

# THE CONSIDERATION OF SECURITY ASPECT IN REVIEW FOR NUCLEAR INSTALLATION OF SITING STAGE

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# INTRODUCTION

- The lifetime of a nuclear installation extends from the earliest planning stages - decommissioning.
- Various requirements apply to a nuclear installation during all stages.
- Nuclear security measures were added later.
- Implementing new or additional security measures after a nuclear facility is in operation may be difficult and costly.



# METHODS

- A literature study
- present consideration of the result of evaluation for site characteristics for nuclear security purposes, including review of regulation on security aspect especially for site stage.



# RESULTS AND DISCUSSION (1)

## **Nuclear Security Legislation and Regulation**

- A. Ratification of international legal instruments
- B. Establishment of regulatory body
- C. Development of regulation and legislation



## A. Ratification of international legal instruments

No	Title legal instruments	Ratification instruments
1.	Non-Proliferation Treaty	Act No. 8 Year 1978
2.	South East Asia Weapon Free Zone	Act No. 9 Year 1997
3.	Comprehensive Nuclear Test Ban Treaty	Act No. 1 Year 2010
4.	International Convention on Suppression Act of Nuclear Terrorism	Act No. 10 Year 2014
5.	Convention on Physical Protection of Nuclear Materials	Presidential Regulation No. 49 Year 1986
6.	Amendment of Convention on Physical Protection of Nuclear Materials	Presidential Regulation No. 46 Year 2009



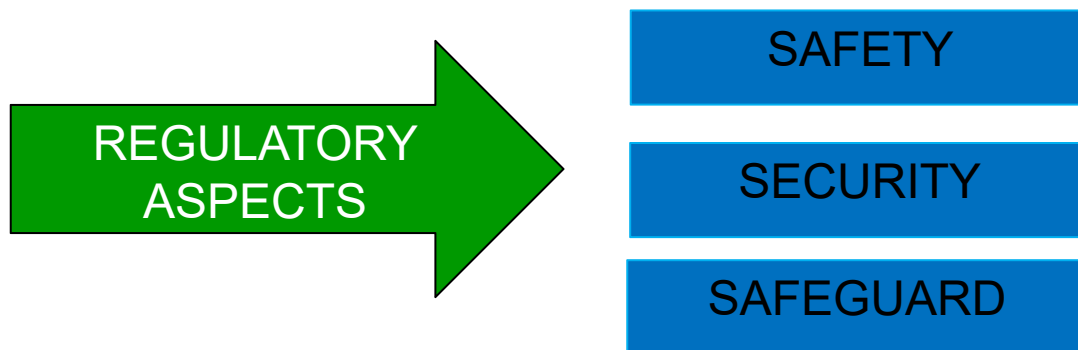
## B. Establishment of regulatory body

BAPETEN was established based on Act No. 10 on Nuclear Energy, year 1997 and is directly subject to the President of Indonesia.

### Article 4

(1) The Government establishes a Regulatory Body, under and directly responsible to the President. The Regulatory Body shall have the task to control any activity using nuclear energy.

(2) To accomplish the task under clause (1), the Regulatory Body establishes regulations, conduct licensing processes & inspections.



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GOVERNMENT REGULATIONS

- GR No. 33 Year 2007  
Safety of Ionizing Radiation & Security of radioactive sources
- GR No. 29 Year 2008  
Licensing the use of Ionizing Radiation Sources and Nuclear Materials
- GR No. 46 Year 2009  
Nuclear Liability
- GR No. 54 Year 2012  
Safety and Security of Nuclear Installation
- GR No. 61 Year 2013  
Management of Radioactive Waste
- GR No. 2 Year 2014  
Licencing on Nuclear Installation And Nuclear Material Utilization
- GR No. 58 Year 2015  
Radiation Safety and Security in Transport of Radioactive Source

C. DEVELOPMENT OF REGULATIONS

BAPETEN CHAIRMAN REGULATION

- BCR No. 4 Year 2018  
Site Evaluation for Nuclear Installation  
NS-R-3
- BCR No. 3 Year 2008  
Dispersion of Radioactive Material in Air And Water and Consideration of Population Distribution in Site Evaluation For NPP  
NS-G-3.2
- BCR No. 4 Year 2008  
Geotechnical Aspect of Site Evaluation and Foundation for NPP  
NS-G-3.6
- BCR No. 6 Year 2008  
External Human Induce Event in Site Evaluation for NPP  
NS-G-3.1
- BCR No. 8 Year 2013  
Seismic aspect of Site Evaluation for Nuclear Installation  
SSG-9
- BCR No. 6 Year 2014  
Meteorological and Hydrological aspect of Site Evaluation for Nuclear Installation  
SSG-18
- BCR No. 5 Year 2015  
Volcanology aspect of Site Evaluation for Nuclear Installation
- BCR No. 4 Year 2008  
Geotechnical Aspect of Site Evaluation and Foundation for NPP
- BCR No. 3 Year 2008  
Dispersion of Radioactive Material in Air And Water and Consideration of Population Distribution in Site Evaluation For NPP

- BCR No...Year...  
Construction for NPP
- BCR No. 1 Year 2009  
System of Physical Protection of Nuclear Installation and Materials
- BCR No. 4 Year 2011  
Safeguards System
- BCR No. 2 Year 2009  
Design Information Questionnaire (DIQ)
- BCR No. 6 Year 2015  
Security of Radioactive Sources

- BCR No. 3 Year 2010  
Design of Fuel Handling and Storage System For NPP  
NS-G-1.4
- BCR No. 3 Year 2011  
Safety for NPP Design  
NS-R-1
- BCR No. 7 Year 2011  
Design of Emergency Power System for NPP  
NS-G-1.8
- BCR No. 1 Year 2012  
Protection Against Internal Fires and Explosion In the Design of NPP  
NS-G-1.7
- BCR No. 6 Year 2012  
Software for Computer Based System Important to Safety in NPP  
NS-G-1.1
- BCR No. 2 Year 2012  
Protection against Internal Hazard Other Than Fire and Explosion Design of NPP  
NS-G-1.11
- Draft BCR No...Year...  
Design Safety of NPP
- Draft BCR No...Year...  
SAR of NPP
- Draft BCR No...Year...  
Safety Classification of SSC's for NPP

**Legend**

- In Preparation
- In Reviewing & Assessment Process
- Published

SITING

DESIGN

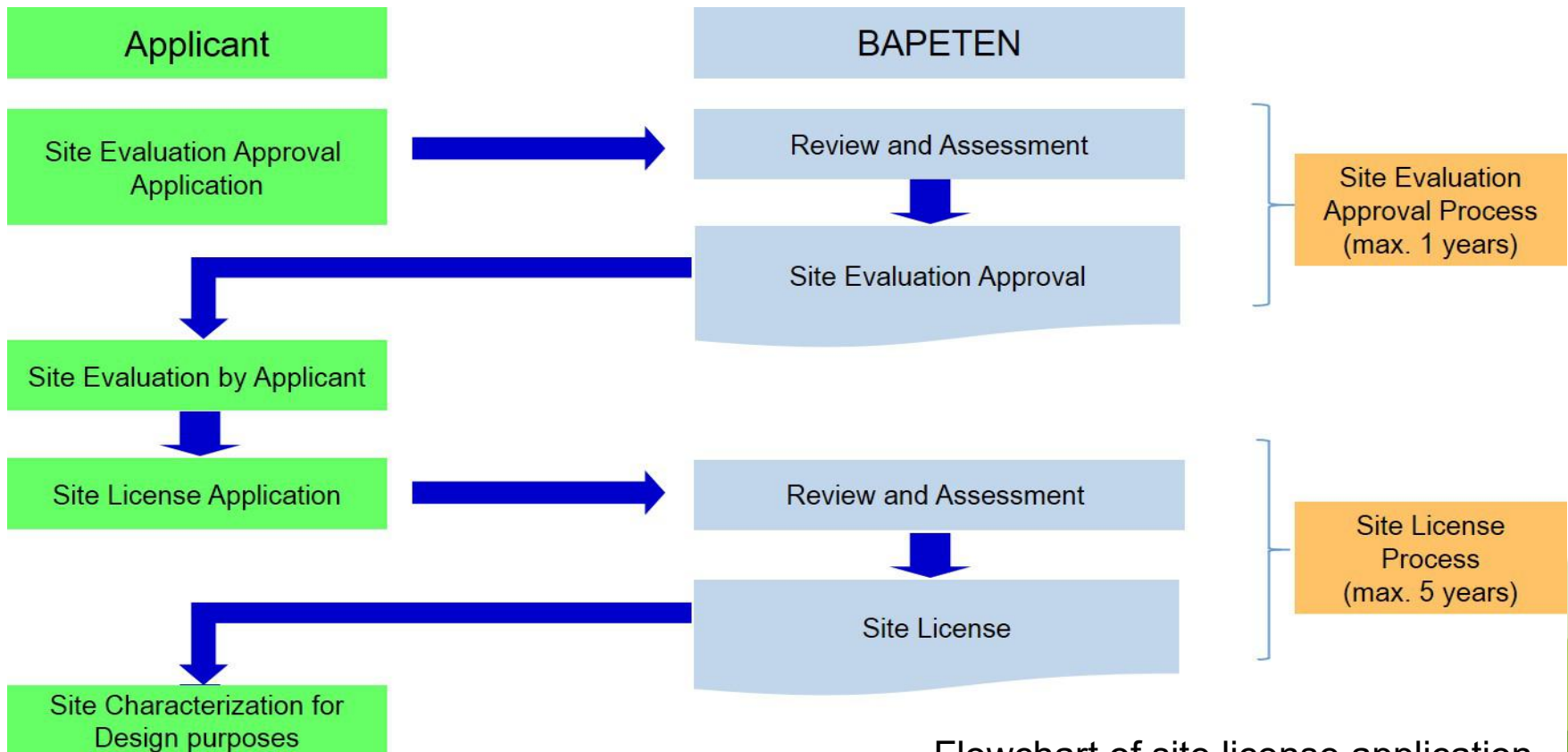
Act No. 10  
1997





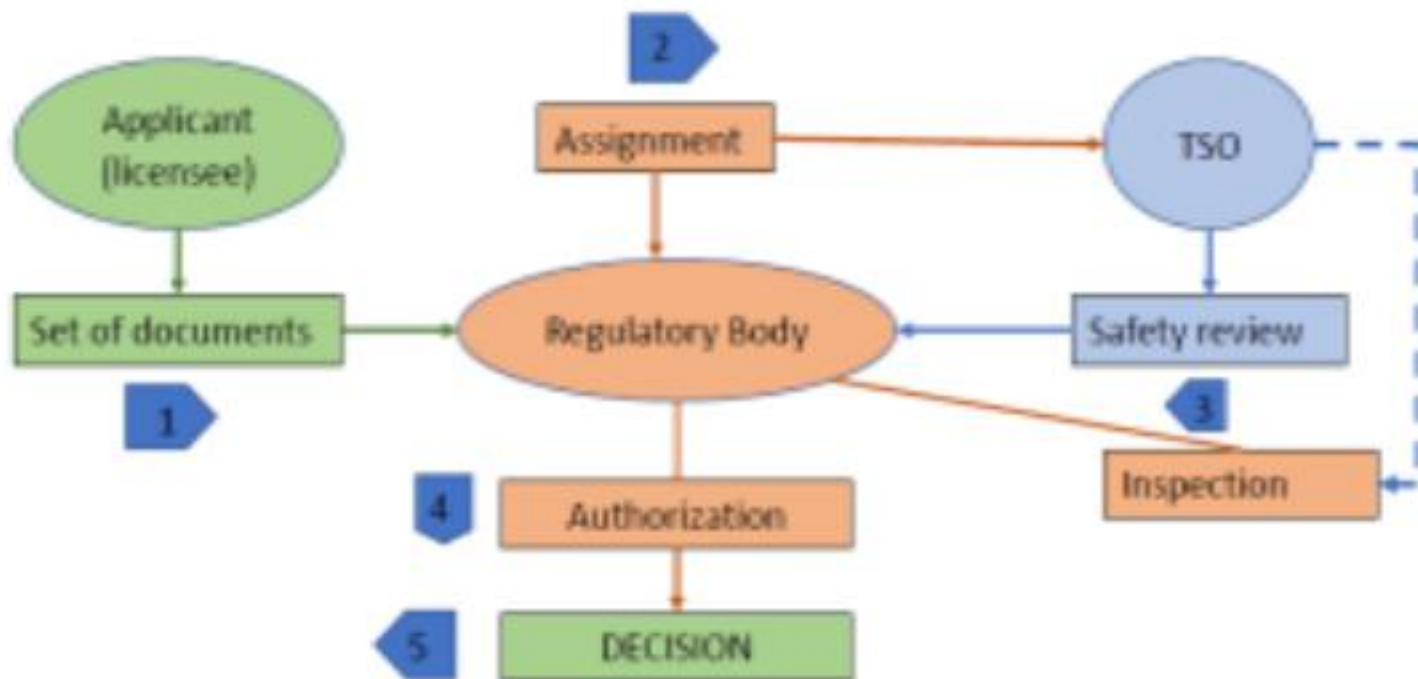
# RESULTS AND DISCUSSION (2)

## Procedures for Application and Issuance of Permits for site license in Indonesia



Flowchart of site license application

## Procedures for Application and Issuance of Permits for site license in Indonesia





## RESULTS AND DISCUSSION (3)

### **Review and assessment during site stage:**

Consideration of the result of evaluation for site characteristics for nuclear security purposes

- Site Location
- Hazardous Material in Vicinity/On-Site or Nearby Facilities
- Floods and Low Water Conditions
- Regional Climatology and Local Meteorology
- Geology and Seismology



# RESULTS AND DISCUSSION (3-1)

Table 2. Review and assessment during siting by regulatory body

Site Location	Hazardous Material in Vicinity/On-Site or Nearby Facilities
<p>The regulatory body should verify that:</p> <ol style="list-style-type: none"> <li>Information is sufficiently detailed to demonstrate site characteristics will support the development of a security plan;</li> <li>Sufficient spatial separations exist for physical barriers and the designations of security boundaries;</li> <li>Highways, railroads, and waterways that pass through LAA are sufficiently distanced from planned facility location; and</li> <li>If the proposed site is at a remote location, the off-site contingency plans and measures can be developed adequately.</li> </ol>	<p>The regulatory body should verify that:</p> <ol style="list-style-type: none"> <li>Potential hazardous materials in the vicinity or on-site do not present impediments to planned PPS engineered and administrative controls.</li> <li>Postulated accidents and consequences are analyzed for determining possible impediments to maintaining adequate nuclear security.               <ol style="list-style-type: none"> <li>Security structures or fighting positions are spatially separated at safe distances to resist against effects of hazards.</li> <li>PPS engineered features are designed to protect against hazardous and corrosive environments to assure continued nuclear security functions.</li> </ol> </li> <li>Nearby facilities (e.g. chemical plants), mining/quarrying operations, transportation routes, oil and gas pipelines, drilling operations, wells and underground gas storage facilities identified in the vicinity are considered for potential impediments.</li> </ol>
<p><b>Floods and Low Water Conditions (1/2)</b></p>	<p><b>Floods and Low Water Conditions (2/2)</b></p>
<p>The regulatory body should verify that:</p> <ol style="list-style-type: none"> <li>Probable maximum flood conditions and combination of flood producing phenomena are analyzed and established for design of PPS.</li> <li>Designs, specifications, and configurations of the PP elements including the following, can be developed and maintained to perform their intended functions in the event of flood:               <ul style="list-style-type: none"> <li>- Central and backup alarm stations.</li> <li>- Security posts or fighting positions.</li> <li>- Engineered physical protection systems and structures.</li> <li>- Digital, electronic, and communication signal transmission lines.</li> </ul> </li> <li>Contingency plans meeting the regulatory requirements can be established.</li> </ol>	<p>The regulatory body should verify that:</p> <ol style="list-style-type: none"> <li>Site locations subject to flooding are identified and any challenges or impediments to designs of engineered controls and implementation of operational requirements are considered.</li> <li>Changes to topography of the site caused by low water conditions (e.g., drought, set down) are considered for determining if they challenge the design of engineered and administrative controls for security</li> </ol>



# RESULTS AND DISCUSSION (3-2)

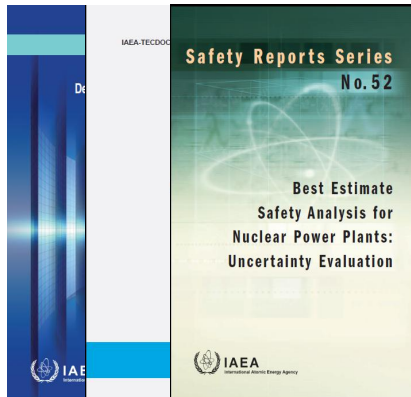
<b>Regional Climatology and Local Meteorology</b>	<b>Geology and Seismology</b>
<p>The regulatory body should verify that identification and consideration of acute and prolonged exposure to severe weather and resulting environmental conditions is considered in order to:</p> <ol style="list-style-type: none"> <li>a. Develop and implement the security plan</li> <li>b. Ensure that the following PPS components perform as designed:               <ol style="list-style-type: none"> <li>i. intrusion detection.</li> <li>ii. surveillance and assessment cameras.</li> <li>iii. communications equipment.</li> <li>iv. Illumination.</li> <li>v. defensive fighting structures or enclosures.</li> <li>vi. active and passive vehicle barrier systems.</li> <li>vii. search and access control systems.</li> </ol> </li> </ol>	<p>The regulatory body should verify that:</p> <ol style="list-style-type: none"> <li>a. The geology and seismology characteristics have been considered to determine the suitability of the site;</li> <li>b. The ground motion environment for seismic design of the nuclear facility has been considered for engineered and administrative controls required for the PPS;</li> <li>c. Security plan can be developed.</li> </ol>
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# RESULTS AND DISCUSSION (4)

GR 2 Year 2014 on Licensing of Nuclear Installation and Utilization of Nuclear Materials:

- (1) Site Evaluation report on the implementation
- (2) Report on the implementation of Site Evaluation management systems
- (3) Documents containing the main data of Nuclear Installation
- (4) Design Information Questionnaire (for siting license).

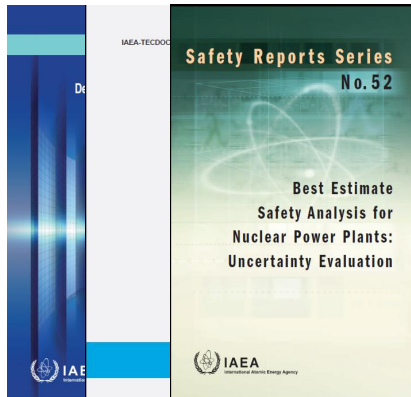


The data and assesment of security aspect evaluation based on literature study can be retrieved from (1) and (4), yet local and regional treat also vulnerability analysis are not included.



# RESULTS AND DISCUSSION (4-1)

Article 44 GR 54-year 2012 regarding Safety and Security of Nuclear Installations: During the site monitoring before design and construction, the Licensee in performing physical protection shall establish local design basis threat (DBT) that is based on the national design basis threat.



Document of DBT describes information of the characteristics of internal and external enemies that are used to design and evaluate physical protection system.

Therefore, the data collection gathered during site characteristic activities, besides in review and assessment for safety purposes can also be apply for security purposes, including the determination of design basis parameter as an input for designing and constructing a nuclear installation.



# CONCLUSION

- Indonesia has issued several government regulations and BCRs addressing nuclear security.
- Nowadays, nuclear security aspect has been implemented during review and assessment in siting stage of nuclear installation.
- However, several regulations should be updated, in the future



Thankyou



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