the public because the first item of the deliberations deals with information on the physical protection of nuclear materials, and there is a risk of harm to public safety if this information and deliberations become public and are known to those who plan to sabotage nuclear facilities. The second is the discussion on the appropriateness and unfairness of the disposition that NRA is deemed to have made itself, and there is a risk that the publicity of the discussion will hinder the frank hearing of opinions from those who were involved in the disposition, and as a result, the original function of the objection, which is to make a fair and neutral judgment through simple procedures, may be hindered.
- \*11 The 54th meeting in FY2020 was closed to the public to prevent endangering public safety by disclosing information relating to physical protection from a person(s) who might ultimately attempt to sabotage nuclear facilities with such information.
- \*12 The 55th meeting in FY2020 was closed to the public to prevent endangering public safety by disclosing information relating to physical protection from a person(s) who might ultimately attempt to sabotage nuclear facilities with such information.
- \*13 The 58th meeting in FY2020 was closed to the public to prevent endangering public safety by disclosing information relating to physical protection from a person(s) who might ultimately attempt to sabotage nuclear facilities with such information.
- \*14 The 60th meeting in FY2020 was closed to the public to prevent endangering public safety by disclosing information relating to physical protection from a person(s) who might ultimately attempt to sabotage nuclear facilities with such information.
- \*15 The 62nd meeting in FY2020 was closed to the public to prevent endangering public safety by disclosing information relating to physical protection from a person(s) who might ultimately attempt to sabotage nuclear facilities with such information.
- \*16 The 64th meeting in FY2020 was closed to the public to prevent endangering public safety by disclosing information relating to physical protection from a person(s) who might ultimately attempt to sabotage nuclear facilities with such information.
- \*17 The 66th meeting in FY2020 was closed to the public to prevent endangering public safety by disclosing information relating to physical protection from a person(s) who might ultimately attempt to sabotage nuclear facilities with such information.
- \*18 The 68th meeting in FY2020 is closed to the public because the first through third items of the deliberations, etc. are for the selection of the members of the relevant Committee, etc., because there is a risk of harm to the rights and interests of individuals if this information and deliberations are made public, and because there is a risk of hindering the securing of fair and smooth personnel management with regard to the affairs related to the personnel management of the relevant Committee, etc. The fourth is the discussion on the appropriateness and unfairness of the disposition that NRA is deemed to have made itself, and there is a risk that the publicity of the discussion will hinder the frank hearing of opinions from those who were involved in the disposition, and as a result, the original function of the objection, which is to make a fair and neutral judgment through simple procedures, may be hindered.
- \*19 The 69th meeting in FY2020 was closed to the public to prevent endangering public safety by disclosing information relating to physical protection from a person(s) who might ultimately attempt to sabotage nuclear facilities with such information.

## 9. Decisions by NRA (April 1, 2020 - March 31, 2021)

Date of determination	Decision made in Committee
4.8	<ul style="list-style-type: none"> <li>-Hearing of comments on the permission for change in the installation of nuclear reactors for power generation (change in reactor facilities for power generation Units 6 and 7) at Kashiwazaki-Kariwa NPS (toxic gas protection backfitting)</li> <li>-Evaluation of the report and future measures concerning the pull-up of the control rod cluster during the lifting of the core structure above the reactor vessel of Unit 3 at Ikata NPS, Shikoku Electric Power Co.</li> <li>-Policy on preparation of the NRA annual report</li> </ul>
5.13	<ul style="list-style-type: none"> <li>-Hearing of opinions, etc. on the permission for change in the reprocessing plant's processing business of Japan Nuclear Fuel Limited</li> <li>-Permission for change in the installation of nuclear reactors for power generation (change in reactor facilities for power generation Units 6 and 7) at Kashiwazaki-Kariwa NPS (toxic gas protection backfitting)</li> </ul>
5.28	<ul style="list-style-type: none"> <li>-NRA annual report for FY2019</li> </ul>
6.3	<ul style="list-style-type: none"> <li>-Hearing of opinions on permission for change in the installation of nuclear reactors for power generation (change in reactor facility for power generation Unit 3) at Mihama NPS (installation of special facility for severe accident management and the permanent in-premises DC power supply system (the third system))</li> <li>-Permission for change in reactor installation of the HTTR (High Temperature Engineering Test Reactor) at Oarai Research and Development Institute (north area) of the Japan Atomic Energy Agency</li> <li>-Evaluation and future actions to be taken in response to the reports concerning the water level drop in the drain sump pit of Units 1 and 2 and the shaft breakage of the valve drive unit of the residual heat removal system in Unit 6 at TEPCO's Fukushima Daiichi NPS</li> <li>-Evaluation and future actions concerning the report of the collapse of the cooling tower in the secondary cooling system of the Japan Materials Testing Reactor (JMTR) at Oarai Research Establishment (north area), Japan Atomic Energy Agency</li> </ul>
6.10	<ul style="list-style-type: none"> <li>-Matters to be investigated and deliberated at the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee</li> <li>-Consultation with the Radiation Council on the proposed enactment of the clearance rule</li> </ul>
6.17	<ul style="list-style-type: none"> <li>-Approval of selection of the members of designated bodies for safeguards inspections</li> </ul>
6.24	<ul style="list-style-type: none"> <li>-Hearing opinions concerning permission for change in installation of reactor for power generation at Ikata NPS (change of nuclear reactor facilities for power generation Unit 3) (dry cask)</li> </ul>
7.1	<ul style="list-style-type: none"> <li>-Decision on request for administrative review of and petition for stay of execution to the permission for change in reactors installation and permission of construction plan at Tokai Daini NPS (Japan Atomic Power Company)</li> <li>-Decisions on the request for administrative review of and the petition for stay of execution of permission for change in operational safety programs for Takahama NPS and Ohi NPS (Kansai Electric Power Company)</li> </ul>
7.8	<ul style="list-style-type: none"> <li>-Permission for change in the installation of nuclear reactors for power generation (change in reactor facility for power generation Unit 3) at Mihama NPS (installation of special facility for severe accident management and the permanent in-premises DC power supply system (the third system))</li> <li>-Hearing of opinions, etc. on permission for change in reactor installation (change of the STACY (Static Experiment Critical Facility)) at the Japan Atomic Energy Agency's Nuclear Science Research Institute</li> </ul>
7.15	<ul style="list-style-type: none"> <li>-Action plan on management system and nuclear safety culture</li> </ul>
7.29	<ul style="list-style-type: none"> <li>-Permission for change in reprocessing business of reprocessing facilities (Japan Nuclear Fuel Ltd.)</li> <li>-Hearing of opinions, etc. on the permission for change in the waste management's waste storage business of Japan Nuclear Fuel Limited</li> <li>-Enactment of regulations, etc. based on the report from the Radiation Council on the proposed enactment of clearance rule</li> <li>-Approval of "Rules for Confirmation of Transportation of radioisotope" by Radiation Management Institute, Inc.</li> </ul>
8.19	<ul style="list-style-type: none"> <li>-Appointment of the Reactor Safety Examination Committee members and Nuclear Fuel Safety Examination Committee members</li> </ul>
8.26	<ul style="list-style-type: none"> <li>-Permission for change in business of waste management at reprocessing facility (Japan Nuclear Fuel Ltd.)</li> </ul>
9.2	<ul style="list-style-type: none"> <li>-Hearing of opinions, etc. on the permission for change in business of waste management at reprocessing</li> </ul>

	<p>facility (Japan Nuclear Fuel Ltd.)</p> <p>-Partial revision of the rules for the Act on Regulations of Radioisotopes, etc. for securing the reliability of measurement of radiation dose, etc.</p>
9.9	<p>-Policy evaluation report of implementation measures in FY2019, pre-analysis table of implementation measures of policy evaluation report and ex-post evaluation of regulation report for FY2020</p> <p>-Performance evaluation (under co-management with the NRA) of the National Institutes for Quantum and Radiological Science and Technology in FY2019</p> <p>-Performance evaluation (under co-management with the NRA) of JAEA in FY2019</p>
9.16	<p>-Permission for change in installation of reactor for power generation at Ikata NPS (change of nuclear reactor facilities for power generation Unit 3) (dry cask)</p> <p>-Approval of operational safety program for MOX Fuel Fabrication Facility at Reprocessing Plant of Japan Nuclear Fuel Limited (enacted based on the revision of the Nuclear Reactor Regulation Law (enforced on April 1, 2020))</p> <p>-Approval of the operational safety program for nuclear reactor facilities at the Ohma NPS of the Power Development Corporation (enacted based on the revision of the Nuclear Reactor Regulation Law (enforced on April 1, 2020))</p> <p>-Approval of operational safety program for nuclear reactor facilities at the Higashidori NPS of TEPCO (enacted based on the revision of the Nuclear Reactor Regulation Law (enforced on April 1, 2020))</p> <p>-Approval of operational safety program for the spent fuel storage facility at the Recycled Fuel Storage Center (enacted based on the revision of the Nuclear Reactor Regulation Law (enforced on April 1, 2020))</p> <p>-Partial revision of Code of Conduct related to Ethics for the NRA Chairman and Commissioners</p>
9.23	<p>-Hearing of opinions on permission for change in installation of nuclear reactor for power generation (change of Units 1 and 2 power reactor facilities) at the Sendai NPS (installation of waste removal facilities)</p>
9.30	<p>-Japan's seventh national report on the Convention on the Safety of Spent Fuel Management and Radioactive Waste Management</p> <p>-Addition of items for investigation and deliberation at the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee and appointment of committee members</p>
10.7	<p>-Hearing opinions on permission for change in JNFL's nuclear fuel material processing business (MOX fuel fabrication facility)</p> <p>-Approval of the decommissioning plan of Unit 2 at Ikata NPS</p>
10.14	<p>-Partial revision of NRA Administrative Document Management Guidelines</p> <p>-Evaluation and future response to the report from Kansai Electric Power Co., Inc. on the damage to the steam generator tube of unit 3 at Takahama NPS</p> <p>-Hearing opinions on permission for change in reactor installation at Takahama NPS (Units 1, 2, 3 and 4) (Response to tsunamis for which no tsunami warning, etc. may be issued)</p> <p>-Consultation with the Radiation Council on the proposed revisions to the NRA's notification on the transport of radioactive materials</p>
10.21	<p>-Permission for change in installation of nuclear reactor for power generation (change of Units 1 and 2 power reactor facilities) at the Sendai NPS (installation of waste removal facilities)</p> <p>-Decision on the request for review of the summary of the results of the request for opinions on the review document for the permission for change in reactor installation at Onagawa NPS (Tohoku Electric Power Co.) (cases 1 and 2)</p>
10.28	<p>-Partial revision of the Guidelines for Nuclear Emergency Preparedness and Response and related regulations (revision of Emergency Action Levels (EAL)) (partially revised on October 29)</p> <p>-Partial revision of the regulations concerning technical standards for nuclear reactors used for testing and research pertaining to the power suppression characteristics of criticality experimental equipment</p>
11.11	<p>-Permission for change in spent fuel storage business at Recyclable-Fuel Storage Center of Recyclable-Fuel Storage Company</p>
11.18	<p>-Partial revisions to the relevant NRA rules, public notices, guidelines, and bylaws to incorporate the IAEA safety requirements for the transport of radioactive materials and to address the issues raised by the IRRS</p> <p>-The approval of design and construction method for modification of reactor facilities at the Nuclear Science Research Institute of the Japan Atomic Energy Agency [changes to the STACY facility (3rd application)]</p>
12.2	<p>-The NRA's comments on "FY2020 Comprehensive Nuclear Emergency Response Drill"</p> <p>-Enactment or revision of rules, etc. for the review of stamps and documents related to applications submitted to NRA</p>

	<ul style="list-style-type: none"> <li>-Permission for change in installation of nuclear reactor for power generation at Takahama NPS (change of reactor facilities for power generation Units 1, 2, 3 and 4) (Countermeasures for Tsunamis that may not be accompanied by Tsunami Warnings)</li> <li>-Hearing opinions concerning permission for change in installation of reactor for power generation at Mihama NPS (change of nuclear reactor facilities for power generation Unit 3) (Toxic gas prevention backfits for Special Facility for Severe Accident Management)</li> <li>-Hearing of opinions on permission for change in installation of nuclear reactors for power generation at Ohi NPS (Change of Units 3 and 4 power reactor facilities) (Toxic gas prevention backfits for Special Facility for Severe Accident Management)</li> </ul>
12.9	<ul style="list-style-type: none"> <li>-Partial revision of regulations on the establishment, operation, etc. of nuclear reactors used for research and development with regard to the review of approval criteria for decommissioning plan</li> <li>-The application for change in nuclear fuel material fabrication business at MOX fuel fabrication facility (Japan Nuclear Fuel Ltd.)</li> </ul>
12.23	<ul style="list-style-type: none"> <li>-Permission for change in installation of nuclear reactors for power generation at Mihama NPS (Change of Unit 3 power reactor facilities) (Toxic gas prevention backfits for Special Facility for Severe Accident Management)</li> <li>-Permission for change in installation of nuclear reactors for power generation at Ohi NPS (Change of Units 3 and 4 power reactor facilities) (Toxic gas prevention backfits for Special Facility for Severe Accident Management)</li> </ul>
1.20	-Approval of the decommissioning plan of the fabrication business at the JAEA's Ningyo-toge Environmental Engineering Center
1.26	-Decision on objection to disposition of permission for nuclear fuel material fabrication business at MOX fuel fabrication facility (Japan Nuclear Fuel Ltd.)
2.3	-Results of requesting public comments on draft of amendment to the notification of the NRA concerning calculation of effective doses at the site boundary for handling radioisotopes at TEPCO's Fukushima Daiichi NPS and consultation to the Radiation Council
2.10	-Revision and enactment of rule for partially revising the Rules for the Use, etc. of International Controlled Material
2.17	-Hearing of opinions, etc., on permission for change in reactor installation (change of criticality experiment equipment) at the Institute of Nuclear Science, Kyoto University (partially modified on March 3)
3.10	<ul style="list-style-type: none"> <li>-“NRA’s initiatives” (reported on March 11)</li> <li>-Concept of regulations concerning clearance and burial of uranium waste</li> </ul>
3.17	<ul style="list-style-type: none"> <li>-Partial revision of NRA’s Organization Rule</li> <li>-Hearing opinions concerning permission for change in installation of reactor for power generation at the Genkai NPS (change of nuclear reactor facilities for power generation Units 3 and 4) (dry cask)</li> <li>-Hearing opinions concerning permission for change in installation of reactor for power generation at Mihama NPS (change of nuclear reactor facilities for power generation Unit 3) (Response to the revision of the eruption scale of the Daisen-Namatake Tephra of Daisen Volcano)</li> <li>-Hearing opinions on permission for change in reactor installation at Takahama NPS (change of reactor facilities for power generation Units 1, 2, 3 and 4) (Response to the revision of the eruption scale of the Daisen-Namatake Tephra of Daisen Volcano)</li> <li>-Hearing opinions on permission for change in reactor installation at Ohi NPS (change of reactor facilities for power generation Units 3 and 4) (Response to the revision of the eruption scale of the Daisen-Namatake Tephra of Daisen Volcano)</li> <li>-Approval of the decommissioning plan of the JMTR reactor facility (Material testing reactor) in Oarai Research Establishment (North area) of Japan Atomic Energy Agency</li> <li>-Approval related to decommissioning plan for TCA (light-water critical experiment equipment) facilities at Nuclear Science Research Institute of Japan Atomic Energy Agency</li> </ul>
3.24	<ul style="list-style-type: none"> <li>-FY2021 NRA Priority Plan</li> <li>-Policy evaluation implementation plan and policy evaluation results of NRA for FY2021, and the status of their reflection in the policy (published in FY2020)</li> </ul>
3.25	-Decision on the request for review and the petition for stay of execution concerning the permission for change in installation of nuclear reactors for power generation at the Genkai NPS of Kyushu Electric Power Co.
3.31	-Giving an opportunity for justification to TEPCO

## **10. View on the relationship between review of approval for operation period extension and aging deterioration of nuclear power plants during long shutdowns**

July 29, 2020

NRA

On July 22, 2020, NRA received a report from the Secretariat of the NRA on the "Results of working-level technical discussions with ATENA on aging management". This exchange of opinions was triggered by a suggestion from the operator that a certain period of time should be excluded from the operation period in the review of the approval for the extension of the operation period, because the degradation of safety-important facilities during the shutdown period is not considered to be a technical problem. NRA has been stating for some time that it is not in a position to express its opinion on the nature of the operation period, but on the occasion of receiving the report on the above-mentioned technical opinion exchange meeting, NRA would like to take this opportunity to explain our view again.

1. The role of NRA with regard to nuclear facilities for power generation is limited to setting standards from a scientific and technical perspective, examining individual facilities to determine whether they conform to those standards, and monitoring them through inspections. Planning, drafting, and implementation of policies concerning the justification of the use of nuclear facilities for power generation and other matters related to the use of nuclear facilities fall under the function of promoting the use of nuclear energy, and are not matters that NRA should be involved in.
2. Article 43-3-32 of the Nuclear Reactor Regulation Law stipulates that the period during which reactors for power generation may be operated is 40 years from the start of operation (the date on which the first pre-service inspection is passed), and that the period may be extended only once with the approval of NRA upon expiration of the period.
3. The role of NRA in this system is to evaluate, from a scientific and technical perspective, whether or not the facilities of a nuclear reactor, etc., comply with the standards specified in the technical regulations, taking into account the deterioration of the reactor, etc., during the extended period of time after a certain period of time has elapsed from the start of operation. From the standpoint of NRA, the provision of 40 years for the operation period is meant to specify the timing for such evaluation (after a certain period of time from the start of operation).
4. In the review of the approval for the extension of operation period, it is important to collect and organize the knowledge on the progress of degradation of nuclear reactors, especially on the progress of degradation of hard-to-replace components. This discussion with ATENA summarized findings on whether or not the degradation of components and structures in power reactor facilities that are difficult to replace will progress during the long-term shutdown period for each event that may cause aging. As a result, the following was confirmed. First of all, events such as neutron irradiation embrittlement, low-cycle fatigue, cracking of the lower layer of the cladding, corrosion (FAC), fatigue cracking, reduction of concrete strength due

to heat and radiation, and reduction of concrete shielding capacity due to heat should not be considered as degradation factors because these hard-to-replace components and structures in the power reactor facilities are not in an environment where they are exposed to radiation, large temperature or pressure fluctuations, or high speed steam flow.

On the other hand, degradation of concrete structures such as neutralization, salt penetration, alkali-aggregate reaction, mechanical vibration, strength loss due to freezing and thawing, and wear of the reactor pressure vessel stabilizers, etc., will progress during the long-term shutdown period as well as during other periods. The progress of these degradation events can be controlled by appropriate storage and inspection at each plant by each operator. However, it is necessary for the regulatory authority to confirm the appropriateness of the storage measures and inspections conducted by the operator for each individual plant. Degradation events, which would make it impossible to take appropriate storage measures and repairs, were not observed during the long-term shutdown period.

The progress of these degradation events during the long-term shutdown period should be evaluated for each individual facility according to the type of equipment, etc., because the degradation of various components and structures that constitute the power reactor facility varies and also depends on the adequacy of storage and inspection conducted by each operator at each individual plant.

5. As described in 4, depending on the type of equipment and the factors of degradation, the degree of progress of degradation differs between the long-term shutdown period and the non-long-term shutdown period, and the operator's proposal to exclude a certain period from the operation period can be considered to have been made from this perspective. However, from the standpoint of NRA, the operating period means nothing more than that the end of the period is the time when the evaluation described in 3 in the above should be conducted, and in light of 4 in the above, it is difficult to reach a scientifically and technically unique conclusion on whether or not the operating period should include the long-term shutdown period, and it is not possible to quantitatively determine a specific period of time that can be excluded as not being degraded.

On the other hand, no matter how the timing is determined, the future progress of deterioration of power reactor facilities can be evaluated scientifically and technically for each individual facility, depending on the type of equipment.

6. Thus, the period of 40 years from the start of operation in the current system itself is not the only option for the time of evaluation in 3 in the above, but was established as a legislative policy for the operation period of power reactor facilities. The decision on how long to allow the use of nuclear facilities for power generation is a policy decision on how to use nuclear energy, and not a matter for NRA to express its opinion.

## 11. Opinion Exchange with Operators

### (1) Exchange of Opinions with Chief Executive Officers (CEOs) on Safety Improvements

Dates	Nuclear Operators
September 9, 2020	Kansai Electric Power Co., Inc.
November 18, 2020	Japan Nuclear Fuel Limited
December 2, 2020	Hokkaido Electric Power Co., Inc.
December 21, 2020	Tokyo Electric Power Company Holdings

### (2) Exchange of Opinions with Chief Nuclear Officers (CNOs) of Major Nuclear Facility Operators

Dates	Nuclear Operators	Main Issues of Discussions
July 10, 2020	Chubu Electric Power, TEPCO Holdings, Kansai Electric Power, Atomic Energy Association (ATENA)	-Results of working-level technical discussions with ATENA on aging management -Status of ATENA's response to key issues being addressed

### (3) Visits to Nuclear Power Stations by NRA Commissioners

	Dates	Purpose	Place of Visit (NPS, etc.)	Commissioner in Charge
1	September 10-11, 2020	On-site inspection	Tomari NPS, Hokkaido Electric Co., Inc.	Commissioner Ishiwatari
2	October 8, 2020	On-site inspection	Fukushima Daiichi NPS, TEPCO Holdings	Chairman Fuketa

## 12. Meetings and Opinion Exchange with Local Parties

### (1) Meetings with Local Parties

Dates	Meeting with	NRA representative
July 9, 2020	Governor of Saga Prefecture	Secretary-General
July 15, 2020	Governor of Shimane Prefecture	Secretary-General
July 21, 2020	Governor of Tottori Prefecture	Secretary-General
September 25, 2020	Governor of Ehime Prefecture	Secretary-General
November 16, 2020	Chairperson of the prefectural assembly related to nuclear power generation, and chairperson of the council	Secretary-General

### (2) Exchange of opinions with local stakeholders by committee members

Dates	Overview	Attendees	Attendance of Commissioners in charge
December 11, 2020	Opinion exchange with local parties concerned on regulatory issues relating to nuclear facilities	Kagoshima Prefecture Governor, Satsumasendai City Mayor, Ichikikushikino City Mayor, Akune City Mayor, Izumi City Mayor, Aira City Mayor, Nagashima Town Mayor, and others	Chairman Fuketa Commissioner Ishiwatari



### (3) Results of on-site exchange of opinions with local stakeholders by officials of the Nuclear Regulation Authority

Dates	Venue	Name of meeting/session	Main attendees
May 22, 2020	Aomori Prefecture	Explanation on the new inspection system	Aomori Prefectural Government staff
August 4-5, 2020	Aomori Prefecture	Overview of the examination of the JNFL Reprocessing Plant (prefectural governors, mayors, council chairpersons)	Prefectural governor, chairperson of the Prefectural Assembly□ Mayor of Rokkasho Village, chairperson of the Village Assembly
August 20, 2020	Aomori Prefecture	Opinion exchange with Kamikita Fire Department, Aomori Prefecture	Kamikita Fire Department Headquarters
September 9, 2020	Aomori Prefecture	Mutsu Ogawara Energy Measures Special Committee, Rokkasho Village Council	Members of the Rokkasho Village Assembly
September 18, 2020	Aomori Prefecture	Overview of the examination of the JNFL Reprocessing Plant (Aomori Prefecture Assembly)	Members of the Prefectural Assembly
October 7, 2020	Aomori Prefecture	Special Committee on Nuclear Power and Energy Measures, Aomori Prefectural Assembly	Members of the Prefectural Assembly
October 13-14, 2020 (Twice in total)	Aomori Prefecture	Opinion exchange meetings on nuclear power in Aomori Prefecture (Misawa City, Nakadomari Town)	Local residents
October 30, 2020	Aomori Prefecture	Opinion exchange with the prefecture regarding revisions of supplementary materials the Guideline for Nuclear Emergency Preparedness and Response	Aomori Prefecture's Nuclear Safety Division, Aomori Prefecture Nuclear Energy Center
November 2, 2020	Aomori Prefecture	Aomori Prefecture Nuclear Policy Committee	Group representatives, experts, local residents and others
November 19, 2020	Aomori Prefecture	Nuclear Safety Management Committee, Rokkasho Village	Group representatives, experts, local residents and others
November 25, 2020	Aomori Prefecture	Briefing on the next radiation monitoring	Aomori Prefecture's Nuclear Safety Division, Aomori Prefecture Nuclear Energy Center
May 13, 2020 - February 19, 2021 (4 times in total)	Aomori Prefecture	Explanation and opinion exchange regarding the nuclear regulation inspection	Aomori Prefectural Press Association, prefectural government, Higashidori Village, Rokkasho Village
July 20, 2020 – March 23, 2021 (4 times in total)	Miyagi Prefecture	Meeting of Nuclear Emergency Preparedness WG	Local governments, operators
August 1, 2020	Miyagi Prefecture	Briefing for local residents	Local governments, operators, residents
August 5, 2020 - February 9, 2021 (3 times in total)	Miyagi Prefecture	Environmental Research and Measurement Technology Group for Onagawa NPS	Local governments, operators
August 26, 2020, February 19, 2021 (2 times in total)	Miyagi Prefecture	Environmental Conservation Monitoring Council for Onagawa NPS	Local governments, operators
November 2, 2020	Miyagi Prefecture	Meeting of UPZ-related governors and mayors	Local governments, operators
November 18, 2020	Miyagi Prefecture	Opinion exchange with Fire Prevention Office, Ishinomaki Fire Department Headquarters	Organization of actual operation
June 10, 2020 - February 16, 2021 (4 times in total)	Fukushima Prefecture	Fukushima Prefecture Environmental Monitoring Evaluation Subcommittee	Local governments, experts
June 17, 2020 - February 16, 2021 (3 times in total)	Fukushima Prefecture	Fukushima Prefecture Labor Safety and Health Subcommittee	Local governments, experts

July 14, 2020 – March 8, 2021 (3 times in total)	Fukushima Prefecture	Fukushima Prefecture Decommissioning Safety Monitoring Council	Local governments, experts
July 28, 2020, March 9, 2021 (2 times in total)	Fukushima Prefecture	Prefectural Council for Ensuring the Safety of Reactor Decommissioning	Residents, representatives of organizations
January 15 and February 26, 2021 (2 times in total)	Fukushima Prefecture	Naraha Nuclear Facility Monitoring Committee	Experts
June 3, 2020 - March 3, 2021 (10 times in total)	Niigata Prefecture	Regional Panel for Ensuring Transparency of Kashiwazaki-Kariwa NPS	Experts, local governments, operators
April 20, 2020 - February 3, 2021 (5 times in total)	Niigata Prefecture	Municipal Study Group on Nuclear Safety Measures	Experts, local governments, operators
May 21, 2020 - February 15, 2021 (5 times in total)	Niigata Prefecture	Liaison meeting on technology for the environmental radiation monitoring of the NPP surrounding area in Niigata Prefecture	Local governments, operators
July 21, 2020 - March 25, 2021 (5 times in total)	Niigata Prefecture	Working group of Kashiwazaki Kariwa Region nuclear disaster prevention council	Local governments, concerned institutions, and operators
August 21, 2020	Niigata Prefecture	Summer school on nuclear emergency preparedness	Governors, mayors, local governments, operators
August 25, 2020, March 29, 2021	Niigata Prefecture	Regular meeting for monitoring and assessing the environment of the NPP surrounding area in Niigata Prefecture	Governors, mayors, local governments, academic experts, concerned organizations and operators
August 4, October 20, and October 24, 2020	Niigata Prefecture	Niigata Prefecture's nuclear emergency drill (field training)	Governors, mayors, local governments, concerned institutions, and operators
June 30, 2020	Niigata Prefecture	Practical training of Environmental Research Headquarters	Local governments, operators
September 29 and 30, 2020	Niigata Prefecture	Activity drill of Emergency Monitoring Center	Local governments
September 25, 2020	Niigata Prefecture	Kashiwazaki City disaster prevention conference	Heads of local governments, experts
February 12, 2021	Niigata Prefecture	Briefing for local residents in Kashiwazaki City	Local residents
February 12, 2021	Niigata Prefecture	Plenary meeting, Kashiwazaki City Council	Governors, mayors, members of municipal assemblies
March 26, 2021	Niigata Prefecture	Special Committee, Kariwa Village Assembly	Village council members
July 13 and August 11, 2020	Niigata Prefecture	Evacuation Verification Committee, Niigata Prefecture	Experts
December 25, 2020, February 12, 2021 (2 times in total)	Niigata Prefecture	Technology Verification Committee, Niigata Prefecture	Experts
January 22, 2021	Niigata Prefecture	Comprehensive Verification Committee, Niigata Prefecture	Experts
March 19, 2021	Niigata Prefecture	Fire Prevention Liaison Committee	Local governments, public fire department, operators
March 2, 2021	Niigata Prefecture	Lecture at the Kashiwazaki Energy Forum	Kashiwazaki Chamber of Commerce and Industry
December 21, 2020	Niigata Prefecture	Lecture at Nagaoka University of Science and Technology	Professors, students
February 16, 2021	Niigata Prefecture	Requests by citizens' groups	Association of Kashiwazaki-Kariwa for not allowing the restart of NPS
March 8, 2021	Niigata Prefecture	Requests by citizens' groups	Niigata Women's Group for Life and Nuclear Power

August 17, 2020	Niigata Prefecture	Explanation regarding the nuclear regulation inspection	Local governments
June 30, 2020	Ibaraki Prefecture	Meeting on environmental radiation monitoring plan	Prefectural government
July 17 and October 22, 2020 (2 times in total)	Ibaraki Prefecture	Advisory committee for the Ibaraki Prefecture Environmental Radiation Monitoring Committee	Prefectural government, related municipalities and residents
August 20, 2020 - February 16, 2021 (3 times in total)	Ibaraki Prefecture	Reporting of operational safety inspection results and opinion exchange	Prefectural government, related municipalities
November 19, 2020	Kawasaki City	Kawasaki Nuclear Facility Safety Committee (Secretariat meeting)	Three entities (Toshiba ESS, Tokyo City University and Hitachi Ltd. Ozenji Center), local governments (crisis management office, ward officials, health bureau, waterworks bureau, hospital bureau, fire department, and crisis management officials) and regulatory office
December 24, 2020	Kawasaki City	Kawasaki Nuclear Facility Safety Committee (plenary meeting)	Three business operators, local governments (vice city mayor, ward officials, hospital bureau, fire department, health and welfare bureau, environment bureau, and crisis management officials) and regulatory office
June 19, 2020	Shizuoka Prefecture	Omaezaki City Special Committee on Nuclear Countermeasures	Members of municipal assemblies, etc.
July 30, 2020 - March 26, 2021 (4 times in total)	Ishikawa Prefecture	Ishikawa Prefecture Nuclear Environmental Safety Control Council	Deputy governor of Ishikawa Prefecture, chairperson, experts, relevant local governments, etc.
October 12, 2020, January 27, 2021 (Twice in total)	Ishikawa Prefecture	Shika Nuclear Power Station Safety Promotion Committee	Mayor of Shika Town, chairpersons, representatives of residents
October 12, 2020, January 27, 2021 (Twice in total)	Ishikawa Prefecture	Joint Meeting of Akasumi Area Committee and Safety Promotion Liaison Committee	Mayor of Shika Town, chairpersons of wards, representatives of residents
May 13, 2020 - January 10, 2021 (4 times in total)	Ishikawa Prefecture	Explanatory meeting on operational safety inspection results	Ishikawa Prefectural Government staff
May 13, 2020 - January 10, 2021 (4 times in total)	Ishikawa Prefecture	Explanatory meeting on operational safety inspection results	Shika Town Office staff
May 13, 2020 - February 10, 2021 (4 times in total)	Fukui Prefecture	Fukui Prefecture NPP liaison meeting	Local governments
June 19, 2020	Fukui Prefecture	Explanation on review of Tsuruga NPS Unit 2	Staff of Tsuruga City Government
June 23, 2020	Fukui Prefecture	Meeting with Tsuruga City councilors and the group "Don't Start Old Nuclear Power Plants! Large Rally in Osaka"	City council and civic organizations
August 7-20, 2020	Fukui Prefecture	Appearance on Ohi Town CATV (introduction of the new inspection system, etc.)	Local residents
July 21, 2020 - March 24, 2021 (4 times in total)	Fukui Prefecture	Fukui Prefecture Nuclear Environmental Safety Control Council	Members of the Prefectural Assembly, heads of local governments, representatives of organizations
August 17, 2020	Fukui Prefecture	Mihama Town Nuclear Environment and Safety Monitoring Committee	Town council members, district representatives, organization representatives, experts, etc.

August 22 - September 11, 2020	Fukui Prefecture	Appearance on Mihama CATV (introduction of the review results of Mihama NPS Unit 3)	Local residents
September 24, 2020	Fukui Prefecture	Takahama Town Assembly, Special Committee on Nuclear Energy	Town council members
October 7, 2020, March 30, 2021 (Twice in total)	Fukui Prefecture	Obama Nuclear Power Station Environmental Safety Council	Mayor, city council members, representatives of organizations
October 12, 2020	Fukui Prefecture	Explanation of the review results of Mihama NPS Unit 3	Mihama Town Mayor, Deputy mayor, etc.
October 20 - November 2, 2020	Fukui Prefecture	Appearance on Takahama CATV (introduction of the review results of Takahama NPS Units 1 and 2, etc.)	Local residents
October 27, 2020 - March 4, 2021 (3 times in total)	Fukui Prefecture	Nuclear Safety Expert Council	Experts
October 31, 2020	Fukui Prefecture	Briefing for local residents in Mihama Town	Local residents
November 12, 2020	Fukui Prefecture	Mihama Town Assembly Special Committee on Nuclear Power Plants	Town council members
November 13-19, 2020	Fukui Prefecture	Appearance on Wakasa Town CATV	Local residents
November 19 and December 8, 2020 (twice in total)	Fukui Prefecture	Mihama Town Council plenary meeting	Town council members
December 16 and 17, 2020 (5 times in total)	Fukui Prefecture	Explanation of base earthquake motion to local government leaders, etc.	Heads of local governments, etc.
February 9 and March 21, 2021 (twice in total)	Fukui Prefecture	Briefing for local residents	Local residents
February 12, 2021	Fukui Prefecture	Liaison Council of Special Committee in Fukui Prefecture Nuclear Power Plant Location Assembly	Local council members
November 26, 2020	Gifu Prefecture	Nuclear Expert Subcommittee of the Disaster Prevention Council	Experts, heads of local governments, representatives of organizations
November 30, 2020	Gifu Prefecture	Ibigawa Town Council	Town council
December 5, 2020	Gifu Prefecture	Explanation for local residents in Ibigawa Town	Local residents
August 24, 2020, January 25, 2021 (Twice in total)	Shiga Prefecture	Nuclear Safety Measures Liaison Council	Local governments, experts, etc.
December 19, 2020	Shiga Prefecture	Explanation for local residents in Takashima City	Local residents
December 20, 2020	Shiga Prefecture	Explanation for local residents in Nagahama City	Local residents
November 22, 2020 - March 14, 2021 (3 times in total)	Kyoto Prefecture	Regional Council for Takahama NPS	Local governments, experts, etc.
December 6, 2020	Kyoto Prefecture	Explanation for local residents in Maizuru City	Local residents
December 12, 2020	Kyoto Prefecture	Joint explanation for local residents	Local residents
May 18, 2020 - February 17, 2021 (9 times in total)	Okayama Prefecture	Explanation regarding the nuclear regulation inspection results (TV conference)	Okayama Prefectural Government staff, Tottori Prefectural Government staff, Kagamino Town Office staff, Misasa Town Office staff, operators
August 26, 2020	Okayama Prefecture	Explanation regarding the nuclear regulation inspection guide (TV conference)	Okayama Prefectural Government staff, Kagamino Town Office staff, operators

April 21 and December 17, 2020 (twice in total)	Okayama Prefecture	Opinion exchange on fire protection	Tsuyama Area Firefighting Union staff, operators
May 13, August 19 and 20, and November 11, 2020 and February 10, 2021 (5 times in total)	Shimane Prefecture	Explanation on the Operational Safety Inspection results	Local government staff (Shimane Prefecture, Matsue City, Unnan City, Yasugi City, Tottori Prefecture, Sakaiminato City, Yonago City)
May 25, 2020, February 18, 2021 (Twice in total)	Shimane Prefecture	Matsue City's Shimane Special Committee meeting on NPP-related measures	Matsue City Council members
June 22, 2020	Shimane Prefecture	Explanation the new regulation inspection system	Tottori Prefectural Government staff
June 29 and December 16, 2020 February 19, 2021 (3 times in total)	Shimane Prefecture	Matsue City Council meeting for NPP-related environmental safety measures	Matsue City Commissioner
February 15, 2021	Shimane Prefecture	Shimane Prefecture Council meeting for NPP-related environmental safety measures	Shimane Prefecture Commissioners
March 29, 2021	Ehime Prefecture	Ikata Nuclear Power Station Environment and Safety Management Committee, Environmental Safety Subcommittee	Experts
June 4, July 16, September 8, October 16, November 13, November 25, 2020 (6 times in total)	Ehime Prefecture	Expert Subcommittee on Nuclear Energy Safety, Ikata Nuclear Power Station Environment and Safety Management Committee	Experts
July 29 and December 17, 2020, March 29, 2021 (3 times in total)	Ehime Prefecture	Ikata Nuclear Power Station Environmental Safety Control Committee	Heads of local governments, local governments, experts
July 21 and December 4, 2020 (twice in total)	Ehime Prefecture	Ikata Environmental Monitoring Committee	Heads of local governments, City council members, representatives of residents
December 3, 2020	Ehime Prefecture	(Ikata Town) Special committee meeting on NPP-related measures	Town council members
December 4, 2020	Ehime Prefecture	(Yawatahama City) Explanation on the establishment of a dry storage facility for spent fuel and decommissioning of Unit 2 of Ikata NPS	Members of municipal assemblies, experts, etc.
August 5, 2020, January 19, 2021 (Twice in total)	Saga Prefecture	Saga Prefecture Nuclear Environmental Safety Liaison Committee	Heads of local governments, representatives of residents
May 27, 2020 - February 2, 2021 (4 times in total)	Saga Prefecture	Saga Environment Radioactivity Technology meeting	Experts, etc.
March 25, 2021	Saga Prefecture	Karatsu City disaster prevention conference	Heads of local governments, Designated Public Agency Officers, etc.
July 1, 2020 - March 26, 2021 (4 times in total, including paper distribution)	Kagoshima Prefecture	Kagoshima Radiation Monitoring Technology Committee meeting	Local governments, operators, experts, etc.
July 22 and December 21, 2020 (Twice in total, including paper distribution)	Kagoshima Prefecture	Kagoshima Prefecture Ocean Monitoring Technology Committee meeting	Local governments, operators, experts, etc.

May 29, 2020 - February 22, 2021 (4 times in total, including paper distribution)	Kagoshima Prefecture	Satsuma Sendai City Nuclear Safety Measures Liaison Council	Heads of local governments, Members of Municipal Assemblies, representatives of residents
August 12, 2020, January 28, 2021 (Twice in total)	Kagoshima Prefecture	Nuclear Safety Measures Liaison Council	Heads of local governments, assembly members, operators, etc.
December 11, 2020	Kagoshima Prefecture	Exchange of opinions on Sendai NPS with local officials and operators	NRA Chairperson, members, head of concerned local governments, chairpersons, operators
March 30, 2021	Kagoshima Prefecture	Kagoshima Prefecture Disaster Prevention Expert Committee for Nuclear Safety and Evacuation Planning	Experts, governor, local governments, operators, etc.
*In addition to those stated in the table, meetings of working groups of local nuclear preparedness councils and committees on radiation oversight or monitoring are occasionally held in related prefectures, and the personnel of the NRA Secretariat attend.			

#### (4) Major explanations on results of review of nuclear facilities

Dates	Venue	Name of meeting/session	Contents
August 4, 2020	Aomori Prefecture	Explanation to Aomori Prefectural governor and chairperson of the Prefectural Assembly	Rokkasho Reprocessing Facility (permission of license modification)
August 5, 2020	Aomori Prefecture	Explanation to Rokkasho Village mayor and chairperson of Village Assembly	Rokkasho Reprocessing Facility (permission of license modification)
September 9, 2020	Aomori Prefecture	Rokkasho Village Special Committee	Rokkasho Reprocessing Facility (permission of license modification)
September 18, 2020	Aomori Prefecture	Explanation to members of the Prefectural Assembly	Rokkasho Reprocessing Facility (permission of license modification)
November 2, 2020	Aomori Prefecture	Nuclear Policy Committee	Rokkasho Reprocessing Facility (permission of license modification)
November 23, 2020	Aomori Prefecture	Nuclear Safety Management Committee, Rokkasho Village	Nuclear Safety Management Committee, Rokkasho Village
August 1, 2020	Miyagi Prefecture	Explanation to local residents in Onagawa Town	Unit 2, Onagawa NPS (permission of installation change)
August 3, 2020	Miyagi Prefecture	Explanation to Ishinomaki City Assembly	Unit 2, Onagawa NPS (permission of installation change)
September 24, 2020	Miyagi Prefecture	Explanation to Entire-member Council of the Miyagi Prefectural Assembly	Unit 2, Onagawa NPS (permission of installation change)
November 2, 2020	Niigata Prefecture	Regional Panel for Ensuring Transparency of Kashiwazaki-Kariwa NPS	Units 6 and 7 of Kashiwazaki-Kariwa NPS (conformity to New Regulatory Requirements)
February 12, 2021	Niigata Prefecture	Explanation to Kashiwazaki City Assembly and explanation to local residents in Kashiwazaki Kariwa Village	Units 6 and 7 of Kashiwazaki-Kariwa NPS (conformity to New Regulatory Requirements) and others
March 26, 2021	Niigata Prefecture	Special Committee, Kashiwazaki-Kariwa Village Assembly	Units 6 and 7 of Kashiwazaki-Kariwa NPS (conformity to New Regulatory Requirements) and others

June 18, 2020	Ibaraki Prefecture	Union Review Board of Ibaraki Prefectural Assembly	Tokai Daini NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
August 17, 2020	Fukui Prefecture	Mihama Town Nuclear Environment and Safety Monitoring Committee	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
August 22 - September 11, 2020	Fukui Prefecture	Mihama Town CATV Broadcast	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
September 24, 2020	Fukui Prefecture	Takahama Town Assembly, Special Committee on Nuclear Energy	Units 1/2 of Takahama NPS (approval of extension of the operation period)
October 12, 2020	Fukui Prefecture	Explanation to Mihama Town mayor and Deputy mayor	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
October 20 - November 2, 2020	Fukui Prefecture	Takahama Town CATV Broadcast	Units 1/2 of Takahama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
October 31, 2020	Fukui Prefecture	Briefing for local residents in Mihama Town	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
November 12, 2020	Fukui Prefecture	Mihama Town Assembly, Special Investigation Committee on Nuclear Energy Issues	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
November 13-19, 2020	Fukui Prefecture	Wakasa Town CATV Broadcast	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
November 19, 2020	Fukui Prefecture	Mihama Town Council plenary meeting	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
December 8, 2020	Fukui Prefecture	Mihama Town Council plenary meeting	Design basis ground motion
December 8, 2020	Fukui Prefecture	Explanation to Ohi Town mayor	Design basis ground motion
December 11, 2020	Fukui Prefecture	Explanation to Mihama Town mayor and Deputy mayor	Design basis ground motion
December 16-17, 2020	Fukui Prefecture	Explanation to local government leaders, etc.	Design basis ground motion
January 15, 2021	Fukui Prefecture	Fukui Prefecture Nuclear Environmental Safety Control Council	Design basis ground motion, Mihama NPS Unit 3 and Takahama NPS Units 1/2 (approval of extension of operation period), Takahama NPS Units 1-4 (permission for change of installation: response to a tsunami that may not be announced as a tsunami warning, etc.)
January 22, 2021	Fukui Prefecture	Nuclear Safety Expert Council	Takahama NPS Units 1-4 (permission for change of installation: response to a tsunami that may not be announced as a tsunami warning, etc.)
February 9, 2021	Fukui Prefecture	Explanation to local residents in Fukui	Design basis ground motion, Mihama NPS Unit 3 and Takahama NPS Units 1/2 (conformity to New Regulatory Requirements, approval of extension of operation period)

March 4, 2021	Fukui Prefecture	Nuclear Safety Expert Council	Design basis ground motion, Takahama NPS Units 1/2 (Approval of operational safety program change)
March 21, 2021	Fukui Prefecture	Explanation to local residents in Fukui	Design basis ground motion, Mihama NPS Unit 3 and Takahama NPS Units 1/2 (conformity to New Regulatory Requirements, approval of extension of operation period)
March 24, 2021	Fukui Prefecture	Fukui Prefecture Nuclear Environmental Safety Control Council	Design basis ground motion, Takahama NPS Units 1/2 (Approval of operational safety program change)
March 30, 2021	Fukui Prefecture	Obama Nuclear Power Station Environmental Safety Council	Design basis ground motion
November 26, 2020	Gifu Prefecture	Nuclear Expert Subcommittee of the Disaster Prevention Council	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
November 30, 2020	Gifu Prefecture	Ibigawa Town Council	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
December 5, 2020	Gifu Prefecture	Explanation for local residents in Ibigawa Town	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
August 24, 2020	Shiga Prefecture	Nuclear Safety Measures Liaison Council	Mihama NPS Unit 3 and Takahama NPS Units 1/2 (conformity to New Regulatory Requirements, approval of extension of operation period)
December 19, 2020	Shiga Prefecture	Explanation for local residents in Takashima City	Mihama NPS Unit 3 and Takahama NPS Units 1/2 (conformity to New Regulatory Requirements, approval of extension of operation period)
December 20, 2020	Shiga Prefecture	Explanation for local residents in Nagahama City	Unit 3 of Mihama NPS (conformity to New Regulatory Requirements, approval of extension of the operation period)
November 22 and 27, 2020 and March 14, 2021	Kyoto Prefecture	Takahama Regional Council (3 times in total)	Units 1/2 of Takahama NPS (approval of extension of the operation period)
December 6, 2020	Kyoto Prefecture	Explanation for local residents in Maizuru City	Units 1/2 of Takahama NPS (approval of extension of the operation period)
December 12, 2020	Kyoto Prefecture	Joint explanation for local residents	Units 1/2 of Takahama NPS (approval of extension of the operation period)
November 13, 2020	Ehime Prefecture	Nuclear Expert Subcommittee	Ikata NPS Unit 3 (permission for change of installation, establishment of dry storage facilities for spent fuel) and Unit 2 (approval of decommissioning plan)
December 3, 2020	Ehime Prefecture	Ikata Town Assembly, Special Committee	Ikata NPS Unit 3 (permission for change of installation, establishment of dry storage facilities for spent fuel) and Unit 2 (approval of decommissioning plan)
December 3-4, 2020	Ehime Prefecture	Explanation for local residents in Yawatahama City	Ikata NPS Unit 3 (permission for change of installation, establishment of dry storage facilities for spent fuel) and Unit 2 (approval of decommissioning plan)



December 4, 2020	Ehime Prefecture	Ikata Environmental Monitoring Committee	Ikata NPS Unit 3 (permission for change of installation, establishment of dry storage facilities for spent fuel) and Unit 2 (approval of decommissioning plan)
January 8, 2021	Kagoshima Prefecture	Nuclear Expert Council	Sendai NPS Units 1/2 (permission for change of installation, waste removal facility)

### 13. Record of Opinion Exchange with Foreign Experts, etc.

#### (1) Opinion Exchange with Foreign Experts

Dates	Attendees	Attendance of Commissioners
November 25, 2020	Richard A. Meserve, External Advisor Dana Drábová, External Advisor Andy Hall, External Advisor Philippe Jamet, External Advisor	Chairman Fuketa Commissioner Tanaka Commissioner Yamanaka Commissioner Ban Commissioner Ishiwatari

#### (2) Opinion Exchange with Foreign Regulatory Authorities

Dates	Participant	Attendance of Commissioners in charge
September 22, 2020	International Nuclear Regulators Association (INRA) (nuclear regulators from the United States, United Kingdom, France, Germany, Canada, Spain, Sweden, and South Korea)	Chairman Fuketa
November 27, 2020	Rumina Velshi, President of Canadian Nuclear Safety Commission (CNSC)	Chairman Fuketa

### 14. Results of FY2020 Internal Audit Conducted in Accordance with the NRA Management Rules and the Status of Improvement

In FY2020, internal audits were conducted for the following four departments. There were no items requiring improvement or items that should be improved, and three good examples were extracted.

A summary of each internal audit is as follows. Efforts are being made to improve operational efficiency, such as sharing knowledge information and managing progress status, and to develop and maintain a nuclear safety culture by, for example, holding study sessions on nuclear safety culture. Thus the management system can be evaluated as generally functioning effectively.

#### 1. Kumatori NRA Regional office

- (1) Date of audit: August 24 and 25, 2020
- (2) Result of audit: Items requiring improvement and items desirable for improvement: 0; good practice: 1
- (3) Description of good practices: Deployment of technical materials prepared by the director within the office and to businesses  
At the Kumatori office, in addition to the collection of good practices of NRC obtained from the main office, the director of the Kumatori office prepared "Technical Document for Examples and Reference", which is a collection of basic technical information for inspections, and stored it in a shared folder in the office. Informing the staff of the updated information each time is helpful when conducting site inspections.  
In addition, the said materials prepared by the director shall be distributed in response to requests from businesses and have been used as educational materials.
- (4) Others (Items confirmed as special notes (4 items))
  - (a) In line with the full-scale operation of the new inspection system, the inspectors carefully read the inspection guide, which had been prepared on the basis of commercial reactors, and steadily carried out nuclear regulatory inspections by inspecting facilities by replacing the terms and equipment names in the inspection guide as necessary.
  - (b) In light of the fact that operators had been experiencing problems before the new inspection system was launched, discussions were held as part of the safety

investigation with operators on the progress of nonconformity treatment (investigation of causes, details of corrective measures, etc.), which helped improve the relationship of mutual trust between the operators and the inspectors and to deepen information sharing.

- (c) In the implementation of team inspections by the specialized inspection division, there is a need for sufficient information sharing between the office and within the specialized inspection division in advance, based on the opinion that there is uncertainty as to whether the implementation methods and contents are consistent with those of the main office.
- (d) In the Kumatori Office, where all staff members are over 60 years old, it is a challenge to devise a way to pass on the knowledge specific to the facilities, given that many of the facilities under the office's jurisdiction are so-called one-of-a-kind items, such as processing facilities and test and research furnace facilities.

## 2. Division of Research for Nuclear Fuel Cycle and Radioactive Waste

- (1) Date of audit: September 3, 2020
- (2) Result of audit: Items requiring improvement and items desirable for improvement: 0; good practice: 1
- (3) Description of good practices: Holding study sessions with technical support organizations

As the application for the review of the waste disposal facility occurred for the first time in about 20 years and the conformity assessment is in progress, it was confirmed that the study meeting between JAEA, the technical support organization (TSO), and the waste disposal team staff has been held eight times in the last two to three months during this audit using the application documents and other information.

The purpose of this study session was to recognize what kind of safety research is necessary for the review and to enable the limited human resources to generate the necessary research results. It was confirmed that the young staff members of the waste disposal team were able to grasp and realize what kind of research is necessary for the review.

- (4) Others (Items confirmed as special notes (3 items))
  - (a) While it is assumed that it is difficult for NRA to sufficiently indicate the needs in some research fields, the divisions of the Technology Foundation Group and the Technology Foundation Section, which is the coordinating section, need to consider the research topics to be addressed in the future, including medium- and long-term issues.
  - (b) With regard to human resources for research positions in the field of waste disposal, which has a wide range of research targets and is highly specialized, it is needed to continue to conduct necessary research by utilizing transferred workers, etc., and to continue activities to secure necessary human resources by conducting recruitment activities in cooperation with the Personnel Division, for example by visiting universities, etc.
  - (c) The joint research with JAEA and universities, which started in the last fiscal year, has produced results such as the improvement of the technical skills of the staff, including the acquisition of knowledge that cannot be obtained only through desk studies, in addition to the effects of the staff's voluntary research efforts and the improvement of their awareness of the need to obtain degrees.

## 3. Division of Licensing for Research Reactors, Use of Nuclear Material

- (1) Date of audit: November 26 and 27, 2020
- (2) Result of audit: Items requiring improvement and items desirable for improvement: 0; good practice: 1
- (3) Description of good practices: Conducting study sessions to develop and maintain a safety culture

The above-mentioned study session was held at Research Reactor Review Division on September 30, 2020.

During the discussion, the following comments were made: "I was reminded that detailed management of the progress of audits and sharing of the list of comments made during the approval process of audit reports lead to measures to prevent the occurrence of nonconformities and to improve the quality of audit reports, which in turn leads to activities to develop and maintain a safety culture."

The discussion of the issues closely related to the current audit work (i.e., measures to prevent the occurrence of recent nonconformity incidents) is considered to be an advanced activity for the development and maintenance of safety culture.

- (4) Others (Items confirmed as special notes (3 items))
  - (a) Necessary corrective actions are taken on an ongoing basis for items requiring improvement, such as document management, that have been reported so far.
  - (b) Documents that show the progress of the review cases are prepared and managed at the in-division meetings to improve the work and increase efficiency. In addition, prior to the start of the review, the use team conducts a preliminary review of the issues of the review, and proceeds with the review with a common understanding within the team.
  - (c) With the implementation of the new inspection system, notifications of quality control have been received from a large number of business operators (about 200 users of nuclear fuel materials) before the deadline, through explanatory meetings and following-up with individual business operators.

#### 4. Genkai NRA Regional Office

- (1) Date of audit: December 8 and 9, 2020
- (2) Result of audit: Items requiring improvement, items desirable for improvement, and good practice: 0
- (3) Others (Items confirmed as special notes (5 items))
  - (a) Since the Director has experience in the examination of the new regulatory standards in his/her previous job, he/she shares information with the inspectors about the newly installed equipment, including not only the meaning of the numerical values of the equipment in the design, but also the background and history of the installation of the equipment, which he learned during the examination, so that the knowledge is shared and utilized in the inspection.
  - (b) The number of samples, etc. in the basic inspection operation guide for nuclear regulatory inspections has been instructed by the Agency to be used only as a reference value. However, there is a tendency for inspectors to think that they are required to meet the number of samples, etc. Therefore, NRA will devise ways to convey to local inspectors that NRA aims to conduct inspections of quality rather than quantity.
  - (c) Due to the increase in the inspection period caused by the new inspection system, nuclear regulatory inspections are often conducted by one person. It is desirable for NRA to examine and, if necessary, devise ways to prevent the loss of good practices, such as multiple inspectors conducting inspections from multiple angles and consulting on matters of concern, which were carried out in the previous operational safety inspections.
  - (d) With the completion of the Special Facility for Severe Accident Management, the scale of the operator's facility is expected to increase and the number of monitoring activities is expected to increase, and some people are concerned about what kind of inspections should be conducted. It would be desirable for NRA to provide instructions to the office on the points of inspection and on conducting inspection activities by paying close attention to facilities and equipment of high safety importance.
  - (e) Although the full harness type safety belts were provided around last summer, they cannot be used because the training required by the Personnel Authority Rules has not been implemented. The Personnel Section and the Nuclear Safety Human Resources Development Center will provide training so that inspectors can use them as soon as possible, and will manage the participants.

### 15. Record of responses to formal objections in FY2020

	Formal objection	Date of determination	Contents of determination
1	Request for review of and petition for stay of execution to the permission for change in reactors installation at Tokai Daini NPS (Japan Atomic Power Company)	July 1, 2020	Dismissed
2	Request for review of and petition for stay of execution to the approval of construction plan at Tokai Daini NPS (Japan Atomic Power Company)	July 1, 2020	Dismissed
3	Request for review of and petition for stay of execution of permission for change in operational safety programs for Takahama NPS (Kansai Electric Power Company)	July 1, 2020	Dismissed
4	Request for review of and petition for stay of execution of permission for change in operational safety programs for Ohi NPS (Kansai Electric Power Company)	July 1, 2020	Dismissed
5	Request for review concerning the summary of the results of requesting public comment on the review report for the permission of change in reactor installation at the Onagawa NPS (Tohoku Electric Power Co.)(case 1)	October 21, 2020	Rejected
6	Request for review concerning the summary of the results of requesting public comment on the review report for the permission of change in reactor installation at the Onagawa NPS (Tohoku Electric Power Co.)(case 2)	October 21, 2020	Rejected
7	Formal objection to the disposition of permission for nuclear fuel material fabrication business at MOX fuel fabrication facility (Japan Nuclear Fuel Ltd.)	January 26, 2021	Dismissed
8	Request for review of and petition for stay of execution to the permission of change in reactor installation (change in the reactor facilities for units 3 and 4) at Genkai NPS (Kyushu Electric Power Company)	March 25, 2021	Dismissed

## Reference 2 Materials related to Implementation of Various International Treaties on Nuclear Safety (related to Section 2 in Chapter 1)

The NRA is promoting cooperation with international organizations and overseas regulatory agencies through treaties and participation in the development and reviews of the IAEA's safety standards and in joint research to continuously improve nuclear regulation in Japan and contribute to nuclear safety in the international society.

### 1. Implementation of various International Treaties on Nuclear Safety

#### (1) Convention on Nuclear Safety (Nuclear Safety Convention)

This convention applies to nuclear power plants and intends to globally achieve and maintain a high-level of nuclear safety. It is aimed to establish and maintain radiation protection at nuclear power plants, to prevent an accident with radiological consequences, and to mitigate its consequences in the event of an accident. According to the Convention, the NRA has been implementing activities (so-called "review process") every three years such as (1) developing a national report, (2) conducting a peer review among contracting parties and (3) participating the meeting of contracting parties (review meeting).

(Past major activities under the Convention on Nuclear Safety)

Periods	Overview
August 2013	Submission of Japan's 6th National Report
March and April 2014	The 6th Review Meeting (participated by Commissioner Oshima and others)
August 2016	Submission of Japan's 7th National Report
March and April 2017	The 7th Review Meeting (participated by Commissioner Ban and others)
August 2019	Submission of Japan's 8th National Report

#### (2) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention on Nuclear Waste)

This convention applies to the safety of the management of spent fuel and radioactive waste generated from facilities including nuclear power plants, research reactors and other nuclear facilities such as re-processing plants and rad-waste storage facilities, etc. It is aimed to achieve and maintain a high-level of safety worldwide in spent fuel and radioactive waste management, and to ensure radiation protection during all stages of spent fuel and radioactive waste management, to prevent an accident with radiological consequences and to mitigate its consequences in the event of an accident. According to the Convention, the NRA has been implementing activities (so-called "review process") every three years such as (1) preparing a national report, (2) conducting a peer review among contracting parties and (3) participating the meeting of contracting parties (review meeting).

(Past major activities under the Joint Convention on Nuclear Waste)

Periods	Overview
October 2014	Submission of Japan's 5th National Report for the 5th Review Meeting
May 2015	The 5th Review Meeting (participated by commissioner Tanaka Satoru and others)
October 2017	Submission of Japan's 6th National Report
May and June, 2018	The 6th Review Meeting (participated by commissioner Tanaka Satoru and others)
October 2020	Submission of Japan's 7th National Report

**(3) Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency**

The Early Notification Convention is a framework for providing “information on an accident causing a transborder radiation impact” to countries that may be affected and the IAEA, whereas the Assistance Convention is a framework for providing assistance in case of a nuclear accident or a radiological emergency.

The meetings of the competent authorities of the contracting parties under the Early Notification Convention and the Assistance Convention are held every two years. The most recent meeting of the countries was held in June 2020, in the which NRA staff participated along with the Ministry of Foreign Affairs and the Cabinet Office.

**(4) The Convention on the Physical Protection of Nuclear Material, its amendment and the International Convention for the Suppression of Acts of Nuclear Terrorism (Nuclear Terrorism Suppression Convention)**

The Physical Protection Convention obligates the contracting countries to take protective measures for nuclear materials during their international transportation, and requires them to protect nuclear materials against their illegal acquisition and uses. The amendment of Physical Protection Convention took effect in Japan in May 2016 and the targets of protection based on the convention were expanded to domestic peaceful uses of nuclear materials, storage and transportation, and nuclear facilities.

The Nuclear Terrorism Prevention Convention is intended to strengthen international cooperation for taking effective and feasible measures to prevent nuclear terrorism, and prosecute and punish the suspect(s) on the basis of the recognition that nuclear terrorism will lead to a serious consequence and will threaten international peace and safety. The NRA is involved in the implementation of the Convention for which Japan made ratification.

## 2. Cooperation under International Organizations

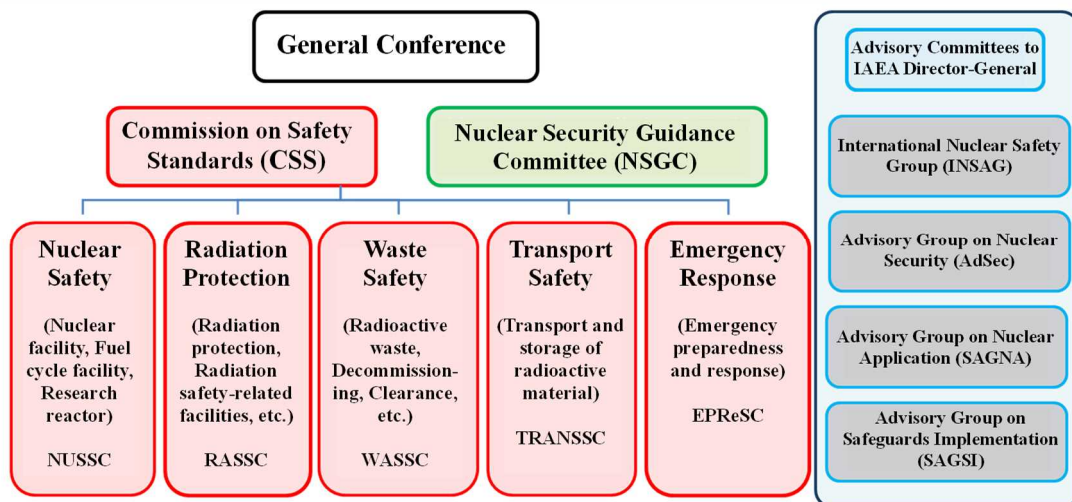
### (1) International Atomic Energy Agency (IAEA)

The IAEA is an international organization established in 1957 under the leadership of the UN with the aim of promoting peaceful uses of nuclear energy, and consists of 172 member states, as of March 2021. Its secretariat is located in Vienna and the director-general is Rafael Mariano Grossi.

The IAEA's activities in the field of nuclear safety range widely, such as the development or review of its safety standards, activities relating to emergency arrangements, radiation protection and physical protection, and international cooperation for improving nuclear regulation.

The Commission on Safety Standards (CSS), which is a standing committee, reviews the safety standard documents. The NRA also is actively participating in the activities of CSS and its subcommittees.

Through the IAEA, NRA has been contributing internationally as an international, professional organization by joining the IAEA's standing advisory groups such as the International Nuclear Safety Advisory Group (INSAG), Advisory Group on Nuclear Security (AdSec, of which NRA Commissioner Tanaka is a member), and others.



**Figure iii. Major IAEA Committees in which the NRA participates**

In addition, the NRA actively participates in and contributes to efforts to improve nuclear safety worldwide through the Regulatory Cooperation Forum (RCF; General Conference, steering committee and support meetings are held (once a year).), which is a framework for cooperation among regulatory bodies under the IAEA, and the Asia Nuclear Safety Network (ANSN; Japan serves as



the Chair of the Steering Committee and the Chair and Vice Chair of the Self-Assessment Coordination Group (SACG).), which is a framework for cooperation to improve the safety of nuclear facilities in the Asian region. The NRA also collects technical information and shares knowledge and findings through the IAEA's cooperative projects.

(IAEA's major cooperative projects in which the NRA participates)

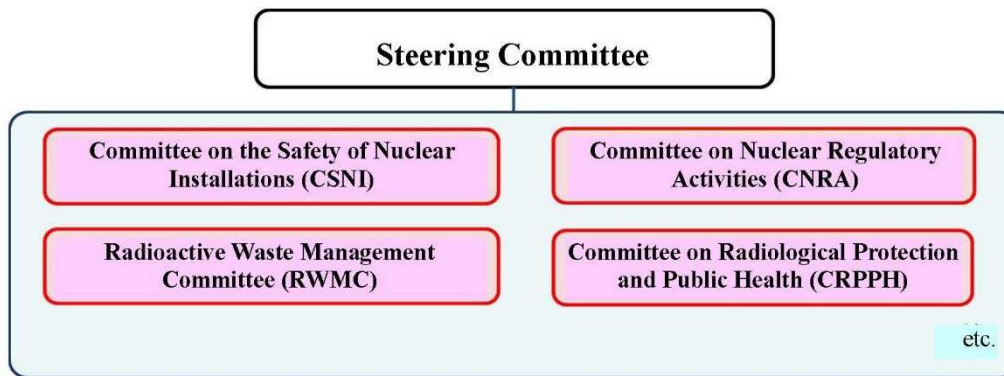
Project names	Overview
EESS-EBP	It develops detailed guides to the IAEA safety standards for external events.
IGALL	It formulates technological and practical guidelines for the aging deterioration management of systems, structures and components important for the safety of light-water and heavy-water reactors to ensure their long-term operations.
The joint project between the IAEA and Japan with regard to marine monitoring	In marine-monitoring activities joined by the IAEA at the coastal sea area of Fukushima Prefecture, the project takes samples in order to evaluate the method and mutual comparison of the analytical findings.

In response to requests from member states, the IAEA has been conducting peer reviews such as the Integrated Regulatory Review Service (IRRS), which comprehensively reviews nuclear regulation legal system and regulatory organizations. The NRA invited an IRRS mission in January 2016, an IRRS follow-up mission in January 2020, an International Physical Protection Advisory Service (IPPAS) mission (for reviewing the situation of nuclear security measures) in February 2015 and an IPPAS follow-up mission from November to December 2018.

## **(2) Organization for Economic Co-operation and Development/Nuclear Energy Agency (OECD/NEA)**

Established in 1958, the OECD Nuclear Energy Agency (headed by Director-General Magwood, with 34 member countries as of March 2021) is headquartered in Paris and its activities are deliberated in steering committee meetings held twice a year. Benefiting from its characteristic of sharing the latest knowledge among advanced nuclear energy countries, the OECD/NEA discusses the prevention and mitigation of a possible nuclear accident and carries out related activities (including the sharing of OECD/NEA member countries' situations of regulatory efforts and joint safety research based on lessons learned from the accident at the Fukushima Daiichi Nuclear Power Station).

Among the standing committees, the Committee on Nuclear Regulatory Activities (CNRA), the Committee on the Safety of Nuclear Installations (CSNI), the Committee on Radiation Protection and Public Health (CRPPH), the Radioactive Waste Management Committee (RWMC) and working groups operating under them are studying various issues concerning nuclear safety, and also the NRA is actively participating in these activities.



**Figure iv. Major OECD/NEA committees relating to the NRA**

In addition, the NRA has been joining various joint projects under the OECD/NEA, and contributing to the gathering of the latest technological information of advanced countries in order to make technological advancement.

(Major OECD/NEA joint projects in which the NRA participates)

Project names	Overview
ARC-F	Elaboration of the accident progression analysis of 1F, investigation of the inside of the reactor building and containment vessel, and information analysis related to the migration and diffusion of fission products are performed to gain a better understanding of the accident scenario and the conditions inside the building and vessel after the accident.
HYMERES	Performing experiments and analytical works on the behaviors of hydrogen accumulated in a containment during a severe accident progression.

**(3) Record of NRA chairperson and committee members' participation in meetings held by international organizations**

Dates	Names of meetings held by international organizations	Attendance of Commissioners in charge
April 20-22, 2020	OECD/NEA/CNRA <sup>17</sup> Working Group on Safety Culture (WGSC)	Commissioner Ban
July 2, 2020	IAEA Advisory Group on Nuclear Security (AdSec)	Commissioner Tanaka
October 27-29, 2020	OECD/NEA/CNRA Working Group on Safety Culture (WGSC)	Commissioner Ban
November 2-6, 2020	Advisory Group on Nuclear Security (AdSec)	Commissioner Tanaka
November 18, 2020	International Commission on Radiological Protection (ICRP), Commission IV	Commissioner Ban

<sup>17</sup> Committee on Nuclear Regulatory Activities

**(4) Record of participation in International Nuclear Regulators Association (INRA) meetings**

Periods	Main participants from the NRA
May 2013	Chairman Tanaka and Commissioner Fuketa
September 2013	Chairman Tanaka
April 2014	Chairman Tanaka
September 2014	Chairman Tanaka
May 2015	Chairman Tanaka
September 2015	Director-General for Technical Affairs, Yasui
May 2016	Commissioner Tanaka (Satoru)
September 2016	Chairman Tanaka
May 2017	Secretary-General Yasui
September 2017	Secretary-General Yasui
May 2018	Secretary-General Yasui
September 2018	Chairman Fuketa
May 2019	Secretary-General Yasui
September 2019	Chairman Fuketa
September 2020	Chairman Fuketa

**(5) Record of participation in Western European Nuclear Regulators Association (WENRA) meetings**

Periods	Main participants from the NRA
April 2016	Secretary-General Shimizu
October 2016	Commissioner Ban
April 2017	Commissioner Ban
October 2017	Senior Coordinator for International Collaborations, Hirano
April 2018	Director of Nuclear Policy Planning Division, Ichimura
November 2018	Director of Nuclear Policy Planning Division, Ichimura
April 2019	Director of Nuclear Policy Planning Division, Ichimura
October 2019	Director-General Kaneko
November 2020	Director-General Kaneko

**(6) Record of participation to the Top Regulators Meeting on Nuclear Safety among Japan, China and the ROK (TRM)**

Periods	Main participants from the NRA
November 2012	Commissioner Oshima
November 2013	Commissioner Oshima
September 2014	Chairman Tanaka and Commissioner Oshima
October 2015	Commissioner Ban
November 2016	Secretary-General Shimizu
December 2017	Commissioner Yamanaka
November 2018	Commissioner Yamanaka
November 2019	Commissioner Ban

### 3. Bilateral Cooperation

(Organizations having signed a bilateral cooperation document (as of the end of March 2021))

Countries	Organizations
U.S.	Nuclear Regulatory Commission (NRC) Department of Energy (DOE)
France	Nuclear Safety Authority (ASN)
UK	Office for Nuclear Regulation (ONR)
Russian Federation (Russia)	Federal Environmental, Industrial and Nuclear Supervision Service of Russia (Rostechнадзор)
Sweden	Swedish Radiation Safety Authority (SSM)
Germany	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)
Spain	Spanish Nuclear Safety Council (CSN)
Finland	Finnish Radiation and Nuclear Safety Authority (STUK)
Canada	Canadian Nuclear Safety Commission (CNSC)

### 4. External Advisors from Overseas

#### External Advisors and their careers

Richard Meserve	Former chairman of the U.S. Nuclear Regulatory Commission (NRC) Chairperson of International Nuclear Safety Advisory Group (INSAG), IAEA
Dana Drabova	Director-General of the Czech Republic (Czech) State Office for Nuclear Safety (SUJB) Former chairperson of IAEA Commission on Safety Standards (CSS)
Andy Hall	Former Chief Nuclear Inspector of the UK Office for Nuclear Regulation (ONR) Former chairperson of European Nuclear Safety Regulator Group (ENSREG)
Philippe Jamet	Former commissioner of the Nuclear Safety Authority (ASN), France Former director of the Division of Nuclear Installation Safety, IAEA
Randall Gauntt	Former director of the Severe Accident Analysis Department, Sandia National Laboratory, the USA

#### Dates of External Advisors meetings and major agendas

Dates	Major agendas
November 25, 2020	Designation of Reprocessing Business of JNFL Rokkasho Reprocessing Facility Implementation Status of New Oversight Program

**Reference 3 Materials related to Implementation of Regulations Relating to the Reactor Regulation Act (related to Section 1 in Chapter 2)**

**1. Status of Application and Approval for Review of Commercial Power Reactors**

Applicant	Targeted power reactor	Application types	Receipt date	Review Meetings (times)	Documentary review (times)	On-site investigations (times)	Date of permission
Hokkaido Electric Power Co., Inc.	Tomari NPS (Units 1, 2)	Installation change	July 8, 2013	1	-	-	-
		Design and construction plan					
	Operational safety program change						
Hokkaido Electric Power Co., Inc.	Tomari NPS (Unit 3)	Installation change	July 8, 2013	5	-	1	-
		Design and construction plan					
	Operational safety program change						
	◆Tomari NPS (Unit 3)	Installation change	December 18, 2015	-	-	-	-
Tohoku Electric Power Co., Inc.	Onagawa NPS (Unit 2)	Installation change	December 27, 2013	3	-	-	February 26, 2020
		Design and construction plan					-
	Operational safety program change	-					
Tohoku Electric Power Co., Inc.	Higashidori NPS (Unit 1)	Installation change	June 10, 2014	6	-	-	-
		Design and construction plan					-
	Operational safety program change	-					
Tokyo Electric Power Company Holdings, Inc.	Kashiwazaki-Kariwa NPS (Units 6, 7)	Installation change	September 27, 2013	14	-	-	October 5, 2016
		Design and construction plan					October 14, 2020 (Unit 7)
	Operational safety program change	October 30, 2020 (Unit 7)					
	◆ Kashiwazaki-Kariwa NPS (Units 6, 7)	Installation change	December 15, 2014	20	1	-	-
Chubu Electric Power Co., Inc.	Hamaoka NPS (Unit 3)	Installation change	June 16, 2015	5	-	-	-
		Design and construction plan					
	Operational safety program change						
Chubu Electric Power Co., Inc.	Hamaoka NPS (Unit 4)	Installation change	February 14, 2014 January 26, 2015 *1	5	-	-	-
		Design and construction plan					
	Operational safety program change						
Hokuriku Electric Power Company	Sika NPS (Unit 2)	Installation change	August 12, 2014	3	-	-	-
		Design and construction plan					
	Operational safety program change						

Applicant	Targeted power reactor	Application types	Receipt date	Review Meetings (times)	Documentary review (times)	On-site investigations (times)	Date of permission
Kansai Electric Power Company	Ohi NPS (Units 3, 4)	Installation change	July 8, 2013	-	-	-	May 24, 2017
		Design and construction plan					August 25, 2017
		Operational safety program change					September 1, 2017
	Ohi NPS (Units 3, 4)	Installation change	March 8, 2019	2	1	-	February 26, 2020
		Design and construction plan* <sup>3</sup>	March 6, 2020 August 26, 2020				December 22, 2020
	Takahama NPS (Units 3, 4)	Installation change	July 8, 2013	-	-	-	February 12, 2015
		Design and construction plan					August 4, 2015 (Unit 3)
		Operational safety program change					October 9, 2015 (Unit 4)
	◆Takahama NPS (Units 3, 4)	Installation change	December 25, 2014	4	1	-	September 21, 2016
		Design and construction plan	April 26, 2017				August 7, 2019
		Operational safety program change	April 17, 2020				October 7, 2020
	Takahama NPS (Units 1 and 2 (3, 4))	Installation change	March 17, 2015	1	0	-	April 20, 2016
		Design and construction plan	July 3, 2015				June 10, 2016 (Units 1, 2)
		Operational safety program change	July 31, 2019				February 15, 2021
	◆Takahama NPS (Units 1 and 2 (3, 4))	Installation change	December 22, 2016	-	-	-	March 7, 2018
Design and construction plan* <sup>3</sup>		March 8, 2018 November 16, 2018 March 15, 2019 May 31, 2019	April 25, 2019 September 13, 2019 October 24, 2019 February 20, 2020				
Mihama NPS (Unit 3)	Installation change	March 17, 2015	-	-	-	October 5, 2016	
	Design and construction plan	November 26, 2015				October 26, 2016	
	Operational safety program change	March 17, 2015				February 27, 2020	
◆Mihama PS (Unit 3)	Installation change	April 20, 2018	3	-	-	July 8, 2020	
	Design and construction plan	July 10, 2020				-	
Chugoku Electric Power Company	Shimane NPS (Unit 2)	Installation change	December 25, 2013	31	-	-	-
		Design and construction plan					-
		Operational safety program change					-
◆Shimane NPS (Unit 2)	Installation change	July 4, 2016	-	-	-	-	
Shimane NPS (Unit 3)	Installation change	August 10, 2018	-	-	-	-	

Applicant	Targeted power reactor	Application types	Receipt date	Review Meetings (times)	Documentary review (times)	On-site investigations (times)	Date of permission
Shikoku Electric Power Company	Ikata NPS (Unit 3)	Installation change	July 8, 2013	-	-	-	July 15, 2015
		Design and construction plan					March 23, 2016
		Operational safety program change					April 19, 2016
	◆Ikata NPS (Unit 3)	Installation change	January 14, 2016	5	1	-	October 4, 2017
		Design and construction plan*3	December 7, 2017 March 16, 2018 May 11, 2018 August 13, 2018 July 11, 2019				March 25, 2019 December 24, 2019 March 27, 2020 October 10, 2019 March 27, 2020
		Operational safety program change	November 27, 2020				-
Kyushu Electric Power Company	Genkai NPS (Units 3, 4)	Installation change	July 12, 2013	-	-	-	January 18, 2017
		Design and construction plan					August 25, 2017 (Unit 3) September 14, 2017 (Unit 4)
		Operational safety program change					September 14, 2017
	Sendai NPS (Units 1, 2)	Installation change	July 8, 2013	-	-	-	September 10, 2014
		Design and construction plan					March 18, 2015 (Unit 1) May 22, 2015 (Unit 2)
		Operational safety program change					May 27, 2015
	◆Genkai NPS (Units 3, 4)	Installation change	December 20, 2017	0	1	-	April 3, 2019
		Design and construction plan*3 (Unit 3)	May 16, 2019 September 19, 2019 January 17, 2020				November 28, 2019 March 4, 2020 August 26, 2020
		Design and construction plan*3 (Unit 4)	June 18, 2019 September 19, 2019 January 17, 2020				November 28, 2019 March 4, 2020 August 26, 2020
		Operational safety program change	December 17, 2015				April 5, 2017
	◆Sendai NPS (Units 1, 2)	Design and construction plan*3 (Unit 1)	May 24, 2017 August 8, 2017 March 9, 2018	-	-	-	May 15, 2018 July 26, 2018 February 18, 2019
		Design and construction plan*3 (Unit 2)	July 10, 2017 August 8, 2017 March 9, 2018				August 10, 2018 August 31, 2018 April 12, 2019
Operational safety program change		August 2, 2019	March 25, 2020				

Applicant	Targeted power reactor	Application types	Receipt date	Review Meetings (times)	Documentary review (times)	On-site investigations (times)	Date of permission
Japan Atomic Power Company	Tokai Daini NPS	Installation change	May 20, 2014	-	-	-	September 26, 2018
		Design and construction plan					October 18, 2018
		Operational safety program change					-
	◆Tokai Daini NPS	Installation change	September 24, 2019	12	1	-	-
Tsuruga NPS (Unit 2)	Installation change	November 5, 2015	2	-	-	-	-
	Operational safety program change						
Electric Power Development Co., Ltd	Oma NPS* 2	Installation change	December 16, 2014	8	-	-	-
		Design and construction plan					

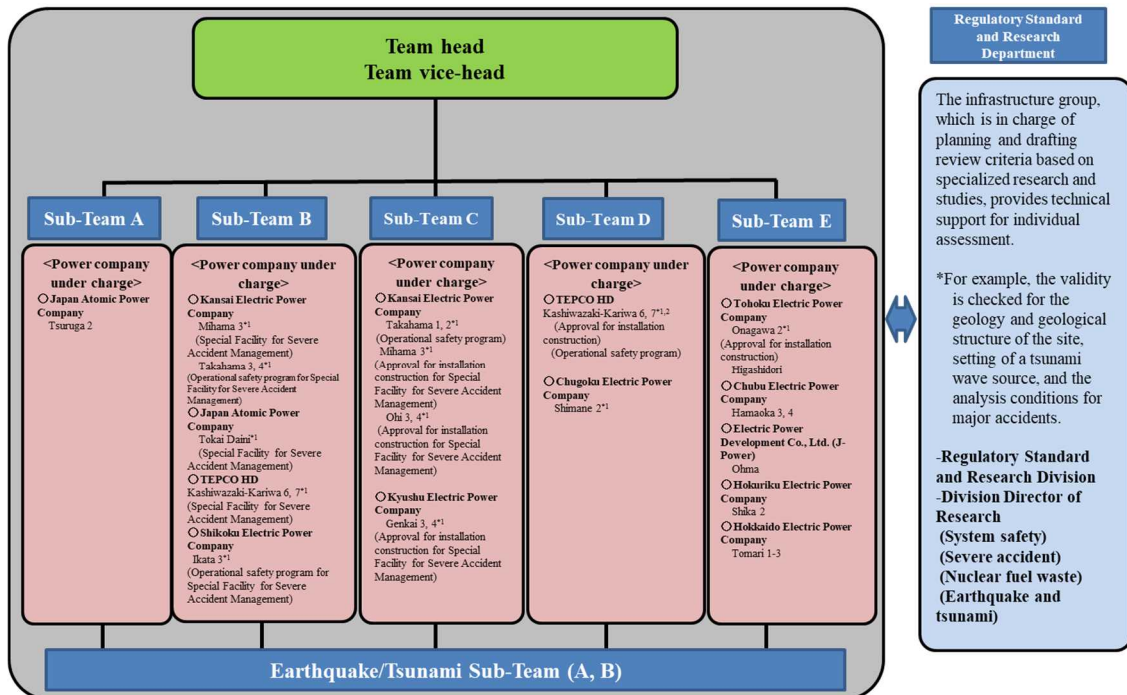
- Several applications may be reviewed at one session of the review meeting.
- The number of review meetings mainly attended by members of the NRA is mentioned as a rule.
- The number of on-site investigations implemented by the members of the NRA is mentioned, and that implemented only by the staff of the secretariat of the NRA is excluded.
- The numbers of review, meetings and on-site investigations represent the number of times held in FY2020

\*Application for Special Facility for Severe Accident Management

- \*1: Application for reactor installation permit change of nuclear power reactor dated February 14, 2014, was withdrawn on January 26, 2015, and submitted again in order to add a dry storage facility for spent fuel.
- \*2: This application includes contents regarding Special Facility for Severe Accident Management.
- \*3: The design and construction plan is divided into several phases and separate applications are submitted.



## 2. Review System of Conformity of Nuclear Power Stations to New Regulatory Requirements (Figure v)



\*1: Sites reviewed in FY2020, \*2: Approval of installation construction and operational safety program at Kashiwazaki-Kariwa NPS are only for Unit 7.

### 3. Status of Inspection in Major Nuclear Facilities

(April 1, 2020 – March 31, 2021)

#### 1. Status of nuclear regulatory inspections

##### (1) Inspection plan

##### (a) Daily inspection (power reactor)

(as of April 1, 2020)

No	Guide No.	Inspection guide name	Frequency	Sendai	Genkai	Ikata	Takahama	Ohi	Mihama
				Units 1, 2: In operation	Unit 1: Decommissioned A Unit 2: Review on decommissioning Units 3, 4: In operation	Unit 1: Decommissioned B Unit 2: Review on decommissioning Units 3: In operation	Unit 1, 2: Long-term shutdown Units 3, 4: In operation	Unit 1, 2: Decommissioned A Units 3, 4: In operation	Unit 1, 2: Decommissioned A Unit 3: Long-term shutdown
1	BM0020	Instruction for regular operator inspections*2	Regular inspection	10	12	7	12	12	3
2	BM1040	Heat sink performance	year	2	3	2	3	3	1
3	BM0060	Evaluation of the effectiveness of maintenance	year	5	5	5	5	5	1
4	BM0100	Design management	year	6	6	6	6	6	1
5	BM0120	Work management	year	4	4	4	4	4	2
6	BO0010	Surveillance test	year	18	22	17	22	22	5
7	BO1020	System configuration of equipment	year	18	22	18	22	22	5
8	BO1030	Start and shutdown of reactor	Regular inspection	2	2	1	2	2	0
9	BO1040	Determination of operability and evaluation of functionality	year	20	24	19	24	24	5
10	BO0060	Fuel body management (Transportation and storage)	year	3	4	3	4	4	1
11	BO1070	Operator's capability	year	4	4	4	4	4	1
12	BE0010	Protection against natural disaster	year	4	4	4	4	4	2
13	BE0020	Fire protection	year	13	13	13	13	13	7
14	BE0030	Internal overflow protection	year	3	4	3	4	4	1
15	BE0040	Maintaining of emergency response organization	2 years	1	1	1	1	1	1
16	BE0050	Emergency preparedness and maintenance	2 years	1	1	1	1	1	1
17	BE0060	Maintaining of capacity of personnel to respond to major accidents, etc.	year	10	10	10	10	10	0
18	BE0090	Earthquake protection	year	4	4	4	4	4	1
19	BE1000	Tsunami protection	year	4	4	4	4	4	1
20	BR0010	Radiation exposure control	year	6	6	6	6	6	5
21	BR0070	Management of radioactive waste solid, etc.	year	3	3	3	3	3	3
22	BQ0010	Operation of quality management system	Day	1	1	1	1	1	1
			Half period	1	1	1	1	1	1
23	BQ0040	Verification of performance indices	year	1	1	1	1	1	1
24	BQ0050	Initial response to occurrence of an event	At occurrence	*3	*3	*3	*3	*3	*3
				Total	144	161	138	161	50

[Legend]

- (1) "Operation": In service in compliance with new regulatory requirements.
- (2) "Long-term shutdown": Long-term shutdown in preparation for compliance with new regulatory requirements
- (3) "Decommissioning A": Decommissioning approved with spent fuel in SFP The same inspection is performed as in the long-term shutdown.
- (4) "Decommissioning B": Decommissioning approved with no spent fuel in SFP
- (5) "Decommissioning review": Under review for decommissioning The same inspection is performed as long-term shutdown.
- (6) "Decommissioning planned": Planned to apply for decommissioning. The same inspection is performed as long-term shutdown.
- (7) "Construction A": In the construction phase with no new fuel delivered.
- (8) "Construction B": In the construction phase with new fuel delivered. The same inspection is performed as long-term shutdown

\*1 Set based on the status of reactors as of March 31, 2020.

\*2 The number of inspection samples for long-term shutdown and decommissioning A/B in No.1 "Supervision for Periodic Operator's Inspection" is 1/reactor.

\*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

No	Guide No.	Inspection guide name	Frequency	Tomari	Higashidori	Onagawa	Kashiwazaki	Fukushima Daini	Tokai
				Unit 1-3: Long-term shutdown	Unit 1: Long-term shutdown	Unit 1: Review on decommissioning Unit 2-3: Long-term shutdown	Unit 1-7: Long-term shutdown	Unit 1-4: Decommissioning planned	Unit 1: Decommissioned B Unit 2: Long-term shutdown
1	BM0020	Instruction for regular operator inspections	Regular inspection	3	1	3	7	4	2
2	BM1040	Heat sink performance	year	1	1	1	2	1	1
3	BM0060	Evaluation of the effectiveness of maintenance	year	1	1	1	1	1	1
4	BM0100	Design management	year	1	1	1	1	1	1
5	BM0120	Work management	year	2	2	2	2	2	2
6	BO0010	Surveillance test	year	5	3	5	8	6	3
7	BO1020	System configuration of equipment	year	5	3	5	8	6	4
8	BO1030	Start and shutdown of reactor	Regular inspection	0	0	0	0	0	0
9	BO1040	Determination of operability and evaluation of functionality	year	5	3	5	8	6	4
10	BO0060	Fuel body management (Transportation and storage)	year	1	1	1	2	1	1
11	BO1070	Operator's capability	year	1	1	1	1	1	1
12	BE0010	Protection against natural disaster	year	2	2	2	2	2	2
13	BE0020	Fire protection	year	7	7	7	7	7	7
14	BE0030	Internal overflow protection	year	1	1	1	2	2	1
15	BE0040	Maintaining of emergency response organization	2 years	1	1	1	1	1	1
16	BE0050	Emergency preparedness and maintenance	2 years	1	1	1	1	1	1
17	BE0060	Maintaining of capacity of personnel to respond to major accidents, etc.	year	0	0	0	0	0	0
18	BE0090	Earthquake protection	year	1	1	1	1	1	1
19	BE0100	Tsunami protection	year	1	1	1	1	1	1
20	BR0010	Radiation exposure control	year	5	5	5	5	5	5
21	BR0070	Management of radioactive waste solid, etc.	year	3	3	3	3	3	3
22	BQ0010	Operation of quality management system	Day	1	1	1	1	1	1
			Half period	1	1	1	1	1	1
23	BQ0040	Verification of performance indices	year	1	1	1	1	1	1
24	BQ0050	Initial response to occurrence of an event	At occurrence	*3	*3	*3	*3	*3	*3
Total				50	42	50	66	55	45

[Legend]

- (1) "Operation": In service in compliance with new regulatory requirements.
- (2) "Long-term shutdown": Long-term shutdown in preparation for compliance with new regulatory requirements
- (3) "Decommissioning A": Decommissioning approved with spent fuel in SFP The same inspection is performed as in the long-term shutdown.
- (4) "Decommissioning B": Decommissioning approved with no spent fuel in SFP
- (5) "Decommissioning review": Under review for decommissioning The same inspection is performed as long-term shutdown.
- (6) "Decommissioning planned": Planned to apply for decommissioning. The same inspection is performed as long-term shutdown.
- (7) "Construction A": In the construction phase with no new fuel delivered.
- (8) "Construction B": In the construction phase with new fuel delivered. The same inspection is performed as long-term shutdown

\*1 Set based on the status of reactors as of March 31, 2020.

\*2 The number of inspection samples for long-term shutdown and decommissioning A/B in No.1 "Supervision for Periodic Operator's Inspection" is 1/reactor.

\*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

No	Guide No.	Inspection guide name	Frequency	Hamaoka	Shika	Tsuruga	Shimane	Ohma	(TEPCO) Higashidori
				Unit 1,2: Decommissioned B Unit 3,5: Long-term shutdown	Unit 1,2: Long-term shutdown	Unit 1: Decommissioned A Unit 2: Long-term shutdown	Unit 1: Decommissioned A Unit 2: Long-term shutdown Unit 3: Construction B	Unit 1: Construction A	Unit 1: Construction A
1	BM0020	Instruction for regular operator inspections*2	Regular inspection	5	2	2	3	-	-
2	BM1040	Heat sink performance	year	1	1	1	1	-	-
3	BM0060	Evaluation of the effectiveness of maintenance	year	1	1	1	1	-	-
4	BM0100	Design management	year	1	1	1	1	-	-
5	BM0120	Work management	year	2	2	2	2	-	-
6	BO0010	Surveillance test	year	5	4	4	5	-	-
7	BO1020	System configuration of equipment	year	6	4	4	5	-	-
8	BO1030	Start and shutdown of reactor	Regular inspection	0	0	0	0	-	-
9	BO1040	Determination of operability and evaluation of functionality	year	6	4	4	5	-	-
10	BO0060	Fuel body management (Transportation and storage)	year	1	1	1	1	-	-
11	BO1070	Operator's capability	year	1	1	1	1	-	-
12	BE0010	Protection against natural disaster	year	2	2	2	2	-	-
13	BE0020	Fire protection	year	7	7	7	7	-	-
14	BE0030	Internal overflow protection	year	1	1	1	1	-	-
15	BE0040	Maintaining of emergency response organization	2 years	1	1	1	1	-	-
16	BE0050	Emergency preparedness and maintenance	2 years	1	1	1	1	-	-
17	BE0060	Maintaining of capacity of personnel to respond to major accidents, etc.	year	0	0	0	0	-	-
18	BE0090	Earthquake protection	year	1	1	1	1	-	-
19	BE0100	Tsunami protection	year	1	1	1	1	-	-
20	BR0010	Radiation exposure control	year	5	5	5	5	-	-
21	BR0070	Management of radioactive waste solid, etc.	year	3	3	3	3	-	-
22	BQ0010	Operation of quality management system	Day	1	1	1	1	-	-
			Half period	1	1	1	1	-	-
23	BQ0040	Verification of performance indices	year	1	1	1	1	-	-
24	BQ0050	Initial response to occurrence of an event	At occurrence	*3	*3	*3	*3	-	-
Total				54	46	46	50	0	0

[Legend]

- (1) "Operation": In service in compliance with new regulatory requirements.
- (2) "Long-term shutdown": Long-term shutdown in preparation for compliance with new regulatory requirements
- (3) "Decommissioning A": Decommissioning approved with spent fuel in SFP The same inspection is performed as in the long-term shutdown.
- (4) "Decommissioning B": Decommissioning approved with no spent fuel in SFP
- (5) "Decommissioning review": Under review for decommissioning The same inspection is performed as long-term shutdown.
- (6) "Decommissioning planned": Planned to apply for decommissioning. The same inspection is performed as long-term shutdown.
- (7) "Construction A": In the construction phase with no new fuel delivered.
- (8) "Construction B": In the construction phase with new fuel delivered. The same inspection is performed as long-term shutdown

\*1 Set based on the status of reactors as of March 31, 2020.

\*2 The number of inspection samples for long-term shutdown and decommissioning A/B in No.1 "Supervision for Periodic Operator's Inspection" is 1/reactor.

\*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

## (b) Daily inspection (Nuclear Fuel Related Facilities, etc.)

(as of April 1, 2020)

Control No.	Inspection guide name	Type	Inspection frequency (year)	Reprocessing	Fabrication						
				JNFL Rokkasho Reprocessing Facility	Global Nuclear Fuel Japan	Kumatori Office, Nuclear Fuel Industries	Tokai Office, Nuclear Fuel Industries	Mitsubishi Nuclear Fuel	JAEA Ningyo-toke Environmental Engineering Center (decommissioning planned)	JNFL Fabrication Facility	JNFL MOX Fabrication Facility
BM0020	Instruction for regular operator inspections	Daily	1	5	4	4	6	5	10	4	
BM1040	Heat sink performance	Daily	1								
BM0060	Evaluation of the effectiveness of maintenance	Daily	1	5	3	3	3	3	3	3	
BM0100	Design management	Daily	1	6	3	3	1	2	2	3	
BM0110	Work management	Daily	1	4	2	2	4	4	3	2	
BO0010	Surveillance test	Daily	1	14	7	7	7	7	7	7	
BO1020	System configuration of equipment	Daily	1								
BO1030	Start and shutdown of reactor	Daily	1								
BO1040	Determination of operability and evaluation of functionality	Daily	1								
BO0060	Fuel body management (Transportation and storage)	Daily	1	2	1	1	-	-	1		
BO1070	Operator's capability	Daily	1								
BO2010	Operation management	Daily	1	10	8	8	8	8	4	9	
BO2020	Critical safety management	Daily	1	10	4	4	2	2	2	4	
BO2030	Experiment	Daily	1								
BE0010	Protection against natural disaster	Daily	1	4	2	2	2	2	2	2	
BE0020	Fire protection	Daily	1	13	7	7	7	7	7	7	
BE0030	Internal overflow protection	Daily	1	2	1	1	1	1	1	1	
BE0040	Maintaining of emergency response organization	Daily	2	1	1	1	1	1	1	1	
BE0050	Emergency preparedness and maintenance	Daily	2	1	1	1	1	1	1	1	
BE0060	Maintaining of capacity of personnel to respond to major accidents, etc.	Daily	1	5	5	5	5	5	5	5	
BE0090	Earthquake protection	Daily	1	4	2	2	2	2	2	2	
BE0100	Tsunami protection	Daily	1								
BR0010	Radiation exposure control	Daily	1	6	10	10	10	10	8	10	
BR0070	Management of radioactive waste solid, etc.	Daily	1	3	2	2	3	3	2	2	
BQ0010	Operation of quality management system (daily)	Daily	1	1	1	1	1	1	1	1	1
	Operation of quality management system (half period)	Daily	0.5	1	1	1	1	1	1	1	1
BQ0040	Verification of safety record indices	Daily	1	-	-	-	-	-	-	-	
BQ0050	Initial response to occurrence of an event	Daily	1	-	-	-	-	-	-	-	
		Total		97	65	65	65	65	63	65	2

\*1 Set based on the status of facilities as of March 31, 2020

\*2 Although the prototype fast breeder reactor MONJU is in the decommissioning stage, part of the inspection volume of the team inspection is accounted for the daily inspection because there is a requirement to deal with large-scale damage.

\*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

Control No.	Inspection guide name	Type	Inspection frequency (year)	Management and burial				Storage	Use			
				Japan Nuclear Fuel Limited		Japan Atomic Energy Agency			Recyclable-Fuel Storage Center	Rokkasho Safeguards Center	Tokai Safeguards Center	Nippon Nuclear Fuel Development (NFD)
				Waste management facility	Waste Disposal Facility	Nuclear Science Research Institute (Waste Disposal Facility)	Osai Research and Development Institute (Specified Radioactive Waste Interim Storage Facility)					
BM0020	Instruction for regular operator inspections	Daily	1	3			3					
BM1040	Heat sink performance	Daily	1									
BM0060	Evaluation of the effectiveness of maintenance	Daily	1	1	1	-	1		1	1		
BM0100	Design management	Daily	1	1	1	-	1		1	1		
BM0110	Work management	Daily	1	1	1	-	1		1	1		
BO0010	Surveillance test	Daily	1	1			1		1	1		
BO1020	System configuration of equipment	Daily	1									
BO1030	Start and shutdown of reactor	Daily	1									
BO1040	Determination of operability and evaluation of functionality	Daily	1									
BO0060	Fuel body management (Transportation and storage)	Daily	1							1		
BO1070	Operator's capability	Daily	1									
BO2010	Operation management	Daily	1	4	3	—	3		2	3		
BO2020	Critical safety management	Daily	1				1		1	1		
BO2030	Experiment	Daily	1									
BE0010	Protection against natural disaster	Daily	1	1	1	1	1		1	1		
BE0020	Fire protection	Daily	1	1	1	-	1		1	1		
BE0030	Internal overflow protection	Daily	1	1	1	-	1		1	1		
BE0040	Maintaining of emergency response organization	Daily	2	1	1	-	1		1	1		
BE0050	Emergency preparedness and maintenance	Daily	2	1	1	-	1		1	1		
BE0060	Maintaining of capacity of personnel to respond to major accidents, etc.	Daily	1									
BE0090	Earthquake protection	Daily	1	1	1	—	1		1	1		
BE0100	Tsunami protection	Daily	1									
BR0010	Radiation exposure control	Daily	1	2	1		2		2	2		
BR0070	Management of radioactive waste solid, etc.	Daily	1	1	1	—	1		1	1		
BQ0010	Operation of quality management system (daily)	Daily	1	1	1	1	1	1	1	1		
	Operation of quality management system (half period)	Daily	0.5	1	1	1	1	1	1	1		
BQ0040	Verification of safety record indices	Daily	1	-	-	-	-		-	-		
BQ0050	Initial response to occurrence of an event	Daily	1	—	—	—	—		—	—		
		Total		22	16	3	22	2	18	19		

\*1 Set based on the status of facilities as of March 31, 2020

\*2 Although the prototype fast breeder reactor MONJU is in the decommissioning stage, part of the inspection volume of the team inspection is accounted for the daily inspection because there is a requirement to deal with large-scale damage.

\*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

Control No.	Inspection guide name	Type	Inspection frequency (year)	Use							
				Nuclear Development (NDC)	Nuclear Fuel Cycle Engineering Laboratories, JAEA	Nuclear Science Research Institute, JAEA	Omni Research and Development Institute, JAEA (south)	Omni Research and Development Institute, JAEA (north)	Toshiha Nuclear Engineering Laboratory	Special Nuclear Fuel Storage Room, Institute for Integrated Radiation and Nuclear Science, Kyoto University	Ningyo-toge Environmental Engineering Center, JAEA
BM0020	Instruction for regular operator inspections	Daily	1	/	/	/	/	/	/	/	/
BM1040	Heat sink performance	Daily	1	/	/	/	/	/	/	/	/
BM0060	Evaluation of the effectiveness of maintenance	Daily	1	1	1	1	1	1	1	/	1
BM0100	Design management	Daily	1	1	1	1	1	1	1	/	1
BM0110	Work management	Daily	1	1	1	1	1	1	1	1	2
BO0010	Surveillance test	Daily	1	1	1	1	1	1	1	-	1
BO1020	System configuration of equipment	Daily	1	/	/	/	/	/	/	/	/
BO1030	Start and shutdown of reactor	Daily	1	/	/	/	/	/	/	/	/
BO1040	Determination of operability and evaluation of functionality	Daily	1	/	/	/	/	/	/	/	/
BO0060	Fuel body management (Transportation and storage)	Daily	1	1	1	1	1	1	1	1	1
BO1070	Operator's capability	Daily	1	/	/	/	/	/	/	/	/
BO2010	Operation management	Daily	1	2	2	2	2	2	2	/	2
BO2020	Critical safety management	Daily	1	1	1	1	1	1	1	1	1
BO2030	Experiment	Daily	1	/	/	/	/	/	/	/	/
BE0010	Protection against natural disaster	Daily	1	1	1	1	1	1	1	/	2
BE0020	Fire protection	Daily	1	1	1	1	1	1	1	/	2
BE0030	Internal overflow protection	Daily	1	1	1	1	1	1	1	/	2
BE0040	Maintaining of emergency response organization	Daily	2	1	1	1	1	1	1	/	1
BE0050	Emergency preparedness and maintenance	Daily	2	1	1	1	1	1	1	/	1
BE0060	Maintaining of capacity of personnel to respond to major accidents, etc.	Daily	1	/	/	/	/	/	/	/	/
BE0090	Earthquake protection	Daily	1	1	1	1	1	1	1	1	1
BE0100	Tsunami protection	Daily	1	/	-	/	/	/	/	/	/
BR0010	Radiation exposure control	Daily	1	2	2	2	2	2	2	2	3
BR0070	Management of radioactive waste solid, etc.	Daily	1	1	1	1	1	1	1	1	2
BQ0010	Operation of quality management system (daily)	Daily	1	1	1	1	1	1	1	/	1
	Operation of quality management system (half period)	Daily	0.5	1	1	1	1	1	1	/	1
BQ0040	Verification of safety record indices	Daily	1	-	-	-	-	-	-	-	-
BQ0050	Initial response to occurrence of an event	Daily	1	-	-	-	-	-	-	-	-
		Total		19	19	19	19	19	19	7	25

\*1 Set based on the status of facilities as of March 31, 2020

\*2 Although the prototype fast breeder reactor MONJU is in the decommissioning stage, part of the inspection volume of the team inspection is accounted for the daily inspection because there is a requirement to deal with large-scale damage.

\*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

Control No.	Inspection guide name	Type	Inspection frequency (year)	Testing reactor							
				Toshiba Nuclear Critical Assembly (NCA) (decommissioning planned)	Kyoto University		Atomic Energy Research Institute, Kindai University (UTR)	Nuclear Science Research Institute			
					Kyoto University Critical Assembly (KUCA)-Institute for Integrated Radiation and Nuclear Science	Institute for Integrated Radiation and Nuclear Science (KUR)		Fast Critical Assembly (FCA)	JRR-3 (including radioactive waste processing site)	Static Experiment Critical Facility (STACY)	Nuclear Safety Research Reactor (NSRR)
BM0020	Instruction for regular operator inspections	Daily	1	4	4	4	4	4	4	4	4
BM1040	Heat sink performance	Daily	1	/	/	/	/	/	/	/	/
BM0060	Evaluation of the effectiveness of maintenance	Daily	1	1	1	3	1	1	1	1	1
BM0100	Design management	Daily	1	1	1	1	1	1	1	1	1
BM0110	Work management	Daily	1	1	1	2	1	1	1	1	1
BO0010	Surveillance test	Daily	1	1	1	4	1	1	3	1	1
BO1020	System configuration of equipment	Daily	1	/	/	/	/	/	/	/	/
BO1030	Start and shutdown of reactor	Daily	1	/	/	/	/	/	/	/	/
BO1040	Determination of operability and evaluation of functionality	Daily	1	/	/	/	/	/	/	/	/
BO0060	Fuel body management (Transportation and storage)	Daily	1	1	1	1	1	1	1	1	1
BO1070	Operator's capability	Daily	1	/	/	/	/	/	/	/	/
BO2010	Operation management	Daily	1	2	2	10	2	2	5	2	2
BO2020	Critical safety management	Daily	1	/	/	/	/	/	/	/	/
BO2030	Experiment	Daily	1	2	2	8	2	2	2	2	2
BE0010	Protection against natural disaster	Daily	1	1	1	2	1	1	1	1	1
BE0020	Fire protection	Daily	1	1	1	10	1	1	3	1	1
BE0030	Internal overflow protection	Daily	1	1	1	1	1	1	1	1	1
BE0040	Maintaining of emergency response organization	Daily	2	1	1	1	1	1	1	1	1
BE0050	Emergency preparedness and maintenance	Daily	2	1	1	1	1	1	1	1	1
BE0060	Maintaining of capacity of personnel to respond to major accidents, etc.	Daily	1	/	/	/	/	/	/	/	/
BE0090	Earthquake protection	Daily	1	1	1	2	1	1	1	1	1
BE0100	Tsunami protection	Daily	1	/	/	/	/	/	/	/	/
BR0010	Radiation exposure control	Daily	1	2	2	6	2	2	5	2	2
BR0070	Management of radioactive waste solid, etc.	Daily	1	1	1	5	1	1	2	1	1
BQ0010	Operation of quality management system (daily)	Daily	1	1	1	1	1	1	1	1	1
	Operation of quality management system (half period)	Daily	0.5	1	1	1	1	1	1	1	1
BQ0040	Verification of safety record indices	Daily	1	-	-	-	-	-	-	-	-
BQ0050	Initial response to occurrence of an event	Daily	1	—	—	—	—	—	—	—	—
		Total		24	24	63	24	24	35	24	24

\*1 Set based on the status of facilities as of March 31, 2020

\*2 Although the prototype fast breeder reactor MONJU is in the decommissioning stage, part of the inspection volume of the team inspection is accounted for the daily inspection because there is a requirement to deal with large-scale damage.

\*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.



Control No.	Inspection guide name	Type	Inspection frequency (year)	Testing reactor				Decommissioning measure			
				Nuclear Science Research Institute	Oral Research and Development Institute	Oral Research and Development Institute (north)		Tokai Reprocessing Plant, Nuclear Fuel Cycle Engineering Laboratories	Institute for Atomic Energy, Rikkyo University (no nuclear fuel materials in the plants, etc.)	Hitachi Training Reactor at Hitachi Ozeji Center (HTR) (no nuclear fuel materials in the plants, etc.)	Toshiba (TTR1) (no nuclear fuel materials in the plants, etc.)
						Toshiba Nuclear Critical Assembly (TCA) (decommissioning planned)	Experimental Fast Reactor (Joyo)				
BM0020	Instruction for regular operator inspections	Daily	1	4	4	4	4	5	1	1	1
BM1040	Heat sink performance	Daily	1	/	/	/	/	/	/	/	/
BM0060	Evaluation of the effectiveness of maintenance	Daily	1	1	1	1	1	5	1	1	1
BM0100	Design management	Daily	1	1	1	1	1	6	1	1	1
BM0110	Work management	Daily	1	1	1	1	1	4	/	/	/
BO0010	Surveillance test	Daily	1	1	3	3	3	14	/	/	/
BO1020	System configuration of equipment	Daily	1	/	/	/	/	/	/	/	/
BO1030	Start and shutdown of reactor	Daily	1	/	/	/	/	/	/	/	/
BO1040	Determination of operability and evaluation of functionality	Daily	1	/	/	/	/	/	/	/	/
BO0060	Fuel body management (Transportation and storage)	Daily	1	1	1	1	1	2	/	/	/
BO1070	Operator's capability	Daily	1	/	/	/	/	/	/	/	/
BO2010	Operation management	Daily	1	2	5	5	5	10	/	/	/
BO2020	Critical safety management	Daily	1	/	/	/	/	10	/	/	/
BO2030	Experiment	Daily	1	2	2	2	2	/	/	/	/
BE0010	Protection against natural disaster	Daily	1	1	1	1	1	4	/	/	/
BE0020	Fire protection	Daily	1	1	3	3	3	13	/	/	/
BE0030	Internal overflow protection	Daily	1	1	1	1	1	2	/	/	/
BE0040	Maintaining of emergency response organization	Daily	2	1	1	1	1	1	/	/	/
BE0050	Emergency preparedness and maintenance	Daily	2	1	1	1	1	1	/	/	/
BE0060	Maintaining of capacity of personnel to respond to major accidents, etc.	Daily	1	/	/	/	/	5	/	/	/
BE0090	Earthquake protection	Daily	1	1	1	1	1	4	/	/	/
BE0100	Tsunami protection	Daily	1	/	/	/	/	4	/	/	/
BR0010	Radiation exposure control	Daily	1	2	5	5	5	6	1	1	1
BR0070	Management of radioactive waste solid, etc.	Daily	1	1	2	2	2	3	1	1	1
BQ0010	Operation of quality management system (daily)	Daily	1	1	1	1	1	1	1	1	1
	Operation of quality management system (half period)	Daily	0.5	1	1	1	1	1	/	/	/
BQ0040	Verification of safety record indices	Daily	1	-	-	-	-	-	-	-	-
BQ0050	Initial response to occurrence of an event	Daily	1	-	-	-	-	-	-	-	-
	Total			24	35	35	35	101	6	6	6

\*1 Set based on the status of facilities as of March 31, 2020

\*2 Although the prototype fast breeder reactor MONJU is in the decommissioning stage, part of the inspection volume of the team inspection is accounted for the daily inspection because there is a requirement to deal with large-scale damage.

\*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

Control No.	Inspection guide name	Type	Inspection frequency (year)	Decommissioning measure										
				Atomic Energy Research Laboratory, Tokyo City University (no nuclear fuel materials in the plants, etc.)	Nuclear Science Research Institute			Ozmi Research and Development Institute (south)		Deuterium Critical Assembly (DCA) (no nuclear fuel materials in core)	University of Tokyo Nuclear Reactor "Yayoi" (no nuclear fuel materials in core)	First Nuclear Ship's reactor (no nuclear fuel materials in the plants, etc.)	Prototype Advanced Converter Reactor (Fugen) (no nuclear fuel materials in core)	Prototype Fast Breeder (Monju) (no nuclear fuel materials in core)
					Transient Experiment Critical Facility (TRACY) (no nuclear fuel materials in the plants, etc.)	JRR-2 (no nuclear fuel materials in the plants, etc.)	JRR-4 (no nuclear fuel materials in core)							
BM0020	Instruction for regular operator inspections	Daily	1	1	1	1	1	1	1	1	8	17		
BM1040	Heat sink performance	Daily	1	/	/	/	/	/	/	/	/	-		
BM0060	Evaluation of the effectiveness of maintenance	Daily	1	1	1	1	1	1	1	1	3	5		
BM0100	Design management	Daily	1	1	1	1	1	1	1	/	2	6		
BM0110	Work management	Daily	1	/	/	/	1	1	1	1	1	4		
BO0010	Surveillance test	Daily	1	/	/	1	1	1	1	1	2	14		
BO1020	System configuration of equipment	Daily	1	/	/	/	/	/	/	/	5	7		
BO1030	Start and shutdown of reactor	Daily	1	/	/	/	/	/	/	/	/	/		
BO1040	Determination of operability and evaluation of functionality	Daily	1	/	/	/	/	/	/	/	2	8		
BO0060	Fuel body management (Transportation and storage)	Daily	1	/	/	/	1	1	1	/	1	24		
BO1070	Operator's capability	Daily	1	/	/	/	/	/	/	/	/	-		
BO2010	Operation management	Daily	1	/	/	/	/	/	/	/	/	/		
BO2020	Critical safety management	Daily	1	/	/	/	/	/	/	/	/	/		
BO2030	Experiment	Daily	1	/	/	/	/	/	/	/	/	/		
BE0010	Protection against natural disaster	Daily	1	/	/	1	1	1	1	1	1	4		
BE0020	Fire protection	Daily	1	/	/	1	2	2	2	1	10	7		
BE0030	Internal overflow protection	Daily	1	/	/	1	1	1	1	1	1	3		
BE0040	Maintaining of emergency response organization	Daily	2	/	/	/	1	1	1	/	1	1		
BE0050	Emergency preparedness and maintenance	Daily	2	/	/	/	1	1	1	/	1	1		
BE0060	Maintaining of capacity of personnel to respond to major accidents, etc.	Daily	1	/	/	/	/	/	/	/	/	3		
BE0090	Earthquake protection	Daily	1	/	/	1	1	1	1	1	1	4		
BE0100	Tsunami protection	Daily	1	/	/	/	/	/	/	/	/	-		
BR0010	Radiation exposure control	Daily	1	1	1	1	5	2	2	1	8	11		
BR0070	Management of radioactive waste solid, etc.	Daily	1	1	1	1	2	1	1	1	4	3		
BQ0010	Operation of quality management system (daily)	Daily	1	1	1	1	1	1	1	1	1	1		
	Operation of quality management system (half period)	Daily	0.5	/	/	1	1	1	1	1	1	1		
BQ0040	Verification of safety record indices	Daily	1	-	-	-	-	-	-	-	-	-		
BQ0050	Initial response to occurrence of an event	Daily	1	-	-	-	-	-	-	-	-	-		
		Total		6	6	12	22	18	18	12	53	124		

\*1 Set based on the status of facilities as of March 31, 2020

\*2 Although the prototype fast breeder reactor MONJU is in the decommissioning stage, part of the inspection volume of the team inspection is accounted for the daily inspection because there is a requirement to deal with large-scale damage.

\*3 The number of samples may be increased or decreased at the discretion of the head of the regulatory office or the head of the team, in coordination with the overseeing department in charge, according to the condition of the facility or the application from the operator concerning the statutory verification action.

## (c) Team inspection

(As of February 10, 2021)

Fiscal year, quarter			FY2020			
			Record in first quarter	Record in second quarter	Record in third quarter	Fourth quarter
1	BM0010	Pre-service operator inspection		Kashiwazaki-Kariwa 7, Mihama 3, Ohi 3, Ohi 4, Takahama 2, Sendai 2	Kashiwazaki-Kariwa 7, Takahama 3, 4 Genkai 3, 4, Sendai 1, 2, JAEA Nuclear Science Research Institute	Response based on process information of pre-service operator inspection
2	BM1050	Inspection during operation		Ohi 3 (1)	Ohi 4 (1) Takahama 1-4 (4) Ikata 3 (1), Genkai 3 (1) Sendai 1 (1), Sendai 2 (1)	Genkai 4 (1)
3	BM0100	Design management			Takahama (1) JNFL reprocessing (1)	Genkai (1) Sendai (1)
4	BO1050	Safety of replaced core (dependent of regular inspection process)		Ohi 3 (1)	Takahama 3 (1) Genkai 3 (1) Sendai 1 (1), Sendai 2 (1) Ohi 4 (1)	Genkai 4 (1)
5	BO1070	Operator's capability (simulator training) Appropriateness for operation personnel test				All power plants (1)
6	BE1021	Fire protection (3 years)		Ikata (3) Sendai (1)	Genkai (3) (continued)	Takahama (3)
7	BE0070	Evaluation of training for personnel to respond to major accidents, etc.		Genkai (1) Sendai (1)	Mihama (2) Takahama (2) Sendai (2) Ikata (1)	Kashiwazaki-Kariwa (2) Ohi (1) Ikata (1) Genkai (1)
8	BE0080	Evaluation of scenario for drills for major accidents, etc.	Genkai (1)	Mihama (2) Sendai (2)	Kashiwazaki-Kariwa (2) Ikata (1) Takahama (2)	Ohi (1) Ikata (1) Genkai (1)
9	BR0020	Radiation exposure evaluation and personal monitoring		Kashiwazaki-Kariwa (6) Genkai (6) JAEA reprocessing (6)	Fukushima Daini (3) Hamaoka (2)	Tsuruga (1) Sendai (6)
10	BR0030	Radiation exposure ALARA activity		Kashiwazaki-Kariwa (4) Genkai (4) JAEA reprocessing (4)	Fukushima Daini (2) Hamaoka (2) Onagawa (1)	Tsuruga (1) Sendai (4)
11	BR0040	Management and reduction of radioactive material concentration in air		Kashiwazaki-Kariwa (3) JAEA reprocessing (3)	Fukushima Daini (3) Hamaoka (3) Ikata (3)	Tsuruga (3) Ohi (3), Takahama (3) Genkai (3), Sendai (3)
12	BR0050	Management of radioactive waste gas/liquid		Mihama (5) Genkai (1) JAEA reprocessing (5)	Onagawa (5) Fukushima Daini (3) Hamaoka (4) Ikata (5)	Tsuruga (3) Ohi (3), Takahama (3) Genkai (3), Sendai (3)
13	BR0070	Management of radioactive waste solid, etc.				Response based on operator's carry-out plan
14	BR0080	Radiation environment monitoring program	Ikata (3)	Mihama (3) JAEA reprocessing (3)	Onagawa (3) Fukushima Daini (4) Hamaoka (3)	Tsuruga (2) Ohi (3), Takahama (3)
15	BR0090	Radiation monitoring equipment	Ikata (3)	Mihama (3) JAEA reprocessing (3)	Onagawa (3) Fukushima Daini (3) Hamaoka (3)	Tsuruga (3) Ohi (3), Takahama (3)
16	BQ0010	Operation of quality management system		Shika (1) Ikata (1) Shimane (1) Ohma (1)	Tohoku Higashidori (1) Tokai Daini (1) Hamaoka (1)	Sendai (1) Mihama (1) Takahama (1)
17	Physical protection of nuclear material		Fukushima Daini Shika Ohi Genkai Kyoto University	Tomari Tohoku Higashidori Ohma Tokai Daini Shika Mihama Shimane Monju Fugen JNFL reprocessing JNFL MOX JNFL Waste JNFL Concentration and Burial JAEA reprocessing RFS Mitsubishi Nuclear Fuel Tokai Office, Nuclear Fuel Industries GNF-J Kumatori Office, Nuclear Fuel Industries Ningyo-toge Oarai Mitsubishi Electric Kindai University NDC Rokkasho, Nuclear Material Control Center Tokai, Nuclear Material Control Center	Tomari Onagawa Fukushima Daini Kashiwazaki-Kariwa Hamaoka Tsuruga Fugen Ohi Takahama Shimane Ikata Genkai Sendai JAEA reprocessing GNF-J Nuclear Fuel Cycle Engineering Laboratories Nuclear Science Research Institute The University of Tokyo Toshiba	Tohoku Higashidori JNFL reprocessing JNFL MOX Onagawa Tokai Daini Kashiwazaki-Kariwa Hamaoka Tsuruga Mihama Takahama Monju Ikata Sendai NFD Oarai Ohi Kumatori Office, Nuclear Fuel Industries Nuclear Fuel Cycle Engineering Laboratories

(Note 1) The above annual plan was formulated after confirming the activity plans of the operators as of January 2020. However, there are some activities for which no specific plan has been presented at this time, and the inspection plan may be changed in the future if the activity plan is changed.

(Note 2) The number in the parentheses indicates the number of samples for FY2020.

(2) Inspection Findings  
(Nuclear facility safety and radiation safety)

		Subject	Overview	Safety Significance Severity
First quarter 2020	1	Internal radiation exposure of workers due to inappropriate surface contamination density measurement at Unit 2 of Onagawa NPS	Appropriate surface contamination density measurement and radiation exposure protection measures were not implemented, resulting in unintended internal radiation exposure of workers.	Green SL IV
	2	Trip of seawater pumps due to improper maintenance at Unit 3 of Mihama NPS	The seawater pump used to remove heat from the spent fuel pits, etc. tripped automatically because the installation and operating environments were not properly considered in the maintenance plan.	Green SL IV
Second quarter 2020	3	Wears on steam generator tubes due to inadequate control of foreign objects in secondary system at Unit 3 of Takahama NPS (Legal report)	During the 24th periodic outage of Takahama NPS Unit 3, two of the three steam generators were found to have wears on two steam generators exceeding 20% from the outer surface.	Green SL IV
	4	Trip of residual heat removal system B pump due to improper operation at Unit 2 of Shimane NPS	At the Shimane NPS Unit 2, which has been shut down for a long period, the residual heat removal pump, which was cooling the spent fuel pool, tripped due to improper valve operation.	Green SL IV
	5	Inadequate fire mitigation measures due to inappropriate cable installation in the seawater pipe trench at Unit 3 of Ikata NPS	In the Ikata NPS Unit 3, a bare cable for ventilation and air conditioning system entered the cable tray that houses the control cable for the seawater pump.	Green SL IV
	6	Degraded reliability of fire detection function due to installation of detectors in inappropriate locations in the control panel room at Unit 3 of Ikata NPS	In the Ikata NPS Unit 3, an automatic fire detector (heat detector) on the ceiling of the control panel room was installed close to an air vent.	Green SL IV
	7	Inadequate measures to mitigate fire effects due to improper cable installation in a wire routing room at Unit 2 of Sendai NPS	In the Sendai NPS Unit 2, a bare safety system cable entered the cable tray that houses the safety shutdown system cable.	Green SL IV
Third quarter 2020	8	Trip of the spent fuel pool cooling and purification system pump (B) due to inadequate safety operation at Unit 6 of Kashiwazaki- Kariwa NPS	In the Kashiwazaki-Kariwa NPS Unit 6, which was shut down, the valve of the spent fuel pool cooling and purification system was opened for inspection of the drive unit, and the system flow rate temporarily increased, causing the pump (B) of the spent fuel pool cooling and purification system in operation to stop due to an interlock, and cooling of the spent fuel pool stopped.	Green SL IV
	9	Unauthorized entry into the high radiation area by temporary visitors at Tokai Daini NPS	During a plant observation of work by temporary visitors at the Tokai Daini NPS, the power station staff who guided the temporary visitors allowed them to enter the liquid waste neutralization tank room in the high radiation area without obtaining permission from the Radiation and Chemical Management Group Manager.	Green SL IV
	10	Inadequate control of employee exposure when entering high radiation areas at Unit 1 of the Shimane NPS	During a routine operator inspection of the Shimane NPS Unit 1, two inspectors of the operator entered a high radiation area, which was outside of the work area which they were permitted to enter.	Green SL IV
	11	Wear on steam generator heat transfer tubes due to scales generated by inadequate maintenance at Unit 4 of Takahama NPS	During the 23rd periodic outage of Takahama NPS Unit 4, a total of four heat transfer tubes with a wear exceeding 20% of the tube were found in two of the three steam generators (wall wearing rates of approximately 33% for A-SG, approximately 36%, approximately 25% and approximately 32% for C-SG).	Green SL IV

	Subject	Overview	Safety Significance Severity	
Fourth quarter 2020	12	Inadequate fire mitigation measures due to improper cable installation at Units 3 and 4 of Takahama NPS	As a result of lateral spread by the operator in response to inspection findings (inadequate fire mitigation measures due to inappropriate cable installation) at other operators (Ikata and Sendai), cables exposed from cable trays with fireproof bulkheads were found in 52 locations in 9 fire compartments in Unit 3 and 53 locations in 9 fire compartments in Unit 4.	Green SL IV
	13	Inadequate fire mitigation measures due to improper cable installation at Units 3 and 4 of Ohi NPS	As a result of lateral spread by the operator in response to inspection findings (inadequate fire mitigation measures due to inappropriate cable installation) at other operators (Ikata and Sendai), cables exposed from cable trays with fireproof bulkheads were found in 33 locations in 9 fire compartments in Unit 3 and 34 locations in 10 fire compartments in Unit 4.	Green SL IV
	14	Improper dust sampling of the Urasoko monitoring post at Tsuruga NPS	The dust sampler installed inside the monitoring post facility was inhaling air inside the facility when it should have been measuring radiation using air outside the facility as a sample.	Green SL IV
	15	Multiple cases of inappropriate management of entry time into the controlled area at Unit 3 of Mihama NPS	Although there were many cases of workers entering the controlled area without passing through the control gate where they registered their digital personal dosimeters with alarms, appropriate non-conformity management was not conducted at the entry control room of the controlled area.	Green SL IV
	16	Exceeding dose rate (estimate) at the boundary of the controlled area due to inappropriate storage of radioactive waste in the waste storage (A) at Takahama NPS	The dose rate measured outside the solid waste storage was higher than the control standard at the boundary of the controlled area because appropriate shielding measures were not taken for the drum cans with relatively high dose.	Green SL IV
	17	Inadequate installation of smoke detectors in the pull box in the seawater pipe trench area at Units 3 and 4 of Genkai NPS	Smoke detectors for fire prevention were not properly installed in the pull box that houses the power cables of the seawater pump.	Green SL IV

(Physical Protection of nuclear material)

	Subject	Importance Severity
First quarter	18 Establishment of the protected area around the Fukushima Daini NPS	Green SL IV
Second quarter	19 Information control at Shimane NPS	Green SL IV
	20 Information control at Recyclable-Fuel Storage Center	Findings (No additional response) SL IV
Third quarter	21 Unauthorized use of ID card at Kashiwazaki-Kariwa NPS	White SL III

Fourth quarter	22	Case of partial loss of function of physical protection equipment at Kashiwazaki-Kariwa NPS	Red SL I
	23	Physical protection of nuclear material cases at Fukushima Daini NPS, TEPCO	Green SL IV
	24	Physical Protection of nuclear material cases at Ikata NPS, Shikoku Electric Power Co., Inc.	Green SL IV
	25	Physical Protection of nuclear material cases at Hamaoka NPS, Chubu Electric Power Co., Inc.	Green SL IV
	26	Physical protection of nuclear material cases at Fukushima Daini NPS, TEPCO	Green SL IV
	27	Physical protection of nuclear material cases at Fukushima Daini NPS, TEPCO	Green SL IV

## 2. Implementation status of inspections of implementation plan pertaining to TEPCO's Fukushima Daiichi NPS

(1) Inspection plan for inspections of implementation plan (as of April 1, 2020)

In FY2020, the following inspection items were inspected in accordance with the "FY2020 Plan for Execution of Implementation Plan Inspection at TEPCO's Fukushima Daiichi NPS", which was prepared based on the "Basic Policy for the Inspection Plan at TEPCO's Fukushima Daiichi NPS in 2020."

Inspection type	Inspection item
Periodic Facility Inspection	- Equipment having the required functions during the service period of the facility, which was approved and started operation under the implementation plan, will be inspected to ensure that the equipment is in a condition to perform the required functions as specified in the implementation plan. In particular, the following facilities, etc., which were selected based on the focus of the inspection, will be designated as priority items, and inspections will be conducted by attending the inspections conducted by the operators as much as possible.
	(1) Contaminated water treatment facilities, etc. (transfer function of the stagnant water transfer pump)
	(2) Fuel removal equipment from spent fuel pool (fuel holding function of Unit 3 fuel handling machine)
	(3) Spent fuel dry cask temporary storage facility (monitoring function of area radiation monitor)
	(4) Sub-drainage and other water treatment facilities (transfer function of groundwater from sub-drainage pits)
Operational safety inspection	(5) Large equipment decontamination facility (function to maintain negative pressure in the processing room)
	(1) Decommissioning project management
	(2) Fire protection
	(3) Radiation control
	(4) Fuel management
	(5) Radioactive waste management
Physical protection inspections	(6) Other operational safety activities
	(1) System of checking trustworthiness of individuals
	(2) Drill for physical protection of nuclear material
	(3) Periodic evaluation and improvement of protective measures
	(4) Other protective measures

(2) Inspection finding of implementation plan pertaining to TEPCO's Fukushima Daiichi NPS

	Subject	Overview	Classification of violations of implementation plan	
Second quarter	1	Failure to conduct rest area surveys in large equipment maintenance buildings	The surface contamination density and the concentration of radioactive materials in the air, which should have been measured once a day to confirm that there was no contamination in the rest area, had not been measured. In addition, the operator had not confirmed the measurement results.	Minor violations (monitoring)
	2	Face contamination in rainwater control work above the turbine building of Unit 3	Failure to instruct workers to wear appropriate masks and failure to properly monitor the work environment resulted in facial contamination of the workers.	Minor violations (monitoring)
	3	Improper operation of the Unit 2 spent fuel pool skimmer surge tank water refilling operation*1	Since the operation was performed without using the procedure manual and the interlock was not excluded, the interlock was activated and the SFP primary system pump in operation stopped.	Minor violations (monitoring)
	4	Failure to receive fire signals from automatic fire alarm systems in Units 5 and 6	Due to the lack of proper design control in the equipment replacement work, the monitoring PC screen did not show "fire" when the smoke detectors were operating.	Minor violations (monitoring)
Third quarter	5	Exhaust fan stopped completely due to an error in replacing the storage media on the PCV gas management system server at Unit 1.	During the replacement of the server storage media, the emergency stop button was accidentally pressed, causing the "Unit 1 PCV gas management extraction fans all stopped" alarm to go off and all exhaust fans in operation to stop, making it impossible to monitor the various monitors in the PC gas management facility for both systems.	Minor violations (monitoring)
	6	Improper operation of the Unit 2 spent fuel pool skimmer surge tank water refilling operation*1	Since the operation was performed without using the procedure manual and the interlock was not excluded, the interlock was activated and the SFP primary system pump in operation stopped.	Minor violations (monitoring)
Fourth quarter	7	Unit 1 reactor pressure vessel thermometer misconnected	During the replacement of the Unit 1 reactor pressure vessel thermometers, one of the six thermometers was not monitored for approximately 42 hours due to a misconnection of the signal cable. The cause of this event was insufficient risk identification in advance, and the construction manual did not reflect the site conditions and accurate construction details.	Minor violations (monitoring)
	8	Face contamination in the main process building	After an employee conducted a site investigation alone in the main process building, his/her face became contaminated when he/she adjusted the position of his/her full face mask and glasses while wearing contaminated rubber gloves due to poor visibility of his/her full face mask (recorded level less than 2 mSv).	Minor violations (monitoring)
	9	Non-fire alarms in the construction of a service gate building	When a test was conducted to transfer the fire signal from the automatic fire alarm system installed in the service gate building to the receiver at the main gate guard station, the fire signal was transferred without confirming the isolation, shutdown, and guard assignment of the receiver in the entry/exit guard room as specified in the procedure manual, causing a fire signal to be issued in the entry/exit guard room. As a result, the security guard judged that a fire had broken out and reported it to the recovery team leader, but it took more than an hour for the public fire department to confirm the location of the fire signal and determine that it was a non-fire alarm because the setting of the access control room receiver was such that it could not identify the location of the fire signal transmission.	Minor violations (monitoring)

\*No inspection findings in the first quarter.

\*1 Since similar events have occurred and new factors (unestablished system) have been identified, appropriate personnel assignments, risk identification, confirmation of work procedures, analysis of factors of past nonconformities and improvement measures, and effectiveness evaluation were continuously inspected and confirmed in the third quarter. The final comprehensive evaluation was conducted based on the above.

#### 4. Status of Application and Approval for Review of Nuclear Fuel Cycle Facilities, etc.

(April 1, 2020 – March 31, 2021)

Applicant	Facility	Application date	Review Meetings (times)	On-site investigations (times)	Date of permission or approval
Japan Nuclear Fuel Ltd.	Reprocessing facility	License modification January 7, 2014 Operational safety programs change June 1, 2020 January 29, 2021 January 29, 2021 Design and construction plan*1 December 24, 2020	13	-	Permission of license modification July 29, 2020 Approval of operational safety program change September 16, 2020 March 4, 2021
	MOX fuel fabrication facility	License modification January 7, 2014 Design and construction plan*1 December 24, 2020 Operational safety program June 1, 2020	16	-	Permission of license modification December 9, 2020 Approval of operational safety program September 16, 2020
	Uranium enrichment facility	Operational safety programs change June 1, 2020 January 29, 2021 Design and construction plan December 24, 2020	4	-	Approval of operational safety program change September 16, 2020 March 4, 2021
	Waste management facility	License modification January 7, 2014 Operational safety programs change June 1, 2020 January 29, 2021 January 29, 2021	4	-	Permission of license modification August 26, 2020 Approval of operational safety program change September 16, 2020 March 4, 2021
	Waste Disposal Facility	License modification August 1, 2018 Operational safety programs change December 20, 2019 June 1, 2020 January 29, 2021	6	-	Approval of operational safety program change April 27, 2020 September 16, 2020 March 4, 2021
Recyclable-Fuel Storage Company	Spent fuel storage facility	License modification January 15, 2014 Operational safety program July 28, 2020 Design and construction plan*2 February 26, 2021	5	-	Permission of license modification November 11, 2020 Approval of operational safety program September 16, 2020
Mitsubishi Nuclear Fuel	Uranium fuel fabrication facility	Operational safety programs change September 4, 2020 February 15, 2021 Design and construction plan January 21, 2020 August 3, 2020 February 22, 2021	3	-	Approval of operational safety program January 14, 2021 March 16, 2021 Approval of design and construction plan August 5, 2020 February 25, 2021
Japan Atomic Energy Agency	JRR-3	Operational safety programs change September 26, 2014 Design and construction plan September 3, 2018 April 2, 2019 August 8, 2019 November 20, 2019 May 28, 2020	10	-	Operational safety program February 9, 2021 Approval of design and construction plan September 10, 2020 November 30, 2020 October 28, 2020 September 10, 2020 January 25, 2021



	HTRR (High-temperature engineering test reactor)	Installation change, November 26, 2014 Operational safety programs change November 26, 2014 October 17, 2018*3 Design and construction plan February 9, 2018 July 11, 2018 November 16, 2018 March 30, 2020*4	5	-	Permission of change in reactor installation June 3, 2020 Approval of design and construction plan October 26, 2020 September 9, 2020 October 19, 2020
	Radioactive Waste Treatment Facility of Nuclear Science Research Institute	Operational safety programs change July 31, 2020 Design and construction plan June 1, 2018 January 15, 2021*5 July 4, 2019 July 4, 2019	5	-	March 30, 2021 Approval of design and construction method October 26, 2020 January 25, 2021 March 5, 2021
	JMTR (Materials Testing Reactor)	Decommissioning plan September 18, 2019 Operational safety programs change July 17, 2020	3	-	Approval of decommissioning plan March 17, 2021 Approval of operational safety program change March 17, 2021
	TCA (light-water critical assembly)	Decommissioning plan April 26, 2019 Operational safety programs change November 15, 2019	2	-	Approval of decommissioning plan March 17, 2021 Approval of operational safety program change March 17, 2021
	STACY (Static Experiment Critical Facility)	Design and construction plan March 29, 2019 June 21, 2019 December 24, 2019	3	-	Approval of design and construction plan November 18, 2020 July 31, 2020
	Experimental Fast Reactor Facility	Installation change March 30, 2017	8	-	-
Nuclear Fuel Industries, Ltd	Uranium fuel fabrication facility (Tokai Works)	Operational safety programs change September 18, 2020 February 15, 2021	1	-	Approval of operational safety program change January 29, 2021 March 16, 2021
	Uranium fuel fabrication facility (Kumatori Works)	Operational safety programs change July 31, 2020 February 15, 2021 Design and construction plan December 2, 2019 August 27, 2020 February 15, 2021	2	-	Approval of operational safety program change January 29, 2021 March 16, 2021 Approval of design and construction plan October 2, 2020
Global Nuclear Fuel Japan	Uranium fuel fabrication facility	Operational safety programs change September 25, 2020	1	-	Approval of operational safety program change March 16, 2021
Kyoto University	KUR (Kyoto University Research Reactor)	Design and construction plan September 14, 2016	1	-	Approval of design and construction plan
	KUCA (Kyoto University Critical Assembly)	Installation change December 24, 2020 Design and construction plan February 8, 2021	6	-	Approval of installation change: March 30, 2021 Approval of design and construction plan March 30, 2021
Kindai University	Kindai University Nuclear Reactor	Operational safety programs change September 28, 2020	2	-	Approval of operational safety program change March 10, 2021

Toshiba Nuclear Engineering Laboratory	Toshiba Nuclear Critical Assembly (NCA)	Decommissioning plan December 23, 2019	2	-	-
Japan Atomic Power Company	Tokai Low Level Waste Disposal Facility	Business approved, July 16, 2015	1	-	-

- There is no facility that received designation or approval of business of refining facility or Category 1 waste disposal facility as of March 31, 2021.
  - The numbers of review meetings and on-site investigations represent the number of times held in FY2020
  - Several applications may be reviewed at one session of the review meeting.
  - The number of on-site investigations implemented by the members of the NRA is mentioned, and that implemented only by the staff of the secretariat of the NRA is excluded.
- \*1 The application for approval of change in design and construction plans that had been submitted was withdrawn on December 24, 2020 and reapplied for on the same date.
- \*2 The application for approval of change in design and construction plans that had been submitted was withdrawn on February 26, 2021 and reapplied for on the same date.
- \*3 The application for approval of change in security regulations, which was submitted on November 26, 2014, was withdrawn on October 17, 2018, and reapplied for on the same date.
- \*4 The application for approval of change in design and construction plans, which was submitted on March 26, 2019, was withdrawn on March 30, 2020, and reapplied for on the same date.
- \*5 The application for approval of change in design and construction plans, which was submitted on August 29, 2018, was withdrawn on January 15, 2021, and reapplied for on the same date.
- \*6 The application for approval of change in security regulations, which was submitted on September 30, 2014, was withdrawn on May 27, 2016, and reapplied for on the same date.

## 5. Numbers of Reviews and Checks of Nuclear Facilities

(April 1, 2020 – March 31, 2021)

### (1) Status of the reviews and checks of commercial power reactors

Type of facility		No. of cases
Commercial power reactors (60 plants) (Under decommissioning procedures: 14 plants) (Specified Nuclear Facility: 6 plants)	Permission of installation change	7
	Notification of installation change	63
	Approval of design and construction plan	38
	Approval of change of design and construction plan	11
	Notification of design and construction plan	3
	Extension of review period concerning the notification of design and construction plan	2
	Pass in pre-service inspection	32
	Approval of operational safety programs or approval of changes	49
	Pre-service check	12
	Notification of evaluation of safety improvement	5
	Approval of extension of the operation period	0
	Approval of change of decommissioning plan	13
	Check of method and implementation system for determining assignment of responsible facility operator	10
	Approval of the trial use of reactor	1
	Approval of partial use	3
Commercial power reactors in the research and development phase (Under decommissioning procedures: 2 facilities)	Instruction of omission of pre-service inspection	2
	Permission of installation change	0
	Notification of installation change	0
	Approval of operational safety programs or approval of changes	3
	Approval of change of decommissioning plan	1
	Notification of minor change to decommissioning plan	1

### (2) Status of reviews and checks of nuclear fuel cycle facilities, etc.

Type of facility		No. of cases
Processing facility (6 facilities) (Under construction: 1 facility)	Permission of license modification	1
	Approval of change of design and construction plan	0
	Approval of design and construction plan	3
	Pass in pre-service inspection	0
	Approval of operational safety program change	11
	Approval of operational safety program	1
	Approval of decommissioning plan	1
Research reactor facility (22 facilities) (Under decommissioning procedures: 10 facilities)	Installation change permission (Approval)	3
	Approval of a design and construction plan or approval of changes	14
	Pass in pre-service inspection	6
	Issuance of pre-use confirmation certificate	1
	Approval of partial use	1
	Approval of operational safety program or approval of changes	26
	Approval of decommissioning plan	2
	Approval of change of decommissioning plan	1
Spent Fuel Interim Storage Facility (Under construction: 1 facility)	Permission of license modification	1
	Approval of design and construction plan	0
	Approval of operational safety program	1

	Type certificate or approval of change	2
	Type certificate or approval of change	0
Reprocessing facility (2 facilities) (Under decommissioning procedures: 1 facilities)	Permission of license modification	1
	Approval of design and construction method	0
	Approval of modification of design and construction method	0
	Pass in pre-service inspection	0
	Approval of change of decommissioning plan	3
	Approval of operational safety program change	4
Category 2 waste disposal facilities (2 facilities)	Confirmation of waste package	9
	Approval of operational safety program change	3
Waste management facility (2 facilities)	Permission of license modification	1
	Approval of design and construction plan	0
	Approval of operational safety program change	4
	Approval of operational safety program	0
Facilities where nuclear fuel materials are used (11 facilities)	Approval of change of use	6
	Pass in facility inspection	2
	Issuance of pre-use confirmation certificate	1
	Approval of operational safety programs or approval of changes	19
	Approval of decommissioning plan	1
	Confirmation of decommissioning measure completion	0
Off-site disposal and transportation of nuclear fuel material, etc.	Confirmation of off-site disposal	0
	Packaging design approval	9
	Packaging approval	4
	Renewal of design approval period	9
	Renewal of vessel approval period	7
	Confirmation of off-site transportation	7
	Confirmation of radioactive concentration	2

-There is no facility that received designation or approval of business of refining facility or Category 1 waste disposal facility as of March 31, 2021

## 6. Status of Application and Approval of Operation Period Extension

Applicant	Targeted power reactor	Application date	Review meetings (times)	Date of approval	Date at which 40 years have elapsed after operation started
Kansai Electric Power Co., Inc.	Unit 1 of the Takahama NPS	April 30, 2015	-	June 20, 2016	July 7, 2016 <sup>*1</sup>
	Unit 2 of the Takahama NPS	April 30, 2015	-	June 20, 2016	July 7, 2016 <sup>*1</sup>
	Unit 3 of the Takahama NPS	November 26, 2015	-	November 16, 2016	November 30, 2016
Japan Atomic Power Company	Tokai Daini NPS	November 24, 2017	-	November 7, 2018	November 27, 2018

- Since no plant has filed an application for operation period extension, no review meeting was held in FY2019.

\*1 For commercial power reactors to which Paragraph 2 of Article 25 of Supplementary Provision of the Act for Establishment of the NRA are applied, the application period is from April 8 to July 8, 2015.

## 7. Status of Application and Approval of Change in Operational Safety Program concerning Aging Management

Applicant	Targeted power reactor	Application date	Review Meetings (times)	Date of approval	Date at which 30 years or 40 years elapse after operation started
Hokkaido Electric Power Co., Inc.	Unit 1 of the Tomari NPS (30 years) (only maintaining cold shutdown)	June 18, 2018	-*4	May 27, 2019	June 22, 2019
	Unit 2 of the Tomari NPS (30 years) (only maintaining cold shutdown)	March 19, 2020	1	December 8, 2020	April 12, 2021
Tohoku Electric Power Co., Inc.	Unit 1 of the Onagawa NPS (30 years) (only maintaining cold shutdown)	November 6, 2013	-*4	May 21, 2014	June 1, 2014
TEPCO	Unit 2 of the Fukushima Daini NPS (30 years) (only maintaining cold shutdown)	July 31, 2013	-*4	January 22, 2014	February 3, 2014
	Unit 2 of the Fukushima Daini NPS (30 years) (only maintaining cold shutdown)	October 31, 2018	-*4	January 30, 2019	_*2
	Unit 3 of the Fukushima Daini NPS (30 years) (only maintaining cold shutdown)	June 20, 2014	-*4	June 10, 2015	June 21, 2015
	Unit 4 of the Fukushima Daini NPS (30 years) (only maintaining cold shutdown)	August 23, 2016	-*4	August 16, 2017	August 25, 2017
	Unit 1 of the Kashiwazaki-Kariwa NPS (30 years) (only maintaining cold shutdown)	September 16, 2014	_*4	September 14, 2015	September 18, 2015
	Unit 2 of the Kashiwazaki-Kariwa NPS (30 years) (only maintaining cold shutdown)	September 26, 2019	-*4	August 28, 2020	September 28, 2020
	Unit 5 of the Kashiwazaki-Kariwa NPS (30 years) (only maintaining cold shutdown)	April 5, 2019	-*4	February 27, 2020	April 10, 2020
Chubu Electric Power Co., Inc.	Unit 3 of the Hamaoka NPS (30 years) (only maintaining cold shutdown)	August 25, 2016	-*4	August 16, 2017	August 28, 2017
Kansai Electric Power Co., Inc.	Unit 1 of the Takahama NPS (40 years) (only maintaining cold shutdown)	November 12, 2013	_*4	November 12, 2014	November 14, 2014
	Unit 3 of the Takahama NPS (30 years) (operation preconditioned)	January 15, 2014	-	November 18, 2015 *3	January 17, 2015
	Unit 4 of the Takahama NPS (30 years) (operation preconditioned)	June 3, 2014	-	November 18, 2015 *3	June 5, 2015
	Unit 2 of the Takahama NPS (40 years) (only maintaining cold shutdown)	November 11, 2014	-*4	April 8, 2015	November 14, 2015
	Unit 1 of the Takahama NPS (40 years) (operation preconditioned)	April 30, 2015	-	June 20, 2016	July 7, 2016*1
	Unit 2 of the Takahama NPS (40 years) (operation preconditioned)	April 30, 2015	-	June 20, 2016	July 7, 2016*1

Applicant	Targeted power reactor	Application date	Review Meetings (times)	Date of approval	Date at which 30 years or 40 years elapse after operation started
	Unit 1 of the Mihama NPS (only maintaining cold shutdown)	September 29, 2015	-*4	November 17, 2015	-*2
	Unit 3 of the Mihama NPS (40 years) (operation preconditioned)	November 26, 2015	-	November 16, 2016	November 30, 2016
	Unit 3 of the Ohi NPS (30 years) (operation preconditioned)	December 2, 2020	1	-*3	December 18, 2021
Chugoku Electric Power Co., Inc.	Unit 1 of the Shimane NPS (40 years) (only maintaining cold shutdown)	September 27, 2013	-*4	February 26, 2014	March 29, 2014
	Unit 2 of the Shimane NPS (30 years) (operation preconditioned)	February 7, 2018	-	-*3	February 20, 2019
Kyushu Electric Power Co., Inc.	Unit 1 of the Sendai NPS (30 years) (operation preconditioned)	December 18, 2013	-	August 5, 2015*3	July 4, 2014
	Unit 1 of the Genkai NPS (40 years) (only maintaining cold shutdown)	October 10, 2014	-*4	June 10, 2015	October 15, 2015
	Unit 2 of the Sendai NPS (30 years) (operation preconditioned)	November 21, 2014	-	November 18, 2015	November 28, 2015
Japan Atomic Power Company	Unit 2 of the Tsuruga NPS (30 years) (only maintaining cold shutdown)	February 15, 2016	-*4	February 2, 2017	February 17, 2017
	Tokai Daini NPS (40 years) (operation preconditioned)	November 24, 2017	-	November 7, 2018	November 27, 2018

- The numbers of review meetings represent the number of times held in FY2020.

\*1 For commercial power reactors to which Paragraph 2 of Article 25 of Supplementary Provision of the Act for Establishment of the NRA are applied, the application period is from April 8 to July 8, 2015.

\*2 The change of the long-term maintenance management policy due to the review of technical evaluation concerning the aging degradation of reactor facilities.

\*3 The review of aging management measures is implemented based on the conformity review to New Regulatory Requirements, on the basis of the policy approved in the NRA.

\*4 Based on the policy approved in the NRA, the Secretariat of the NRA performs the review of the plants to which only an evaluation on the precondition of maintenance for a cold shutdown is performed and reports the results to the NRA to seek the approval. From June 11, 2015, they will be operated in accordance with the NRA Document Management Procedures (September 19, 2012) based on discussions at the NRA Commission Meeting held on June 10, 2015.

## 8. Status of Application and Approval of Decommissioning Plans

Type of facility	Applicant	Facility	Receipt date	Date of approval
Processing facility (1 facility)	Japan Atomic Energy Agency (JAEA)	Ningyo-toge Environmental Engineering Center	September 28, 2018	January 20, 2021
Research reactor facility (Under decommissioning procedures: 10 facilities)	Japan Atomic Energy Agency (JAEA)	Nuclear Science Research Institute JRR-2	May 12, 2006	November 6, 2006
		Nuclear Science Research Institute JRR-4	December 25, 2015	June 7, 2017
		Transient Experiment Critical Facility (TRACY), Nuclear Science Research Institute	March 31, 2015	June 7, 2017

Type of facility	Applicant	Facility	Receipt date	Date of approval
		Tank-type critical assembly (TCA), Nuclear Science Research Institute	April 26, 2019	March 17, 2021
		Deuterium Critical Assembly (DCA), Oarai Science Institute	May 12, 2006.	October 20, 2006
		Japan Materials Test Reactor (JMTR), Oarai Science Institute	September 18, 2019	March 17, 2021
		First Nuclear Ship "Mutsu," Aomori Research and Development Center	March 31, 2006	October 20, 2006
	University of Tokyo	University of Tokyo Reactor (Yayoi), Nuclear Professional School, the University of Tokyo	June 29, 2012	August 24, 2012
	Rikkyo University	Rikkyo University Reactor, Institute for Atomic Energy, Rikkyo University	May 30, 2006	June 1, 2007
	Goto Educational Corporation	TCU Reactor, Atomic Energy Research Laboratory, Tokyo City University	May 30, 2006	June 5, 2007
	Hitachi Ozenji Center	Hitachi Training Reactor (HTR)	May 31, 2006	April 20, 2007
	Toshiba Nuclear Engineering Laboratory	Toshiba Nuclear Critical Assembly (NCA)	December 23, 2019	-
		Toshiba Training Reactor (TTR-1)	March 31, 2006	May 22, 2007
Commercial power reactors (Under decommissioning procedures: 13 facilities)	Japan Atomic Power Company	Tokai NPS	March 10, 2006	June 30, 2006
		Unit 1 of the Tsuruga NPS	February 12, 2016	April 19, 2017
	Tohoku Electric Power Co., Inc.	Unit 1 of the Onagawa NPS	July 29, 2019	March 18, 2020
	Tokyo Electric Power Company Holdings, Inc.	Units 1, 2, 3, and 4 of the Fukushima Daini NPS	May 29, 2020	-
	Chubu Electric Power Co., Inc.	Units 1 and 2 of the Hamaoka NPS	June 1, 2009	November 18, 2009
	Kyushu Electric Power Co., Inc.	Unit 1 of the Genkai NPS	December 22, 2015	April 19, 2017
		Unit 2 of the Genkai NPS	September 3, 2019	March 18, 2020
	Kansai Electric Power Co., Inc.	Units 1 and 2 of the Mihama NPS	February 12, 2016	April 19, 2017
		Units 1 and 2 of the Ohi NPS	December 11, 2019	February 26, 2020
	Chugoku Electric Power Co., Inc.	Unit 1 of the Shimane NPS	July 4, 2016	April 19, 2017
Shikoku Electric Power Co., Inc.	Unit 1 of the Ikata NPS	December 26, 2016	June 28, 2017	
	Unit 2 of the Ikata NPS	October 10, 2018	October 7, 2020	
Commercial power reactors in the research and development phase (Under decommissioning procedures: 2 facilities)	Japan Atomic Energy Agency (JAEA)	Prototype Advanced Converter Reactor	November 7, 2006	February 12, 2008
		Prototype Fast Breeder Reactor Monju	December 6, 2017	March 28, 2018
Reprocessing Facility		Reprocessing Facility, Nuclear Fuel Cycle Engineering Laboratories	June 30, 2017	June 13, 2018

**Reference 4 Materials related to the promotion of safety research and continuous improvement of regulatory standards (related to Section 2 in Chapter 2)**

**1. FY2020 Safety Research**

No.	Research area	Project	Period
1	External events	Research on advancement of methods for near-source seismic hazard assessment	FY2020-FY2023
2		Research on reliability improvement for tsunami hazard assessment	FY2017-FY2020
3		Study on evaluating the activity of faults	FY2020-FY2023
4		Research for accumulating knowledge of large-scale eruption process	FY2019-FY2023
5		Research on fragilities of facilities and equipment related to earthquakes, tsunamis and other external events	FY2017-FY2020
6	Fire protection	Research on fire hazard analysis for protection of nuclear power stations	FY2017-FY2020
7	Human and organizational factors	Regulatory research for systematic analysis of human and organizational factors based on human factors engineering	FY2019-FY2022
8	Risk evaluation	Development of PRA methods and their application to regulation	FY2017-FY2021
9	Severe accident (LWR)	Experiments for reduction on uncertainty of important physicochemical phenomena under a severe accident conditions	FY2020-FY2025
10		Development of simulation codes for physicochemical phenomena including large uncertainties under severe accident conditions	FY2017-FY2022
11		Development of analysis methodologies for the containment failure and probabilistic risk assessment associated with severe accident conditions	FY2017-FY2022
12	Neutronic and thermal-hydraulic characteristics	Study on best-estimate thermal-hydraulic evaluation for nuclear power plants	FY2019-FY2022
13	Nuclear fuel	Research on fuel integrity for advancement of regulation	FY2007-FY2020
14		Evaluation study on fuel failure impact on reactor core coolability under accident conditions	FY2019-FY2023
15	Materials and structures (including aging degradation)	Research on ultimate endurance evaluation of containments in severe accident conditions	FY2017-FY2021
16		Research on aging degradation assessment and verification using the equipment and materials used in nuclear power plants	FY2020-FY2024
17	Specified Nuclear Facilities	Development of a database and evaluation methodology for criticality of fuel debris at Fukushima Daiichi Nuclear Power Plants	FY2014-FY2021
18	Fuel cycle facilities	Study on risk assessment methods for internal fire and other events in nuclear fuel fabrication and reprocessing facilities	FY2017-FY2020
19		Research on evaluation methods relating to the latest analysis techniques in the areas of transportation and storage of spent fuel	FY2020-FY2023
20	Radioactive waste disposal facilities	Study on survey methods for long-term natural phenomena influencing radioactive waste disposal and assessment methods for long-term evolution of barrier performance	FY2017-FY2020
21	Decommissioning and clearance	Study on activity concentration evaluation for radioactive wastes	FY2017-FY2020



22	Nuclear emergency response, radiation control and regulation	“Radiation Safety Research Promotion Project”	FY2017-
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## 2. Publication in journals and list of publications

No.	Category	Paper titles, etc.
1	Publication in journals	Hashikura, Y. et al., "Consideration on stress corrosion cracking evaluation of zirconium for fuel reprocessing facilities", Journal of Japan Society of Maintenology, Vol. 19, No. 3, 2020 (in Japanese).
2		Azuma, K., et al., "Effects of crack closure on the fatigue crack growth rates of ferritic steels subjected to severe reversing loads", Journal of Pressure Vessel Technology, Vol. 142, No. 6, 061503, 2020.
3		Kaneko, J. et al., "Analytical functions and development status of the system analysis code for nuclear power plants, AMAGI", Japanese Journal of Atomic Energy Society of Japan, Vol. 19, No. 3, pp. 163-177, 2020 (in Japanese).
4		Kitano, K., et al., "Analysis of stress applied to a ruptured cladding tube under horizontal vibration", Journal of Nuclear Science and Technology, Vol. 57, No. 9, pp. 1051-1061, 2020.
5		Minakawa, T., et al., "Degradation of cables insulated with silicone rubber for nuclear power plants by aqueous solution of NaOH sprayed during a severe accident", IEEJ Transactions on Fundamentals and Materials, Vol. 140, No. 9, pp. 457-463, 2020 (in Japanese).
6		Ozawa, M. et al., "Status of investigation to ensure applicability of ECCS acceptance criteria to high burnup fuel", Trans. At. Energy Soc. Jpn., Vol. 19, No. 4, pp. 185-200, 2020 (in Japanese).
7		Hata. K., et al., "Grain-boundary phosphorus segregation in highly neutron-irradiated reactor pressure vessel steels and its effect on irradiation embrittlement", Journal of Nuclear Materials, Vol. 543, 152564, 2021.
8		Okawa, T., "Application of Three Dimensional Detailed Geometry to Simulation of Melt Progression in an Intricate BWR Lower Head", Annals of Nuclear Energy, Vol. 153, 108065, 2021.
9		Ishizu, T., et al., "Development of a Simple Model for Estimating the Design Limit of Core Void Reactivity to Prevent Re-criticality of MOX-Fueled Cores in Liquid Metal-Cooled Fast Reactors", Nuclear Engineering and Design, Vol. 374, 111045, 2021.
10		Kaneko, J., et al., "Validation of Mechanistic Dryout and Rewetting Model Based on the Three-Field Model with Single-Tube Experiments", Journal of Nuclear Science and Technology, 2021. <a href="https://doi.org/10.1080/00223131.2021.1892551">https://doi.org/10.1080/00223131.2021.1892551</a>
11		Aoki, H. et al., "Performance based regulatory requirements for radioactive waste and waste acceptance criteria", Journal of Nuclear Fuel Cycle and Environment., Vol.27, No.2, pp.94-103, 2020 (in Japanese)
12		Sakai, H., et al., "Evaluation of the detection limit of net count in peak for the energy spectrum of CZT detector", Applied Radiation and Isotopes, Vol. 169, 109569, 2021
13		Sakai, H., et al., "Derivation of uncertainty propagation for clearance measurement", Applied Radiation and Isotopes, Vol. 170, 109630, 2021.
14		Yamamoto, K., et al, "In situ isotopic analysis of uranium using a new data acquisition protocol for 10 <sup>13</sup> ohm Faraday amplifiers", Journal of Analytical Atomic Spectrometry, Vol. 36, pp. 668-675, 2021.
15		Kobayashi, G. et al., "Basic study on the cases of cut-off frequency fmax of earthquakes (Part 3) -Evaluation of bedrock ground motion using the stochastic Green's function method considering the bedrock characteristics of the observation site", Proc. of the Japan Association for Earthquake Engineering, Vol.20, No.6, pp.6 41-6 64, 2020 (in Japanese).
16		Ota, Y. et al, "A study on local damage evaluation of reinforced concrete plate subjected to rigid flying object impact," Annual Proc. of Japan Concrete Institute, Vol.42, No.2, pp.571-576, 2020 (in Japanese).

No.	Category	Paper titles, etc.
17		Sato, T. etc., "Reproducibility of the characterized models for sources of tsunamis arising from interplate earthquakes of magnitudes up to Mw8.8," Proc. of JSCE B2 (Coastal Engineering), Vol. 76, No. 2, pp. I_337-I_342, 2020 (in Japanese).
18		Taoka, H. et al., "Examination and analysis of the water tightness of watertight doors in nuclear facilities (Water tightness of the watertight doors beyond design conditions)," Proc. of the Japan Society of Mechanical Engineers, Vol. 86, No. 892, pp. 20-00045, 2020 (in Japanese).
19		Sugino, E. et al, "Generating artificial tsunami waveforms using statistical method," Proc. of Japan Association for Earthquake Engineering, Vol. 21, No. 1, pp. 1-24, 2021 (in Japanese).
20		Matsu'ura, T., et al, "Late Quaternary tephrostratigraphy and cryptotephrostratigraphy of core MD012422: Improving marine tephrostratigraphy of the NW Pacific", Quaternary Science Reviews, Vol. 257, 2021. <a href="https://doi.org/10.1016/j.quascirev.2021.106808">https://doi.org/10.1016/j.quascirev.2021.106808</a>
21	Publication of papers at international conferences	Watanabe, A., et al, "Insulation Performance of Safety-Related Electrical Penetrations for Pressurized Water Reactors under Simulated Severe Accident Conditions", Proceedings of 9th International Symposium on Electrical Insulating Materials (ISEIM2020), 2020.
22		Kojo, R., et al, "Analytical Approach to Measurement of Local and Bulk Temperatures under High Temperature Accident Sequences of BWRs", Proceedings of OECD/NEA SAMMI-2020 Specialist Workshop, online, 2020.
23		Toriyama, T., et al, "A Method for Evaluating Tsunami Loading on Seawalls during Overflow", Proceedings of virtual international conference on costal engineering (VICCE2020), online, 2020.

-List of "Received two awards from the Atomic Energy Society of Japan for outstanding academic achievements in safety research" (one Paper Award from the Atomic Energy Society of Japan and one Performance Award from the Thermal-Hydraulic Division of the Atomic Energy Society of Japan).

No.	Name of award	Award winner
1	53rd Paper Award from the Atomic Energy Society of Japan	Yamauchi Akihiro, Researcher, Division of Research for Reactor System Safety, Regulatory Standard and Research Department
2	32nd Performance Award from the Thermal-Hydraulic Division of the Atomic Energy Society of Japan	Hoshi Harutaka, Chief Researcher, Division of Research for Severe Accident, Regulatory Standard and Research Department

**Reference 5 Materials related to Promotion of Nuclear Security (related to Section 1 in Chapter 3)**

**1. Approval and Inspection for Security Plans**

(April 1, 2020 – March 31, 2021)

Approvals of changes of the security plan	72 (breakdown) Uranium Fuel Fabrication Facility: 4 Research and Test Reactor: 6 Commercial Power Reactor: 49 Power Reactor in a Research and Development Phase: 1 Spent Fuel Storage Facility: 1 Reprocessing Facility: 2 Radioactive Waste Interim Storage Facility: 0 Facilities using nuclear fuel: 9
Approval of implementation plan	Specified Nuclear Facility: 3
Inspection of compliance with the security plan (Security inspections)	79 (breakdown) Uranium Fuel Fabrication Facility: 10 Research and Test Reactor: 7 Commercial Power Reactor: 37 Power Reactor in a Research and Development Phase: 3 Spent Fuel Storage Facility: 1 Reprocessing Facility: 4 Radioactive Waste Interim Storage Facility: 2 Facilities using nuclear fuel: 15
Inspection of compliance with the implementation plan	Specified Nuclear Facility: 3

**Reference 6 Materials related to Oversight of Efforts toward the Decommissioning of Reactors at TEPCO’s Fukushima Daiichi NPS (related to Section 1 in Chapter 4)**

**1. Approval and Inspection for Specified Nuclear Facilities (TEPCO Fukushima Daiichi NPS)**

(April 1, 2020 – March 31, 2021)

Type of Approval/Inspection	No. of cases
Approval of changes in the Implementation Plan	21
Completion of pre-service inspection	27
Approval of test use	0
Approval of partial use	1
Instruction of omission of pre-service inspection	0
Completion of welding inspection	8
Completion of welding inspection for imports	2
Completion of periodic facility inspection	1
Operational safety inspection	4

**Reference 7 Materials related to Implementation and Continuous Improvement of Regulations relating to the Radioisotope Regulation Act (related to Section 2 in Chapter 5)**

**1. Status of Reviews and Inspections under the Radioisotope Regulation Act**

(April 1, 2020 – March 31, 2021)

(1) Review

Operator	Type of permissions and notifications	No. Of cases
Permission users (Number of offices: 2128)	Permission (approval) of use	20
	Permission (approval) for change in permission of use	241
	Notification of discontinuation of use, etc.	50
Notification users (Number of offices: 442)	Notification of use	10
	Notification of change for notification of use	33
	Notification of discontinuation of use, etc.	28
Notification users of approved devices with a certification label (Number of offices: 5016)	Notification of use of approved devices with certification label	751
	Notification of change concerning use of approved devices with certification label	691
	Notification of discontinuation of use, etc.	725
Notification sellers (Number of offices: 322)	Notification of selling business	19
	Notification of change for notification of selling business	42
	Notification of discontinuation of selling, etc.	7
Notification lessors (Number of offices: 159)	Notification of lessor business	3
	Notification of change for notification of lessor business	24
	Notification of discontinuation of leasing, etc.	2
Permission waste management operators (Number of offices: 7)	Permission (approval) of managing waste	0
	Permission of change for managing waste	3
	Notification of discontinuation of use, etc.	0
Off-site transport of radioisotopes	Approval of a containers to be transported	0
Registered organizations (Number of registered organizations: 19)	Registration	0
	Renewal of registration	14
	Approval and notifications of operational rules	2
	Approval and notifications of change in operational rules	21

(2) Inspection

Users with permit notifications	On-site inspection for safety	5
	On-site inspection for security of specific radioisotopes	57
Registered organizations	On-site inspection pertaining to implementation status of registered organization's operation	0

## **Reference 8 Activities of Committees, Councils, Review Meetings, Study Teams, etc.**

\* Meeting records as of the end of FY2020

### 1. Committees and Councils

- (1) Reactor Safety Examination Committee
- (2) Nuclear Fuel Safety Examination Committee
- (3) Joint Review Meetings of the Reactor Safety Examination Committee and the Nuclear Fuel Safety Examination Committee
- (4) Radiation Council
- (5) National Research and Development Agency Council

### 2. Review Meetings

- (1) Review Meeting on Conformity to the New Regulatory Standards
- (2) Review Meeting on Decommissioning of Nuclear Facilities
- (3) Review Meeting on Clearance
- (4) Review Meeting on Container for Transportation and Specified Container for Spent Fuel Facilities
- (5) Review Meeting on Type Certification, etc. of Specific Dual-Use Cask Design

### 3. Study Teams

- (1) Technical Study Team on Environmental Radiation Monitoring
- (2) Safety Oversight Team for the Tokai Reprocessing Plant
- (3) Safety Oversight Team for Prototype Fast Breeder Reactor Monju Decommission
- (4) Study Team on Seismic Isolation of Buildings and Structures
- (5) Study Team for Technical Evaluation of Method of Checking Reactor Pressure Vessel Fracture Toughness during Service Period
- (6) Study Team on Technical Evaluation of the Standards of the Japan Electrical Manufacturers Association (JEMA) for Eddy Current Testing, Ultrasonic Testing and Leakage Testing
- (7) Study Team on Measures against Common Cause Failure of Digital Safety Protection Systems in Nuclear Power Reactor Facilities
- (8) Study Team on Continuous Improvement of Safety
- (9) Study Team on Thyroid Dose Monitoring in Emergencies

### 4. Committees for Specific Research and Study

- (1) Committee on Oversight and Evaluation of Specified Nuclear Facilities
- (2) Committee on Accident Analysis of the Fukushima Daiichi Nuclear Power Station
- (3) Fukushima Daiichi NPS Decommissioning and Accident Investigation Liaison and Coordination Meeting
- (4) Technical Information Committee
- (5) Technical Evaluation Committees

### 5. Others

- (1) NRA Policy Evaluation Meeting
- (2) Meeting on NRA's Administrative Project Review for FY2020
- (3) Meeting on Hearing Opinions of Operators regarding New Regulatory Requirements
- (4) Meeting on Continuous Improvement of Safety Evaluation of Commercial Power Reactors
- (5) Public Meeting on Inspections for Commercial Power Reactor
- (6) Working-Level Exchange of Technical Views
- (7) Promotion Committee, Research Evaluation Committee, and Debriefing Session of Research Results
- (8) Public Meeting on Response to Accidents and Troublesome Events at Nuclear Facilities
- (9) Debriefing Session of Emergency Drills by Nuclear Operators
- (10) Meeting for Reviewing the Emergency Action Level (EAL) and Others

## 1. Committees and Councils

### (1) Reactor Safety Examination Committee

#### Overview

The Reactor Safety Examination Committee (RSEC) was established to investigate and deliberate matters relating to reactor safety upon request of the NRA in accordance with the Act for Establishment of the Nuclear Regulation Authority. Taking into account the House of Councilors' resolution added to the Act for Establishment of the Nuclear Regulation Authority, the RSEC's investigations are intended to provide objective advice for the NRA's decisions, but without substitutions for such decisions. The RSEC is also expected to check the effectiveness of the regulatory activities by the NRA and advice on their activities from a scientific and technical point of view while maintaining independence from the NRA.

At the 41st FY2013 NRA Commission Meeting on February 5, 2014, the NRA adopted RSEC establishment policies based on the Act for Establishment of NRA. Based on the policy, RSEC held its first examination meeting on May 12 the same year. It has been holding RSEC meetings regularly since then.

New items for investigation and deliberation were decided at the 9th FY2020 NRA Commission Meeting (June 10, 2020) and the 28th FY2020 NRA Commission Meeting (September 30, 2020). Subsequently, at the 21st RSEC meeting (December 15, 2020), the Subcommittee on Earthquake and Tsunami Hazard was newly established. The name of the Subcommittee on Volcano Monitoring was changed to the Subcommittee on Volcanic Hazards. Changes were made to the work under the jurisdiction of the Reactor Safety Subcommittee, and items for investigation and deliberation were assigned to each subcommittee. (Items to be investigated and deliberated and subcommittees to which the items were assigned are as shown in the table of items to be investigated and deliberated in (3)).

In FY2020, the RSEC held two meetings and the Subcommittee on Volcano Monitoring held a meeting. At the 50th NRA of FY2020 (January 20, 2021), the status of the deliberations at the 21st RSEC meeting was reported.

#### Members of the Committee

Examination Commissioners	Uchiyama Mayuki	Professor, Department of Radiology, Jikei University School of Medicine
	Oigawa Hiroyuki	Vice Division Director and Director of Nuclear Science Research Institute, Nuclear Science Division, Japan Atomic Energy Agency
	Ogawa Yasuo	Professor, Volcanic Fluid Research Center, Tokyo Institute of Technology Director of the Center
	Katsuta Tadahiro	Professor, School of Law, Meiji University

	Kanda Reiko	Vice Director, Advanced Radiation Emergency Medical Support Center, National Institutes for Quantum and Radiological Science and Technology Director, Center for Radiation Protection Knowledge, National Institute of Radiological Sciences
	Sekimura Naoto ©	Vice-President, the University of Tokyo Professor, Nuclear Engineering and Management, Graduate School of Engineering, the University of Tokyo
	Takada Tsuyoshi	Head, Office for Promotion of Risk-informed Applications, Sector of Nuclear Safety Research and Emergency Preparedness Japan Atomic Energy Agency
	Takahashi Makoto	Professor, Technology and Social Systems, School of Engineering, Tohoku University
	Nagai Kousuke	Professor, Institute for Materials Research, Tohoku University Director of the affiliated International Research Center for Nuclear Materials Science
	Nakagawa Toshiko	Professor emeritus, Tokyo City University
	Nakajima Ken	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Hisada Yoshiaki	Professor, Department of Urban Design and Planning, School of Architecture, Kogakuin University
	Hohara Shinya	Associate Professor, Atomic Energy Research Institute, Kindai University
	Matsuo Akiko	Professor, Faculty of Science and Technology, Keio University
	Maruyama Yu	Deputy Director, Nuclear Safety Research Center, Sector of Nuclear Safety Research and Emergency Preparedness, Japan Atomic Energy Agency (JAEA)
	Miyamachi Hiroki	Professor, Research Field in Science, Science and Engineering Area, Research and Education Assembly, Kagoshima University
	Matsumura Ken	Affiliate Professor, Faculty of Engineering, Tokyo City University
	Yamaoka Koshun	Professor, Graduate School of Environmental Studies, Nagoya University, Tokai National Higher Education and Research System
	Yoshida Hiroko	Associate Professor, Graduate School of Pharmacy, Tohoku University
	Yoshihashi Sachiko	Associate Professor, Faculty for Nuclear Materials, Nagoya University, Tokai National Higher Education and Research System
	Yoneoka Yuko	Former Executive Director and Director General, Japan Accreditation Board
Temporary commissioners	Okuno Tsutomu	Professor, Department of Earth System Science, Faculty of Science, Fukuoka University
	Takahashi Tomoyuki	Management Council Member, Kansai University Professor, Faculty of Societal Safety Sciences, Kansai University
	Takahashi Hiroaki	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Tanioka Yuichiro	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Tohda Shinji	Professor, International Research Institute of Disaster Science, Tohoku University
	Miyake Hiroe	Associate Professor, Earthquake Research Institute, The University of Tokyo
Expert commissioners	Azuma Takashi	Senior Researcher, Active Fault Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology
	Ueda Hideki	Senior Researcher, National Research Institute for Earth Science and Disaster Resilience Head, Volcano Observation Network Laboratory, Network Center for Earthquake, Tsunami and Volcano, National Research Institute for Earth Science and Disaster Resilience
	Tanaka Akiko	Director, Magmatic Activity Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

\* Double circle © indicates chairperson.



### Members of the Subcommittee on Earthquake and Tsunami Hazards

Examination commissioners	Hisada Yoshiaki	Professor, Department of Urban Design and Planning, School of Architecture, Kogakuin University
	Yamaoka Koshun◎	Professor, Graduate School of Environmental Studies, Nagoya University, Tokai National Higher Education and Research System
Temporary commissioners	Takahashi Tomoyuki	Management Council Member, Kansai University Professor, Faculty of Societal Safety Sciences, Kansai University
	Tanioka Yuichiro	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Toda Shinji	Professor, International Research Institute of Disaster Science, Tohoku University
	Miyake Hiroe	Associate Professor, Earthquake Research Institute, The University of Tokyo
Expert commissioners	Azuma Takashi	Senior Researcher, Active Fault Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

\* Double circle ◎ indicates chairperson.

### Members of the Subcommittee on Volcanic Hazards

Examination commissioners	Ogawa Yasuo◎	Professor and Center Director, Volcanic Fluid Research Center, Tokyo Institute of Technology
	Miyamachi Hiroki	Professor, Research Field in Science, Science and Engineering Area, Research and Education Assembly, Kagoshima University
Temporary commissioners	Okuno Tsutomu	Professor, Department of Earth System Science, Faculty of Science, Fukuoka University
	Takahashi Hiroaki	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
Expert commissioners	Ueda Hideki	Senior Researcher, National Research Institute for Earth Science and Disaster Resilience Head, Volcano Observation Network Laboratory, Network Center for Earthquake, Tsunami and Volcano, National Research Institute for Earth Science and Disaster Resilience
	Tanaka Akiko	Director, Magmatic Activity Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

\* Double circle ◎ indicates chairperson.

## Members of the Subcommittee on Reactor Safety Fundamentals

Examination commissioners	Uchiyama Mayuki	Professor, Department of Radiology, Jikei University School of Medicine
	Oigawa Hiroyuki	Deputy Head, Nuclear Science Department, Japan Atomic Energy Agency (JAEA) Director, Nuclear Science Institute, JAEA
	Katsuta Tadahiro	Professor, School of Law, Meiji University
	Kanda Reiko	Vice Director, Advanced Radiation Emergency Medical Support Center, National Institutes for Quantum and Radiological Science and Technology Director, Center for Radiation Protection Knowledge, National Institute of Radiological Sciences
	Sekimura Naoto◎	Vice-President, the University of Tokyo Professor, Nuclear Engineering and Management, Graduate School of Engineering, the University of Tokyo
	Takada Tsuyoshi	Head, Office for Promotion of Risk-informed Applications, Sector of Nuclear Safety Research and Emergency Preparedness Japan Atomic Energy Agency
	Takahashi Makoto	Professor, Technology and Social Systems, Graduate School of Engineering, Tohoku University
	Nagai Kousuke	Professor, Institute for Materials Research, Tohoku University Director of the affiliated International Research Center for Nuclear Materials Science
	Nakagawa Toshiko	Professor emeritus, Tokyo City University
	Nakajima Ken	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Hohara Shinya	Associate Professor, Atomic Energy Research Institute, Kindai University
	Matsuo Akiko	Professor, Faculty of Science and Technology, Keio University
	Maruyama Yu	Deputy Director, Nuclear Safety Research Center, Sector of Nuclear Safety Research and Emergency Preparedness, Japan Atomic Energy Agency
	Matsumura Ken	Affiliate Professor, Faculty of Engineering, Tokyo City University
	Yoshida Hiroko	Associate Professor, Graduate School of Pharmacy, Tohoku University
	Yoshihashi Sachiko	Associate Professor, Facility for Nuclear Materials, Nagoya University, Tokai National Higher Education and Research System
Yoneoka Yuko	Former Executive Director and Director General, Japan Accreditation Board	

\* Double circle ◎ indicates chairperson.

## (2) Nuclear Fuel Safety Examination Committee

### Outlines

The Nuclear Fuel Safety Examination Committee (NFSEC) was established based on the Act for Establishment of the Nuclear Regulation Authority to investigate and deliberate matters related to nuclear fuel safety upon direction by the NRA. Taking into account the House of Councilors' resolution added to the Act for Establishment of the Nuclear Regulation Authority, the NFSEC's investigations and deliberations are intended to provide objective advice for the NRA's decisions, but without substitutions for such decisions. The NFSEC is also expected to check the effectiveness of the regulatory activities by the NRA and advice on their activities from a scientific and technical point of view while maintaining independence from the NRA.

At the 41st FY2013 NRA Commission Meeting on February 5, 2014, the NRA adopted NFSEC establishment policies based on the Act for Establishment of

NRA. Based on the policy, RSEC held its first examination meeting on May 12 the same year, and has been holding NFSEC meetings regularly since then.

New items for investigation and deliberation were decided at the 9th FY2020 NRA Commission Meeting (June 10, 2020) and the 28th FY2020 NRA Commission Meeting (September 30, 2020). Subsequently, at the 27th NFSEC (December 15, 2020), the Subcommittee on Earthquake and Tsunami Hazards, the Subcommittee on Volcanic Hazards, and the Basic Subcommittee on Nuclear Fuel Safety were newly established, and matters for investigation and deliberation were transferred to each subcommittee. (Items to be investigated and deliberated and subcommittees to which the items were assigned are as shown in the table of items to be investigated and deliberated in (3)).

In FY2020, the NFSEC held two meetings. At the 50th NRA of FY2020 (January 20, 2021), the status of the deliberations at the 27th RSEC meeting was reported.

### Members of the Committee

Examination Commissioners	Unesaki Hironobu	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Enokida Yoichi	Professor, Graduate School of Engineering, Nagoya University, Tokai National Higher Education and Research System
	Ogawa Yasuo	Professor and Center Director, Volcanic Fluid Research Center, Tokyo Institute of Technology Director of the Center
	Katsuta Tadahiro	Professor, School of Law, Meiji University
	Kirishima Akira	Professor, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University
	Kurosaki Ken	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Sumi Minako	Head, Radiation Oncology Department, Tokyo Metropolitan Geriatric Medical Center
	Takagi Ikuji	Professor, Graduate School of Engineering, Kyoto University
	Takada Tsuyoshi	Head, Office for Promotion of Risk-informed Applications, Sector of Nuclear Safety Research and Emergency Preparedness Japan Atomic Energy Agency
	Nakamura Takehiko	Head, Nuclear Safety Research Center, Sector of Nuclear Safety Research and Emergency Preparedness Japan Atomic Energy Agency
	Hisada Yoshiaki	Professor, Department of Urban Design and Planning, School of Architecture, Kogakuin University
	Matsuo Akiko	Professor, Faculty of Science and Technology, Keio University
	Miyamachi Hiroki	Professor, Research Field in Science, Science and Engineering Area, Research and Education Assembly, Kagoshima University
	Yamamoto Akio©	Professor, Graduate School of Engineering, Nagoya University, Tokai National Higher Education and Research System
	Yamaoka Koshun	Professor, Graduate School of Environmental Studies, Nagoya University, Tokai National Higher Education and Research System
	Yoshida Hiroko	Associate Professor, Graduate School of Pharmacy, Tohoku University
Yoshihashi Sachiko	Associate Professor, Facility for Nuclear Materials, Nagoya University, Tokai National Higher Education and Research System	
Temporary commissioners	Okuno Tsutomu	Professor, Department of Earth System Science, Faculty of Science, Fukuoka University
	Takahashi Tomoyuki	Management Council Member, Kansai University Professor, Faculty of Societal Safety Sciences, Kansai University
	Takahashi Hiroaki	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University

	Tanioka Yuichiro	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Toda Shinji	Professor, International Research Institute of Disaster Science, Tohoku University
	Miyake Hiroe	Associate Professor, Earthquake Research Institute, The University of Tokyo
Expert commissioners	Azuma Takashi	Senior Researcher, Active Fault Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology
	Ueda Hideki	Senior Researcher, National Research Institute for Earth Science and Disaster Resilience Head, Volcano Observation Network Laboratory, Network Center for Earthquake, Tsunami and Volcano, National Research Institute for Earth Science and Disaster Resilience
	Tanaka Akiko	Director, Magmatic Activity Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

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### Members of the Subcommittee on Earthquake and Tsunami Hazards

Examination commissioners	Hisada Yoshiaki	Professor, Department of Urban Design and Planning, School of Architecture, Kogakuin University
	Yamaoka Koshun©	Professor, Graduate School of Environmental Studies, Nagoya University, Tokai National Higher Education and Research System
Temporary commissioners	Takahashi Tomoyuki	Management Council Member, Kansai University Professor, Faculty of Societal Safety Sciences, Kansai University
	Tanioka Yuichiro	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
	Toda Shinji	Professor, International Research Institute of Disaster Science, Tohoku University
	Miyake Hiroe	Associate Professor, Earthquake Research Institute, The University of Tokyo
Expert commissioners	Azuma Takashi	Senior Researcher, Active Fault Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

\* Double circle © indicates chairperson.

### Members of the Subcommittee on Volcanic Hazards

Examination commissioners	Ogawa Yasuo©	Professor, Volcanic Fluid Research Center, Tokyo Institute of Technology Director of the Center
	Miyamachi Hiroki	Professor, Research Field in Science, Science and Engineering Area, Research and Education Assembly, Kagoshima University
Temporary commissioners	Okuno Tsutomu	Professor, Department of Earth System Science, Faculty of Science, Fukuoka University
	Takahashi Hiroaki	Professor, Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University
Expert commissioners	Ueda Hideki	Senior Researcher, National Research Institute for Earth Science and Disaster Resilience Head, Volcano Observation Network Laboratory, Network Center for Earthquake, Tsunami and Volcano, National Research Institute for Earth Science and Disaster Resilience
	Tanaka Akiko	Director, Magmatic Activity Research Group, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

\* Double circle © indicates chairperson.

### Members of the Subcommittee on Nuclear Fuel Safety Fundamentals

Examination commissioners	Unesaki Hironobu	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Enokida Yoichi	Professor, Graduate School of Engineering, Nagoya University, Tokai National Higher Education and Research System

	Katsuta Tadahiro	Professor, School of Law, Meiji University
	Kirishima Akira	Professor, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University
	Kurosaki Ken	Professor, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Sumi Minako	Head, Radiation Oncology Department, Tokyo Metropolitan Geriatric Medical Center
	Takagi Ikuji	Professor, Graduate School of Engineering, Kyoto University
	Takada Tsuyoshi	Head, Nuclear Safety Research Center, Sector of Nuclear Safety Research and Emergency Preparedness Japan Atomic Energy Agency
	Nakamura Takehiko	Head, Nuclear Safety Research Center, Sector of Nuclear Safety Research and Emergency Preparedness Japan Atomic Energy Agency
	Matsuo Akiko	Professor, Faculty of Science and Technology, Keio University
	Yamamoto Akio ◎	Professor, Graduate School of Engineering, Nagoya University, Tokai National Higher Education and Research System
	Yoshida Hiroko	Associate Professor, Graduate School of Pharmacy, Tohoku University
	Yoshihashi Sachiko	Associate Professor, Facility for Nuclear Materials, Nagoya University, Tokai National Higher Education and Research System

\* Double circle ◎ indicates chairperson.

### (3) Joint Review Meetings of the Reactor Safety Examination Committee and the Nuclear Fuel Safety Examination Committee

RSEC meetings	NFSEC meetings	Date	Agendas
20 Joint	26 Joint	6/5	<ul style="list-style-type: none"> <li>- Nomination of review committee members belonging to Subcommittee on Volcano Monitoring</li> <li>- Status of activities of Subcommittee on Volcano Monitoring of Reactor Safety Examination Committee</li> <li>- Status of screening and technological information to be considered</li> <li>- Status report on "response of domestic nuclear power plants to 1-phase open fault events"</li> <li>- Results of the Technical Information Review Meeting on the "study on the giant earthquake model along the Japan Trench and the Kuril Islands Trench (summary report)" by the cabinet office</li> <li>- Report on IRRS follow-up mission by IAEA</li> <li>- Status of training of inspectors, etc. and implementation of education and training</li> </ul>
21 Joint	27 Joint	12/15	<ul style="list-style-type: none"> <li>- Selection of chairperson of the Reactor Safety Examination Committee</li> <li>- Selection of chairperson of the Nuclear Fuel Safety Examination Committee</li> <li>- Matters to be investigated and deliberated in the future at the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee</li> <li>- Subcommittee of Earthquake and Tsunami</li> <li>- Subcommittee on Volcanic Hazards</li> <li>- Subcommittee on Reactor Safety and Subcommittee on Nuclear Fuel Safety</li> <li>- Revision of management rules of the Reactor Safety Examination Committee and the Nuclear Fuel Safety Examination Committee</li> <li>- Status of nuclear regulatory inspections</li> <li>- Status of screening and technological information to be considered</li> <li>- Status of activities of Subcommittee on Volcano Monitoring of Reactor Safety Examination Committee</li> </ul>

### Meetings of the Subcommittee on Volcano Monitoring of Reactor Safety Examination Committee

No.	Date	Agendas
9	10.20	<ul style="list-style-type: none"> <li>-NRA's evaluation of commercial power reactor establishers' volcano monitoring results</li> <li>-Others</li> </ul>

**Investigations and deliberations delegated by the NRA to the Reactor Safety Examination Committee (RSEC) and the Nuclear Fuel Safety Examination Committee (NFSEC)**

Items for investigation and deliberation	Subcommittee assigned
<p>Collect and analyze worldwide information on accidents, problems and regulatory trends, deliberate on the necessity of the NRA's actions in response to such information, and provide advice. [Instruction to the RSEC/NFSEC in June 2020]</p>	<p>Subcommittee on Reactor Safety of RSEC Subcommittee on Nuclear Fuel Safety of NFSEC</p>
<p>Evaluate and advise on the status of NRA's response to the conclusions of the follow-up mission of the IRRS (IAEA's Integrated Regulatory Review Service) conducted in January 2020. [Instruction to the RSEC/NFSEC in June 2020]</p>	<p>Subcommittee on Reactor Safety of RSEC Subcommittee on Nuclear Fuel Safety of NFSEC</p>
<p>Study and deliberate on the implementation status of the new nuclear regulatory inspection system, which came into effect in April 2020, by regulatory bodies and operators, and provide advice. [Instruction to the RSEC/NFSEC in June 2020]</p>	<p>Subcommittee on Reactor Safety of RSEC Subcommittee on Nuclear Fuel Safety of NFSEC</p>
<p>Hear from operators about evaluations for improving the safety of reactor facilities for power generation conducted by the establishers of reactors for power generation under Article 43-3-29 of the Act on Regulation of Nuclear Source Materials, Nuclear Fuel Materials and Reactors, and provide advice on how to utilize such evaluations. [Instruction to the RSEC/NFSEC in June 2020]</p>	<p>Subcommittee on Reactor Safety of RSEC Subcommittee on Nuclear Fuel Safety of NFSEC</p>
<p>Study and deliberate on NRA evaluation of commercial power reactor establishers' volcano monitoring results, and provide advice. [Instruction to the RSEC in June 2020]</p>	<p>Subcommittee on Volcanic Hazards of RSEC</p>
<p>Study and deliberate on NRA evaluation of nuclear fuel cycle facility operator' volcano monitoring results, and provide advice. [Instruction to the NFSEC in September 2020]</p>	<p>Subcommittee on Volcanic Hazards of NFSEC</p>
<p>Investigate and deliberate on the necessity of regulatory responses based on the results of collecting and analyzing information related to disasters that have occurred in Japan and abroad and findings announced by government agencies, etc., concerning events such as earthquakes and tsunamis, and provide advice. [Instruction to the RSEC/NFSEC in September 2020]</p>	<p>Subcommittee of Earthquake and Tsunami of RSEC Subcommittee of Earthquake and Tsunami of NFSEC</p>
<p>Investigate and deliberate on the necessity of regulatory responses based on the results of collecting and analyzing information related to disasters that have occurred in Japan and abroad and findings announced by government agencies, etc., concerning events such as volcanoes, and provide advice. [Instruction to the RSEC/NFSEC in September 2020]</p>	<p>Subcommittee on Volcanic Hazards of RSEC Subcommittee on Volcanic Hazards of NFSEC</p>

#### (4) Radiation Council

##### Overview

In FY2020, the Radiation Council held four general meetings. During the general meetings, the participants discussed how to incorporate the ICRP 2007 recommendations on medical examinations for radiation workers into the domestic system, etc., and prepared the "Interim Summary on How to Proceed with Future Deliberations on Medical Examinations for Radiation Workers." In addition, the following consultations on the technical standards for preventing radiation hazards from NRA and relevant ministries and agencies were deliberated and a report was submitted stating that consultations (1), (2) and (3) are appropriate and that a revision of technical standard regarding consultation (4) is unnecessary.

- (1) Revision of technical standards relating to incorporation of equivalent dose limit for lens of eye (149th General Meeting of the Radiation Council held on July 17, 2020)
- (2) Revision of Clearance Rules (149th General Meeting of the Radiation Council held on July 17, 2020)
- (3) Incorporation of IAEA Rules for Safe Transportation of Radioactive Materials (2018 version) into domestic laws and regulations (150th General Meeting of the Radiation Council held on October 23, 2020)
- (4) Revision of relevant notifications of the Act on Regulation of Radioisotope (152nd General Meeting of the Radiation Council, February 26, 2021)

##### Members of the Committee

Commissioners	Ishii Tetsuro	Deputy head (on safety management) of J-PARC, Japan Atomic Energy Agency
	Ohno Kazuko	Professor, Department of Radiological Technology, Faculty of Medical Science, Kyoto College of Medical Science
	Oda Keiji○	Executive Vice President, Kobe University and Professor, Kobe University Graduate School of Maritime Sciences
	Kai Michiaki◎	Professor, Human Biology Division, Department of Health Sciences, Oita University of Nursing and Health Sciences
	Karasawa Kumiko	Professor and department head, Department of Radiation Oncology, Faculty of Medicine, Tokyo Women's Medical University
	Kanda Reiko	Director, Center for Radiation Protection Knowledge, National Institute of Radiological Sciences, National Institutes for Quantum and Radiological Science and Technology
	Kishimoto Atsuo	Professor, Ethical, Legal and Social Issue Core, Institute for Dataability Science, Osaka University
	Takata Ayako	Professor, Department of Preventive Medicine, St. Marianna University School of Medicine
	Takada Chie	Deputy Director and General Manager, Radiation Dosimetry and Instrumentation Section, Nuclear Fuel Cycle Engineering Laboratories, Sector of Nuclear Fuel, Decommissioning and Waste Management Technology Development, Japan Atomic Energy Agency

	Tanigawa Koichi	Director of Futaba Medical Center, Fukushima Prefecture and Director of Affiliated Hospital Specially Appointed Professor, Fukushima Medical University
	Nakamura Nobutaka	Director of Pharmaceutical Department, Japan Radioisotope Association
	Matsuda Naoki	Professor, Atomic Bomb Disease Institute, Nagasaki University
	Yokoyama Sumi	Associate professor, Support Center for Collaborative Research Facilities, Research Support Promotion Headquarters, Fujita Health University
	Yoshida Hiroko	Associate Professor, Radioisotope Research and Education Center, Graduate School of Pharmacy, Tohoku University

\*Double circle (©) indicates chairperson, and circle (○) indicates the deputy to the chairperson.

### Meetings of the Radiation Council

No.	Date	Agendas
149	07.17	<ul style="list-style-type: none"> <li>- Selection of chairperson and nomination of deputy chairperson</li> <li>- Revision of technical standard of equivalent dose limit for lens of eye, etc. (inquiry)</li> <li>- Revision of clearance rules (inquiry)</li> <li>- International trend of technical standards for prevention of radiation hazards</li> <li>- Others</li> </ul>
150	10.23	<ul style="list-style-type: none"> <li>- Incorporation of ICRP 2007 Recommendations (medical examination of radiation workers)</li> <li>- Incorporation of IAEA Rules for Safe Transportation of Radioactive Materials (2018 version) into domestic laws and regulations (inquiry)</li> <li>- Countermeasures taken by of the relevant ministries and agencies for equivalent dose limit for lens of eye</li> <li>- Status of deliberations on naturally occurring radioactive materials to date, etc.</li> <li>- Others</li> </ul>
151	02.12	<ul style="list-style-type: none"> <li>- Revision of the relevant notification of the Act on Regulation of Radioisotopes (inquiry)</li> <li>- Incorporation of ICRP 2007 Recommendations (medical examination of radiation workers)</li> <li>- Others</li> </ul>
152	02.26	<ul style="list-style-type: none"> <li>- Revision of the relevant notification of the Act on Regulation of Radioisotopes (inquiry)</li> <li>- ICRP Recommendation on Radiological Protection of People and the Environment in the Event of a Large Nuclear Accident (Pub.146)</li> <li>- Guidelines of clearance for the Nuclear Reactor Regulation Act (Report)</li> <li>- Countermeasures taken by of the relevant ministries and agencies for equivalent dose limit for lens of eye (report)</li> <li>- Others</li> </ul>



## (5) National Research and Development Agency Council

### Overview

Based on the Act on General Rules for Incorporated Administrative Agencies (Act No. 103, 1999), the NRA, a competent administrator is required to hear R&D-related council's opinions regarding part of work by the National Institutes for Quantum and Radiological Science and Technology (QST) and the Japan Atomic Energy Agency (JAEA) before providing them with instructions regarding their mid-to-long term goals and assess their performance. Therefore, the NRA established the National Research and Development Agency Council on April 10, 2015 as the council for R&D.

In FY2020, sub-committee meetings of the QST were held twice to hear opinions including performance evaluation of the QST.

In addition, JAEA sub-committee meetings were held twice to hear opinions including performance evaluation of the JAEA.

### Members of the Committee

Commissioners	Kai Michiaki	Professor, Human Biology Division, Department of Health Sciences, Oita University of Nursing and Health Sciences
	Kamiya Kenji ○	Vice President, Hiroshima University Director, Radiation Emergency Medicine Promotion Center Vice President, Fukushima Medical University Director, Radiation Medical Science Center for the Fukushima Health Management Survey
	Koshizuka Seiichi ◎	Professor, School of Engineering, the University of Tokyo
	Yamanishi Hirokuni	Director, Atomic Energy Research Institute, Kindai University
	Yamamoto Akio	Professor, Department of Applied Energy Science, Graduate School of Engineering, Nagoya University
	Hirose Yuko	Executive Producer, Editorial Office, BS Nippon Corporation

\*Double circle (◎) indicates chairperson, and circle (○) indicates the deputy to the chairperson.

### Members of the Subcommittees

-Subcommittee of the National Institutes for Quantum and Radiological Science and Technology

Commissioner	Kai Michiaki	Professor, Human Biology Division, Department of Health Sciences, Oita University of Nursing and Health Sciences
	Kamiya Kenji	Vice President, Hiroshima University Director, Radiation Emergency Medicine Promotion Center Vice President, Fukushima Medical University Director, Director, Radiation Medical Science Center for the Fukushima Health Management Survey
	Yamanishi Hirokuni	Director, Atomic Energy Research Institute, Kindai University

-Subcommittee of the Japan Atomic Energy Agency

Commissioner	Koshizuka Seiichi	Professor, School of Engineering, the University of Tokyo
	Yamamoto Akio	Professor, Department of Applied Energy Science, Graduate School of Engineering, Nagoya University
	Hirose Yuko	Executive Producer, Editorial Office, BS Nippon Corporation

## Meetings of each subcommittee

### -Subcommittee of the National Institutes for Quantum and Radiological Science and Technology

No.	Date	Agendas
10	8.4	- FY2019 performance assessment of the National Institutes for Quantum and Radiological Science and Technology (hearing from the National Institutes for Quantum and Radiological Science and Technology) - Others
11	8.17	- FY2019 performance assessment of the National Institutes for Quantum and Radiological Science and Technology (summary assessment) - Others

### -Subcommittee of the Japan Atomic Energy Agency

No.	Date	Agendas
12	7.21	- Written decisions of the 11th subcommittee meetings - Performance in FY2019 - Technical support to nuclear safety regulatory administration and budget and personnel required for safety research - Others
13	8.5	- Summarization of opinions on performance in FY2019 (documentary review)

## 2. Review Meetings

### (1) Review Meeting on Conformity to the New Regulatory Requirements

#### Overview

Based on the new regulatory requirements for nuclear power plants that took effect on July 8, 2013 and the new regulatory requirements for nuclear fuel cycle facilities, etc. that took effect on December 18, 2013, applications for permission for change in reactor installation submitted by the nuclear operators were examined. The examinations were conducted by NRA commissioners and a study team organized by the Secretariat of the NRA. In FY2020, 106 review meetings were held for the examinations of nuclear power plants and 79 meetings were held for the examinations of nuclear fuel cycle facilities, etc. Also in FY2020, two review meetings were held to examine applications for changing operational safety programs relating to the aging management countermeasures, submitted by nuclear operators.

#### Members of Review Meetings

### -Review Meeting on Conformity to the New Regulatory Requirements for Nuclear Power Plants

NRA Commissioners	Ishiwatari Akira	NRA Commissioner
	Yamanaka Shinsuke	NRA Commissioner
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)

	Oasada Kaoru	Director for Nuclear Regulation (in charge of examining measures against earthquake and tsunami)
	Naito Hiroyuki	Director for Regulation of Nuclear Facilities
	Koyamada Takumi	Director for Regulation of Nuclear Facilities
	Fujimori Akihiro	Nuclear Regulation Research Officer
	Watanabe Keiichi	Director for Regulation of Nuclear Facilities
	Iwata Junichi	Nuclear Regulation Research Officer
	Kawasaki Kenji	Nuclear Regulation Research Officer
	Yamaguchi Michio	Nuclear Regulation Research Officer (attended until the 880th meeting)
	Amano Naoki	Nuclear Regulation Research Officer
	Seki Masayuki	Planning and Research Officer (attending since the 891st meeting)

**-Review Meeting on Conformity to the New Regulatory Requirements for Nuclear Fuel Cycle Facilities, etc.**

NRA Commissioner		Tanaka Satoru	NRA Commissioner
		Yamanaka Shinsuke	NRA Commissioner
		Ishiwatari Akira	NRA Commissioner
Secretariat of the NRA		Yamagata Hiroshi	Director-General for Emergency Response
		Ichimura Tomoya	Director-General, Nuclear Regulation Department
		Ono Yuji	Director for Nuclear Regulation (in charge of examining research reactors) (attended until the 363rd meeting)
		Oshima Toshiyuki	Director for Nuclear Regulation (in charge of examining research reactors) (attending since the 365th meeting)
		Hasegawa Kiyomitsu	Director for Nuclear Regulation (in charge of examining nuclear fuel facilities)
		Oasada Kaoru	Director for Nuclear Regulation (in charge of examining measures against earthquake and tsunami)
		Shima Masakazu	Deputy-Director for Nuclear Regulation
		Togasaki Ko	Deputy-Director for Nuclear Regulation
		Koyamada Takumi	Director for Regulation of Nuclear Facilities
		Naito Hiroyuki	Director for Regulation of Nuclear Facilities
		Ozawa Takahiro	Nuclear Regulation Research Officer
		Ishii Toshimitsu	Planning and Research Officer
		Kosaku Yasuo	Planning and Research Officer
		Ezaki Junichi	Planning and Research Officer
		Hosono Yukio	Deputy-Director for Safety Management

**-Review Meeting on Technical Evaluation of Aging Management of Nuclear Power Plants**

Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Fujimori Akihiro	Nuclear Regulation Research Officer

**(2) Review Meeting on Decommissioning of Nuclear Facilities**  
Overview

Review Meetings on Decommissioning of Nuclear Facilities are held with the attendance of NRA Commissioners and NRA Secretariat staff to examine the decommissioning plans of the nuclear facilities. In FY2020, the Review Meetings were held 7 times on nuclear power plants and 6 times on nuclear fuel cycle facilities, etc.

### Members of Review Meetings

#### -Review Meeting on Decommissioning Plan for Nuclear Power Reactor Facilities

NRA Commissioner	Yamanaka Shinsuke	NRA Commissioner
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Fujimori Akihiro	Nuclear Regulation Research Officer

#### -Review Meeting on Decommissioning Plan for Nuclear Fuel Cycle Facilities, etc.

NRA Commissioner	Tanaka Satoru	NRA Commissioner
	Yamanaka Shinsuke	NRA Commissioner
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response (attending since the 6th meeting)
	Ono Yuji	Director for Nuclear Regulation (in charge of examining research reactors) (attending since the 3rd meeting until the 18th meeting)
	Oshima Toshiyuki	Director for Nuclear Regulation (in charge of examining research reactors) (attending since the 19th meeting)
	Togasaki Ko	Deputy-Director for Nuclear Regulation (attending since the 3rd meeting)
	Hosono Yukio	Deputy-Director for Safety Management (attending since the 3rd meeting)
	Sugawara Hiroyuki	Deputy-Director for Planning and Examination (attending since the 11th meeting)

### (3) Review Meeting on Clearance

#### Overview

Review Meeting on the methods of measuring, and evaluating radioactive concentration in materials used in nuclear facilities are held with the attendance of a study team consisting of NRA Secretariat staff. Three review meetings for clearance were held in FY2020.

#### -Members of Review Meetings on Clearance

Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response
	Ono Yuji	Director for Nuclear Regulation (in charge of examining research reactors) (attended until the 2nd meeting)
	Hasegawa Kiyomitsu	Director for Nuclear Regulation (in charge of examining nuclear fuel facilities) (attending since the 4th meeting)
	Oshima Toshiyuki	Deputy-Director for Nuclear Regulation (attending the 3rd meeting)
	Shima Masakazu	Deputy-Director for Nuclear Regulation (attending since the 3rd meeting)

#### **(4) Review Meeting on Container for Transportation and Specified Container for Spent Fuel Facilities**

##### **Overview**

Review Meeting on Container for Transportation and Specified Container for Spent Fuel Facilities are held with the attendance of a study team consisting of NRA Secretariat staff. In FY2020, four review meetings were held.

##### **-Members of Review Meeting on Container for Transportation and Specified Container for Spent Fuel Facilities**

Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response
	Hasegawa Kiyomitsu	Director for Nuclear Regulation (in charge of examining nuclear fuel facilities) (attending since the 4th meeting)
	Oshima Toshiyuki	Nuclear fuel facilities review division (attended until the 2nd meeting)
	Shima Masakazu	Nuclear fuel facilities review division (attending since the 3rd meeting)
	Ishii Toshimitsu	Planning and Research Officer

#### **(5) Review Meeting on Type Certification, etc. of Specific Dual-Use Cask Design**

##### **Overview**

A system consisting of staff from NRA has been established and is holding Review Meeting on Type Certification, etc. of Specific Dual-Use Cask Design. Eight Review Meetings were held in FY2020.

##### **Members of Review Meeting on Type Certification, etc. of Specific Dual-Use Cask Design**

Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Iwata Junichi	Nuclear Regulation Research Officer

### **3. Study Teams**

#### **(1) Technical Study Team on Environmental Radiation Monitoring**

##### **Overview**

In order to conduct appropriate radiation monitoring during emergencies as well as during normal times, it is important to establish a technological base for monitoring, reviewing monitoring methods, and maintaining a monitoring skill. In order to continuously study monitoring technology, the Technical Study Team on Environmental Radiation Monitoring consisting of Commissioner Nobuhiko Ban and external experts was formed, under which three meetings were held in FY2020 (for more details, see Chapter 5, Section 5-6).

##### **The Members of Study Team**

NRA Commissioner	Ban Nobuhiko	NRA Commissioner
External experts	Aono Tatsuo	Team Leader, Environmental Radiation Dynamics Research Team, Fukushima Project Headquarters, Advanced Radiation Emergency Medical Center, National Institutes for Quantum and Radiological Science and Technology
	Abe Yukio	Chief Engineer, Environmental Radiation Monitoring Centre, Centre for Environmental Creation, Fukushima Prefectural Government
	Iimoto Takeshi	Professor, Division for Environment, Health and Safety, the University of Tokyo
	Takahashi Tomoyuki	Associate Professor, Division of Nuclear Engineering Science, Institute for Integrated Radiation and Nuclear Science, Kyoto University
	Tagami Keiko	Team Leader, Environmental Transfer Parameter Research Team, Fukushima Project Headquarters, Advanced Radiation Emergency Medical Center, National Institutes for Quantum and Radiological Science and Technology
	Takeishi Minoru	Analysis Technology Development Adviser, Environmental Impact Research Division, Collaborative Laboratories for Advanced Decommissioning Science in Fukushima District, Sector of Fukushima Research and Development, Japan Atomic Energy Agency
	Momose Takumaro	Deputy Director-General, Nuclear Fuel Cycle Engineering Laboratories, Sector of Nuclear Fuel, Decommissioning and Waste Management Technology Development, Japan Atomic Energy Agency
	Yamazawa Hiromi	Professor, Department of Applied Energy Science, Graduate School of Engineering, Nagoya University
Secretariat of the NRA	Yamada Tomoho	Director-General for Radiation Protection Strategy and Security
	Murayama Ryosuke	Director, Radiation Monitoring Division
	Ono Yuji	Director, Radiation Protection Policy Planning Division
	Tomisaka Takashi	Director, Environmental Radioactivity Office, Radiation Monitoring Division
	Kikuchi Kiyotaka	Director for Institutional, Radiation Monitoring Division

## (2) Safety Oversight Team for the Tokai Reprocessing Plant

### Overview

Eighteen meetings of this oversight team, consisting of an NRA Commissioner, NRA Secretariat staff and others, were held in FY2020 to continuously check the state of implementing measures for risk reduction such as vitrification, safety measures and decommissioning at the Tokai reprocessing plant, Nuclear Fuel Cycle Engineering Laboratories, Japan Atomic Energy Agency (JAEA).

### The Members of Study Team

NRA Commissioner	Tanaka Satoru	NRA Commissioner
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response (attending since the 33rd meeting)
	Ono Yuji	Director for Nuclear Regulation (in charge of examining research reactors) (attending since the 29th meeting until the 46th meeting)
	Oshima Toshiyuki	Director for Nuclear Regulation (in charge of examining research reactors) (attending since the 47th meeting)
	Hosono Yukio	Nuclear Regulation Research Officer (attending since the 29th meeting)

### (3) Safety Oversight Team for Prototype Fast Breeder Reactor Monju Decommission

#### Overview

This safety oversight team, consisting of NRA Commissioners, NRA Secretariat staff and others, was formed in January 2017 in order to continuously check the state of decommissioning of the JAEA's Fast Breeder Reactor Monju and its activities. In FY2020, eight meetings were held under the team.

#### The Members of Study Team

NRA Commissioner	Yamanaka Shinsuke	NRA Commissioner (attending since the 20th meeting)
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response (attending since the 23rd meeting)
	Ono Yuji	Director for Nuclear Regulation (in charge of examining research reactors) (attending since the 17th meeting until the 30th meeting)
	Oshima Toshiyuki	Director for Nuclear Regulation (in charge of examining research reactors) (attending since the 31st meeting)
	Hosono Yukio	Deputy-Director for Planning and Coordination (attending since the 17th meeting)

### (4) Study Team on Seismic Isolation of Buildings and Structures

#### Overview

It was aimed to carry out the review for the permission for basic design and the approval of the design and construction plan for the buildings and structures of the power reactor facilities adopting seismic isolation structure in a rational and efficient manner. For this purpose, the provisions related to seismic isolation structure in the current interpretation of the Standard Regulations for Commercial Nuclear Power Reactor Facilities was needed to be revised, and a draft of the review guidelines was prepared for seismic isolation structure of buildings and structures. In order to revise the provisions and complete the review guidelines, a study team meeting consisting of NRA members, external experts, and NRA staff was held three times in FY2020 for the purpose of discussing technical matters related to seismic isolation.

#### The Members of Study Team

NRA Commissioner	Yamanaka Shinsuke	NRA Commissioner
	Ishiwatari Akira	NRA Commissioner
External experts	Kikuchi Masaru	Professor, Division of Architectural and Structural Design, Faculty of Engineering, Hokkaido University
	Hisada Yoshiaki	Professor, Department of Urban Design and Planning, School of Architecture, Kogakuin University
	Furuya Osamu	Professor, Division of Mechanical Engineering, School of Science and Engineering, Tokyo Denki University
Secretariat of the NRA	Ohmura Tetsuo	Director-General for Nuclear Regulation (Director, Regulatory Standard and Research Department)
	Kawauchi Hidefumi	Director, Division of Research Earthquake and Tsunami, Regulatory Standard and Research Department

	Oasada Kaoru	Director, Division of Licensing for Earthquake and Tsunami Measures, Nuclear Regulation Department
	Nagura Shigeki	Nuclear Regulation Research Officer, Division of Licensing for Earthquake and Tsunami Measures, Nuclear Regulation Department
	Ezaki Junichi	Planning and Research Officer, Division of Licensing for Earthquake and Tsunami Measures, Nuclear Regulation Department
	Miura Nobuaki	Chief Safety Examiner, Division of Licensing for Earthquake and Tsunami Measures, Nuclear Regulation Department
	Inoue Takashi	Chief Safety Examiner, Division of Licensing for Earthquake and Tsunami Measures, Nuclear Regulation Department
	Ohno Yoshifumi	Safety Examiner, Division of Licensing for Earthquake and Tsunami Measures, Nuclear Regulation Department
	Ohashi Morito	Principal Researcher, Division of Research for Earthquake and Tsunami, Regulatory Standard and Research Department
	Yamazaki Hiroaki	Chief Researcher, Division of Research for Earthquake and Tsunami, Regulatory Standard and Research Department
	Saruta Masaaki	Chief Researcher, Division of Research for Earthquake and Tsunami, Regulatory Standard and Research Department
	Kobayashi Koichi	Chief Researcher, Division of Research for Earthquake and Tsunami, Regulatory Standard and Research Department
	Hidaka Shinjiro	Chief Researcher, Division of Research for Earthquake and Tsunami, Regulatory Standard and Research Department

## (5) Study Team for Technical Evaluation of Method of Checking Reactor Pressure Vessel Fracture Toughness during Service Period

### Overview

In order to perform the technical evaluation of a method for checking reactor pressure vessel fracture toughness during an in-service period, meetings under the Study Team consisting of NRA Secretariat staff, external experts and others were held once in FY2020.

### The Members of Study Team

NRA Commissioner	Yamanaka Shinsuke	NRA Commissioner
External experts	Ohata Tsutomu	Professor, Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University
	Okita Taira	Associate Professor, Research into Artifacts Center for Engineering, School of Engineering, the University of Tokyo
	Kasada Ryuta	Professor, Institute for Materials Research, Tohoku University
Nuclear Safety Research Center, Japan Atomic Energy Agency	Onizawa Kunio	Nuclear Safety Research Center
	Takamizawa Yu	Researcher, Materials and Water Chemistry Research Group, Material and Structure Safety Research Division
Secretariat of the NRA	Ohmura Tetsuo	Director, Regulatory Standard and Research Department
	Toyama Makoto	Director, Regulatory Standard and Research Division, Regulatory Standard and Research Department
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Division, Regulatory Standard and Research Department
	Hojo Tomohiro	Officer for Technical Research and Examination, Division of Research for Reactor System Safety, Regulatory Standard and Research Department
	Tsukabe Nobuyuki	Deputy Management Director, Division of Licensing for Nuclear Power Plants, Nuclear Regulation Department
	Fujisawa Hiromi	Technical Consultant
	Funada Tatsuo	Technical Consultant



## **(6) Study Team on Technical Evaluation of the Standards of the Japan Electrical Manufacturers Association (JEMA) for Eddy Current Testing, Ultrasonic Testing and Leakage Testing**

### **Overview**

In order to perform the technical evaluation of guideline for eddy current flaw testing of nuclear power equipment, meetings under the Study Team consisting of NRA Commissioner, NRA Secretariat staff, external experts and others were held three times in FY2020.

### **The Members of Study Team**

NRA Commissioner	Yamanaka Shinsuke	NRA Commissioner
External experts	Mihara Tsuyoshi	Professor, Department of Materials Processing, Graduate School of Engineering, Tohoku University
	Furukawa Takashi	Director, Nondestructive Evaluation Center, Japan Power Engineering and Inspection Corporation
	Yusa Noritaka	Professor, Department of Quantum Science and Energy Engineering, Graduate School of Engineering, Tohoku University
	Koyama Kiyoshi	Professor, Department of Electrical and Electronic Engineering, College of Industrial Technology, Nihon University
Nuclear Safety Research Center, Japan Atomic Energy Agency	Katsuyama Jinya	Leader, Materials Evaluation Research Group, Materials and Structural Integrity Research Division
	Mano Akihiro	Researcher, Structural Integrity Research Group, Materials and Structural Integrity Research Division
Secretariat of the NRA	Ohmura Tetsuo	Director, Regulatory Standard and Research Department
	Toyama Makoto	Director, Regulatory Standard and Research Division, Regulatory Standard and Research Department
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Division, Regulatory Standard and Research Department
	Kojima Masayoshi	Chief Officer for Technical Research and Examination, Division of Research for Reactor System Safety, Regulatory Standard and Research Department
	Kono Katsumi	Chief Officer for Technical Research and Examination, Division of Research for Reactor System Safety, Regulatory Standard and Research Department
	Arai Kensaku	Officer for Technical Research and Examination, Division of Research for Reactor System Safety, Regulatory Standard and Research Department
	Nakata Satoshi	Senior Inspector Specialized in Nuclear Facilities, Division of Specified Oversight, Nuclear Regulation Department
	Morita Kenji	Chief Inspector Specialized in Nuclear Facilities, Division of Specified Oversight, Nuclear Regulation Department
	Fujisawa Hiromi	Technical Consultant
	Okada Shiro	Technical Consultant

## **(7) Study Team on Measures against Common Cause Failure of Digital Safety Protection Systems in Nuclear Power Reactor Facilities**

### **Overview**

In order to proceed with a specific examination on measures against the common cause of failure of digital safety protection system at nuclear power reactor facilities, meetings under the Study Team consisting of an NRA Commissioner and NRA Secretariat staff were held once in FY2020.

### The Members of Study Team

NRA Commissioner	Yamanaka Shinsuke	NRA Commissioner
Secretariat of the NRA	Ichimura Tomoya	Director-General, Nuclear Regulation Department
	Yamada Tomoho	Director-General for Radiation Protection Strategy and Security
	Toyama Makoto	Director, Regulatory Standard and Research Division
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Division
	Suzuki Akiko	Deputy Director, Regulatory Standard and Research Division
	Omori Noriyuki	Section Chief, Regulatory Standard and Research Division
	Murakami Gen	Deputy Director, Nuclear Regulation Policy Planning Division
	Imase Masahiro	Senior Expert on Nuclear Regulation, Division of Research for Reactor System Safety
	Sekine Masashi	Officer for Technical Research and Examination, Division of Research for Reactor System Safety
	Kawasaki Kenji	Nuclear Regulation Research Officer, Division of Licensing for Nuclear Power Plants
	Terui Hiroyuki	Safety Examiner, Division of Licensing for Nuclear Power Plants

### (8) Study Team on Continuous Improvement of Safety

#### Overview

In order to further smoothly and more effectively promote efforts to continuously improve the safety of nuclear facilities, the NRA decided to establish a study team meeting consisting of NRA commissioners, external experts, and NRA staff was on July 8, 2020, for the purpose of broadly discussing improvements in past efforts as well as advanced domestic and overseas examples. A total of nine meetings were held in FY2020.

### The Members of Study Team

NRA Commissioner	Fuketa Toyoshi	NRA Chairman
	Ban Nobuhiko	NRA Commissioner
External experts	Itagaki Katsuhiko	Associate Professor, Graduate School of International Social Sciences, Yokohama National University
	Ohya Takehiro	Professor, Faculty of Law, Keio University
	Katsuta Tadahiro	Professor, School of Law, Meiji University
	Kamei Zentaro	Chief Researcher, PHP Research Institute Specially appointed professor, Graduate School of Social Design Studies, Rikkyo University
	Sekimura Naoto	Vice-President, the University of Tokyo Professor, Nuclear Engineering and Management, Graduate School of Engineering, the University of Tokyo
	Yamamoto Akio	Professor, Department of Applied Energy Science, Graduate School of Engineering, Nagoya University
Secretariat of the NRA	Ogino Toru	Secretary-General
	Kaneko Shuichi	Director-General for Policy Planning and Coordination, Secretary-General's Secretariats
	Ichimura Tomoya	Director-General, Nuclear Regulation Department
	Kurokawa Yoichiro	Policy Planning Counselor, Director-General's Secretariats
	Tsutsumi Tappei	Deputy head, Judicial Review Office, General Affairs Division, Director-General's Secretariats
	Shibata Nobuaki	Deputy Counselor, Legal Department, Director-General's Secretariats
	Hirano Masashi	Technical Consultant, Nuclear Safety Regulatory Standard Division
Nishizaki Takanori	Planning Officer, Nuclear Regulation Policy Planning Division	

	Tanigawa Yasuatsu	Nuclear Regulation Expert, Nuclear Regulation Policy Planning Division
	Masaoka Hideaki	Deputy Management Director, Division of Licensing for Commercial Nuclear Power Plants (in charge of summarization)
	Morimitsu Tomokazu	Group Director, Division of Licensing for Research Reactor (attended until the 6th meeting)

## (9) Study team on thyroid dose monitoring in emergencies

### Overview

In the safety research project of NRA, the development of a device that can measure thyroid radiation doses in detail has been promoted, and now the practical application of the device is in sight. A study team consisting of NRA commissioners, external experts, and NRA staff was established on February 3, 2021, for the purpose of discussing basic matters concerning the monitoring of thyroid radiation doses in emergencies. Two meetings were held in FY2020.

### The Members of Study Team

NRA Commissioner	Ban Nobuhiko	NRA Commissioner
External experts	Kurihara Osamu	Director of Department of Radiation Measurement and Dose Assessment, Advanced Radiation Emergency Medical Support Center, National Institutes for Quantum and Radiological Science and Technology
	Suzuki Gen	Professor and Director, International University of Health and Welfare Clinic
	Takahara Shogo	Leader of Risk Analysis Research Group, Nuclear Safety Research Center, Japan Atomic Energy Agency
	Tatsuzaki Hideo	Deputy Director of Advanced Radiation Emergency Medical Support Center, National Institutes for Quantum and Radiological Science and Technology
Secretariat of the NRA	Yamada Tomoho	Director-General for Radiation Protection Strategy and Security
	Ono Yuji	Director, Radiation Protection Policy Planning Division
	Honma Toshimitsu	Radiation Protection Technology Researcher, Radiation Protection Policy Planning Division
	Yamamoto Tetsuya	Radiation Protection Technology Researcher, Radiation Protection Policy Planning Division
	Mitsuhashi Yasuyuki	Director for Policy Planning and Examination, Radiation Protection Policy Planning Division
	Hirase Tomohiko	Expert for exposure medicine and disaster prevention, Radiation Protection Policy Planning Division
	Kikuchi Kiyotaka	Director for Institutional, Radiation Monitoring Division
	Maekawa Motokazu	Technical Consultant, Radiation Monitoring Division

#### 4. Committees for Specific Research and Study

##### (1) Committee on Oversight and Evaluation of Specified Nuclear Facilities

###### Overview

Meetings of the Commission on Oversight and Evaluation of the Specified Nuclear Facilities, consisting of an NRA Commissioner, officials of the NRA Secretariat, and external experts, were to evaluate the schedule management and safety measures for decommissioning work of TEPCO's Fukushima Daiichi NPS and to give necessary advice. In FY2020, a total of ten meetings were held.

###### Members of the Committee

NRA Commissioner	Ban Nobuhiko	NRA Commissioner
	Tanaka Satoru	NRA Commissioner
External experts	Iguchi Tetsuo	Professor emeritus, Nagoya University
	Kittaka Yoshinori	Professor, Department of Architecture, Faculty of Urban Environmental Sciences, Tokyo Metropolitan University
	Tanaka Seiichiro	President, Futaba Town Reconstruction Promotion Council
	Tokunaga Tomochika	Professor, Department of Environment Systems, Graduate School of Frontier Sciences, the University of Tokyo
	Hachisuka Reiko	Society President of Okuma Town Society of Commerce and Industry
	Yamamoto Akio	Professor, Department of Applied Energy Science, Graduate School of Engineering, Nagoya University
Secretariat of the NRA	Sakurada Michio	Deputy Secretary-General for Technical Affairs
	Kaneko Shuichi	Director-General for Nuclear Regulation Policy
	Minamiyama Rikio	Regional Administrator (in charge of Fukushima)
	Takeuchi Atsushi	Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Iwanaga Kohei	Planning and Research Officer, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Shibutani Tomoki	Planning and Research Officer, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Hayashida Hideaki	Deputy Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Kobayashi Ryusuke	Director, NRA Regional Office for Fukushima Daiichi Nuclear Power Station
	Aoki Hiroomi	Chief Officer for Technical Research and Examination, Division of Research for Nuclear Fuel Cycle and Radioactive Waste
Yasui Masaya	Special International Negotiator for Nuclear Regulation	

##### (2) Committee on Accident Analysis of the Fukushima Daiichi Nuclear Power Station

###### Overview

Meetings of the Commission on Oversight and Evaluation of the Specified Nuclear Facilities, consisting of an NRA Commissioner, officials of the NRA Secretariat, and external experts and researchers of Japan Atomic Energy Agency were held to examine the TEPCO's Fukushima Daiichi NPS accident analysis issues from a technical aspect based on the information obtained from on-site investigation. In FY2020, a total of eight meetings were held.

### Members of the Committee

NRA Commissioner	Fuketa Toyoshi	NRA Chairman
External experts	Ihino Hiroyoshi	Associate Professor, National Defense Academy of Japan (attending from the 13th meeting)
	Kadowaki Satoshi	Professor, Nagaoka University of Technology (attending from the 13th meeting)
	Ninokata Hisashi	Professor emeritus, Tokyo Institute of Technology
	Maekawa Osamu	Senior Technical Advisor, Nuclear Damage Compensation and Decommissioning Facilitation Corporation
	Miyata Koichi	Director-General, Atomic Energy Association
	Muta Hitoshi	Associate Professor, Department of Nuclear Safety Engineering, Faculty of Engineering, Tokyo City University
Secretariat of the NRA	Sakurada Michio	Deputy Secretary-General for Technical Affairs
	Kaneko Shuichi	Director-General for Nuclear Regulation Policy
	Yasui Masaya	Special International Negotiator for Nuclear Regulation
	Hirano Masashi	Technical Consultant, Nuclear Safety Regulatory Standard Division
	Nagase Fumihisa	Director, Division of Research (in charge of Reactor System Safety) (attended until the 12th meeting)
	Takeuchi Atsushi	Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Iwanaga Kohei	Planning and Research Officer, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Hoshi Harutaka	Chief Officer for Technical Research and Examination, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Kawasaki Kenji	Nuclear Regulation Research Officer, Division of Licensing for Nuclear Power Plants
	Kaminouchi Hisamitsu	Lecturer, Reactor Technology Training Division, NRA Human Resource Development Center
Japan Atomic Energy Agency	Maruyama Yu	Vice Director, Nuclear Safety Research Center
	Yonomoto Kousuke	Vice Director, Nuclear Safety Research Center
	Sugiyama Tomoyuki	Director, Reactor Safety Research Division, Nuclear Safety Research Center

### (3) Fukushima Daiichi NPS Decommissioning and Accident Investigation Liaison and Coordination Meeting

#### Overview

Meetings of the Fukushima Daiichi NPS Decommissioning and Accident Investigation Liaison and Coordination Meeting, consisting of the Secretariat of the NRA, which has been conducting related research and analysis, as well as the Agency for Natural Resources and Energy, the Nuclear Damage Compensation and Decommissioning Facilitation Corporation and Tokyo Electric Power Company, which are responsible for the decommissioning work were held to coordinate the works relating to accident analysis and decommissioning work. In FY2020, a total of three meetings were held.

### Members of the meeting

Agency for Natural Resources and Energy	Shinkawa Tatsuya	Director-General for Nuclear Accident Disaster Response
	Tsuchiya Hiroshi	Director, Nuclear Accident Response Office (attended until the 4th meeting)
	Okuda Shuji	Director, Nuclear Accident Response Office (attending since the 5th meeting)
	Ishihara Kouji	Planning Officer, Nuclear Accident Response Office (attending since the 4th meeting)
	Hata Yumiko	Director for International Issues/Waste Management of Fukushima Daiichi NPS, Nuclear Accident Response Office
	Nakadate Naohito	Deputy Director, Nuclear Accident Response Office(attending since the 4th meeting)
	Minagawa Shigeharu	Director, Office for Nuclear Safety Improvement, Nuclear Energy Policy Planning Division
Secretariat of the NRA	Kaneko Shuichi	Director-General for Nuclear Regulation Policy
	Takeuchi Atsushi	Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Iwanaga Kohei	Planning and Research Officer, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Hayashida Hideaki	Deputy Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Kihara Shouji	Deputy Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
Nuclear Damage Compensation and Decommissioning Facilitation Corporation	Ikenoue Sanroku	Managing Director
	Maekawa Osamu	Senior Technical Adviser
	Wakabayashi Koji	Senior Technical Adviser
Tokyo Electric Power Company Holdings	Fukuda Toshihiko	Vice President, Fukushima Daiichi Decontamination and Decommissioning Engineering Company
	Ishikawa Masumi	In charge of Reactor Decommissioning Technology, Fukushima Daiichi Decontamination and Decommissioning Engineering Company
	Mizokami Shinya	Director, Fuel Debris Removal Program Division, Fukushima Daiichi NPS, Fukushima Daiichi Decontamination and Decommissioning Engineering Company

#### (4) Technical Information Committee

##### Overview

A meeting of the Technical Information Committee, consisting of an NRA Commissioner, NRA Secretariat division directors and others, is held approximately every month with the purpose of organizing and sharing information on accidents and failures that occurred at nuclear power plants in Japan and abroad as well as the latest scientific and technological knowledge and judging the necessity of reflecting them in the regulations. Four meetings of the Committee were held in FY2020.

## Members of meeting

(As of September 4, 2019)

NRA Commissioner	NRA Commissioner (1)
Secretariat of the NRA Director-General's Secretariats	Deputy Secretary-General for Technical Affairs
	Director-General for Emergency Response
	Director-General for Nuclear Regulation (in charge of the Regulatory Standard and Research Department)
	Director-General for Nuclear Regulation (in charge of inspections, international affairs and the Fukushima Daiichi NPS)
	Director, Office for International Affairs, Policy Planning and Coordination Division
	Senior Coordinator for International Collaborations
	Director of Emergency Preparedness and Response Office, Policy Planning and Coordination Division
Regulatory Standard and Research Department	Director, Regulatory Standard and Research Division
	Coordination Officer for Regulatory Fundamental Technology
	Director, Division of Research (in charge of Reactor System Safety)
	Director, Division of Research (in charge of Severe Accidents)
	Director, Division of Research (in charge of Nuclear Fuel Cycle and Radioactive Waste)
	Director, Division of Research (in charge of Earthquake and Tsunami)
	Director-General, Nuclear Regulation Department
Nuclear Regulation Department Divisions of Licensing	Director, Nuclear Regulation Policy Planning Division
	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Director for Nuclear Regulation (in charge of examining research reactors)
	Director for Nuclear Regulation (in charge of examining nuclear fuel facilities)
	Director for Nuclear Regulation (in charge of examining measures against earthquake and tsunami)
Division of Oversight	Director, Division of Oversight of Nuclear Power Plants
	Director for Nuclear Regulation (in charge of commercial power reactor oversight)
	Director for Nuclear Regulation (in charge of special inspections)
	Director for Nuclear Regulation (in charge of nuclear fuel facility oversight)
Japan Atomic Energy Agency	Chief Engineer, Regulatory & International Information Analysis Office
Secretariat	Director, Regulatory Standard and Research Division, Regulatory Standard and Research Department The Oversight Planning and Coordination Division cooperates depending on the agenda.

\* When the agenda of the meeting relates to knowledge and findings concerning radiation protection, relevant divisions within the Radiation Protection Department attend the committee meeting.

## (5) Technical Evaluation Committees

### Overview

In order to obtain technical opinions from external experts well versed in technological fields for the NRA's prior assessments, interim assessments and post assessments, eight meetings of the following six Technical Evaluation Committees were held in FY2020.

## The Members of each Technical Evaluation Committee

### Technical Evaluation Committee on Plant Safety

External experts	Kitada Takanori	Professor, Division of Sustainable Energy and Environment Engineering, School of Engineering, Osaka University
	Yamaji Tetsushi	Associate Professor, School of Advanced Science and Engineering, Faculty of Science and Engineering, Waseda University
	Gofuku Akio	Professor, Graduate School of Interdisciplinary Science and Engineering in Health Systems, Okayama University

### Technical Evaluation Committee on Material Technology

External experts	Kasahara Naoto	Professor, Nuclear Engineering and Management, School of Engineering, the University of Tokyo
	Matsumoto Akira	Professor, Department of Electrical Engineering and Computer Science, Graduate School of Engineering and Science, Shibaura Institute of Technology
	Mochizuki Masato	Professor, Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University

### Technical Evaluation Committee on Severe Accident

External experts	Itoi Tatsuya	Associate Professor, Graduate School of Engineering, the University of Tokyo
	Muta Hitoshi	Associate Professor, School of Integrative Science and Engineering, Tokyo City University
	Morita Kouji	Professor, Graduate School of Engineering, Kyushu University

### Technical Evaluation Committee on Nuclear Fuel Cycle

External experts	Enokida Yoichi	Professor, Graduate School of Engineering, Nagoya University
	Honma Shunji	Associate Professor, Department of Applied Chemistry, Faculty of Engineering, Saitama University
	Matsumura Ken	Affiliate Professor, Department of Nuclear Safety Engineering, Faculty of Engineering, Tokyo City University
	Asanuma Noriko	Associate Professor, Department of Nuclear Engineering, School of Engineering, Tokai University

### Technical Evaluation Committee on Back-end

External experts	Iguchi Tetsuo	Professor Emeritus, Nagoya University
	Kozaki Tamotsu	Professor, Faculty of Engineering, Hokkaido University
	Niibori Yuichi	Professor, Graduate School of Engineering, Tohoku University
	Yamamoto Takahiro	Deputy Director, Research Institute of Earthquake and Volcano Geology, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology

### Technical Committee on Earthquake and Tsunami

External experts	Iwata Tomotaka	Professor, Disaster Prevention Research Institute, Kyoto University
	Sakai Naoki	Deputy Director-General, Center for Advanced Research Facilities, National Research Institute for Earth Science and Disaster Resilience
	Itoi Tatsuya	Associate Professor, Graduate School of Engineering, the University of Tokyo



## 5. Others

### (1) NRA Policy Evaluation Meeting

#### Overview

It is a requirement to conduct hearing of opinions from external experts regarding policy evaluation (ex-post assessment) conducted by the NRA. The meeting was held once in FY2020 to hear opinions on policy evaluation.

#### Members of the NRA Policy Evaluation Meeting

External experts	Iizuka Yoshinori	President, Japan Accreditation Board Professor emeritus, the University of Tokyo
	Ohya Takehiro	Professor, Faculty of Law, Keio University
	Kamei Zentaro	Chief Researcher, PHP Research Institute Specially appointed professor, Graduate School of Social Design Studies, Rikkyo University
	Shiroyama Hideaki	Professor, Graduate School of Public Policy, the University of Tokyo Professor, Graduate Schools for Law and Politics, the University of Tokyo
	Fujita Yukiko	Professor, Faculty of Law, Gakushuin University
	Machi Asei	Freelance journalist

### (2) Meeting on NRA's Administrative Project Review for FY2020

#### Overview

In the administrative project review, all ministries and government offices are required to clarify the status of implementation of all their projects, taking into account external opinions. Furthermore, as part of the review, an expert meeting shall be held for some of the projects for hearing external experts' opinions on problems and improvement. In FY2020, a total of three expert meetings were held.

#### Members of the Meeting

External experts	Iijima Hirokuni	Professor, Faculty of Economics, Chuo University
	Nishigaki Mei	Partner, Avantia GP
	Itoh Shin	General Director, Japan Initiative

### (3) Meeting on Hearing Opinions of Operators regarding New Regulatory Requirements

#### Overview

This Meeting is held on an irregular basis whenever a necessity arises to publicly hear operators' opinions on the new regulatory requirements. In FY2020, one meeting was held on the continuous review of regulatory standards, one meeting on the ergonomic design evaluation guide, one meeting on the impact of debris passing through the sump screen on the reactor core, and one meeting on the priority of technical evaluation.

## Members of the Meeting

### -Continuous improvement, etc. of regulatory requirements (August 26, 2020)

Secretariat of the NRA	Sakurada Michio	Deputy Secretary-General for Technical Affairs
	Toyama Makoto	Director, Regulatory Standard and Research Division
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Division
	Kitainoue Hiroki	Expert, Regulatory Standard and Research Division

### -Ergonomic design evaluation guidelines (October 26, 2020)

Secretariat of the NRA	Ichimura Tomoya	Director-General, Nuclear Regulation Department
	Toyama Makoto	Director, Regulatory Standard and Research Division
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Division
	Suzuki Akiko	Deputy Director, Regulatory Standard and Research Division
	Imase Masahiro	Senior Expert on Nuclear Regulation, Division of Research for Reactor System Safety
	Horiuchi Tomoaki	Officer for Technical Research and Examination, Division of Research for Reactor System Safety
	Mizuno Hiroshi	Deputy Management Director, Division of Oversight of Nuclear Power Plants

### -Effect of debris passing through the sump screen on the core (December 7, 2020)

Secretariat of the NRA	Toyama Makoto	Director, Regulatory Standard and Research Division
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Division
	Tsukamoto Tadashi	Chief Officer for Technical Research and Examination, Division of Research for Reactor System Safety
	Eguchi Hiroshi	Officer for Technical Research and Examination, Division of Research for Reactor System Safety
	Kobayashi Takaaki	Chief Safety Examiner, Division of Licensing for Nuclear Power Plants
	Tanaka Toshio	Safety Examiner, Division of Licensing for Nuclear Power Plants
	Ono Tatsuya	Senior Reactor Analysis Examiner, Division of Oversight of Nuclear Power Plants

### -Priority order of technical assessments in FY2021 (January 22, 2021)

Secretariat of the NRA	Toyama Makoto	Director, Regulatory Standard and Research Division
	Sasaki Haruko	Director for Policy Planning and Coordination, Regulatory Standard and Research Division
	Kono Katsumi	Chief Officer for Technical Research and Examination, Division of Research for Reactor System Safety
	Imase Masahiro	Senior Expert on Nuclear Regulation, Division of Research for Reactor System Safety
	Otsuka Ichiro	Chief Officer for Technical Research and Examination, Division of Research for Nuclear Fuel Cycle and Radioactive Waste
	Maeda Toshikatsu	Safety Regulation Coordination Officer, Division of Licensing for Research Reactor
	Shimazaki Akio	Deputy Management Director, Division of Specified Oversight
	Morita Kenji	Chief Inspector Specialized in Nuclear Facilities, Division of Specified Oversight
	Fujisawa Hiromi	Technical Consultant

#### **(4) Meeting on Continuous Improvement of Safety Evaluation of Commercial Power Reactors**

##### **Overview**

Two meetings on the continuous improvement of the safety evaluation of commercial power reactors, which consists of the staff of the Nuclear Regulation Authority (NRA), were held in FY2020 in order to confirm the safety evaluation reports submitted by the operators and to discuss the continuous improvement of the future safety evaluation with a view to reflecting the results in other plants.

Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Fujimori Akihiro	Nuclear Regulation Research Officer

#### **(5) Public Meeting on Inspections for Commercial Power Reactor**

##### **- Public meeting regarding significant indications of welding in the pressurizer spray line piping of Ohi NPS Unit 3**

With regard to the cracks detected in the welding area of the pressurizer spray line piping of Unit 3 of the Ohi NPS of the Kansai Electric Power Company, eleven public meetings were held in FY2020 to hear from the operator about the conformity to the technical standard regulations, the results of the cause analysis by direct observation of the cracks, and future measures.

##### **Members of the Public Meeting**

Secretariat of the NRA	Kaneko Shuichi	Executive Inspector of Nuclear Regulation
	Sugimoto Takanobu	Director, Division of Specified Oversight
	Takasu Yoji	General Oversighting Advising Officer
	Takiyoshi Koji	Senior Coordinator for Policy Planning
Japan Atomic Energy Agency	Onizawa Kunio	Head, Planning Control Office, Sector of Nuclear Safety Research and Emergency Preparedness, Japan Atomic Energy Agency (JAEA)

##### **- Public meeting to investigate and analyze the cause of the rewriting of borehole map data at Tsuruga NPS Unit 2**

In FY2020, one public meeting was held to confirm the validity of the investigation and analysis of the cause of the rewriting of the borehole map data of Tsuruga NPS Unit 2 by the operator.

##### **Members of the Public Meeting**

Secretariat of the NRA	Koganeya Toshiyuki	Director, Oversight Planning and Coordination Division
	Kosaka Atsuhiko	Senior Coordinator for Policy Planning
	Takemoto Akira	Senior Coordinator for Policy Planning

## (6) Working-Level Exchange of Technical Views

### - Working-level exchange of technical views concerning aging deterioration management with ATENA

In response to a request by the ATENA, a working-level meeting between the ATENA and the NRA Secretariat was held to exchange technical views concerning aging deterioration management. In FY2020, five meetings were held.

Situation of meeting	Main contents of technical view exchange
1st meeting (March 6, 2020)*	<ul style="list-style-type: none"> <li>- Methods of opinion exchanges</li> <li>- Activities for aging degradation management for the safe and long operations of nuclear power plants</li> </ul>
2nd meeting (April 27, 2020)	<ul style="list-style-type: none"> <li>- Activities for aging degradation management for the safe and long operations of nuclear power plants               <ul style="list-style-type: none"> <li>➢ Maintenance during long-term plant shutdown</li> <li>➢ Management of aging of design</li> <li>➢ Management of discontinued products</li> </ul> </li> </ul>
3rd meeting (May 22, 2020)	<ul style="list-style-type: none"> <li>- Activities for aging degradation management for the safe and long operations of nuclear power plants               <ul style="list-style-type: none"> <li>➢ Analysis of cable insulation properties under severe accident conditions</li> <li>➢ Findings on the effect of neutron irradiation on the strength of concrete</li> <li>➢ Maintenance during long-term plant shutdown</li> </ul> </li> </ul>
4th meeting (June 1, 2020)	<ul style="list-style-type: none"> <li>- Activities for aging degradation management for the safe and long operations of nuclear power plants               <ul style="list-style-type: none"> <li>➢ Analysis of cable insulation properties under severe accident conditions</li> <li>➢ Findings on the effect of neutron irradiation on the strength of concrete</li> <li>➢ Maintenance during long-term plant shutdown</li> </ul> </li> </ul>
5th meeting (June 15, 2020)	<ul style="list-style-type: none"> <li>- Activities for aging degradation management for the safe and long operations of nuclear power plants               <ul style="list-style-type: none"> <li>➢ Maintenance during long-term plant shutdown</li> <li>➢ Management of aging of design</li> </ul> </li> </ul>
6th meeting (July 1, 2020)	<ul style="list-style-type: none"> <li>- Activities for aging degradation management for the safe and long operations of nuclear power plants               <ul style="list-style-type: none"> <li>➢ Maintenance during long-term plant shutdown</li> <li>➢ Management of aging of design</li> <li>➢ Draft document on "Working-level Technical Discussions with ATENA on Aging Management"</li> <li>➢ Overview of Understanding of Aging Deterioration during Long Shutdown Periods of Hard-to-Replace Devices and Structures in Nuclear Power Plants</li> </ul> </li> </ul>

\*The first meeting was held in FY2019.

## (7) Research Promotion Committee, Research Evaluation Committee, and Debriefing Session of Research Results

### Overview

For the Radiation Safety Research Strategic Promotion Project, which was launched in FY2017, the NRA publicly seeks research project offers for the priority research areas set by the NRA every fiscal year. The Research Promotion Committee held three meetings in FY2020 in order to select research themes for the project, to manage their progress, and to set the priority research areas for the next fiscal year.

In addition, the Research Evaluation Committee held two meetings in order to evaluate research plans and research results, and the Debriefing Session of Research Results was held once.

## Members of the Research Promotion Committee and the Research Evaluation Committee

### Research Promotion Committee

NRA Commissioner	Ban Nobuhiko	NRA Commissioner
External experts	Ishikawa Tetsuo	Professor, School of Medicine, Fukushima Medical University
	Takahashi Tomoyuki	Associate Professor, Kyoto University Research Reactor Institute
	Furuta Sadaaki	Director, PESCO, Co., Ltd Chubu Office
Secretariat of the NRA	Ono Yuji	Director, Radiation Protection Policy Planning Division
	Murayama Ryosuke	Director, Radiation Monitoring Division
	Miyamoto Hisashi	Director, Division of Regulation for Radiation
	Takayama Ken	Planning Officer, Radiation Protection Policy Planning Division
	Mitsuhashi Yasuyuki	Planning Officer, Radiation Protection Policy Planning Division
	Shigeyama Masaru	Planning and Research Officer, Radiation Protection Policy Planning Division
	Kikuchi Kiyotaka	Planning Officer, Radiation Monitoring Division
	Omachi Yasushi	Deputy Director, Radiation Protection Policy Planning Division
	Kobayashi Shunji	Assistant Manager, Radiation Protection Policy Planning Division
	Honma Toshimitsu	Radiation Protection Technology Researcher, Radiation Protection Policy Planning Division
	Nakamura Takashi	Senior Technical Consultant, Division of Regulation for Radiation

### Research Evaluation Committee

External experts	Urabe Itsumasa	Professor Emeritus, Fukuyama University
	Oda Keiji	Executive Vice President, Kobe University
	Suzuki Gen	Professor and Director, International University of Health and Welfare Clinic
	Futatsugawa Shoji	Radiation Safety Officer, Alpha Tau Medical
	Yoshida Hiroko	Associate Professor, Radioisotope Research and Education Center, Graduate School of Pharmacy, Tohoku University

## (8) Public Meeting on Response to Accidents and Troublesome Events at Nuclear Facilities

### Overview

In order to check on the nuclear operators' cause identification and corrective actions of accidents and troubles at their nuclear facilities, public meetings has been held and NRA Commissioners Yamanaka and Tanaka participated in them as necessary. In FY2020, four meetings from the 13th to 16th meetings were held.

### Members of the Public Meeting

Secretariat of the NRA	Takeyama Shoji	Director for Nuclear Regulation (in charge of commercial power reactor oversight)
	Takasu Yoji	Special Officer for Oversight Guidance (attending since the 14th meeting)

## (9) Debriefing Session of Emergency Drills by Nuclear Operators

### Overview

Regarding nuclear emergency drills conducted by nuclear operators, a debriefing session was held once in FY2020, led by Commissioners Yamanaka and Tanaka with the aim of strengthening information sharing between NRS and the operators and improving the emergency response capabilities. In addition, two working groups were held under the debriefing session to discuss scenarios related to training for improving the judging ability of the commanders of nuclear power plants' emergency response centers and central control rooms and also training for enhancing on-site response ability.

### Members of the Debriefing Session

NRA Commissioner	Yamanaka Shinsuke	NRA Commissioner
	Tanaka Satoru	NRA Commissioner
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response
	Kaneko Shuichi	Director-General for Nuclear Regulation Policy
	Kinjo Shinji	Director of Personnel
	Morishita Yasushi	Director, Nuclear Regulation Policy Planning Division
	Ono Yuji	Director, Radiation Protection Policy Planning Division
	Taguchi Tatsuya	Director for Nuclear Regulation (in charge of examining commercial power reactors)
	Hasegawa Kiyomitsu	Director for Nuclear Regulation (in charge of examining nuclear fuel facilities)
	Takeuchi Atsushi	Director, Office for Accident Measures of Fukushima Daiichi Nuclear Power Station
	Koganeya Toshiyuki	Director, Emergency Preparedness and Response Office
	Murata Shinichi	Director, Accidents Response Office
	Kodama Satoshi	Director for Policy Planning and Coordination, Emergency Preparedness and Response Office
Cabinet Office	Satoh Gyo	Director-General for Nuclear Regulation Policy of Nuclear Emergency Preparedness

## (10) Meeting for Reviewing the Emergency Action Level (EAL) and Others

### Overview

With regard to the Emergency Action Levels (EALs) in commercial power reactor facilities, three meetings were held in FY2020 to exchange opinions with nuclear operators who actually operate the facilities on the review of EALs in consideration of the Special Facility for Severe Accident Management and diversity expansion facilities.

### Members of the Meeting

NRA Commissioner	Yamanaka Shinsuke	NRA Commissioner
	Ban Nobuhiko	NRA Commissioner
Secretariat of the NRA	Yamagata Hiroshi	Director-General for Emergency Response
	Yamada Tomoho	Director-General for Radiation Protection Strategy and Security
	Okuma Kazuhiro	Director, Radiation Protection Policy Planning Division (attended until the 6th meeting)
	Ono Yuji	Director, Radiation Protection Policy Planning Division (attended from the 7th meeting)
	Funayama Kyoko	Director, Division of Research (in charge of Severe Accidents)
	Koganeya Toshiyuki	Director, Emergency Preparedness and Response Office