



National Presentation Republic of Indonesia



Presentation Outline



- Summary of basic information on the national programme
- Changes in the national programme since the last Review Meeting
- Action on Challenges and Planned Measures from the last Review Meeting
- Actions taken in the light of the Fukushima Daiichi accident
- Planned Measures to Improve safety
- Current and future Challenges
- Updates to National Report to 6th Review Meeting
- Questions Raised from Peer Review of National Report
- Conclusions

Summary of basic information on the national programme (1/4)



Status of Indonesia in CNS:

- Indonesia signed the Convention in 1994 (20 September) and ratified it in 2002 (12 April);
- Contracting Party to CNS since 2004;
- First participation in CNS Review Meeting (RM): the 3rd RM (2005)

Summary of basic information on the national programme (2/4)



NPP Programme:

- Currently no NPP is established yet in Indonesia;
- Site studies of potential NPP's location candidates were done in Provinces of Central Java and Bangka Belitung;
- Law and regulations to support NPP establishment have been enacted:
 - Presidential Regulation No. 5/2006 on National Energy Policy
 - Act No. 17 Year 2007 on Long-Term National Development Planning
 - Technical-level regulations related to siting and design of NPPs.

Summary of basic information on the national programme (3/4)



Regulatory Body:

- ❖ Indonesia has established an independent regulatory body, the Chairman of which is directly responsible to the President of the Republic of Indonesia.

International Peer Review:

- ❖ The IAEA-INIR mission has been performed in 2009, concluding that Indonesia has already completed the action plans for Phase 1, and accomplished most requirements for the Phase 2;
- ❖ IAEA ETReS (Education and Training Review Service) Mission was received in 2012;
- ❖ IAEA IRRS Mission will take place in 2015 (planning).

Summary of basic information on the national programme (4/4)



HR Development:

- ❖ Personnel's competency is developed and maintained through domestic and international education and training

Action Plan related to Fukushima Daiichi Accident:

- ❖ Safety assessment of three research reactors has been undertaken, showing no significant threat toward the safety;
- ❖ Continuous capacity building;
- ❖ Increasing exercises in nuclear emergency response;
- ❖ Developing and improving relevant regulations;
- ❖ Strengthening international cooperation; etc.

Changes in the national programme since the last Review Meeting



Several changes since the last Review Meeting:

- o the enactment of GR No. 54/2012 on the Safety and Security of Nuclear Installation;
- o the enactment of PR No. 74/2012 on Nuclear Liability;
- o the enactment of various BCRs on the Site Evaluation, Design of NPPs, Clearance, Environmental Radioactivity Limit;
- o the enactment of GR No. 2/2014 on the Licensing of Nuclear Installation and Use of Nuclear Material; and
- o various activities to improve the safety infrastructure.

Action on Challenges and Planned Measures from the last Review Meeting



Question/Comment	Follow up
siting requirements	BAPETEN Chairman Regulation (BCR) No. 1/ 2008 has been superseded by BCR No. 8/ 2013 to put more stringent requirements regarding the seismic characteristics of the site candidate.
<i>“Combined system”</i> of licensing a new reactor	<i>“Combined License”</i> for a new reactor is not covered anymore in the new regulation, Government Regulation (GR) No. 2/2014 (which is superseding the GR No. 43/2006).
Financial guarantee requirements	GR No. 2/2014 stipulates some financial guarantee requirements on the implementation of construction, commissioning, operation, and decommissioning stage of nuclear installation, and nuclear liability

Actions taken in the light of the Fukushima Daiichi accident (1/5)



Improvement of safety regulations on NPP design, covering the provisions on:

- the electrical power supply system, where it must be designed to withstand earthquakes, floods, and other extreme natural disasters, as well as multi-events;
- the design of Reactor Cooling System of NPP to withstand a prolonged loss of ultimate heat sinks.
- the external events, particularly the design issues in anticipating multi-events hazards and to multi-unit events in a single site.

Actions taken in the light of the Fukushima Daiichi accident (2/5)



Improvement of safety regulations (cont'd):

- o BAPETEN Chairman Regulation (BCR) No. 1 of 2008 on Site Evaluation of NPPs for Seismic Aspect has been superseded by BCR No. 8 of 2013 to put more stringent requirements.
- o BCR No. 5 of 2008 on Site Evaluation of NPPs for Meteorological Aspect is in the final process of revision, to be combined with aspects of hydrology and to put more stringent requirements, including a potential tsunami hazards.

Actions taken in the light of the Fukushima Daiichi accident (3/5)



Improvement of safety regulations (cont'd):

- o BCR No. 7 of 2011 on Design of Emergency Power Supply of NPPs will be revised to put requirement on mobile emergency power supply
- o BCR No. 5 of 2007 on Site Evaluation will be updated in 2015 to accommodate lesson-learned from the Fukushima Daiichi incident.

Actions taken in the light of the Fukushima Daiichi accident (4/5)



Measures taken to improve Emergency Preparedness & Response:

- ❖ Building and enhancing capabilities at facility, local government and national levels on:
 - o national emergency response organization
 - o severe accident management and recovery;
 - o emergency preparedness and response and post-accident management.

Actions taken in the light of the Fukushima Daiichi accident (5/5)



Measures taken to improve Emergency Preparedness & Response (cont'd):

- ❖ Building and enhancing regional and international cooperation in the framework of capacity building:
 - o institutional capacity building, technical upgrading of nuclear emergency preparedness and response and prevention of nuclear/radiological disaster, control and coordination among agencies; and
 - o sharing of information.

Planned Measures to Improve Safety (1/2)



- ❑ To enhance effectiveness of the national regulatory body, through:
 1. Capacity building: to develop a personnel competence standard, to conduct OJT, workshops, and education and training for the personnel.
 2. International cooperation: technical cooperation with the IAEA, the European Union, and Asian Nuclear Safety Network (ANSN).
 3. International peer review: expert mission on BAPETEN Management System, and Integrated Regulatory Review Service (IRRS) mission in 2015.

Planned Measures to Improve Safety (2/2)



- ❑ To enhance emergency preparedness and response capabilities, through:
 1. Intensifying exercises and drills in nuclear emergency response.
 2. Enhancing coordination among related national agencies.
 3. Establishing early warning system.

Current and future Challenges (1/2)



Plant Ageing (existing nuclear facilities):

1. How to ensure that the design of an installation have considered aspects of ageing?
2. How to determine the critical SSCs?
3. What aspects need to be considered in assessing the lifetime of nuclear facilities?
4. How to link between ageing management program with PSR?
5. How to asses and review PSR and ageing management document as requirements to obtain renewal operating license?

Current and future Challenges (2/2)



Possible New Builds:

1. It is indicated there is a plan to introduce a small experimental power reactor, but type of the reactor has not been confirmed yet.
2. Accordingly, the regulatory approach to regulate the reactor can not be determined yet.

Knowledge Management:

1. Personnel ageing.
2. Transfer of tacit knowledge.

Updates to National Report to 6th Review Meeting



1. Enactment of Government Regulation (GR) No. 61 Year 2013 on Radioactive Waste Management (superseding GR No. 27 Year 2002)
2. Enactment of GR No. 2 Year 2014 on Licensing of Nuclear Installation and Use of Nuclear Materials
3. Establishment of BAPETEN Chairman Regulation (BCR) No. 3 Year 2014 on Format and Content of Environmental Impact Assessment of Nuclear Installation.
4. Change of execution of IAEA – IRRS Mission plan from year 2014 to 2015.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
BAPETEN Management System	General	<p>The BAPETEN Management System was developed based on ISO 9001 and partly on the IAEA GS-R-3. But, After the IAEA experts reviewed the Management System in 2012, BAPETEN decided to revise the Management System to fully comply with GS-R-3.</p> <p>Some opportunities for improvement are identified, such as in the area of product map, standard of service, and standard format and content of the products.</p>

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
Reactor's type/power	General	The type/power of NPPs will be decided after the result of the site evaluation has been formally reported.
Role of regulatory body in establishing the nuclear policy	General	Regulatory Body is mandated by the law to conduct the regulatory functions. The ultimate goal of the regulatory functions is to ensure the safety of public, workers and the protection of environments. Therefore, BAPETEN could initiate developing the safety policy of nuclear energy.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
site and construction of new NPP	General	Currently, the feasibility study of Bangka Belitung Site covering site evaluation has been done. However, result of the site evaluation has not been formally reported yet to BAPETEN. Therefore, information on a planned construction of this new NPP could not be provided yet.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
Prolong- ation for the operating licence	6	<p>It is not decided yet whether the operating licenses of MPR GA Siwabessy and Kartini reactors are to be prolonged.</p> <p>In case the licenses are to be extended, following documents will be required, according to the regulation: SAR, PSR report, operating report, and ageing assessment report.</p>
MPR GA- Siwabessy	6	<p>The fuel type of MTR reactor is plate-type with uranium silicide fuel (U_3Si_2-Al).</p> <p>Depending on the needs (demand) of users, MPR GA Siwabessy research reactor is operated daily with power of 15 MWt .</p>

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
land-based NPP	7	<p>Gov. Reg. No. 2 of 2014 on Licensing of Nuclear Installation and Use of Nuclear Materials stipulates that NPP shall be constructed on-land.</p> <p>Indeed, there were some technical discussions on the feasibility of transportable NPP in Indonesia, but no formal plan to introduce a such kind of NPP.</p>

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
international practices to enhance regulatory inspection procedures.	7	To enhance regulatory inspection procedures, the international practices, including the IAEA documents such as (GS-G-1.3) are commonly used. However, for practical use BAPETEN also refers to US-NRC document, namely Reg. Guide, "Inspection and Enforcement Manual".
number of inspectors	8	Currently BAPETEN has 55 inspectors in the field of nuclear installations and materials, and 54 inspectors in the field of radiation facilities and radioactive materials.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
Independence of regulatory body	8	<p>Terms of independence for a regulatory body (BAPETEN) covers several aspects:</p> <ul style="list-style-type: none">(1) <u>legal</u>: Act No.10 of 1997 on Nuclear Energy.(2) <u>political</u>: BAPETEN is directly responsible to the President.(3) <u>financial</u>: Operational budgets for BAPETEN are provided by the government.(4) <u>competency</u>: BAPETEN is powered by staffs with the number and competency are adequate to conduct the current regulatory missions by themselves.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
Employees and annual budget	8	<p>BAPETEN has around 450 employees, 300 of which are technical staffs. This number has been considered to cover the regulatory activities to control the first NPPs.</p> <p>BAPETEN's annual budget is around IDR 200 billions.</p>

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
Link of promoting and regulatory bodies	8	<p>According to Law on Nuclear Energy, there are two bodies dealing with the nuclear energy:</p> <ol style="list-style-type: none">1.BAPETEN as a regulatory body2.BATAN as a promoting body <p>Both of them are directly responsible to the President of Rep. of Indonesia.</p> <p>As a promoting body, BATAN operates nuclear and radiation facilities, which are subject to be licensed by BAPETEN.</p>

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
Responsibility of licensee	9	<p>In implementing the technical safety and security of Nuclear installation, <u>the licensee is responsible for, inter alia:</u></p> <ul style="list-style-type: none">a. achieving the safety and security objective;b. establishing and performing policy according to the safety and security objective;c. determining the safety and security criteria;d. establishing, performing, and developing internal procedures and provision to ensure safety and security;f. creating an organization with task, authorization, responsibility, and clear communication path;g. establishing and ensuring that the personnel have appropriate competency with their task field.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
practical activities by the licensees	10	<p>Practical activities undertaken by the license holders to achieve the safety and security goals include:</p> <ul style="list-style-type: none">o to determine the criteria of safety and security;o to establish, implement, and develop procedures and internal rules to ensure the safety and security;o to have an organization with the appropriate tasks, functions, authorities, responsibilities, and clear lines of communication;o to establish and ensure workers fulfilling levels of competence and expertise in their respective sectors; ando to evaluate, monitor, and audit periodically on safety and security activities.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
Decommissioning funding for research reactors	11	Funding of decommissioning is one of the requirements of licensing of research reactor , according to the safety standards and regulations.
education and training programme	11	Based on the recommendation of IAEA/ ANSN Mission, BATAN and BAPETEN plan to strengthen the programme should include: <ol style="list-style-type: none">1. developing training need assessment (TNA) based on required competencies using IAEA SARCON tool; and2. dispatching technical staff to attend the instructor training program (ToT) as well as on the job training (OJT) in experienced countries.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
Standards for NPP	13	<p>In principle, Indonesia applies Indonesia National Standards (SNI) which are adopted from international standards.</p> <p>In case of the SNI is not available during the NPP construction, BAPETEN applies the policy for implementing the operable standards from the NPP supplier countries, such as ASME, ASTM, ANSI (USA), KTA, DIN (Germany), JIS (Japan), CSA (Canada), etc.</p>

Questions Raised from Peer Review of National Report



Topic	Article	Answers/Responses
Periodic Safety Review	14	<p>BAPETEN reviews the licensee's periodical report on safety operation, and performs both announce routine and short notice inspections, where necessary. All aspects of safety are subject for the inspection program, including emergency plan, management system (QA/QC), and radiological and environmental safety.</p> <p>Currently, licensees are mandated to conduct their Periodic Safety Review (PSR) every 5 years for research reactors.</p>

Questions Raised from Peer Review of National Report



Topic	Article	Answers/Responses
PSA	14	In principle, PSA is not required for non-power reactors, i.e. research reactors, but the licensee may implement voluntary PSA. For Multipurpose Reactor (MPR) GA Siwabessy, it has been carried out, although not comprehensive PSA, i.e. only partial PSA aiming at improving the human resource capability in system reliability analysis, especially for the safety system.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
Independent radiological monitoring	15	<p>BAPETEN carries out independent verification by conducting: in situ measurement, witnessing, and laboratory measurement.</p> <p>BAPETEN also takes environmental samples surrounding nuclear installation.</p>
dose limits	15	<p>Indonesia has adopted the IAEA BSS-115 (ICRP 103) on dose limits and dose constraints concept, Including limits for release of radioactive effluents.</p> <p>For occupational exposure, we adopted:</p> <ol style="list-style-type: none">1. 20 mSv per year for average effective dose, and2. 50 mSv per year for maximum effective dose.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
emergency preparedness	16	<p>Nuclear emergency preparedness level consists of facility, local government, and national level.</p> <p>The exercises and drills on emergency preparedness is conducted with different scenarios and levels:</p> <ol style="list-style-type: none">1. on facility level, at least once a year2. on local government level, at least once every 2 years3. on national level, at least once every 4 years

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
Future reactor type	18	Indonesia is considering to construct NPPs of major types of reactors with high safety performance. But, currently, the reactor type has not been specified yet.
Defense-in-depth concept	18	Achieving the safety objectives is carried out through the effective defense measures against radiation hazards posed from nuclear facilities by applying the principle of defense-in-depth to meet the basic safety functions of the facilities.

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
practical measures for safe operation	19	<p>Practical measures taken by the operator/ licensee in order to ensure the safe operation, include inter alia:</p> <ol style="list-style-type: none">1. to establish:<ol style="list-style-type: none">a. limit and condition of operation;b. operation procedure;c. maintenance, surveillance, and inspection programme; andd. ageing management programme.2. to establish and perform operation procedure in all nuclear installation conditions;

Questions Raised from Peer Review of National Report



Topic	Article	Responses/Answers
practical measures for safe operation	19	<p>(continuation)</p> <ol style="list-style-type: none">3. to guarantee that operation, maintenance, surveillance, and inspection of nuclear facilities are performed by personnel who are qualified according to regulations;4. to establish and perform the maintenance, surveillance, and inspection program for every structure, system, and component important to safety; <p>BAPETEN ensure the above measures taken by operator/ licensee.</p>

Conclusions



- Indonesia is committed itself to continuously improve the safety infrastructure to comply with Convention on Nuclear Safety.
- Indonesia has been significantly preparing the necessary infrastructures for the first NPP including capacity building, international cooperation, science and technology bases for research and engineering, and improvement of legal instruments.
- Based on the lessons learned from Fukushima Daiichi Accident, Indonesia has been strengthening nuclear safety infrastructures and enhancing the independence of the regulatory body.

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