SARIS Summary Report

November 2015

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Introduction

The Nuclear Regulation Authority (NRA) was established to learn the lessons from the Fukushima Dai-ichi accident of 11 March 2011, to ensure that such accidents never happen again, to restore public trust in regulatory body both in Japan and abroad and to establish and foster a genuine safety culture by placing the highest priority on public safety, since September 19, 2012. Everyone involved in nuclear activities must display 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. Based on these core values, the NRA has established guiding principles and performs its tasks.

Through self-assessment and discussion during the IRRS mission, the NRA will continue to improve its performance. Having learned lessons from the Fukushima Dai-ichi accident and with reference to IAEA safety standards, the NRA was established as an independent regulatory body, and the regulatory requirements were strengthened in particular for hazards such as tsunamis and earthquake which may lead to common cause failures. Emergency preparedness and response (EPR) for nuclear emergencies was also enhanced.

The NRA will strengthen further these improvements and foster a stronger safety culture while recognizing that 'absolute safety' can never be achieved and the possibility of future severe accidents.

The valuable suggestions of the IRRS mission in 2007, which reviewed the regulatory activities of former regulatory bodies, regrettably had not been fully utilized, and its follow-up mission was not even conducted. The revamp of the regulatory system in Japan after the Fukushima Dai-ichi accident did address major issues identified in this 2007 IRRS mission, but the NRA still recognizes these further challenges: ensuring a sufficient number of qualified personnel to meet the regulatory needs, continuous improvement through the implementation of an integrated management system, and the improvement of regulatory inspection systems. The NRA developed action plans to address these issues in this self-assessment.

The NRA will continue efforts to enhance the safety of nuclear facilities and activities, while recognizing IAEA safety standards as minimum requirements and paying attention to the unique conditions in Japan. In particular, natural hazards such as earthquakes and tsunamis are major problems in Japan, and the NRA places the highest priority on measures to predict, prevent and mitigate the effects of such natural hazards.

In view of the above, the NRA will address these identified challenges with seriousness and agility, and with prioritization. The NRA will have an international feedback on our progress through an IRRS follow-up mission, and continues our efforts for improvements.

1 Responsibilities and functions of the government

1.1 Conclusions

Based on the self-assessment (SARIS) covering the responsibilities and functions of the government, it finds that, as shown from 1.2 through 1.9, Japan's national policy and strategy for ensuring the safe use of nuclear energy are provided by the Atomic Energy Basic Act, the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors (hereinafter the "Reactor Regulation Act"), the Act on Prevention of Radiation Hazards due to Radioisotopes, etc. (hereinafter the "Radiation Hazards Prevention Act"), and the Act on Special Measures Concerning Nuclear Emergency Preparedness (hereinafter the "Nuclear Emergency Act"). The restructuring of the nuclear regulation agencies following the Fukushima Dai-ichi accident led to the establishment of the NRA, which regulates nuclear energy and radiation facilities and activities in an integrated manner and has effective independence. Therefore, it concludes that the framework and measures are in principle in accordance with the relevant IAEA safety requirements.

1.2 National policy and strategy for safety

Japan's national policy for nuclear safety is stated in the Atomic Energy Basic Act: "In ensuring the safe use of nuclear energy, such nuclear energy shall be utilized with the objectives of (a) contributing to the protection of people's lives, health, and properties, (b) maintaining environmental conservation, and (c) protecting Japan's national security, based on established international standards (Article 2, paragraph 2). In addition, the Act for the Establishment of the Nuclear Regulation Authority (NRA) (hereinafter the "NRA Establishment Act") stipulates the establishment of the NRA and its authorities to ensure nuclear safety. Furthermore, the Reactor Regulation Act provides regulations on nuclear source materials and nuclear facilities; the Radiation Hazards Prevention Act provides regulations for the prevention of radiation hazards, and the Nuclear Emergency Act provides the required measures for emergency preparedness and response to nuclear emergencies. The objective provisions of these acts prescribe national policies for safety.

The Reactor Regulation Act, the Radiation Hazards Prevention Act and other relevant acts provide a national strategy for regulatory framework.

1.3 Establishment of a framework for safety

The Atomic Energy Basic Act clarifies the basic framework policy for ensuring the safe use of nuclear energy, and the following acts, among others, define specific measures in implementing that framework.

- The NRA Establishment Act
- The Reactor Regulation Act
- The Radiation Hazards Prevention Act
- The Nuclear Emergency Act

1.4 Establishment of a regulatory body and its independence

Before the Fukushima Dai-ichi accident, the Nuclear and Industrial Safety Agency (NISA), which regulates nuclear facilities and activities, had been a subordinate organization of the Ministry of Economy, Trade and Industry (METI), which promotes the utilization of nuclear energy. After the Fukushima Dai-ichi accident, the lack of independence of the regulatory authority was cited as one of the causes of the accident. For this reason, combined with other lessons learned, the Government separated the safety regulation department from METI. It established the NRA as a new regulatory body, and incorporated the regulations on use of nuclear and radiation administrated by other ministries to the NRA. That act clearly states that the NRA independently performs duties from a neutral and fair standpoint based on its expertise.

The Reactor Regulation Act, the Radiation Hazards Prevention Act, and the Nuclear Emergency Act grant the NRA legal authority to perform its statutory responsibilities of regulating facilities and activities.

These legal frameworks ensure the NRA's effective independence in safety-related decision making.

1.5 Responsibility for safety and compliance with regulations

The Reactor Regulation Act and the Radiation Hazards Prevention Act assign licensees safety responsibilities over all activities in manufacturing, using, storing, transporting, or processing nuclear material and radioisotopes. The Reactor Regulation Act assigns licensees responsibility for enhancing safety by taking into account the latest findings, through installation of components or equipment, or other measures such as strengthening safety training program.

Neither of the acts allows the delegation of licensees' safety responsibilities to other parties, which means that such maneuvers are legally prohibited for licensees.

1.6 Coordination of authorities with responsibilities for safety within the regulatory framework

The NRA is solely responsible for nuclear safety regulation, except in the following circumstances (including measures not for regulations.)

- Safety regulations on transportation (air and marine transportation, transporting methodology of land transportation): Ministry of Land, Infrastructure and Transport
- Safety regulations on occupational exposure in terms of labour safety, medical exposure, and control of radioactive material in food and tap water: Ministry of Health, Labour and Welfare
- Emergency preparedness and response (off-site radiation protection measures): Cabinet Office
- Monitoring of radioactive materials in the atmosphere, water for public use, and ground water during normal situation: Ministry of the Environment
- Security of nuclear facilities: National Police Agency and Japan Coast Guard

(These Ministries have the responsibilities for the above measures within their mandate)

The NRA communicates and coordinates with the above authorities when necessary, but also establishes the following standing mechanisms for collaboration and cooperation.

Radiation Council	Reports on promoting consistency of related technical standards, based on consultation for radiation protection as requested from other government agencies. (Secretariat: NRA)
Interagency Coordination Meeting for the Safe Transport of Radioactive Material	Provides opportunities for government officers responsible for the transportation of radioactive material to share information and exchange views on various issues, such as the development and revision of the IAEA safety standards on transportation, or national legislation based on these IAEA safety standards. (Secretariat: NRA)
Interagency meeting on nuclear security	Provides opportunities to discuss urgent issues on nuclear security issues (Secretariat: NRA)
Nuclear Emergency Preparedness Commission (NEPC)	Promotes implementation of measures to ensure comprehensive Government efforts to prepare for nuclear accidents. The Prime Minister is the chair of the Commission and the NRA Chair is one of the members (Secretariat: Cabinet office)

The NRA Establishment Act (Article 4-2) allows the NRA to make recommendations on nuclear safety to the heads of other ministries, and to request follow-up action reports on said recommendations, when necessary for the NRA to fulfil its legal mandates.

1.7 Provisions for the decommissioning of facilities and the management of radioactive waste and spent fuel

The Reactor Regulation Act and the Radiation Hazards Prevention Act provide regulations for the safe decommissioning of facilities and for the safe management of radioactive waste and spent fuel.

The funds for the decommissioning of nuclear power plants, the management of spent fuel and the disposal of high level radioactive waste are ensured by licensees of those nuclear facilities, through the relevant acts and other measures. The NRA requests METI to ensure adequate funding for nuclear safety.

1.8 Competence for safety

To develop and maintain the competence of NRA Secretariat (S/NRA) personnel, the NRA Establishment Act requires that training programs, including facilities to improve their professional skills, be established, and that financial resource for human resource development be secured. (Article 6 of Supplemental Provision) To meet this requirement, the Cabinet Order for Organization of the NRA requires the establishment of a Human Resource Development Center within the NRA (Article 8).

To ensure the competence of licensees, for example, the Reactor Regulation Act requires licensees to have the technical competence necessary to install systems, structures and components (hereinafter “SSCs”) and to operate them, and, if required, to take measures to prevent and mitigate severe accidents.

1.9 Provision of technical services

In Japan, technical services, such as individual dose monitoring, environmental monitoring, and calibration of measuring instruments, are available mainly from private enterprises as necessary and appropriate. Therefore, the Government sees no need to take special additional measures for these technical services.

2 Global nuclear safety regime

2.1 Conclusions

Based on the self-assessment (SARIS) for global nuclear safety regime, it finds that, as shown in 2.2 and 2.3, Japan is a signatory to all the conventions on nuclear safety under IAEA auspices. The NRA has a mechanism in place to share operating and regulatory experiences with the international community and promotes international cooperation to improve nuclear safety globally. Therefore, it concludes that the framework and measures of Japan are in principle in accordance with the relevant IAEA safety requirements, with the exception of the following.

- In order to further enhance international cooperation and the NRA's contribution to global nuclear safety, the NRA should develop its human resources which are capable of interacting international human networks as well as having technical knowledge, contributing to global nuclear safety.

To address this challenge, the NRA will implement the Acton Plan as shown in 2.4.

2.2 International obligations and arrangements for international cooperation

Japan is a signatory to all the conventions on nuclear safety under IAEA auspices: the Convention on Nuclear Safety, the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management and the Convention on the Physical Protection of Nuclear Material. The NRA promotes international cooperation to improve global nuclear safety through many bilateral and multilateral partnerships.

Japan has also made a written commitment to the IAEA with regard to the Code of Conduct on the Safety and Security of Radioactive Sources, the Supplementary Guidance on the Import and Export of Radioactive Sources, and the Code of Conduct on the Safety of Research Reactors. The NRA ensures that licensees comply with these codes, by enshrining these requirements in the regulations under the Reactor Regulation Act and the Radiation Hazards Prevention Act.

However, the NRA recognizes the limitation of its contribution to international peer reviews, since its staff has not been able to provide sufficient feedback to other countries' regulatory activities covered by the Convention on Nuclear Safety and other conventions.

2.3 Sharing operating experiences and regulatory experiences

The NRA has an established mechanism to share operating and regulatory experiences. Under this mechanism, the NRA collects such information in Japan and overseas, identifies those relevant to nuclear safety through primary screening, and receives advice from the Committee on Examination of Reactor Safety and the Committee on Examination of Nuclear Fuel Safety. Through this mechanism, any matters deemed to require regulatory action are classified as "technical information requiring action", and are accordingly reflected in regulatory activities.

Japan collects and shares information on operating and regulatory experiences through bilateral information exchanges with countries such as the U.S., France, and the U.K., as well as multilateral corroborations (e.g., IAEA, OECD/NEA, INRA, and Top Regulators' Meeting (TRM) between Japan, China, and the Republic of Korea). Such information is reflected in regulatory activities.

2.4 Action plans

No.	1
Basis	(B1) The IAEA safety standard states that "The Government shall participate in the relevant international arrangements, including international peer reviews," [GSR Part 1, R14]. However, the NRA has not provided sufficient feedbacks to other countries regulatory activities in the Review Meetings of the Convention of Nuclear Safety and other conventions.
Recommendation	(R1) The NRA needs to expand human resources to contribute fully to international peer reviews and train personnel who have an experience in international networking and possess the required technical knowledge.
Action Plan	(A1) In evaluating the performance of staff for international affairs, safety research, improvement of regulations and guides, and other relevant positions, contribution to international activities (in particular for peer review) should be included in such personnel evaluation. In order to establish global human networks, the frequency of personal rotation and the opportunities for working in international organizations should be optimized.

3 Responsibilities and functions of the regulatory body

3.1 Conclusions

Based on the self-assessment (SARIS) for responsibilities and functions of the regulatory body, it finds that, as shown in 3.2 through 3.10, the NRA was established to serve as a regulatory body with effective independence and undertakes the responsibility of nuclear safety regulation in an integrated manner, through the restructuring of the nuclear safety regulatory organization following the Fukushima Dai-ichi accident. The NRA has greater independence and neutrality, and the NRA's activities are much more open and transparent in communicating with regulated parties in order to reduce public doubt and distrust, compared to the previous situation. Therefore, it concludes that the framework and measures of the NRA are in principle in accordance with the relevant IAEA safety requirements, with the following exceptions.

- The NRA does not have sufficient qualified staff to meet the needs of the several specific regulatory activities and therefore needs to ensure sufficient staff to perform its responsibilities.
- The NRA should optimize the frequency and pattern of personnel rotation in consideration of the characteristics of individual posts, based on the NRA's "Basic policy for human resource development" and the "Model career path for NRA personnel". This effort should be combined with training in specialized fields to help personnel effectively acquire the competence necessary for their tasks.
- Safety research of JAEA (Japan Atomic Energy Agency) should be further enhanced for strengthening technical competence of the regulatory body, and also the cooperation between the NRA and JAEA in terms of human resource development be strengthened.

For addressing these challenges, the NRA will implement the Acton Plans as shown in 3.10.

3.2 Organizational structure of the regulatory body and allocation of resources

The NRA, following the procedures required for government organizations, may change its organizational structure according to needs, and create suitable bodies to fulfill its responsibilities in a manner commensurate with the level of radiation risk associated with regulated facilities and activities.

The NRA, after developing priority policies for the next fiscal year, establishes an annual priority plan for its staff size and allocation and a budget. Based on this annual priority plan, the NRA manages its human and financial resources, anticipating expected changes in task loads and priority, and may increase the number of staff and budget if any shortage is anticipated or

streamline when necessary. These procedures are implemented as part of the NRA integrated management system.

3.3 Effective independence in the performance of regulatory functions

The NRA Establishment Act requires the NRA Chairman and Commissioners to perform their duties independently (Article 5). The NRA is effectively independent of organizations or agencies responsible for operating or promoting nuclear facilities and activities. Under the Reactor Regulation Act and the Radiation Hazards Prevention Act, the NRA regulates nuclear and radiation safety in an integrated manner, which means that the NRA can perform its functions without undermining its effective independence.

The NRA is also granted authority to intervene with licensees under the Reactor Regulation Act and the Radiation Hazards Prevention Act. This authority enables the NRA to order licensees, to take necessary measures to prevent a nuclear disaster or radiation hazard (e.g. suspension of the use of facilities), when the NRA decides such actions are necessary including situations of, earthquakes, fire or other disasters.

3.4 Staffing and competence of the regulatory body

The NRA, following the procedures required for government organizations, may change its organizational structure according to needs. The NRA tries to ensure the required competence of S/NRA personnel is met by: recruiting new graduates with the necessary engineering expertise through examinations and interviews, and mid-career experts who both meet the recruitment conditions (e.g., job history in the nuclear power industry and associated expertise) and pass intensive interview. In particular, for highly specialized posts (e.g. Nuclear Safety Inspector, Nuclear Facility Inspector, and Senior Specialist for Nuclear Emergency Preparedness), the competence of the candidates is determined based on specific requirements such as the years of working experience and completion of the designated training courses. However, the NRA does not have a sufficient number of qualified staff for performing the assigned responsibilities, which may undermine its effective independence.

For human resource development, the NRA has adopted a “Basic policy for human resource development” and a “Model career path for NRA personnel”, and implements programs based on these policies. The NRA develops a training program with reference to IAEA standards and other good practices. Specifically, the NRA clarifies the knowledge and skill levels required for each tasks, and implements adequate training programs. The supervisors of staff are required to provide on-the job training and to provide advice on the required trainings.

In the near-term, the NRA should implement efficient specialized training programs to enable personnel to acquire the necessary competencies, and ensure suitable job rotations (frequencies,

patterns) taking into account various task needs, based on Basic policy for human resource development" and the "Model career path for NRA personnel".

3.5 Liaison with advisory bodies and support organizations

Several advisory committees have been legally established within the NRA. The Reactor Safety Examination Committee and the Nuclear Fuel Safety Examination Committee investigate and review safety matters associated with reactors and other nuclear facilities when instructed by the NRA. The Radiation Council reviews the coordination of technical standards for the prevention of radiation hazards, when consulted by other ministries or agencies, and provides its reports. The NRA appoints external "experts for emergency response" to examine EPR (Emergency Preparedness and Response) matters based on the NRA Establishment Act (Article 22), and these experts may provide advice or support to the NRA on specific issues in an emergency.

In addition to legally constituted advisory committees, the NRA may establish other ad-hoc teams (e.g. a study team), consisting of NRA members (commissioner and staff) and external experts, for specific issues on nuclear regulations. These external experts may provide advice.

However, the external experts' advice do not replace the assigned responsibilities to the NRA, and the NRA makes final decisions on regulatory activities (e.g. authorization, change of regulatory framework) taking into accounts of these advice.

The NRA supervises the groups supporting NRA activities within the Japan Atomic Energy Agency (JAEA), which conducts safety research and provides input to regulations, and the National Institute of Radiological Sciences (NIRS), which conducts studies and research to support NRA activities.

However, the Department of Regulatory Standards and Research within the NRA (internal TSO) does not have facilities necessary for experiments. The JAEA's safety research is not sufficient to support the NRA technical competency, even though this is one of the NRA's most important conditions for performing its duties and its independence, with the cooperation of Technical Support Organizations such as the JAEA and NIRS. Therefore, it is necessary to further enhance the safety research of JAEA to ensure technical competence, and also to enhance cooperation between NRA and JAEA in terms of human resource development.

3.6 Liaison between the regulatory body and authorized parties

The NRA has a "Policy on Ensuring the Operational Transparency of the NRA," to ensure transparency in communicating with licensees and other interested parties. This will contribute to reducing public doubt and distrust, as well as enhancement of neutrality and independence. The NRA intends to foster communications with licensees while ensuring high levels of transparency in accordance with this policy.

Review meetings with licensees for authorizations are in principle open to the public. In addition to those open review meetings, the NRA has a system of "Interview", where the NRA staff may clarify matters related to the authorization applications, or the licensees may clarify the regulatory standards or regulatory systems. The summary of these interviews as well as the used materials are made available to the NRA website.

In 2014, the NRA launched dialogues with the heads of licensees, open to the public, to deepen mutual understanding. These dialogues focus on the basic policy of the licensees for their activities enhancing safety and their proposals for improvements of the current regulatory systems.

3.7 Stability and consistency of regulatory control

Under the Atomic Energy Basic Act which defines the basic policy for the utilization of nuclear energy, the Reactor Regulation Act provides regulations on facilities and activities associated with nuclear energy, and the Radiation Hazards Prevention Act governs the use of radioisotopes, etc. The NRA Establishment Act spells out the NRA's authority and functions as a regulatory body. The NRA defines regulatory criteria to implement these acts in the NRA Ordinances, and standard review plans or guides in the form of NRA directives. The NRA makes these criteria or guides publicly available. The NRA conducts reviews for authorizations (e.g. establishment permits, construction plan approval, operational safety programs approval, decommissioning plans approval), regulatory inspections, and other authorizations in accordance with these regulatory criteria and guides. The NRA also publishes the result of its reviews for these authorizations such as an evaluation report that explains the basis for the NRA judgment. Therefore, the NRA ensures stability and consistency of regulatory control.

3.8 Safety related records

The NRA manages licensees' applications and other documents as administrative documents based on the Public Records and Archives Management Act. The records of the NRA's regulatory inspections are developed in accordance with directives and kept together with relevant applications as administrative documents.

In addition, the Reactor Regulation Act and the Radiation Hazards Prevention Act require licensees to record necessary matters and keep these records within the facility. The NRA verifies the creation and retention of these records thorough operational safety inspections and on-site inspections as needed.

For licensees of nuclear facilities which are required measures for severe accidents, the Reactor Regulation Act requires licensees to conduct periodic safety assessment of continuous improvement, to submit that report to the NRA, and to make that report publically available.

Therefore, the NRA ensures the creation of retention of safety related records.

3.9 Communication and consultation with interested parties

The NRA makes decisions in its commissioner meetings, which are open to the public, except for those on nuclear security and other confidential matters. These meeting are broadcast live on the Internet and recorded video is available on the NRA web site. Materials used for such meetings are instantly made available to the public and licensees via the NRA's website after their start, which gives licensees and the public instant access to the information. Other meetings, such as study groups consisting of external experts are also broadcast live on the Internet, with their materials and minutes published. When making important regulatory decisions, including establishing regulatory criteria and associated guides, the NRA solicits public comments even when the Administrative Procedure Act does not require such public input.

Within this broad range of available public information, the NRA also develops, for interested overseas parties such as international organizations and regulatory authority, publicly available English reports on such issues as accidents or monitoring. The NRA sends these reports to international organizations and overseas regulatory authorities.

The NRA may ask the opinion of other competent authorities on regulatory decisions if legally required, and otherwise communicate and coordinate with them if thought necessary even though this is not legally required.

For local governments, the NRA participates in meetings with residents or their representatives living near nuclear facilities and provides further explanation on its important decisions such as the new regulatory requirements or decisions to issue permits under new regulatory requirements, based on a request form local governments.

For the academic community, the NRA participants in research discussions or as an observer in committees for industrial standards development, and also provides information on regulatory activities.

For the media, the NRA organizes weekly press conferences by the Chairman and regular briefings by the S/NRA twice a week.

3.10 Action plans

No.	2
Basis	(B2) The IAEA Safety Standard states that "The government, through the legal system, shall establish and maintain a regulatory body, and shall confer on it the legal authority and provide it with the competence and the resources necessary to fulfill its statutory obligation for the regulatory control of facilities and activities." and that "To be effectively independent, the regulatory body shall have sufficient authority and sufficient staffing and shall have access to sufficient financial resources for the proper discharge of its assigned responsibilities." [GSR Part 1, para 2.8]. However, the NRA currently does not have sufficient numbers of qualified staff to fulfill these tasks. (B3) The IAEA Safety Standard states that "The government shall make provision for adequate arrangements for the regulatory body and its support organizations to build and maintain expertise in the disciplines necessary for discharge of the regulatory body's responsibilities in relation to safety" [GSR Part 1, para 2.36. (b)] and that "A process shall be established to develop and maintain the necessary competence and skills of the staff of the regulatory body, as an element of knowledge management. This process shall include the development of a specific training program on the basis of an analysis of the necessary competence and skills" [GSR Part 1, para 4.13]. The NRA should optimize training programs and staff rotations to make staff more effectively attain the competence necessary for their tasks.
Recommendation	(R2) The NRA should ensure there is sufficient qualified staff to meet the needs of regulatory activities. (R3) The NRA should optimize the frequency and pattern of personnel rotation in consideration of the characteristics of individual posts based on the NRA's "Basic policy for human resource development" and the "Model career path for NRA personnel". This should be combined with specialized training to help personnel achieve maximum efficiency in acquire the competence necessary for their tasks.
Action Plan	(A2) With strengthening its efforts to recruit new graduates and mid-career experts, and with enhancing the attractiveness of its working conditions, the NRA will ensure to have sufficient qualified staff to meet the needs of regulatory activities. (a) The NRA will acquire staff with administrative experience and those with high expertise, through further extension of their retirement age and inter-

governmental exchanges of staff.

(b) The NRA will enhance its attractiveness through (i) sending newly recruited staff for overseas training or education from an early stage, (ii) expanding opportunities to exchange personnel with other organizations (e.g. universities, research institutes, international organizations), and (iii) improving welfare programs (e.g. housing). In the case of cooperation with universities, internships should be further utilized and overall human resource development programs in the field of nuclear safety and regulations should be jointly implemented.

(c) In planning the expected needs of regulatory activities, the additional needs of legal experts and inspectors should be considered, since the increase of administrative decisions and the improvement of inspection systems are foreseen, as well as current imminent needs to expand staff engaged in review and other authorization tasks.

(d) The NRA will ensure a sufficient number of qualified staff, and optimizes their allocation based on their competence evaluation. This process will take into consideration not only the needs of administrative tasks but also the required training programs, including long-term ones conducted in domestic or overseas educational or regulatory institutes.

(A3) The NRA will make the following improvements for human resource development, based on the "Basic policy for human resource development" and the "Model career path for NRA personnel".

(a) Enhancing training programs in each specialized field in reflecting career path. In particular, strengthening hands-on training with simulators for field response capabilities

(b) Considering improving the frequency of personnel rotation, paying particular attention to individuals' expertise, in a manner that extends the overall rotation cycle

(c) Management of staff competences and the development of necessary system for that management

(d) The NRA will ensure a sufficient number of qualified staff, and optimizes the allocation of its staff based on their competence evaluation with the consideration of not only the needs of administrative tasks but with the required training program, including long-term one conducted in educational or regulatory institutes in domestic or overseas (the same as in the last bullet of A2)

(e) In evaluating the performance of staff for international affairs, safety

	research, improvement of regulations and guides, and other relevant positions, contribution to international activities (in particular for peer review) should be included in such an evaluation. In order to establish global human networks, the frequency of personal rotation and the opportunities for working in international organizations should be optimized. (the same as in A1)

No.	3
Basis	(B4) The IAEA Safety Standard states that "The building of competence shall be required for all parties with responsibilities for the safety of facilities and activities, including authorized parties, the regulatory body and organizations providing services or expert advice on matters relating to safety. Competence shall be built, in the context of the regulatory framework for safety, by such means as research and development work" [GSR Part 1 R11 & para 2.35] and that "A process shall be established to develop and maintain the necessary competence and skills of the staff of the regulatory body, as an element of knowledge management." [GSR Part 1, para 4.13]. The regulatory authority's technical competence is an essential element for performing duties and ensuring independence and needs to be supported by safety research. However, the Department of regulatory standards and research in the NRA, which is an internal TSO, does not possess facilities for experiments, and safety research of external TSOs (JAEA) are not sufficient to contribute to develop and maintain technical competence of regulatory bodies.
Recommendation	(R4) JAEA's safety research should be enhanced in order to develop and maintain technical competence of the regulatory body and the collaboration of safety research between the NRA and JAEA should be strengthened in terms of human resource development.
Action Plan	(A4) The NRA will enhance activities to achieve objectives set forth in "Safety Research by the NRA," with an emphasis on the following aspects: (i) Enhancing fundamental research that contributes to human resource development (ii) Strengthening cooperation between the NRA and JAEA in research fields

4 Management system of the regulatory body

4.1 Conclusions

Based on the self-assessment (SARIS) for management system of the regulatory body, it finds that, as shown in 4.2, the NRA established the rules for an integrated management system with reference to IAEA standards and ISO 9001 standards, and started its implementation from April 2015. Therefore, it concludes that its integrated management system is in principle in accordance with the IAEA safety requirements, except in the following area:

- As the integrated management system has just been established, the NRA will need to improve it through a steady implementation of the PDCA cycle focused on any challenges found, in order to firmly root the system in the organization.

For addressing this challenge, the NRA will implement the Acton Plan shown in 4.3.

4.2 Management system of the regulatory body

The NRA established the rules for an integrated management system with reference to IAEA standards and ISO 9001 standards and started implementation in April 2015. In implementing its integrated management system, the NRA defines the "NRA's Mission Statement (core values and guiding principles)" as basic policy for management, and determines a mid-term (5-year) goal and priority programs for each fiscal year based on the basic policy. To achieve these goals and programs, the NRA manages resources and tasks, evaluates, and improves its activities. Specifically, the NRA implements an integrated management system for each task, namely organizational management, responsibilities and mandates, resource management (assignment of human resource, human resource development, knowledge management, training program), documentation, communication, procurement, and other administrative tasks. For evaluation and improvement, the NRA conducts internal audits, management of items needed for improvement, self-evaluation on the achievements of tasks, and top management reviews of these results, which will be reflected in the goals and programs for the following fiscal year.

The NRA in May 2015 also developed a "Policy Statement on nuclear safety" to supplement its mission statement and this is applied in the implementation of its integrated management system.

4.3 Action plans

No.	4
Basis	(B5) The IAEA Safety Standard states that "A management system shall be established, implemented, assessed and continually improved" [GS-R-3, para 2.1.] Since the NRA's integrated management system has just been established, the NRA needs to improve it continuously through the implementation of the PDCA cycle.
Recommendation	(R5) Issues identified for the integrated management system in the course of self-assessment should be autonomously resolved through the implementation of the PDCA cycle on the NRA integrated management system.
Action Plan	(A5) Although the NRA's integrated management system has been established, it has not fully been matured. The NRA will implement internal audits and management reviews, and identify any new issues. These issues, as well as those already identified during the preparation for IRRS, will be addressed in continuous improvement of the integrated management system.

5 Authorization

5.1 Conclusions

Based on the self-assessment (SARIS) for authorization, it finds that, as shown in 5.2 through 5.8, the Reactor Regulation Act and the Radiation Hazards Prevention Act provide the legal framework for authorizations appropriately. The requirements, formats and contents of applications, and criteria for the review are well developed, tailored for each authorization stage of each type of facility and activity, based on a graded approach. Therefore, it concludes that the framework and measures for authorizations are in principle in accordance with relevant IAEA safety requirements, except in the following circumstances:

- Quality assurance programs should be required for the establishment or equivalent stage.
- An initial decommissioning plan should be developed at the time of establishment, and be updated periodically during the lifetime of operations.
- The dismantling plan of the authorized facilities should be reviewed when that dismantling work may result in releasing radioactive materials with possible exposure beyond the dose limit to the public (1 mSv/year) at the site boarder.

For addressing these challenges, the NRA will implement Acton Plans as shown in 5.9.

5.2 Generic issues

The NRA performs nuclear safety regulatory functions in an integrated manner, as described in 1.6. The Reactor Regulation Act, which provides safety regulations for nuclear facilities and activities, and the Radiation Hazards Prevention Act, which provides safety regulations for the handling of radioisotopes, etc., enables the NRA to make final regulatory decisions, even in cases when the NRA is legally required to hear the opinions of other government agencies.

○ Facilities and activities subject to authorization under the Reactor Regulation Act

- Refining of nuclear source material or nuclear fuel material
- Fabrication and enrichment of nuclear fuel material
- Installation and operation of reactors
- Interim storage of spent fuel
- Reprocessing of spent fuel
- Waste management of nuclear fuel material or material contaminated by nuclear fuel material
- Use of nuclear source material or nuclear fuel material as designated in terms of nuclide and amount

- Transportation of nuclear fuel material or material contaminated by other nuclear fuel material

○ Facilities and activities subject to authorization under the Radiation Hazards Prevention Act

- Use of radioisotopes as designated in terms of nuclide and amount
- Selling or renting of radioisotopes
- Waste management of radioisotopes

The Reactor Regulation Act and the Radiation Hazards Prevention Act require the applicants for authorization to submit materials and documents demonstrating the safety of regulated facilities or activities in order to support their applications. However, the required materials and documents may differ depending on the type of facility or activity, based on a graded approach.

The NRA Ordinances specifically requires a licensee's quality assurance program in their applications for construction plans or operational safety programs of nuclear facilities, but they are not required for applications for establishment permits.

5.3 Authorization of nuclear power plants

5.3.1 Authorization of nuclear power plants

The Reactor Regulation Act provides the regulatory framework, which obliges licensees to submit applications with supporting documents to show the compliance with safety requirements, at each stage of progress, for installation, modification, use or operation of nuclear power reactor facilities. That act further obliges applicants to undergo reviews and inspections by the NRA, and to have its authorization (permit, approval or confirmation) before installation, modification, use, or operation of their facilities.

The format of the application and appended documents is defined by the Cabinet Order or the NRA Ordinances under the Reactor Regulation Act. The NRA develops and publishes various guides explaining requirements and procedures for these applications.

5.3.2 Staffing of the operating organization

The Reactor Regulation Act provides a qualification system for "Chief engineer of reactors" (Article 41), and requires licensees to appoint a supervisor for safety of reactor operations from those who are qualified as a "Chief engineer of reactors" and have work experiences commensurate with NRA ordinances (Article 43-3-26). That act also requires licensees to take safety measures for the operation of nuclear power reactors (Article 43-3-22, paragraph (1)(ii)). In implementing such measures, the Commercial Reactors Ordinance obliges licensees (i) to employ

operational staff with the required knowledge, (ii) to have the required number of staff for reactor operations, and (iii) to have supervisors with the necessary knowledge, skills and experience (Article 87, paragraph (1)(iii)). That ordinance also requires the licensees to have an NRA confirmation in advance for the licensees' procedures and implementation systems that judge the conformity of these supervisors' ability to the NRA's criteria. (Article 87, paragraph (1)(iv)). That Ordinance requires operational safety programs to include the assigned tasks (scope and description) for a Chief engineer of reactors, its mandates and the organizational position in supervising operational safety. The Act requires licensees to have an NRA approval of operational safety programs. (Article 43-3-24)

As described above, the framework under the Reactor Regulation Act and its ordinance require licensees of nuclear power reactors to allocate competent managers and a sufficient number of qualified personnel for the safe operation of nuclear power plants.

5.3.3 Operational limits and conditions

The Reactor Regulation Act requires licensees to develop and receive an NRA approval of operational safety programs (Article 43-3-21), and to maintain the compliance of the operational activities to these programs (Article 43-3-24). The Commercial Reactors Ordinance requires operational safety programs to include operational limits and conditions (Article 92, paragraph (1)(ix)). That Standards Review Plan requires licensees to define the limits of operations, according to the operating state, for SSCs important to safety and those coping with severe accidents. As described above, the regulatory framework obliges licensees of nuclear power reactors to conduct operations in compliance with the defined operational limits and conditions.

5.3.4 Qualification and training of personnel

As described in 5.3.2, the Reactor Regulation Act provides a qualification system for a "chief engineer of reactors", and requires licensees to appoint a supervisor for the safety of reactor operations from those who are qualified as a "chief engineer of reactors" and have work experiences commensurate with NRA ordinances (Article 43-3-26).

The Commercial Reactors Ordinance requires licensees to establish a quality assurance program in accordance with the operational safety program, to implement the said program (plan, implement, evaluate, and improve operational safety activities), and to continuously improve the quality assurance program (Article 69). That ordinance also requires operational safety programs to include a quality assurance program (Article 92, paragraph (1)(iii)), and its Standards Review Plan quotes the industrial code "Rules of Quality Assurance for Safety of Nuclear Power Plants (JEAC4111-2009)" (Japan Electric Association) as required criteria, and JEAC4111-2009 calls for defining competence management, necessary education and training programs, and evaluation of

such measures. As described in the above, the regulatory framework obliges licensees to manage its competences.

5.3.5 Management of modification

The Commercial Reactors Ordinance requires licensees to take necessary measures (e.g. development of a plan for maintenance and management, its implementation) for facility modification (Article 81), and the NRA confirms these licensees' measures in the approval of operational safety programs.

The Reactor Regulation Act requires licensees either to obtain the NRA's permit for the modification of an establishment, or to notify such modifications to the NRA in cases where such modifications will evidently not affect the conformity to the regulatory requirements (Article 43-3-8).

That act requires licensees either to obtain the NRA's approval for a construction plan or to notify the NRA of such a plan, before starting constructions (Article 43-3-9, 43-3-10). In the case that licensees plan to modify construction plans after the NRA's approval, licensees shall again seek NRA approval or notify to the NRA of the said changes.

That act requires licensees to undergo NRA pre-service inspections for modified facilities to enable the NRA to confirm that all modifications comply with the approved construction plans and other requirements, and to receive NRA confirmation before beginning operations (Article 43-3-11). Licensees are required to submit the documents on maintenance, replacement or other modifications as annexes to the applications for pre-service inspections.

As described above, the regulatory framework obliges licensees to manage facility modifications.

The dismantling plan of the authorized facilities should be reviewed when that dismantling work may result in releasing radioactive materials with possible exposure beyond the dose limit to the public (1 mSv/year) at the site boarder.

5.3.6 Commissioning

The Reactor Regulation Act requires licensees to undertake pre-service inspections and receive an NRA confirmation before facilities begin operations (Article 43-3-11).

The Commercial Reactors Ordinance specifies the required inspections according to the progress of the preparations, and the following inspections are conducted for commissioning:

- When ready to start criticality operations, regulatory inspections for the performance and function of SSCs (i.e. reactors, cooling systems for reactors, instrumentation and control systems, and generators) required for criticality operations

- When completing all the approved construction, regulatory inspections for the overall performance of facilities in power operations

That act requires licensees to develop an operational safety program which includes a maintenance and management program for the operation of reactor facilities, and to have NRA approval before the start of operations. (Article 43-3-24 and Commercial Reactors Ordinance)

5.3.7 Operating procedures

The Commercial Reactors Ordinance requires licensees to establish necessary operational documentation as follows;

- To establish operational manuals, work procedures and other operational safety documents in accordance with the operational safety program, and to comply with these documents (Article 76).
- To establish necessary plans and work procedures in the event of extensive damage or severe accidents (Articles 85, 86).
- To establish measures to be taken in an emergency, and specifically in the event of an emergency shutdown, to establish a plan to identify the cause, to evaluate damage, and to confirm that the restart of operation will not cause any further troubles; (Article 87)

Licensees are required to observe these plans or procedures. As described above, licensees are required to establish and comply with operational manuals both under normal operations and in the event of accidents.

5.3.8 Maintenance programmes

The Commercial Reactors Ordinance requires licensees to establish a maintenance management policy (1) to ensure that the performance of a nuclear power reactor facility is maintained according to the permitted establishment plan and the approved construction plan; (2) to set up maintenance management targets under that policy; (3) to set up a plan to implement maintenance management to achieve these targets; and (4) implement maintenance management as planned (Article 81). In addition, that ordinance requires operational safety programs to specify the maintenance management for the facilities, and its Standards Review Plan quotes the industrial standard “Code of maintenance and inspections for nuclear power plants (JEAC4209-2007)” as one of the acceptable standards for these requirements.

As described above, licensees are required to establish and comply with operational manuals both under normal operations and in the event of accidents.

5.4 Authorization of research reactors

The requirements and procedures of authorization for research reactors are basically the same as those for nuclear power plants, but the requirements in terms of contents and levels differ based on a graded approach.

The Reactor Regulation Act requires licensees of research reactors to appoint a supervisor for safety of reactor operations from those who are qualified as a “chief engineer of reactors” (Article 40) and have work experiences commensurate with NRA ordinances. The NRA’s approval for welding methods of the designated research reactors is required for welding parties, not for licensees of research reactors.

5.5 Authorization of fuel cycle facilities

The requirements and procedures of authorization for fuel cycle facilities are basically the same as those for nuclear power plants, but the requirements in terms of contents and levels differ based on a graded approach.

The Reactor Regulation Act requires licensees of fuel cycle facilities to appoint a supervisor for safety of facility operations from those who are qualified as a “chief engineer of nuclear fuel”, who is certified under a qualification system of the Act (Article 22-3). The NRA’s approval for welding methods of the designated fuel cycle facilities is required for welding parties, not for licensees

5.6 Authorization of waste management facilities

The requirements and procedures of authorization for waste management facilities are basically the same as those for nuclear power plants, but the requirements in terms of contents and levels differ based on a graded approach.

At present, for buried disposals, only near surface disposals (disposals in a trench or pit) are implemented in Japan, and the NRA regulates these facilities and activities. With regard to radioactive waste originating from nuclear power plants but is not suitable for near surface disposals, and waste from facilities other than nuclear power plants (e.g. research facilities), currently there are no projects for such disposals foreseen in the near future. Therefore, the NRA has not developed any regulatory requirements for the disposal of these wastes. However, since the number of decommissioned plants is expected to increase and certain waste will not be allowed for near surface disposal because of exceeding the limit of radioactivity concentration designated for that disposal , the NRA is developing regulatory requirements for intermediate depth disposal. The NRA needs to start deliberations on the regulatory requirements for the

disposal of radioactive waste coming from research institutes etc., as the JAEA is advancing its programme to build such disposal facilities.

5.7 Authorization of radiation sources facilities and activities

The Radiation Hazards Prevention Act requires relevant organizations to receive NRA authorization before the use of radioisotopes and radiation generating apparatuses. Required authorizations differ according to the level of the risk associated with that use. The act requires the relevant operators using the designated radioisotopes (nuclides and amount) to obtain an NRA permit and its confirmation via inspections at several different stages. Operators using radioisotopes below the designated level shall notify the NRA, if those do not apply to exemptions. The act prohibits the possession of radioisotopes without NRA permission or prior notification to the NRA.

That Act also stipulates that applicants for a permit or inspection shall submit necessary documents to the NRA to confirm the safety and other required matters, and that ordinance stipulates formats of the documents and attachments. The NRA develops and publishes various guides explaining requirements and application procedures related to these authorizations,

In confirming the required compliance of these authorized operators, the act (1) provides a qualification system for a Radiation Protection Supervisor, to persons who have passed the examination prepared by the NRA or a Registered Examination Body (by the NRA approval) (Article 35), (2) requires authorized operators to make an appointed Radiation Protection Supervisor to supervise radiation protection measures (Article 34), and (3) requires any persons in the facility to follow the instructions of the Radiation Protection Supervisor to comply with all legal requirements and for the implementation of the Radiation Hazards Prevention Program (Article 36).

5.8 Authorization of decommissioning activities

The Reactor Regulation Act provides the framework for decommissioning activities. It requires licensees (1) to submit applications for authorization with documents to explain safety and other requirements, (2) to undergo NRA reviews or inspections, (3) to obtain NRA authorization (approval or confirmation), according to the stage of decommissioning. Licensees are required to receive confirmation of the completion of each stage, before moving to the next stage.

The requirements for decommissioning are basically the same for all the nuclear facilities, but the items and the levels of requirements differ depending on the types of nuclear facilities, based on a graded approach.

The Reactor Regulation Act requires licensees to develop and obtain an NRA approval of decommissioning plans. However, licensees are not required to develop an initial

decommissioning plan at the time of establishment, and to update such plan periodically during operations.

5.9 Action plans

No.	5
Basis	(B6) The IAEA Safety Standard states that "A quality assurance programme shall be implemented for all activities that may influence safety or the derivation of parameters for the design basis for the site." [NS-R-3 paragraph 6.6.] and that "The design organization shall establish and implement a management system for ensuring that all safety requirements established for the design of the plant are considered and implemented in all phases of the design process and that they are met in the final design." [SSR 2/1 R2, paragraph 3.2.] Under the current system, at the basic design stage, while a quality assurance program is required and reviewed in terms of the technical competence of licensees, these reviews do not apply to quality assurance programs during the basic design stage including the evaluation of site characteristics. (B7) The IAEA Safety Standard states that "Management systems to provide for the assurance of quality shall be applied to all safety related activities, systems and components throughout all the steps of the development and operation of a disposal facility." [SSR-5 R25] In the design/construction stage of a waste disposal facility, development and implementation of quality assurance programs are not set as a regulatory requirement.
Recommendation	(R6) The NRA should consider requiring licensees to institute quality assurance programs during the establishment permit procedure or equivalent stage.
Action Plan	(A6) The NRA will consider adding requirements to plan and implement quality assurance programs at the establishment permit or equivalent stage, and to review these implementations. In considering these actions for nuclear facilities other than nuclear power plants, the measures to be taken for nuclear power plants and the facility specific features will be taken into account.

No.	6
Basis	(B8) The IAEA Safety Standard states that "The licensee shall prepare and submit to the regulatory body an initial decommissioning plan, and the decommissioning plan shall be updated by the licensee, reviewed by the regulatory body periodically and maintained throughout the lifetime of the facility." [GSR Part 6 R10, paragraph 7.4. and paragraph 7.5, (WS-R-5

	paragraph 5.6. and paragraph 5.7)] Under the current system, however, licensees are not required to develop and update decommissioning plans as staged in the above.
Recommendation	(R7) The NRA should consider developing a regulatory framework for licensees to develop an initial decommissioning plan at the establishment or equivalent stage, and to update such plans periodically throughout the lifetime of the facility.
Action Plan	(A7) The NRA will require the establishment and periodic updating of the decommissioning at plan throughout the lifetime of an existing facility, in the implementation of licensees' periodic safety assessment of continuous improvement for nuclear power plants, reprocessing facilities and fuel fabrication facilities. In considering these actions for nuclear facilities other than nuclear power plants, the measures to be taken for nuclear power plants and the facility specific features will be taken into account.

No.	7
Basis	(B9) The IAEA Safety Standard states that "The regulatory body shall review and assess relevant information to determine whether facilities and activities comply with regulatory requirements and the conditions specified in the authorization. This review and assessment of information shall be performed prior to authorization and again over the lifetime of the facility or the duration of the activity, as specified in regulations promulgated by the regulatory body or in the authorization." [GSR Part 1 R25] and "The decommissioning plan shall be supported by an appropriate safety assessment covering the planned decommissioning activities and abnormal events that may occur during decommissioning." [GSR Part 6 paragraph 5.2., (WS-R-5 paragraph 5.2.)]. However, while the plan for permanently decommissioning a nuclear power plant is set as the scope of review and assessment, the safety of dismantling work of individual SSCs is not covered in the review and assessment.
Recommendation	(R8) The dismantling plan of the authorized SSCs should be reviewed when that dismantling work may result in releasing radioactive materials with possible exposure beyond the dose limit to the public (1 mSv/year) at the site boarder.
Action Plan	(A8) The dismantling plan of the authorized SSCs will be reviewed by the NRA, when that dismantling work may result in releasing radioactive materials with possible exposure beyond the dose limit to the public (1 mSv/year) at the site boarder.

6 Review and assessment

6.1 Conclusions

Based on the self-assessment (SARIS) for review and assessment, it finds that, as shown in 6.2 through 6.3, the Reactor Regulation Act and the Radiation Hazards Prevention Act provide the legal framework requiring licensees to conduct safety assessment for each authorization stage of regulated facilities and activities, and under which the NRA conducts its review and assessment on the licensees' applications before authorization. This legal framework is well developed with consideration of a graded approach. Therefore, it concludes that the framework and measures for review and assessment are in principle in accordance with the relevant IAEA safety requirements, except in the following circumstance.

- The standard review plans for authorization of nuclear power plants should be enhanced

To address this challenge, the NRA will implement the Acton Plan as shown in 6.3.

6.2 Generic issues

6.2.1 Management of review and assessment

The Reactor Regulation Act and the Radiation Hazards Prevention Act, with their subordinate ordinances, require the submission of applications and necessary appendixes that explain the safety and other measures for all facilities and activities governed by these acts. The items included in these documents differ, depending on the types of facilities and activities, based on a graded approach.

The NRA develops and publishes its ordinances, standard review plan and other guides. These define the items to be reviewed to verify application compliance to the relevant requirements, so that applicants understand the required application information in advance. In conducting a review, if the NRA identifies unclear explanations in any submitted documents, it requires applicants to provide supplementary information to ensure the accuracy and sufficiency of the information for review and assessment.

6.2.2 Organization and technical resources and bases for review and assessment

The NRA may change its resource allocations and organizational structure according to the needs and importance of the tasks, and may formulate other suitable organizations to fulfill its review and assessment responsibilities effectively in a manner commensurate with the level of

radiation risk associated with regulated facilities and activities. At present, the NRA has a shortage of staff to implement review and assessments.

The NRA supervises the groups within JAEA which support NRA activities. These include conducting safety research and providing technical support to evaluate the effectiveness of safety measures in the licensees' applications.

6.3 Action plans

No.	8
Basis	(B10) The IAEA Safety Standard states that "The regulatory body shall inform applicants of the objectives, principles and associated criteria for safety on which its requirements, judgments and decisions are based" [GSR Part 1 paragraph 4.26] and that "The regulatory body shall issue guidance on the format and content of the documents to be submitted by the applicant in support of an application for an authorization" [GSR Part 1 paragraph 4.34]. Though the standard review plan and guides for the review of application for authorization of nuclear power plants are published, they should be further enhanced.
Recommendation	(R9) The standard review plan and guides for the authorization for commercial nuclear power plants should be enhanced.
Action Plan	(A9) Considering the progress of on-going compliance reviews and the priority in expected applications, the NRA will enhance standard review plans for nuclear power plants.

7 Inspection

7.1 Conclusions

Based on the self-assessment (SARIS) for regulatory inspections, it finds that, as shown in 7.2, the Reactor Regulation Act and the Radiation Hazards Prevention Act provide the legal framework for various types of regulatory inspections, (e.g. pre-service, welding, fuel assembly, periodic facility, operational safety, and on-site inspections for nuclear facilities), and under which these inspections are structured to confirm the compliance of facilities and activities to the relevant requirements, based on a graded approach. Therefore, it concludes that the framework and measures for regulatory inspections are in principle in accordance with relevant IAEA safety requirements, except in the following circumstances under the Reactor Regulation Act.

- Regulatory inspection should be improved so that they do not substitute for the control, supervision and verification activities conducted by the authorized party itself. For confirmation of waste disposal facilities and waste packages, it should be improved in order not to merely act as a substitute for licensees' own confirmation.
- The scope of regulatory inspections should cover all safety activities of licensees.
- The inspection approach should be more effective by applying risk informed and performance basis inspections.
- The inspection framework should be simplified, flexible and effective by streamlining the scope of various regulatory inspections.
- Competency of inspectors should be further enhanced in accordance with the improvement of the framework.

For addressing these challenge. The NRA will implement the Action Plans as shown in 7.3.

7.2 Generic issues

7.2.1 Inspection approaches, methods and plans

The Reactor Regulation Act defines the regulatory inspections of nuclear power plants at various stages: namely construction, operation and decommissioning stages

At the construction stage, the act stipulates pre-service inspections, fuel assembly inspections, and welding safety management reviews. In conducting the pre-service inspections, the NRA verifies the compliance of the facility with the approved construction plan and relevant technical standards in each step of construction. In conducting the fuel assembly inspections for domestic fabricating parties, the NRA verifies the compliance of the fuel assembly with the approved design and the relevant technical standards at each step of fabrication; and for imported assemblies, their compliance with the relevant technical standards. In conducting the welding safety management

review, that act requires licensees to implement their own inspection on welding, and the NRA then verifies the implementation system of the licensees' inspection.

At the operation stage, the act stipulates periodic facility inspections, operational safety inspections and periodic safety management reviews. In conducting the periodic facility inspections, the NRA inspects the items specified by the Commercial Reactors Ordinance during the period of planned shut-down for periodic maintenance. In conducting the periodic safety management reviews, the act requires licensees to implement their own inspections in the maintenance cycle period (covering the periods of both operation and planned shut-down). The NRA verifies the implementation system of the licensees' inspection. In conducting operational safety inspection, the NRA reviews the compliance of licensees' operational activities with the approved operational safety programs. The NRA conducts operational safety inspections quarterly and additional ones as required by the Commercial Reactors Ordinance (e.g. implementing an inspection at the timing of emergency drill or others).

At the decommissioning stage, the act stipulates periodic facility inspections and operational safety inspections. At the completion of decommissioning, the NRA is required to confirm such completion. The NRA conducts periodic facility inspections for the items specified by the Commercial Reactors Ordinance not later than nine months from the completion date of the previous periodic facility inspection. The NRA conducts operational safety inspection similar to that in the operational stage, but the frequency may be set to quarterly or less frequently depending on the progress of decommissioning work and other conditions. In confirming the completion of the decommissioning, the NRA verifies the compliance of the final conditions with the defined criteria.

As described above, the NRA inspects facilities and activities through programmed inspections, where the items and the timing for inspections are legally defined. During programmed inspections, the NRA may have free access to the site and may conduct inspections on specific items without prior notification.

In addition, the Reactor Regulation Act allows the NRA to conduct on-site inspections of licensees, suppliers for SSCs and other related parties, at the detailed design, construction, operation and decommissioning stages as necessary for the enforcement of law (Article 68). On-site inspections are regarded as reactive inspections, and the NRA may undertake such inspections at short notice, denying licensees the chance to prepare for the inspections. It may have the same effects as an unannounced inspection.

Inspections of facilities and activities other than nuclear power plants are basically the same as those for nuclear power plants, but the scope and methods of inspection differ according to the risk associated with the facilities and activities, based on a graded approach. For welding inspections of nuclear fuel cycle facilities, the NRA inspects welding parties, not licensees. This differs from inspections of nuclear power plants.

The Radiation Hazards Prevention Act requires designated applicants for specified use and waste management of radioisotopes to undergo facility inspections during the construction stage, and subsequent periodic inspections and periodic confirmations during the operational stage. In addition, the NRA may conduct on-site inspection at any authorized operators subject to the regulations of the Radiation Hazards Prevention Act, if deemed necessary for the enforcement of the act.

7.2.2 Inspection processes and practices

NRA inspectors develop the inspection records and reports based on these results, and report them to the responsible NRA directors in accordance with the organization's directive.

When the inspectors identify non-conformance situations during a facility inspection, they shall record the facts, explain the situation to licensees and ask them to initial the report. If non-compliance is found during an inspection where the NRA makes a pass/fail judgment, the inspection is suspended. The licensee is asked to make a report on the corrective action of the non-compliance, and the inspection may be resumed only after that report is confirmed as appropriate.

The results of operational safety inspections are reviewed and shared within the NRA, sent to the licensees and made available to the public. When inspectors find activities not in compliance with approved operational safety programs, they will inspect these items at the next inspection to confirm that corrective actions have been taken to prevent recurrences.

The regulatory framework provides a step-by-step approach at each stage, confirming compliance with the authorization at the previous stage. Specifically, at the establishment stage, the compliance of basic designs and siting conditions with the relevant requirements is confirmed. Subsequently at the stage of construction, the compliance of such plans with the approved establishment permit is confirmed and then the compliance of the SSCs with the approved construction plans is confirmed in pre-service inspections.

7.2.3 Inspectors

The Reactor Regulation Act and the Radiation Hazards Prevention Act requires licensees to undergo regulatory inspections with legally designated scope, and grants authority to certified NRA inspectors (Article 67-2 and Articled 43, respectively). For regulatory inspections under the Radiation Hazards Prevention Act, Registered Inspection Bodies may conduct facility inspections before use, and periodic inspections/ confirmations during use (Articles 41-15 to 41-18)

The nuclear operational safety inspectors, nuclear facility inspectors and radiation inspectors are appointed from those who have a minimum number of years of practical experience, have completed an NRA approved training course, and are equipped with the expertise necessary for such tasks.

7.3 Action plans

No.	9
Basis	(B11) The IAEA Safety Standard states that "Regulatory inspection cannot diminish the prime responsibility for safety of the authorized party, and cannot substitute for the control, supervision and verification activities conducted under the responsibility of the authorized party." [GSR Part 1 paragraph 4.49] Concerning pre-service inspections, fuel assembly inspections and welding inspections, the Reactor Regulation Act requires only NRA regulatory inspections, and does not stipulate the licensees' responsibilities for conducting their own inspections to verify compliance with regulatory requirements. (B12) The IAEA Safety Standard states that "Regulatory inspections shall cover all areas of responsibility of the regulatory body." [GSR Part 1 paragraph 4.52.】 Currently, however, part of the licensees' safety activities (e.g. Compliance of welding standards (except for nuclear power plants) and of fuel assemblies with the relevant requirements) are not within the scope of regulatory inspections. (B13) The IAEA Safety Standard states that "The manner, extent and frequency of inspections shall be in accordance with a graded approach." [GSR Part 1 paragraph 4.52.] The current inspection method should be more efficient and effective in accordance with a graded approach. (B14) The IAEA Safety Standard states that "Regulatory inspection cannot diminish the prime responsibility for safety of the authorized party, and cannot substitute for the control, supervision and verification activities conducted under the responsibility of the authorized party." [GSR Part 1 paragraph 4.49] For confirmation of waste disposal facilities and waste packages, the Reactor Regulation Act requires only NRA regulatory inspections, and does not stipulate the licensees' responsibilities for conducting own inspections to verify the compliance with regulatory requirements.
Recommendation	(R10) The framework for regulatory inspections should be improved so that they do not substitute for the control, supervision and verification activities conducted under the responsibility of the authorized party. (R11) The scope of regulatory inspections should cover all the licensees' safety activities.

	(R12) Regulatory inspections should be more risk informed and more performance based (R13) The inspection framework should be simplified, flexible and effective by streamlining the scope of various regulatory inspections. (R14) For confirmation of waste disposal facilities and waste packages, the NRA should consider improvements in order not to substitute the licensees' own confirmation.
Action Plan	(A10) The NRA will take measures to improve the framework for regulatory inspections, with reference to overseas frameworks − Not to substitute for the control, supervision and verification activities conducted under the responsibility of the authorized party. − To formulate a more flexible framework by integrating the existing regulatory inspections − To ensure effectiveness and efficiency − To enhance inspectors' competency in accordance with an improved framework For confirmation of waste disposal facilities and waste packages, the NRA considers improving the regulatory frame work in order not to substitute the licensees' own confirmation.

8 Enforcement

8.1 Conclusions

Based on the self-assessment (SARIS) for enforcement, it finds that, as shown in 8.2, the Reactor Regulation Act and the Radiation Hazards Prevention Act clearly provides the use of enforcement actions and the conditions for such enforcement actions, and allow the NRA to decide on these enforcement actions. Therefore, it concludes that the framework and measures for enforcement are in principle in accordance with relevant IAEA safety requirements.

8.2 Generic issues

The Reactor Regulation Act and the Radiation Hazards Prevention Act stipulate requirements for enforcement, and the NRA decides on the necessity of enforcement actions, according to the level of any violation or non-compliance to legal requirements.

For example, if the NRA finds a violation against the operational safety programs in nuclear power plants, the NRA may decide on a disposition ranging from administrative guidance, an order to modify operational safety programs under that act (Article 43-3-24, paragraph 3), rescission of an establishment permit or orders to stop operations under the act (Article 43-3-20, paragraph 2).

For a power generating nuclear reactor facility, the Reactor Regulation Act stipulates the following enforcement actions. For other nuclear facilities, that act stipulates basically the same provisions.

Order to return the certificate for chief engineer of reactors (Article 41)
Order to change the notification on an establishment permit (Article 43-3-8)
Order to change the notification on a construction plan (Article 43-3-10)
Rescissions of an establishment permit (Article 43-3-20)
Order of halt the use of facility (Article 43-3-23)
Order to change the operational safety program (Article 43-3-24)
Order to dismiss the chief engineer of reactors (Article 43-3-26)
Order to change the physical protection program (Article 43-3-27)
Order to dismiss the physical protection manager (Article 43-3-28)
Order to change the periodic safety assessment of continuous improvement (Article 43-3-29)
Rescission of the design certificate (Article 43-3-30)
Rescission of the designation of design certificates for specific SSCs (Article 43-3-31)
Order to take measures for decommissioning (Article 43-3-33)

Order to take necessary measures for previous licensees (Article 43-3-34)
Order to take emergency measures (Article 64)

For facilities that use radioisotopes etc., the Radiation Hazards Prevention Act stipulates the following enforcement actions.

Rescission of certificates (Article 12-7)
Order to compel facilities to follow required standards (Article 14)
Order to take measures necessary for preventing radiation hazards in case of non-compliance with technical standard for use (Article 15 paragraph 2)
Order to take measures necessary for preventing radiation hazards in case of non-compliance with technical standard for storage (Article 16 paragraph 2)
Order to take measures necessary for preventing radiation hazards in case of non-compliance with technical standard concerning transport inside the site (Article 17 paragraph 2)
Order to take measures necessary for preventing radiation hazards in case of non-compliance with technical standard concerning transport outside the site (Article 18 paragraph 4)
Order to take measures necessary for preventing radiation hazards in case of non-compliance with technical standard concerning waste management (Article 19 paragraph 2)
Order to change the Radiation Hazards Prevention Program (Article 21 paragraph 2)
Rescission of permission (Article 26)
Order to take measures necessary for preventing radiation hazards in cases where inappropriate decommissioning measures were taken (Article 28 paragraph 6)
Order to take measures in an emergency (Article 33)
Order to return the certificates of the Radiation Protection Supervisor (Article 35 paragraph 6)
Order to dismiss the Radiation Protection Supervisor (Article 38)
Levying of reports (Article 42)

The Reactor Regulation Act and the Radiation Hazards Prevention Act stipulates that the commission of the NRA implements enforcement, and do not specifically allow inspectors to execute these enforcement actions.

The Reactor Regulation Act stipulates conditions for suspension of activities and operation of nuclear facilities. In the case of nuclear power plants, for example, the act stipulates the followings in order to take enforcement actions such as halt, modify or transfer, designate the operational conditions, or other measures necessary for safety (Article 43-3-23).

- When the NRA confirms non-compliance with establishment permit standards as required in the NRA ordinance;

- When the NRA confirms the non-compliance with the technical standards as required in the NRA ordinance
- When the NRA finds that the situation violates required measures , in activities related to maintenance of facilities, operation of facilities, or transport, storage of nuclear fuel material or materials contaminated by nuclear fuel material

The NRA may amend the regulatory requirements, considering the risk and urgency of the findings, when it identifies a new risk which had not been foreseen in the previous authorization process. With the modified requirements, the NRA may order the suspension of operations or other activities for facilities that are not in compliance with these modified requirements (application of back fitting).

9 Regulations and guides

9.1 Conclusions

Based on the self-assessment (SARIS) for regulations and guides, it finds that, as shown in 9.2 through 9.8, that the NRA develops and publishes regulation and guides for various stages (e.g. design, construction, operation, decommissioning) for different types of facilities and activities in various NRA ordinances and directives. The NRA develops regulatory requirements (NRA ordinances) basically as performance-based, and develops standard review plans and other supplementary guides. The NRA also establishes a system to utilize voluntary consensus standards in the regulation. These new regulatory requirements, which were introduced in 2013 incorporating lessons learned from the Fukushima Dai-ichi accident and with reference to IAEA safety standards, are also applicable to existing nuclear facilities.

New regulatory requirements for nuclear power reactors significantly strengthened the requirements for natural hazards (e.g. earthquakes and tsunamis) and human induced events, and introduced measures to tackle severe accidents (beyond design basis accidents). The measures for severe accidents include the prevention of core damage, prevention of containment function failure, and further mitigation measures even in the case of the release of radioactive materials outside the plant. These requirements are in accordance with SSR-2/1, except in the situation mentioned below.

Therefore, it concludes that the framework and measures for regulations and guides are in principle in accordance with the relevant IAEA safety requirements, excepting the followings.

- Site characteristics applied for the establishment permit or equivalent authorization should be reassessed during the lifetime of the nuclear installation. Currently, only seismic and tsunami hazards are reassessed in the guide for periodic safety assessment of continuous improvement.
- The potential risk of nuclear installation to the outside of its site should be assessed based on the investigations of the site characteristics covering sufficient areas outside the nuclear installations.
- The regulatory framework for decommissioning is in principle well developed. However the specific criteria for confirming the completion of decommissioning (site release) of nuclear facilities and method to confirm compliance with these criteria should be developed, including the cases when the remediation work is needed on the site.
- Measures to facilitate decommissioning and management of radioactive waste should be considered starting at the design phase.
- The regulatory standards for disposal facilities and waste packages should be amended so as to be performance based requirements
- A standard review plan for operational safety programs should be clarified to cover the method of closing of waste disposal facilities (e.g. backfilling, sealing and capping) as well as that of monitoring and surveillance after closure.

- The NRA should expedite its work to develop a regulatory standard for intermediate depth disposal facility. In addition, in response to the progress of the projects to install a disposal facility of radioactive waste originating from research institutes etc., a regulatory standard for such facilities also should be developed.
- The NRA should consider establishing a mechanism to identify, collect, and evaluate new findings on radiation protection (e.g. the ICRP recommendations in 2007) in order to reflect such findings in the regulatory activities adequately. The NRA also needs to consider the action to respond to new criteria for lens of eyes applicable to occupational exposure as introduced in the IAEA safety standard.

To address these challenges, the NRA will implement the Action Plans as shown in 9.9.

9.2 Generic issues

The NRA ordinances and related directives for the Reactor Regulation Act and the Radiation Hazards Prevention Act stipulate the regulatory criteria (e.g. technical standards) and procedures (e.g. format for applications). When developing or amending NRA ordinances or associated directives, the NRA may establish a 'study team' of NRA and external experts to develop a draft of these requirements, solicit public comment, and decide on these documents.

The various processes used to develop regulations and guides are open to the public. The NRA shares its views on public comments, and may modify the regulations and guides if appropriate. When the NRA established new regulatory requirements in 2013, it held several hearings to solicit the opinion of licensees on the proposed drafts.

In order to ensure consistency with international standards, the NRA participates in all the IAEA safety standards committees, and collects information and analyzes the differences in safety standards and the respective regulations and guides in preparing for these committee meetings. The NRA tries to reflect state-of-the-art knowledge in its regulations and guides, by having a single department within the NRA responsible both for safety research and the regulations/ guides. This enables it to incorporate the latest research findings into the regulations/ guides.

The NRA has an established a mechanism to share operating and regulatory experiences. The NRA collects information in Japan and overseas, identifies those situations relevant to nuclear safety through primary screening, and receives input from various advisory committees. Through this mechanism, matters deemed to require regulatory action are classified as “technical information requiring action”, and are subsequently reflected in the regulations/ guides. (See 1.2)

The NRA will consider establishing a mechanism to identify, collect, and evaluate new radiation protection findings (e.g. the ICRP recommendations in 2007) in order to reflect such findings in the regulatory activities adequately, since, currently, such mechanism is not sufficiently in place.

The NRA makes this information, such as the basic approach for safety and criteria in formulating regulations/ guide or important modifications of regulatory framework, available to the public and licensees via the NRA web site. Information from NRA commissioner meeting and study teams developing or modifying regulations and guides is broadcasted via the internet. All relevant documents and video recordings are also available on the NRA web site.

9.3 Regulations and guides for nuclear power plants

The regulations and guides for authorization and inspection described in 5.3 are as shown in Table 1 and Table 2 in the Appendix.

Based on the self-assessment (SARIS) for regulations and guides of nuclear power plants, it finds that these regulations and guides are in principle in accordance with relevant IAEA safety requirements, but the following are considered separately.

- Site characteristics applied for the establishment permit or equivalent authorization should be reassessed during the lifetime of the nuclear installation. Currently, only the characteristics of seismic and tsunami hazards are reassessed in the guide for periodic safety assessment of continuous improvement.
- The potential risk of nuclear installation to the outside of its site should be assessed based on the investigations of the site characteristics covering sufficient areas outside the nuclear installations.
- Measures to facilitate decommissioning and management of radioactive waste should be considered starting at the design phase.
- Specific criteria to confirm the completion of decommissioning (site release) of nuclear facilities and methods to confirm compliance with the criteria should be developed, including the conditions after remediation of the site.

9.4 Regulations and guides for research reactors

The regulations and guides corresponding to authorization and inspection described in 5.4 are as shown in Table 3 and Table 4 in the Appendix.

Based on the self-assessment （SARIS） for regulations and guides of research reactors, it finds that these regulations and guides are in principle in accordance with relevant IAEA safety requirements, but the challenges identified for nuclear power (9.2) may be applicable to research reactors. These exceptions should be addressed, taking into account the unique features of research reactors on a graded approach.

9.5 Regulations and guides for fuel cycle facilities

The regulations and guides corresponding to the authorization and inspection described in 5.5 are as shown in Table 5 through Table 12 in the Appendix.

Based on the self-assessment （SARIS） for regulations and guides of fuel cycle facilities, it finds that these regulations and guides are in principle in accordance with relevant IAEA safety requirements, but the exceptions identified for nuclear power (9.2) may also be applicable to fuel cycle facilities. These challenges should be addressed taking into account the unique features of fuel cycle facilities on a graded approach.

9.6 Regulations and guides for waste management facilities

The regulations and guides corresponding to the authorization and inspection described in 5.6 are as shown in Table 13 through Table 15 in the Appendix.

Based on the self-assessment (SARIS）for regulations and guides of waste management facilities, it finds that these regulations and guides are in principle in accordance with relevant IAEA safety requirements, but the following are considered as challenges.

- The regulatory standards for disposal facilities and waste packages should be amended so as to be performance based requirements.
- A standard review plan for operational safety programs should be clarified concerning the method of closing of waste disposal facilities (e.g. backfilling, sealing and capping) as well as that of monitoring and surveillance after closure.
- The NRA will complete the development of a regulatory standard for intermediate depth. disposal, and consider establishing regulatory standards for the disposal of radioactive waste from research institutes.

9.7 Regulations and guides for radiation sources and radiation generating apparatus

The regulations and guides corresponding to the authorization and inspection described in 5.7 are as shown in Table 16 and Table 17 in the Appendix. See “11.5 Code of conduct on the safety and security of radioactive sources”.

9.8 Regulations and guides for decommissioning activities

The regulations and guides for decommissioning are included in those for respective facilities. For example, the regulations for decommissioning of nuclear power reactors are stipulated in the Commercial Reactors Ordinance (Articles 105 through 122) based on the Reactor Regulation Act (Article 43-3-33).

The regulations and guides corresponding to authorization and inspection described in 5.8 are as shown in Table 18 and Table 19 in the Appendix.

9.9 Action plans

No.	１０
Basis	(B15) The IAEA Safety Standard stipulates that "Site characteristics that may affect the safety of the nuclear installation shall be investigated and assessed. These characteristics shall be monitored over the lifetime of the nuclear installation." [NS-R-3 paragraph 2.4., paragraph 5.1.] Under the current system, however, licensees are required to monitor only weather and volcanic conditions, and to reassess only earthquake and tsunami hazards.
Recommendation	(R15) Site characteristics which were applied for an establishment permit or equivalent authorization should be reassessed during the lifetime of a nuclear installation. However, currently, in conducting periodic safety assessment of continuous improvement, only seismic and tsunami hazards are required for reassessment.
Action Plan	(A11) In the case of nuclear facilities which are legally required to conduct periodic safety assessment of continuous improvement (e.g. nuclear power, reprocessing and fabrication facilities), the NRA will include all site characteristics that may affect the risk of nuclear facilities as items to be reassessed every five years in that safety assessment, in addition to those already required (e.g. earthquakes and tsunami hazards). For research reactors, the NRA will consider adding reassessment of site characteristics in periodic safety review (every 10 years). Action plans for nuclear fuel cycle facilities and research reactors should take into account the unique features of these facilities on a graded approach, as well as the progress of the action plan for nuclear power plants.

No.	１１
Basis	(B16) The IAEA Safety Standard stipulates that “The combined effects of the site and the installation shall be such that the radiological risk to the population associated with accident conditions is acceptably low.” [NS-R-3 para 2.27.] The new regulatory requirements for nuclear power only set limits to the dose at the site border in design basis accidents and the amount of release in the case of controlled release of radioactive materials for preventing a containment function failure.
Recommendation	(R16) The potential risk of nuclear installation to the outside of its site should be assessed based on the investigations of the site characteristics covering sufficient areas outside the nuclear installations.
Action Plan	(A12) The NRA will start deliberations and preparations for including an assessment of the potential risk of nuclear installation to the outside of its site, in periodic safety assessment of continuous improvement. When applying probabilistic risk assessment (PRA), the scope of external hazards and its applicability should be well considered, based on the maturity of the methodologies.

No.	１２
Basis	(B17) The IAEA Safety Standard states that “On the completion of decommissioning actions, the licensee shall demonstrate that the end state criteria as specified in the final decommissioning plan and any additional regulatory requirements have been met. The regulatory body shall verify compliance with the end state criteria and shall decide on termination of the authorization for decommissioning.” [GSR Part 6 R15, (WR-S-5 paragraph 9.1. and paragraph 9.2)] and that “The regulatory body shall establish or adopt regulations and guidelines to specify the principles, requirements and associated criteria for safety upon which its regulatory judgments, decisions and actions are based.” [GSR Part 1 R32] However, the specific criteria for confirming the completion of decommissioning (site release) of nuclear facilities and the method to confirm the compliance with the criteria have not been developed. (B18) The IAEA Safety Standard states that “The national government shall establish restrictions on entry to an area left with residual radioactive materials; to restore the area and, after the restoration measures on the area left with residual radioactive materials are completed, regularly investigate the condition of the restored area and, if appropriate, change

	or lift the restriction." [GSR Part 3 paragraph 5.10. and paragraph 5.15] However, in the case where an area requiring remedial action exists at the decommissioning stage, a standard review plan and a confirmation method for the completion of decommissioning have not yet been developed.
Recommendation	(R17) The criteria for confirming the completion of decommissioning (site release) of nuclear facilities and method to confirm compliance with these criteria should be developed. (R18) The above criteria should also consider the conditions where a contaminated area requiring remediation exists on the site at the decommissioning stage (see 11.3 Remediation safety requirements for regulatory authorities).
Action Plan	(A13) The NRA will consider developing specific criteria for confirming the completion of decommissioning (site release) of nuclear facilities. This also covers the conditions where a contaminated area requiring remediation exists on the site at the decommissioning stage. Action plans for nuclear fuel cycle facilities and research reactors should take into account the unique features of these facilities on a graded approach, as well as the progress of the action plan for nuclear power plants.

No.	１３
Basis	(B19) The IAEA Safety Standard states that "Measures to facilitate decommissioning and control the generation volume of radioactive waste have to be considered from the design phase." [GSR Par5 R8, paragraph 4.6.-4.7., SSR-2/1 R12, NS-R-5 paragraph 6.35.-6.36., NS-R-4 para 6.50.] Under the current system, however, this requirement is not included in the regulatory requirements for nuclear facilities.
Recommendation	(R19) Measures to facilitate decommissioning and control the volume of radioactive waste should be considered from the design phase.
Action Plan	(A14) Based on the experience of the decommissioning of existing nuclear power reactors, the NRA will revise the installation permission standard and technical standard (NRA ordinances) for newly built nuclear power reactors so that measures to facilitate decommissioning and control the volume of radioactive waste should be included from the design phase. Action plans for nuclear fuel cycle facilities and research reactors

	should take into accounts the unique features of these facilities on a graded approach, as well as the progress of the action plan for nuclear power plants.

No.	１４
Basis	(B20) The IAEA Safety Standard states that “Waste packages and unpackaged waste accepted for emplacement in a disposal facility shall conform to criteria that are fully consistent with, and are derived from, the safety case for the disposal facility in operation and after closure.” [SSR-5 R20] However, currently, the required standards for waste disposal facilities and waste packages have not been amended for many years and allow only one technical specification.
Recommendation	(R20) The regulatory standards for disposal facilities and waste packages should be amended so as to be performance based requirements.
Action Plan	(A15) Before accepting applications for new construction or modification of the facilities for near surface disposal or intermediate depth disposal, the NRA will amend the relevant regulations (The NRA ordinance and its notification) so as to be performance based requirements.

No.	１５
Basis	(B21) The IAEA Safety Standard states that “Plans for closure, including the transition from active management of the facility, shall be well defined and practicable, so that closure can be carried out safely at an appropriate time. [SSR-5 R19] “Before construction activities commence, there has to be sufficient evidence that the performance of the backfilling, sealing and capping will function as intended to meet the design requirements.” [SSR-5 par4.38] and that “This (monitoring) programme shall be designed to collect and update information necessary for the purposes of protection and safety.”[SSR-5 R21] The NRA plans to confirm the method of closing of waste disposal facilities (e.g. backfilling, sealing and capping) as well as that of monitoring and surveillance programs after closure through the modification of operational safety programs. However, a standard review plan has not yet been prepared.
Recommendation	(R21) A standard review plan for operational safety programs should be implemented for closing of waste disposal facilities as well as monitoring and surveillance after closure.

Action Plan	(A16) Before waste disposal facilities to move to the stage of closure, the NRA will develop a standard review plan for relevant operational safety programs.

No.	１６
Basis	(B22) The IAEA Safety Standard states that “The regulatory body shall establish or adopt regulations and guidelines to specify the principles, requirements and associated criteria for safety upon which its regulatory judgments, decisions and actions are based.” [GSR Part 1 R32] The regulatory standard for intermediate depth disposal is currently being developed, but has not yet been established. The project for building a buried disposal for radioactive waste from research institutes etc. is being progressed, but its regulatory standards have not yet been established.
Recommendation	(R22) A regulatory standard for intermediate depth disposal should be established. The NRA should consider developing regulatory standards for the disposal of radioactive waste from research institutes.
Action Plan	(A17) The NRA should expedite its work to develop a regulatory standard for intermediate depth disposal facility. In addition, in response to the progress of the projects to install a disposal facility of radioactive waste from research institutes, a regulatory standard for such facilities also should be developed.

No.	１７
Basis	(B23) The IAEA Safety Standard states that “Regulations and guides shall be reviewed and revised as necessary to keep them up to date, with due consideration taken of relevant international safety standards and technical standards and of relevant experience gained” [GSR Part 1 R33] However, the NRA has not established a system to reflect new radiation protection findings in its regulatory framework. (B24) The IAEA Safety Standard states that “For occupational exposure of workers over the age of 18 years, the dose limits are: (b) An equivalent dose to the lens of the eye of 20 mSv per year averaged over five consecutive years (100 mSv in 5 years) and of 50 mSv in any single year” for occupational exposure in planned exposure situations (GSR Part 3 Schedule III). However, currently, our regulatory framework does

	not respond to these newly introduced criteria.
Recommendation	(R23) The NRA should consider establishing a mechanism to identify, collect, and evaluate new radiation protection findings (e.g. the ICRP recommendations in 2007) in order to reflect such findings in the regulatory activities adequately. (R24) The NRA also needs to consider the action to respond to new criteria for lens of eyes applicable to occupational exposure as introduced in the IAEA safety standard.
Action Plan	(A18) The NRA considers establishing a mechanism to identify, collect, and evaluate new radiation protection findings (e.g. the ICRP recommendations in 2007) in order to reflect such findings in the regulatory activities adequately. (A19) The NRA considers the action to respond to new criteria for lens of eyes applicable to occupational exposure as introduced in the IAEA safety standard.

10 Emergency preparedness and response

10.1 Conclusions

Based on the self-assessment (SARIS) for emergency preparedness and response, it finds that, as shown in 10.2 through 10.5, that the regulatory framework is well established to regulate licensees' emergency preparedness and response. Therefore, it concludes that the framework and measures for emergency preparedness and response are in principle in accordance with relevant IAEA safety requirements, except in the following areas:

- EALs for nuclear facilities other than nuclear power plants should be developed and included in the NRA EPR guide.
- As the dose limit of occupational exposure in emergency is changed and that the associated radiation protection measures are strengthened from April 2016, a preparatory work should be well completed for the implementation of this system.
- The NRA should consider developing rules for the conditions or parameters for judging EALs, which are included in licensee's EPR plan, in order to avoid possible confusion in a nuclear emergency.
- The NRA should consider having regulatory measures for an EPR development over operators regulated under the Radiation Hazards Prevention Act.

To address these challenges, the NRA will implement the Action Plans as shown in 10.6.

10.2 Generic EPR regulatory requirements

The Nuclear Emergency Act requires licensees to develop a "Nuclear operator's EPR plan" for each site, to update that plan annually, and to consult with the government, local governments and other related parties when developing or modifying that plan. The act requires licensees to conduct emergency exercises and to report the result to the NRA. The NRA may order licensees to change their exercise or other measures if it finds that their emergency procedures are not sufficient to prevent or mitigate a nuclear emergency. Thus the NRA is authorized to supervise the planning, implementation and improvement of the licensees' EPR plans.

The Radiation Hazards Prevention Act requires authorized operators to give notice of an accident (e.g. the theft or disappearance of radioisotopes), to take necessary measures (e.g. first response notification) in emergency situations such as an earthquake or fire, to develop a Radiation Hazards Prevention Program, to include measures covering emergency situations and disasters (e.g. earthquakes, fires) and other dangerous conditions, and to submit that to the NRA.

However, authorized operators under the Radiation Hazards Prevention Act are not required to develop their own EPR plans, so the NRA will consider asking authorized operators for specific EPR measures.

10.3 Functional regulatory requirements

10.3.1 Establishing emergency management and operations

For nuclear facilities, the NRA guide "Viewpoints in reviewing the nuclear operator's EPR plan" clarifies the allocation of EPR staff and seconded personnel, requirements for an operator's emergency response center. The NRA confirms the compliance of such EPR plans to these requirements.

The Radiation Hazards Prevention Act requires the authorized operators to stipulate measures to be taken in emergency situations in their Radiation Hazards Prevention Program, and to take necessary measures to prevent radiation hazards under the supervision of qualified radiation personnel (e.g. a Radiation Protection Supervisor).

Thus, the NRA ensures that the authorized operators can take prompt action in a site emergency.

10.3.2 Identifying, notifying and activating

For nuclear facilities, the Nuclear Emergency Act requires licensees to promptly notify an emergency situation to the relevant parties if they find the ambient dose rate around the site border exceeding 5mSv/h or other significant events as defined by the NRA Ordinance (e.g. loss of cooling water which requires ECCS) (Article 10). This is in accordance with requirements for the notification timing in the appendix VI of GS-G-2.1. Licensees are also required to prepare notification procedures in their EPR plan.

The Radiation Hazards Prevention Act requires authorized operators to notify fire fighters, police stations, the NRA and other concerned parties in the event of serious incidents such as earthquakes, fire or leakage of radioactive materials.

10.3.3 Taking mitigation actions

For nuclear facilities, the "Order for nuclear operator's EPR plan" based on the Nuclear Emergency Act (Article 7) requires licensees to include the assigned tasks for EPR staff and EPR organizational structure in their EPR plan.

The Radiation Hazards Prevention Act requires authorized operators to undertake first response measures such as the use of firefighting equipment to prevent the spread of fires, measures to prevent the spread of contamination and its removal in the event of leakage. Authorized operators are required to include measures to tackle emergencies such as fires or earthquakes in their Radiation Hazard Prevention Program.

10.3.4 Taking urgent protective actions

For nuclear facilities, the NRA EPR Guide, which is quoted in the Nuclear Emergency Act, sets the OIL (Operational Intervention Level) as the criteria in taking protective actions to protect the public. This OIL is in principle in accordance with the relevant IAEA standard.

For authorized operators under the Radiation Hazards Prevention Act, criteria such as the OIL is not defined, taking into accounts of a graded approach since the inventory is significantly smaller compared with nuclear facilities. However, in an emergency (e.g. earthquakes, fire), authorized operators are required to take necessary actions including warnings, prevention of contaminated spread, remediation of contaminated areas, and prohibit entering the site.

10.3.5 Providing information and issuing instructions

The Nuclear Emergency Act requires nuclear facilities licensees to notify the government, local governments or other related parties promptly in the event of emergencies (See 10.3.2). Based on the “Basic Plan for Emergency Preparedness”, the government and local governments notify the public and may institute protective measures.

In emergencies, the Radiation Hazards Prevention Act requires authorized operators to take actions such as alert persons to prohibit entering the site, notify the police, fire department and coast guard and promptly notify the NRA. After such notification, the NRA or other related parties may provide information to the public.

10.3.6 Protection of emergency workers

Under the framework of the Reactor Regulation Act, the Radiation Hazards Prevention Act and other acts aimed at protecting employees, the dose limit for occupational exposure during an emergency response is set as 100 mSv in effective dose, 300 mSv for the eyes in equivalent dose, and 1 Sv for skin in equivalent dose.

The related ordinances were revised in August 2015 to allow for an increase of those dose limits (e.g. 250 mSv in effective dose), provided that radiation workers have received the necessary training, that they fully intend to undertake emergency work after being informed of the possibility of exposure and the high possibility that radioactive material could be released beyond the site's boundaries.

10.3.7 Assessing the initial phase

Nuclear operators are required to assess emergency situations in accordance with the NRA EPR guide, and to then notify the appropriate emergency category to the government, local governments and other related parties. The NRA EPR guide also defines the EALs (Emergency Action Level).

Authorized operators under the Radiation Hazards Prevention Act are required to alert competent authorities to accidents and other emergency situations.

However, the EALs are defined only for nuclear power facilities. EALs for nuclear facilities other than nuclear power plants should be developed and included in the NRA EPR guides.

The NRA should consider developing rules for the conditions or parameters for judging EALs, to be included in licensee's EPR plan, to avoid possible confusion in a nuclear emergency.

10.3.8 Managing the medical response

The "Basic Plan for Emergency Preparedness" and the "Nuclear Emergency Preparedness Manual" describe the necessary medical responses of licensees and local governments, which are, in principle, in accordance with the requirements in 4.78 and 4.79 of GS-R-2.

10.4 Regulatory requirements for infrastructure

The NRA regulates licensees' on-site emergency preparedness and response from the viewpoint of nuclear safety and radiation protection.

Licensees are required to include the employment of their EPR staff in an emergency and procedures to change these allocations in their EPR plan. The NRA verifies the effectiveness of these measures through licensees' emergency exercises.

The Nuclear Emergency Act requires the following measures and the NRA verifies their effectiveness by reviewing the plan and the result of a licensees' exercise.

- Coordination between licensees and organizations to support emergency work
- Development of an emergency response plan
- Supporting logistical measures and the facilities used in an emergency
- An education and training program

The NRA verifies the effectiveness of a licensees' quality assurance program by periodic reviews of plans and procedures and review of improvements in emergency response plans.

10.5 Role of regulatory body during emergency response

The Nuclear Emergency Act provides that in a nuclear emergency, the NRA is assigned (a) to provide advice to licensees, coordinate with involved parties, evaluate of the situation, impact analysis, etc., (b) to providing information, advice and instructions to local governments, (c) assist the prime minister in deciding emergency response measures.

The Radiation Hazards Prevention Act stipulates that during an emergency at an authorized operator's facility, the NRA may issue an order for authorized operators to transfer materials, to remediate contamination or leaks, or to undertake other necessary measures. The NRA provides advice or support to authorized or related parties as necessary.

10.6 Action plans

No.	１８
Basis	(B25) The IAEA Safety Standard states that "the operator shall make arrangements for determination of the appropriate level of response to a nuclear or radiological emergency in accordance with international standards that classify potential radiological emergencies." [GS-R-2 para 4.19.] Currently, however, the NRA has established emergency action levels (EALs) only for power reactors.
Recommendation	(R25) EALs for nuclear facilities other than nuclear power should be developed.
Action Plan	(A20) The NRA will develop EALs for nuclear facilities other than nuclear power plants and include these EALs in the NRA EPR guide.

No.	１９
Basis	(B26) The IAEA Safety Standard states that "response organizations and employers shall ensure that emergency workers who undertake actions in which the doses received might exceed 50 mSv do so voluntarily; that they have been clearly and comprehensively informed in advance of the associated health risks, as well as of available measures for protection and safety; and that they are, to the extent possible, trained in actions that they may be required to take." [GSR Part 3 para 4.17.] The related regulations were revised in August 2015 to allow the increase of the dose limits in emergency work under specified conditions and will be enacted from April 2016.

Recommendation	(R26) Steady implementation of the system relating to the increase of the dose limit for emergency workers at nuclear facilities and the associated arrangements for radiation protection should be ensured.
Action Plan	(A21) The proper implementation should be ensured for the new system of radiation protection for emergency workers (e.g. increase of effective dose limit from 100 mSv to 250 mSv), for which plans will be enacted in April 2016. This also includes the modification of licensees' operational safety programme.

No.	２０
Basis	(B27) The IAEA Safety Standard states that "the operators of facilities shall make arrangements to assess promptly abnormal conditions at facilities, exposures and releases of radioactive material and so on, and also that these assessments shall be used for emergency classification and recommendations for urgent protective actions to be taken off the site." [GS-R-2 para 4.70.] Currently, licensees include these arrangements in their EPR plan and submit it to the NRA. However, the contents of these arrangements differ among licensees.
Recommendation	(R27) The contents of licensees' documents explaining the conditions or parameters for judging EALs should be clearly defined in order to avoid possible confusion in nuclear emergency..
Action Plan	(A22) The NRA should consider defining the conditions or parameters for judging EALs.

No.	２１
Basis	(B28) The IAEA Safety Standard states that "the operator of a facility shall establish a quality assurance programme, in accordance with international standards, to ensure a high degree of availability and reliability of emergency preparedness." [GS-R-2 para 5.37.] Currently, however, authorized operators under the Radiation Hazards Prevention Act are not required to develop such quality assurance programme. (B29) The IAEA Safety Standards state that each organization responsible for response to emergencies shall prepare plans for performing their assigned functions in the event of an emergency. Currently, however, the operators who are regulated by the Radiation Hazards Prevention Act are not required to prepare such emergency plans. [GS-R-2 para 5.13.]

Recommendation	(R28) The NRA will consider requesting specific measure for EPR to the authorized operators under the Radiation Hazards Prevention Act.
Action Plan	(A23) The NRA will consider requesting authorized operators under the Radiation Hazards Prevention Act to include an EPR plan and quality assurance program in their Radiation Hazards Prevention Program or other means, considering the risk level of the inventory of radioisotopes based on a graded approach.

11 Additional area

11.1 Occupational radiation protection

11.1.1 Conclusions

Based on the self-assessment (SARIS) for occupational radiation protections, it finds that the regulatory framework for occupational radiation protection is well developed by the NRA and Ministry of Health, Labour and Welfare.

The related ordinances were revised in August 2015 to allow an increase of dose limits (e.g. from 100 mSv to 250 mSv in effective dose) provided that radiation workers undergo the necessary training, that they are committed to undertaking emergency work even after being briefed on the dangers of exposure, and the high possibility that radioactive material could be released beyond the site border. Preparations are under way for its enactment in April 2016.

Therefore, it concludes that the framework and measures for occupational radiation protection are in principle in accordance with the relevant IAEA safety requirements, while new systems of radiation protection for emergency workers are being prepared (See the action plan No.19 in 10.6), with the following exception.

The NRA also needs to consider the action to respond to new criteria for lens of eyes applicable to occupational exposure as introduced in the IAEA safety standard. (See the action plan No.17 in 9.9).

11.2 Control of discharge and material for clearance, Environmental monitoring for public radiation protection

11.2.1 Conclusions

Based on the self-assessment (SARIS) for control of discharge, materials for clearance and environmental monitoring, it finds that that the appropriate regulatory frameworks are in place under the Reactor Regulation Act and the Radiation Hazards Prevention Act for control of discharge and clearance. Local governments and other agencies conduct environmental monitoring with the support of the government.

Therefore, it concludes that the framework and measures for control of discharge, clearance and environmental monitoring are in principle in accordance with the relevant IAEA safety requirements.

11.3 Remediation safety requirements for regulatory authorities

11.3.1 Conclusions

Based on the self-assessment (SARIS) for remediation safety requirements over the situation that is regulated by the NRA, it finds that the completion of decommissioning (site release) may be applicable to the remediation if some areas are contaminated. The regulatory criteria for confirming the completion of decommissioning have not been established, and this issue should be addressed in accordance with the action plan No. 12 in 9.9.

11.4 Safety requirements for management of radioactive waste

11.4.1 Conclusions

Based on the self-assessment (SARIS) for management of radioactive waste, it finds that the appropriate regulatory frameworks are in place under the Reactor Regulation Act and the Radiation Hazards Prevention Act for management of radioactive waste, commensurate with risk involved in the waste based on a graded approach. The predisposal facilities for radioactive waste within nuclear facilities are regulated under those same conditions for nuclear facilities.

Therefore, it concludes that the framework and measures for management of radioactive waste are in principle in accordance with the relevant IAEA safety requirements with the identified exceptions in 5.6 Authorization of waste management facilities.

11.5 Code of conduct on the safety and security of radioactive sources

11.5.1 Conclusions

Based on the self-assessment (SARIS) for safety of radioactive sources, it finds that the appropriate regulatory frameworks are in place under the Radiation Hazards Prevention Act for radioisotopes and radiation generating apparatuses. The NRA develops and implements the registration system to identify and track the location of radioactive sources for those under Categories 1 and 2, and a part of those under Category 3.

Therefore, it concludes that the framework and measures for safety of radioactive sources are in principle in accordance with safety provisions under the Code of Conduct on the safety and security of radioactive sources, except in the following instance.

- A system to foster a safety culture among authorized operators authorized under the Radiation Hazards Prevention Act should be considered.

To address these challenges, the NRA will implement the Action Plans in 11.5.2.

11.5.2 Action plans

No.	２２
Basis	(B30) The Code of Conduct on the safety and security of radioactive source states that “it shall be ensured that the regulatory body promotes the establishment of a safety culture and of a security culture among all individuals and in all bodies involved in the management of radioactive sources.” [CoC 2004 para 22. (d)] However, currently, authorized operators under the Radiation Hazards Prevention Act are not explicitly required to take measures fostering a safety culture.
Recommendation	(R29) A system to foster a safety culture should be considered for the authorized operators under the Radiation Hazards Prevention Act, based on a graded approach.
Action Plan	(A24) The NRA will consider taking specific measures for fostering safety culture in authorized operators under the Radiation Hazards Prevention Act, such as inclusion of “fostering a radiation safety culture in their Radiation Hazards Prevention Program or other means, with consideration of a graded approach based on the level of risk associated with the handling of radioisotopes.

12 Interface with nuclear security

12.1 Conclusions

Based on the self-assessment (SARIS) for interface with nuclear security, it finds that the NRA is now responsible for safety, security (physical protection) and safeguards(control of nuclear materials) in an integrated manner, after the restructuring of government organizations incorporating lessons learned from the Fukushima Dai-ichi accident, which allows the NRA to prevent harmful interactions among regulatory activities for safety, security and safeguards.

Therefore, it concludes that the framework and measures for interface with security are in principle in accordance with the relevant IAEA safety requirement.

12.2 Legal basis and regulatory oversight activities

Based on the NRA Establishment Act, the NRA is responsible for safety, security and safeguards, and also for the coordination among the competent authorities for security matters on radioactive materials.

12.3 Interface among authorities

The NRA supervises safety, security and safeguards, and manages the interfaces among these various regulatory activities to prevent any harmful interactions. The NRA is also responsible for coordination among competent authorities on security matters of radioactive materials.

The NRA developed the Code of Conduct on Nuclear Security Culture in January 2015 and the Policy Statement on Nuclear Safety Culture in May 2015, which stipulated the harmonization of regulatory activities for nuclear safety and nuclear security. The NRA management system incorporates these codes and statement into its basic policy. The NRA's mid-term goals (April 2015 through March 2020) under its management systems stipulate the efficient coordination for enhancing both safety and security.

The NRA is also responsible for safeguards, and, if there is a need, coordinates the interfaces among safety, security and safeguards.

Appendix

Table 1: Regulations and Guides for Requirements in Authorization and Inspection of Commercial Power Reactors

Authorization / Inspection	Regulations stipulating requirements for authorization and inspection
	Regulatory guides for requirements / Standard review plans on authorization
	Guidelines
Permission for installation	The NRA Ordinance on Standards for the Location, Structure, and Equipment of Commercial Power Reactors
	The Regulatory Guide of NRA Ordinance on Standards for the Location, Structure, and Equipment of Commercial Power Reactors
	[1] Guidelines for Design Basis Seismic Ground Motion and Seismic Design Policy
	[2] Guidelines for Assessing Stability of Foundation Ground and Surrounding Slope
	[3] Guidelines on Surveys for Soil and Geological Structure of Sites and their Surrounding Areas
	[4] Guidelines for Design Basis Tsunamis and Design Policy against Tsunami
	[5] Guidelines for Volcanic Effects Assessment for Nuclear Power Plants
	[6] Guidelines for Tornado Effects Assessment for Nuclear Power Plants
	[7] Guidelines for External Fire Effects Assessment for Nuclear Power Plants
	[8] Guidelines for Fire Protection of Commercial Power Reactor Facilities
	[9] Guidelines for Evaluation of Effectiveness of Measures to Prevent Core Damage and Containment Vessel Function Failure of Commercial Power Reactors
	[10] Guidelines for Evaluation of Effectiveness of Measures to Prevent Fuel Damage in Spent Fuel Storage Pools of Commercial Power Reactors
	[11] Guidelines for Evaluation of Effectiveness of Measures to Prevent Fuel Damage of Commercial Power Reactors during Shutdown
	[12] Guidelines for Exposure Assessment related to Habitability of the Control Room and the Emergency Control Center in case of Severe Accidents involving Commercial Power Reactors
	[13] Guidelines for Specialized Safety Facility for Responding to Severe Accidents involving Commercial Power Reactors
	[14] Guidelines for Assessment of Airplane Crash on Commercial Power Reactors
	[15] Regulatory Guide for Reviewing Technical Competence of Nuclear Operator.
	Standard Review Plan for Technical Competence of Licensees in Taking Necessary Measures to Prevent and Mitigate Severe Accidents at Commercial Power Reactors
Approval of plan for construction work Welding safety management inspection Periodic facility inspection Periodic safety management inspection	The NRA Ordinance on Technical Standards for Commercial Power Reactor Facilities
	The Regulatory Guide of NRA Ordinance on Technical Standards for Commercial Power Reactor Facilities
	Guidelines for Seismic Design for Approval of Construction Plan
	Guidelines for Design against Tsunami for Approval of Construction Plan.
	Guidelines for Effects Assessment of Internal Flooding in Nuclear Power Plants
	Guidelines for Effects Assessment of Internal Fires in Nuclear Power Plants
	Guidelines for Cracking and Other Defects that Cause Damage to Commercial Power Reactor Facilities
	(Note) Refer also to guidelines used in the licensing for establishment ([1]-[12])
	Industrial Codes quoted in regulatory guides
	- Japan Society of Mechanical Engineers: Standards on design and construction, materials, welding, maintenance, etc.
	- Japan Electric Association: Monitoring and testing methods for reactor structure materials, etc.
	The NRA Ordinance on Technical Standards for Quality Management System Concerning the Design and Construction of Commercial Power Reactors for Licensee of Commercial Reactor Operation and System for their Inspection
	The Regulatory Guide of NRA Ordinance on Technical Standards for Quality Management System Concerning the Design and Construction of Commercial Power Reactors for Licensee of Commercial Reactor Operation and System for their Inspection
Fuel assembly inspection	The NRA Ordinance on Technical Standards for Nuclear Fuel Material Being Used as a Fuel in Commercial Power Reactors

Table 2 : Regulations and Guides for Procedures in Authorization and Inspection of Commercial Power Reactors

Authorization / Inspection	Basis in the Commercial Reactors Ordinance	Regulatory guides for requirements / Standard review plans on authorization
Permission for installation / Permission for changes	Articles 3 to7	Guidelines for Application for Establishment (Modification) of Commercial Power Reactors
Approval of plan construction work	Articles 8 to14	Guidelines for Procedure on Approval of Construction Plan of Commercial Power Reactors
Pre-service inspection	Articles 15 to 22	Guidelines for Commercial Reactors Ordinance on Pre-Service Inspection, Periodic Facility Inspection and Periodic Licensees' Inspection Guide for Pre-Service Inspection of Commercial Power Reactors
Fuel assembly inspection	Articles 23 to 34	Guide for Fuel Assembly Inspection of Commercial Power Reactors
Licensees' inspection on welding and welding safety management review	Articles 35 to 44	Guidelines for Commercial Reactors Ordinance on Welding Licensees' Inspection Guide for Welding Safety Management Review
Periodic facility inspection, periodic licensees' inspection, and periodic safety management review Operational safety program and operational safety inspection	Articles 45 to 61	Guidelines for Commercial Reactors Ordinance on Pre-Service Inspection, Periodic Facility Inspection and Periodic Licensees' Inspection Guide for Periodic Facility Inspection of Commercial Power Reactors Guide for Periodic Safety Management Review
Operational safety program and operational safety inspection	Articles 92 to 93	Standard Review Plan on Approval of Operational Safety Program of Commercial Power Reactor Facilities Implementation Guideline for Operational Safety Inspection for Commercial Power Reactor Facilities
Extension of operation period	Articles 113-114	Standard Review Plan on extension of operation period Guide for Application for Extension of Operation Period of Commercial Power Reactors
On-site inspection	Articles 138 (Article 68 of the Act)	

Table 3 : Regulations and Guides for Requirements in Authorization and Inspection of Research Reactors

Authorization / Inspection	Regulations stipulating requirements for authorization and inspection	
		Regulatory guides for requirements / Standard review plans on authorization
Permit for installation	The NRA Ordinance on Standards for the Location, Structure, and Equipment of Nuclear Research and Test Reactors, etc.	
		The Regulatory Guide on the NRA Ordinance on Standards for the Location, Structure, and Equipment of Nuclear Research and Test Reactors, etc.
		The Regulatory Guide for Reviewing Safety Design of Water-Cooled Test and Research Reactors
		The Regulatory Guide for Reviewing Safety Assessment of Water-Cooled Test and Research Reactors
		The Regulatory Guide for Reviewing Technical Competence of Nuclear Operator.
Approval of design and construction method	The NRA Ordinance on Technical Standards for the Design and Construction Plan of Nuclear Research and Test Reactors, etc.	
	The NRA Ordinance on Technical Standards for Quality Management System Concerning the Design and Construction of Nuclear Research and Test Reactors, etc. for Licensee of Nuclear Research and Test Reactors, etc. and System for their Inspection	
		Regulatory Guide of the NRA Ordinance on Technical Standards for Quality Management System Concerning the Design and Construction of Nuclear Research and Test Reactors, etc. for Licensee of Nuclear Research and Test Reactors, etc. and System for their Inspection
Approval of welding method / Welding inspection	The NRA Ordinance on Technical Standards for Welding of Nuclear Research and Test Reactors, etc	
		Guidelines for Approval of Welding Method for Nuclear Research and Test Reactors, etc.
Periodic facility inspection	The NRA Ordinance on Technical Standards for the Capabilities of Nuclear Research and Test Reactors, etc.	
Approval of operational safety program		The Standard Review Plan on Approval of Operational Safety Program of Nuclear Research and Test Reactors, etc.

Table 4 : Regulations and Guides for Procedures in Authorization and Inspection of Research Reactors

Authorization / Inspection	Basis in the Research Reactors Ordinance	Regulatory guides for requirements / Standard review plans on authorization
Permission for installation / Permission for changes	Articles 1-3 and 2	
Approval of design and construction method	Articles 3, 3-2 and 3-2-2	
Pre-service inspection	Articles 3-3 to 3-6	
Welding inspection	Articles 3-7 to 3-13	Guide for Welding Inspection of Nuclear Research and Test Reactors
Periodic facility inspection	Articles 3-14 to 3-16	
Operational safety inspection	Article 15-2	Guide for Operational Safety Inspection of Fuel Cycle Facilities, etc.
On-site inspection	Article 20, (Article 68 of the Reactor Regulation Act)	

Table 5 : Regulations and Guides for Requirements in Authorization and Inspection of Fuel Fabricating and Enrichment Facilities

Authorization / Inspection	Regulations stipulating requirements for authorization and inspection
	Regulatory guides for requirements / Standard review plans on authorization
Permission for activity	The NRA Ordinance on Standards for the Location, Structure and Equipment of Fuel Fabrication Facilities
	The Regulatory Guide of the NRA Ordinance on Standards for the Location, Structure and Equipment of Fuel Fabrication Facilities
	Standard Review Plan for Technical Competence of Licensees to take Measures to Prevent and Mitigate Severe Accidents at Fuel Fabricating and Enrichment activities
	The Regulatory Guide for Reviewing Technical Competence of Nuclear Operator.
Approval of design and construction method	The NRA Ordinance on Technical Standards for the Design and Construction Methods of Fuel Fabrication Facilities
	The NRA Ordinance on Technical Standards for Quality Management System concerning the Design and Construction of Fuel Fabrication Facilities for Fuel Fabrication Activity and System for their Inspection
	The Regulatory Guide of Technical Standards for Quality Management System concerning the Design and Construction of Fuel Fabrication Facilities for Licensee of Fuel Fabrication Activity and System for their Inspection
Approval of welding method / Welding inspection	The NRA Ordinance on Technical Standards for Welding of Fuel Fabrication Facilities, Reprocessing Facilities, Specified Waste Disposal Facilities, Specified Waste Interim Storage and Treatment Facilities
	Guidelines for Welding Method for Fuel Fabrication Facilities
Periodic facility inspection	The NRA Ordinance on Technical Standards for the Capabilities of Fuel Fabrication Facilities
Approval of operational safety program	The Standard Review Plan on Approval of Operational Safety Program of Fuel Fabrication Facilities

Table 6 : Regulations and Guides for Procedures in Authorization and Inspection of Fabricating and Enrichment Facilities

Authorization / Inspection	Basis in the Fuel Fabrication Ordinance	Regulatory guides for requirements / Standard review plans on authorization
Permission for activity / Permission for changes	Articles 2 and 3	
Approval of design and construction method	Article 3-2	
Pre-service inspection	Articles 3-8 to 3-11 and Articles 3-13 to 3-14	
Welding inspection	Articles 3-7 to 3-13	Guide for Welding Inspection on Fuel Fabrication Facilities, Reprocessing Facilities and Facilities Using Nuclear Fuel Materials
Periodic facility inspection	Articles 3-15 to 3-17	
Approval of operational safety program / Operational safety inspection	Articles 8 to 8-2	Standard Review Plan on Approval of Operational Safety Program of Fuel Fabrication Facilities
		Guide for Operational Safety Inspection of Fuel Cycle Facilities, etc.
On-site inspection	Articles 15 (Article 68 of the Reactor Regulation Act)	

Table 7 : Regulations and Guides for Requirements in Authorization and Inspection of Spent Fuel Interim Storage Facilities

Authorization / Inspection	Regulations stipulating requirements for authorization and inspection	
		Regulatory guides for requirements / Standard review plans on authorization
Permission for activity	The NRA Ordinance on Standards for the Location, Structure and Equipment of Spent Fuel Interim Storage Facilities	
		The Regulatory Guide of the NRA Ordinance on Standards for the Location, Structure and Equipment of Spent Fuel Interim Storage Facilities
		The Regulatory Guide for Reviewing Technical Competence of Nuclear Operator.
Approval of design and construction method	The NRA Ordinance on Technical Standards for the Design and Construction Methods of Spent Fuel Interim Storage Facilities	
		The Regulatory Guide of the Ordinance on Technical Standards for the Design and Construction Methods of Spent Fuel Interim Storage Facilities
	The NRA Ordinance on Technical Standards for Quality Management System Concerning the Design and Construction of Spent Fuel Interim Storage Facilities for Licensee of Spent Fuel Interim Storage Activity and System for their Inspection	
		The Regulatory Guide of NRA Ordinance on Technical Standards for Quality Management System Concerning the Design and Construction of Spent Fuel Interim Storage Facilities for Licensee of Spent Fuel Interim Storage Activity and System for their Inspection
Approval of welding method / Welding inspection	The NRA Ordinance on Technical Standards for Welding of Spent Fuel Interim Storage Facilities	
		The Regulatory Guide of the NRA Ordinance on Technical Standards for Welding of Spent Fuel Interim Storage Facilities
		Guidelines for Welding Method for Spent Fuel Interim Storage Facilities
Periodic facility inspection	The NRA Ordinance on Technical Standards for the Capabilities of Spent Fuel Interim Storage Facilities	
Approval of operational safety program		The Standard Review Plan for Operational Safety Program of Spent Fuel Interim Storage Facilities

Table 8 : Regulations and Guides for Procedures in Authorization and Inspection of Spent Fuel Interim Storage Facilities

Authorization / Inspection	Basis in the Spent Fuel Storage Ordinance	Regulatory guides for requirements / Standard review plans on authorization
Permission for activity / Permission for changes	Articles 2 and 3	
Approval of design and construction method	Articles 4 to 6	
Pre-service inspection	Articles 7 to 10	
Welding inspection	Articles 10 to 17	Guide for Welding Inspection on Spent Fuel Interim Storage Facilities
Periodic facility inspection	Articles 19 to 21	
Approval of operational safety program / Operational safety inspection	Articles 37 to 38	The Standard Review Plan on Approval of Operational Safety Program of Spent Fuel Interim Storage Facilities
		Guide for Operational Safety Inspection of Fuel Cycle Facilities, etc.
On-site inspection	Articles 49, (Article 68 of the Reactor Regulation Act)	

Table 9 : Regulations and Guides for Requirements in Authorization and Inspection of Spent Fuel Reprocessing Facilities

Authorization / Inspection	Regulations stipulating requirements for authorization and inspection	
		Regulatory guides for requirements / Standard review plans on authorization
Designation of activity	The NRA Ordinance on Standards for the Location, Structure and Equipment of Reprocessing Facilities	
		The Regulatory Guide of the NRA Ordinance on Standards for the Location, Structure and Equipment of Reprocessing Facilities
		The Standard Review Plan for Licensees' Technical Capacity to take Measures to Prevent and Mitigate Severe Accidents at Spent Fuel Reprocessing Facilities
		The Regulatory Guide for Reviewing Technical Competence of Nuclear Operator.
Approval of design and construction method	The NRA Ordinance on Technical Standards for the Design and Construction Methods of Reprocessing Facilities	
	The NRA Ordinance on Technical Standards for Quality Management System Concerning the Design and Construction of Reprocessing Facilities for Licensee of Reprocessing Activity and System for their Inspection	
		The Regulatory Guide of the NRA Ordinance on Technical Standards for Quality Management System Concerning the Design and Construction of Reprocessing Facilities for Licensee of Reprocessing Activity and System for their Inspection
Approval of welding method / Welding inspection	The NRA Ordinance on Technical Standards for Welding of Fuel Fabrication Facilities, Reprocessing Facilities, Specified Waste Disposal Facilities, Specified Waste Interim Storage and Treatment Facilities	
		Guidelines for Welding Method for Reprocessing Facilities
Periodic facility inspection	The NRA Ordinance on Technical Standards for the Capabilities of Reprocessing Facilities	
Approval of operational safety program		The Standard Review Plan on Approval of Operational Safety Program of Reprocessing Facilities

Table 10 : Regulations and Guides for Procedures in Authorization and Inspection of Spent Fuel Reprocessing Facilities

Authorization / Inspection	Basis in the Reprocessing Ordinance	Regulatory guides for requirements / Standard review plans on authorization
Designation of activity / Changes of designation	Articles 1-2 and 1-4	
Approval of design and construction method	Article 2	
Pre-service inspection	Articles 5 to 7	
Welding inspection	Articles 7-2 to 7-5 and Article 7-7 to7-8	Guide for Welding Inspection on Fuel Fabrication Facilities, Reprocessing Facilities and Facilities Using Nuclear Fuel Materials
Periodic facility inspection	Articles 7-9 to 7-11	
Approval of operational safety program / Operational safety inspection	Articles 17 to 17-2	The Standard Review Plan on Approval of Operational Safety Program of Reprocessing Facilities
		Guide for Operational Safety Inspection of Fuel Cycle Facilities, etc.
On-site inspection	Article 22 (Article 68 of the Reactor Regulation Act)	

Table 11: Regulations and Guides for Requirements in Authorization and Inspection for Use of Nuclear Fuel Materials

Authorization / Inspection	Regulations stipulating requirements for authorization and inspection	
		Regulatory guides for requirements / Standard review plans on authorization
Permission for activity	The NRA Ordinance on Standards for the Location, Structure and Equipment of Facilities using Nuclear Fuel Materials	
		The Regulatory Guide of the NRA Ordinance on Standards for the Location, Structure and Equipment of Facilities using Nuclear Fuel Materials
Welding inspection	The NRA Ordinance on Technical Standards for Welding of Facilities using Nuclear Fuel Materials, etc.	
Facility inspection	The NRA Ordinance on Use, etc. of Nuclear Fuel Materials (Article 2-5)	
Approval of operational safety program		The Standard Review Plan on Approval of Operational Safety Program of Facilities using Nuclear Fuel Materials

Table 12 : Regulations and Guides for Procedures in Authorization and Inspection for Use of Nuclear Fuel Materials

Authorization / Inspection	Basis in the Nuclear Fuel Materials Use Ordinance	Regulatory guides for requirements / Standard review plans on authorization
Permission for activity / Permission for change	Articles 1-2 and 2	
Facility inspection	Articles 2-2 to 2-4	
Welding inspection	Articles 2-6 to 2-10	Guide for Welding Inspection on Fuel Fabrication Facilities, Reprocessing Facilities and Facilities Using Nuclear Fuel Materials
Approval of Operational Safety Program / Operational safety inspection	Articles 2-12 to 2-13	The Standard Review Plan on Approval of Operational Safety Program of Facilities using Nuclear Fuel Materials
		Guide for Operational Safety Inspection of Fuel Cycle Facilities, etc.
On-site inspection	Article 10 (Article 68 of the Reactor Regulation Act)	

Table 13 : Regulations and Guides for Requirements in Authorization and Inspection of Waste Interim Storage/Treatment Facilities

Authorization / Inspection	Regulations stipulating requirements for authorization and inspection
	Regulatory guides for requirements / Standard review plans on authorization
	Guidelines
Permit for Activity	The NRA Ordinance on Standards for the Location, Structure, and Equipment of Waste Interim Storage and Treatment Facilities
	The Regulatory Guide of NRA Ordinance on Standards for the Location, Structure, and Equipment of Waste Interim Storage and Treatment Facilities
	The Regulatory Guide for Reviewing Technical Competence of Nuclear Operator.
Approval of design and construction method	The NRA Ordinance on Technical Standards for the Design and Construction Methods for Specified Waste Disposal Facilities or Specified Waste Interim Storage and Treatment Facilities
	The NRA Ordinance on Technical Standards for Quality Management System Concerning the Design and Construction of Specified Waste Interim Storage and Treatment Facilities for Licensee of Specified Waste Interim Storage and Treatment Activity and System for their Inspection
	The Regulatory Guide of NRA Ordinance on Technical Standards for Quality Management System Concerning the Design and Construction of Specified Waste Interim Storage and Treatment Facilities for Licensee of Specified Waste Interim Storage and Treatment Activity and System for their Inspection
Approval of welding method / Welding inspection	The NRA Ordinance on Technical Standards for Welding of Fuel Fabrication Facilities, Reprocessing Facilities, Specified Waste Disposal Facilities, Specified Waste Interim Storage and Treatment Facilities
	Guidelines for Approval of Welding Method for Specified Waste Management Facilities
Periodic facility inspection	The NRA Ordinance on Technical Standards for the Capabilities of Specified Waste Disposal Facilities or Specified Waste Interim Storage and Treatment Facilities
Approval of operational safety program	The Standard Review Plan on Approval of Operational Safety Program of Waste Interim Storage and Treatment Facilities

Table 14 : Regulations and Guides for Requirements in Authorization and Inspection of Waste Disposal Facilities

Authorization / Inspection	Regulations stipulating requirements for authorization and inspection
	Regulatory guides for requirements / Standard review plans on authorization
	Guidelines
Permission for activity / Permission for changes	The NRA Ordinance on Standards for the Location, Structure and Equipment of Category 2 Waste Disposal Facilities
	The Regulatory Guide of the NRA Ordinance on Standards for the Location, Structure, and Equipment of Category 2 Waste Disposal Facilities
	The Regulatory Guide for Reviewing Technical Competence of Nuclear Operator.
Approval of design and construction method	The NRA Ordinance on Technical Standards for the Design and Construction Methods for Specified Waste Disposal Facilities or Specified Waste Interim Storage and Treatment Facilities
Approval of welding method / Welding inspection	The NRA Ordinance on Technical Standards for welding for Fuel Fabrication Facilities, Reprocessing Facilities, Specified Waste Disposal Facilities and Specified Waste Management Facilities
Periodic facility inspection	The NRA Ordinance on Technical Standards for the Capabilities of Specified Waste Disposal Facilities or Specified Waste Interim Storage and Treatment Facilities
Approval of operational safety program	the Standard Review Plan on Approval of Operational Safety Program of Category 2 Waste Disposal Facilities

Table 15 : Regulations and Guides for Procedures in Authorization and Inspection of Waste Management Facilities

Authorization / Inspection	the NRA Ordinance	Basis in the NRA Ordinance	Regulatory guides for requirements / Standard review plans on authorization
Permission for activity / Permission for changes	The Category 1 Waste Disposal Ordinance	Articles 3 and 4	
	The Category 2 Waste Disposal Ordinance	Articles 2 and 3	
	The Waste Storage Ordinance	Articles 2 and 3	
Confirmation of waste disposal facilities	The Category 1 Waste Disposal Ordinance	Articles 5 to 9	
	The Category 2 Waste Disposal Ordinance	Articles 4 to 6-3	Guide for Confirmation of Waste Disposal Facilities
Confirmation of waste packages	The Category 1 Waste Disposal Ordinance	Articles 11 to 13	
	The Category 2 Waste Disposal Ordinance	Articles 7 to 9	Guide for Confirmation of Waste Packages
Approval of design and construction methods	The Category 1 Waste Disposal Ordinance	Articles 15 to17	
	The Waste Storage Ordinance	Articles 4 to 6	
Pre-service inspection	The Category 1 Waste Disposal Ordinance	Articles 18 to 24	
	The Waste Storage Ordinance	Articles 7 to 10	
Welding inspection	The Category 1 Waste Disposal Ordinance	Articles 25 to 31	
	the Waste Storage Ordinance	Articles 11 to 17	Guide for Welding Method for Specified Waste Interim Storage and Treatment Facilities
Periodic facility inspection	The Category 1 Waste Disposal Ordinance	Articles 32, 33 and Articles 35 to 39	
	the Waste Storage Ordinance	Articles 18 to 21	
Approval of Operational safety program / Operational safety inspection	The Category 1 Waste Disposal Ordinance	Articles 63 and 64	Guide for Operational Safety Inspection of Fuel Cycle Facilities, etc.
	The Category 2 Waste Disposal Ordinance	Articles 20 and 20-2	
	The Waste Storage Ordinance	Articles 34 and 34-2	
On-site inspection	The Category 1 Waste Disposal Ordinance	Articles 92, (Article 68 of the Reactor Regulation Act)	
	The Category 2 Waste Disposal Ordinance	Article 28, (Article 68 of the Reactor Regulation Act)	
	The Waste Storage Ordinance	Article 41, (Article 68 of the Reactor Regulation Act)	

Table 16 : Regulations and Guides for Authorization and Inspection Based on the Radiation Hazards Prevention Act

Authorization / Inspection	Cabinet Order / NRA Ordinance	
		Notification
Permission and Notification of Use	The Cabinet Order for Enforcement of the Radiation Hazards Prevention Act	
	The NRA Ordinance for Enforcement of the Radiation Hazards Prevention Act	
		The Notification to Specify Standards for the Amount, etc. of Radioisotopes
Facility Inspection / Periodic Inspection / Periodic Confirmation	The NRA Ordinance for Enforcement of the Radiation Hazards Prevention Act	
		The Notification to Specify Standards for the Amount, etc. of Radioisotopes
Notification of Radiation Hazards Prevention Program	The NRA Ordinance for Enforcement of the Radiation Hazards Prevention Act	
Notification of the Termination of Use		

Table 17 : Regulations and Guides for Authorization and Inspection Procedure for Licensees regulated by the Radiation Hazards Prevention Act

Authorization / Inspection / Report	Authorization and Inspection Procedure			Standards
	Basis in the Radiation Hazards Prevention Act	Basis in the Radiation Hazards Prevention Cabinet Order	Basis in the Radiation Hazards Prevention Ordinance	Basis in thee Radiation Hazards Prevention Ordinance
Permission of Use	Articles 3, 6, 9 and 10	Articles 3 and 8	Articles 2, 9, 10, 10-2 and 10-3	Articles 14-7, 14-9 and 14-11
Notification of Use	Article 3-2	Article 4	Articles 3, 4, 10-2 and 12	Article 14-9
Notification of a User of an Approved Device with Certification Label	Article 3-3	Article 5	Articles 5, 10-2 and 12	
Notification of Selling and Rental Business	Article 4	Article 6	Article 6, 6-2, 10, 10-2 and 12	
Permission for Waste Management Business	Articles 4-2, 6, 9 and 11	Articles 7and 10	Articles 7, 9-3, 10 and 10-2	Articles 14-8, 14-10 and 14-11
On-site Inspections	Article 43-2		Articles 40 and 41	
Facility Inspection	Article 12-8	Article 13	Articles 14-13 to 14-16	Articles 14-7 to 14-11
Periodic Inspection	Article 12-9	Article 14	Articles 14-17 to 14-19	Articles 14-7 to 14-11
Periodic Confirmation	Article 12-10	Article 15	Articles 14-20 to 14-21	Articles 20 and 24
Notification of Radiation Hazards Prevention Program	Article 21		Article 21	
Notification of the Termination of Use	Article 27		Article 25, Paragraph 2 of the Article 39	
Notification of Decommissioning Plan	Paragraphs 2 and 3 of the Article 28		Articles 26 and 26-2	
Report on the Completion of Measures Specified in the Decommissioning Plan	Paragraph 5 of the Article 28		Paragraph 6 of the Article 26	

Table 18 : Regulations and Guides for Requirements in Authorization and Inspection of Decommissioning

Authorization / Inspection	Regulations stipulating requirements for authorization
	Standard review plans on authorization
Approval of decommissioning plan	The NRA Ordinance Concerning the Installation and Operation of Commercial Power Reactors
	Standard review plans for decommissioning plans of nuclear power plants and research reactors
	The NRA Ordinance on the Installation and Operation of Power Reactors at the Research and Development Stage
	Standard review plans for decommissioning plans of nuclear power plants and research reactors
	The NRA Ordinance Concerning the Installation and Operation of Nuclear Research and Test Reactors, etc.
	Standard review plans for decommissioning plans of nuclear power plants and research reactors
	The NRA Ordinance on Activity of Refining Nuclear Source or Nuclear Fuel Materials
	The NRA Ordinance on Activity of Fuel Fabricating and Enrichment
	The NRA Ordinance on Activity of Interim Storage of Spent Fuel
	The NRA Ordinance on Activity of Spent Fuel Reprocessing
	The NRA Ordinance on Activity of Category 1 Waste Disposal of Nuclear Fuel Material and Materials contaminated by Nuclear Fuel Material
	The NRA Ordinance on Activity of Category 2 Waste Disposal of Nuclear Fuel Material and Materials Contaminated by Nuclear Fuel Material
	The NRA Ordinance on Activity of Waste Interim Storage and Treatment of Nuclear Fuel Materials and Materials Contaminated by Nuclear Fuel Material
	The NRA Ordinance on Use, etc. of Nuclear Fuel Materials
Confirmation of the completion of measures specified in the decommissioning plan	The NRA Ordinance Concerning the Installation and Operation of Commercial Power Reactors
	The NRA Ordinance on the Installation and Operation of Reactors at the Research and Development Stage
	The NRA Ordinance Concerning the Installation and Operation of Nuclear Research and Test Reactors, etc.
	The NRA Ordinance on Activity of Refining Nuclear Source or Nuclear Fuel Materials
	The NRA Ordinance on Activity of Fuel Fabricating and Enrichment
	The NRA Ordinance on Activity of Interim Storage of Spent Fuel
	The NRA Ordinance on Activity of Spent Fuel Reprocessing
	The NRA Ordinance on Activity of Category 1 Waste Disposal of Nuclear Fuel Material and Materials Contaminated by Nuclear Fuel Material
	The NRA Ordinance on Activity of Category 2 Waste Disposal of Nuclear Fuel Material and Materials Contaminated by Nuclear Fuel Material
	The NRA Ordinance on Activity of Waste Interim Storage and Treatment of Nuclear Fuel Materials and Materials Contaminated by Nuclear Fuel Material
	The NRA Ordinance on Use, etc. of Nuclear Fuel Materials

Table 19: Regulations and Guides for Procedures in Authorization and Inspection of Decommissioning

Authorization / Inspection / Report during decommissioning	The NRA Ordinance	Basis in the NRA Ordinance	Standard Review Plan
Permission(or designation) for installation or activity / Permission of change	The Commercial Reactors Ordinance	Articles 3 to 7	
	The Research Reactors Ordinance	Articles 1-3 and 2	
	The Fuel Fabrication Ordinance	Articles 2 and 3	
	The Spent Fuel Storage Ordinance	Articles 2 and 3	
	The Reprocessing Ordinance	Articles 1-2 and 1-4	
	The Category 1 Waste Disposal Ordinance	Articles 3 and 4	
	The Category 2 Waste Disposal Ordinance	Articles 2 and 3	
	The Waste Storage Ordinance	Articles 2 and 3	
	The Nuclear Fuel Materials Use Ordinance	Articles 1-2 and 2	
Approval of design and construction method / Approval of change	The Commercial Reactors Ordinance	Articles 8 to14	
	The Research Reactors Ordinance	Articles 3, 3-2 and 3-2-2	
	The Fuel Fabrication Ordinance	Article 3-2	
	The Spent Fuel Storage Ordinance	Articles 4 to 6	
	The Reprocessing Ordinance	Article 2	
	The Category 1 Waste Disposal Ordinance	Articles 15 to 17	
	The Waste Storage Ordinance	Articles 4 to 6	
Pre-service Inspection or Facility Inspection	The Commercial Reactors Ordinance	Articles 15 to 22	
	The Research Reactors Ordinance	Articles 3-3 to 3-6	
	The Fuel Fabrication Ordinance	Articles 3-5 to 3-7	
	The Spent Fuel Storage Ordinance	Articles 7 to 10	
	The Reprocessing Ordinance	Articles 5 to 7	
	The Category 1 Waste Disposal Ordinance	Articles 18 to 24	
	The Waste Storage Ordinance	Articles 7 to 10	
	The Nuclear Source Materials Use Ordinance	Articles 2-2 to 2-4	
Welding inspection	The Research Reactors Ordinance	Articles 3-7 to 3-13	
	The Fuel Fabrication Ordinance	Articles 3-8 to 3-11 and Articles 3-13 to 3-14	
	The Spent Fuel Storage Ordinance	Articles 11 to17	
	The Reprocessing Ordinance	Articles 7-2 to7-5 and Articles 7-7 to7-8	
	The Category 1 Waste Disposal Ordinance	Articles 25 to 31	
	The Waste Storage Ordinance	Articles 11 to 17	
	The Nuclear Source Materials Use Ordinance	Articles 2-6 to 2-10	
Licensees' inspection on welding and welding safety management inspection	The Commercial Reactors Ordinance	Articles 35 to 44	
Periodic facility inspection	The Commercial Reactors Ordinance	Articles 45 to 53	
	The Fuel Fabrication Ordinance	Articles 3-15 to 3-17	
	The Reprocessing Ordinance	Articles 7-9 to 7-11	
	The Category 1 Waste Disposal Ordinance	Articles 32 to 39	
Periodic Facility Inspection during decommissioning	The Commercial Reactors Ordinance	Articles 45 to 53	
	The Fuel Fabrication Ordinance	Articles 3-15 to 3-17	
	The Reprocessing Ordinance	Articles 7-9 to 7-11	
	The Category 1 Waste Disposal Ordinance	Articles 32 to 39	

Approval of Operational Safety Program and Operational Safety Inspection	The Commercial Reactors Ordinance	Articles 92 to 93	Standard Review Plan on Operational Safety Program of Nuclear Power Plants at the stage of decommissioning
			Guide for Operational Safety Inspection for Nuclear Facilities under decommissioning
	The Research Reactors Ordinance	Article 15 and Article 15-2	Standard Review Plan on Operational Safety Program of Research Reactors at the stage of decommissioning
			Guide for Operational Safety Inspection for Nuclear Facilities under decommissioning
	The Fuel Fabrication Ordinance	Articles 8 to 8-2	Guide for Operational Safety Inspection for Nuclear Facilities under decommissioning
	The Spent Fuel Storage Ordinance	Article 37 and 38	
	The Reprocessing Ordinance	Articles 17 to 17-2	
	The Category 1 Waste Disposal Ordinance	Article 63 and 64	
	The Category 2 Waste Disposal Ordinance	Article 20 and 20-2	Guide for Operational Safety Inspection for Nuclear Facilities under decommissioning
	The Waste Storage Ordinance	Article 34 and 34-2	
	The Nuclear Source Materials Use Ordinance	Articles 2-12 to 2-13	
On-site Inspection	(See Table 2, Table 4, Table 8, Table 10, Table 12 and Table 15 in the Appendix)		