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REGULATORY REVIEW AND DEVELOPMENT OF NORM REGULATIONS IN INDONESIA

Radionuclides of natural origin are originally come from nature contained in ores and raw materials. This material is commonly referred to as Naturally Occurring Radioactive Material (NORM). The concentration of radionuclide activity in rocks and soil in nature is usually low. The most common radionuclide elements are radionuclides from the uranium decay series, thorium decay series, and potassium. However, in some materials, the activity concentrations of radionuclides of natural origin increased significantly, hence the regulatory control is needed for the purpose of radiation protection.

Provisions on nuclear utilization oversight are enacted in the Act No. 10 Year 1997 on Nuclear Energy. One of the mandates contained in the Act the establishment of a regulatory body, namely the Nuclear Energy Regulatory Agency (BAPETEN), to oversee and ensure the utilization of nuclear energy only for peaceful purposes. The oversight of BAPETEN is carried out through three pillars, which are regulation, licensing, and inspection. Act No. 10 year 1997 has mandated into several government regulations (GR) related to licensing, radiation safety, nuclear safety, radioactive waste management, and transportation.

Radiation safety is stipulated in GR No. 33 of 2007 on the Safety Ionizing Radiation and the Security of Radioactive Source. Regulatory control of NORM and TENORM has been regulated in PP No. 33 of 2007. However, the GR No. 33 Year 2007 is still using two terms, namely NORM and TENORM. NORM is radioactive materials containing radionuclides of natural origin. While TENORM is a natural radioactive substance due to human activities or processes technology there is an increased exposure when compared with the initial state. The processes most often associated with processing of NORM with elevated concentrations of radioactive materials can be found in the fields of industry and energy mineral resources such as oil and gas, coal power plants, sandblasting, metal smelting, as well as mining, processing, and metal refining.

At the level of BAPETEN chairman regulations (BCR) regarding the NORM, there are BCR No. 9 Year 2009 on Intervention of TENORM and BCR No. 16 Year 2013 on the Radiation Safety in TENORM Storage. BCR No. 9 year 2009 set provisions regarding radiation safety analysis, the criteria to be subject to regulatory control, assessment of radiation safety analysis, and implementation of interventions. The criteria to be 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). BCR No. 16 Year 2013 sets provision regarding radiation safety, facility requirement, and operational procedures in TENORM storage. BCR No. 16 Year 2013 only regulates temporary storage in a certain period of time and does not regulate policies related to the final disposal of TENORM.

There are several things to be considered in the development of NORM/TENORM regulations. First, the use of the term NORM/TENORM needs to be harmonized with the term in several IAEA recommendations. The use of different and non-uniform terms will only distract attention from the principal purpose of NORM regulation: controlling exposures to natural sources of radiation that are significant enough to be of regulatory concern. Therefore the approach adopted by the IAEA in the framework of radiation protection standards is to use only the term NORM, regardless the origin of the material, while “radioactive material” as “material stipulated in national regulation or by the regulatory body as being subject to regulatory control because of its radioactivity”.

Second, it is related to the establishment of NORM criteria in accordance with the various levels of the graded approach to regulatory control (exemption, notification, registration and licensing. Currently, Indonesia has set criteria related to monitoring criteria. Material with activity concentrations below 1 Bq/g for radionuclides

in the uranium and thorium decay series and 10 Bq/g for 40K may be released from regulatory control. If the criteria level is exceeded, the material regarded as NORM is subject to regulatory control by BAPETEN through the licensing process. In addition to considering the concentration of activity, it is necessarily considered on a case by case basis to use a dose criterion of the order of 1 mSv in a year, commensurate with typical doses with natural background levels of radiation. Sometimes, there is a tendency to ignore the dose criterion of 1 mSv/year because it requires a dose assessment that must be done, which is not as easy as just measuring the activity concentration.

Third, there is a need to consider developing regulations to allow the possibility of reusing NORM waste. NORM that has fulfilled the exemption criteria can be removed from supervision. Residues can be recycled for use in other industries or used directly as a by-product after meeting clearance the criteria.

Fourth, the importance of clear arrangements regarding the issue of disposal shall be considered. Currently BCR No. 16 Year 2013, only regulates temporary storage of NORM/TENORM, not for final disposal. However, there is another regulation, namely Minister of Environment and Forestry Regulation No. 63 Year 2016 on Requirements and Procedures for Hazardous and Toxic Waste in Final Disposal Facilities that does not use the terminology of NORM or TENORM waste, but uses the terminology of radioactive contaminated hazardous waste. Based on these minister regulations, hazardous waste contaminated with NORM or TENORM can be disposed of in class I or class II landfill facilities. So it is necessary to further study the requirements of class I or class II landfill facilities on its capability when used as disposal facility of NORM waste. This also needs to be compared with other countries that have regulation and have implemented it on NORM waste disposal.

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