

# Challenges on Licensing of Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) in Indonesia

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**ABSTRACT.** INDONESIA ALREADY DECIDED ITS POLICY ON MANAGEMENT WITH THE ISSUANCE OF BAPETEN CHAIRMAN REGULATION (BCR) NO. 9 YEAR 2009 ON INTERVENTION ON EXPOSURE FROM TENORM AND BAPETEN CHAIRMAN REGULATION (BCR) NO. 16 YEAR 2013 ON RADIATION SAFETY IN STORAGE OF TENORM. BOTH OF THESE REGULATIONS HAVE BECOME THE REGULATORY BASIS FOR BAPETEN AS NUCLEAR REGULATORY BODY IN INDONESIA TO INTRODUCE ITS REGULATORY OBLIGATIONS TO THE NON NUCLEAR INDUSTRY THAT PRODUCE TENORM.

ACCORDING TO BCR NO. 9 YEAR 2009, TENORM PRODUCER SHALL CONDUCT A TENORM RADIATION SAFETY ANALYSIS IN EACH TENORM LOCATION OWNED OR WITHIN PRODUCER'S CONTROL. BAPETEN CONDUCTS AN ASSESSMENT ON RESULTS OF TENORM RADIATION SAFETY ANALYSIS BASED ON INTERVENTION LEVEL. BCR NO. 16 YEAR 2013 STATED THAT EVERY TENORM PRODUCER THAT WILL CARRY OUT TENORM STORAGE SHALL HAVE A RADIOACTIVE MATERIAL STORAGE LICENSE FROM BAPETEN AND MEET RADIATION SAFETY REQUIREMENTS. AN APPLICANT TO OBTAIN A RADIOACTIVE MATERIAL STORAGE LICENSE SHALL SUBMIT A WRITTEN APPLICATION AND COMPLETING LICENSE REQUIREMENTS DOCUMENT TO BAPETEN, WHILE RADIATION SAFETY REQUIREMENTS INCLUDE MANAGEMENT REQUIREMENTS, RADIATION PROTECTION REQUIREMENTS, ENGINEERING REQUIREMENTS, AND SAFETY VERIFICATION.

BAPETEN HAS ALREADY PERFORMED COORDINATION AND COOPERATION WITH RELATED GOVERNMENTAL INSTITUTION IN COMMUNICATING THE REGULATIONS TO INDUSTRIES. HOWEVER, CURRENT NUMBER OF LICENSEE STILL DOESN'T REFLECT POTENTIAL TENORM PRODUCER IN INDONESIA. THE DRAFTING OF GOVERNMENT REGULATION PROVIDES MEASURE TO STRENGTHEN THE REGULATORY BASIS FOR MANAGEMENT OF TENORM. HOWEVER, THERE ARE OTHER CHALLENGES TO EFFECTIVELY ENFORCED TENORM LICENSING IN ORDER TO ENSURE THE SAFETY OF WORKERS, PUBLIC, AND ENVIRONMENT IN INDONESIA.

**KEYWORDS:** MANAGEMENT OF TENORM, NON NUCLEAR INDUSTRY, RADIOACTIVE MATERIAL STORAGE LICENSE

## INTRODUCTION

TENORM according to its meaning, is a radioactive material taken from nature (rock, soil, and minerals) and concentrated or increased its radioactivity content as a result of industrial activities. Although IAEA has not yet published any recommendations or guidelines on how to manage TENORM, some advanced countries have established the regulations for TENORM. BAPETEN as Indonesia's nuclear regulatory body have the task to control any activity using nuclear energy by undertaking regulatory activities of developing regulation, and conducting licensing and inspection. Regarding management of TENORM, BAPETEN has developed BCR No. 9 Year 2009 on Intervention on Exposure from TENORM and BCR No. 16 Year 2013 on Radiation Safety in Storage of TENORM. Both of these regulations have become the regulatory basis for BAPETEN as nuclear regulatory body in Indonesia to introduce its regulatory obligations to the non nuclear industry that produce TENORM. This paper will describe policy on management of TENORM in Indonesia, challenges for BAPETEN in imposing the policy, and proposed measures to overcome it.

## DISCUSSION

TENORM producers must conduct an analysis of radiation safety for TENORM for each location of the TENORM owned or in his possession. Analysis of radiation safety for TENORM includes:

- types and processes of activities carried out;
- amount or quantity of TENORM;
- type and level of radionuclide concentration; and
- radiation exposure and / or highest contamination at TENORM surface

The level of intervention can be stated in:

- the amount or quantity of TENORM is at least 2 tons; and
- contamination level equal to or less than 1 Bq / cm<sup>2</sup> and / or activity concentration of 1 Bq / gr for each radionuclides in the uranium and thorium series or 10 Bq / gr for potassium.

Each TENORM producers that will carry out TENORM storage must have a radioactive material storage license and meet radiation safety requirements.

Requirements for a radioactive material storage license includes:

- TENORM storage location;
- TENORM storage facilities document;
- Work permit of Industrial Radiation Protection Officer level 3 (three);
- Evidence of personal dose monitoring evaluation
- Results of health monitoring of radiation workers;
- Valid surveymeter and contamination monitor calibration certificate;
- Radiation protection and safety program documents.

Radiation Safety Requirements covers management requirements, radiation protection requirements, technical requirements, and safety verification; whereas design of TENORM storage facilities must meet dose limiting for people who do not exceed 0.3 mSv in one year.

## RESULT

BAPETEN performed coordination and cooperation with Ministry of Environment and Ministry of Energy and Mineral Resource in communicating the regulations to industries. Heretofore, in total BAPETEN has issued only 36 licenses. 31 licenses are issued for TENORM producers from tin mining industries, 3 licenses for oil and gas industries, and 1 license for zircon production plant. 29 out of 31 licensees from tin mining industries are in Bangka Belitung province where BAPETEN has a long history cooperation with the local government, while the other 2 licensees are in a close by Riau province. 3 licensees from oil and gas industries are in East Kalimantan province, and the licensee from zircon production is in West Java province.

## LESSON LEARNED

The current number of licensee and its distributions still far away from the potential TENORM producers across Indonesia. The data provides an overview of the challenges occur to effectively enforced TENORM licensing in Indonesia. Indonesia is the world's largest island country, an archipelago that consists of more than seventeen thousand island. Although coordination and cooperation with related institution already been performed, lack of knowledge in the local government level has caused lack of implementation of the regulations. Designating part of BAPETEN TENORM regulatory tasks are needed in order to ensure the safety of workers, public, and environment for this non-nuclear industries.

## CONCLUSION

Indonesia already has TENORM management policy that defines level of intervention on exposure originating from TENORM and set it as level to regulates non nuclear industry that produce TENORM. TENORM producer that will carry out TENORM storage shall have a radioactive material storage license from BAPETEN and meet radiation safety requirements. However, current number of licensee and its distributions still far away from the potential TENORM producers across Indonesia. Main challenges in implementing the regulations comes from lack of coordination with the local government and lack of laboratory that can perform activity concentration analysis. The drafting of Government Regulation will provides measure to strengthen the regulatory basis for management of TENORM.

### REFERENCE

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