

## An Approach of Financial Stability for Enhancement of Regulatory Independence

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### 1. Introduction

In order to use nuclear power as a sustainable electrical power resource, it is necessary to secure institutional policies and systems that can ensure the safety of nuclear power plants. On the other hand, in accordance with the changes in the NPP policy of the new government, separation of regulations and promotion is needed. To this end, it is necessary to find ways to enhance social acceptance through securing the independence of regulatory financial resources and accounting process.

The International Atomic Energy Agency (IAEA) has stated in the Nuclear Safety Convention (Article 8, 35) and IAEA Nuclear Safety Standards Article 2 (2) 36 that the regulatory authority must be established and operated to be independent of the organization or organization responsible for its activities and facilities. In order to achieve these goals, the budget for nuclear regulation and control should be managed independently from the Nuclear Energy Fund, which is a resource of promotion, to protect the people and the environment from the risks accompanied with the use of nuclear energy. In addition, it is necessary to comply with the principle of separation of regulations and promotion by reviewing the inclusion of the budget for nuclear safety R&D, which is the budget of the regulatory authority, on the budget allocation and coordination of national R&D projects of the Ministry of Science and ICT.

In addition, in order that the Nuclear Safety and Security Commission (NSSC) timely establishes the budget to secure the necessary resources for the regulation, it will be necessary the budget formulation and deliberation process of the NSSC will be independence for stably implementing and managing multi-year projects. To secure autonomy, it is necessary for the NSSC to be recognized as an independent institution under the National Financial Law and Science and Technology Basic Law.

Hence, this study proposed approaches, which could secure regulatory independence and enhancement the independence of financial resources and accounting process through the fundamental separation of

regulation and promotion in accordance with the changes in the nuclear policy environment of the government. .

### 2. Policy and recommendation for Independence of Nuclear Regulatory Authorities

#### 2.1 Safety Requirements of the IAEA

The Nuclear Energy Promotion and Regulatory Separation issue was discussed in the IAEA Nuclear Safety Convention (Article 8, Article 35) and IAEA Nuclear Safety Standard GSR Part 1, Government, Legal and Regulatory Framework for Safety requires that the government shall ensure that the regulatory body is effectively independent in its safety-related decision making and that it has functional separation from entities having responsibilities or interests that could unduly influence its decision making.

#### 2.2 Safety Recommendations of the IAEA

IAEA safety standards (GS-G-1.1, 2002) address the establishment of regulatory bodies and the separation or independence of nuclear technology from promoters. The primary reason for this independence is to confirm that regulatory judgments and enforcement actions can be made without pressure from profits that may conflict with safety. Furthermore, the public's credibility with regulatory agencies is largely dependent on whether the regulator is considered independent of the regulatory organization and of the governmental organizations or industries that promote nuclear technology.

In paragraph 2.8 on financial aspects, the regulatory body shall be provided with adequate authority and power, and it shall be ensured that it has adequate staffing and financial resources to discharge its assigned responsibilities. While it is recognized that the regulatory body is in principle subject to the same financial controls as the rest of government, the budget of the regulatory body should not be subject to review and approval by government agencies responsible for exploiting or promoting the development of nuclear technologies.

### **3. Nuclear Safety Regulatory and Finance System in Major Countries of the World**

#### *3.1 Nuclear Regulatory Commission of USA (NRC)*

The United States of America constructs cooperative system consists of various organizations such as the NRC, which is a presidential agency, and the federal administrative department and the state government. The workforce and budget of the NRC, as an independent agency responsible for nuclear safety regulations, need an approval from Congress.

In order to separate between the nuclear safety and promotion and the nuclear safety regulation financially, the Nuclear Power Safety Act was amended to remove independence from the Nuclear Energy Fund in the Nuclear Energy Promotion Act (Article 18 and 19) to establish provisions on "Installation of Nuclear Safety Fund and Management and Operation of Funds".

The NRC operates the system in such a way that 90% of the budget is returned to the National Assembly by collecting the service fee and annual fee from nuclear industry, nuclear fuel, etc. in accordance with 10 CFR Part 170 (Service Fee) and 10 CFR Part 171 (Annual Fee).

#### *3.2 Japan Nuclear Regulatory Authority (NRA)*

Nuclear Regulation and Promotion Agency in Japan is a coexistence system within an organization. Nuclear Safety Commission (NSC) and Nuclear Regulatory Agency (NRA), which is an independent organization for nuclear safety management integrates all Nuclear Safety Regulatory Affairs.

The budget of the Nuclear Regulatory Authority (NRA) consists of three types: general account, special measures for energy measures (power development promotion account), and East Japan great earthquake disaster revival special account. The NRA shall be clearly distinguished by a special accounting account or general account which is made up of all the details of the business in the form of contributions. For all projects related to the nuclear safety assurance project, the entire energy special account shall be financed. In the case of other businesses, the energy special accounts and general accounts, the East Japan great earthquake disaster revival special accounts are financed.

#### *3.3 French Nuclear Safety Authority (Autorite de Surete Nucleaire, ASN)*

The nuclear safety regulatory agencies in France are the Secretariat General for Defense and SGDSN, the French National Security and Safety Agency (HFDS) and the Nuclear Safety Commission.

Regulatory resources in France consist of nuclear safety and nuclear security, with nuclear safety at 92% and nuclear security at around 8%. All resources for nuclear

safety are collected from stakeholders related with nuclear power. While a budget for ASN is composed of BNI TAX (Nuclear Cooperative Investor Charge), the budget for Nuclear Safety Radiation Protection Institute (IRSN) is composed of ASN funding, but additional funding is available from the research fund and ASN as well.

#### *3.4 Canadian Nuclear Safety Commission (CNSC)*

Canada's major nuclear safety regulatory body is the Nuclear Safety Commission, an award-winning organization and an independent organization, and a single organization that performs nuclear safety regulations, nuclear security and nuclear nonproliferation.

The budget for Canadian Nuclear Safety Commission (CNSC) is comprised of 28% of general account and 72% of nuclear-related operators (nuclear operators, nuclear operators, material users, transportation, dosimetry, etc.). Dues are collected by dividing the charge collection system into License Fee, Formula Fee and Fixed Fee according to the characteristics of the facilities to be imposed. Similar with the NRC in the USA, the CNSC prepares the necessary budget through the budget prepared by the government and returns the used government fund to the government.

#### *3.5 Germany*

The German nuclear administration is largely divided into the realm of the federal government under the Federal Atomic Energy Act and the realm of the Land government as a representative of the federal government. The Bundesamt fur Wirtschaft und Ausfuhrkontrolle (BAFA) is responsible for the import and export of nuclear fuel, and the Bundesamt für Strahlenschutz (BfS) is responsible for the transportation, storage, construction and operation of the final facility of nuclear waste. The licensing of nuclear facilities is entrusted by the federal government.

Financial means are supported from the Bundestag and the budget of each state assembly. Applicants and licensors of nuclear facilities are required to pay a fee from the provincial government for the cost of licensing and regulatory projects according to German federal law, federal regulators cannot impose fees directly on reactor operators. Therefore, the contribution is paid by the licensee U to the Treasury of the site. In the case of construction and operation permits for nuclear power plants, a change of 2/10 (20%) of construction costs and a license fee of 500 euros to 100 million euros. Regulatory costs are billed at actual costs, typically between 25 euros and 500,000 euros. In addition, the BMU receives approximately € 23 million annually from the federal budget for research related to nuclear safety, including assessment and evaluation of operational experience, safety issues research,

development of technical requirements for nuclear facilities, consultative activities and international cooperation including the cost of specialist support. It also takes about 8 million Euros for a year to study radiation protection.

### 3.6 United Kingdom

In the UK, the Nuclear Regulation is established by the Office for Nuclear Regulation (ONR), an independent regulator regulating the nuclear power generation business, in February 2011 as a ministerial statement.

In April 2011, the Fukushima Nuclear Power Plant accident requested to strengthen the effectiveness of nuclear power regulation, so it was decided to establish a legal independent regulatory agency securing safety regulatory independence, transparency, and expertise, such as promoting the ONR private corporation.

The Office for Nuclear Regulation (ONR) is funding the budget through contributions in accordance with the Energy Act of 2013 (94% of the total budget), as well as non-taxable activities such as safety and transportation inspection (The Department of Work and Pensions (DWP) (6% of the total budget)).

## 4. Current Nuclear Safety Regulatory Finance System

Financing provisions of Nuclear Safety Regulation are stated in Articles 17 and 18 of the Nuclear Energy Promotion Act, which provide funding for nuclear safety regulatory accounts in the Nuclear Energy Fund. The detailed provisions of the Nuclear Energy Promotion Act and Nuclear Safety Act are as follows.

### (1) Provisions related to safety regulation in "Nuclear Promotion Act"

#### *Article 18 (Management and Operation of Funds)*

Nuclear R & D accounts are managed by the Minister of Science, Technology and Information. Nuclear safety regulation accounts are managed and operated by Nuclear Safety Commission. However, if it is deemed necessary by the management and operating entity of the account, it may delegate or entrust affairs related to the management and operation of the fund to the related organization or organization as prescribed by the Presidential Decree.

#### *Article 19 (Use of Funds)*

Nuclear R & D accounts shall be used for the projects listed below, and Nuclear Regulatory Accounts shall be used in accordance with Article 111-4 of the Nuclear Energy Promotion Act.

### ① Nuclear Research and Development Project

② Research and development equipment and equipment support business necessary for nuclear research and development

③ Nuclear-related personnel training

④ Other projects related to nuclear energy research and development projects set by Presidential Decree

The Minister of Science, and ICT may contribute the cost to the organizations performing the business of any of the items under Paragraph 1 above.

### (2) Safety Regulations in Nuclear Safety Act

#### *Article 111-4 (Resources and Use of Nuclear Safety Regulation Account in Nuclear Energy Fund)*

The financial resources of the nuclear safety regulation account pursuant to Article 17 (2) of the "Nuclear Energy Promotion Act" are as follows.

### (3) Nuclear safety regulation financial system

The financial development of the Nuclear Safety Regulations requires that the provisions of Article 1 of the "Nuclear Safety Act" stipulate the matters relating to safety management in accordance with the research, development, production, and use of nuclear energy, "For this purpose, in accordance with Article 17 of the "Nuclear Energy Promotion Act ", a safety regulatory account in the Nuclear Safety Fund is established and funds are created pursuant to Paragraph 1 of Article 111-4 of the Nuclear Safety Act necessary for nuclear safety regulation.

### (4) Budget Process

In the national budget process of Korea, each department submits a medium-term business plan to the Ministry of Strategy and Finance until end of March. At the end of April, the Ministry of Strategy and Finance disseminates the budget preparation guidelines and preparation guidelines of fund management plan to each department and the Budget Deliberation and Decision Committee of the National Assembly.

At the end of June, based on the guidelines for preparing the budget and the fund management plan and the expenditure ceiling, the Ministries will send the budget request to the Ministry of Strategy and Finance, and after concluding the national fiscal management plan, budget assessment, approval by the President after consultation and deliberation by the National Assembly as a state council.

## 5. Nuclear Safety Regulatory Resources and Operating System Independence Strengthening Plan

### (1) Improvement of Nuclear Safety Regulation Resources and Operation

For securing independence of safety regulation resources, it is necessary to separately finance the nuclear safety related-budget for nuclear power regulation and supervision from the Ministry of Science, Technology and Information, which is the promoting agency. In other words, it is necessary to separate regulatory and supervisory resources from the nuclear energy promotion fund to protect the people and the environment from the risks associated with the use of nuclear energy. In addition, it is necessary to secure the necessary resources for regulation in a timely manner by securing autonomy and independence in the process of organizing and deliberating the Nuclear Safety and Security Commission's budget and reviewing measures to ensure stable implementation and management of multi-year projects. To this end, it is necessary to revise the major relevant laws and regulations such as the National Financial Law, the Basic Law on Science and Technology, the Nuclear Safety Act, and the Nuclear Energy Promotion Act.

For the independence of nuclear regulatory finances, it is necessary to revise Articles 18 and 19 of the Nuclear Energy Promotion Act, which is related to the Nuclear Energy Fund.

(2) Amendment of Nuclear Safety Act according to Special Accounting Act

According to Article 4 (Accounting Division) of the National Finance Act, "special accounts are separated from general accounts by operating certain businesses in the country, holding certain funds and operating them, and other specific revenues to cover certain expenditures. And when necessary, install it by law." According to Article 9 of the Budget Accounting Act, "special accounts are required to be separated from general accounting by operating certain businesses in the country, holding certain funds and operating them, or financing specific expenditures with specific revenues. It is prescribed by law." Article 7 of the Budget Accounting Act stipulates that "the State may establish special funds as a law only when it is necessary to operate certain funds for a specific purpose," so that the purpose of the establishment of the Fund and the purpose of the special accounting are substantially similar. Therefore, special accounts have a lot of room for discretion and resilience in terms of purposefulness in the process of execution of income and expenditure.

In order to enact a special accounting law, the Nuclear Energy Regulations of the Nuclear Energy Fund under Articles 18 and 19 of the Nuclear Energy Promotion Act are separated independently.

(3) Stable operation plan of financial resources

In the provisions of Articles 4 and 5 of the National Finance Act, the independence of safety regulation

projects can be ensured because the purposes of setting up funds and special accounts are similar, so that the autonomy and flexibility of financial management can be enhanced by special accounting on behalf of the fund.

In order to operate the Nuclear Regulatory Finance as a special account, the new Law on the Establishment of the "Special Law on the Safety Management of Nuclear Facilities" (tentative name) should be reflected in Appendix 1. Prior to this, in accordance with Article 14 of the National Finance Act, a plan for the creation of a special account shall be prepared and submitted to the Minister of Strategy and Finance, and a request for examination of the feasibility of the creation of the special account shall be made.

(4) Nuclear Safety Regulation Financial Independence Plan

*(a) Amendment of the Science and Technology Basic Law for reflecting financial and contracting system for multi-year project*

In Article 12-2 of the Basic Law of Science and Technology (allocation and coordination of national R & D budget), the head of the central administrative agency related to the national R&D project shall submit comments on investment priorities of the national R&D to the Ministry of Strategy and Finance and the Ministry of Science and ICT, by March 31. However, among the mid-term business plans and budget requests related to national research and development projects in the defense sector, the Ministry of National Defense, an exception is stipulated to not submit a request. This is based on the provisions of the "Continuous Expense" and "Continuous Expense and Long Term Contract" provisions of the State Finance Act such as the difference between the total amount of expenses and the amount. The amount of R & D expenditure can be spent over a multi-year period within the scope of obtaining the resolution of the National Assembly in advance, so that safety regulation and research and development activities can be carried out.

Safety regulation technology R & D budget allocation, coordination, and evaluation of the budget National security regulation as prescribed by Presidential Decree prescribed in Article 21 of the Fundamental Law of Science and Technology, so as not to be disturbed by the administrative agency as stipulated by National Research and Development Article 12 (Survey, Analysis and Evaluation of the National Research and Development Project). Article 2 of the "Law on the Safety Management of Nuclear Facilities is added to the Project and Article 21 of the Enforcement Decree of the Basic Law of Science and Technology states the Nuclear Regulatory Development Project, which requires professional and technical judgment as a project to be carried out for safety management, shall be

revised to prevent investigation and account of Nuclear Safety Regulation Research and Development budget.

*(b) Amendment of the Nuclear Energy Promotion Act*

In order to achieve the purpose of nuclear safety management specified in Article 1 of the Nuclear Safety Act (Article 17 (Establishment of the Nuclear Energy Fund) of the Nuclear Energy Promotion Act), the Nuclear Safety Regulation Research and Development Account was established. As a result of changes to the collection of committees, the "Nuclear Safety Regulatory Account" is deleted from Article 18 (Management and Operation of Funds) of the Nuclear Energy Promotion Act.

However, the cost of nuclear safety regulation research and development projects shall be transferred from the Nuclear Energy Fund according to Article 19 (use of funds).

*(c) Amendments to the Nuclear Safety Law taking into consideration the establishment of the "(tentative name) Nuclear Safety Fund"*

Nuclear Safety Regulation Research and Development Account was deleted from Article 17 (Installation of Nuclear Energy Fund) of the Nuclear Energy Promotion Act to promote the financial separation of promotion and regulation in the Nuclear Energy Fund, and the "Nuclear Safety Fund Establishment" and "Nuclear Safety Fund Management and Operation" were newly added or revised.

*(d) Legislation of the Special Account for Safety Management of Nuclear Facilities*

The fact that the budget for safety management activities for nuclear facilities is deliberated and organized by a specific government organization may weaken the independence of the nuclear regulatory organization and the government budget may not appropriately allocate the budget necessary for nuclear energy regulation. Therefore, the IAEA recommends that a special accounting law be enacted so as to ensure that the contributions and capital management income are financed and separately operated for financial independence.

*(e) Amendment of Nuclear Safety Law*

As the Nuclear Energy Fund has removed the Nuclear Safety Regulation Research and Development Account from Article 17 (Establishment of Nuclear Energy Fund) of the Nuclear Energy Promotion Act for the financial independence of promotion and regulation, it shall amend the relevant provisions of Nuclear Safety Act.

## 6. Summary and Conclusion

In order to use nuclear power as a sustainable power source, it is necessary to secure an institutional device

and system that can secure the safety of the nuclear power plant. In addition, according to the changes in the NPP policy of the new government, it is necessary to separate the budgets for the regulations and promotion. To achieve this, it is necessary to find ways to increase the social acceptance through securing the independence of the regulated business resources.

Therefore, the Nuclear Safety Budget for Nuclear Regulation and Supervision should be managed independently from the Nuclear Energy Fund, which is a source of promotion, to protect the people and the environment from the risks accompanied with the use of nuclear energy. In addition, it is necessary to comply with the principle of separation of regulations and promotion by reviewing the inclusion of the budget for nuclear safety R&D, which is the budget of the regulatory agency, on the budget allocation and coordination of national R&D projects of the Ministry of Science and ICT.

The International Atomic Energy Agency (IAEA) has stated in the Nuclear Safety Convention (Article 8, 35) and Nuclear Safety Standards Article 2.2.36 that the regulatory organization must be established and operated to be independent of the organization or institution responsible for its promotions, facilities, and activities.

Nevertheless, the nuclear safety regulatory activities are funded by Article 17 of the Nuclear Energy Promotion Act. Therefore, the operational costs and expenses of the nuclear regulatory agencies should be controlled by the law related to the promotion of nuclear energy, so that it is inadequate to fully meet the regulatory independence requirements of the IAEA Recommendations.

In order to achieve regulatory independence, it is necessary to secure measures, which ensure that the necessary resources for regulation can be secured in a timely manner by securing independence in the process of formulating and reviewing the NSSC budget and stably implementing and managing multi-year projects. To this end, it is required to revise major alternative laws such as the National Financial Law and the Basic Law of Science and Technology, or to suggest alternatives.

In this study, some approaches for securing regulatory independence and financial stability are proposed as followings;

- Amendment of relevant laws such as the National Finance Law, the National Science and Technology Law, the Nuclear Energy Promotion Act, and the Nuclear Safety Act
- Establishment of the Nuclear Safety Fund or the Special Plan for the Safety Management of Nuclear Facilities as supplementary.

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## REFERENCES

- [1] IAEA, “Safety Standards Series No SF-1, Fundamental Safety Principles”, IAEA, 2006
- [2] IAEA, “Safety Standard Series No GSR Part 1, Governmental, Legal and Regulatory Framework for Safety”, IAEA, 2010
- [3] IAEA, “Safety Standard Series No GS-G-1.1”, IAEA, 2002
- [4] IAEA, “Convention on the Physical Protection of Nuclear Material and Nuclear Facilities”, IAEA, 2005
- [5] Jung Hoon et al., "Analysis of Regulatory Framework for Nuclear Regulation in Nuclear Safety Regulations", Nuclear Safety and Security Commission, 2015
- [6] "National Finance Law" (enforcement June 21, 2017)
- [7] "Nuclear Power Promotion Act" (Law No. 14839)
- [8] "Nuclear Safety Act" (Law No. 14839)
- [9] “Basic Law on Science and Technology」 (Law No. 14839)
- [10] B.-K. Min, et. al., ”A Study on Enhancement of Financial Independence for Strengthening Nuclear Regulation”, UNIST, 2018.