

INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

INTERNATIONAL SEISMIC SAFETY CENTRE (ISSC)

**“Regional Workshop on Volcanic, Seismic, and Tsunami Hazard Assessment
Related to NPP Siting Activities and Requirements”**

Nuclear Energy Regulatory Agency (BAPETEN), Indonesia

13-17 June 2011

INFORMATION SHEET

Background:

The selection and the evaluation of a site for a nuclear power plant are crucial parts of establishing a first nuclear power plant programme in a country and it can significantly affect the costs, public acceptance and safety of the installation during its complete lifecycle.

The outcome of this task of the programme, at its initial stages, may even affect seriously the final success of the programme. Poor planning and execution, lack of information and knowledge on applicable international safety standards and recognized practices have led in the past to faulty decision making and major delays either at the construction or at the operational stages of a nuclear power plant project.

It has been seen in many examples in Member States that faulty decisions in the site selection stage may also require major resource commitments at a much later phase of the project. The IAEA has been involved in many projects where the site related design parameters were changed during the plant operation stage and, consequently, re-evaluation and upgrades were required to be performed on existing plants, with costly shutdown periods.

Site selection is a multi-faceted process where safety considerations largely dominate and provides two distinct levels of defence in depth:

- The first level in site selection is preventive and aims at decreasing the exposure to external hazards. It involves a comprehensive process of screening out sites where hazards are too important and a proper determination of design basis for possible sites is done.
- The second level is mitigative and aims at decreasing the impact on the environment. It involves the selection of a site with good dispersion characteristics of radionuclides in the air and water and also a favourable terrain and infrastructure for the implementation of an emergency plan in case of an accident.

Considering all that, the IAEA strongly recommends that the site selection process be guided by a clearly established set of criteria or regulatory requirements from the very beginning. This is of particular importance for those aspects that can exclude sites due to unacceptable conditions. On the other hand, a global balance has to be established between the characteristics of a site on the one hand, and specific design features, site protection measures and administrative procedures on the other hand, in order to obtain an acceptable solution. IAEA safety standards provide a strong basis to establish such a balance and for site selection in general.

Other important element to be considered is the need for adequate support for performing this task at the initial stages of the first nuclear power plant project to the institutions involved on it. At the first phases of such programme, usually, the nuclear project organization lacks expertise in

the site related topics, in one hand, while on the other hand, the national specialized institutions with such expertise lack experience in nuclear power projects.

Because of this, a balance is needed to equip the nuclear project team with sufficient knowledge to be an 'intelligent customer' on the subject. On the other hand, it is necessary to provide adequate training to those specialized institutions before they start their contractual work in relation to the site selection tasks.

The IAEA has a complete and comprehensive set of safety standards (requirements and guides) dealing with all site related aspects. This set of safety standards was developed since the 70s and has been revised periodically accounting from developments on the practice and the methodologies, as well as from the experience and lessons learned from the occurrence of strong natural events in a continuous improvement process. Besides that, the well-recognized IAEA Site and Seismic Safety Review Services were provided to more than 50 Member States during the last 30 years, in more than 250 missions, assisting in the review of more than 40 nuclear installations sites around the world, collecting and sharing facts and findings and providing recommendations on how to resolve the issues found.

At the IAEA, the International Seismic Safety Centre (ISSC) at the Nuclear Installation Safety Division of the Nuclear Safety and Security Department is in charge to deal with this area, developing the related safety standards, organizing and conducting the related safety review services which include also all capacity building activities (training courses, workshops, experts meetings, dissemination of databases, etc.).

In conclusion, there is an increasing need from many Member States starting their first nuclear power plant programmes to initiate activities on selecting an adequate suitable site for locating the nuclear installation and, at that time, to avoid mistakes that should be costly resolved at later stages.

As a response to that need and taking into account the necessity of common understandings on the complexities involved in the problem to be resolved, on the new approaches and ideas to be used, on the requirements and challenges to be faced, it is proposed to conduct, first, capacity building activities in the form of regional workshops, in different regions of the world, aimed to make aware and to train experts of those countries on all related aspects of the site selection and site evaluation for nuclear installations and to identify what, how and when to do what shall be done well.

Purposes of the workshop:

The purposes of the workshop are (i) to train representatives from countries embarking on their first nuclear programme on topics related to site selection and evaluation and on the current suite of IAEA safety standards on these topics; (ii) to disseminate the lessons learned from recent strong natural events and to discuss their impact on the revisions to the safety standards; and (iii) to assist with the identification of actions to be undertaken by each country at the start of their nuclear programme.

Venue: Jakarta Indonesia

Millennium Hotel Sirih Jakarta
Jalan Fachrudin 3
Jakarta 10250

<http://www.millenniumhotels.com/id/millenniumjakarta/index.html>

Counterpart: Mr. Zulkarnain, BAPETEN,
Nuclear Energy Regulatory Agency (BAPETEN),
e-mail: m.zulkarnain@bapeten.go.id

Date: 13-17 June 2011

Main topics of the meeting:

- Site selection and evaluation process for nuclear power plants, safety and non-safety related aspects: with emphasis on site survey, and site selection and assessment stages. Exclusionary and ranking criteria. Details of the process: work plan, scheduling and interfaces.
- Site selection and evaluation criteria in relation to external hazards: (i) seismic hazards, (ii) meteorological and hydrological hazards, (iii) volcanic hazards, and (iv) human induced hazards (aircraft crash, explosions, toxic releases). Geotechnical aspects and soil instability hazards. Determination of related design bases.
- Site selection and evaluation criteria in relation to: (i) site characteristics for dispersion in air, soil and water (surface and underground), (ii) population density and distribution, (iii) feasibility of implementation of emergency plans.
- Monitoring and Management System.
- Non-safety related aspects: site development, infrastructure needs, grid connection, etc.

Language: English (no simultaneous translation will be provided)

Workshop Contact Persons:

Mr. Zulkarnain, (BAPETEN) m.zulkarnain@bapeten.go.id

IAEA–Technical Officer: Mr. Ovidiu Coman

IAEA–ISSC staff:

Mr. Sujit Samaddar – ISSC Centre Head

Mr. Ayhan Altinyollar – ISSC Staff

IAEA Experts Team:

- 1) Seismology - Ramon Secanel (Spain)
- 2) Geology, hydrogeology and seismo-tectonics - Alessandro Michetti (Italy)
- 3) Volcanology – Antonio Costa (UK)
- 4) Severe Meteorology, Flood and Tsunami - Ahmet C. Yalciner (Turkey)
- 5) Radiological Dispersion –Karl Heinz Lehmann (Germany)
- 6) Human Induced Events, Geotechnical Hazards and site preparation – Jean Pierre Touret (France)

Participants Asia Pacific Region:

It is expected the active participation of experts from the Hub countries from institutions with experience in nuclear power plant programmes, at (i) high level planning management and at (ii) the specific groups dealing with the site selection and evaluation tasks, from the managerial to specialized technical levels.

The participants from Member States of the region will present their case studies, the status of development of their plans in relation to site selection and evaluation for the nuclear power plant project, and the specific issues to be resolved for getting the site approval permit.

WORKSHOP PROGRAMME

DAY 1 MONDAY:

Session 1: OPENING SESSION

08:30 – 09:00 Registration

09:00 – 09:30 Welcome & Opening Ceremony

Opening remarks (BAPTEN and IAEA)

Aims and objectives of the Training Course

Introduction of Participants

Orientation information

09:30 – 10:30 Lecture 1: IAEA - Global Nuclear Safety Regime and IAEA Safety Standards (SS)

10:30 – 11:00: Coffee break

Session 2: SITE SELECTION AND EVALUATION – METHODOLOGICAL APPROACH

11:00 – 12:00 Lecture 2: An integrated approach for site selection and evaluation for a NPP project - Site Selection Process – IAEA Safety Guide 50-SG-S9 (DS433), Licensing Process and the Phases of Site Selection. (AA)

12:00- 13:00 Lecture 3: IAEA Safety Requirements for Site Evaluation of Nuclear Installations – NS-R-3 (O.C.).

13:00 – 14:00: Lunch break

Session 3: COUNTRY EXPERIENCES

14:00 – 15:00 Supporting Country Presentation 1 (USA)

15:00 – 16:00 Hub Country Presentation 2 (Japan)

16:00 – 16:30: Coffee break

Session 4: COUNTRY EXPERIENCES – PLENARY DISCUSSIONS

16:30 - 17:00 Country Presentation 1 (Indonesia)

17:00 - 17:30 Country Presentation 2 (Indonesia)

17:30 – 18:00 Discussions

DAY 2 TUESDAY:

Session 5: EXTERNAL EVENTS - SEISMIC HAZARDS

08:30 – 09:00 Lecture 4: IAEA Safety Guide on Seismic Hazards in Evaluation for Nuclear Installations – SSG-9. (IAEA)

09:00 – 10:30 Lecture 5: Collection and interpretation of geological, geophysical and geotechnical data – Geological Database and Seismotectonic Model. (AM)

10:30 – 11:00: Coffee break

Session 6: EXTERNAL EVENTS - SEISMIC HAZARDS

11:00 - 12:00 Lecture 6: Collection and interpretation of seismological data – Seismological Database and Seismic Hazard Assessment (RS).

12:00 - 13:00 Lecture 7: Seismic hazard assessment – Case Study Illustrating Deterministic and Probabilistic Approaches – Uncertainties treatment (RS).

13:00 – 14:00: Lunch break

Session 7: COUNTRY EXPERIENCES

14:00 – 15:00 Hub Country Presentation 3 (Korea)

15:00 – 16:00 Hub Country Presentation 4 (Japan)

16:00 – 16:30: Coffee break

Session 8: COUNTRY EXPERIENCES – PLENARY DISCUSSIONS

16:30 - 17:30 Country Presentation 3 (Malaysia)

Country Presentation 4 (Thailand)

17:30 - 18:00 Discussions

DAY 3 WEDNESDAY:

Session 9: EXTERNAL EVENTS - VOLCANIC HAZARDS

08:30 – 9:00 Lecture 8: IAEA Safety Guide (Draft) on Volcanic Hazards in Site Evaluation for Nuclear Installations (DS405) (IAEA).

09:00 – 10:30 Lecture 9: Volcanic Hazards Assessment (AC).

10:30 – 11:00: Coffee break

11:00 – 12:00 Lecture 10: Volcanic Hazards Assessment – Case Study (AC).

Session 10: EXTERNAL EVENTS – METEOROLOGICAL HAZARDS

12:00 – 12:30 Lecture 11: IAEA Safety Guide (Draft) on Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations (IAEA).

12:30 – 13:30: Lunch break

Session 11: EXTERNAL EVENTS – HYDROLOGICAL HAZARDS (FLOODS)

13:30 – 15:00 Lecture 12: IAEA Safety Guide on Hydrological Hazards in Site Evaluation for Nuclear Installations (DS417) (AY).

15:00 – 16:00 Lecture 13: Tsunamis – Tsunami Hazard Assessment – Warning and Notification Systems. (AY)

16:00 – 16:30: Coffee break

Session 12: COUNTRY EXPERIENCES – PLENARY DISCUSSIONS

16:30 – 17:30 Hub Country Presentation 6 (Korea)

17:30 – 18 Discussions

DAY 4 THURSDAY:

Session 13: EXTERNAL EVENTS – HUMAN INDUCED HAZARDS

08:30 – 09:30 Lecture 14: IAEA Safety Guide on Human induced (NS-G-3,1) and Geotechnical Hazards (NS-G-3.6) in site evaluation for NPPs (IAEA & JPT)

9:30 – 10:30 Lecture 15: Geotechnical aspects and foundation safety, NS-G-3.6 (IAEA & JPT),

10:30 – 11:00: Coffee break

Session 14: POTENTIAL EFFECTS OF NUCLEAR INSTALLATIONS IN THE REGION

11:00 – 11:30 Lecture 16: Dispersion in air and water, NS-G-3.2, (IAEA&KHL)

11:30 – 13:00 Lecture 17: Population considerations, Radiological Impact and Demonstration of the feasibility of emergency plan (KHL)

13:00 – 14:00: Lunch break

Session 15: COUNTRY EXPERIENCES

14:00 – 15:00 Hub Country Presentation 7 (Korea)

15:00 – 16:00 Country Presentation 7 (Vietnam)

16:00 – 16:30: Coffee break

Session 16: COUNTRY EXPERIENCES – PLENARY DISCUSSIONS

16:30 – 17:00 Country Presentation 8 (Philippine)

17:00 – 17:30 Discussions

DAY 5 FRIDAY:

Session 17: ENVIRONMENTAL RADIOLOGICAL IMPACT ASSESSMENT

08:30 – 9:00 Lecture 18: Environmental radiological impact assessment (KHL)

Session 18: PROJECT MANAGEMENT AND SITE DEVELOPMENT

9:00 – 10:00 Lecture 19: Project Management, Field experiences and lessons learned in preparation and development of the site for a nuclear power plant project. (JPT)

10:00 – 10:30: Coffee break

Session 19: CLOSING SESSION

10:30 – 11:30 Closing Remarks (BAPTEN, ANSN, IAEA)

11:30 – 12:00 Conclusions