

# **Continuous Improvement of Nuclear Safety Regulations of Japan**

~Research on the Nuclear Safety Regulation System and Organizations~

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# 1 Introduction

The 1970s oil crisis was the catalyst prompting resource-scarce Japan to actively adopt nuclear power generation, but the accident at the Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station in 2011 (herein after referred to as the "TEPCO Fukushima Daiichi accident") started discussion on the fundamental question of utilization of nuclear energy.

Investigations into the details of what transpired during the TEPCO Fukushima Daiichi accident to identify the causes were conducted by investigatory committees sponsored by the Diet, national government, academic societies and other groups. The result was the deduction of issues to be addressed as pertaining to safety measures, as well as the review of measures from the perspective of resolving such issues and further enhancing safety. The Japanese government adapted the necessary safety measures into new regulatory requirements, which are currently being applied in examinations on restarting existing nuclear power stations.

What has been sought through this sort of technical response is a rebuilding of the public's trust in relevant organizations. In particular, from a public perspective, severe criticism has been leveled at regulatory agencies, which were supposed to protect the people, for not having played the role expected of them. As such, the government initiated a review to reassess regulatory organizations associated with nuclear power. In this reassessment, international standards indicating the way in which regulatory agencies should be structured as well as the state of regulatory agencies and other countries were referenced.

The first issues addressed were what form such an agency should take and what standing it should be given within the government from the perspective of regulatory agency independence. The government's proposal for a regulatory agency at the time called for the former Nuclear and Industrial Safety Agency to be moved from the Ministry of Economy, Trade and Industry, which had been the government agency promoting nuclear power, and into the Ministry of the Environment.

In response to this, the Liberal Democratic Party and New Komeito(Komei Party), which were the opposition parties at the time, considered that the government bill afforded insufficient independence to the regulatory agency and did not thoroughly centralize such operations, so they prepared the Bill for Establishment of the Nuclear Regulation Authority, which was based on the idea that the regulatory agency should be an independent administrative commission (Article 3 commission under the National Government Organization Act), and submitted their bill to the Diet. The government's bill was reconciled mainly with the Liberal Democratic Party and New Komeito's establishment bill, and, in the end, a legislative measure put forth by members of the House of Representatives was

deliberated and approved by the Diet.

The Liberal Democratic Party, which submitted the bill, felt, “The TEPCO Fukushima Daiichi accident was also the responsibility of the Liberal Democratic Party, which had promoted nuclear policies, and, furthermore, that it was the Diet’s responsibility to create a regulatory agency which would serve as a model for the world in view of the tremendous worry and concern that had been caused to everyone around the world.” In order to fulfill this responsibility, the aim was to realize a bill establishing a regulatory agency that would be a model for the world, from the standpoint of the Diet doing everything that could be done to improve the situation.

In view of such a course of events, it is necessary now at a stage where the Nuclear Regulation Authority has been established and built up a track record to verify to a certain extent as to whether or not a regulatory agency, which is to be a model for the world as the Diet envisioned, has been realized as stated in the purpose of the establishment act.

Article 5 of the Supplementary Provisions to the Act for Establishment of the Nuclear Regulation Authority takes into account the status of enforcement of this act, the substance of the National Diet Fukushima Nuclear Accident Independent Investigation Commission report and international standards, and keeps in mind that the use of nuclear energy is closely related to Japan’s security. The Supplementary Provisions stipulate that a review will be conducted of the regulatory agency, including such matters as its transfer from the Ministry of Environment to the Cabinet Office, within three years after enforcement of the Establishment Act.

September 2015 marks the third year as prescribed by the Supplementary Provisions, and deliberations on such a reassessment have been held during the current ordinary session of the Diet.

Supplementary Provisions to the Act for Establishment of the Nuclear Regulation Authority

(Review of Government Organizations Having Jurisdiction over Affairs for Ensuring Safety in the Use of Nuclear Energy)

Article 5. With regard to government organizations having jurisdiction over affairs for ensuring safety in the use of nuclear energy, the government shall review them, within three years after the enforcement of this Act, including the possibility of establishing an Independent Regulatory Commission under the Cabinet Office, in order to make them better match international criteria, based on the status of the enforcement of this Act, the details of the report to be submitted by the National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission, and the latest international criteria, etc. for ensuring safety in the use of nuclear energy, and in light of the fact that the physical protection of radioactive material and other affairs for ensuring safety in the use of nuclear energy are closely related to the national security of Japan, and shall take necessary measures based on the results thereof.

For the third-year review of the Nuclear Regulation Authority, it is necessary to take into account the Act for Establishment of the Nuclear Regulation Authority and the Supplementary Provisions (Reference 1), the resolution of the House of Representatives at the time the act was approved (Reference 2), the accompanying resolution of the House of Councillors (Reference 3), and, moreover, the recommendations from the report of the National Diet Fukushima Nuclear Accident Independent Investigation Commission on the organization and its administration (Reference 4) as well as other sources.

First, it needs to be verified whether or not these accompanying resolutions and recommendations, which the National Diet has sought in the Nuclear Regulation Authority, have been realized. If matters which were the intent of the National Diet have not been implemented by the Nuclear Regulation Authority, then, after a determination on whether or not the National Diet's demands are reasonable or not, such matters should be reflected in the state of the Nuclear Regulation Authority.

In addition, issues, which were not initially anticipated, will also have surfaced in activities that the Nuclear Regulation Authority has carried out so far. It is also important that the facts pertaining to such matters be analyzed and methods be proposed to address them.

Moreover, the Nuclear Regulation Act has been substantially revised. It was also anticipated that difficulties will arise in its enforcement, therefore Article 97 of the Supplementary Provisions to the Act for Establishment of the Nuclear Regulation Authority calls for the necessary measures to be adopted while “taking into account the status of enforcement,” and a reassessment is also needed from this perspective.

Supplementary Provisions to the Act for Establishment of the Nuclear  
Regulation Authority

Article 97 With regard to the provisions revised under Articles 17 and 18 of the Supplementary Provisions, the government shall review them promptly, while taking into account the status of their enforcement, and shall, when it finds it necessary, take necessary measures based on the results thereof.

Newly established in September 2012, the Nuclear Regulation Authority deserves recognition for the assiduous efforts it made over the short period of one year after its establishment, including drafting the new regulatory requirements and restarting safety examinations.

Nevertheless, it is also a fact that criticism has been leveled at the Nuclear Regulation Authority, including that it has become too “isolated” in stressing its “independence.” From the standpoint of a return to basics, it is felt to be necessary to review and reconcile the way in which the Nuclear Regulation Authority communicates not only with those whom it regulates but also the general public in accordance with the purpose of the Establishment Act, its Supplementary Provisions, Accompanying Resolutions and other such fundamental provisions.

In addition, much more time has been required than initially planned for examinations on restarting existing nuclear power stations, and improvements have been sought from the perspective of enhancing predictability in the way in which administrative procedures are carried out. Examinations have also begun on extending reactor operations past 40 years. However, when the projected increase in the number of examinations is taken into account, the pressing issue then must be giving consideration to bolstering the examination system and improving the efficiency of such examinations.

Of course, nuclear power should be prudently regulated so as not to allow its potential risks to be actualized. The Nuclear Regulation Authority, as it continues to steadily implement legal requirements, must strive to construct a regulatory structure in which appropriate checks are made while, at the same time, making it difficult to commit errors. However, there are situations where the Nuclear Regulation Authority has been obliged to concentrate on formulating new regulatory requirements and conducting examinations for restarting nuclear power stations, which are matters to be immediately dealt with. Issues have also been found here and there where verification appears to be needed as to whether or not the Nuclear Regulation Authority has sufficiently reflected the Act for Establishment of the Nuclear Regulation Authority and its purpose, including in the utilization of review sessions not grounded in law and insufficient use of examination committees. The greatest lesson learned from the TEPCO Fukushima Daiichi accident is that endeavors must be continuously made to improve safety without allowing a lapse into a conceited sense of pride, and that main principle is not altered even for regulatory agencies.

This report, along with discussing the various issues pertaining to enforcement of the Nuclear Regulation Act as based on previous research, takes into account investigations and reviews of current nuclear power regulations and also analyzes matters related to organizational activities prescribed in the Supplementary Provisions and Accompanying Resolutions to the Act for Establishment of the Nuclear Regulation Authority so as to offer recommendations for a picture of how regulatory administration should be structured. It is strongly wished that the Nuclear Regulation Authority and other relevant government organizations take seriously the recommendations presented here from the perspective of a continuous effort to improve nuclear safety regulations without being content with the current situation.

Furthermore, in light of the current situation that sufficient experience in administering revised nuclear power regulations has still not been accumulated and that examinations to review nuclear power stations for restarting are currently underway, in addition to this third-year reassessment, strong encouragement is given to the recommendation that the regulatory agency and the framework for nuclear energy be reassessed again in another two to three years.

## 2 Recommendations: Continuous Improvement of Nuclear Safety Regulations

Within three years after establishment of the Nuclear Regulation Authority, a review was to be conducted of the regulatory system, which is also to include the manner in which the Nuclear Regulation Authority is administrated. Taking the opportunity presented by September of this year which marks the Nuclear Regulation Authority's third year, important matters that the National Diet should be directly involved in or the Nuclear Regulation Authority should monitor as well as pressing issues in enforcement of the Nuclear Regulation Act have been narrowed down as given below, and recommendations are presented for reassessing the regulatory system from the perspective of creating a more ideal regulatory agency and regulatory system.

### 2-1. Resolution of issues in enforcement of the Nuclear Regulation Act

#### 2-1-1 Reassessment of the 40-year primary operating life regulation

① The Nuclear Regulation Authority should consider reassessment of the 40-year primary operating life regulation from a technical standpoint.

According to the accounts presented by the Diet members who submitted the bill, during the deliberation process of the legislative measure to establish the Nuclear Regulation Authority, the 40-year operating life was not a limit that was derived based on scientific and technical review, but was a political determination. After the Nuclear Regulation Authority, which possesses specialized knowledge and is independent, was set up, it was supposed to promptly review and reconsider this 40-year limit, and, moreover, to take into account the status of enforcement of the Nuclear Regulation Act in reconsidering safety regulations as a whole.

The Nuclear Regulation Authority should take into account the purpose expressed during the legislative process to immediately reconsider and review the 40-year primary operating life regulation from a technical and scientific point of view.

- ② The Nuclear Regulation Authority should separate the 40-year primary operating life regulation and backfitting, and only apply standards related to equipment degradation in its authorizations pertaining to the 40-year operating life.

The standards for authorization related to extending the 40-year operating life are mandated under a provision concerning “Operating Periods, etc.” of Article 43-3-32 of the Nuclear Regulation Act, and the criteria, which take into account the conditions of equipment degradation, are stipulated in the Regulations on Commercial Reactors. However, the Commission’s Ordinance for Commercial Nuclear Power Reactors as prescribed by the Nuclear Regulation Authority includes equipment degradation, and, in addition, also demands compliance with engineering standards and regulations, which are requirements separate from Article 43-3-14 of the Nuclear Regulation Act (Backfitting). In other words, requirements have been stipulated in which subordinate legal rules, the Commission’s Ordinance for Commercial Nuclear Power Reactors, exceed the scope mandated by the act, a situation which can only be said to be illegal and evasive.

Accordingly, the spirit of the law and its provisions must be accurately taken into account, and the Commission’s Ordinance for Commercial Nuclear Power Reactors concerning extension of operations must be revised so that only those provisions related to equipment degradation serve as the criteria for extending the operating life.

In addition, the examination criteria (the Commission’s internal rules), which are used in examinations for authorizing an extension of the operating period as determined by decision of the Nuclear Regulation Authority, call for backfitting to have been performed at the time such an extension is authorized. As mentioned earlier, this is granted under the Commission’s Ordinance for Commercial Nuclear Power Reactors, which prescribe provisions beyond the scope mandated by law, and this clause must be expunged.

Backfits are based on the Chairman's personal proposal, which was approved by the Nuclear Regulation Authority (March 19, 2013). This new regulatory requirement allows backfits to be applied in the case of reactors shut down until the time when operations are recommenced. Backfits should be applied according to this policy to reactors being examined in conjunction with an extension of the operating life as well as those whose operating life has expired.

- ③ The Nuclear Regulation Authority should integrate the 40-year primary operating life regulation with the system for assessing power station aging, which has been applied and normalized in international standards.

Japan's nuclear safety regulations already have in place a system for assessing the aging of nuclear power facilities, which is separate from the 40-year primary operating life regulation, such that a situation has arisen in which similar systems coexist regarding assessments of facility and equipment degradation. For this reason, the Accompanying Resolution of the House of Councillors calls for “making the system restricting the operating life to 40 years compatible with existing measures to address aging.”

In addition, with regard to the 40-year operating life, authorization is provided only once at the 40-year mark. Thus, after the operating period has been extended, there is no verification of whether or not maintenance has been performed that is appropriate to such authorization. The system for assessing facility aging needs to be utilized for such confirmation.

In other words, the system pertaining to the 40-year primary operating life regulation is technically equivalent to the system for assessing facility aging. Because of the fact that the regulation is incomplete unless supplemented by the system for assessing facility aging and that Japan's nuclear safety regulations include the existing aging assessment system which is predominantly like schemes utilized around the world, the 40-year primary operating life regulation should be abolished and integrated with the system to aging assessment system.

- ④ The Nuclear Regulation Authority should reconsider the period of time for submitting applications to extend operations, and should extend the time for such applications so that an application seeking an extension of the operating life may be made immediately after a special inspection has been conducted, and so that even if the 40-year mark is reached during an examination, the examination may continue and authorization be provided.

The timing for an application requesting authorization to extend the 40-year operating life is limited by the Commission's Ordinance for Commercial Nuclear Power Reactors to a period ranging from one year and three months until one year prior to the 40-year mark after operations were commenced. Also, a special inspection must be conducted prior to an application for extension of the 40-year operating life, but such

special inspections are to be performed after 35 years of operation have elapsed.

The period of time it takes for a standard examination on authorization to extend the operating life is one year, and, because cases may also be envisioned where issues will arise and the application will have to be amended, such an examination time period is extremely tight.

As part of an application for extending the operating life, necessary data are obtained during a special inspection. In order to ensure continuity with the special inspection and guarantee that a prudent examination is conducted over a sufficient period of time, the Commission's Ordinance for Commercial Nuclear Power Reactors should be amended so that an application for extension of the operating life may be assembled and presented directly after a special inspection has been conducted. Also, even if the 40-year mark is reached during the examination process, the examination should be allowed to continue and authorization granted.

In the United States, an application for extending a facility's operating life may be presented 20 years prior to the day on which the 40th year of operation is reached.

#### 2-1-2 Addressing delays in examinations, etc.

- ⑤ The Nuclear Regulation Authority should work to improve the examination system, and put maximum effort and ingenuity into enhancing the quality of examinations and efficiently transacting its business. Additionally, with regard to specified major accident response facilities, it should take into account delays in examinations and reassess the prescribed grace period of five years in setting a more appropriate period of time.

The Nuclear Regulation Authority initially stated that examinations would take about six months, but, in reality, not one reactor has been restarted.

Moreover, in the future, there will be applications presented requesting that other plants be allowed to restart, applications for authorization of extension of an operating period to exceed 40 years, and applications concerning facilities to address backfits, such that the volume of work is expected to increase. It is inevitable that permits and other authorizations will take longer to process.

For this reason, the Nuclear Regulation Authority should put maximum effort and ingenuity into improving the efficiency of its examinations. First, it should clarify in writing its decisions and interpretations on the application of standards, which have been rendered in previous examinations, and make this information public. It should take measures so that applicants may sufficiently prepare and so that its examinations

proceed efficiently. In addition, in cases where the regulator and applicant are divided on a technical issue and do not reach a consensus, a legal board of review should be requested to deliberate the matter in a forum where each party presents its technical justifications. From this perspective, the state of examinations will have been individually reviewed with regard to the principle points at issue in safety inspections, and an analysis also attempted of the specific points at issue which are considered to be factors causing delays in the examinations. (See attachment.)

In addition, the Nuclear Regulation Authority should work to make improvements by referencing examples from other countries, including the streamlining of documents for examinations and enhancement of the examination structure.

Also, a five-year grace period has been established for the specified major accident response facilities, which form a backup measure to improve the reliability of antiterrorism measures, but it is highly likely that the prescribed grace period will be exceeded when the facts are considered that enactment of the examination guide for addressing such measures came more than a year after regulatory requirements were laid out, and that examinations are currently underway and designs have not been determined; regulators should have easily anticipated in advance that it will take several years just to perform the actual installation work for such large facilities.

Taking into account the reality that examinations of the specified major accident response facilities are currently behind schedule, the Nuclear Regulation Authority should consider the actual conditions related to such examinations and designs, consider the time needed for such examinations and installation work, and reset the current five-year grace period to a more realistic period of time.

## 2-2. Formulation of safety goals and backfit rules

⑥ The Nuclear Regulation Authority should formulate safety goals and other targets, and utilize these in regulations.

In 2015, the Fukui District Court and the Kagoshima District Court reached completely different decisions in lawsuits requesting a provisional injunction on operation of nuclear power stations. The Fukui District Court decision demanded that there not be any risks which might cause a severe accident, while the Kagoshima District Court decision held that there was no absolute standard of safety and that reactor risks were permissible if safety goals were achieved. Moreover, the Kagoshima

District Court decision stated with regard to safety goals that “It would be desirable for the debate on the extent of acceptable risks to continue in the future as well and that discussions proceed not just internally within the Nuclear Regulation Authority but also in the National Diet and at all levels of society.” The decision indicates the importance of forming a social consensus on the issue, which includes the National Diet.

Also, in the private sector, there have been movements to formulate safety goals apart from regulations for autonomous measures aimed at improving safety.

The National Diet Fukushima Nuclear Accident Independent Investigation Commission recommended that there be “National Diet monitor regulators,” and cited the following specific items for continuous monitoring.

- ① Formulation of qualitative and quantitative safety goals
- ② Appropriate revision of policies and continually shaping those policies into safety goals

In this way, the National Diet Fukushima Nuclear Accident Independent Investigation Commission calls on the National Diet’s relevant committees to monitor the formulation of safety goals and their application in enacting and revising requirements.

In the United States after the accident at Three Mile Island Unit 2, the Nuclear Regulatory Commission released a policy statement “Safety Goals for the Operations of Nuclear Power Plants (Levels Quantitatively Curbing Acceptable Risks on the Public),” which presented its regulatory policy from the perspective of clarifying the question of “How safe is safe enough?” as pertains to the safety of nuclear power plants. The IAEA also presented comprehensive nuclear safety goals, radiological protection goals, and engineering safety goals; and the United Kingdom, France, Germany and other advanced nations also have very similar safety goals.

By contrast, in comparison to the situation in other countries, Japan’s Nuclear Regulation Authority has not laid down clear safety goals.

Taking into account this situation and so that the target level of safety sought is presented to the public, the Nuclear Regulation Authority should prescribe safety and performance goals, should incorporate the obligation to respect safety goals into the Nuclear Regulation Act, and should take measures so that performance goals are also utilized in standard compliance examinations as well as in the enactment and revision of standards, and, moreover, in the criteria for backfits as discussed in the following section.

Also, the National Diet should monitor the activities of the Nuclear Regulation Authority regarding the formulation of safety goals and other targets as well as their

use in regulations, as was indicated by the National Diet Fukushima Nuclear Accident Independent Investigation Commission.

- ⑦ With regard to backfits which levy new requirements based on the latest knowledge and other information, the Nuclear Regulation Authority should enact rules that clearly stipulate the approach employed to standards for adopting new regulatory requirements and the permissible grace periods so as to increase regulatory predictability and transparency.

In other countries, rules have been created from the standpoint of enhancing regulatory predictability and transparency regarding the application of backfits, which incorporate new knowledge into regulations and are applied retroactively.

In the case of the United States, rules have been formulated for backfits, and such procedures and criteria are clearly stipulated. France, Germany and the United Kingdom have similarly developed rules on the application of backfits.

In the case of Japan, all of the latest knowledge was automatically required to be backfitted by revising technical standards through a reflection of the most recent knowledge. However, the method of such application has only been indicated in the Nuclear Regulation Authority Chairman's personal proposal (March 19, 2013). No such application has been legislated nor has the Nuclear Regulation Authority rendered any decisions.

For this reason, in reference to the example of the United States, backfits should be arranged on the basis of risk into those mandatorily applied immediately and those transitioning to a value-impact analysis, and rules should be enacted for backfitting that clearly stipulate the approach to grace periods as well.

When the scope of regulatory requirements is determined by the formulation of rules for backfits, then such a move will clarify that any further measures to improve safety are voluntary safety activities implemented by the operator, which is believed to encourage operators to take the initiative in measures for improving safety.

## 2-3. Strengthening the Nuclear Regulation Authority and monitoring functions

### 2-3-1 Strengthening the Nuclear Regulation Authority

- ⑧ In order to ensure independence and further strengthen liaisons in nuclear emergency preparedness, the Nuclear Regulation Authority should be transferred from the Ministry of the Environment to the Cabinet Office.

The Supplementary Provisions to the Act for Establishment of the Nuclear Regulation Authority require that a review be conducted “including the possibility of establishing an independent regulatory commission under the Cabinet Office” and to take any necessary measures. This was a decision that it would be desirable, from the standpoint of independence, for the Nuclear Regulation Authority to be under the Cabinet Office and not be constrained by the interests of any particular government ministries and agencies.

With regard to the independence of regulatory bodies, IAEA safety standards state, “It must be ensured that the regulatory body’s functions are separate from organizations having responsibilities or interests which may exert undue influence on decision-making.” The Ministry of the Environment, under which the Nuclear Regulation Authority is currently placed, is the government ministry promoting measures to address global warming and the implementing ministry for intermediate storage of radioactive materials. So, for ensuring regulatory agency independence, it is determined to be inappropriate to place the Nuclear Regulation Authority under the Ministry of the Environment.

Also, if the Nuclear Regulation Authority is transferred to the Cabinet Office which has general responsibility for emergency preparedness, liaisons between both bodies will be strengthened, making it possible to improve the effectiveness of nuclear emergency preparedness.

Accordingly, the Nuclear Regulation Authority should be transferred at an early date to the Cabinet Office in accordance with international standards.

- ⑨ The Nuclear Regulation Authority should end its commissioner-assignment system and change to an administrative system in which the Nuclear Regulation Authority audits the Secretariat and administers the organization through decisions made after consultation among all the Commissioners.

The Nuclear Regulation Authority performs its work by assigning the Commissioners areas of responsibility and having them directly preside over the Secretariat of the Nuclear Regulation Authority by adopting a so-called commissioner-assignment structure.

In order for a consultative body to function as the highest decision-making body, all Commissioners need to be simultaneously and completely aware of information pertaining to matters for which each is responsible, and the system of having Commissioners assigned to specific areas does not meet this requirement. As such, it is unequivocal that this is not suited to a consultative system, which was the original purpose of the Establishment Act where council decisions would be made by majority vote.

Referencing the organization and decision-making process in the United States, an audit system should be established at an early date whereby the Secretariat has responsibility for performing examinations and other regulatory affairs, and the regulatory decisions are made by all Commissioners in a consultation as they take an overall view based on reports presented by the Secretariat.

In order for a consultative system to function effectively, each Commissioner needs to be assigned his or her own staff and have a structure created which supports independent determinations.

- ⑩ The Examination Specialized Committee in Nuclear Reactor Safety and other committees based in law should be allowed to participate in the regulatory process to enhance the specialization of examinations. Also, a review panel concerned with earthquakes and ground foundations should be established.

The Nuclear Regulation Authority does not allow the Examination Committee Specialized in Nuclear Reactor Safety or other legally-based review committees to have any contact with safety examiners or observe other activities in the regulatory process, and it has been operating nontransparent consultative bodies, including the use of meetings of experts, which are private advisory panels not in accordance with

the law, in the regulatory process.

However, because the field of nuclear power is very broad in scope and it is realistically difficult for the entire field to be covered only by the Chairman and Commissioners, the National Diet's deliberations at the time of the Nuclear Regulation Authority's establishment should be taken into account with respect to the permanent establishment of committees that are based in law should be used in safety examinations and other facets of the regulatory process. Also, the Establishment Act should be revised to clarify that enacting and revising standards as well as safety examinations conducted by the Secretariat are done by order of the Commission and audits carried out from a specialized perspective by the Examination Committee Specialized in Nuclear Reactor Safety and other committees.

So that review panels are comprised of a good balance of outstanding experts and are able to render high-level technical decisions, experts, who participated in examinations previously, should not be excluded and the composition of members on review panels should be reconsidered.

In addition, in examinations for restarting reactors, voluntary meetings of experts have been used regardless of the fact that the focus has been on reviewing earthquakes and ground foundations. From the standpoint of having examinations proceed more meticulously, a review panel on earthquakes and ground foundations should be newly established to serve as a legal committee handling issues related to such matters.

⑪ Regulatory administration should proceed based on a mutual understanding after a thorough deliberation between the Nuclear Regulation Authority and operators in cases where each other's technical views differ.

In its report, the National Diet Fukushima Nuclear Accident Independent Investigation Commission also pointed out that "regulatory authorities gradually became the 'captives' of electric power operators." Neutrality and independence have been understood that there should be separation from operators and those promoting nuclear power. As a result, criticism has been invited that the Nuclear Regulation Authority has become "isolated."

IAEA Safety Standards (GSR Part 1) stipulate that, in relationships with concerned parties, a structure for dialogue with operators should be constructed while pursuing specialized and constructive liaisons.

To this end, the Standards state that: (1) there must be liaisons with trade

organizations in order to achieve the common goal of ensuring safety; (2) mutual respect and understanding must be created with operators through official relationships which are frank and open; and (3) regulatory agency decisions must demonstrate reasonableness as the occasion demands and the basis for such decisions must be explained.

Even when opinions ultimately differ, the Nuclear Regulation Authority and operators should endeavor to deliberate until they accept the other's views and can understand the other party's position. They should create a relationship of mutual trust by calling for review by a panel and obtain a conclusion based on the result.

⑫ In order to ensure its technical independence as an organization comprised of experts on nuclear power, the Nuclear Regulation Authority should work to thoroughly stipulate a no-return rule for its employees and endeavor to develop experts in a proper manner at an early date. Also, in order to increase its independence from the standpoint of financial resources, it should be funded sufficiently through an independent source of revenue; such as covering expenses by mandatory fees collected from operators.

In order for the Nuclear Regulation Authority to maintain a high degree of independence, it is necessary that its internal employees be able to have technical discussions with those who are regulated as well as outside experts, and, moreover, that its employees have excellent specialized knowledge and skills allowing them to make their own decisions. Currently, there are many employees assigned to the Nuclear Regulation Authority who do not necessarily maintain a specialization in nuclear power, but such specialization is gradually being developed through actual work, education and training.

Nevertheless, even if the regulatory agency's employees develop into experts through education and training, when these employees return to their parent government ministries and agencies from which they came and replacement employees are brought to the Secretariat from outside the regulatory agency by means of personnel transfers, the overall specialization of the regulatory agency's employees will not improve, neither will a sense of unity within the organization be formed nor a sense of belonging.

For this reason, although the no-return rule has been laid down, it is recommended that all government agencies be subject to application of the no-return rule by the end of a five-year period, and that the Secretariat be made a proper government agency in five years.

Also, IAEA safety standards dictate that a regulatory agency must have sufficient available financial resources in order for it to be effectively independent. Accordingly, the Nuclear Regulation Authority should have independent financial revenue such as covering expenses by mandatory fees collected from operators in order to increase its independence from the standpoint of financial resources and ensure sufficient resources.

Note: The current no-return rule “does not allow an employee to be assigned or transferred to an administrative organization having jurisdiction over affairs promoting the use of nuclear power,” and is for the purpose of ensuring independence of the Nuclear Regulation Authority from government organizations tasked with promoting nuclear energy and of allowing the regulatory agency’s specialization to develop.

#### 2-3-2 Strengthening the National Diet’s monitoring operations

⑬ In order to strengthen the National Diet’s monitoring operations vis-à-vis the Nuclear Regulation Authority, an advisory body comprised of experts should be established in the National Diet.

Taking into account what the National Diet Fukushima Nuclear Accident Independent Investigation Commission pointed out in its report, the National Diet established a permanent committee in the National Diet to serve as a body monitoring regulatory agencies, but it would be desirable to have support from experts in order to enhance such monitoring from a technical and specialized perspective in accordance with the recommendations of the National Diet Fukushima Nuclear Accident Independent Investigation Commission.

For this reason, an advisory body should be created which is comprised of experts in nuclear energy (including aspects pertaining to systems and procedures) in the National Diet’s committee so as to construct a system where this body may furnish advice to the committee.

### 3 Detailed Explanation of the Desirable State of the Nuclear Regulation System and Organizations

#### 3-1. Situation surrounding implementation of the Supplemental Provisions, Accompanying Resolutions, etc., of the Establishment Act

In establishing the Nuclear Regulation Authority, the Supplemental Provisions to the Act for Establishment of the Nuclear Regulation Authority, the Resolution of the House of Representatives and the Accompanying Resolution of the House of Councillors were passed in regard to organizational administration of the regulatory body, and the National Diet Fukushima Nuclear Accident Independent Investigation Commission report also offer a variety of recommendations.

Article 5 of the Supplementary Provisions to the Act for Establishment of the Nuclear Regulation Authority takes into account the status of enforcement of this act, content of the National Diet Fukushima Nuclear Accident Independent Investigation Commission report and international standards while bearing in mind that the use of nuclear energy is closely related to Japan's security, and stipulates that a review will be undertaken of the regulatory agency, including moving it from the Ministry of Environment to the Cabinet Office, within three years after enforcement of the act.

Also, in the 2012 Act for Establishment of the Nuclear Regulation Authority, the Nuclear Regulation Act was substantially revised and difficulties are projected to emerge in its enforcement, therefore Article 97 of the Supplementary Provisions to the Act for Establishment of the Nuclear Regulation Authority calls for the necessary measures to be taken while "taking into account the status of enforcement."

In September 2014, the "Three-Year Limit Revision and Review Team," which will review revisions over this third year, was established within the Cabinet Office. From the results of its analysis summarizing items assessed into seven points, the Review Team has addressed most of the matters indicated about the Nuclear Regulation Authority with the exception of whether or not it should be transferred to the Cabinet Office and the nuclear emergency preparedness structure. In addition, at the Team's second meeting, the "Second Report on Enhancing and Strengthening the Nuclear Emergency Preparedness Structure" was presented, the content and handling of which were left to the Review Team Chairman's discretion.

Because dozens of items were summarized into seven assessment items, the aforementioned Review Team's evaluation is limited to a generalized assessment.

Therefore, this research study is an attempt to evaluate the degree to which individual items have been attained, which were listed in the Supplementary Provisions, Accompanying Resolutions and other such documents reviewed by the Team. As a result, although some items were difficult to evaluate, it was determined that only a few items have been implemented, and many remained unimplemented or only partially implemented.

Partially implemented or unimplemented items can be classified into: (1) review of the Nuclear Regulation Act; (2) the state of the Nuclear Regulation Authority and establishment of an assessment body, etc.; (3) personnel, training, qualifications, etc.; and (4) transparency and accountability.

This report narrows down the items to be reviewed into broad categories for which the National Diet should be directly involved in the third-year review as well as pressing important matters regarding enforcement of the Nuclear Regulation Act. It does not address items (3) or (4), which are issues concerning the specific details of organizational administration. Also, in addition to items (1) and (2), the issue of transferring the Nuclear Regulation Authority to the Cabinet Office was added to the scope considered by this report.

Based on the aforementioned items (1) and (2) and the added item of the Nuclear Regulation Authority transfer to the Cabinet Office, this report has been broken down into, and provides analysis and recommendations on, issues concerning enforcement of the Nuclear Regulation Act, safety goals and backfits, and the way the Nuclear Regulation Authority organization ought to be.

## 3-2 Analysis and recommendations

### 3-2-1 Resolution of issues concerning enforcement of the Nuclear Regulation Act

#### 3-2-1-1 Review of the 40-year operating life

[The 40-Year primary operating life regulation ] (Recommendations ①-④)

Unit 1, where the first hydrogen explosion occurred in the TEPCO Fukushima Daiichi accident, had just reached 40 years since its operation commenced. Therefore, without waiting for the causes of the accident to be determined, discussions took on a tone that plants over 40 years old are very dangerous and should not be allowed to

continue to operate. Subsequently, without any scientific or technical discussion and in combination with political debate about moving away from nuclear energy, a bill to revise the Nuclear Regulation Act, which included a the 40-Year primary operating life regulation, was passed.

In this way, the 40-year primary operating life regulation was introduced from a political perspective without debate from the viewpoints of engineering experts. In National Diet deliberations on introducing the 40-Year operating life regulation, this regulation was supposed to be reconsidered after establishment of the regulatory agency. However, the Nuclear Regulation Authority has not done so.

Also, based on reports of the National Diet Fukushima Nuclear Accident Independent Investigation Commission and other organizations as well as subsequent investigations, it became clear that the principal cause of the TEPCO Fukushima Daiichi accident was the tsunami strikes on the site after the earthquake. However, legal regulations on the 40-year primary operating life, which took into consideration equipment deterioration, were not amended, and the application of this provision was sought for reactors operating for 40 years or longer.

In this section, the course of events taken in introducing the 40-year primary operating life regulation is followed and improvements are proposed based on analysis of the points at issue.

[National Diet Debate on the 40-year Primary Operating Life Regulation and Review of the Deliberations] (Recommendation ①)

The Bill for Establishment of the Nuclear Regulation Authority was a Diet member-submitted legislative measure that consolidated proposals by the Liberal Democratic Party and New Komeito with the government's bill during deliberations in the House of Representatives. Therefore, during debate in the House of Councillors, it was not the government, but the Diet members who submitted the bill in the House of Representatives' Committee on the Environment that held the right to provide an authoritative interpretation of the legislative measure.

According to pleadings presented by Diet member Kazunori Tanaka (senior member on the House of Representatives' Committee on the Environment: submitter of the House of Representatives' bill) at the House of Councillors' Committee on the Environment, the 40-year operating life is not a fixed number of years that was derived on the basis of scientific or technical considerations, but was determined politically. After the Nuclear Regulation Authority, which is independent and possesses

specialized knowledge, is established, the 40-year period is to be promptly reviewed, and, moreover, the status of enforcement of the Nuclear Regulation Act and the harmonization with Aging Assessment System is to be taken into account in reconsidering all safety regulations.

However, after the Nuclear Regulation Authority was established, Chairman Shunichi Tanaka, in response to a question from a reporter about reviewing the 40-year primary operating life regulation, said, “40 years is ‘reasonably long’ in terms of ‘one engineering life’... I am aware that there were ‘political statements’, and, subsequently, it has been left to the Commission, but I am suspicious about this.” Thereafter, the Nuclear Regulation Authority has not conducted a review aimed at reconsidering the 40-year primary operating life regulation.

In his statement, regarding ① the operating life of 40 years, Chairman Tanaka simply gives his general impression that it is “one engineering life” and “reasonably long.” His statement is not a determination based on a specialized perspective about nuclear power facilities. Also, as for ② the legislative will, confirmation and review of the engineering basis for this 40-Year primary operating life regulation was entrusted to a professional decision of the independent Nuclear Regulation Authority, and his understanding that the statements were “political statements” is a mistake.

At the July 8, 2015 session of the House of Councillors’ Special Committee on the Great East Japan Earthquake Reconstruction and Nuclear Accident Issues, in reply to a question by Democratic Party of Japan member Yoshifumi Hamano, Chairman Tanaka mentioned that the Nuclear Regulation Authority will review the 40-year period, at last. The Nuclear Regulation Authority should reassess and review immediately this 40-Year primary operating life regulation from a specialized and scientific perspective, confirming the purpose expressed during the legislative process that also includes the Accompanying Resolution of the House of Councillors which is compatible with existing measures to address aging.

[Legal Issues Concerning the Commission’s Ordinance for Commercial Nuclear Power Reactors] (Recommendation②)

As backfits have increased in importance following the TEPCO Fukushima Daiichi accident, a so-called Technical Standard Conformity Duty was introduced in Article 43-3-14 of the Nuclear Regulation Act, and the law was revised to introduce the obligation that nuclear reactor facilities be maintained so that they are always in compliance with technical standards incorporating the latest knowledge (backfits). Separate from the backfit provision, the 40-Year primary operating life regulation was

introduced in Article 43-3-32.

The 40-year primary operating life regulation mandates that operators, who wish to operate nuclear reactor facilities in excess of 40 years, obtain authorization to extend such operation. The criteria for such authorization are specifically prescribed in Article 114 of the Commission's Ordinance for Commercial Nuclear Power Reactors, drawing on the provision to set "standards for ensuring safety ... [that] take into account the condition of equipment degradation" in Article 43-3-32 of the Nuclear Regulation Act.

However, Article 114 of the Commission's Ordinance for Commercial Nuclear Power Reactors states that "During the period to be extended, it shall conform to criteria prescribed in technical standards and regulations after consideration is given to deterioration accompanying operation during the period for which the reactor and other equipment is to be extended." In addition to degradation of equipment, so-called backfits are also required to be performed so as to comply with criteria prescribed in technical standards and regulations.

The Act leaves the standards concerning degradation of equipment to the Commission's Ordinance for Commercial Nuclear Power Reactors. But the Commission's Ordinance for Commercial Nuclear Power Reactors, to which such authority is delegated, require backfits in addition to provisions concerning degradation of equipment, and these regulations are clearly beyond the scope mandated by law, a situation which can only be said to be illegal and evasive.

For this reason, the spirit and provisions of the law must be accurately taken into account, and Article 114 of the Commission's Ordinance for Commercial Nuclear Power Reactors must be revised so that only those matters related to degradation of equipment serve as the standard for extending operation.

One of the reasons why such an illegal and evasive situation has been neglected, in which regulations beyond the scope mandated by law have been stipulated, seems to be that there are no legal experts at the Nuclear Regulation Authority, and a scrupulous examination of the laws and regulations has not been conducted. During deliberations at the Nuclear Regulation Authority, Commissioners have made statements including, "Although the 40-year limit appears to be stipulated in the Act in a separate arrangement from backfits, ... [taking] into consideration the spirit of the 40-year restriction, it is only natural that... the point of this policy is that backfits be properly performed." Regardless of whether there is some degree of understanding of the relationship between laws and regulations, the problem is that there is an insufficient recognition that this is illegal and an evasion of the law.

[Legal Issues Concerning Examination Criteria] (Recommendation②)

The examination criteria used in examinations to authorize extension of operating periods were set by the Nuclear Regulation Authority in the “Examination Criteria for Extension of the Operating Period of Commercial Power Reactors” (Internal Rules) dated November 27, 2013. These examination criteria require in Item 1 that backfits have been made at the time an authorization to extend the operating life is granted, and in Item 2 that measures to address aging have been adopted.

The requirement for backfits in Item 1 concerning examination criteria was stipulated under the Commission’s Ordinance for Commercial Nuclear Power Reactors, which is illegal and evasive as stated previously, and, not surprisingly, Item 1 is an unnecessary standard and must be deleted.

Backfits are also applied to reactors undergoing an examination for extension of their operating life. However, in such an application, a general rule for backfits should be applied. According to Chairman Tanaka’s March 19, 2013 personal proposal entitled “Basic Policy for Enforcement of New Regulations on Nuclear Power Stations,” it is sufficient that these new regulatory requirements be applied in the case of reactors which are shut down by the time operations are restarted. So, backfits should be applied as stated in this policy also for reactors undergoing examination for an extension of their operating life and those whose operating life has expired.

[Systematic Issues Concerning the 40-year Primary Operating Life Regulation] (Recommendation③)

Under Japan’s nuclear safety regulations, a system has been in place for assessing the aging of nuclear power facilities apart from the 40-year primary operating life regulation. This has been the Aging Assessment System, and the 40-year primary operating life regulation are similar in that the degradation of facilities and other equipment is evaluated.

So, the House of Councillors accompanying resolution calls for “the system of the 40-year primary operating life regulation shall be consistent with the existing Aging Assessment System.”

As has been pointed out, the Nuclear Regulation Authority has required backfits even in the 40-year primary operating life regulation, but, as legal requirements, these were originally to be regulated separately. Accordingly, if backfits are removed from the 40-year primary operating life regulation, the 40-year primary operating life regulation will be the same system as that for assessing aging in terms of technical substance so

that it will also be clear in terms of the criteria for authorizing an extension of the operating life.

Moreover, the 40-year primary operating life regulation is faulty in that it has never functioned independently in a systematic manner. In other words, the system for extending the operating life is a one-time<sup>1</sup> only authorization at the 40-year mark, so after an extension has been granted, there is no verification whether or not appropriate maintenance is being carried out as detailed in the authorization and the 40-year primary operating life regulation itself does not allow for verification or guarantees of appropriate maintenance management during the extended period. Therefore, it is necessary to utilize the Aging Assessment System in terms of regulations so as to confirm that appropriate maintenance management is being performed.

The 40-year primary operating life regulation and the Aging Assessment System are technically equivalent. And there is a systematic defect: that the 40-year primary operating life regulation must be supplemented by the Aging Assessment System, then the Accompanying Resolution of the House of Councillors should be respected with the 40-year primary operating life regulation being abolished and integrated into the existing Aging Assessment System. It should be noted that the Japanese Aging Assessment System is in accord with periodic safety reviews in IAEA Safety Standards (GS-G-1.2).

[Issues Concerning the Application Period for Extending Operation] (Recommendation④)

Under the 40-year primary operating life regulation prescribed by Article 43-3-32 of the Nuclear Regulation Act, it is necessary to ascertain in detail the current condition of the plant when making a decision on whether or not to grant an extension, so the

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<sup>1</sup> The 40-year primary operating life regulation only allows for a one-time extension (extension period not to exceed 20 years). So, even if the maximum duration is granted to extend operation of the reactor, it cannot be operated any longer once 60 years have passed since the reactor was placed into operation. Notwithstanding the fact that this period of time was determined politically without any scientific review, the decision to set the operating life at 60 years was arrived at not as a means of policy under a law such as the Basic Act on Energy Policy, which governs energy policy including that for nuclear energy, but in accordance with the Nuclear Regulation Act, which regulates issues pertaining to safety and engineering.

In addition, because applicants requesting an extension are limited to one application only, this system does not allow for a prudent treatment under which reassessments may be continually conducted at fixed intervals as required by IAEA safety guides, such as, for example, requiring two applications to be presented, one for each 10-year period.

Moreover, if it has passed the approved extension period, the reactor cannot be operated beyond the extended operating life, even if safety standards are satisfied.

inspection for ascertaining facility and equipment degradation extracts items that have not been inspected previously for deterioration events and those for which the scope of inspection was only partial and excludes items addressed in ordinary maintenance. It also requires that a detailed inspection be conducted, which is a special inspection.

In the “Operational Guide on Applications for Authorizing an Extension of the Operating Life of Commercial Power Reactors” (Internal Rules), which was adopted by the Nuclear Regulation Authority on June 19, 2013, this special inspection, which must be undertaken ahead of an application being presented, is to be performed no sooner than the day on which 35 years have elapsed since operation commenced.

By contrast, the timing of an application requesting authorization to extend the 40-year operating life is limited to between one year and three months to one year prior to expiration of the operating period, in accordance with the provisions of Article 113-1 of the Commission’s Ordinance for Commercial Nuclear Power Reactors.

In other words, when seeking to extend the operating period, a special inspection is performed in the 35th year or later after the reactor has begun to operate, and after the inspection has been conducted, an application for extension of the operating life needs to be made between one year and three months to one year prior to reaching the 40th year in order to obtain such an authorization.

According to the “Examination Criteria Pertaining to Disposition of the Nuclear Regulation Authority Pursuant to the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors” (Internal Rules), the standard period of time for processing an authorization to extend the operating life under Article 43-3-32 is one year. Even if an application for an extension authorization is presented at the earliest point of one year and three months in advance and an examination is undertaken according to the standard processing period, there would only be a margin of three months until the deadline for an extension expires.

Moreover, it is also assumed that there will be cases during an application for an extension authorization where matters to be changed will arise leading to a revised application needing to be presented, and cases where testing and research as well as a revised application must be presented in order to address new knowledge. It is projected that such a time period will compel an extremely tight examination schedule.

Japan's 40-year primary operating life regulation was designed with reference to authorization given for operating licenses in the United States. However, in the United States, an application for extending the operating life may be presented 20 years prior to the 40-year mark. Japan's system, which only allows applications to be made a mere one year to one year and three months in advance, is late for such applications and limited to a short period of time when consideration is made for the amount of time required for examination and the numerous applications expected for extension of the operating life.

When the aforementioned matters are taken into account, the Commission's Ordinance for Commercial Nuclear Power Reactors should be revised with regard to the timing of applications requesting authorization for an extension of operation so that, once a special inspection is completed and the necessary data for an extension of operation is obtained, an application may be presented, and, in order to guarantee that prudent assessment will be conducted with sufficient margin of time and ensure continuity with the special inspections, an application may be presented as soon as one is put together to request an extension of operation after a special inspection has been conducted.

### 3-2-1-2 Countermeasure for Delays in Examinations, etc.

[Countermeasure for Delays in Examinations, etc.] (Recommendation⑥)

Of the 25 plants operated by 11 companies which have applied for an examination to review compliance with new requirements in the aim of restarting these reactors, the number of plants for which an amended establishment license has so far been granted is limited to five: Units 1 and 2 at Sendai, Units 3 and 4 at Takahama, and Unit 3 at Ikata. Examinations for approval of construction plans and pre-use examinations are currently underway or being prepared for these as well. As of the time of writing, there is no plant that has reached the point of restarting.

Although initially the Nuclear Regulation Authority had made statements to the effect that inspections would take six months, the reality is that many of the 25 plant applications have already expended two years or longer in the examination process and significant delays have occurred.

The Nuclear Regulation Authority has said about the substantial delays in examinations that "applicants have been insufficiently prepared," a statement that unilaterally imputes the responsibility for these delays on the applicants. However, applicants have found themselves in a situation where they are not able to

appropriately prepare because the Nuclear Regulation Authority has not clarified the specific criteria or interpretations for its decisions on regulatory requirements. With regard to this point, the status of examinations has been individually reviewed regarding the principal points of contention in the safety examinations, and an analysis attempted also of the points considered to be factors in delaying of the examinations. (See Attachment.)

Moreover, in the future, there will be applications presented to examine regulatory compliance at other plants, applications requesting authorization for extension of the operating life in conjunction with the 40-year primary operating life regulation, and applications for specified major accident response facilities as concerns backfits, such that the amount of work is expected to increase, and it is inevitable that permits and other authorizations will take even longer to process.

The Nuclear Regulation Authority should clarify in writing the decisions and interpretations on the application of standards that have been rendered in previous examinations and make such information public, and it should take measures so that applicants may prepare sufficiently and examinations proceed efficiently. The Nuclear Regulation Authority has also appeared to make statements expecting information to be shared among operators presenting applications, but this is shifting the responsibility onto the operators, and the Nuclear Regulation Authority should be aware of its responsibility as the regulatory agency.

In addition, when the regulator and applicant are at odds over technical issues and unable to come to a conclusion, deliberations should be called for in a legal board of review (such as the Examination Committee Specialized in Nuclear Reactor Safety) where technical justifications may be presented by each party.

In addition, administrative efficiency should be improved in the processing of examinations through the use of electronic documentation and the quality of examinations improved in order to streamline administrative affairs such as reprinting and resubmitting a large volume of documents following revisions for clerical omissions and errors.

To address the enormous number of examination requests for newly installed reactors, the United States' Nuclear Regulatory Commission has put maximum effort and ingenuity into its response, referencing cases where hundreds of examiners have been employed and outside organizations utilized for standardized examinations.

In addition, a five-year grace period has been set for specified major accident response facilities, which are a backup measure improving the reliability of antiterrorism measures, but it is highly likely that this grace period (to July 7, 2018), by the end of which such facilities must be installed, will be exceeded considering that the

examination guide for specified major accident response facilities (internal rules) was enacted more than a year after enactment of the new regulatory requirements, and that as of the time of writing examinations are ongoing and designs have not been determined; regulators should have been easily able to anticipate in advance that these are large facilities which will take several years just for their actual installation and construction.

Article 97 of the Supplementary Provisions to the Act for Establishment of the Nuclear Regulation Authority calls for the status of enforcement of the revised provisions pertaining to reactors to be taken into account in any necessary measures to be adopted. With regard to facilities for addressing specified major accidents, taking into account also the reality that examinations are currently behind schedule, the Nuclear Regulation Authority should conduct adequate hearings with operators about the actual state of the installation of such facilities, and should take into account the period of time needed for examinations as well as the installation of such facilities in reconfiguring the current grace period of five years to a more realistic duration.

### 3-2-2 Formulation of safety goals and backfit rules

#### [Lawsuits over Nuclear Power] (Recommendation⑥)

With regard to lawsuits seeking provisional injunctions on the operation of nuclear power stations, the Fukui District Court approved an injunction against the Takahama Nuclear Power Station, while a completely different decision was reached by the Kagoshima District Court which did not grant an injunction against the Sendai Nuclear Power Station.

The Fukui District Court decision required that there not even be the slightest possibility of a serious accident occurring. Chairman Tanaka's statement that "We conducted an examination for compliance with requirements. I am not able to say that it is safe" cannot be interpreted to mean that although the strictest requirements possible have been prescribed for safety, it cannot be denied that there are residual risks. Thus, it was taken as meaning nothing else but acknowledging that safety is not ensured even though standards have literally been complied with.

The Kagoshima District Court decision stated that there was no such thing as absolute safety, and held to the scope of allowing nuclear reactor risks if safety goals are achieved which limit the frequency of an accident occurring, during which over 100 tetra becquerels of cesium-137 are released, to less than a frequency of  $10^{-6}$ /year.

And moreover, the Kagoshima District Court decision stated that because it has

not been seen whether or not a social consensus has formed through public debate to serve as a standard as to whether or not the content of safety goals are within the scope of permissible to society, “It goes without saying that it would be desirable for any debate on the extent of the degree of acceptable risks concerning the use of nuclear power to continue in the future as well, not only within the Nuclear Regulation Authority but also in the National Diet and all levels of society.”

[Recommendations by the National Diet Fukushima Nuclear Accident Independent Investigation Commission Concerning “Matters Requiring Continuous Monitoring by the National Diet”] (Recommendation⑥)

In its first recommendation, the National Diet Fukushima Nuclear Accident Independent Investigation Commission raised the issue of the “National Diet monitoring regulatory agencies.” In this first recommendation, the National Diet Fukushima Nuclear Accident Independent Investigation Commission called on the National Diet to establish a permanent committee concerned with issues related to nuclear energy, which would continue to monitor the status of many issues discovered during the investigation of the accident and their mitigation.

The National Diet Fukushima Nuclear Accident Independent Investigation Commission attached the following “Matters Requiring Continuous Monitoring by the National Diet” as specific matters to be implemented in regard to Recommendation 1.

- ① Formulation of qualitative and quantitative safety goals
- ② Appropriate revision of technical standards and continually shaping those into safety goals

Accordingly, the House of Representatives’ Special Committee on Investigating Nuclear Energy Issues and the House of Councillors’ Special Committee on the Great East Japan Earthquake Reconstruction and Nuclear Accident Issues were requested by the National Diet Fukushima Nuclear Accident Independent Investigation Commission to formulate safety goals and monitor their application in the enactment and revision of requirements.

[Formulation of Safety Goals] (Recommendation⑥)

In reply to a question posed in the National Diet, Prime Minister Abe stated, “The Nuclear Regulation Authority will sanction compliance with new regulatory requirements having the most stringent levels throughout the world, and we will proceed to restart reactors, for which a request for restart has been presented and

whose safety has been verified.”

On the other hand, at a press conference on July 16, 2014, Nuclear Regulation Authority Chairman Tanaka said, “Although we are looking at compliance with requirements, I am not able to say that this is safe.”

Moreover, during questioning in the National Diet, Chairman Tanaka stated that the fact that Sendai Units 1 and 2 have passed an examination for regulatory compliance “ensures safety at a level required for restart and operation.”

The respective meanings used to refer to “safe” are different and a common explanation is sought as to what degree of safety is meant.

In the United States after the accident at Three Mile Island Unit 2 in 1979, a policy statement was released in 1986 entitled “Safety Goals for the Operations of Nuclear Power Plants (Levels Quantitatively Curbing Acceptable Risks on the Public),” which stipulated the regulatory policy from the perspective of clarifying the question of “How safe is safe enough?” as concerns the safety of nuclear power plants.

In INSAG-3 (revised as INSAG-12), the IAEA presented comprehensive nuclear safety goals, radiological protection goals, and engineering safety goals.

The United Kingdom, France, Germany and other advanced nations also have very similar safety goals.

By contrast, in its April 10, 2013 meeting document entitled “Important Matters Debated Through the Term of the Previous Commission (April 3, 2013) Concerning Safety Goals,” the Nuclear Regulation Authority considered having the “Interim Report on the Status of Investigations and Deliberations Pertaining to Safety Goals” of the former Nuclear Safety Commission serve as a foundation for discussion and that a target should be added for which accidents where the quantity of cesium-137 released is over 100 tetra (tetra = 1 trillion) becquerels should be held below one in 1 million years per nuclear reactor, but no safety goals and performance goals were enacted in terms of regulations or other such provisions. Consequently, it is unclear also whether or not these are used at the time of assessments and their standing is not well defined. Also, safety levels, at which regulatory requirements are achieved, have no relationship with safety goals.

Meanwhile, in the private sector, there have been moves to formulate safety goals independently in terms of autonomous measures aimed at improving safety.

The decision on an injunction seeking to halt operation of the Sendai Nuclear Power Station determined that “it is appropriate that [the Nuclear Regulation

Authority's] safety goals serve as a provisional standard," but then stated, "It would be desirable for the debate on the extent of acceptable risks to continue in the future as well and that discussions proceed not just internally within the Nuclear Regulation Authority but also in the National Diet and at all levels of society."

Also, the meanings of "safety" used by Prime Minister Abe and Chairman Tanaka as mentioned earlier differ. However, if safety goals were to be established, then these three concepts of "safety" could be incorporated into "safety goals will be achieved" using the same word.

From this standpoint, safety goals are also needed for Japan and the formulation of safety goals to be utilized in nuclear regulation are called for.

For this reason, the Nuclear Regulation Authority should prescribe safety goals and performance goals, and, moreover, incorporate the obligation to respect safety goals and performance goals into the Nuclear Regulation Act, and it should take measures utilizing a systematic approach to determine what sort of technical requirements are necessary in order to achieve such goals over the period of about five years so as to provide uniformity in the degree of tolerance afforded in technical standards and so that they may be also used for backfitting requirements as described in the following section.

The National Diet encourages the Nuclear Regulation Authority to appropriately implement such activities, and should engage in monitoring as was also pointed out by the National Diet Fukushima Nuclear Accident Independent Investigation Commission.

Safety goals	Qualitative goals	The possibility of public health being harmed through the emission of radiation or the emission of radioactive materials accompanying activities using nuclear power should be held to a level at which <u>health risks do not significantly increase</u> in the public's daily activities.
	Quantitative goals	<p>The <u>average risk of acute death</u> to individuals of the public along the perimeter of nuclear power facility sites <u>due to radiation exposure originating in an accident</u> at the facility should be held <u>so that it does not exceed 1/1,000,00th per year</u>.</p> <p>The <u>average risk of death</u> to individuals of the public within the range from a nuclear power facility <u>due to cancer</u> which may arise from radiation exposure originating in an accident at the facility should be held <u>so that it does not exceed 1/1,000,00th per year</u>.</p>

Performance goals	Core Damage Frequency (CDF): $10^{-4}$ /year
	Containment Failure Frequency (CFF): $10^{-5}$ /year
	Managed Release Function Failure Frequency (frequency of an accident occurring where over 100 tetra becquerels of cesium-137 are released during an accident): $10^{-6}$ /year

Note: Prepared from safety goals issued by the former Nuclear Safety Commission and documents from the Nuclear Regulation Authority

[Formulation of Backfit Rules] (Recommendation⑦)

The Nuclear Regulation Act was revised based on a serious reconsideration of the TEPCO Fukushima Daiichi accident, and backfits, which require retrospective compliance with standards reflecting the latest knowledge, came to be applied. However, unless the way in which backfits are administered is clear, projecting business risk becomes considerably difficult and there is the possibility that such a situation may truly impede the necessary safety investments. For this reason, other countries have endeavored to create rules concerning the application of backfits, so called backfit rules.

In the case of the United States, regulations on backfits have been drafted into official documents (10 CFR 50.109), and the procedures and criteria are clearly stipulated. Although not as clearly prescribed as in the United States, France, Germany and the United Kingdom have rules for backfits.

In the case of Japan, Article 43-3-14 of the Nuclear Regulation Act prescribes that “the establisher of a nuclear reactor facility for electricity generation shall maintain the nuclear reactor for electricity generation in compliance with technical criteria prescribed by regulations of the Nuclear Regulation Authority.” By revising these technical standards to reflect the latest knowledge, all revisions of technical standards will automatically apply to all reactors. In other words, without exception, the application of backfits will be imposed, and there is the risk that the required level of safety may not be clear and that additional safety measures may be adopted endlessly. Also, only the Chairman’s personal proposal, which is entitled “Basic Policy for Enforcement of New Regulations on Nuclear Power Stations (personal proposal)” (March 19, 2013), has been approved by the Commission as to the way in which backfits will be applied, and no sort of legislation nor Commission decision has been rendered.

Referencing the example of the United States, rules need to be enacted at an early date for backfits, which comprise solutions to this sort of problem. In these rules, the approach to grace periods in the application of backfits should also be clarified.

The creation of backfit rules is thought to encourage operators’ independent efforts to improve safety. Operators adopting measures to improve safety that exceed measures required by regulation would result in mandatory regulatory measures and risk that incentives be lost if operators ended up constraining themselves. However, autonomous efforts do not necessarily lead to regulations, and proactive efforts by operators can be expected if other options for improving safety may also be freely considered in the future.

### 3-2-3 Strengthening the Nuclear Regulation Authority and monitoring functions

#### 3-2-3-1 Strengthening the Nuclear Regulation Authority

[Issue of Transferring the Nuclear Regulation Authority to the Cabinet Office]  
(Recommendation®)

Article 5 of the Supplementary Provisions to the Act for Establishment of the Nuclear Regulation Authority requires that a review be conducted “including the

possibility of establishing an Independent Regulatory Commission under the Cabinet Office,” and that the necessary measures be taken.

Recommendation 5 of the report of the National Diet Fukushima Nuclear Accident Independent Investigation Commission calls for realizing the Nuclear Regulation Authority’s independence from organizations promoting the use of nuclear energy within the government.

With regard to the independence of regulatory bodies, IAEA safety standards state, “It must be ensured that the regulatory body’s functions are separate from organizations having responsibilities or interests which may exert undue influence on decision-making.” Within the organization of the government, the Cabinet Office has the role of “ensuring liaisons among the relevant government agencies from the standpoint of the government as a whole,” and it is considered to be an appropriate organization for ensuring the independence of regulatory agencies as called for by the IAEA safety standards<sup>2)</sup>.

The Nuclear Regulation Authority is currently positioned as a commission under the Ministry of the Environment. If affairs under the jurisdiction of the Ministry of the Environment have no relationship with the jurisdiction for which the Nuclear Regulation Authority is responsible, then it would be determined that there was no issue from the standpoint of independence. However, the Ministry of the Environment has:

- ① promoted electricity generation using nuclear power which does not emit CO<sub>2</sub> from the standpoint of preventing global warming
- ② served as the implementing government agency for disposal of waste contaminated with radioactive materials pursuant to the Act on Special Measures Concerning the Handling of Radioactive Materials and Contamination since the TEPCO Fukushima Daiichi accident

So, in order to guarantee regulatory agency independence, it has been determined that placing the Nuclear Regulation Authority under the Ministry of the Environment is inappropriate.

In addition, the Cabinet Office is in charge of disaster prevention including nuclear

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<sup>2)</sup> The external bureaus of the Cabinet Office are the Fair Trade Commission, National Public Safety Commission (National Police Agency), Imperial Household Agency, Specific Personal Information Protection Commission, Financial Services Agency, and Consumer Affairs Agency, and, with the exception of the Consumer Affairs Agency and other bureaus, which are comprised of employees reassigned from the relevant government ministries and agencies, the Fair Trade Commission, National Public Safety Commission and others, which have their own full-time employees, maintain a high degree of independence from the Cabinet and other ministries and agencies.

In Japan’s administrative machinery, the organizational form having the highest level of independence from the Cabinet or related ministries or agencies is found in those cases where an administrative committee, the appointment of whose commissioners requires the consent of the National Diet, is placed in the Cabinet Office.

emergency preparedness, and, from the standpoint of enhancing liaisons during a nuclear accident, it is proper that the Nuclear Regulation Authority be placed under the Cabinet Office.

The Nuclear Regulation Authority should be transferred to the Cabinet Office at an early date based on these points as well as addressing the requirements of the Supplementary Provisions to the Act for Establishment of the Nuclear Regulation Authority, conformance with international standards, and, moreover, the standpoint of improving measures to address nuclear emergencies.

[State of the Nuclear Regulation Authority and Its Secretariat] (Recommendation⑨)

The United States' Nuclear Regulatory Commission, which served as a reference when debating the Act for Establishment of the Nuclear Regulation Authority, is administered in such a manner that translates the Commissioners' function of auditing the Secretariat so that transparency is ensured as employees of the Executive Director for Operations, which is the Commission's Secretariat, are not permitted to do any behind the scenes consultations with Commissioners in advance, the Commissioners and employees of the Executive Director for Operations are forbidden from having any contact, and deliberations between the Commissioners and the Executive Director for Operations are first conducted at official Commission meetings.

However, the Nuclear Regulation Authority has adopted a so-called commissioner-assignment structure whereby the respective Commissioners are assigned to be in charge of disaster planning and policy, plant reviews, earthquake and tsunami reviews and so on, and the Commissioners participate directly in the review process and operations are conducted in an integrated manner in which the Commissioners issue directions directly to the Secretariat of the Nuclear Regulation Authority. The Commissioners do not function as auditors of the Secretariat, which is thought to lead to a reduction in the Secretariat's sense of responsibility.

Originally, administrative commissions have been administrative bodies in which the highest decision-making body is set up in a consultative system comprised of multiple members, beneath which a secretariat is established in the realm of administrative affairs where political neutrality and the reconciliation of various interests are strongly sought. A person possessing the highest decision-making authority is comparable to a single administrative body (a single person decision-making body). So that the consultative commission system may function

properly, all commission members need to be completely and simultaneously notified of information related to matters for which the commission has jurisdiction. The commissioner-assignment structure does not satisfy this requirement, so it is clear that it is not suited to a consultative-type organization.

So that a consultative commission system for the Commission may function soundly, the commissioner-assignment structure should be discontinued and the current framework restructured by replacing it with a system in which the Commission internally audits the Secretariat. In order for the consultative commission system to function in a healthy manner, all of the regulatory Commissioners need to have an overall view and also make appropriate decisions about matters outside their area of expertise. Accordingly, the example of the United States needs to be referenced and professional staff, which are separate from those employed within the Secretariat, need to be assigned to each of the Commissioners.

[Examination Committee Specialized in Nuclear Reactor Safety and Examination Committee Specialized in Fuel Safety] (Recommendation⑩)

In February 2014, a year and a half after its establishment, the Nuclear Regulation Authority set up the Examination Committee Specialized in Nuclear Reactor Safety and the Examination Committee Specialized in Fuel Safety whose establishment was mandated by the Act for Establishment of the Nuclear Regulation Authority, but the matters on which these committees would deliberate differed from those pertaining to previously conduct safety examinations and were limited to surveying and analyzing regulatory trends in other countries as well as accidents and problems that occurred both in Japan and abroad, and it was decided that these Committees would not have anything to do with the regulatory process.

The reasons for this as cited by the Nuclear Regulation Authority were that the Examination Committee Specialized in Nuclear Reactor Safety under the former Nuclear Safety Commission was linked to causes of the TEPCO Fukushima Daiichi accident, that the Examination Committee Specialized in Nuclear Reactor Safety had a different legal standing despite having the same name as the previous committee, and that the Accompanying Resolution of the House of Councillors stated to the effect that the Examination Specialized in Nuclear Reactor Safety and other committees were limited to providing advice to the Commission.

However, nothing was pointed out in the report of the National Diet Fukushima Nuclear Accident Independent Investigation Commission indicating that the

Examination Committee Specialized in Nuclear Reactor Safety under the former Nuclear Safety Commission was linked to the causes of the TEPCO Fukushima Daiichi accident. If anything, it pointed out that there was a problem in that the policy on station blackouts was revised within a private advisory panel under the former Nuclear Safety Commission. The Nuclear Regulation Authority has in some cases used panels of experts in the process of preparing standards and pre-examinations, which is the equivalent of such a private advisory panel, and, on this point as well, it seems that the lessons learned from the TEPCO Fukushima Daiichi accident have not been adequately applied.

Also, although it has been stated that the legal standing of the Examination Committee Specialized in Nuclear Reactor Safety and other committees has been modified, no legal changes have been made to its standing or other characteristics in the Establishment Act. The provisions about questions posed by the former Nuclear and Industrial Safety Agency to the Nuclear Safety Commission and its responses in regard to examining establishment licenses under the Nuclear Regulation Act were deleted, but these deletions were made along with its integration into the Secretariat of the Nuclear Regulation Authority, which is equivalent to the former Nuclear and Industrial Safety Agency, and the Nuclear Regulation Authority, which is equivalent to the former Nuclear Safety Commission, and, as such, these are merely perfunctory changes.

In response to a question about the Examination Committee Specialized in Nuclear Reactor Safety and other committees during the National Diet's deliberations on the Act for Establishment of the Nuclear Regulation Authority, Diet member Hokuto Yokohama, who was the member officially submitting the House of Representatives' bill, stated, "The field of nuclear energy is very wide-ranging... It is difficult realistically for that entire field to be covered just by the Chairman and Commissioners," so "advisory committees should be permanently established and entrusted with daily regulations concerning the assurance of safety in the use of nuclear power so that the regulations in such areas not fall behind." This reply also indicates that there is no change in the roles or standing of the Examination Committee Specialized in Nuclear Reactor Safety or other committees.

Next, the Nuclear Regulation Authority has stated that the basis for changing the standing of the Examination Committee Specialized in Nuclear Reactor Safety and other committees is found in the Accompanying Resolution of the House of Councillors where it states that these committees are: "Not to be a substitute for decisions by the Nuclear Regulation Authority but are limited to providing objective advice for its decisions." The Accompanying Resolution of the House of Councillors requires only

that the Nuclear Regulation Authority be the decision-making body and underscores the purport of the Establishment Act that, even if matters are deliberated by the Examination Committee Specialized in Nuclear Reactor Safety or other committees, ultimately it is the Nuclear Regulation Authority that has the singular responsibility for making a decision and the Examination Committee Specialized in Nuclear Reactor Safety or other committees are limited to an advisory position vis-à-vis the Commission, and it does not require any change in the standing of the Examination Committee Specialized in Nuclear Reactor Safety or other committees. This point is also clear from the aforementioned response given by Diet member Hokuto Yokohama.

The Examination Committee Specialized in Nuclear Reactor Safety and other committees are not built into the regulatory process and are not able to play a proper role as a statutory deliberative committee in the current framework. For this reason, it is recommended the Establishment Act clearly specify that the Examination Committee Specialized in Nuclear Reactor Safety and other committees are responsible for enacting and revising safety examinations and standards. Also, it is necessary that experts, who participated in previous examinations, not be excluded and that the composition of members of examination committees be reworked so that committees are comprised of a well-balanced makeup of outstanding experts who are able to render high-level technical decisions.

In addition regardless of the fact that the focus has been on reviews concerning earthquakes and ground foundations in the examinations for restarting reactors, voluntary panels of experts have been used. From the standpoint of advancing more rigorous examinations, it is recommended that an “Examination Committee Specialized in Earthquakes and Ground Foundation” (provisional name) be newly established to serve as a statutory Committee handling issues concerning earthquakes and ground foundations.

[Ensuring True Independence] (Recommendation<sup>⑪</sup>)

The National Diet Fukushima Nuclear Accident Independent Investigation Commission also pointed out that “regulatory authorities gradually became ‘captives’ of electric power operators” in its report. The Nuclear Regulation Authority has misunderstood neutrality and independence as the separation from operators and those promoting nuclear power, as result, such a move has invited criticism that they have become “isolated.”

To put it concretely, it is a fact that problems have been pointed out about the

Nuclear Regulation Authority, such as it does not follow the will of the National Diet, it intentionally interpret laws and regulations in a wide sense and misuses them , it does not incorporate public comments with any presentation of specific technical reasons, it has adopted the commissioner-assignment structure thus losing its consultative commission function, it does not allow the Commission's Ordinance for Commercial Nuclear Power Reactors to participate in examinations, formulate standards or other aspects of the regulatory process, it does not engage in dialogue with the heads of local governments, it provides explanations that create misunderstandings among international advisers, it does not review or incorporate the opinions of outside experts, and finally it has been criticized in that its "independence" has turned into "isolation."

With regard to the requirements sought of administrative organizations in the United States, balance is demanded in place of the term neutrality. In other words, the decisions of administrative organizations in the composition of experts on councils need to be balanced and not biased, and the opinions of the public and industry appropriately understood.

Moreover, some key points concerning independence are that regulatory agencies acquire specialization, do not bend to other sorts of pressure, and make their own decisions.

The Nuclear Regulation Authority should listen to the public at large, and the Secretariat should acquire the ability to make its own high-level decisions on specialized technical matters, thus ensuring its independence in the true sense.

This would allow it to be truly "independent" rather than "isolated."

IAEA safety standards state that a framework for dialogue with operators should be constructed while engaging in specialized and constructive liaisons in its relationships with interested parties and others. To this end, the standards state that: (1) there must be liaisons with operators in order to achieve the common goal of ensuring safety; (2) mutual respect and understanding must be created with operators through official relationships which are frank and open; and (3) regulatory agency decisions must demonstrate reasonableness as the occasion demands and the basis for such decisions must be explained.

However, the Nuclear Regulation Authority has been confrontational with operators during examinations and other situations, has unilaterally broke off technical discussions, has not appropriately handled technical material, and has shown a stance towards examinations from an advantageous position based on its authority. The Nuclear Regulation Authority and operators, even if ultimately there is a difference of

opinion, should be able to understand the other's views and engage in discussions until each other's position is understood, and they should construct a relationship of mutual trust, requesting the matter be reviewed by the Examination Committee and obtaining a conclusion based on the result.

[The Committee Consisting of Regular Secretariats] (Recommendation<sup>⑫</sup>)

Article 6-2 of the Supplementary Provisions to the Act for Establishment of the Nuclear Regulation Authority establishes the so-called no-return rule, which says, "From the viewpoint of ensuring the independence of regulations for ensuring safety in the use of nuclear energy, the officials of the Secretariat of the Nuclear Regulation Authority, including its executive personnel and other officials, may not be transferred to any government organizations that have jurisdiction over affairs concerning the promotion of the use of nuclear energy; provided, however, that this shall not apply in the case within five years after the enforcement of this Act where unavoidable grounds are found in particular by taking into consideration motivation, competence, etc. of the relevant officials."

Initially, the Liberal Democratic Party had planned to set up a no-return rule for all government agencies immediately after the regulatory agency was established in order to enhance specialization of the new regulatory organization.

However, during negotiations with the Democratic Party of Japan government at the time, as given in the aforementioned Supplementary Provisions, a no-return rule was established only between "government organizations that have jurisdiction over affairs concerning the promotion of the use of nuclear energy," and, moreover, while the no-return rule was set in principle, a grace period of five years was established.

The aforementioned Supplementary Provisions are not clear on whether the no-return rule will be applied to all government agencies in five years or whether it will be applied to government organizations promoting the use of nuclear energy as it has been.

In order for the regulatory agency to acquire the independence sought by IAEA safety standards, it must naturally avoid constantly exchanging personnel in a manner over which related government ministries and agencies may extend their personnel management authority. This is because regulatory agencies, over which personnel matters are conducted in a so-called colonial manner, will not be able to attain independence.

Also, even if the regulatory agency's employees are developed into experts through education and training, if these employees return to the government ministries and agencies from which they came and, in their place, employees are brought to the Secretariat from outside the regulatory agency through personnel transfers, the specialization of the regulatory agency's employees will not be improved, a sense of unity within the organization will not be created nor will a sense of belonging, and, moreover, the employees will not be able to develop a sense of responsibility for the agency's regulations.

Of course, in cases where it is desirable to have the knowledge of employees at other government agencies who possess specialization in particular fields (for example, obtaining the knowledge of employees of the self-defense forces for responding to emergencies, etc.) or to have the advice of researchers or engineers (for example, to have the knowledge of employees and research institutes under the auspices of government agencies promoting nuclear energy, etc.), it would be beneficial to invite such employees in the form of a temporary reassignment to transfer such specialization to the regulatory agency. Also, conversely, in order to obtain specialized knowledge, there may also be cases where it will be beneficial for regulatory agency employees to be reassigned for a short period of time to another government agency in order to gain specialized knowledge. Such general personnel exchanges, which lead to improved specialization, should be promoted.

Among the regulatory agencies in other countries, there are no examples of regulatory agencies where the top two administrative positions (Secretary-General and Deputy Secretary-General) are employees other than those who have been regular employees of the regulatory agency in question. However, at the present, the Nuclear Regulation Authority, the Secretary-General hails from the National Police Agency and for two consecutive times employees from the Ministry of the Environment, who have not been engaged in nuclear power regulation, have been appointed to the Deputy Secretary-General post. (The Secretary-General and the Deputy Secretary-General positions have been monopolized constantly by the Ministry of the Environment and the National Police Agency.) And, moreover, numerous employees from other ministries and agencies have been assigned to or rotated through other top positions. In such a situation where there has been a constant exchange of personnel, the regulatory agency cannot be seen as independent from other government ministries and agencies.

It may also be understood that it also takes time to develop employees within a

regulatory agency. For this reason, it is recommended that the no-return rule will be applied to all government ministries and agencies in five years, and the Nuclear Regulation Authority be made a proper government committee in five years.

It took a quarter of a century for the former Science and Technology Agency to free its top posts from a situation in which those top positions were filled by persons previously working at other government ministries and agencies. The Nuclear Regulation Authority should not follow the example set by the former Science and Technology Agency.

[Ensuring Independent Revenue Sources] (Recommendation<sup>⑫</sup>)

The Nuclear Regulation Authority's budget is audited and arranged by the Ministry of the Environment, and a request is presented to the Ministry of Finance. The government's general account and the special account for reconstruction from the Great East Japan Earthquake provide some of the sources of the Authority's revenue, but its budget is mainly drawn in regard to nuclear safety regulations and countermeasures under the special account for energy.

IAEA Safety Standards GSR Part 1 stipulates that sufficient sources of revenue must be available in order for the regulatory agency to be effectively independent. IAEA Safety Standards GS-G-1.1 states that revenue sources should be secured by the provision of funding from the government, collection of costs from operating entities or by a combination of both.

In order to increase its independence from the standpoint of financial resources as well as to ensure sufficient resources, the Nuclear Regulation Authority should have an independent source of revenue, such as covering expenses from mandatory fees collected from operators.

In addition, the United States Nuclear Regulatory Commission, which has independent sources of revenue, offers high salaries to its employees in combination with an open atmosphere in the workplace such that the organization is highly popular within the United States federal government machinery.

In Japan as well, in order to employ highly capable personnel, a flexible salary structure should be realized along with ensuring independent sources of revenue. For example, a salary structure should be constructed which does not conform to the salary schedules of the National Personnel Authority and a new salary schedule should be set up including allowances for employees of the Nuclear Regulation Authority.

### 3-2-3-2 National Diet Monitoring Functions

[National Diet Monitoring Functions] (Recommendation<sup>⑬</sup>)

For monitoring regulatory agencies, the National Diet Fukushima Nuclear Accident Independent Investigation Commission called for the National Diet to: (1) establish permanent committee in the National Diet for monitoring regulatory agencies concerned with nuclear energy; and (2) on this committee, establish an advisory body comprised of experts that is independent of operators and administrative organs and so that the committee is able to have the latest knowledge for addressing safety issues.

With regard to item (1), the Special Committee on Nuclear Power Issues in the House of Representatives and the Special Committee on the Great East Japan Earthquake Reconstruction and Nuclear Accident Issues in the House of Councillors have been established, realizing this recommendation of the National Diet Fukushima Nuclear Accident Independent Investigation Commission.

However, there are no Diet members on either of these special committees who may be said to be experts in nuclear power, so it is desirable to have the support of experts on technical issues particular to nuclear power, on enactment of safety goals based on concepts of nuclear safety, and on technical standards based on engineering and other areas where extensive knowledge is needed across a broad range including laws at the regulatory level.

As was recommended by the National Diet Fukushima Nuclear Accident Independent Investigation Commission, if an advisory body is established which is comprised of experts on nuclear power (including systematic and procedural aspects) under the National Diet committee and a system is adopted whereby the advisory body provides advice to the committee, the profundity of deliberations will also increase in discussions on technical matters specific to nuclear power. Also, as recommended by the National Diet Fukushima Nuclear Accident Independent Investigation Commission, the formulation of safety goals and continuing adaptation of standards to meet safety goals are also matters to be monitored by the committee, and the National Diet's monitoring functions must be strengthened in conjunction with establishment of an advisory committee.

The recommendations of the National Diet Fukushima Nuclear Accident Independent Investigation Commission also call for National Diet committees to undertake monitoring continuously, and consideration also needs to be given to this point.



## Main points of discussion regarding the application of the regulatory requirements

No.	Item (issue)	Blueprint, regulatory and guideline proposals	Public comments	New regulatory requirements	Review results (situation)	Relevant IAEA guidelines, etc.
1	[Activity in shear zone] For faults directly under facilities important to safety, those shear zones for which future activity cannot be “clearly” determined are judged as having “activity cannot be negated.”	[Blueprint proposal] 1. Basic policy for design to address earthquakes and tsunami - Facilities having important safety functions are <u>installed on subgrades where it has been confirmed that there are no faults or other outcrops which may be active in the future.</u> [Regulatory proposal] Such facilities are to be installed on subgrades where it has been confirmed that there are no faults or other outcrops which may be active in the future.	[Blueprint proposal] · <u>Safety assessments can be conducted to look for fault displacement.</u> [Regulatory proposal] · <u>Revisions should be made to regulatory provisions so that regulatory determinations can be made at a high scientific and technological level in both a physical and engineering manner.</u> · <u>As for guidelines for assessing faults within sites in other countries, the International Atomic Energy Agency (IAEA)'s international guidelines' include provisions stipulating the use of deterministic methods and probabilistic methods in assessing fault displacement.</u> *: Specific Safety Guide No.SSG-9 “Seismic Hazards in Site Evaluation for Nuclear Installations”	[Regulatory interpretation] In cases where aseismic important facilities are installed on subgrades where there are faults or other outcrops which may be active in the future, activity of the fault or other outcrop may have a significant impact on safety function, so <u>such facilities are to be installed on subgrades where it has been confirmed that there are no faults or other outcrops which may be active in the future</u>	[Expert council on survey of shear zones with the Tsuruga Power Station site] Results of Japan Atomic Power Company assessment: · According to data obtained from surveys, the shear zones within the site show <u>no activity</u> . Nevertheless, the Nuclear Regulation Authority <u>decided on an assessment compiled by the expert council, which stated, “activity of shear zones within the site cannot be negated and it is determined that there are faults, etc. which may be active in the future.”</u> [Expert council on survey of shear zones with other station sites] At Higashidori and Shika, the results of the operators' evaluations showed that “there is no activity according to the data obtained from surveys,” but the panel of experts' synopsis was that “activity in shear zones within the site cannot be negated.” [Issues with the examinations] · The panel of experts does not have any legal standing per se. · The panel of experts is a forum for a discussion to take place among experts and an evaluation to be consolidated, and, accordingly, even if the opinion differs from that of the operator, it has appeared that panels have not sufficiently discussed operators' assertions. · Also, peer review meetings have not been held to conduct a reassessment, and there have been cases where matters were indicated that relate to the basis of conclusions in the peer review assessment report but that have not been reflected either.	①NS-R-3 Original and Japanese-language version Site Evaluation for Nuclear Installation ②SSG-9 Original and Japanese-language version Seismic Hazards in Site Evaluation for Nuclear Installations ③NS-G-2.13 Original and Japanese-language version Evaluation of Seismic Safety for Existing Nuclear Installation
2	[Interlocking, etc. of active faults] With regard to seismic ground motion for which the hypocenter has been identified and formulated, determinations are required to be made on the safe side by taking into consideration uncertainty as well as interlocking, etc. of active faults. In addition, the basis is not clearly defined for determining “how activity should be assessed based	[Blueprint proposal] In assessing hypocenter model configurations, hypocenter characteristic parameters, etc., <u>consideration is given to the treatment of short isolated active faults, and interlocking among multiple faults is taken into account.</u>	[Blueprint proposal] · <u>Interlocking of active faults should be taken into consideration after examining such possibility based on the process of formation of the topography and geological structures (tectonics), stress conditions, etc.</u>	[Review guide] For lengthy active faults, <u>it is confirmed that magnitude and source fault models have been configured by sufficiently taking into account the latest research results on mutual interaction between faults (interlocking of active faults), fault displacement from one earthquake, fault incline angles, thickness of seismogenic layer, and length of fault line.</u>	[Review of design basis seismic ground motion at Sendai Nuclear Power Station] · The Kyushu Electric Power Company estimates the length of active fault in sea areas based on the results of sonic prospecting. · However, with regard to the Nuclear Regulation Authority's interpretation of sonic prospecting results, <u>in contrast to determinations made by operators, the regulatory agency is required to make estimates on the long side.</u> · On this basis, <u>Kyushu Electric Power Company accepted such and computed its estimates of active faults on the long-side.</u>	④SSG-9 Original and Japanese-language version Seismic Hazards in Site Evaluation for Nuclear Installations

No.	Item (issue)	Blueprint, regulatory and guideline proposals	Public comments	New regulatory requirements	Review results (situation)	Relevant IAEA guidelines, etc.																																																																																																						
	on survey results.”				<p>[Review of design basis seismic ground motion at Oi Nuclear Power Station]</p> <ul style="list-style-type: none"> <li>• Kansai Electric Power Company assessed that assumptions of interlocking are not necessary based on the results of marine sonic prospecting.</li> <li>• However, <u>the Nuclear Regulation Authority found that a clear determination could not be made with the results of marine sonic prospecting, and requested that interlocking be taken into consideration.</u></li> <li>• On this basis, <u>Kansai Electric Power Company accepted such and took into consideration interlocking.</u></li> </ul> <p>[Issues with the examinations]</p> <ul style="list-style-type: none"> <li>• The method, criteria, basis and other facets used by the Nuclear Regulation Authority's in determining its comments on the operators' survey results and determinations have not been indicated.</li> <li>• As a result, the examination has continued to be delayed.</li> </ul>																																																																																																							
3	<p>[Seismic ground motion formulated without identifying the hypocenter] (DIFFUSE SEISMICITY)</p> <p>The Nuclear Regulation Authority has requested that seismic ground motion, which should be subject to review by taking into consideration regional characteristics as illustrated in review guides, be subject to review as such regional characteristics cannot be clearly determined. Also, a basis has not been clearly defined for determining to what extent a margin should be taken into account.</p>	<p>[Guideline proposal]</p> <p>In assessing seismic ground motion which is formulated without identifying the hypocenter, examples of seismic ground motion within inland crusts, data about which are subject to collection, are shown in Table-1.</p> <p>Table 1. Examples of inland crustal earthquakes subject to data collection</p> <table border="1" data-bbox="543 1241 955 1961"> <thead> <tr> <th>No</th> <th>Name</th> <th>Date/time</th> </tr> </thead> <tbody> <tr><td>1</td><td>2008 Iwate-Miyagi inland earthquake</td><td>Jun. 14, 2008, 08:43</td></tr> <tr><td>2</td><td>2000 Western Tottori earthquake</td><td>Oct. 6, 2000, 13:30</td></tr> <tr><td>3</td><td>2011 Northern Nagano earthquake</td><td>Mar. 12, 2011, 03:59</td></tr> <tr><td>4</td><td>March 1997 Northwestern Kagoshima earthquake</td><td>Mar. 26, 1997, 17:31</td></tr> <tr><td>5</td><td>2003 Northern Miyagi earthquake</td><td>Jul. 26, 2003, 07:13</td></tr> <tr><td>6</td><td>1996 Northern Miyagi (Onikoube) earthquake</td><td>Aug. 11, 1996, 03:12</td></tr> <tr><td>7</td><td>May 1997 Northwestern Kagoshima earthquake</td><td>May 13, 1997, 14:38</td></tr> <tr><td>8</td><td>1998 Northern Iwate inland earthquake</td><td>Sep. 3, 1998, 16:58</td></tr> <tr><td>9</td><td>2011 Eastern Shizuoka earthquake</td><td>Mar. 15, 2011, 22:31</td></tr> <tr><td>10</td><td>1997 Northern Yamaguchi earthquake</td><td>Jun. 25, 1997, 18:50</td></tr> <tr><td>11</td><td>2011 Northern Ibaraki earthquake</td><td>Mar. 19, 2011, 18:56</td></tr> <tr><td>12</td><td>2013 Northern Tochigi earthquake</td><td>Feb. 25, 2013, 16:23</td></tr> <tr><td>13</td><td>2004 Earthquake in Southern Rumoi subprefecture</td><td>Dec. 14, 2004, 14:56</td></tr> <tr><td>14</td><td>2005 Afterquake of the Fukuoka Seihoeki earthquake</td><td>Apr. 20, 2005, 06:11</td></tr> <tr><td>15</td><td>2012 Northern Ibaraki earthquake</td><td>Mar. 10, 2012, 02:25</td></tr> <tr><td>16</td><td>2011 Northern Wakayama earthquake</td><td>Jul. 5, 2011, 19:18</td></tr> </tbody> </table>	No	Name	Date/time	1	2008 Iwate-Miyagi inland earthquake	Jun. 14, 2008, 08:43	2	2000 Western Tottori earthquake	Oct. 6, 2000, 13:30	3	2011 Northern Nagano earthquake	Mar. 12, 2011, 03:59	4	March 1997 Northwestern Kagoshima earthquake	Mar. 26, 1997, 17:31	5	2003 Northern Miyagi earthquake	Jul. 26, 2003, 07:13	6	1996 Northern Miyagi (Onikoube) earthquake	Aug. 11, 1996, 03:12	7	May 1997 Northwestern Kagoshima earthquake	May 13, 1997, 14:38	8	1998 Northern Iwate inland earthquake	Sep. 3, 1998, 16:58	9	2011 Eastern Shizuoka earthquake	Mar. 15, 2011, 22:31	10	1997 Northern Yamaguchi earthquake	Jun. 25, 1997, 18:50	11	2011 Northern Ibaraki earthquake	Mar. 19, 2011, 18:56	12	2013 Northern Tochigi earthquake	Feb. 25, 2013, 16:23	13	2004 Earthquake in Southern Rumoi subprefecture	Dec. 14, 2004, 14:56	14	2005 Afterquake of the Fukuoka Seihoeki earthquake	Apr. 20, 2005, 06:11	15	2012 Northern Ibaraki earthquake	Mar. 10, 2012, 02:25	16	2011 Northern Wakayama earthquake	Jul. 5, 2011, 19:18	<p>[Guideline proposal]</p> <ul style="list-style-type: none"> <li>• 16 earthquakes are shown as examples of seismic ground motion within inland crusts, data about which are subject to collection for considering “seismic ground motion formulated without identifying the hypocenter,” and <u>these should be shown along with a reasonable explanation given of the selection basis and positioning in review guides.</u></li> </ul>	<p>[Guidelines]</p> <p>In assessing seismic ground motion which is formulated without identifying the hypocenter, <u>examples of seismic ground motion within inland crusts, data about which are subject to collection, are shown in Table-1.</u></p> <p>Table 1. 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					<p><u>that such earthquakes will not occur, and requested that such be taken into consideration.</u></p> <ul style="list-style-type: none"> <li>Each company has decided to take such into consideration as design basis seismic ground motion.</li> </ul> <p>[Design basis seismic ground motion at Tomari Nuclear Power Station]</p> <ul style="list-style-type: none"> <li>Hokkaido Electric Power Company <u>explained the inland earthquakes in Iwate and Miyagi were not subject to review because the focal areas and density of geological structures surrounding the power stations differ.</u></li> <li>However, the Nuclear Regulation Authority stated that, because said earthquakes and active faults surrounding each site are both reverse faults, <u>it takes time to judge the regionality, and requested that it be subject to review.</u></li> <li>Under continuous discussion</li> </ul> <p>[Issues with the examinations]</p> <ul style="list-style-type: none"> <li>The method, criteria, basis and other facets used by the Nuclear Regulation Authority's in determining its comments on the operators' survey results and determinations have not been indicated.</li> <li>As a result, a decision on the magnitude of the Rumoi subprefecture seismic ground motion has been set conservatively while the basis for such a determination remains vague, and, with regard to earthquakes in Western Tottori and inland Iwate and Miyagi, it has taken time to respond to the operator's argument that these should not be subject to review as the regionality is different.</li> </ul>	
4	<p>[Redundancy of static components] In the "regulatory interpretation," it states that "when it can be reasonably explained that there is an extremely low possibility of a single failure occurring." However, the "criterion for reasonably determining that something is extremely low" is unclear. Operators have explained that the "likelihood of a single failure occurring is extremely low," but regulatory authorities have not</p>	<p>[Blueprint proposal] 2. Common engineering requirements for reactor facilities (9) Design considerations concerning reliability <u>Even in cases where it can be reasonably explained that there is an extremely low possibility of a single failure occurring</u> and cases where system function may be lost on the assumption of a single failure, <u>the requirement for redundancy of said component</u> does not apply if it can be confirmed by safety or other such analysis that said function may be substituted by using other systems.</p>	<p>[Blueprint proposal] What is a "case which can be reasonably explained"? &lt;Main point&gt; With regard to a "case which can be reasonably explained" in detail E of the regulatory requirement, <u>we would like the terms and conditions which correspond to this</u> to be clearly indicated from the standpoint of effective regulation.</p>	<p>[Regulatory interpretation] Article 12 (Safety Facilities) 5 (Excerpt) In assessing safety function over the long-term which assumes either a single failure of a dynamic component or a static component, such a single failure does not have to be assumed if it is assured that such a single failure can be removed or repaired within a period of time that does not hinder safety even under the most severe conditions assumed. Moreover, <u>even in cases where it can be reasonably explained that there is an extremely low possibility of a single failure occurring</u> and cases where</p>	<p>[Filtered units and ducts at Sendai Nuclear Power Station]</p> <ul style="list-style-type: none"> <li>For review at the Sendai NPS, it has been accepted that a single failure of static equipment is to be able to be removed or repaired within a period of time not hindering safety or the designated safety function is to be able to be maintained by substituting the use of other systems.</li> <li>However, <u>"the basis for determining cases where an extremely small likelihood of a single failure is able to be reasonably explained" is still unclear, and filtered units and ducts are premised on functionality loss.</u></li> </ul> <p>[Tomari Unit 3 PCV spray pipes]</p> <ul style="list-style-type: none"> <li>The Nuclear Regulation Authority has</li> </ul>	<p>©SSR-2/1 Original and Japanese-language version Safety of NPPs: Design</p> <p>REF: (US) ⑦GDC Original and Japanese-language version General Design Criteria (Federal Regulation 10CFR50 Appendix A) Criterion 35</p> <p>©SRP Original and Japanese-language version Branch Technical Position3-4</p> <p>©SECY-77-439 Original and</p>

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	accepted this explanation, and requested that redundancy be established.”			system function may be lost on the assumption of a single failure, <u>the requirement for redundancy of said equipment</u> does not apply if it can be confirmed by safety or other analysis that said function may be substituted by using other systems.	<p>requested that redundancy be established for static components for inspection of Tomari Unit 3.</p> <ul style="list-style-type: none"> <li>The Hokkaido Electric Power Company explained that “the likelihood of a single failure occurring is extremely small.”</li> <li>However, the Nuclear Regulation Authority indicated the following opinion and did not accept the operator’s explanation, and construction is to be implemented for duplexing pipes. <ul style="list-style-type: none"> <li>In the guidelines concerning static components, there are cases where reliability is taken into consideration and a single failure is assumed and cases where such is not assumed, and, in cases where a single failure is assumed, functionality loss is postulated</li> <li>The guidelines distinguish between whether such single failure will occur or not, and <u>do not permit the assumption of failure to be changed by means of frequency</u>. The loss the pipe’s function means the flow path is lost.</li> </ul> </li> </ul> <p>[Issues with the examinations]</p> <ul style="list-style-type: none"> <li>The previous Nuclear Safety Commission did not consider it necessary to have duplexing for passive components as they were highly reliable. Also, such duplexing is not needed for facilities that address specified major accidents, which are currently underway, and the examinations lack coherence and predictability.</li> </ul>	Japanese-language version “Information report by the office of nuclear regulation on the single failure criterion”
5	[Maximum wind speed of reference tornado] Criteria have not been indicated about what sort of data is sufficiently reliable and the approach that the Nuclear Regulation Authority will take in sanctioning “areas where nuclear power stations are sited and areas where meteorological conditions are similar from the perspective of tornadoes arising,” which are indicated in the guidelines.	<p>[Guideline proposal] Areas subject to tornado review: Areas where nuclear power stations are sited and areas where meteorological conditions are similar from the perspective of tornadoes arising.</p> <ul style="list-style-type: none"> <li>Maximum wind speed of reference tornado</li> <li>As a rule, the maximum wind speed of tornadoes which have previously occurred in Japan is configured as VB1. However, <u>in cases where the assessment can be made based on sufficiently reliable data</u> about maximum wind speeds of tornadoes which have occurred in the past in areas subject to tornado review, “Japan” may be substituted</li> </ul>	<p>[Guideline proposal]</p> <ul style="list-style-type: none"> <li>Configuration of maximum wind speed for reference tornado</li> <li>As for configuration of maximum wind speed for reference tornado, the approach of comparing the historical maximum wind speed (VB1) and the maximum wind speed a hazard curve for the tornado maximum wind speed in the area subject to tornado review (VB2) and using whichever is of greater wind speed, or the <u>approach of using the historical maximum in Japan</u> seem to be too conservative.</li> <li>Even in cases where sufficient data have not been accumulated and <u>statistical processing cannot be carried out, isn’t it unnecessary to always adopt the historical maximum wind speed in Japan as the reference wind speed if regional characteristics can be explained?</u></li> <li>In configuring the maximum wind speed for reference tornado, it is unambiguously stated that “when the largest historical tornado in Japan is not</li> </ul>	<p>[Guidelines] Areas subject to tornado review: Areas where nuclear power stations are sited and areas where meteorological conditions are similar from the perspective of tornadoes arising.</p> <ul style="list-style-type: none"> <li>Maximum wind speed of reference tornado</li> <li>As a rule, the maximum wind speed of tornadoes which have previously occurred in Japan is configured as VB1. However, <u>in cases where the assessment can be made based on sufficiently reliable data about maximum wind speeds of tornadoes which have occurred in the past in areas subject to</u> tornadoes review, “Japan” may be</li> </ul>	<p>[Maximum wind speed of tornados at Sendai Nuclear Power Station]</p> <ul style="list-style-type: none"> <li>In the Sendai review, “Japan” is read as “area subject to tornado review,” but <u>it has been accepted that the actual maximum wind speed (VB1) uses the maximum wind speed that occurred in the past in Japan</u>.</li> </ul> <p>[Maximum wind speed of reference tornado]</p> <ul style="list-style-type: none"> <li>When Kansai Electric Power Company undertook a tornado impact assessment in the evaluation of the current state of Units 3 &amp; 4 at Oi NPS, <u>it referred to “IAEA SSG-18,” which is the reference provision for the guidelines, to configure the area subject to tornado review</u>.</li> <li>However, at a hearing, the Nuclear Regulation Authority pointed out the basis for configuring areas subject to tornado review and the appropriateness of such an approach, which resulted in “Japan” not being read as “area subject to tornado</li> </ul>	<p>①NS-R-3 Original and Japanese-language version Site Evaluation for Nuclear Installation</p> <p>①NS-G-1.5 External Events Excluding Earthquakes in the Design of NPPs</p> <p>②SSG-18 Original and Japanese-language version Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations</p> <p>REF (US) SRP 3.3.2 TORNADO LOADS (There are entries on methods of</p>

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		for “areas subject to tornados review.”	<p>taken into account, a clear basis for such needs to be presented” (p. 11), but it is held to be appropriate that “in cases where it is difficult using a well-defined basis to find the maximum wind speed which takes into consideration regional characteristics and distinguishing features of tornadoes occurring in areas subject to tornado review using a survey of past data, research results and other information, the largest tornado in Japan should be taken into account.”</p> <ul style="list-style-type: none"> <li>Configuration of areas subject to tornado review is fundamentally based upon the results of surveys conducted of areas having similar meteorological conditions in areas where nuclear power stations are sited from the standpoint of tornadoes occurring,” (p. 9) and it cannot be distinguished which forms the basis either the largest tornado in Japan or the largest tornado in the area subject to review.</li> </ul>	<p><u>substituted for “areas subject to tornados review.”</u></p> <ul style="list-style-type: none"> <li>➢ Setting of area subject to tornado review <ul style="list-style-type: none"> <li>The area subject to tornado review is set for an area having similar meteorological conditions with the area where the nuclear power station is sited from the perspective of tornados occurring and the area where the nuclear power station is sited.</li> <li>Commentary 3.2. Setting of area subject to tornado review</li> <li>In setting the area subject to tornado review, IAEA standards (Reference 1) are referenced....Using this IAEA standard as a reference, the criterion for the area subject to tornado review is a range of 100,000km<sup>2</sup> with the nuclear power station at the center. However, Japan may have cases where meteorological conditions vary greatly over a relatively narrow range, such as the differing meteorological conditions along the Japan Sea and Pacific coast sides, so, notwithstanding a range of 100,000km<sup>2</sup>, the basis is to set the area subject to tornado review in accordance with the results of surveys of areas having similar meteorological conditions as the area where a nuclear power station is sited from the standpoint of tornados occurring.</li> </ul> </li> </ul>	<p>review” during the calculation of VB1, and <u>the maximum wind speed of the reference tornado VB being configured at 92m/s based on a tornado which previously occurred in Japan.</u></p> <ul style="list-style-type: none"> <li>At hearings, regulatory authorities have also repeatedly pointed out the basis for configuring areas subject to tornado review and the appropriateness of such an approach.</li> </ul> <p>[Issues with the examinations]</p> <ul style="list-style-type: none"> <li>With regard to “reading ‘Japan’ as ‘area subject to tornado review,’” while referencing the IAEA standards, in the commentary on setting areas subject to tornado review in the guide, the Japan Sea side (where tornados do not arise which are weaker than on the Pacific side) and the Pacific side are to be taken into consideration, but the Nuclear Regulation Authority has pointed out the appropriateness concerning “sufficiently reliable data” which will serve as the conditions prescribed by the maximum velocity of the reference tornado in the guide, and standards are not well defined for the following.</li> <li>- What are the conditions under which it is acceptable to read “Japan” as “area subject to tornado review”?</li> <li>- Treatment of such matters as to what extent it is necessary to be conservative at the time of the assessment and the methods for making determinations in situations where data does not coincide in countries such as Japan where there is a low frequency of tornados</li> </ul>	<p>assessing tornado load. No entries have been found on methods for configuring such areas.)</p>
6	[Non-combustibility and flame-retardancy of cables] The guidelines accept non-combustible materials and flame-retardant materials as substitutes only in cases where such have the same or better performance as non-combustible materials and flame-retardant materials do, but it is not clearly indicated what sort of specific requirements are meant by “having the same or better performance as	[Proposed examination criteria] Structures, systems and equipment, which have safety functions, are designed using noncombustible materials or flame-retardant materials as cited in each of the following items. However, in cases where the material of said structures, systems and equipment <u>has the same or better performance as non-combustible materials or flame-retardant materials</u> (hereinafter, “substitute materials”) or in cases where the use of substitute materials necessary for ensuring the function of said structures, systems and equipment is technically difficult, and when	[Proposed examination criteria] -	[Examination criteria] Structures, systems and equipment, which have safety functions, are designed using noncombustible materials or flame retardant materials as cited in each of the following items. However, in cases where the material of said structures, systems and equipment <u>has the same or better performance as noncombustible materials or flame retardant materials</u> (hereinafter, “substitute materials”) or in cases where the use of substitute materials necessary for ensuring the function of said structures, systems and equipment is technically difficult, and when	[Substitution of non-combustible and flame retardant cables] <ul style="list-style-type: none"> <li>At an inspection meeting for Japan Atomic Power Company’s Tokai Daini Power Station, the following items were raised as issues concerning <u>flame retardant cables to which fireproof paint has been applied.</u></li> <li>- ①Equivalent performance with flame-retardant cables</li> <li>- ②Physical properties with respect to work efficiency in construction and construction management</li> <li>- ③Durability</li> <li>- ④Adverse effects due to application of fireproof paint</li> <li>- ⑤Verification properties</li> </ul>	<p>⑬NS-G-1.3 Instrumentation and Control Systems Important to Safety in NPPs</p> <p>⑭NS-G-1.5 External Events Excluding Earthquakes in the Design of NPPs Safety management</p> <p>⑮NS-G-2.1 Fire Safety in the Operation of NPPs</p> <p>⑯NS-G-1.7 Original and</p>

No.	Item (issue)	Blueprint, regulatory and guideline proposals	Public comments	New regulatory requirements	Review results (situation)	Relevant IAEA guidelines, etc.
	non-combustible materials and flame-retardant materials.”	<p>measures have been adopted to prevent fires, which originate from a fire in said structures, systems or equipment, from arising in structures, systems and equipment having other safety functions, this stipulation does not apply.</p> <p>(3) Flame retardant cables Cables, which are used, have the “characteristics of being difficult to ignite by fire, not burning significantly, and not spreading the area of combustion when the heat source is removed, and these qualities are indicated by verification tests of flame spread characteristics and self-extinguishment.</p> <p>(Examples of verification tests)</p> <ul style="list-style-type: none"> <li>· Verification test for self-extinguishment: UL vertical flame test</li> <li>· Verification test for flame spread characteristics: IEEE383 or IEEE1202</li> </ul>		<p>measures have been adopted to prevent fires, which originate from a fire in said structure, system or equipment, from arising in structures, systems and equipment having other safety functions, this stipulation does not apply.</p> <p>(3) Flame-retardant cables Cables, which are used, have the “characteristics of being difficult to ignite by fire, not burning significantly, and not spreading the area of combustion when the heat source is removed, and these qualities are indicated by verification tests of flame spread characteristics and self-extinguishment.</p> <p>(Examples of verification tests)</p> <ul style="list-style-type: none"> <li>· Verification test for self-extinguishment: UL vertical flame test</li> <li>· Verification test for flame spread characteristics: IEEE383 or IEEE1202</li> </ul>	<ul style="list-style-type: none"> <li>· Members of the Nuclear Regulation Authority requested the Japan Atomic Power Company to explain in detail whether or not flame-retardant cables, which have been applied with fireproof paint, have performance equivalent to that of flame-retardant materials.</li> <li>· The Japan Atomic Power Company stated <u>that it is working to demonstrate equivalent performance with the results of IEEE Standard 383 flammability tests and UL vertical flame tests, which have been indicated as verification tests in the guidelines, and these are scheduled to be examined in the future.</u></li> <li>· On the other hand, examinations at Kansai Electric Power Company’s Takahama Units 1 and 2 have preceded first, and the policy was modified so that it was narrowed down to the application of fire-retardant sheets, which have higher work efficiency and better reliability for maintenance and management rather than fire-retardant paint. For the application of fire-retardant sheets, similar performance is indicated using the results of the UL vertical flame test, which is given as an example for verification tests in the guide, and the IEEE standard 383 flame tests (examination is currently underway).</li> <li>· Besides Tokai No. 2, the same issue is present at Takahama Units 1 and 2 and other plants prior to application of the fire protection policy enacted in 1980, and it will be necessary to focus on the state of examinations at Takahama Units 1 and 2 in the future. (A similar method is accepted in the United States.)</li> </ul>	<p>Japanese-language version Protection against Internal Fires and Explosions in the Design of NPPs</p> <p>REF (US) ⑩10CFR Appendix R to Part 50</p>

Reference 1: Excerpts from the Act for Establishment of the Nuclear Regulation Authority

Article 10

(3) A resolution of the Nuclear Regulation Authority shall be made by a majority of the attendants, and in the case of a tie, the Chairman shall make a decision.

Article 13 (1) The following committees shall be established under the Nuclear Regulation Authority:

Reactor Safety Examination Committee

Nuclear Fuel Safety Examination Committee.

Article 14 The Reactor Safety Examination Committee shall examine and discuss matters concerning the safety of reactors, when instructed by the Nuclear Regulation Authority.

Supplementary Provisions (Excerpts)

Article 5 With regard to government organizations having jurisdiction over affairs for ensuring safety in the use of nuclear energy, the government shall review them, within three years after the enforcement of this Act, including the possibility of establishing an Independent Regulatory Commission under the Cabinet Office, in order to make them better match international criteria, based on the status of the enforcement of this Act, the details of the report to be submitted by the National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission, and the latest international criteria, etc. for ensuring safety in the use of nuclear energy, and in light of the fact that the physical protection of radioactive materials and other matters for ensuring safety in the use of nuclear energy are closely related to the national security of Japan, and shall take necessary measures based on the results thereof

Article 6 (1) Considering that regulations for ensuring safety in the use of nuclear energy are urgently needed upon the occurrence of the accident at the nuclear power plant after the Great East Japan Earthquake, the government shall promptly take necessary measures concerning the

following and other necessary matters, with regard to the officials of the Secretariat of the Nuclear Regulation Authority, for the purpose of constantly securing excellent and highly-motivated personnel well-versed in international trends concerning such regulations:

- (i) To develop a remuneration system under which the acquisition of qualifications, etc. is taken into consideration and to otherwise improve the treatment of the officials in accordance with their duties and responsibilities that require specialized knowledge and experience;
  - (ii) To first ensure a sufficient number of positions available for new recruits, and to positively employ those with specialized knowledge and experience from domestic universities, research institutes, private business operators and the like, and at the same time positively employ those with specialized knowledge and experience from foreign universities, research institutes, private business operators and the like, in such manners as employing them as staff members who present their third-party opinions on the nuclear energy administration of Japan, in light of the importance of adopting the latest foreign knowledge on the ensuring of safety in the use of nuclear energy proactively;
  - (iii) To ensure opportunities for the officials to study abroad, to be dispatched to international organizations or government organs of foreign countries, or to work at diplomatic missions abroad, and to advance personnel exchanges with domestic and foreign universities and research institutes;
  - (iv) To establish training facilities for improving the officials' professional abilities, and to otherwise develop training systems;
  - (v) To ensure funds for expanding personnel or physical systems of the Nuclear Regulation Authority, including the means for ensuring new recruits and other personnel and fostering them, and to introduce a system to classify accounts.
- (2) From the viewpoint of ensuring the independence of regulations for ensuring safety in the use of nuclear energy, the officials of the Secretariat of the Nuclear Regulation Authority, including its executive personnel and other officials, may not be transferred to any government organizations that have jurisdiction over affairs concerning the promotion of the use of nuclear energy; provided, however, that this shall not apply in the case within five years after the enforcement of this Act where unavoidable grounds are

found in particular by taking into consideration motivation, competence, etc. of the relevant officials.

- (3) From the viewpoint of ensuring the independence of regulations for ensuring safety in the use of nuclear energy, the officials of the Secretariat of the Nuclear Regulation Authority shall be restricted from being reemployed in a manner that may bring about suspicion or distrust from the citizens with regard to the fairness of their duties.
- (4) In order to have the Nuclear Regulation Authority take over the business of the Japan Nuclear Energy Safety Organization, the government shall abolish the Japan Nuclear Energy Safety Organization as promptly as possible, and shall promptly take legal measures necessary therefor, such as placing officials of the Japan Nuclear Energy Safety Organization as relevant officials of the Secretariat of the Nuclear Regulation Authority.
- (5) In addition to the points prescribed in the preceding paragraph, the government shall review the structures and businesses of incorporated administrative agencies and other related organizations so that regulations for ensuring safety in the use of nuclear energy may be implemented in a more efficient and effective manner, and shall take necessary measures based on the results thereof.
- (6) The government shall review means to increase the effectiveness of the system for making an allegation under Article 66 paragraph (1) of the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors, and shall take necessary measures based on the results thereof.
- (7) Based on the fact that the Great East Japan Earthquake has caused tremendous damage, the government shall explore a fundamental overhaul of its structure to respond to large-scale disasters so that it would be able to make more flexible and effective responses to nuclear emergencies and other large-scale disasters, and shall take necessary measures based on the results thereof.
- (8) Based on the experience of the accident at the nuclear power plant after the Great East Japan Earthquake, the government shall promptly review how to disclose information on the relevant nuclear sites and disasters caused by the nuclear accident to local governments, and shall take necessary measures based on the results thereof, and at the same time, in light of the importance of developing closer cooperative systems among related parties, shall take measures for sharing information among the national government, local governments, residents, and the relevant

nuclear operators, as well as among the relevant administrative organs, and take other necessary measures.

- (9) Nuclear operators shall be deeply aware that they have the primary responsibility for ensuring the safety of their nuclear facilities and settling any accident, and shall endeavor to further formulate voluntary measures with the aim of developing a system for thorough crisis management for each of their nuclear facilities in order to prevent the occurrence of an accident at said facilities and the expansion of disasters in the event of an accident, in addition to the measures that are required under the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors and the provisions of other laws and regulations.

Article 97 With regard to the provisions revised under Articles 17 and 18 of the Supplementary Provisions<sup>3</sup>, the government shall review them promptly, while taking into account the status of their enforcement, and shall, when it finds it necessary, take necessary measures based on the results thereof.

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<sup>3</sup> Articles 17 and 18 of the Supplementary Provisions are revised as the Nuclear Regulation Act.

## Reference 2: Resolution of the House of Representatives

### Matters Concerning Establishment, etc. of the Nuclear Regulation Authority

In enforcing the Act for Establishment of the Nuclear Regulation Authority, the government should bear in mind the following matters and ensure such implementation.

1. In view of the fact that the purpose of this law is “to contribute to the protection of the lives, health, and property of the citizens, preservation of the environment, and national security of Japan,” the administration of nuclear power regulations shall first ensure the safety of the public without being affected by the logic of those promoting nuclear power.
2. With regard to the personnel affairs concerning employees of the Secretariat of the Nuclear Regulation Authority, in view of the fact that the no-return rule will be applied to all employees of administrative organizations having jurisdiction over affairs related to promoting the use of nuclear power from the standpoint of this law ensuring independence in regulations for ensuring safety in the use of nuclear power, personnel affairs shall be conducted in accordance with this purpose to the extent possible even within the first five years after this law takes effect.
3. In view of the fact that it is essential to ensure an integrated administration for nuclear safety regulations, the relevant administrative organs shall unite to work on consolidating the Japan Nuclear Energy Safety Organization and the incorporated administrative agency responsible for specialized technical affairs concerning nuclear safety regulations so that legal measures for such consolidation may be undertaken as promptly as possible. Also, in the transfer of employees, current salary levels will be ensured and, depending on the duties and responsibilities requiring specialized knowledge and experience, measures will be taken for developing a salary structure which takes into account the status of acquisition of qualifications and other certifications as well as for improving the treatment of employees.
4. In view of the importance of improving the abilities of employees with regard to nuclear safety, measures shall be implemented for engaging in personnel exchanges with universities and research institutes both inside and outside Japan

as well as international institutions, and for improving the system for training employees in order to ensure independence in nuclear safety regulations.

5. In view of the reflection that facilities serving as temporary response bases for emergencies, so-called off-site centers, did not function during the accident at Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station, off-site centers shall be established at locations which are at an appropriate distance from nuclear power facilities in order to guarantee effectiveness at the site during taking of nuclear emergency countermeasures. Also, at a location near the nuclear power facility that will not be affected by a nuclear accident, offsite centers will not be set up, but such centers shall be based at a location where means of transportation are well ordered allowing for those concerned to gather easily such as at a prefectural office and where communications may be easily secured for gathering information as well as communicating instructions, orders and information.
6. So as to ensure the safety of residents whose evacuation has been delayed during a nuclear accident, facilities shall be maintained enabling a primary evacuation to be conducted for protection against radiation.
7. In light of the lesson learned from the accident at Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station that preparation against disaster prevention during normal times is important for disaster prevention during an emergency, the Nuclear Emergency Preparedness Commission and Nuclear Regulation Authority shall construct a close collaborative relationship in normal times and work to integrate the emergency preparedness system.
8. With regard to the state of the Nuclear Emergency Preparedness Commission, its Director General and Secretariat which are under the Cabinet Office, while taking into account the direction of a fundamental review of the state of government organizations dedicated to responding during large-scale disasters including a nuclear emergency, such a reconsideration shall be undertaken along with a review of administrative organizations having jurisdiction over affairs related to ensuring safety in the use of nuclear power, which will be conducted no later than three years after enforcement of this act, and the necessary measures shall be adopted.

9. In order to maintain a close collaborative and cooperative structure between local governments and other community organizations made up of residents and other citizens, and the national government, nuclear power operators and the relevant administrative bodies, while taking into account examples found in other countries including the community information committee system prescribed by France's law concerning transparency in nuclear matters, the desirable structure for such a legal system shall be reviewed and the necessary measures promptly adopted.
10. In prescribing internal norms under Article 11-4, the Nuclear Regulation Authority shall establish regulations pertaining to the following points.
  - (i) With regard to donations from nuclear power operators and others for research by the Chairman or individual Commissioners as well as research offices affiliated with such, provisions to the effect that donators and the amount donated shall be made public not only during such tenure but also for the three years immediately preceding their appointment.
  - (ii) Provisions to the effect that the Chairman and Commissioners shall not receive donations from nuclear power operators or others during their tenure
  - (iii) With regard to employment with nuclear power operators by students whose academic research has been guided by persons who are appointed as the Chairman or Commissioners, provisions making public the name of such nuclear power operators and the number of people hired by each operator, etc.
11. With regard to affairs concerning investigations into the cause of nuclear accidents as conducted by the Nuclear Regulation Authority, reflecting on the fact that in the past nuclear accidents and problems have been covered up in the administration of nuclear energy, regardless of the scale of an accident or other such incident, all information shall be promptly disclosed to the public.
12. In new hiring of national government employees, consideration shall be given to ensuring a specific hiring quota so that sufficient personnel may be placed in the Secretariat of the Nuclear Regulation Authority.

The aforementioned is hereby resolved.

### Reference 3: Accompanying Resolution of the House of Councillors

#### Accompanying Resolution to the Bill for Establishment of the Nuclear Regulation Authority

June 20, 2012

Committee on the Environment

House of Councillors

In order to restore confidence in the administration of nuclear safety which lost its credibility due to the accident at Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station, the government needs to work as one to ensure safety in the use of nuclear power. Accordingly, the government shall sufficiently respect the purpose of this law establishing a nuclear safety regulatory agency as an independent administrative commission and shall ensure the following matters in such enforcement.

1. The government shall smoothly establish the Nuclear Regulation Authority, promptly proceed with the National Diet procedures and selection of personnel to serve as the Chairman and Commissioners so that the nuclear regulatory administration which protects people and the environment from any harmful impact from radiation is raised to international standards without further delay, and provide for an organizational composition reflecting such a view, and the government shall furnish special consideration so that sufficient resources are secured.
2. In appointing the Chairman and Commissioners of the Nuclear Regulation Authority, selection of such personnel shall proceed so that there is not an imbalance towards one field but specializations, experience and other attributes are sufficiently taken into account to select persons suitable to be responsible for safety regulations concerning nuclear power, and the reasons for selection of such personnel shall be sufficiently explained to the National Diet in obtaining the consent of the National Diet. On such occasion, information from the most recent three years concerning donations and other contributions from nuclear power operators and others as well as those to research offices affiliated with such persons shall be submitted along with the personnel proposal so as to contribute to deliberations in the National Diet.

3. The Chairman and Commissioners of the Nuclear Regulation Authority shall undergo training in a planned manner in order to be able to make use of their specialized knowledge and experience so that they may fulfill all their responsibilities including making decisions for ensuring the safety of nuclear power facilities when there is a nuclear accident. Also, in order not to avoid to the extent possible the application of Article 7-3 of this Act, the Chairman of the Nuclear Regulation Authority shall designate in advance the order of the four Commissioners who will perform the duties of the Chairman on his or her behalf in accordance with Article 6-3 of this Act.
4. The Nuclear Regulation Authority shall formulate the basic policy for its operations as well as an operational plan, and conduct annual assessments of such, and, particularly, shall attempt to adopt the PDCA cycle in its operations including the development and training of specialized abilities in its employees as well as ensuring other such reliable implementation, and these matters and a report on its operations shall be given to the National Diet, which shall be audited by the National Diet, and then shall be made public. Also, when reporting such matters to the National Diet, in light of the fact that the Nuclear Regulation Authority will also provide findings related to disaster prevention countermeasures, the opinion of the Prime Minister who serves as Chairman of the Nuclear Emergency Preparedness Commission shall be appended so as to contribute to his or her monitoring role.
5. The Nuclear Regulation Authority, in addition to organizations promoting nuclear energy, shall ensure transparency by preparing rules pertaining to contact with concerned businesses and other outside parties in order to ensure independence and neutrality. Also, the Nuclear Regulation Authority shall promptly prescribe matters related to agreements, general principles and discipline concerning issues necessary for obtaining the trust of the public as well as appropriate administration in ensuring the constant performance of accountability in neutrality, independence, openness, and preventing conflicts of interest, and these shall be made public.
6. Application of the no-return rule to all employees shall be managed appropriately so as not to impair the desire, aptitude and other capabilities of employees, and consideration shall be given so that it is able to lead to securing and developing personnel.

7. Because the Nuclear Regulation Authority has the singular responsibility for making determinations concerning nuclear safety regulations, the Reactor Safety Examination Committee and Nuclear Fuel Safety Examination Committee, which are under the Nuclear Regulation Authority, shall not be a substitute for decisions by the Nuclear Regulation Authority, but shall be limited to providing objective advice for such decisions under the administration of a council that ensures transparency including public disclosure of meetings and minutes.
8. Along with maintaining the secrecy of safeguards pertaining to nuclear security and nuclear nonproliferation, the Nuclear Regulation Authority shall fairly establish a system for preserving and managing documents and other information in order to ensure the openness of information to the maximum extent, and shall formulate and make public guidelines concerning matters to be kept secret as well as matters which may not be disclosed to the public. Also, when a request has been presented for disclosure of information in accordance with the Act on Access to Information, the Nuclear Regulation Authority shall give particular consideration to an extent greater than ordinary administrative bodies such that the pieces of information that are not disclosed are minimized to the greatest extent in accordance with the proper guidelines.
9. The Nuclear Regulation Authority shall take the necessary measures including establishing an assessment body concerning the affairs over which the Nuclear Regulation Authority has jurisdiction in order to free itself from the myth of safety, shall put a high value on minority views and dissenting opinions as well as a safety culture seeking continuing improvements in safety, and shall ensure the appropriate implementation of its operations while ensuring an organizational culture that encourages an active dialogue.
10. The division of roles and relationship between the Nuclear Regulation Authority and nuclear emergency response headquarters shall be sufficiently reviewed and top priority placed on protecting the lives and health of citizens and preserving the environment so that no new harmful influences of sectionalism arise. Also, because it is important to enhance disaster prevention countermeasures during normal times, the Nuclear Regulation Authority and the Nuclear Emergency Preparedness Commission shall construct a close cooperative relationship in normal times to unify the disaster prevention structure under a clear division of roles and responsibilities for each respective organization.

11. The government shall endeavor to respectfully explain to the citizens that the purpose prescribing a contribution to Japan's security is one of the purposes for ensuring safety in nuclear energy under Article 1 of this Act and Article 2 of the Atomic Energy Basic Act which is revised along with the revision in this Act was added from the perspective of the Nuclear Regulation Authority having centralized responsibility for operations pertaining to nuclear safety regulations, nuclear security and nuclear nonproliferation safeguards in accordance with the revisions under this Act, and that it does not overturn the principle of nuclear nonproliferation nor Japan's three non-nuclear principles.
12. In view of the importance of the public's understanding of issues concerning nuclear safety, the Nuclear Regulation Authority shall take into account that previously used words made it difficult for the public to achieve an understanding, and shall reform its wording.
13. The government shall sufficiently regulate and supervise the management and operation of the accident site at Tokyo Electric Power Company's Fukushima nuclear power stations, including the rigorous centralized management of exposure received by workers from the standpoint of protecting the public and the environment.
14. With regard to international standards concerning the health impacts of radiation, the standards of the International Commission on Radiological Protection (ICRP) and the European Committee on Radiation Risk (ECRR) shall also be sufficiently verified and put to use in policies. Also, such knowledge shall be made use of in reviewing efforts including risk communication with the participation of residents.
15. Affairs concerning nuclear nonproliferation safeguards and radiation protection as well as functions concerning the implementation of monitoring shall be transferred from the Ministry of Education, Culture, Sports, Science and Technology to the Nuclear Regulation Authority, and, following this centralization, the Nuclear Regulation Authority shall deploy employees to diplomatic missions abroad to be responsible for such matters so as to ensure the effective implementation of such operations.

16. The Nuclear Regulation Authority shall launch an investigation and research framework for issues concerning nuclear safety regulations, shall construct a system for such operation so that the most recent knowledge is always able to be assembled including the verification of past earthquakes and tsunamis, and these results shall be reflected in safety regulations. Also, in view of the fact that the Nuclear Regulation Authority is an organization responsible for matters related to the implementation of assurances concerning nuclear safety, the Nuclear Regulation Authority shall also be responsible for the safety of the overall use of nuclear power, including issues pertaining to the reprocessing of nuclear fuel.
17. In cases where the Nuclear Regulation Authority investigates nuclear accidents, the Nuclear Regulation Authority shall reflect on the fact that in the past, nuclear accidents and problems have been covered up in the administration of nuclear energy, and shall promptly disclose all information publicly. Also, the Nuclear Regulation Authority shall reassess the employee reporting system pursuant to the Nuclear Regulation Act to make it more effective.
18. With regard to the restarting of nuclear power stations, in light of the objective that “it will always be assumed that an accident may occur and the utmost and maximum effort must be given to prevent such a recurrence,” the Nuclear Regulation Authority shall sufficiently verify the appropriateness of stress tests and decision-making criteria for safety through the four ministers meeting, including measures for responding when a major accident occurs, and shall proceed with such procedures.
19. The roles and responsibility of implementing organizations and support organizations to reliably implement disaster prevention countermeasures shall be clarified in laws, regulations, basic disaster prevention plans, regional disaster prevention plans, manuals and other such documents, and the personnel necessary for such shall be sufficiently secured.
- Also, a system shall be reviewed for confirming the appropriateness and feasibility of such.
- In addition, a framework shall be reviewed that meets the needs of residents and others, including the distribution of stable iodine tablets as part of the formulation of regional disaster prevention plans.

20. Because the amount of time during which an accident and a nuclear power station have an impact on the surrounding environment, as well as the extent of such impact, varies depending on aspects of the abnormal circumstances, the characteristics of the facility, meteorological conditions and other factors, target areas for disaster prevention countermeasures shall be studied in detail for each nuclear power station and made use of in cooperating with local governments to formulate regional disaster prevention plans and other such schemes.
21. In view of the importance of demonstrating flexible crisis response capabilities and responding at the time of a nuclear accident, the disaster prevention training conducted by nuclear power operators shall be conducted by setting stringent conditions, including the occurrence of major accidents as well as surprise training sessions and blind training sessions incorporating unforeseen events, to ensure the effectiveness of such training.
22. In introducing severe accident countermeasures and backfitting, the world's highest level of regulations shall be introduced as the government has declared without being influenced by the intentions of proponents of nuclear energy. Also, because close to half of the existing reactors have been operating for 30 years, the system restricting the operating life of commercial power reactors to 40 years shall be made compatible with existing measures to address aging, and measures shall be consolidated immediately as a nation for the decommissioning of reactors, which are estimated to increase, as to how such reactor facilities and nuclear fuel material will be disposed of.
23. A review shall promptly be conducted to reassess the Nuclear Regulation Act revised in accordance with the Supplementary Provisions to this Act, and, to improve the effectiveness of nuclear safety regulations, a regulatory system shall be put in place that is consistent with international standards and trends and is based on the most recent scientific and technical knowledge. In particular, referencing cases in other countries, the Nuclear Regulation Authority shall conduct a rigorous and effective verification of the examination and inspection system so that such shall not become a pro forma affair, and a regulatory system shall be constructed so that operators must continually improve their facilities.
24. The government shall take into account the massive damage that occurred on account of the Great East Japan Earthquake, and shall conduct a fundamental reassessment, referencing the United States Federal Emergency Management

Agency (FEMA), of the state of government organizations focused on responding to large-scale disasters so that a dynamic and effective response may be meted to a large-scale disaster including a nuclear accident, and the necessary measures shall be adopted based on such results.

25. Examples from other countries shall be referenced in reviewing modes for securing independent revenue sources for the budget of the Nuclear Regulation Authority from the standpoint of ensuring independence.
26. Taking into account the nuclear safety agreements that have been concluded between local governments and operators as well as in view of the importance of the role of local governments in safety regulations and disaster response measures concerning nuclear power, no later than one year after enforcement of this Act, a close collaborative and cooperative system shall be developed among local governments, the national government and operators, and, no later than three years after enforcement of this Act, a review shall be conducted, referencing examples in other countries, that shall include the way in which a desirable legal framework should be structured and the necessary measures for such adopted.
27. The report of the National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission shall be sufficiently studied not only with regard to nuclear safety regulatory organizations, but also safety measures and disaster response measures concerning nuclear power, and the necessary measures shall be adopted promptly, notwithstanding the three-year period after enforcement of this Act.
28. A deep remorse for the accident at Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station shall be etched into the government's memory, and, on March 11 of each year, a general inspection of safety at nuclear power stations nationwide, a confirmation of the nuclear disaster prevention system and public announcements by the government of efforts related to nuclear regulations shall be made, and the opportunity will serve to reassess our own efforts so that a major accident does not occur again.

The aforementioned is hereby resolved.

Reference 4: Recommendations of the National Diet Fukushima Nuclear Accident Independent Investigation Commission Concerning Matters Related to the State of Organizations and Organizational Administration

Recommendation 1: Monitoring of the nuclear regulatory authorities by the Diet

A permanent committee to deal with issues regarding nuclear power should be established within the Diet in order to supervise the nuclear regulatory authorities and to secure the health and safety of the public. This committee:

1. Should regularly conduct explanatory hearings with the regulatory authorities, opinion hearings of stakeholders or academics, and other investigations,
2. Should establish an advisory body that is independent of any nuclear operators and administration organs, and consists of experts with global perspectives, in order for them to be able to deal with safety issues utilizing the latest knowledge in the field,
3. Should conduct continuous monitoring activities regarding whether the problems found through this accident investigation are addressed or mitigated (see attached for matters that require continuous monitoring by the Diet), and
4. Should monitor the implementation by the future government of the recommendations in this accident investigation report and request regular reports on such activities.

Recommendation 2: Reform of the governmental crisis management system

A fundamental re-examination of the systems relevant to the government's crisis management system should be made, including the clarification of the roles and responsibilities of the government, local government and operators in emergency.

1. A re-examination of the crisis management system of the government should be conducted. A structure with enforcement capabilities and a system with a consolidated chain of command to deal with emergency situations should be established.
2. Setting public health and safety as the priority, national and local governments must bear responsibility for the response to the release of radiation outside of nuclear power plants and act according to the division of roles assigned under the government's crisis management function.
3. The operator should be given the primary responsibility for on-site accident response, including the discontinuation of operations, reactor cooling and containment, in order to prevent haphazard instructions/intervention by politicians.

#### Recommendation 5: Criteria for new regulatory bodies

In the wake of this accident, regulatory organizations should fundamentally transform themselves to become equipped with continuous self-reform mechanisms toward enhanced safety, with considerations for the health and safety of the public as top priority. The new regulatory organizations must adhere to the following conditions.

1. High independence: Regulatory agencies should establish a chain of command, responsibilities and authorities, and work processes to strengthen supervising functions, realizing (i) independence from promotional organizations within the government, (ii) independence from nuclear operators, and (iii) independence from politics.
2. Transparency: (i) Decision-making processes, including those at any advisory committees, should be disclosed, and the involvement of stakeholders such as electric power operators should be precluded from these processes. (ii) The new regulatory organizations should be required to report to the Diet the entirety of their decision-making processes, including all participants as well as the implementation status of measures. (iii) The organizations should keep minutes of negotiations with promotional organizations, operators and politicians, and in principle disclose them to the public. (iv) Transparency in the process of selecting committee members should be secured. A third party should make the first sizable selection of candidates, from which the Diet shall make the final selection.
3. Professional capabilities and sense of responsibilities for duties: (i) The quality of personnel in the new regulatory organizations should be improved to meet global standards, and thus personnel exchange programs with overseas regulatory authorities as well as educational and training programs regarding nuclear regulation should be carried out so as to realize employment and fostering of such talent. (ii) An advisory organization that includes foreign experts should be established to give advice for setting necessary criteria for such matters as the operation of regulatory authorities, personnel and positioning, etc. (iii) A no-return rule should be applied without exception, so that a sense of responsibility as members of the new organizations shall be shared among core personnel.
4. Consolidation: The effective consolidation of organizational systems should be sought, toward swift information sharing, decision-making and exertion of control functions, among others.
5. Autonomy: Those organizations will be required to keep up with the latest knowledge and technology and undergo continuous organizational reform and voluntary changes, for the purpose of protecting public health and safety. The Diet shall monitor this process.

#### Recommendation 6: Reforming laws and regulations related to nuclear energy

Laws and regulations concerning the regulation of nuclear power should be thoroughly revised, with directions including the following:

1. Existing laws should be restructured into an integrated legal framework, with top priority placed on the health and safety of the public and in reflection of the latest technical knowledge in the world.
2. The roles of the nuclear operators bearing the primary responsibility for securing safety as well as those of all other parties to carry out accident responses in support of the nuclear operators at the time of a nuclear disaster, should be clearly defined.
3. In order for the nuclear laws and regulations to reflect the lessons from both domestic and international nuclear accidents, global safety standard trends, and the latest technological knowledge, regular and timely reviews should be required of the regulatory authorities and a monitoring mechanism on such a review process should also be constructed.
4. Retroactive application of new rules to existing reactors (“backfit”) should be made into a principle. Criteria should be set to determine whether reactors should be decommissioned or a second-best measure should be allowed, in order to prevent the principle from suppression of rule updating, which would be irrational.

#### Recommendation 7: Utilization of an independent investigation committee

A Special Investigation Committee on Nuclear Power (tentatively named) should be established in the Diet as a third party organization. It should be composed of experts mostly from the private sector and independent of the nuclear power operators and administrative organs so that the Committee investigates and discusses important themes that influence public livelihood, such as the investigation into the unexplained causes of the accident, the process towards the stabilization of the accident, the prevention of damage escalation, matters not discussed this time including the decommissioning process of reactors, and spent fuel issues. In addition, there should be a mechanism through which the Diet can create such independent investigation committees for different themes, and investigation and examinations should be continuously carried out, uninhibited by conventional ideas.

