

Nuclear Regulatory Body's Performance Indicators in Enhancing Effectiveness: A Review Based on OECD/NEA Perspective

¹Ridha Roslan and ²Kwang-Sik Choi

¹Korea Advance Institute of Science & Technology

²Korea Institute of Nuclear Safety

ridha@aelb.gov.my, k083cks@kins.re.kr

1. Introduction

Safety of nuclear installations should rely on the operating organization, and this responsibility shall not be delegated to another party. Operators should equip themselves with sufficient training and resources. However, the regulatory body should be able to ensure that a high level of safety in the nuclear activities, under its jurisdiction, is achieved by operating organizations. In dealing with this issue, there is a need for establishment of an effective nuclear regulatory body. The regulatory body should be provided with necessary authority and sufficient resources, enabling them to effectively perform its intended mission. The drive for an effective management system has strongly enhanced interest in the development of performance indicators in many organizations, including nuclear regulatory bodies. Introduction of these indicators as a tool to monitor the result of actions is being used to foster continuous improvement. It may also be used to communicate with stakeholders, to monitor internal processes and budgeting, and when necessary to assist strategic development and to manage changes in management system. This study aims to highlight several issues related to regulatory effectiveness based on OECD/NEA perspective. All findings in this study could be useful to assist regulatory body in developing their effectiveness model.

2. Effectiveness and Efficiency

The International Atomic Energy Agency has defined the regulatory effectiveness in reference [1]. However, OECD Nuclear Energy Agency (OECD/NEA) used more relative definition to distinguish the difference between regulatory effectiveness and regulatory efficiency, as in Figure 1 [2]. Based on these two definitions, one can observe that the main key elements contribute to effectiveness of regulatory body when it is given the adequate resources and necessary authority, therefore it will enable the regulatory body to carry out their mission as intended. However, the term used in the IAEA definition is too general and indefinite. To some extent, it is acceptable but too general, although it recognized the importance of having the effective regulatory body. Turning to other issue, it is noted that there is no absolute method to measure the regulatory effectiveness due to complexity relationship between regulatory effectiveness and regulatory efficiency. In

other view, the degree of effectiveness is hard to measure compared to the efficiency in which they provide the distinct, measurable output that can be evaluated for continuous improvement. In addition, it is difficult to develop performance indicators that show the extent to which a regulatory body has achieved well-defined effectiveness level.

Regulatory effectiveness	“to do the right work”
Regulatory efficiency	“to do the work right”

Figure 1: Definitions used by OECD/NEA

3. Regulatory Failure and Importance of Effective Management System

3.1 Regulatory Failure

Regulatory failure is one form of government failure [3]. In economics, government failure occurs when the government intervention creates more inefficiency than would occur without its intervention. In the nuclear field, the regulatory body may fail to ensure that the operating organization provide the nuclear safety as “public good” within a socially acceptable level. With the increase of nuclear risk as negative externalities to the public, the regulatory body should intervene effectively, in which balanced situation between pursuing economics and protecting public interest is created. This could be accomplished with having effective regulatory body with clear mission and responsibilities, besides having adequate competence level and financial resources to support its activities.

3.2 Importance of Effective Management System

The regulatory body should establish or adopt the quality system model in order to achieve effectiveness in meaningful manner. As the quality system evolves into an integrated management system, it should provide a single framework for the arrangements and processes necessary to address all the goals of the organization. This should include organizational models, concepts and tools, human resources and other integrated management approaches that complement the traditional approach to achieving results. On the other hand, the dynamics of an organization need to be emphasized particularly the need for continuous improvement in performance. There have been

numerous integrated management model introduced to address the effectiveness of the organization. It is observed that by adopting those models, they could have the potential to enhance both the effectiveness and efficiency of the regulatory body.

4. Nuclear Regulatory Body's Performance Indicator: Comprehensive Study

4.1 Uses of Indicator

A study conducted by OECD/NEA introduced two categories of regulatory performance indicators: direct and indirect [4]. Direct performance indicators attempt to measure the regulatory body's activities, while indirect performance indicators rely on the other stakeholder's response. The advantage of direct performance indicators is that they can provide a relatively clear, measurable regulator's performance. However, direct indicators allow the regulatory body to manipulate them as it seems fits with their goal. On other perspective, indirect performance indicators could provide insight on such desired regulatory outcomes, but they are difficult to control. Therefore, the selection of indicator plays major role in determining the regulatory body's desired outcome, so as to enable the regulatory body to detect an early sign of degradation of nuclear safety level.

4.2 Review of OECD/NEA study

OECD conducted one-year self-assessment study on nine nuclear regulatory organizations from OECD member countries. Some observations have been made towards OECD/NEA study on the development of regulatory body's performance indicators, which includes:

- a) The indicators produce more output than desired outcome;
- b) The indicators used:
 - i) allowed the identification of poor performance and triggered corrective action;
 - ii) allowed more effective communication with stakeholders;
 - iii) should be part of long-term commitment to self-improvement;
 - iv) can lead to staff frustration due to too many, unhelpful and not focused to regulatory body's main function;
- c) The regulatory body's direct contribution to nuclear safety is difficult to demonstrate.

4.3 Good practice of nuclear regulatory body performance indicators in enhancing effectiveness

It is observed that based on the previous study conducted, self-assessment conducted by the participating country was less persuasive in terms of demonstrating regulatory effectiveness holistically. The

performance indicator used by OECD/NEA was based on the IAEA definition. The development and use of performance indicators was good, however, it does not give holistic picture of regulatory effectiveness. The Integrated Regulatory Review Services (IRRS) of the IAEA is introduced to strengthen and enhance the effectiveness of the national regulatory infrastructure including the effectiveness of the regulatory body through consideration of both regulatory technical and policy issues, with comparisons against requirements stipulated in IAEA safety standards, and other IAEA safety standards including internationally good practices [5]. IRRS also intended to explore the adequacy of national regulatory policies that influence the efficiency and effectiveness of both the legal framework and the regulatory infrastructure and to identify opportunities for improvement, as well as to harmonize regulatory approaches among IAEA Member States and to create mutual learning opportunities among regulators. Regulatory technical and policy issues discussions take into account current issues coming from the State's self-assessment and resulting from the evaluation of technical areas.

5. Conclusions

During the conduct of this study, it is noted the importance of regulatory effectiveness to enable the regulatory body to carry out its intended mission. Thus, the regulatory body should be effective, as well efficient to ensure the nuclear safety, as a public good, is provided by operating organization within the socially acceptable level. It is also noted that the main element that enables the regulatory body to be effective is supported by a clear, well-defined management system as a tool to prevent the regulatory failure. It is noted that OECD/NEA experience in modeling the regulatory effectiveness provides good practice for other member or non-member of OECD through dissemination of lesson-learned and mutual knowledge sharing.

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