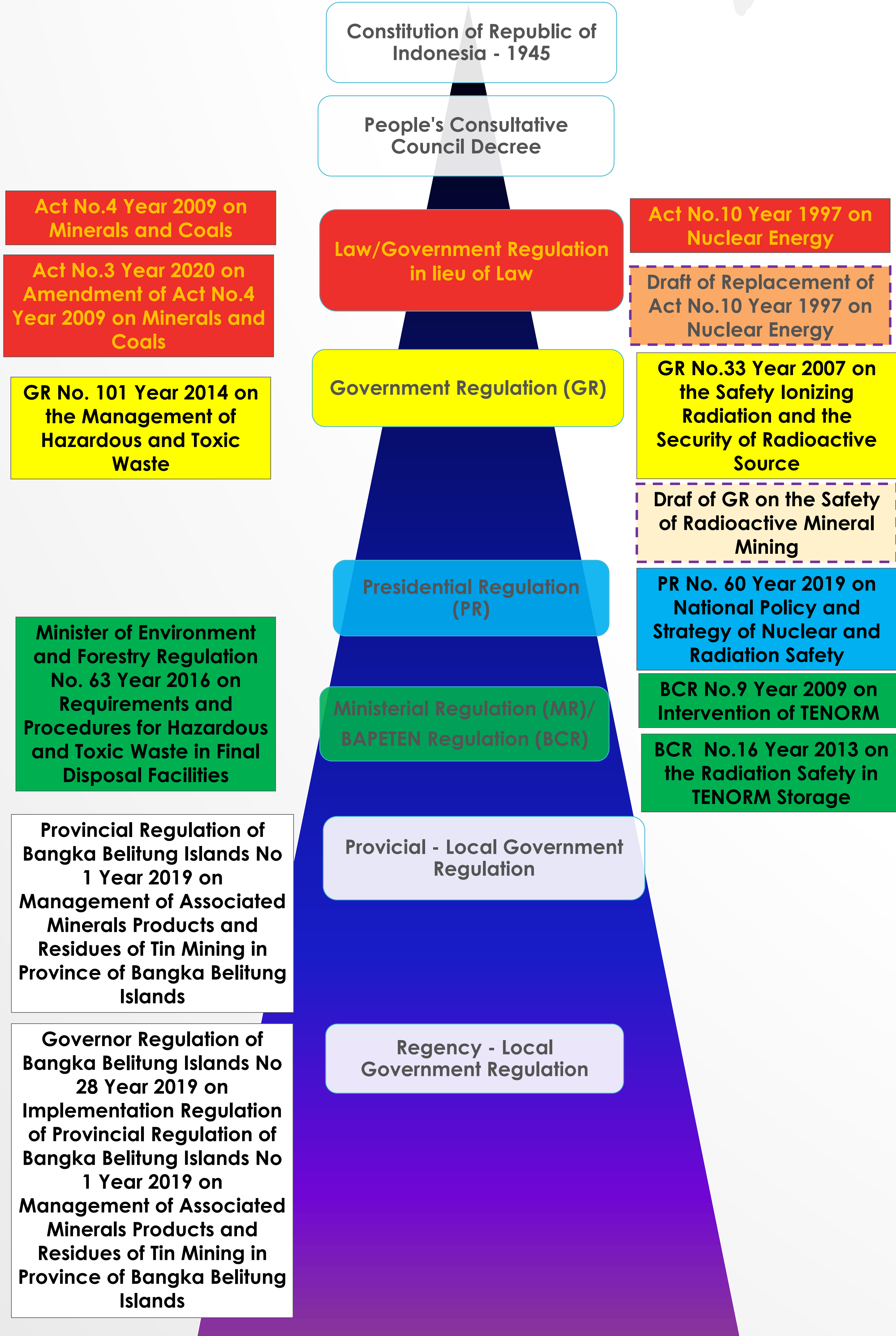




IMPLEMENTATION OF INTERNATIONAL PRACTICES ON NORM MANAGEMENT BY NATIONAL POLICY AND STRATEGY OF NUCLEAR AND RADIATION SAFETY - AN INDONESIA'S REGULATORY PERSPECTIVE

DWIHARDJO RUSHARTONO
 NUCLEAR ENERGY REGULATORY AGENCY (BAPETEN) OF REPUBLIC OF INDONESIA
 JAKARTA, INDONESIA
 EMAIL: d.rushartono@bapeten.go.id, Abstract ID Number: CN-287#67

HIERARCHY OF LEGISLATION AND REGULATION OF REPUBLIC OF INDONESIA



INTRODUCTION

The main NORM issue in Indonesia originally is found in oil and minerals mining. NORM may pose risk to workers, public, or the environment. Therefore some NORM materials require radiation control and regulation. Most of NORM residues in Indonesia are regarded as associated minerals and treated as waste. Main mineral industries are not entitled to possess the associated minerals which contain radioactive materials according to the national regulation. This paper outlines Indonesia's experience in the development of policy and strategy, and its goals of establishing common guidance for NORM management.

DESCRIPTION

At its 55th regular session, the IAEA General Conference, in resolution GC(55)/RES/9 [4], encouraged Member States "to use safety standards issued by the IAEA in their national regulatory programmes, and noted the need to consider the periodic alignment of national regulations and guidance to internationally established standards and guidance". IAEA GSR Part 3 has established requirements for NORM industries which can be used for this purpose. IAEA GSR Part 3 also establishes radiation protection requirements for NORM industries in planned and existing exposure situations. Planned exposure situation is a situation of exposure that arises from the planned operation of a source or from a planned activity that results in an exposure from a source. Existing exposure situation is a situation of exposure that already exists when a decision on the need for control needs to be taken. It includes natural background radiation and exposures from past practices that were never subject to regulatory control, or were regulated.

The ICRP recommends a range of doses spanning two orders of magnitude within which the value of a dose constraint or reference level would usually be chosen. At the lower end of this range, the dose constraint or reference level represents an increase, of up to about 1 mSv, over the dose received in a year from exposure due to naturally occurring radiation sources. It would be used when individuals are exposed to radiation from a source that yields little or no benefit for them, but which may benefit society in general. This would be the case, for instance, in establishing dose constraints for public exposure in planned exposure situations.

According from IAEA Safety Report No. 49 on criteria for regulation that "The selection of activity concentrations that are so low as to invoke widespread regulatory consideration, in circumstances where this is unlikely to achieve any worthwhile improvement in protection, would not be an optimum use of regulatory resources". The requirements for planned exposure situations apply if, in any process material:

The activity concentration of any radionuclide in the U or Th decay chains exceeds 1 Bq/g, or the activity concentration of 40K exceeds 10 Bq/g. These criteria represent (in order of magnitude terms) the upper bounds of the activity concentrations in normal rocks and soil.

According to this reference, the industrial activities that are most likely to require regulatory consideration:

- Mining and processing of uranium ore
 - Extraction of rare earth elements
 - Production and use of thorium and its compounds
 - Production of niobium and ferroniobium
 - Mining of ores other than uranium ore
 - Production of oil and gas
 - The zircon and zirconia industries
 - Manufacture of titanium dioxide pigment
 - The phosphate industry
 - Production of tin, copper, aluminium, zinc, lead, iron & steel
 - Combustion of coal
 - Water treatment

DISCUSSION

The Act No.4 Year 2009 on Mineral and Coal doesn't regulate further provision regarding the possession of the associated minerals which contain radioactive minerals or NORM residues. One of legal issue, since The Act No.4 Year 2009 was deemed as *lex generalis*, in other side Act Number 10 Year 1997 was deemed as *lex specialis*. NORM is considered as part of the term of nuclear material mining. The Act No.4 Year 2009 on Mineral and Coal regulates that the licensee of minerals industries are not entitled to possess the associated minerals which contain radioactive minerals. There are many drafts of legislation and regulation level that already well prepared or still under discussion to cope this matter, such as the draft of replacement of Act No. 10 Year 1997, the draft of Government Regulation on the Safety and Security of Nuclear Material Mining, and, the draft of Government Regulation on the Safety of Ionized Radiation and the Security of Radioactive Material. The latter draft was composed and harmonized with the IAEA GSR Part 3.

Therefore the Government of Indonesia issued the Government Regulation Number 33 Year 2007 on the Safety Ionizing Radiation and the Security of Radioactive Source. This Government Regulation was also composed and harmonized with the BSS 115. This Government Regulation was issued as mandated regulation of Act Number 10 Year 1997 which stipulated as general provision of radiation safety and security of radioactive source, as well as special provisions of NORM and TENORM. The term of TENORM encompasses a natural radioactive substance due to human activities or processes technology there is an increased exposure when compared with the initial state.

For the implementation of NORM and TENORM, Government Regulation Number 33 Year 2007 has mandated two (2) BAPETEN Chairman Regulations which were issued in order to enhance the control of NORM and TENORM, namely: BAPETEN Chairman Regulations (BCR) Number 9 Year 2009 on Intervention of TENORM and BAPETEN Chairman Regulations (BCR) Number 16 Year 2013 on the Radiation Safety in TENORM Storage[10]. BCR Number 9 Year 2009 has stipulated any provisions regarding radiation safety analysis, the criteria which is subject to regulatory control, assessment of radiation safety analysis, and implementation of interventions. The criteria which is subject to regulatory control are based on the amount or quantity of TENORM, the level of contamination equal to or greater than 1 Bq/cm², and/or an activity concentration of 1 Bq/gr (for each radionuclide in the uranium decay chain or thorium decay chain) or 10 Bq/gr for potassium (40K). These criteria was equal to IAEA Safety Report No. 49. Therefore BCR Number 16 Year 2013 has stipulated any provision regarding radiation safety, facility requirement, and operational procedures in TENORM storage. BCR Number 16 Year 2013 only regulates temporary storage in a certain period of time and it doesn't regulate policies related to the final disposal of TENORM.

However, some NORM materials require control and regulation from environmental perspective. Most of NORM residues in Indonesia are also regarded as associated minerals and treated as waste. NORM is as regarded radioactive contaminated hazardous waste. According to Government Regulation Number 101 Year 2014 on the Management of Hazardous and Toxic Waste, every person who generates hazardous waste is prohibited to utilize hazardous and toxic waste from specific or unspecific source with radioactive contamination level exceed than or equal to 1 Bq/g, and/or activity concentration of any radionuclide in the U or Th decay chains equal to 1 Bq/g, or the activity concentration of 40K equal to 10 Bq/g. As implementation of Government Regulation Number 101 Year 2014, therefore Minister of Environment and Forestry Regulation No. 63 Year 2016 on Requirements and Procedures for Hazardous and Toxic Waste in Final Disposal Facilities was issued. This minister regulation stipulates that hazardous and toxic waste contaminated with NORM or TENORM can be disposed of in class I or class II landfill facilities. Other legal issue that emerged for the implementation of these regulations was coordination among ministries/non-ministerial government agencies. To settle down this issue, national policy was established, namely Presidential Regulation No. 60 Year 2019 on National Policy and Strategy of Nuclear and Radiation Safety. Presidential Regulation No. 60 Year 2019 is implemented through 4 (four) major groups, including: developing management information systems, increasing the effectiveness for regulatory of nuclear and radiation safety, increasing coordination among ministries/non-ministerial government agencies, and developing facilities and infrastructure to support regulatory of nuclear and radiation safety. The newest regulation that elaborates the NORM and TENORM is Presidential Regulation No. 60 Year 2019 on National Policy and Strategy of Nuclear and Radiation Safety. The enactment of the Presidential Regulation is a manifestation of the Indonesian government's commitment in terms of protecting radiation safety, and fostering a culture of safety, which is in line with the national goals of the Indonesian people to protect the whole country, to advance the nation, to educate the nation, and to participate in finding world order based on independence, peace lasting, and social justice. The implementation of the Presidential Regulation No. 60 Year 2019 in the local government level which is regarded as the best practice for NORM management, is Provincial Regulation of Bangka Belitung Islands No 1 Year 2019 on Management of Associated Minerals Products and Residues of Tin Mining in Province of Bangka Belitung Islands and Governor Regulation of Bangka Belitung Islands No 28 Year 2019 on Implementation Regulation of Provincial Regulation of Bangka Belitung Islands No 1 Year 2019 on Management of Associated Minerals Products and Residues of Tin Mining in Province of Bangka Belitung Islands

CONCLUSION

The international practices can be implemented into national policy and strategy by increasing coordination between ministries/non-ministerial government agencies, and developing facilities and infrastructure to support regulatory control of radiation safety. The draft of replacement of Act No. 10 Year 1997, the draft of of Government Regulation on the Safety and Security of Nuclear Material Mining, and, the draft of the amendment Government Regulation on the Safety of Ionized Radiation and the Security of Radioactive Material are still under discussion and planned to be promulgated in the near future. These regulations are aimed to strengthen the Presidential Regulation No. 60 Year 2019 on National Policy and Strategy of Nuclear and Radiation Safety especially for NORM management, as well as it is in line with international practices..