

THE ESTABLISHMENT OF REGULATION FOR SUPPORTING THE DEVELOPMENT OF THE FIRST NUCLEAR POWER PLANT IN INDONESIA

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Abstract. To support construction and operation of the first Nuclear Power Plant (NPP), Government of Indonesia through BAPETEN as a national authority in nuclear energy usage has pushed ahead in enhancing the development of regulatory system. BAPETEN is currently focusing its activities to the development of regulations in the form of Chairman Decree, the development of licensing and inspection system, and manpower for NPP regulators. The process of the establishment of national legislation is based on the Act No.10 Year 2004 on The establishment of legislation. The process of legal drafting to establish or to revise a regulation for controlling of the use of nuclear energy shall comply with the constitutional and institutional requirements of national political and legal system. In drafting the regulation of nuclear safety of NPP, BAPETEN has been involving some other agencies or other related government agencies, and also stakeholders such as utility, academic institutions, and publics. In general, in the process of legal drafting, international publications or other country regulations can be a reference. Present paper deals with the legal basis of regulation, the establishment of legislation in Indonesia, the process in legal drafting regulations of NPP, and the current status of NPP regulations.

1. Introduction

Nowadays, the government seriously establishes the management of national energy which determined in the blue print is published by the Energy Department of Energy and Mineral Resources (ESDM) February 2004. In the year 2006, the government has issued the Presidential Regulation Number 5 Year 2006 on The National Energy Policy (NEP) on the period of 2025. This President Regulation stipulated that the national energy planning for nuclear energy up to the year 2025 is 2% ^[1] from the total national energy. To meet the need in the NEP, Nuclear Power Plant (NPP) is preparing through the nuclear energy program to be constructed four units NPP with each capacity 1000 MWe. The first NPP would hopefully be started in commercial operation by year 2017^[2].

The national infrastructure development is needed to support the commitment of Indonesia nuclear energy program. Those includes the various aspects such as human resources development (HRD), industrial and technological aspect, management aspects, and regulatory aspects. In addition it is important in considering in the development and implementation of the nuclear program is development regulation program consistent with the international legal instruments.

One of the implementation of the nuclear energy program is the establishment of independent nuclear energy regulatory authority, namely Nuclear Energy Regulatory Agency (BAPETEN). There are three pillars in controlling the use of nuclear energy in Indonesia are making regulation, processing license and performing inspection. In the establishment of the regulations of nuclear energy, BAPETEN has

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issued some Government Regulations and Chairman Regulations of BAPETEN. For NPP, the regulations have not been completed yet, but some regulations related in the area of siting of NPP have been already available.

2. Legal basis of the development of NPP

Besides having some great advantages, nuclear energy has the potential radiation hazard to the workers, public and the environment. Therefore, the utilization of nuclear energy must be regulated and controlled by the government. For these reason, the government has issued the act Number 10 Year 1997 on Nuclear Energy.

The utilization of nuclear energy, in principle, can be divided into 2 parts, i.e the energy and non energy. Utilization of nuclear energy for electricity product is the activities using the nuclear reactor namely NPP. In the nuclear reactor occurs nuclear reaction and produces a heat. The heat will be changed into the steam which is used to rotate the turbine. It will produce the electricity.

Meanwhile, the other utilizations of nuclear energy is the use of radiation sources and radioactive material in the field of health, industry and research, such as x-ray, and cobalt, Iodine and others.

In ensuring a minor environmental of the utilization with providing a great benefit for human welfare, the utilization of nuclear energy has to be controled by BAPETEN. The objective of the regulatory activity by BAPETEN is to provide^[3]:

- (1) assure the welfare, the security and the peace of people;
- (2) assure the safety and the health of workers and public, and the environmental protection;
- (3) maintain the legal order in implementing the use of nuclear energy;
- (4) increase the legal awareness of nuclear energy user to develop a safety culture in nuclear field;
- (5) prevent the diversion of the purpose of the nuclear material utilization; and
- (6) assure for maintaining and increasing the worker discipline on the implementation of nuclear energy utilization.

The legal basis of the regulatory of utilization of nuclear energy is in the article 14, paragraph (1), the Act No.10/1997 is **"The control on the use of nuclear energy shall be carried out by the Regulatory Body."**

Based on this article, the government issued Presidential Decree No. 76 Year 1998 on the task and function of Regulatory Body, which have been amended by the newest regulations. In the Article 4, the Act No.10/1997, the Government establishes a BAPETEN, under and directly responsible to the President.

In Article 14 paragraph (2) stated that **"the control should be implemented through regulations, licensing, and inspection"**, therefore, the tasks and functions of BAPETEN are establishing the regulations, issuing the license and carrying out inspections for nuclear installations and radiation facilities and radioactive materials.

Up to now, Indonesia has not developed nuclear power plants. Indonesia has established in the research and development activities, and the application of nuclear energy in the field of agriculture, industry, medical, pharmacology and others. The utilization of nuclear energy includes the utilization of research reactor for research and radioisotop production, the Act No. 10 Year 1997 on Nuclear Energy, classifies the type of nuclear reactor into non-commercial and commercial reactor. Meanwhile, in the Government Regulation No. 43/2006 on the licensing of nuclear reactor, nuclear reactor is defined into the power reactor and the non-power reactor. The non-power reactor utilizes neutrons for research or production some isotope, and the power reactor utilizes heat energy to

generate electricity. The commercial reactor power is usually called NPP. The Act No. 10 Year 1997 and Government Regulation No. 43/2006 have been making the business opportunity for the private companies to build a commercial reactor power/NPP in Indonesia. It is stated in the Article 13, paragraph (4) of the Act No.10/1997: **"The commercial construction of nuclear power plants, shall be established by the government after consultation with the House of Representatives of the Republic of Indonesia."**

Then, there is detail regulation on the rules of NPP development, in the Government Regulation No.43/2006 on the Licensing of Nuclear Reactor. The government giving the consultation on the NPP is the minister responsible for energy and mineral resources and that is stipulated in the National Plan of Public Electricity (NPPE). In the Article 5 paragraph (4) Government Regulation No.43/2006, states that: **"the Construction of the aforementioned commercial power reactor as a nuclear power plant is established by Ministry who has responsibility in the field of electric power after consulting with The House of Representative of The Republic of Indonesia."**

One of the most important of provision in the Article 13 paragraph (3) of the Act on nuclear energy is that **"the construction, operation, and decommissioning of the commercial nuclear reactor shall be performed by State-Company, cooperatives and / or private company"**.

3. The establishment of regulation of nuclear energy

3.1. Strategic plan

BAPETEN is the Non-Department Government Agency, which has been established based on Act No. 10 Year 1997 on Nuclear Energy. And, the implementation Regulation of the Act for establishing BAPETEN is the Presidential Decree Number 76 year 1998. The control of the use of nuclear energy is performed through regulation, licensing and inspection from the point of view of safety, security, and Safeguards. Therefore, it is expected in the implementation of their tasks, BAPETEN can ensure the security and peaceful for the public and the environment in the national and international level.

To perform their tasks and functions, BAPETEN has policy for controlling the use of nuclear energy, namely Strategic Plan. This strategic Plan is the strategic policy direction of BAPETEN management during five years working period. The strategic plan must be described in each department or division in the form of five year program of Medium Term Performance Plan (MTPP). The details of their plan will be annually performed by considering the strengthness, weakness, opportunities and challenges. In the period of five years, there are 3 challenges that must be faced:

- (1) introduction of NPP;
- (2) improvement of radiation safety and radiological protection; and
- (3) strengthening of nuclear safety and security.

To apply the five-yearly of MTPP, each department/division/directorate establishes a annual performance plan clearly and consistently.

3.2. The establishment of legislation

3.2.1. Legal system hierarchy of Indonesian legislation

The process of the establishment of national legislation is based on the Act, namely Act Number 10 Year 2004 on the establishment of legislation. Basically, the process divided into several phases, including planning, preparation, technical preparation, formulation, discussion, approval, enactment

and dissemination. The legal system hierarchy of the Republic of Indonesia according to the Act Number.10 Year 2004 is as follow:

- (1) The 1945 Constitution of the Republic of Indonesia and its amendments thereto (*UUD-45*);
- (2) Act, is formulated with the agreement between the House of Representative and the Government of the Republic of Indonesia, signed by the President (*UU No.10/1997*);
- (3) Government Regulation as a substitutes act, which is made by the President when the state is under specific or uncertain conditon (*PERPU*);
- (4) Government Regulation, as an implementation of the Act, initiated and drawn up by the Executive Bodys. It prepared by the relevant minister, department, or non-department, and signed by the President (*Peraturan Pemerintah/PP*);
- (5) Presidential Regulation, issued by the President as the Head of Executive Bodies (*PerPres*);
- (6) District Regulation, is formulated with the agreement between the Province or District' House of Representative and Head of Province (Governor) (*PerDa*).

The regulation of the Minister or the Head of Non-Department Government Agency has the same level of District Regulation. Because the regulation of Ministers or the Head of Non-Department Government Agency is the implementation regulation of Government Regulation or Act. Their regulations are regulating the national matters.

3.2.2 The process in legal drafting regulation

The process of legal drafting to establish or to revise a regulation for controlling of the use of nuclear energy shall comply with the constitutional and institutional requirements of national political and legal system. In drafting the regulation of nuclear energy, BAPETEN is not working alone but involving other agencies or other related government agencies, and also stakeholders such as utility, academic institutions, and publics. In general, in the process of legal drafting, international publications or other country regulations can be a reference.

As the implementation of the Act No.10 Year 2004, the Presidential Regulation No.68 Year 2005 on the general mechanism of establishing national legal framework has been issued. This Presidential Regulation describe how mechanism of establishing and drafting of the Act, the Government Regulation as substitutes Act, Government Regulation, Presidential Regulation, and Minister/Head of Non-Department Government Agency Regualtion.

The following description of this general process of legal drafting a Government Regulation (GR) initiated by BAPETEN. The steps of legal drafting process are:

- (1) The BAPETEN Chairman as an initiate establishes an internal team to make an academic concepts and a draft of the Government Regulation.
- (2) The BAPETEN Chairman sends a letter to the relevant Ministers and Institutions, together with an academic concepts and a draft of the Government Regulation, to ask for the member of interdepartment team.
- (3) After the name of interdepartment team have been received from the relevant ministries and institutions, the BAPETEN Chairman establishes interdepartmental team to discuss and review the draft of the Government Regulation.
- (4) After several the interdepartmental team discuss and review the draft, BAPETEN issues the final draft of the Government Regulation. Then BAPETEN Chairman sends the draft to the relevant ministries and institutions for their approval of the draft.
- (5) The final draft and the approval letter are sent to the President of the Republic of Indonesia through the State Secretary for his signature.
- (6) The Government Regulation is enacted in the State Gazette of the Republic of Indonesia.

The steps of legal drafting process for an Act are similar, except that an Act needs the approval of the House of Representative. Therefore, in the above description, a draft Act will be sent to the House of Representative in step 5. After the House of Representative has approved the draft with a long discussion in the various committees, the Act will be submitted to the President for the enactment.

3.2.3. Hierarchy of Nuclear Safety Regulations

According to the national legislation system, BAPETEN establishes the nuclear safety regulations levels in the hierarchy of some regulations to implement the ideal nuclear program in Indonesia, namely:

1. Acts,
2. Government Regulations (GR),
3. Presidential Regulation (Pres Reg),
4. BAPETEN Chairman Regulation (BCR),
5. Guidelines / operational guidelines / technical guidelines / work instruction.

Hierarchy of nuclear safety regulations referred to above can be illustrated on Figure 1:

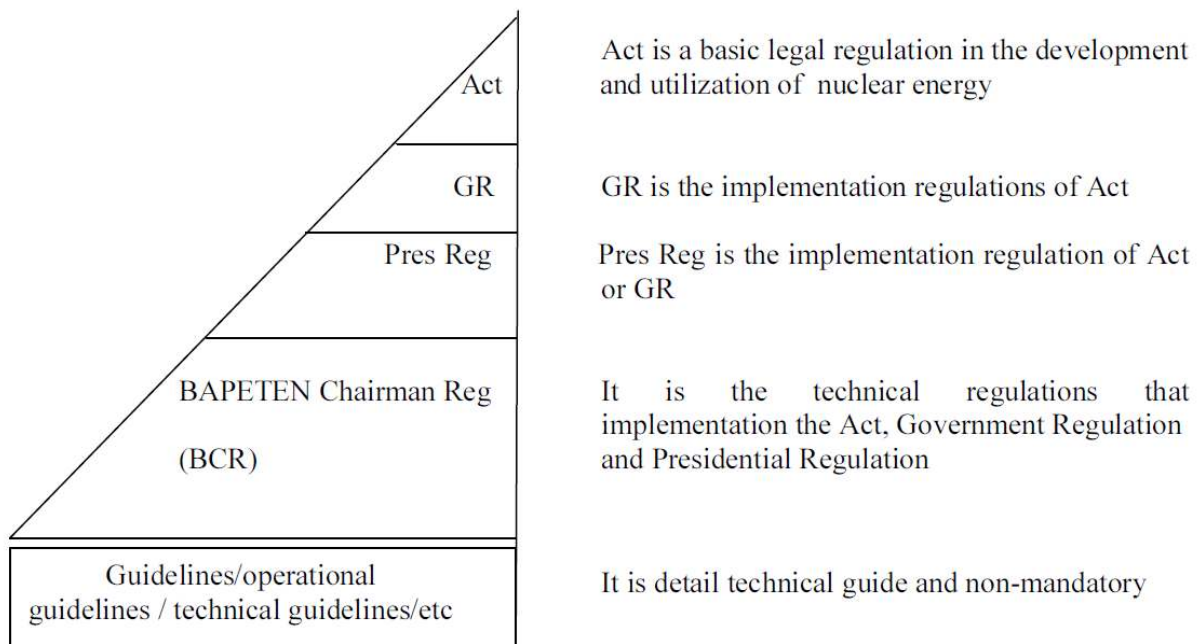


FIG. 1. Hierarchy of nuclear safety regulation

4. Current status of nuclear legislation and regulation

The Act No.10/1997 on nuclear energy contains the necessary provisions for the execution of all the regulatory function, i.e. licensing, review and assessment, inspection, and issuing regulations and guides. It also includes the liability for nuclear damage (Art. 28-40) and enforcement penalties (Art. 41-44).

As the result of the implementation of the Act No.10/1997 on Nuclear Energy, some Government Regulations related to the NPP has been enacted, there are:

- (1) GR Number 43 Year 2006 on The Licensing of Nuclear Reactor.
- (2) GR Number 33 Year 2007 on Safety of Ionizing Radiation and Security of Rad. Source
- (3) GR Number 27 Year 2009 on Tariff for Nuclear Licensing
- (4) GR Number 46 Year 2009 on The limit of Nuclear Liability
- (5) GR Number 26 Year 2002 on Transport Safety of Radioactive Material;
- (6) GR Number 27 Year 2002 on Management of Radioactive Waste.

To provide these Government Regulation operationally, BAPETEN establishes several implemented regulations in the form of BAPETEN Chairman Regulations. The BAPETEN Chairman Regulation contains of more technical provisions stipulating the safety criteria on siting, design, construction, commissioning, operation and decommissioning of NPP.

The establishment of regulation of nuclear power plant is based on the licensing stages of the nuclear reactor, i.e. siting, construction/design, commissioning, operation stages and decommissioning stages. The BAPETEN Chairman Regulations related to the construction and operation of the NPP are shown in the Table 1 and Table 2^[4].

In the process of legal drafting of the nuclear safety regulations related to the construction and operation of the Nuclear Power Plant, BAPETEN has been involving some relevant stakeholders. Some regulations are still in drafting or in planning to be formulated. At the end of the year 2010 all the regulations required for the construction/operation of the Nuclear Power Plan will be completed issued. Beside of the preparation of several NPP of regulations, BAPETEN also prepares the other regulation infrastructures, such as licensing procedures, inspection procedures, human resources development (HRD), etc. Therefore, the availability of NPP regulations and the other regulation infrastructures for NPP are expected supporting national program on construction and operation of NPP in Indonesia.

Table 1. The list of BAPETEN Chairman Regulations related to Nuclear Power Plant^[4]

| No | No/YEAR | TITLE |
|----|----------------|---|
| 1. | BCR No. 5/2007 | Safety of Site Evaluation of Nuclear Reactor |
| 2. | BCR No. 1/2008 | NPP Site Evaluation: Aspects of Seismology |
| 3. | BCR No. 2/2008 | NPP Site Evaluation: Aspects of Volcanology |
| 4. | BCR No. 3/2008 | NPP Site Evaluation: Aspects of Radioactive Material Dispersion |
| 5. | BCR No. 4/2008 | NPP Site Evaluation: Aspects of Geotechnics and Foundation |
| 6. | BCR No. 5/2008 | NPP Site Evaluation: Aspects of Meteorology |
| 7. | BCR No. 6/2008 | NPP Site Evaluation: Aspects of Human Induced External Events |
| 8. | BCR No. 3/2009 | Operational Limits and Conditions and Operating Procedures for Nuclear Power Plants |

Table 2. The list of BAPETEN Chairman Regulations related to Nuclear Power Plant^[4] (*continue*)

| No | No/YEAR | TITLE | STATUS |
|-----|---------|--|---------------|
| 1. | - | Design Safety for NPP | Final draft |
| 2. | - | Operation Safety for NPP | Final draft |
| 3. | - | Safety Design of Reactor Core for NPP | Final draft |
| 4. | - | Safety Design of Reactor Containment for NPP | Final draft |
| 5. | - | Seismic Design and Qualification for NPP | Final draft |
| 6. | - | Design Aspects of Radiation Protection for NPP | Final draft |
| 7. | - | Design of the Reactor Coolant System and Associated Systems in NPP | Final draft |
| 8. | | Safety Assessment and Verification for Nuclear Power Plants | Final draft |
| 9. | - | Commissioning for NPP | Final draft |
| 10. | | Instrumentation and Control Systems Important to Safety in NPP | Final draft |
| 11. | - | Core Management and Fuel Handling for Nuclear Power Plants | On discussion |
| 12. | - | Format and content of Safety Analysis Report for NPP | Planning 2011 |

REFERENCES

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