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Executive Summary

This report describes the activities implemented by the Asian Nuclear Safety Network (ANSN) between January 2013 and December 2013. 56 activities were conducted within the ANSN framework during 2013.

More details about the results of activities described in this report are available on the ANSN's main website at the following address: www.ansn.org.

In April 2009, the ANSN developed the "Vision for the ANSN by the Year 2020", which envisages the ANSN as a strong human and advanced information technology network that is capable of efficiently acquiring, creating and sharing nuclear safety knowledge and experience. In January 2013, the ANSN revised its Vision 2020 to consider the lessons learned from the Fukushima Daiichi accident as well as to emphasize the realistic and practical arrangements that are necessary to achieve the ANSN's objectives. In line with this, it was decided by the ANSN to focus on nuclear safety capacity building, based on an in-depth understanding of risks and their consequences, as well as on fostering nuclear safety culture from the very start of a nuclear power programme.

The ANSN, in its capacity as a regional nuclear safety knowledge and experience sharing network, has also proactively continued to support the implementation of the relevant actions of the IAEA Action Plan on Nuclear Safety at the regional level.

There continues to be a strong need for nuclear safety capacity building and infrastructure development in Asia in order to establish robust scientific and technological expertise and practical problem solving skills that are capable of sustaining the dynamic development of nuclear power programmes throughout the region.

In 2013, the newly formed Capacity Building Management Group (CBMG) proposed a mechanism to promote self-assessment among ANSN member countries, and thereafter to plan the capacity building activities that are required to fill the gaps identified by the self-assessment process. In line with this, the ANSN Topical Groups have also been encouraged to find ways of supporting the practical application of the newly published International Atomic Energy Agency (IAEA) Safety Guide *Establishing the Safety Infrastructure for a Nuclear Power Programme* (IAEA Safety Standards Series No. SSG-16, Vienna, 2012).

At the 17th ANSN Steering Committee meeting in April 2013, the Russian Federation was welcomed as a potential supporting State and the European Nuclear Safety Training and Tutoring Institute (ENSTTI) as a potential supporting organization to facilitate cooperation for ANSN activities, specifically in the area of education and training. During this meeting, discussions were also held on possible approaches to encourage the participation of non-ANSN member countries as observers in ANSN national and relevant regional activities.

In 2013, the ANSN planned a first-of-its-kind evaluation exercise (field visits) to gather recommendations from those of its stakeholders that are responsible for strategic planning as well as the implementation of ANSN activities. The aim was to analyse the effectiveness and efficiency of past ANSN activities, across all ANSN Topical Groups. Based on these field visits, a comprehensive report outlining recommendations and corresponding corrective actions was drafted. The field visits were conducted in three ANSN member countries (Indonesia, Republic of Korea and Viet Nam), and the IAEA has been tasked with considering these recommendations and with prioritizing and executing the necessary actions in the near future.

During the Second ANSN Plenary Meeting in September 2013, discussions were held to explore mechanisms for further enhancing collaboration between the ANSN and the ASEAN Network of Nuclear Regulatory Bodies on Atomic Energy (ASEANTOM). It was also proposed that the number of ANSN Topical Groups should be reassessed in order to realign them to the new ANSN Vision 2020, or, if necessary, restructured, using the IAEA safety standards (SSG-16) as the basis for this process.

The ANSN in close cooperation with Japan also organized a Regional Workshop on Continuous Improvement of Safety in the Light of Lessons Learned from the Accident at TEPCO's Fukushima Daiichi Nuclear Power Plant in December 2013. The purpose of the workshop was to share information in terms of lessons learned from the Fukushima Daiichi accident and to leverage this information to improve the effectiveness of the ANSN programme in future. At the ANSN Steering Committee meeting in November 2013, held in Chiang Mai, Thailand, a comprehensive ANSN work programme for 2014 was adopted. The work programme includes a number of activities to provide support arrangements for capacity building and infrastructure development in ANSN member countries in line with the IAEA Action Plan on Nuclear Safety (Peer Review and Support Arrangement), as well as activities to support the dissemination of feedback on lessons learned from the Fukushima Daiichi accident.

The current ten Topical Groups remain at the forefront of the ANSN's activities. An overview of ANSN activities in 2013 is provided in Table 1, which indicates that a total of 56 activities such as workshops, training courses and review missions were conducted during the year, with 541 international participants and support provided by 34 external experts, and from IAEA staff members. As a result, nuclear safety experts in the region are able to work more closely together, thus continuously improving nuclear safety capacity building and infrastructure development in the region.

The ANSN has also made significant progress in the implementation of the capacity building IT modules, specifically in the establishment of an online nomination process and a 'pool of experts' database, as well as in the use of online communication tools (webinars). The online nomination process has been used successfully by participants and experts taking part in ANSN activities during 2013. The online communication tools (webinars) have been effectively used by ANSN Topical Groups for their discussions. The ANSN also encouraged the IAEA Technical Officers to utilize the pool of experts database to nominate experts for the ANSN regional and national activities.

The ANSN attaches strategic importance to the enhancement of cooperation among the global and other regional networks and forums, including the Global Nuclear Safety and Security Network (GNSSN), the Ibero-American Forum of Radiological and Nuclear Regulatory Agencies (FORO), the Forum of Nuclear Regulatory Bodies in Africa (FNRBA), the Arab Network of Nuclear Regulators (ANNuR), and the European Technical Safety Organisations Network (ETSON). The ANSN participated in several coordination meetings together with other regional safety networks during 2013 in order to exchange best practices.

Finally, it is also important to mention that the IAEA received generous contributions from the European Commission, Japan, the Republic of Korea and the United States of America to support the continuous improvement of nuclear safety in ANSN member countries.

Table 1: Number of activities implemented in 2013

ANSN Management	12
Plenary	1
Steering Committee	2
Capacity Building Management Group (CBMG)	2
Information Technology Support Group (ITSG)	1
Other activities	6
Regional	34
Topical Group on Communication and Consultation with Interested Parties (CTG)	2
Topical Group on Education and Training (ETTG)	8
Topical Group on Emergency Preparedness and Response (EPRTG)	3
Topical Group on Governmental and Regulatory Infrastructure (GRITG)	3
Topical Group on Leadership and Management for Safety (LMSTG)	2
Topical Group on Operational Safety (OSTG)	1
Topical Group on Radioactive Waste Management (RWMTG)	3
Topical Group on Safety Analysis (SATG)	6
Topical Group on Safety Management of Research Reactors (SMRRTG)	3
Topical Group on Siting (STG)	2
Joint	1
National	10
China	2
Indonesia	4
Malaysia	1
Philippines	2
Thailand	1
Total number of activities	56

Table 2: Contributions in 2013

Country/Entity	Contributions
European Commission	€1 080 308
Indonesia	Hosting of four regional workshops and annual meetings.
Japan	€713 107, including one cost-free expert for one year. In addition, hosting of three regional workshops.
Republic of Korea	€346 843, including one cost-free expert, type A and one cost-free expert, type B.
Philippines	Hosting of two regional workshops and annual meetings.
Thailand	Hosting of three regional workshops and annual meetings.
USA	€438 350
Viet Nam	Hosting of two regional workshops and annual meetings.

Strategy and Coordination Activities

Consultancy Meeting to Revise the ANSN Vision 2020

Tokyo, Japan
30–31 January 2013

IAEA Technical Officer: Mr Lingquan GUO
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

A consultancy meeting was organized at the Japan Nuclear Energy Safety Organization (JNES), Tokyo, Japan, from 30 to 31 January 2013, to revise the ANSN Vision 2020. One expert from France and two ANSN Steering Committee members participated in this meeting together with several International Atomic Energy Agency (IAEA) representatives and JNES officials.

The objectives of this meeting were to revise the ANSN Vision 2020, taking into account the outcomes and recommendations reached by the Asian Nuclear Safety Network (ANSN) Plenary in the light of the Fukushima Daiichi accident.

In response to the challenges and lessons highlighted by the Fukushima Daiichi accident, nuclear industry organizations and safety regulators throughout the world are reviewing their approaches to nuclear and radiation safety and undertaking/planning various measures to address possible vulnerabilities in their approaches and to strengthen them. The aspects covered include safety regulation, safety measures, safety culture and emergency preparedness. As part of such activities, the IAEA developed the IAEA Action Plan on Nuclear Safety to further strengthen nuclear safety worldwide. The guidance and methodology for assessment of capacity building in Member States with nuclear power programmes and those planning to embark on such programmes were also developed with reference to the lessons learned from the accident.

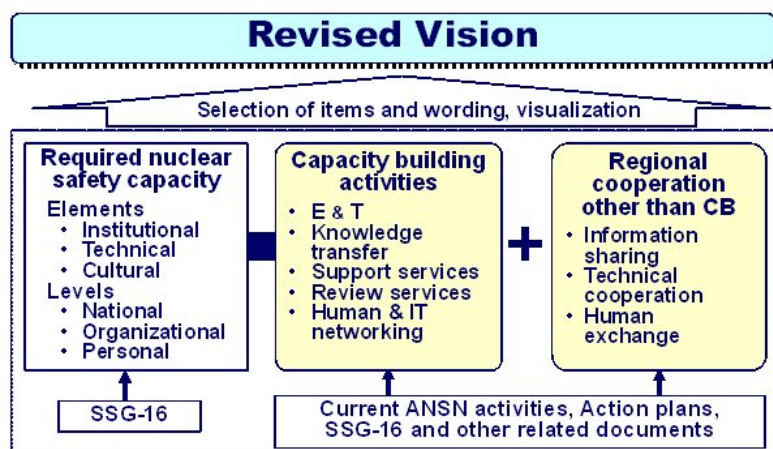
During the meeting, an approach for revising the ANSN Vision 2020 to reflect the various changes in the environment surrounding the ANSN was discussed by the IAEA officers present and the representatives of the ANSN member countries.

Although the fundamental concepts provided in the current ANSN Vision 2020 are still valid and useful for promoting the ANSN's activities, some of the ideas (e.g. virtual technical support organization (TSO) and customized services) were reconsidered on the basis of the operating experience obtained up to now.

The following specific points were considered, explicitly or implicitly, in developing a revised ANSN Vision 2020:

- Capacity building as a major focus;
- Inclusion of radiation safety in the scope of activity;
- Use of *Establishing the Safety Infrastructure for a Nuclear Power Programme* (IAEA Safety Standards Series No. SSG-16, Vienna, 2011) as a basic document for defining safety approaches;
- Making best use of the IAEA's available safety instruments and services;

- Consideration of lessons learned from the Fukushima Daiichi accident (e.g. safety culture aspects); and
- Increased participation and ownership.



The following were some of the key outcomes of the revision of the ANSN Vision 2020:

- For education and training (E&T):
 - Advanced use of training centres and e-library
- For knowledge transfer:
 - Transfer of knowledge of wisdom level, including safety culture aspects
- For support and review services:
 - Support and arrangements for the IAEA's customized services
- For human and information technology (IT) networking
 - Promotion of current plans and activities. including online planning
- For further activation of ANSN activities
 - Increased interaction, participation and ownership

17th ANSN Steering Committee Meeting

Vienna, Austria
24–26 April 2013

IAEA Technical Officer: Mr Lingquan GUO
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

The 17th ANSN Steering Committee meeting was held from 24 to 26 April 2013 at the IAEA's Headquarters in Vienna, Austria, and was attended by the Steering Committee members from Bangladesh, China, France, Germany, Indonesia, Japan, Kazakhstan, Republic of Korea, Malaysia, Philippines, Singapore, Thailand, United States of America, and Viet Nam, as well as by a

representative from the European Nuclear Safety Training and Tutoring Institute (ENSTTI), the Coordinator of the ANSN Capacity Building Management Group (CBMG), the Peer Review and Support Arrangement (PReSA) Coordinator, ANSN Project Management Officers (PMOs), the ANSN Scientific Secretary and other IAEA Technical Officers. A representative of the Russian Federation was also invited to attend the meeting.



The IAEA officers reported on ANSN activities since the last Steering Committee meeting as well as on the progress of the Global Nuclear Safety and Security Network (GNSSN) and various regional networks. The IAEA officers also gave a briefing on the progress of the capacity building and infrastructure development initiative, including a strategic approach to E&T and key elements for building competence, with a focus on developing guidance and support for human resources related activities and processes, the implementation of methodologies and guidance documents for nuclear knowledge management (NKM) and the experience of Finland and Spain in national self-evaluation methodologies to facilitate capacity building initiatives. Members of the IAEA Action Plan team also presented the IAEA Action Plan on Nuclear Safety and the status of its implementation.

National presentations were delivered by the ANSN member countries on the status of their nuclear power plants (NPPs), nuclear safety regulatory bodies, response to the Fukushima Daiichi accident, and nuclear safety development plans.

The progress of the CBMG's work, along with the future approach for the Group's working mechanisms, was presented. It was stressed that the self-assessment approach should be country-driven and that, therefore, ANSN member countries initially needed to commit themselves to conducting self-assessments, and thereafter the CBMG would work closely with these interested countries to plan and conduct self-assessments, identify gaps and implement relevant capacity building activities in close cooperation with the ANSN Topical Groups.

The CBMG also reported on the progress of the revision of the ANSN Vision 2020, with which it had been tasked by the ANSN Plenary, in particular to incorporate the lessons learned from the Fukushima Daiichi accident.

The IAEA Secretariat reported on the progress of ANSN evaluation by independent experts, initiated in 2010. It was noted that several reports based on desk reviews and online surveys had been generated so far. The draft terms of reference for ANSN evaluation highlighted the scope, approach, resources and timescales of the field visits. The draft terms of reference for the future ANSN evaluation visits were accepted.

The IAEA Secretariat presented the provisional agenda for the Second ANSN Plenary, to be held in September 2013 on the sidelines of the 57th regular session of the IAEA General Conference. The agenda was accepted by the participants.

Some key conclusions from this meeting were as follows:

- Mechanisms for future cooperation with ENSTTI.
- Recipient ANSN member countries to report back to the IAEA Secretariat regarding their views on participating in the self-assessment approach for capacity building as proposed by the CBMG.
- The ANSN would explore potential approaches to encourage inviting other IAEA Member States to observe national activities, i.e. international missions and national emergency exercises.

Consultancy Meeting to Finalize the Questionnaire for the ANSN Evaluation Field Visits

Vienna, Austria
28–30 August 2013

IAEA Technical Officer: Mr Lingquan GUO
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

A consultancy meeting to finalize the questionnaire for ANSN evaluation field visits was convened at the IAEA's Headquarters in Vienna, Austria, from 29 to 30 August 2013. Experts from Belgium, France, Japan and the Republic of Korea participated in this meeting along with IAEA representatives.

The objectives of this meeting were to draft the questionnaire and prepare for the ANSN evaluation field visits to be conducted in Indonesia, Japan and the Republic of Korea.

The IAEA representatives briefed participants on the terms of reference for the ANSN evaluation field visits as well as on the results of the online survey conducted in 2011. Discussions were held on the approach for the drafting of questionnaires for the field visits, as well as on the panel of experts to be sent to each of the selected ANSN member countries for the field visits.

During the meeting, sets of questions were drafted for different categories of respondents such as the high level ministerial officials, ANSN Steering Committee members, Topical Group members, etc. The areas to be addressed included the outcome of ANSN activities till now, expectations from ANSN activities in future and operational aspects of the ANSN.

Second ANSN Plenary Meeting

Vienna, Austria

18 September 2013

IAEA Technical Officer: Mr Lingquan GUO
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

The Second ANSN Plenary Meeting was held at the IAEA's Headquarters in Vienna, Austria, on 18 September 2013, on the sidelines of the 57th regular session of the IAEA General Conference. The meeting was attended by senior officials responsible for nuclear safety from Australia, Bangladesh, Cameroon, China, the European Commission, France, Germany, Indonesia, Japan, Kazakhstan, the Republic of Korea, Malaysia, Pakistan, Philippines, the Russian Federation, Spain, Thailand, Tunisia, Viet Nam and the United States of America. The participation of other regional networks and associations such as ENSTTI was also appreciated.



The objectives of the Plenary were to discuss the revision of the proposed ANSN Vision 2020 as well as future challenges facing the ANSN in order to take into account the lessons learned from the Fukushima Daiichi accident. It was also aimed at discussing further coordination and collaboration with global and other regional knowledge networks pertaining to nuclear safety.

The IAEA representatives placed particular emphasis on the IAEA Action Plan for Nuclear Safety and expressed the hope that the ANSN could work in line with the IAEA Action Plan in order to explore mechanisms to address lessons learned from the Fukushima Daiichi accident as well as to strengthen capacity building via ANSN activities. The IAEA officers also emphasized the importance of capacity building initiatives for Member States embarking on nuclear power programmes and, consequently, also of further cooperation among global and regional networks in a mutually beneficial manner, taking into account the unique technical and cultural background within each region.

The Plenary appreciated the clear definition of the new ANSN Vision 2020 as well as the realistic approach adopted while drafting this document in order to be coherent with the changing needs that have emerged after the Fukushima Daiichi accident. The participants reviewed and endorsed the terms of reference for the ANSN Plenary.

The CBMG presented the ANSN's current vision and an approach for its future improvement. It was stressed that the capacity building initiatives should be needs-oriented from the perspective of recipient ANSN member countries.

Key conclusions from the ANSN Plenary were as follows:

- The necessity of communication with the Association of Southeast Asian Nations (ASEAN) was pointed out, and also that the cooperation and coordination between the ANSN and ASEAN need to be further explored.
- It was also recommended that the GNSSN should welcome representatives of all regional networks as observers.
- It was agreed that the ANSN Vision 2020 should be revisited and revised if necessary; it was proposed that the mandate for reviewing the ANSN Vision 2020 should be delegated to the CBMG in cooperation with all ANSN member countries, Topical Groups and the IAEA.

The Plenary decided that the next plenary meeting would focus on more specific topics such as CBMG activities and the ANSN Vision 2020.

ANSN Evaluation Field Visits

Republic of Korea — Indonesia — Viet Nam
30 September–4 October 2013

IAEA Technical Officer: Mr Lingquan GUO
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

Altogether four experts from Belgium, France, Japan and the Republic of Korea participated in the field visits. A panel of two experts visited each of the three above-mentioned ANSN member countries. An IAEA Technical Officer was also present at the field visit in Indonesia to brief the Indonesian ANSN Plenary members on the purpose of the evaluation as well as on future ANSN capacity building initiatives.

The purpose of the ANSN evaluation field visits was to interview various ANSN stakeholders, responsible for the strategic planning as well as operational implementation of ANSN activities. The visits aimed to analyse the effectiveness and efficiency of past ANSN activities, conducted across various ANSN Topical Groups. Based on these field visits, a comprehensive report comprising of recommendations and any corrective actions (if necessary) would be drafted. The IAEA would be responsible for considering these recommendations, prioritizing the actions and executing them so as to enhance the ANSN's operations.

In the Republic of Korea, there was active participation from all the invited respondents. The respondents were mainly the ANSN Topical Group coordinators. Furthermore, the ANSN Steering Committee members from the Republic of Korea also participated in these interviews. High level officials from the Korea Institute of Nuclear Safety (KINS) acknowledged the significance of these interviews and contributed accordingly their viewpoints on the ANSN's achievements in the past few years.

In Indonesia, ANSN Topical Group members from the National Nuclear Energy Agency (BATAN) and the Nuclear Energy Regulatory Agency (BAPETEN) were interviewed separately. Moreover, the Chairpersons of both BATAN and BAPETEN also made themselves available for the interviews. The panel of experts captured the viewpoints of these stakeholders and sought to extract the common issues and challenges encountered by the Indonesian ANSN user community in order to reflect these in the comprehensive report.

In Viet Nam, ANSN Topical Group members from the Vietnam Agency for Radiation and Nuclear Safety (VARANS) and the Viet Nam Atomic Energy Institute (Vinatom) participated in the field visits. Furthermore, high level officials from these organizations also expressed their opinion on the questions addressed to them.

In summary, the ANSN evaluation field visits were a first-of-its-kind exercise in the history of the ANSN. The ANSN project management team actively supported this initiative. The panel of experts was also involved in drafting the necessary questionnaire for these field visits. Based on these questionnaires, they accomplished a very successful, results-oriented and professional evaluation exercise.

The IAEA expressed its sincere thanks to all the respondents from the Republic of Korea, Indonesia as well as Viet Nam. The IAEA also commended the panel of experts for their excellent job and indicated that it would invite them for a consultancy meeting in November 2013 to draft the final comprehensive report based on the results of these field visits.

Expert Mission to Review the Project for Establishing an International Cooperation Centre for Nuclear and Radiation Safety

Beijing, China

8–11 October 2013

IAEA Technical Officer: Mr Lingquan GUO
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

Invited by the National Nuclear Safety Administration (NNSA), four experts from the IAEA, France and the Republic of Korea undertook a mission to China from 8 to 11 October 2013 in order to review the ongoing project for establishing an International Cooperation Centre for Nuclear and Radiation Safety (ICC-NRS).



The context of the mission is that the Asia and the Pacific region is the most active region in the world in terms of development of nuclear energy and nuclear applications, with 49 nuclear reactors under construction and over a hundred in operation. There are several countries constructing nuclear reactors in the region accounting for approximately 70% of the total number of reactors under construction in the world. Moreover, the Chinese nuclear industry is going through a boom, with 17 units under operation and 31 under construction. After years of efforts, the NNSA and its supporting technical institutions have gained important experience in nuclear and radiation safety regulation. China has established a legal and regulatory framework for nuclear and radiation safety in accordance with IAEA safety standards, and this is a major contribution in ensuring the protection

of China's people and environment. The NNSA is thus capable of providing relevant training for countries that are still at the stage of developing their regulatory system. It is expected that the establishment of the ICC-NRS in China will further boost cooperation in the field of nuclear and radiation safety in the Asia and the Pacific region, enhance technical research and development (R&D) and information exchange, and contribute to the continuous improvement of nuclear and radiation safety in China, other Asian countries and worldwide.

The major task of the expert mission was to review China's project for establishing the ICC-NRS, which is to provide services related to nuclear and radiation safety regulatory technical exchange, personnel training and public communication to IAEA member countries, especially developing countries in the Asia and the Pacific region. The mission included a review of the purposes and objectives, the necessity and feasibility, the existing foundation and advantages of the construction and operation of the ICC-NRS.

During the review, the experts were briefed on the current capacity, resources, and relevant performance of the NNSA and its technical supporting institutions, as well as on the progress of the ICC-NRS project. They also visited the existing training premises and facilities, as well as the National Regulation Technical R&D Base on Nuclear and Radiation Safety which will be constructed in the Fangshan District of Beijing.

The experts also gave presentations on the experience and practice of professional education and training at the IAEA, the International Nuclear Safety School (INSS) and the European Nuclear Safety Training and Tutoring Institute (ENSTTI), which provided interesting reference points for the development of the ICC-NRS project.

In general, the review team appreciated the importance of the project and the potential for making a significant impact in training, R&D and public communication in China, the Asia and the Pacific region and at a global level. The team also considered that such a project would contribute to the improvement of nuclear safety worldwide.

After the conclusions of the review had been drawn up, the Chinese counterparts developed a draft Action Plan based on these which was then presented to the expert team.

Finally, the expert team acknowledged the good preparatory work done for the review as well as the open and transparent manner in which the discussions and exchanges took place.

Tenth Annual Meeting of the Information Technology Support Group

Hanoi, Viet Nam
6–8 November 2013

IAEA Technical Officer: Mr Sameer KUNJEER
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

The tenth annual meeting of the Information Technology Support Group (ITSG) was held at Vinatom in Hanoi, Viet Nam, from 4 to 5 November 2013. The meeting was attended by representatives from the IAEA and seven countries, namely China, Indonesia, Japan, Republic of Korea, Malaysia, Philippines and Viet Nam.

The participants acknowledged the progress made in the implementation of capacity building IT modules on the centralized ANSN website and also expressed their appreciation for the support provided by ITSG members in integrating relevant elements of these modules in the national centre websites. The IAEA representatives also informed the participants about the recently conducted national workshops in ANSN member countries for training the ANSN stakeholders on the IT modules as well as gathering constructive recommendations for further enhancements.



During the meeting a report on the IT national workshops in ANSN member countries and the developments in the centralized ANSN website was presented. The participants discussed the use of some cybersecurity software to conduct necessary penetration tests on the current implementation of the content management system (CMS) used by the national centre websites. The IAEA representatives also proposed that a white paper should be drafted to outline such security policies for open source technologies. It was emphasized that the CMS team should in future follow these guidelines in order to ensure the security of the ANSN national centre websites. The participants discussed the master server architecture and hosting arrangements to facilitate integration of the capacity building IT modules in the national centre websites, via the CMS.

Some of the key actions agreed upon by the participants were as follows:

- Prepare a common layout for the home pages of the national centre websites.
- The Chinese ITSG member to refer to the centralized as well as national centre websites of the ANSN and to report back to the National Nuclear Safety Administration (NNSA) on the feasibility of implementing a national centre ANSN website for China.
- Necessary coding standards and best practices for PHP coding would be adopted by the CMS implementation team in near future.

National Workshop on Capacity Building IT Modules for ANSN Topical Group Members from Viet Nam

Hanoi, Viet Nam

6–8 November 2013

IAEA Technical Officer: Mr Sameer KUNJEER
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

The National Workshop on Capacity Building IT Modules for ANSN Topical Group Members from Viet Nam was held in Hanoi, Viet Nam, from 6 to 8 November 2013.

The objectives for this national workshop were:

- To brief and train the ANSN Topical Group coordinators on the various capacity building IT modules available on the centralized ANSN website in order to foster more support for future ANSN activities from the perspective of the ANSN Vision 2020.
- To analyse future enhancements in the IT modules, based on the ANSN Topical Group members' requirements.
- To discuss the full or partial integration of the capacity building IT modules in the national centre websites.
- To discuss an approach to promote the use of these modules among a wider audience within the ANSN member countries.



During the workshop, IAEA representative briefed the Topical Group members on the past ANSN and other global and regional knowledge network activities conducted in 2013. The IAEA representative also gave an overview on the specific ITSG activities conducted in 2013 for creating awareness and promoting the capacity building IT modules on the centralized ANSN website. They encouraged the Topical Group members to consider reviewing the centralized ANSN website as well as national centre websites on a periodic basis as well as to acknowledge the respective responsibilities of the ITSG members.

The IAEA representative clarified that the primary responsibility of the ITSG members was to maintain as well as update the content in the national centre websites in the respective local languages. Furthermore, national centre websites could contribute to the integration of necessary elements of the capacity building IT modules and promote awareness of these modules, thereby assisting with capacity building initiatives in ANSN member countries.

The Topical Group members appreciated the use of the CMS tool for maintenance of the national centre websites, in particular how the CMS made it easier to maintain consistency in terms of layout and structure of content among all the ANSN national centre websites.

The participants proposed that the ITSG member from Viet Nam should arrange periodic workshops, to orient the ANSN users from Viet Nam on the new implementation/functionality of the centralized ANSN website as well as national centre websites. The IAEA also agreed to participate in such sessions through a webinar format.

The IAEA representative gave a demonstration of the centralized ANSN website, highlighting the Topical Group pages, the past activities areas, the management structure, the newsletter, progress reports, different administrative modules, etc.

The IAEA officer briefed participants on the online nomination process in the centralized ANSN website, as well as on the procedures involved, the guidelines for Steering Committee members and statistics related to the online nomination process. The online nomination process was also demonstrated using an existing ANSN regional event as an example.

The IAEA representative briefed the participants on the implementation of a database of experts, including the procedures for registering as an expert and other features such as posting queries to experts from a particular Topical Group and the online nomination of experts.

The IAEA officer presented a proposal with a brief overview of the features of future implementation of an e-library, its proposed taxonomy, structure and search features, etc.

The ITSG member from Viet Nam presented a demonstration of the Vietnamese national centre website, highlighting such features as the local news area, the interface for uploading documents, etc. It was noted that the user registration process in the Vietnamese national centre website was no longer required, since all of the contents and documents pertaining to nuclear safety available on the national centre website were open to the general public.

The IAEA expressed its sincere thanks to Vinatom for the excellent hosting of the workshop. The IAEA also thanked the Topical Group members for their valuable contributions as well as suggestions and viewpoints regarding the ANSN website, national centre websites as well as the capacity building IT modules.

Consultancy Meeting to Prepare the Final Report on the ANSN Evaluation Field Visits

Vienna, Austria
11–12 November 2013

IAEA Technical Officer: Mr Lingquan GUO
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

A consultancy meeting was held at the IAEA's Headquarters in Vienna, Austria, from 11 to 12 November 2013 to prepare the final report on the ANSN evaluation field visits. Experts from Belgium, France, Japan and the Republic of Korea participated in this meeting along with IAEA representatives.

During the meeting, a review of the work done during the ANSN evaluation field visits was carried out, and there were also discussions on the structure of the comprehensive report on the field visits. The experts compiled the comprehensive report which highlighted the following:

- Commonalities as well as interesting differences regarding the involvement and perceptions of ANSN member countries.
- Perceived weaknesses — the identification of these would make it easier for the ANSN management to bridge knowledge gaps between the less experienced countries and those with the know-how.
- Key strengths such as the importance of the capacity building goals of the ANSN and its achievements in this area.
- Feedback on the ANSN website and its content, along with the newly implemented capacity building IT modules.
- Good practices in implementing ANSN activities that some of the other countries could consider in the future.
- Indicators and self-assessment tools such as Integrated Safety Evaluation (ISE).
- Overlaps and duplications of ANSN activities with other IAEA activities or other regional cooperation programmes.
- Recommendations to further improve the planning and implementation of ANSN activities made by high level nuclear safety officials from ANSN member countries, Steering Committee members as well as Topical Group members.

The IAEA has agreed to consider the comprehensive report as a driving force to further improve the strategic and operational aspects of the ANSN.

First Meeting of the Capacity Building Management Group

Chiang Mai, Thailand
18–19 November 2013

IAEA Technical Officer: Mr Masakazu TAKAHASHI
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

The first meeting of the CBMG was held in Chiang Mai, Thailand, from 18 to 19 November 2013. Seventeen participants from the following ANSN member countries: Bangladesh, China, Indonesia, Japan, Republic of Korea, Malaysia, Philippines and Viet Nam, as well as France participated in this meeting along with several IAEA representatives.

The purpose of this meeting was to review the progress made by the CBMG as well as to gather feedback from Topical Group members on the support provided by the CBMG.

During the meeting, the CBMG Coordinator briefed participants on the objective of this first meeting of the CBMG, pointing out four key elements of the new vision and operational strategy for the ANSN, namely: self-initiative, strong IT and human networking, applying practical knowledge and experience, and best use of existing resources of the IAEA for ANSN activities. The PReSA Coordinator provided an explanation on the process of self-assessment.

ANSN member countries were encouraged to commit themselves to conduct a self-assessment on the promotion of capacity building and to nominate a national contact point (NCP) to deal with all the necessary coordination for this activity.

ANSN Topical Groups provided their feedback on the CBMG's approach, including its support for the adoption of the guidance contained in *Establishing the Safety Infrastructure for a Nuclear Power Programme* (IAEA Safety Standards Series No. SSG-16, Vienna, 2011) for the self-assessment process. However, some ANSN stakeholders emphasized the need for elaboration of further details of the self-assessment process before adopting the approach.

Discussions were also held on the question as to whether the CBMG self-assessment process might be used in a complementary manner to the self-assessments carried out by ANSN member countries.

Some of the key recommendations from this meeting were as follows:

- Member countries were strongly encouraged to nominate NCPs with the support of the CBMG to analyse the status of each country.
- The terms of reference of the CBMG would be revised according to the new ANSN Vision 2020, as well as taking into account comments from this meeting.
- The ISE process which covered only six ANSN Topical Groups (namely, ETTG, EPRTG, RWMTG, OSTG, SATG and SMRRTG) should be superseded by the current SSG-16 approach in order to accommodate all existing Topical Groups.
- The current ten Topical Groups did not cover all elements of SSG-16. The responsibility for consolidating the existing Topical Groups or creating new Topical Group(s), as necessary, would be delegated to the CBMG.

18th ANSN Steering Committee Meeting

Chiang Mai, Thailand
20–22 November 2013

IAEA Technical Officer: Mr Lingquan GUO
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

The 18th meeting of the ANSN Steering Committee was held from 20 to 22 November 2013 in Chiang Mai, Thailand, hosted by Thailand's Office of Atoms for Peace (OAP), and attended by the Steering Committee members from Bangladesh, China, France, Germany, Indonesia, Japan, Kazakhstan, the Republic of Korea, Philippines, Thailand, the United States of America, Viet Nam, the CBMG Coordinator, the PReSA Coordinator, eight ANSN Topical Group Coordinators, the ANSN Programme Manager and several IAEA representatives.

During the meeting, the IAEA representatives gave a briefing on the progress of ANSN activities and the ANSN capacity building IT modules since the last meeting, as well as on the progress of the GNSSN and other regional networks. The results of the Second ANSN Plenary Meeting were also reported on by the IAEA Secretariat. The IAEA representatives also provided an overview of the ANSN evaluation field visits, including some key recommendations from the ANSN stakeholders.

ANSN Topical Group coordinators presented the progress made by each Topical Group during the year, as well as the work-plan for the subsequent year. Steering Committee members from ANSN member countries presented an overview of the status of their nuclear power programmes as well as participation in the ANSN activities. Representatives from the Western European Nuclear Regulators Association (WENRA) and the ASEAN Network of Nuclear Regulatory Bodies on Atomic Energy (ASEANTOM) also briefed participants on their initiatives for nuclear safety which serve as a framework for cooperation in order to enhance regional nuclear safety, security and safeguards, based on implementation of relevant commitments to the IAEA's standards and guidelines and other multilateral agreements.



The ANSN work programme for 2014 was reviewed and approved in principle by the ANSN Steering Committee. The IAEA representatives also requested the participants to consider several issues such as visibility of ANSN donors and the nomination of participants for ANSN activities (especially considering possible duplication of participants and the qualifications of potential candidates).

The key results of this meeting were as follows:

- All Topical Groups were asked to revisit their terms of reference to verify whether they were in line with the new ANSN Vision 2020 and, if applicable, to revise them.
- It was decided that the current ISE should be superseded by the SSG-16, to cover all the Topical Groups.
- The Steering Committee encouraged all the ANSN members that receive IAEA technical cooperation (TC) support to provide more details about the ongoing TC projects (national and regional) in their next country reports.
- The Steering Committee requested the development of detailed action plans in relation to each recommendation, and that the progress of these should be reported to the next Steering Committee meeting.
- As a model regional project, the visibility of the ANSN should be promoted not only as requested by the European Commission as one of the donors, but also taking into account the wishes of other donors: Japan, the Republic of Korea and the United States of America.
- All the ANSN members should use the online nomination process and respect any deadlines in order to facilitate the implementation requirements and process.

- All nominated participants should meet the specific qualification requirements indicated for ANSN events, and they should continue to contribute actively to the work of their respective organizations in the long term.
- Other regional networks/forums should be able to participate as observers in the ANSN activities, but bearing the costs themselves.
- Mechanisms should be devised for the participation of non-ANSN members such as Hong Kong and the United Arab Emirates in the ANSN activities.
- Mechanisms for cooperation and coordination should be explored with other Asian networks such as ASEANTOM and the Forum for Nuclear Cooperation in Asia (FNCA).

Coordination Meeting with the United States Nuclear Regulatory Commission

Washington DC, United States of America

10–11 December 2013

IAEA Technical Officer: Mr Lingquan GUO
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

A coordination meeting was held between the IAEA and the United States Nuclear Regulatory Commission (NRC) in Washington DC, United States of America, from 10 to 11 December 2013. Three experts from the NRC's International Department attended the meeting.

The objectives of the meeting were to exchange information on the two organizations' programmes and activities related to global, regional and national safety knowledge networks, and to discuss the possibility of providing support for the safety knowledge networks in the form of an extra-budgetary programme funded by the NRC.

During the meeting, the IAEA officers presented the status and progress of the global, regional and national safety networks, including the GNSSN, the ANSN, the Arab Network of Nuclear Regulators (ANNuR), the Forum of Nuclear Regulatory Bodies in Africa (FNRBA), and the National Nuclear Regulatory Portals (NNRPs) on the GNSSN platform. The IAEA representatives also focused on the future development of these networks, including short, medium and long term strategies, new proposals for the future development using a results based approach, covering the rationales, objectives, outcomes and outputs, activities, and estimated budget.

The NRC officers presented an overview of international assistance activities being implemented by the NRC, including infrastructure development, general technical training and regulatory programme development.

During this meeting, the possible support and contribution from the NRC were discussed. The importance of promoting and strengthening the global nuclear safety and security framework through global, regional and national safety networks was acknowledged, and the NRC consequently agreed to provide more support for the safety networks' activities whilst emphasizing the following points:

- Visibility of US contributions.
- Participation of US experts in knowledge network activities.

- Coordination meetings for further cooperation mechanisms.
- Reporting requirements for US contributions.
- Hosting arrangements for knowledge network activities.

Regional Activities

Regional Workshop on Continuous Improvement of Safety in the Light of Lessons Learned from the Accident at TEPCO's Fukushima Daiichi Nuclear Power Station

Tokyo, Japan

10–13 December 2013

IAEA Technical Officers: Mr Jean-René JUBIN and Mr Muralidhar KRISHNAMACHARI
(Regulatory Activities Section — Incident and Emergency Centre,
Division of Nuclear Installation Safety — n/a,
Department of Nuclear Safety and Security)

The workshop was organized by the IAEA and the Japan Nuclear Energy Safety Organization (JNES) in Tokyo, Japan. Forty two participants from seven ANSN member countries (Bangladesh, Indonesia, Malaysia, Philippines, Thailand, Viet Nam and Japan), three IAEA representatives and three external experts from France and Slovakia attended the workshop.

The purpose of the workshop was:

- To share information on the Fukushima Daiichi nuclear accident and to exchange experience and lessons learned;
- To discuss how to make use of this information within the ANSN framework in order to contribute towards improving the ANSN programme and to enhance the effectiveness of its activities; and
- To identify recommendations for strengthening the regional and global nuclear safety framework and raising the level of nuclear safety in the region.

The IAEA officers presented an overview of the IAEA Action Plan on Nuclear Safety and the implementation status of specific actions conducted by the IAEA in relation to peer review missions, IAEA safety standards, regulatory bodies and countries embarking on nuclear power in order to strengthen nuclear safety infrastructure, including the regulatory framework.

A representative from Japan's Nuclear Regulation Authority (NRA) addressed the lessons learned from the Fukushima Daiichi accident and the NRA's actions following the accident. The presentation outlined the current actions conducted by the NRA to strengthen the regulatory framework and the national emergency preparedness and response provisions, as well as the NRA's specific actions in relation to the Fukushima Daiichi accident.

The expert from France reported on the lessons learned and subsequent actions taken in France after the Fukushima Daiichi accident. Throughout the presentation, several lessons learned were shared, including on: long-term crisis management in terms of resources and management of ongoing 'normal' regulatory body activities; media pressure; and international issues. The presentation also described the mid-term actions conducted by the French Nuclear Safety Authority (ASN), including ad hoc inspections and complementary safety assessment based on European Union (EU) 'stress test' specifications extended to all nuclear installations and also addressing emergency preparedness.

The expert from Slovakia reported on his country's actions to comply with the conclusions from the stress tests performed on Slovakian NPPs. In particular, the presentation summarized the country's three action plans: Action Plan on Nuclear Safety; Regulatory Action Plan; and Action Plan on Emergency Preparedness. The actions embedded into the Action Plan on Nuclear Safety are categorized in integrated short/mid and long-term action groups: natural hazards; loss of safety functions; severe accident management; and specific actions, e.g., large fire. The basis for the Regulatory Action Plan consisted of the conclusions from the Integrated Regulatory Review Service (IRRS) mission conducted in Slovakia in 2012. In this respect, the IRRS team concluded that the response of the Nuclear Regulatory Authority of the Slovak Republic (ÚJD SR) to the Fukushima Daiichi accident was in line with IAEA safety standards and international practices. The Action Plan on Emergency Preparedness was established mainly taking into account the outcomes of a national type exercise based on an accident scenario at the Bohunice NPP involving all relevant national organizations.

A staff member from the IAEA's Incident and Emergency Centre (IEC) described the mission of the IEC as being that of serving as the global focal point for emergency preparedness and response (EPR) to nuclear/radiological safety or security related emergencies, threats or events of media interest, as well as serving as the world's centre for coordination of international assistance in this field. In this connection, the IEC staff member gave actual examples of the IEC's response in 2011 to the Fukushima Daiichi accident and the assistance missions conducted under the Response and Assistance Network (RANET) to Cambodia, Trinidad and Tobago and Peru. The IEC's activities arising from the IAEA Action Plan on Nuclear Safety were detailed and reference was made to strengthening the effectiveness of Emergency Preparedness Review (EPREV) missions, the status of the review of *Preparedness and Response for a Nuclear or Radiological Emergency* (IAEA Safety Standards Series No. GS-R-2, Vienna, 2002), the publication of a recent reference document related to severe accident management and the establishment of the Emergency Preparedness and Response Expert Group (EPREG).

The representatives of the participating countries delivered presentations in order to share their experience related to the Fukushima Daiichi accident and the challenges they have encountered.

A working session was organized to make use of the experiences and information shared during the presentation sessions in order to identify recommendations and make conclusions for strengthening the regional and global nuclear safety framework and raising the level of nuclear safety in the region.

Three working groups were formed to focus respectively on: EPR; communication; and the governmental, legal and regulatory framework.

All three working groups presented a summary of the work they had done along with their recommendations and conclusions. They emphasized that the recommendations would enrich the activities of the ANSN and that the level of priority to be assigned to each recommendation could be discussed by the relevant Topical Groups, such as the EPRTG, CTG and GRITG.

The JNES with the cooperation of the Tokyo Electric Power Company (TEPCO) organized a visit to the Fukushima Daiichi nuclear site.

This regional workshop served as an effective forum to share information on the Fukushima Daiichi accident, to exchange experience and lessons learned, and to use this information to identify recommendations for strengthening the regional and global nuclear safety framework and raising the level of nuclear safety in the region.

Topical Group on Communication and Consultation with Interested Parties

Regional Workshop on Communication Plans and Information Technology Tools

Manila, Philippines
28–31 May 2013

IAEA Technical Officers: Mr Jean-René JUBIN and Ms Brenda PAGANNONE
(Regulatory Activities Section — Nuclear Power Engineering Section,
Division of Nuclear Installation Safety — Division of Nuclear Power,
Department of Nuclear Safety and Security — Department of Nuclear Energy)

A Regional Workshop on Communication Plans and Information Technology Tools was organized in Manila, Philippines, by the IAEA in close cooperation with the Philippine Nuclear Research Institute (PNRI), from 28 to 31 May 2013. Eleven participants from six ANSN member countries (Bangladesh, Indonesia, Republic of Korea, Malaysia, Thailand and Viet Nam) as well as experts from France, Japan and IAEA representatives participated in the workshop.

The objectives of the workshop were:

- Review of each country's current status of stakeholder involvement for their national nuclear power programme.
- Review of the steps for the implementation of a stakeholder involvement strategy and plans.
- Experience-sharing from operating countries and other newcomer countries in the area of stakeholder involvement and public communication.
- Creation of working groups to consider case studies on newcomer countries, their stakeholder involvement plans, activities, stakeholders, key messages and tools.

Three working groups were established and presented the results of their work at three sessions during the workshop. The sessions dealt with: case studies of fictitious newcomer countries; reviewing and applying the theory and concepts that had been presented during earlier workshops; and reviewing the CTG's current tasks and collecting any feedback, to be discussed with the ANSN management.

The PNRI organized a technical tour for the last half-day of the workshop, which consisted of a visit to the PNRI's headquarters and the research reactor that is based there.

In conclusion, the following observations on the 2013 CTG work plan were agreed on by the CTG members at the meeting:

- The ANSN website should be used more often as a platform for this community. Only the website should be used for group discussions, i.e. not group/individual emails, and all presentations and photos from this workshop, as well as any other useful documentation and/or links, should be uploaded there.

- A facilitator should be assigned for every period between two CTG meetings, in order to manage and animate the discussion among the CTG members.
- The concept of public hearings (especially related to a new licence) was discussed and the CTG members would like to know more about the experience gained and standards observed during the organization of such hearings in different operating and advanced newcomer countries.

Annual Meeting of the Topical Group on Communication and Consultation with Interested Parties and Regional Workshop on Emergency Communication

Jakarta, Indonesia

30 September–4 October 2013

IAEA Technical Officer: Mr Jean-René JUBIN
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

The second annual meeting of the CTG was organized by the IAEA from 30 September to 1 October 2013 at Jakarta, Indonesia, in conjunction with a Regional Workshop on Emergency Communication from 2 to 4 October 2013. These events were hosted by BATAN. Sixteen participants from seven IAEA Member States (Bangladesh, France, Indonesia, Malaysia, Philippines, Thailand and Viet Nam), an IAEA staff member, a speaker from Japan and two external experts from Australia and France attended the meeting and workshop. Four observers from the host country (Indonesia) also participated in this event.

The CTG annual meeting served as a forum to discuss the CTG's working arrangements, to identify common needs and to review the CTG action plan for the next period. It was also an opportunity to discuss provisions to evaluate the efficiency and effectiveness of the CTG.

The following issues were addressed and resolved during the meeting:

- CTG performance evaluation;
- Revision and update of the CTG work plan which was formulated during the first CTG annual meeting held in Daejeon, Republic of Korea, in October 2012; and
- Use of the ANSN website.

A session was also devoted to a brief presentation on the status of communication activities of each Member State, taking into account how the information and knowledge obtained from previous CTG activities were incorporated into these activities.

The IAEA officer presented the results of preparatory work, carried out with the support of a dedicated task group, on how to measure the CTG's performance.

The ANSN website was briefly presented to the participants, including the CTG web page to show how to use the CTG discussion forum and to access the materials used during previous CTG events.

Key conclusions of the meeting and workshop were as follows:

- The CTG annual meeting served as an effective forum to discuss how this Topical Group can help ANSN member countries in communicating and

consulting with the interested parties, including the public, in an effective manner.

- The formulation of the CTG work plan for the period 2014–2016 was finalized during the meeting.
- Performance indicators to measure the efficiency and effectiveness of the CTG were formulated.
- The participants agreed to use the CTG discussion forum on the ANSN website regularly in order to exchange and share lessons learned and to obtain feedback and other useful information.
- The CTG members were encouraged to collaborate with the EPRTG, especially with regard to their participation in the communication components of emergency exercises, including the forthcoming ConvEx-3 exercise.

Topical Group on Education and Training

Regional Workshop on Special On-the-Job Training for Newcomers to Nuclear Power

Daejeon, Republic of Korea
18–22 March 2013

IAEA Technical Officer: Ms María Josefa MORACHO RAMÍREZ
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A Regional Workshop on Special On-the-Job Training for Newcomers to Nuclear Power was organised at KINS, Daejeon, Republic of Korea, from 18 to 22 March 2013. The training was organized by the IAEA in coordination with KINS as one of the activities planned in 2013 within the framework of the ANSN. Twelve participants from six ANSN member countries (Bangladesh, China, Indonesia, Malaysia, Thailand, and Viet Nam) as well as several IAEA representatives participated in the workshop. Experts from the Republic of Korea presented multiple lectures and facilitated the conduct of discussions.



The purpose of this workshop was to present special practices of nuclear quality assurance (QA) activities for NPPs based on the IAEA safety standards, as well as country specific practices. The workshop provided an overview of quality verification and audit, application of QA programmes followed by vendors, QA programme audit and practice, and vendor inspection technology.

The participants contributed by delivering short presentations on their national regulatory framework, practices, and national nuclear power plans/programmes.

A technical visit to the KEPCO Nuclear Fuel Company's (KNF's) fuel fabrication plant was also organized.

A final examination was also held on the last day of the workshop to measure how much the training had contributed to the participants' knowledge. All the participants were actively engaged in classroom discussions and exercises.

Overall, the participants found the subjects of the workshop very useful for them. In particular, participants who were specialists in some of the subjects covered said that they had benefited

greatly from the workshop and that it had helped them to enhance their knowledge and experience. The technical tour to the KNF's fuel fabrication plant was very worthwhile for the purposes of providing training for all of the participants. They had a good opportunity to familiarize themselves with the fabrication stages of nuclear fuel assemblies.

Additionally, the participants had an opportunity to exchange with one another their knowledge and experience on many relevant subjects.

Regional Workshop on Basic Professional Training in Nuclear Safety

Daejeon, Republic of Korea
8–19 April 2013

IAEA Technical Officer: Ms María Josefa MORACHO RAMÍREZ
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A Regional Workshop on Basic Professional Training in Nuclear Safety was held at KINS, Daejeon, Republic of Korea, from 8 to 19 April 2013. The workshop was organized by the IAEA in coordination with KINS as one of the activities planned in 2013 within the framework of the ANSN. Thirteen participants from seven ANSN member countries (Bangladesh, China, Indonesia, Malaysia, Philippines, Thailand and Viet Nam) as well as several IAEA representatives participated in the workshop. Experts from the Republic of Korea presented multiple lectures and facilitated the conduct of discussions.

The purpose of this workshop was to provide an overview and introductory training in the field of regulatory control of NPPs as well as to support the regulatory bodies of Member States in their own training activities. The target group comprised professional staff members of nuclear safety regulatory bodies supervising NPPs and other radiation facilities, as well as staff having duties and responsibilities in the following regulatory fields: regulatory framework; regulatory organization; regulatory guidance; licensing and licensing documents; assessment of safety; and regulatory inspection and enforcement. Important topics such as regulatory competence and quality of regulatory work, management system and leadership and safety culture as well as emergency preparedness and public communication were also covered.



The participants contributed by delivering short presentations on their national regulatory framework, practices, and national nuclear power plans/programmes. A technical visit to the Yonggwang NPP site was organized by KINS. Initially, a preliminary examination was held for all

participants to understand the level of their knowledge on the subjects of the workshop. A final examination was also held on the last day of the training to measure how much the workshop had contributed to the participants' knowledge.

In conclusion, all the participants were actively engaged in classroom discussions and exercises. The discussions made it clear that the majority of participants had grasped the concepts presented to them. The participants found the subjects of the workshop to be very useful. In particular, participants who were specialists in some of the subjects covered said that they had benefited greatly from the workshop and that it had helped them to enhance their knowledge and experience. The technical visit to the Yonggwang NPP site was very worthwhile for the purposes of providing training for all of the participants. They had a good opportunity to visit an NPP during its operation and to see the main control room and the spent fuel pool facility. Additionally, the participants had an opportunity to exchange with one another their knowledge and experience on many relevant subjects.

Regional Workshop on Regulatory Control of Nuclear Power Plants

Daejeon, Republic of Korea

27–31 May 2013

IAEA Technical Officer: Ms María Josefa MORACHO RAMÍREZ
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A Regional Workshop on Regulatory Control of Nuclear Power Plants was organized at KINS from 27 to 31 May 2013. A total of 22 participants from four ANSN member countries (China, Indonesia, Malaysia and Viet Nam) as well as experts from KINS and IAEA representatives participated in the workshop.

The purpose of the workshop was to exchange information on the role of the regulatory body in the development of safety culture, the role of assessment in this process, and IAEA guidance for regulatory review and assessment.



Throughout the workshop, IAEA Technical Officers and nine KINS senior experts shared their knowledge and information on the relevant topics with the participants. Through a presentation based on *Governmental, Legal and Regulatory Framework for Safety* (IAEA Safety Standards Series No. GSR Part 1, Vienna, 2010), the IAEA officers focused on conceptual aspects of the IAEA safety standards and emphasized those requirements in terms of global safety and security harmonization. The deliverables from the KINS experts, which reflected the IAEA safety standards and their professional experiences, covered, inter alia, documentation for safety, safety culture, public communication, safety assessment, inspection and enforcement, EPR, and regulatory framework, and they were also of an outstanding quality.

In addition to the technical presentation, the participants also had the opportunity to visit the site of the Hanbit NPP owned and operated by the Korea Hydro & Nuclear Power Company (KHNP).

In conclusion, the workshop was a success. The disseminated knowledge and experience will contribute to the regulatory control of NPPs, especially in the case of participants from newcomer countries.

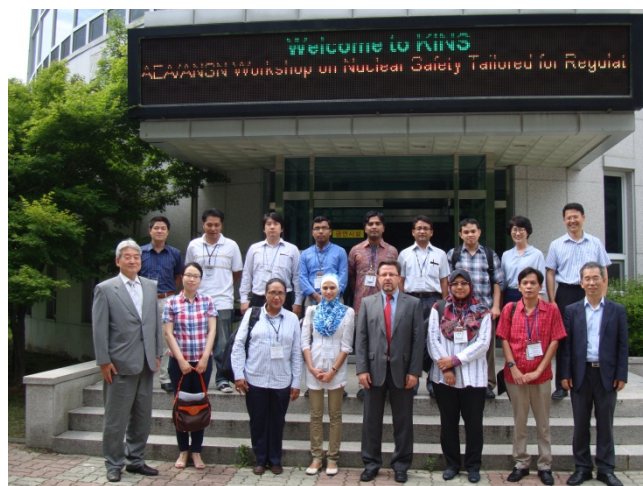
Regional Workshop on Nuclear Safety Tailored for Regulators

Daejeon, Republic of Korea
17–21 June 2013

IAEA Technical Officers: Ms María Josefa MORACHO RAMÍREZ
and Mr Ugur BEZDEGUEMELI
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A Regional Workshop on Nuclear Safety Tailored for Regulators was held at KINS, Daejeon, Republic of Korea, from 17 to 21 June 2013. The training was organized by the IAEA in coordination with KINS as one of the activities planned in 2013 within the framework of the ANSN. Ten participants from six ANSN member countries (Bangladesh, Indonesia, Malaysia, Philippines, Thailand and Viet Nam) as well as experts from KINS and the IAEA participated in the workshop.

The purpose of the workshop was to provide useful knowledge and regulatory practices related to safety assessment in topical areas of electrical power and instrumentation and control (I&C) systems of NPPs. The target group comprised the professional staff of nuclear safety regulatory bodies and their TSOs.



The participants contributed by delivering short presentations on their national regulatory framework, practices, and national nuclear power plans/programmes. A technical visit to the KNF was organized during the workshop. An examination was held to measure how much the workshop has contributed to the participants' knowledge.

In conclusion, all the participants were actively engaged in classroom discussions and exercises. The discussions illustrated that the majority of participants comprehended the concepts presented during the workshop. The participants found the subjects of the workshop very useful for them. In particular, participants who were specialists in some of the subjects covered said that they had benefited greatly from the workshop and that it had helped them to enhance their knowledge and experience. The technical visit to the KNF was very worthwhile for the purposes of providing training for all of the participants. They had a good opportunity to familiarize themselves with the various stages of nuclear fuel manufacturing.

Regional Workshop on Management of Nuclear Knowledge and Safety Competence

Wuhan, China

2–6 September 2013

IAEA Technical Officers: Ms María Josefa MORACHO RAMÍREZ
and Mr Zoltan PASZTORY

(Regulatory Activities Section — Nuclear Knowledge Management Section,
Division of Nuclear Installation Safety — n/a,
Department of Nuclear Safety and Security — Department of Nuclear Energy)

A Regional Workshop on Management of Nuclear Knowledge and Safety Competence was organized in Wuhan, China, from 2 to 6 September 2013. This workshop was proposed by China as a member of the ANSN. Seventeen participants from eight ANSN member countries (Bangladesh, Indonesia, Japan, Kazakhstan, Malaysia, Philippines, Thailand and Viet Nam) along with experts from the Russian Federation and the United States of America as well as IAEA representatives participated in this workshop.

The purpose of the workshop was to present and discuss basic concepts of NKM amongst the ANSN member countries and to share experiences related to NKM programmes in IAEA Member States with highly developed nuclear industries.



A total of 14 presentations, an IAEA practical exercise on NKM self-assessment and discussions were conducted during the workshop. The external experts explained key concepts of knowledge management (KM) based on classical literature and provided practical examples from the Palo Verde

NPP in the USA, and from the State Atomic Energy Corporation “Rosatom” in the Russian Federation, as well as KM examples for regulators and TSOs.

The capacity building umbrella concept developed in line with the IAEA Action Plan on Nuclear Safety, the IAEA safety standards and competence building tools were explained.

Presentations on the IAEA’s KM activities and documents were provided, a practical exercise based on the IAEA’s self-assessment methodology for KM was completed, and time was devoted to the discussion of results.

In conclusion, the participants acknowledged that for safe and secure nuclear power development it is necessary to have in place adequate understanding and NKM resources. The ANSN member countries, which were represented at the workshop by operators, regulators and TSO staff, identified a clear need for further work, including further self-assessment of organizational KM, further development of expertise, training and guidance on KM. In particular, the host organization — the Research Institute of Nuclear Power Operation (RINPO) — expressed its interest in closer cooperation with the IAEA based on the IAEA Knowledge Management Assist Visit methodology.

Leadership and safety culture, human factors, human resource development (HRD), and knowledge engineering expertise are the key pillars of an integrated NKM programme. Participants gained an insight into the current work of the IAEA in these areas, and further assistance and guidance were requested.

The workshop was very much appreciated by the participants, as reflected in the feedback questionnaires. The joint leading of the workshop by IAEA officers from the Department of Nuclear Energy and the Department of Nuclear Safety and Security was fruitful as it illustrated the connection between nuclear safety issues and KM approaches.

Regional Workshop on Safety Review and Assessment for Regulators

Daejeon, Republic of Korea
9–13 September 2013

IAEA Technical Officer: Mr Ugur BEZDEGUEMELI
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A Regional Workshop on Safety Review and Assessment for Regulators was organized at KINS, Daejeon, Republic of Korea, from 9 to 13 September 2013. Fourteen participants from eight ANSN member countries (Bangladesh, China, Indonesia, Kazakhstan, Malaysia, Philippines, Thailand and Viet Nam) as well as IAEA representatives participated in the workshop. The workshop was the first such event to be held from the nine workshop packages which have been designed by the IAEA (some are currently still under development) for embarking countries under Module 1 based on SSG-16.

The purpose of this workshop was to provide lectures on topics from the perspective of the IAEA safety standards; to facilitate relevant discussions (with the help of the IAEA representatives); and to review the workshop material prepared by KINS in order to identify the points requiring further improvement.

An external expert and IAEA representatives delivered presentations on "Safety Assessment" and "Review and Assessment by the Regulatory Body", summarizing the relevant IAEA Safety Requirements publications and Safety Guides. The participants also contributed by delivering short

presentations on their national regulatory framework, practices, and national nuclear power plans/programmes. An examination was held to measure how much the workshop had contributed to the participants' knowledge, and a technical visit to the KNF was organized.



During the presentations on the agenda subjects by the KINS experts, the IAEA experts reviewed their presentations and took notes of the points needed to be further improved; then those notes were discussed with the relevant staff of the International Nuclear Safety School (INSS) at KINS and future actions for further improvement of the presentations were agreed with them.

In conclusion, all the participants were actively engaged in classroom discussions and exercises. The discussions illustrated that the majority of participants comprehended the concepts presented during the workshop. The participants found the workshop to be very useful as it had enabled them to enhance their knowledge and experience, as well as giving them a broader vision of the workshop subject.

The technical visit to the KNF was very worthwhile for the participants, as they had a good opportunity to familiarize themselves with the various stages of nuclear fuel manufacturing.

Annual Meeting of the Topical Group on Education and Training and Regional Workshop to Train the Trainers for the Basic Professional Training Course on Nuclear Safety

Vienna, Austria

4–8 November 2013

IAEA Technical Officer: Ms María Josefa MORACHO RAMÍREZ
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

The annual meeting of the ETTG and the Regional Workshop to Train the Trainers for the Basic Professional Training Course on Nuclear Safety were both organized at the IAEA's Headquarters in Vienna, Austria, from 4 to 8 November 2013. The ETTG's annual meeting was followed by a two-day train the trainers workshop based on the IAEA's safety training materials, in particular the Basic Professional Training Course on Nuclear Safety (BPTC). Seventeen participants from nine ANSN member countries (Bangladesh, China, Indonesia, Japan, Malaysia, Republic of Korea, Philippines, Thailand and Viet Nam) along with an expert from the Russian Federation and IAEA representative participated in the regional workshop. The annual meeting was attended by the ETTG members.

The purpose of the annual meeting of the ETTG was to review the implementation of the ETTG's work programme and the training needs and experience of the ANSN member countries, as well as to outline the Topical Group's activities for 2014.



The IAEA officers presented the latest developments in the ANSN and gave an overview of ETTG activities in 2013, as well as raising a proposal for developing guidelines regarding the nomination of participants for ANSN training events, based on some issues experienced by the IAEA Secretariat. The IAEA representative also presented the concept and definition of capacity building as well as the methodology developed by the IAEA for self-assessment in this area. The ETTG Technical Officer presented the Strategic Approach to Education and Training in Nuclear Safety 2013–2020 and the Strategic Approach to Education and Training in Radiation, Transport and Waste Safety 2011–2020. An update on the IAEA's safety packages in support of countries embarking on a nuclear power programme was also provided.

National presentations outlining Education and Training Review Service (ETRES) guidelines and discussions on E&T-related needs for assistance were delivered by the ETTG representatives. Several presentations on the BPTC, the 'Regulatory Control Book' (i.e. *Regulatory control of nuclear power plants Part A (Textbook)/Part B (Workbook)* (Training Course Series No. 15, IAEA, Vienna, 2012), the Guidelines for Systematic Assessment of Regulatory Competence Needs (SARCoN), and ETRES guidelines were delivered and were well received by the participants. A plenary discussion on country needs, as well as on drafting the ETTG strategic plan for 2014–2016 and the ETTG annual report, were conducted during the annual meeting.

The participants were given a copy of a DVD with a lecture based on Chapter 22 ("Communicating about nuclear technology") of the BPTC. Participants were informed that materials from the BPTC and similar courses that are available in English would be posted on the ANSN/ETTg website.

During the Regional Workshop to Train the Trainers for the Basic Professional Training Course on Nuclear Safety, presentations were delivered by IAEA officers and the invited expert. After the presentations, the participants worked on a case study, namely to develop a training course on human performance in nuclear facilities.

Some of the key conclusions and recommendations from these meetings are as follows:

- ANSN member countries are encouraged to conduct an ETRES mission, as it is an important initial step in building their national strategy for E&T and in establishing their HRD plan.
- Following the ETRES mission, it is recommended to use the SARCoN guidelines and a systematic approach to training (SAT) to develop a national strategy for E&T.
- ANSN member countries should participate in the training courses conducted by the IAEA and/or the ANSN/ETTg in line with their HRD plan.

Regional Workshop on Introduction to the Guidelines for Systematic Assessment of Regulatory Competence Needs (SARCoN), Including the Gap Analysis Tools

Jakarta, Indonesia

11–15 November 2013

IAEA Technical Officer: Ms María Josefa MORACHO RAMÍREZ
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A Regional Workshop on Introduction to the Guidelines for Systematic Assessment of Regulatory Competence Needs (SARCoN), Including the Gap Analysis tools was organized in Jakarta, Indonesia, from 11 to 15 November 2013. Eight participants from four ANSN member countries (Malaysia, Philippines, Thailand and Viet Nam) along with an expert from Mexico and an IAEA Technical Officer participated in the workshop.

The purpose of the workshop was to provide guidance on the processes for management of competence and to introduce participants to the IAEA-developed SARCoN software tool, in particular by providing them with hands-on training on its use.



Indonesia presented the organizational structure of BAPETEN and its role within the national nuclear power programme. This involved a discussion on the regulatory competence level of staff at BAPETEN. The presentation was followed by a discussion and analysis of the HRD mapping at BAPETEN. The difference between the “Junior” and “Young” staff levels was elaborated in detail as were the possibilities of promotion from “Junior” to higher levels and transitions between the various directorates of BAPETEN. The discussions covered the following topics:

- “Junior” to “Young” promotion

- Transfer practices from one directorate to another
- Recruitment and training practices
- Training capabilities for the large number of staff
- Outsourcing of recruitment
- Internal technical support organization (Assessment Centre)

An overview presentation was provided by the IAEA on the Safety Report *Managing Regulatory Body Competence* (Safety Reports Series No. 79, IAEA, Vienna, 2014).

The expert from Mexico introduced the SARCoN guidelines and the associated methodology developed by the IAEA as well as feedback from the practical application of the SARCoN methodology in Mexico and by the Ibero-American Forum of Radiological and Nuclear Regulatory Agencies (FORO).

After this introduction to the topic the experts discussed the tasks of BAPETEN's various directorates, previously discussed in preparation of the workshop. All participating countries presented the status of their regulatory body's structure, competence analysis and current staffing, training and recruitment practices.

The format of the workshop was eminently practical and, at the same time, this led to reflective discussions among the participants. Feedback was collected from the participants in order to improve future workshops on this topic. Participants were also asked to complete an evaluation which contained some questions related to the content of the workshop.

Key conclusions from this workshop are listed below:

- The participants gained confidence in the use of the SARCoN methodology and software tool and were able to complete the exercise without further guidance from the experts.
- The quadrant model for regulatory competence was understood, and the workshop was found useful and enhanced regional communication and collaboration.
- The IAEA Technical Officer emphasized the importance of competence management with regard to the implementation of the IAEA Safety Requirements for the development of regulatory personnel and for a national nuclear energy programme as a whole.
- Possible actions by ANSN member countries and the IAEA were identified and agreed upon during the workshop.

Topical Group on Emergency Preparedness and Response

Regional Workshop on Optimization of Radiation Emergency Preparedness and Response in Line with the New Basic Safety Standards

Hanoi, Viet Nam

16–18 June 2013

IAEA Technical Officer: Mr Jean-François LAFORTUNE
(Incident and Emergency Centre,
Department of Nuclear Safety and Security)

A Regional Workshop on Optimization of Radiation Emergency Preparedness and Response in Line with the New Basic Safety Standards was organized in Hanoi, Viet Nam, from 16 to 18 June 2013. Fifteen participants from Australia, Bangladesh, Indonesia, Japan, Republic of Korea, Malaysia, Philippines and Thailand, as well as an expert from Hungary and IAEA representatives participated in the workshop.

The purpose of the workshop was to inform the participants of the latest IAEA requirements and guidance on EPR, and to inform the Member States on how to optimize their existing EPR arrangements to meet these requirements.



An existing EPR course was customized to focus on optimization of plans and the decision making process during a nuclear or radiological emergency. There was a discussion session on the formulation of a regional action plan to optimize emergency preparedness at a regional level, recognizing and taking advantage of resources that exist in the region.

The workshop focused on two aspects: optimization of decision making regarding the protection of the public following a radiation accident, during the urgent and longer-term/recovery phases; and optimization of plans and arrangements for EPR, building on existing resources and capabilities. During the workshop, working group sessions were conducted, where countries were paired and asked to develop an action plan for optimization of the emergency response plans and arrangements at the national level, and then at the regional level.

Several actions were agreed upon during the workshop as listed below:

- Integrate all radiation monitoring networks.

- Provide training on atmospheric transport modelling for countries in the region, in particular on how to do plume modelling and to know when to use it, mostly for planning purposes.
- Develop a regional database of capabilities for intra-regional cooperation.
- Establish points of contact in the region for normal and emergency situations.
- Adopt IAEA safety standards on a regional basis in order to ensure compatibility and harmonization.
- Use or enhance mechanisms for the coordination and integration of non-nuclear emergency management agencies on a regional level.
- Harmonize the way exercises are conducted on a regional level.
- Conduct regional exercises, integrating all organizations that must respond to a nuclear or radiological emergency.
- Adopt a common regional language for information sharing.
- Conduct joint regional training at all levels.
- Establish a joint strategy for educating the public about radiation emergencies.

Annual Meeting of the Topical Group on Emergency Preparedness and Response

20–21 June 2013

Hanoi, Viet Nam

IAEA Technical Officer: Mr Jean-François LAFORTUNE
(Incident and Emergency Centre,
Department of Nuclear Safety and Security)

The eighth annual meeting of the EPRTG was held in Hanoi, Viet Nam, on 20 and 21 June 2013, and was hosted by VARANS. Twenty-one representatives from Australia, Bangladesh, Indonesia, Japan, the Republic of Korea, Malaysia, Philippines, Thailand and Viet Nam as well as IAEA officer participated in the meeting.

During the meeting, a review of the EPRTG's activities during the preceding year was conducted, and a summary of the results was provided. The participants presented an overview on responses to the Fukushima Daiichi accident, a report based on SSG-16, and EPR progress achieved within respective ANSN member countries.

Some of the recommendations from the workshop are listed below:

- Integrate all radiation monitoring networks.
- Provide training on atmospheric transport modelling for countries in the region, in particular on how to do plume modelling and to know when to use it, mostly for planning purposes.
- Develop a regional database of capabilities for intra-regional cooperation.
- Establish points of contact in the region for normal and emergency situations.

- Adopt IAEA safety standards on a regional basis in order to ensure compatibility and harmonization.
- Use or enhance mechanisms for the coordination and integration of non-nuclear emergency management agencies on a regional level.
- Harmonize the way exercises are conducted on a regional level
- Adopt a common regional language for information sharing.
- Conduct joint regional training at all levels.
- Establish a joint strategy for educating the public about radiation emergencies.

Regional Workshop on Medical Response to a Radiological Emergency: Handling Complex Situations

Chiba, Japan

1–4 October 2013

IAEA Technical Officers: Mr Eduardo Daniel HERRERA REYES
and Mr Jean-François LAFORTUNE
(Incident and Emergency Centre,
Department of Nuclear Safety and Security)

This workshop was organized by the IAEA/IEC, the ANSN and Japan's National Institute of Radiological Sciences (NIRS). Seventeen participants from nine ANSN members countries (Bangladesh, Indonesia, Kazakhstan, Republic of Korea, Malaysia, Philippines, Singapore, Thailand and Viet Nam), as well as experts from Japan and the Republic of Korea, and IAEA Technical Officers participated in the workshop.



The purpose of the workshop was to provide health officials and medical professionals with the information necessary for building and properly using the required capacity to respond to the medical consequences of a radiation emergency and, in particular, to handle complex situations. Medical facility planning and training should be prepared before an emergency. The experts shared their knowledge on the symptoms and treatment of acute radiation syndrome and other deterministic health effects with the participants, who were requested to give presentations on the medical capabilities in their respective countries.

The specific objectives of the workshop were as follows:

- Provide information on radiation accidents and the medical response and lessons learned from the radiation accidents in Goiânia, Brazil (1987), Yanango, Peru (2002), and Nueva Aldea, Chile (2005).
- Coordinate discussions between participants and lecturers regarding the medical capabilities of each country and at the regional level.
- Understand the role of a possible cooperative medical network in radiation emergencies for the region.
- Understand the importance of training medical professionals to recognize patients exposed to radiation and to know the evolution of these cases and the initial treatment that should be administered.
- Provide training materials for the participants.

The participants were proactive and very interested in all the lectures. The first part of the discussion regarding the local and regional medical capabilities was very important to understand the different organizational levels in each country. In the second part of this activity, the organization of a medical network and its role in preparedness for and response to radiation emergencies was discussed.

Some of the conclusions were as listed below:

- In the preparedness area, it is very important to identify for each country the medical teams involved in radiation emergencies (and also their medical capabilities and experience in this area) in order to create the basis for any future cooperation.
- The proposed cooperative medical network would provide the possibility of interaction, sharing knowledge and medical information, organizing scientific events and cooperating in cases of radiation emergencies.

Regional Workshop on Observing a Nuclear Emergency Response Exercise of a Local Government

Hokkaido, Japan
7–10 October 2013

IAEA Technical Officer: Mr Jean-François LAFORTUNE
(Incident and Emergency Centre,
Department of Nuclear Safety and Security)

This workshop was part of a capacity building initiative in Asian countries organized by the ANSN and the IAEA, and was hosted by the Japan Atomic Energy Agency (JAEA) and the JNES in Hokkaido, Japan, from 7 to 10 October 2013. Twenty seven participants from eight ANSN member countries (Bangladesh, Indonesia, Republic of Korea, Malaysia, Philippines, Singapore, Thailand and Viet Nam), as well as an expert from Canada and IAEA representatives participated in the workshop.

The objective of the workshop was to observe a nuclear emergency exercise, and to share observations, experience and knowledge, so that they could be used to improve EPR plans in IAEA Member States.

The Japanese hosts provided a brief overview on their country's experience during the Fukushima Daiichi accident. A visit to the alternative off-site centre in Kutchan was also organized during the workshop, and during the visit a coordination meeting and video conference call between the

response agencies were demonstrated. Furthermore, a visit to Otaru City was arranged to enable participants to witness the reception of evacuees there.



The nuclear emergency exercise was well organized and it served to demonstrate the response to a severe accident with a release triggering an evacuation. At the off-site centre, the exercise appeared to validate all the objectives related to decision making (notification and activation, urgent protective actions, emergency worker protection, medical and other emergency services, public information). A small number of evacuees (less than 50) were transported by bus and helicopter to the reception centre. They were registered and monitored for contamination. They were then directed to a medical team if they had health problems.

During the workshop, each participating country presented the lessons learned during this exercise programme. The IAEA Technical Officer briefed participants on the IAEA's exercise guidelines (*Methods for Developing Arrangements for Response to a Nuclear or Radiological Emergency* (Emergency Preparedness and Response Series, EPR-METHOD 2003, IAEA, Vienna, 2003) and *Preparation, Conduct and Evaluation of Exercises to Test Preparedness for a Nuclear or Radiological Emergency* (Emergency Preparedness and Response Series, EPR-EXERCISE 2005, IAEA, Vienna, 2005), as well as on the documents available from the IAEA and the content of the guidance.

The guidance published by the IAEA on nuclear security and nuclear safety could be further improved by further coordination between the two areas.

Topical Group on Governmental and Regulatory Infrastructure

Regional Workshop on Developing a Legal and Regulatory Framework

Vienna, Austria
3–7 June 2013

IAEA Technical Officer: Mr Kenta OKANO
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A Regional Workshop on Developing a Legal and Regulatory framework was organized from 3 to 7 June 2013 at the IAEA's Headquarters in Vienna, Austria, within the ANSN framework and in close coordination with technical Divisions of the IAEA. This was a regional event supported by TC funds. Twenty-two participants from ANSN member countries, Bahrain, Cambodia, Iraq, Jordan, Lao People's Democratic Republic, Mongolia, Myanmar, Oman, Sri Lanka, Syrian Arab Republic, Turkey, and Yemen as well as IAEA representatives participated in this workshop.



The purpose of the workshop was to assist the participants in gaining a better understanding of the national commitments and responsibilities needed to establish an appropriate infrastructure for safety in a complete, appropriate and timely manner in order to achieve the safe implementation of a nuclear power programme. Based on the discussion held during the last GRITG annual meeting in 2012, the GRITG members were advised to participate in this workshop.

The representatives from all participating countries presented the current and expected situation in the near future regarding their national legal and regulatory framework for nuclear safety. IAEA staff delivered a series of presentations, including on "Overview on Safety Infrastructure", "Legal Framework, Elements of a Comprehensive Nuclear Law for Nuclear Power Programmes", "Regulatory Approaches", "Licensing" and "Leadership and Management for Safety". External experts from Pakistan and Turkey presented an overview of the legal and regulatory framework for nuclear safety, including the regulatory approach adopted by their own countries, and also shared information on their respective countries' status in the following areas: regulatory approaches for nuclear power programmes, the licensing process for nuclear facilities, leadership and management

for safety. In addition, a working session was held to develop a work plan to implement relevant actions based on SSG-16. Through these activities, the participants were able to discuss specific issues freely and to ask the experts questions on them. Further presentations were given at the working session and these helped participants to understand the rationale behind those selected actions, which were directly related to establishing a regulatory framework.

All participants were actively involved in the discussions and working sessions. It was acknowledged that the meeting was very helpful, in particular by enabling participants to figure out the key elements to consider when developing a nuclear safety infrastructure for a nuclear power programme; and to develop a common understanding on how to implement the actions identified in SSG-16.

Fifth Annual Meeting of the Topical Group on Governmental and Regulatory Infrastructure and Regional Workshop on the Establishment of National Policy and Strategy for Safety

Jakarta, Indonesia,
13–15 November 2013

IAEA Technical Officer: Mr Russell GIBBS
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

The fifth annual meeting of the GRITG was held in conjunction with a Regional Workshop on the Establishment of National Policy and Strategy for Safety from 13 to 15 November 2013 in Jakarta, Indonesia. Fifteen participants from eight ANSN member countries (Bangladesh, Indonesia, Japan, Republic of Korea, Malaysia, Philippines, Thailand and Viet Nam) as well as IAEA representatives participated in the workshop. The GRITG members participated in the annual meeting.

The General Safety Requirements publication *Governmental, Legal and Regulatory Framework for Safety* (IAEA Safety Standards Series No. GSR Part 1, Vienna, 2010) includes as one of 36 requirements the establishment of a national policy and strategy for safety. Such a policy and strategy are crucial because they express a long term national commitment to safety, implemented using a graded approach to safety, depending on national circumstances.

The objective of the workshop was to enable participants to gain an appreciation of the importance of developing a national policy and strategy for safety through self-assessment. Workshop activities to support this objective included the following:

- An overview of the safety standards regarding the establishment of national policy and strategy for safety (i.e. GSR Part 1, SSG-16, etc.) were provided.
- An experienced external expert presented experiences and challenges related to the establishment of a national policy and strategy for safety.
- GRITG members shared the results of completed exercises involving self-assessment against the guidance contained in SSG 16.
- An exercise was conducted to prepare a framework/outline of GRITG members' national policy and strategy for safety using the results of action plans derived through self-assessment exercises.

During the workshop, IAEA safety standards relevant to the establishment of a national policy and strategy for safety were introduced and reviewed, with examples provided by some countries on the basis of their actual policies and/or strategies. GRITG members also presented the results of their self-assessment exercises as well as the action plan on establishing a national policy and strategy for safety that they had prepared for this workshop. The participants were divided into two groups and exercises were conducted to prepare a common framework/outline of a national policy and strategy for safety. Finally, the results were discussed and the participants' understanding of how to implement a national policy and strategy for safety was assessed.

The host country (Indonesia) indicated that it was planning to conduct a self-assessment in preparation for receiving an IRRS mission in the near future, and that it would try to use the results of this self-assessment to develop its national policy and strategy for safety.

Topical Group on Leadership and Management for Safety of the Regulatory Bodies

Regional Workshop on Leadership and Management for Safety and Safety Culture for the Regulatory Body and Other Stakeholders of the Nuclear Power Programme

Bangkok, Thailand

20–23 May 2013

IAEA Technical Officer: Ms Abida KHATOON
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

This mission, in the form of a regional workshop, was undertaken as part of the action plan established in 2012 by the newly formed LMSTG for regulatory bodies in ANSN member countries. Thirteen participants from seven ANSN member countries (Bangladesh, China, Indonesia, Malaysia, Philippines, Thailand and Viet Nam) as well as experts from Canada and Slovenia, and IAEA representatives, participated in the workshop.

The purpose of the mission and the workshop was to raise awareness and to foster greater understanding of IAEA safety standards and the concepts of leadership, management for safety, and safety culture for the regulatory body and other stakeholders involved in the implementation of a nuclear power programme. The mission also sought to highlight the importance of senior and line management commitment to the effective implementation of a management system and safety culture in an organization.



The mission and resulting workshop were structured to provide a forum for the participants to discuss their national practices and exchange experience on the subject, to develop shared understanding and competency in leadership and management for safety informed by international standards, best practice and regional culture.

The IAEA representatives stressed the importance of the feedback of the participants on integrated management systems and safety culture. The opening sessions were followed by technical presentations, starting with a presentation on the IAEA approach to leadership, management for safety, and safety culture. This presentation covered the structure of the IAEA safety standards and specific details in these standards, such as the Safety Fundamentals, *Governmental, Legal and Regulatory Framework for Safety* (IAEA Safety Standards Series No. GSR Part 1, Vienna, 2010) and *The Management System for Facilities and Activities* (IAEA Safety Standards Series No. GS-R-3, Vienna, 2006), related to integrated management systems, leadership, management for safety, and safety culture. This first presentation was followed by an interesting discussion on the role of leaders, on the one hand, and that of the top or senior management, on the other.

The expert from Slovenia outlined his country's experience of implementing an integrated management system in a regulatory body. The management system of the Slovenian Nuclear Safety Administration (SNSA) has been developed according to the requirements of the ISO 9001:2008 standard, IAEA standards, and the relevant Slovenian legislation and regulations.

The expert from Canada gave a presentation on safety culture and national nuclear programmes, focusing on the roles and responsibilities of senior managers and management commitment. He also provided a detailed overview on the implementation of a management system by the Canadian regulatory body — the Canadian Nuclear Safety Commission (CNSC). It was noted that after a number of initiatives, the CNSC now had a management system aligned with GS-R-3, in which the mission, vision and values of the regulatory body have been clearly defined. He emphasized that one of the guiding values of the CNSC is that safety will never be compromised.

It was concluded that establishing an integrated management system for a regulatory body is a considerable challenge: it consumes a lot of resources and time, and cannot be achieved without management commitment.

Several national presentations, in which participants shared their experiences related to implementing management systems, national regulatory strategic planning, human resource planning, development and training, and KM, as well as insights on their management systems and the challenges they were facing in implementing them, were delivered in the course of the workshop.

During the workshop, the participants were divided into four working groups to complete practical exercises on the development of regulatory processes under an integrated management system. The experts facilitated the work of the groups, as and when needed.

Each group was supposed to define one key regulatory process, namely:

- Development of regulations
- Review and assessment
- Licensing
- Inspection and enforcement

At the end of the exercise, the representatives of the working groups reported the results of their work, describing the key inputs, activities and their flow, and outputs, of their assigned processes.

Some of the conclusions of the workshop were as follows:

The workshop, and hence also the mission, achieved its objectives of raising awareness, fostering increased understanding, and sharing information and best practices on different aspects of leadership, management for safety, and safety culture for the regulatory body and other stakeholders involved in the implementation of a nuclear power programme. Furthermore, the participants' appreciation of the importance of senior and line management commitment to the effective implementation of a management system and safety culture in an organization were enhanced, along with providing them with valuable insights into the diversity or homogeneity of management and leadership values, and the purpose, scope and design of management systems and the development of safety culture.

In planning future activities informed by feedback from this workshop, the IAEA and the ANSN would make every effort to create and maintain a stable core membership in the LMSTG to which training and information would be transferred in a consolidated, systematic manner. Avoiding a

stochastically dispersed transfer of knowledge in the beginning should facilitate the efficient and fast creation of a core group of regional experts and leaders, who can in turn train others in the region.

Second Annual Meeting of the Topical Group on Leadership and Management for Safety of the Regulatory Bodies and Regional Workshop on Development of a Process for Regulatory Activities

Jakarta, Indonesia
7–11 October 2013

IAEA Technical Officer: Ms Abida KHATOON
(Regulatory Activities Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

The second annual meeting of the LMSTG was held in conjunction with the Regional Workshop on Development of a Process for Regulatory Activities from 7 to 11 October 2013 in Jakarta, Indonesia. Twenty three participants from seven ANSN member countries (Bangladesh, China, Indonesia, Malaysia, Philippines, Thailand and Viet Nam) as well as experts from Canada and Slovenia, and IAEA representatives, participated in the workshop.

The IAEA representatives encouraged the LMSTG members to adopt a strategy of self-reliance to further develop and implement their integrated management systems, and emphasized that the IAEA would provide future support to ANSN member countries in this area. However, it is necessary for each member to develop in-house expertise for the successful development and implementation of their regulatory integrated management system.

The Indonesian participants gave a presentation entitled “Integrating Safety Culture into Regulatory Processes — The Indonesian Experience”. Current industry practices associated with safety culture measurement such as surveys and assessment of performance data (events, non-compliance reports, audit results) were presented by other participants. Each country was asked to provide a specific overview of its nuclear regulatory programme in relation to safety culture. There was some discussion around the migration from ISO 9001 compliant programmes to integrated management systems based on *The Management System for Facilities and Activities* (IAEA Safety Standards Series No. GS-R-3, Vienna, 2006), and it became clear that a better understanding of integrated management systems was needed.

The IAEA officers provided an overview of the IAEA documents and publications dealing with integrated management systems. The content was presented in a logical sequence emphasizing the fundamental principles from which the specific requirements were derived.

Presentations were delivered that shared specific country experience related to regulatory processes (Canada and Slovenia). Both presentations were useful examples that could be used and applied by workshop participants to the development of their own regulatory processes and sub-processes.

During the workshop, an exercise involving a case study of a regulatory organization was conducted. The case study outlined the organization’s core and supporting functions with a further breakdown of specific activities within the functions. The workshop participants were asked to form groups of 3–5 individuals and to complete pre-defined tasks related to process model development, process and sub-process development, and implementation plans for process roll-out.

The expert from Slovenia delivered a presentation entitled “Implementation of Regulatory Processes — Regulations and Regulatory Guides”. This presentation described relevant Slovenian legislation

and concluded with details on how the legislation was prepared using the SNSA process. A presentation entitled “Review and Assessment Process Development” was also delivered. The content represents a good outline or guidance summary for development of a review and assessment process as it provides a comprehensive overview of all the elements that would be included in the development of a regulatory review and assessment process. The expert from Canada delivered via the Internet two presentations entitled “Implementation of Regulatory Processes — Licensing, Inspection and Enforcement” and “Process Management under the Integrated Management System for Safety — Integration of Requirements, Use of Process Performance Indicators, Conduct of Process Reviews and Benchmarking”.

Another presentation by the Canadian expert, entitled “Generic Management System Processes — Control of Documents, Control of Records, Control of Products, Managing Organizational Change, Communication”, was also delivered via the Internet.

In conclusion, the meeting and workshop activities were useful to all attendees and provided those involved in the development and implementation of an integrated management system with good practical guidance. The agenda topics were outlined in a logical and structured sequence promoting understanding. The sessions were very well coordinated and administered by the host organization (BAPETEN).

Topical Group on Operational Safety

Annual Meeting of the Topical Group on Operational Safety and Regional Workshop on the Development of an Information System for Experience Sharing and Feedback during Construction and Commissioning of a New Nuclear Power Plant

Yantai, China
24–27 June 2013

IAEA Technical Officer: Mr Junichi TANAKA
(Division of Operations B,
Department of Safeguards)

The annual meeting of the OSTG and a Regional Workshop on the Development of an Information System for Experience Sharing and Feedback during Construction and Commissioning of a New Nuclear Power Plant were held in Yantai, China, from 24 to 27 June 2013. Ten participants from six ANSN member countries (Bangladesh, China, Indonesia, Japan, Thailand and Viet Nam) as well as an expert from Ukraine and an IAEA representative participated in the workshop.

The purpose of the workshop was to exchange best international practices related to the following topics:

- Events and good practices during construction and commissioning of NPPs; and
- Development of an information system for experience feedback during the construction and commissioning of NPPs.

In addition, the annual meeting of the OSTG was held at the same venue. Discussions at this meeting included the current operating safety status in participating countries, concerns of operational safety in supporting and participating countries and the development of short and medium term work plans for the OSTG.



During the workshop, the participants were provided with comprehensive information on the following topics by experts from Ukraine and China. Furthermore, the following topics were presented and discussed during the course of the workshop:

- The IAEA's guidance on construction and commissioning

- Progress of the Haiyang nuclear power project
- Overview of various stages of NPP, especially during completion
- Status of construction of the Taishan NPP
- Information system of the Ohma nuclear power project
- Commissioning programme stages and test requirements
- The IAEA's guidance on operating experience
- Development of experience feedback system at the Haiyang construction site
- Operating experience feedback system during the construction and commissioning phases for NPPs in Ukraine
- Experience feedback system during the construction phase at Taishan
- Typical experience feedback on construction in the Taishan project
- Lessons learned from events at the Haiyang construction site
- Lessons learned from commissioning-related events in the nuclear industry
- Lessons learned from construction-related events at the Taishan site

In conclusion, the participants actively participated in discussions regarding the detailed process of construction and commissioning. Also, this workshop contributed to providing opportunities for establishing communication channels between organizations in the Chinese nuclear industry.

Topical Group on Radioactive Waste Management

Regional Workshop on the Demonstration of Safety of Radioactive Waste Disposal Facilities

17–21 June 2013

Kuala Lumpur, Malaysia

IAEA Technical Officer: Ms Yumiko KUMANO
(Waste and Environmental Safety Section,
Division of Radiation, Transport and Waste Safety,
Department of Nuclear Safety and Security)

The workshop was organized by the IAEA in coordination with the Atomic Energy Licensing Board (AELB), Malaysia, within the framework of the ANSN/RWMTG, at the AELB's headquarters in Kuala Lumpur, Malaysia from 17 to 21 June 2013. Twelve participants from seven ANSN member countries (Bangladesh, Indonesia, Republic of Korea, Malaysia, Philippines, Thailand and Viet Nam) took part in the workshop together with 22 local observers and two external experts from South Africa and the United Kingdom, as well as IAEA representatives.



The purpose of the workshop was to build and strengthen capacities in the development and demonstration of safety of radioactive waste disposal facilities, focusing on the safety case and safety assessment development by the operator and its review by the regulator. The workshop also addressed the licensing process, regulations, site selection, design, construction and operation of disposal facilities. The workshop was a continuation of the workshops held in 2011 and 2012 on waste safety practices and establishing regulations for near surface disposal. This workshop included case studies from various countries to help participants to understand better the reality of developing a disposal facility and its safety case.

During the workshop, presentations were given on the IAEA safety standards related to radioactive waste management (RWM), the safety requirements on disposal and the organizations involved; examples of near surface and geological disposal design and design bases from a number of countries; introduction to the safety case concept and the safety assessment process in the context of the safety case; and the regulatory review of safety assessments. The representatives of the participating countries delivered presentations on national RWM activities and associated regulatory arrangements. Two group exercises were undertaken; the first dealing with development of a safety

case for a borehole facility based on the safety report on generic safety assessment for borehole disposal, the second on safety case development for a near surface facility. A draft IAEA Safety Report on generic safety assessment for borehole disposal and *The Safety Case and Safety Assessment for the Disposal of Radioactive Waste* (IAEA Safety Standards Series No. SSG-23, Vienna, 2012) were utilized during these exercises to consider the development of a new safety case and management strategy for a hypothetical low level waste disposal facility that had been abandoned by its original operator.

The workshop was concluded with a group discussion on the outcome of the exercises and the identification of areas for future ANSN waste safety activities. The participants felt that the lectures and the delivery of the workshop as a whole met the stated objectives. In particular, the exercises conducted were very helpful for understanding the contents of the lectures. As a result of discussions during the workshop, the following recommendations for the scope of future ANSN/RWMTG activities were made:

- Basic training/workshop for young generation professionals.
- Detailed training/workshop on how to develop the safety case or how to carry out site investigation, safety assessment, etc., targeted at both regulators and operators, but perhaps recognizing their different roles.
- Specific training focusing on the regulatory review process, including modelling and uncertainty analysis.

Regional Workshop on the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management and Annual Meeting of the Topical Group on Radioactive Waste Management

Gyeong-Ju, Republic of Korea
5–8 November 2013

IAEA Technical Officers: Mr Gerard BRUNO and Ms Gabriela SIRAKY
(Waste and Environmental Safety Section,
Division of Radiation, Transport and Waste Safety,
Department of Nuclear Safety and Security)

The Regional Workshop on the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (hereafter referred to as the 'Joint Convention') for IAEA Member States in the Asia region was held in Gyeong-Ju, Republic of Korea, from 5 to 8 November 2013. The workshop was organized by the IAEA in collaboration with the Government of the Republic of Korea through KINS and the Nuclear Safety and Security Commission (NSSC). The workshop was attended by 22 participants from 8 Member States that are not Contracting Parties to the Joint Convention (Bangladesh, Islamic Republic of Iran, Malaysia, Mongolia, Nepal, Pakistan, Philippines and Thailand) and 3 Member States that are Contracting Parties (Indonesia, Japan, and Viet Nam). The Host Government, which is a Contracting Party, was represented by 15 delegates.

The purpose of the workshop was to inform the participating Member States about the Joint Convention and to discuss with them the benefits of becoming a Contracting Party to the Joint Convention.

The workshop was structured into seven sessions dealing with: introductory information on the Joint Convention; the experience of Contracting Parties with the Joint Convention; presentations from the participating Member States regarding the status of RWM activities; a practical exercise with a

simulated Country Group session to discuss Indonesia's report to the Fourth Review Meeting; another practical session with a technical visit to the waste disposal site under construction at Wolsong; perspectives on the Joint Convention from two non-Contracting Parties present (Philippines and Thailand); and a topical session on E&T opportunities.



From the presentations and discussions that took place, the following conclusions were reached:

- Contracting Parties to the Joint Convention are at different stages of maturity with regard to infrastructure, legal framework and resources. Therefore, the Joint Convention provides an important platform for participants to learn and to share experiences.
- One of the challenges in the management of radioactive waste is to build confidence in the programmes and strategies, and obtain support from politicians. National Reports submitted for peer review under the Joint Convention may be useful as a resource to inform all concerned parties on the status of the programmes, resources concerned and safety measures applied.
- Another challenge derives from the responsibilities at national level that are shared by the waste generators, the waste management operating organization and the regulator, regarding the implementation of safety measures and the definition and implementation of a well-structured and optimized waste management strategy.
- An additional challenge is retaining and developing skills and competences in the area of the back end of the fuel cycle and RWM.
- In relation to joining the Joint Convention, some of the incentives of pursuing this objective include:
 - Enhanced confidence in the country's waste management programme
 - Enhanced safety elements within the programme
 - Reports to the Government to justify funding
 - International recognition of the efforts made

- Peer review of the National Reports prepared for the Joint Convention (which are based on a structured approach, capturing a wide range of regulatory and management aspects) provides a very good reflection of the country's status regarding waste management and is a good basis to be used for further improvements.

The workshop participants concluded that the preparation of National Reports for peer review by the Contracting Parties was very important, but it was stressed that the most important outcomes include the actual implementation of the Joint Convention's provisions.

Topical Group on Safety Analysis

Consultancy Meeting to Develop the Methodology and Terms of Reference for an Expert Mission on Gap Finding Related to Safety Analysis Capabilities

Serpong, Indonesia
22–26 April 2013

IAEA Technical Officer: Mr Manwoong KIM
(Safety Assessment Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A Consultancy Meeting to Develop the Methodology and Terms of Reference for an Expert Mission on Gap Finding Related to Safety Analysis Capabilities was organized in Serpong, Indonesia, from 22 to 26 April 2013. Consultants from Croatia, Indonesia, the Republic of Korea and Viet Nam as well as IAEA representatives participated in this meeting.

The goal of the gap analysis service is to facilitate improvement of nuclear safety in the participating ANSN member countries. To achieve this goal, the service is meant to establish a process of gap analysis-related discussion and comparison, which will lead to the sharing of information and experience, as well as collaborative analysis of strengths and weaknesses, among the participants, and will foster regional cooperation to remedy any weaknesses identified and improve safety generally. In order to help launch this service, this consultancy meeting was organized to develop guidelines on the methodology and tools, as well as terms of reference, for an SATG-led expert mission on gap finding related to safety analysis capabilities.



During the meeting presentations were delivered by IAEA experts and consultants as follows: (a) The IAEA officers presented an overview of how to develop guidelines for the implementation of an expert mission on gap finding related to safety analysis capabilities; (b) Consultants discussed the objectives, scope and technical references of such a mission in order to draft the guidelines; and (c) Discussions were held with staff members from BATAN, which is one of the first organizations to have offered to host such a mission in order to explore the applicability and practicability of the draft guidelines. Thereafter, brainstorming and writing sessions were conducted in order to produce suggestions and recommendations relevant to the objectives of the meeting.

During the meeting, consultants and IAEA experts developed and reviewed the draft guidelines for an SATG-led expert mission on gap finding related to safety analysis capabilities. It was also agreed to conduct a pilot expert mission at BATAN, Indonesia, and that the results of this mission would be presented at the next ANSN Steering Committee meeting.

In conclusion, all participants agreed and expected that the peer reviewed guidelines would contribute to ANSN member countries' understanding of the existing gaps and the importance of hosting an expert gap finding mission in order to successfully develop their safety analysis capabilities. In addition to this, the guidelines would help to facilitate the exchange of experience, and the capture of feedback on the effective implementation of IAEA–ANSN/SATG programme.

Regional Workshop on the Best Estimation Plus Uncertainty Method as Applied to Safety Analysis

Beijing China
27–31 May 2013

IAEA Technical Officer: Mr Manwoong KIM
(Safety Assessment Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

The Regional Workshop on the Best estimation Plus Uncertainty Method as Applied to Safety Analysis was organized in Beijing, China, from 27 to 31 May 2013. The workshop was conducted within the framework of the ANSN/SATG and was targeted at the professional staff of nuclear safety regulatory bodies and their TSOs from ANSN member countries. Fourteen participants from seven ANSN member countries (Bangladesh, Indonesia, Kazakhstan, Malaysia, Philippines, Thailand and Viet Nam) attended the workshop. External experts from Germany, Croatia and the Republic of Korea assisted the IAEA in the implementation of the workshop.



The objective of the workshop was to share experiences and knowledge related to the best estimate plus uncertainty (BEPU) method among ANSN member countries. Since deterministic safety analysis (DSA) has become an essential tool for demonstrating the safety of NPPs, some requirements and guidance pertaining to accident analysis have been issued by the IAEA in the form of the following publications: *Safety of Nuclear Power Plants: Design* (IAEA Safety Standards Series No. SSR-2/1, Vienna, 2012), *Safety of Nuclear Power Plants: Commissioning and Operation* (IAEA Safety Standards Series No. SSR-2/2, Vienna, 2011), *Safety Assessment and Verification for Nuclear Power Plants* (IAEA Safety Standards Series No. NS-G-1.2) and *Accident Analysis for Nuclear Power Plants* (Safety Reports

Series No 23, IAEA, Vienna, 2002). According to the Safety Guide NS-G-1.2, two acceptable options are recommended for demonstrating the safety ensured with an adequate margin, namely the use of best estimate computer codes combined with conservative input data or combined with realistic input data. Also best estimate codes with conservative initial and boundary conditions are commonly used in the present licensing analysis.

During the workshop the IAEA experts delivered lectures on the following topics: uncertainty method and tools in safety evaluation; integral and separate effects tests; facility matrices for validation of best estimate thermal-hydraulic computer codes and user effects; practices of using uncertainty methods and results; quantification method for code accuracy prediction and applications; independent evaluation of safety margins; and re-evaluation of safety margins in operation and modification.

Practical method, tools and experimental case studies were also provided to ensure a good understanding of BEPU analysis. Furthermore, a new IAEA safety assessment E&T tool, the Integrated Training and Accident Analysis System (ITASS), the Reactor Excursion and Leak Analysis Program (RELAP) and review guidelines for gap finding related to safety analysis capabilities were also introduced.

The workshop featured practical discussions, questions and response through a wrap-up meeting to ensure that all the participants had achieved a better understanding of the topics.

In conclusion, all participants agreed and expected that this workshop would contribute to the ANSN member countries' understanding of the BEPU method as applied to safety analysis. Furthermore, comments and suggestions from the participants in the workshop would be considered when drawing up the SATG's future work plan.

Second Consultancy Meeting on the Development of an IAEA Technical Document on Fluid–Structure Interaction Assessment for Integrated Safety Evaluation

Vienna, Austria
8–11 July 2013

IAEA Technical Officer: Mr Manwoong KIM
(Safety Assessment Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

The Second Consultancy Meeting on the Development of an IAEA Technical Document on Fluid–Structure Interaction Assessment for Integrated Safety Evaluation was held at the IAEA's Headquarters in Vienna, Austria, from 8 to 11 July 2013. Four experts from Japan and the United Kingdom participated in this meeting along with IAEA representatives.

In advance of the meeting, the IAEA had circulated a draft of the proposed IAEA Technical Document (TECDOC), including additions made to a previous draft following the meeting in Japan in 2012. During the meeting, the IAEA officers gave a presentation describing the structure of the IAEA safety standards, indicating where the TECDOC on fluid–structure interaction (FSI) assessment would fit into the general framework of IAEA documentation. The process for reviewing the final draft of the TECDOC was also discussed.

During the meeting, the participants described the new sections that they had provided for the draft TECDOC. The expert from the UK gave a summary of the draft section on pipe whip based on UK experience embodied in a nuclear industry document. He noted that while the approach had been

used to mitigate the effects of pipe whip by using restraints, for example, there were no UK incidents of pipe whip for inclusion in Section 4 of the TECDOC dealing with plant issues.



Experts from Japan described a new section dealing with the evaluation of structural strength for flow induced vibration. They also provided inputs dealing with steam generator tube wear at Units 2 and 3 of the San Onofre NPP. Several inputs related to dealing with plates in the section on vortex induced vibration; a section on self-excited vibration; some additional paragraphs in the section on flutter in pipes containing fluid flow; some additional information in the section on fluid-elastic vibration of tube bundles in single-phase flow and two-phase flow; and text on forced vibration were also provided. Some additional definitions related to terms in tables and figures in the section on acoustic resonance at branch pipes; some additional definitions related to terms in the section on forced vibration of pipes downstream of pumps; a new section dealing with reactor pressure vessel internals in a boiling water reactor for Section 3; and new advice on acoustic fatigue were discussed during the meeting.

It was noted that there was a need to focus on more practical methods and applications because the draft was rather long. Following the discussion of the new additions to the draft TECDOC, the contents list of the latest draft was discussed in detail. The inclusion of information related to the Fukushima Daiichi accident was also discussed. It was agreed that it was not possible to provide detailed information at this stage but that it would be useful to provide a one-page summary on the current activities and strategy of the Japan Society of Mechanical Engineers (JSME) working group.

During the meeting, significant changes were made to the document as a result of the individual assignments of the consultants, discussed by all attendees and collated into an updated draft.

The timescales for production of the final version of the TECDOC were discussed and several provisional milestones agreed. The IAEA officers described the IAEA quality assurance, editorial and production processes that would then be applied leading to issue of the document by IAEA in 2015.

Regional Workshop on Integrated Deterministic Safety Analysis and Probabilistic Safety Assessment for Risk Management of Nuclear Power Plants and Annual Meeting of the Safety Analysis Topical Group

Manila, Philippines
22–26 July 2013

IAEA Technical Officer: Mr Manwoong KIM
(Safety Assessment Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

The Regional Workshop on Integrated Deterministic Safety Analysis and Probabilistic Safety Assessment for Risk Management of Nuclear Power Plants was held jointly with the annual meeting of the SATG within the framework of the ANSN's programme for enhancing safety analysis capability in the region. The target audience for this workshop consisted of professional staff members of nuclear safety regulatory bodies and their TSOs from ANSN member countries. Twenty participants from seven ANSN member countries (Bangladesh, Indonesia, Republic of Korea, Malaysia, Philippines, Thailand and Viet Nam) attended the workshop along with external experts from the United Kingdom and IAEA representatives.



The objective of this workshop was to share experiences and knowledge related to the application of integrated DSA and probabilistic safety assessment (PSA) for risk management of nuclear installations among ANSN member countries. With respect to risk reduction, the IAEA has promulgated fundamental principles and requirements that encourage the consideration of risk information and analyses along with DSA. This evaluation can be appropriately accomplished using an integrated risk informed decision making (IRIDM) process. IRIDM is a systematic process aimed at the integration of the major considerations influencing NPP safety. The main goal of IRIDM is to ensure that any decision affecting nuclear safety is optimized without unduly limiting the operation of the NPP. It underpins nuclear safety decisions and ensures consistency with the safety goals of the country.

During the workshop, the IAEA experts delivered lectures on the following major topics: 1) Concept of risk and introduction to PSA methods and techniques; 2) PSA applications; 3) Approach for integration of DSA and PSA insights; and 4) Basic concepts of IRIDM method and processes. An exercise on practical application of IRIDM was conducted with the aim being to give the participants a better understanding of the process discussed. In addition, the workshop was held jointly with the annual meeting of the SATG, at which the outcomes of 2013 activities and the work plan for 2014 were discussed. Consultants and IAEA experts also gave presentations on the following topics: introduction to Level 1, Level 2 and Level 3 PSA methods and techniques; major PSA applications

(e.g. risk-informed technical specification optimization, risk monitoring and risk-informed in-service inspection); integration of DSA and PSA; and IRIDM method and processes.

The participants divided into two groups (i.e. regulator group and operator group) for the exercise on the IRIDM process. At the beginning of the exercise, the process of IRIDM was introduced in advance. The exercise simulated a fuel cycle change from 12 to 18 months and plant power uprate to 104%, and involved the two groups selecting one of four available options.

In conclusion, all participants agreed and expected that this workshop would contribute to ANSN member countries' understanding of the IRIDM process using the PSA and DSA methodology. Comments and suggestions from the participants in the workshop would be considered when drawing up the SATG's future work plan.

Topical Group on Safety Analysis Webinar: Second RELAP5 Training and Exercise for VVER Reactors and Preparatory Work

Webinar

28–30 August 2013

IAEA Technical Officer: Mr Manwoong KIM
(Safety Assessment Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A SATG webinar entitled “Second RELAP5 Training and Exercise for VVER Reactors and Preparatory Work” was conducted from 28 to 30 August 2013. In 2011, in view of the increasing E&T needs of ANSN member countries, the SATG started to apply a Web-based seminar (webinar) for sharing information and training on a variety of topics. The webinar invited an external expert from Italy as a lecturer and progressed for three hours a day. Forty participants from ANSN member countries participated in the online sessions.

The main objective of this webinar was to develop online safety analysis training materials and multimedia so as to promote RELAP5 basic exercises and the code's application to water cooled water moderated power reactors (VVERs). A home based assignment was delivered in advance of the webinar in order to enhance the efficiency of lecture materials and to allow for a discussion on the assignment work during the webinar.

During the webinar sessions, the following topics were discussed:

- Lecture Session 1: Fundamentals in Thermal-Hydraulics for Best Estimate Plus Uncertainty
 - Basic issues and the history of thermal-hydraulics
 - Separate effect phenomena and integral effect phenomena
 - The BEPU code and method: the connection with nuclear reactor safety and NPP design
- Lecture Session 2: The Code Structure and Verification and Validation
 - Target for system thermal-hydraulics (SYS–TH) codes
 - Differences between SYS–TH and computational fluid dynamics in terms of their applicability
 - SYS–TH code structure

- Balance equations in the SYS–TH code
- Other equations and key assumptions
- Verification and validation
- Lecture Session 3: VVER Thermal-Hydraulics Technology and Code Application
 - VVER configuration, including new design
 - VVER peculiarities
 - VVER code validation matrix
 - VVER SYS–TH code modelling
 - VVER safety analysis report

All lecture materials were recorded and uploaded to the ANSN website and the IAEA's Global Safety Assessment Network (GSAN) so that they could be used for self-evaluation exercises.

In conclusion, the SATG webinar session was successful in providing the participants with valuable information, knowledge and practical exercises on safety analysis for VVER type NPPs using RELAP5. All lecture materials were uploaded to the ANSN website and the GSAN so that they could be used for self-evaluation and testing. The SATG will continuously promote the webinar approach for capacity building of safety analysis under the ANSN framework.

The screenshot shows a webinar interface. The main slide is titled "THE SYS TH CODE MODELING (OF VVER NPP)" and has a subtitle "... AND/OR ADDRESSING PTS". The slide content is titled "Key issues in structural integrity assessment" and features a diagram of a VVER reactor core. The diagram is a cross-section showing the fuel assembly (blue) and the surrounding cladding (yellow). A yellow circle highlights a specific area of the cladding. Labels point to various factors: "Neutron fluence onto the wall", "Mechanical and physical properties -weld, cladding, base metal", "Residual stresses -weld, cladding", "Stresses due to various mechanical and thermal loading transients", and "Postulated defect location and size". The slide number "3/73" is visible in the bottom right corner. On the right side of the interface, there is a "Participants" window showing a video feed of a man and a list of names: "m.klin (host, mc)", "Mediet", "surp", "Tahiri", and "to coah".

Topical Group on Safety Management of Research Reactors

Regional Workshop on Application of the Code of Conduct on the Safety of Research Reactors for Core Management and Safety of Experiments

Yogyakarta, Indonesia
23–27 September 2013

IAEA Technical Officer: Mr Amgad SHOKR
(Research Reactor Safety Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A Regional Workshop on Application of the Code of Conduct on the Safety of Research Reactors for Core Management and Safety of Experiments was organized in Yogyakarta, Indonesia, from 23 to 27 September 2013. Fourteen participants from ANSN member countries, along with experts from the South African Nuclear Energy Corporation (Necsa), the Australian Nuclear Science and Technology Organisation (ANSTO) and IAEA representatives participated in the workshop.

The objective of the workshop was to provide a forum for the exchange of information and experience between the participating ANSN member countries and the IAEA representatives on effective application of the Code of Conduct on the Safety of Research Reactors (hereafter referred to as the 'Code'), with a focus on the safety management of reactor core components and fuel handling, as well as on the safety of the utilization programme, including beam tube experiments and experimental facilities. The workshop also discussed ways to further improve regional cooperation on research reactor safety on the basis of the Code.

During the workshop, IAEA representatives and the invited experts delivered presentations, covering the following topics:

- Application of the Code and IAEA safety standards dealing with core management and fuel handling, as well as with the safety of utilization and modification of research reactors.
- Safety aspects of research reactor core management and fuel handling, including core calculations, core operation and monitoring, the refuelling process, and handling of fresh and irradiated fuel, including practical examples at the SAFARI-1 research reactor in South Africa.
- Safety of experiments and modifications, including the safety practices at the OPAL Reactor in Australia and practical examples of licensing and installing new experiments.
- Safety considerations in different phases of research reactor experiments and the utilization programme (design, construction, operation, decommissioning), with an emphasis on beam tubes, neutron activation analysis, irradiation and radioisotope production facilities. This included safety assessment of experiments and experimental devices.
- Regulatory supervision of research reactor utilization and modification.
- Management system for core management, fuel handling, experiments and modifications.

A technical visit to the Kartini TRIGA research reactor at the BATAN campus near Yogyakarta was also arranged during the workshop. The visit began with an introduction to the facility, including its history and utilization programme. The areas visited included the reactor hall, pool top, control room and neutron activation analysis (NAA) sample counting laboratory. Of particular note was a new high-purity germanium detector for NAA that was undergoing commissioning.

The workshop included working group activities to discuss national practices regarding core management, fuel handling, experiments and modifications. The participants were divided into two groups which included individuals from operating organizations and regulatory bodies and represented a broad spectrum of the ANSN member countries. Within the framework of the Code, the relevant IAEA safety standards and the IAEA and expert presentations, the groups discussed and prepared presentations that covered common practices, differences, challenges, recommendations and conclusions.

Based on the presentations provided by the participants and the working groups and the related discussions, the workshop concluded that:

- Additional efforts should be made by ANSN member countries to further improve application of the safety standards and the guidance in the Code.
- Most operating organizations have operational limits and conditions (OLCs) that cover core operation and monitoring and use models and codes to verify that new core configurations will be within the bounds of the OLCs. The workshop concluded that the guidance in the Code in this area is generally applied, but that further work needs to be done by Member States to establish formal core management programmes based on the IAEA safety standards.
- Operating organizations and regulatory bodies in the region should continue to enhance their programmes in the areas of safety of experiments and modifications based on the IAEA safety standards.
- Most Member States in the region need to enhance application of the guidance in the Code by developing regulations based on the IAEA safety standards.
- Implementation of the guidance in the Code related to the independence of the regulatory body is progressing, but Member States need to take additional actions to ensure effective regulatory independence.
- Application of the Code using the IAEA safety standards on ageing management is progressing, but requires additional efforts by Member States.
- The IAEA should continue to hold international conferences and workshops on application of the Code.
- The IAEA should continue to organize practical training on the use of the IAEA safety standards and application of the Code.
- Member States should perform self-assessments against the relevant IAEA safety standards and implement measures to close any identified gaps. Member States should request IAEA's review services for operating organizations and regulatory bodies, as needed.
- The IAEA should address regulatory independence and its importance to safety during the next international conference on application of the Code.

Regional Workshop on Complementary Safety Assessment of Research Reactors Following the Lessons Learned from the Fukushima Daiichi Accident

Illinois, United States of America
9–13 December 2013

IAEA Technical Officers: Mr Amgad SHOKR and Mr David SEARS
(Research Reactor Safety Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A Regional Workshop on Complementary Safety Assessment of Research Reactors Following Lessons Learned from the Fukushima Daiichi Accident was organized in the USA from 9 to 13 December 2013. Eighteen participants from ANSN member countries attended the workshop along with experts from France and the USA as well as IAEA representatives.



In the two years since the Fukushima Daiichi accident, IAEA Member States have been carrying out safety reassessments of their nuclear installations to evaluate their ability to withstand the effects of extreme external events that had previously not been considered in the design basis. Although the primary focus of these reassessments has been on NPPs, many Member States have extended the scope of safety reassessments to include research reactors. In order to promote harmonization of the approach towards safety reassessment of research reactors taking into account the feedback from the Fukushima Daiichi accident, a guidelines document was drafted. The guidelines will be published as IAEA Safety Report No. 80, “Safety Reassessment for Research Reactors in the Light of the Accident at the Fukushima-Daiichi Nuclear Power Plant”.

The primary objective of the workshop was to provide the participating Member States with practical knowledge and information on performing safety reassessments of research reactors in the light of the feedback from the Fukushima Daiichi accident, with a focus on methods and approaches for performing analysis of extreme external events, combined and consequential events, and beyond design basis events for different types of research reactors. The workshop also intended to provide a forum for the participants to present and receive feedback on the results of safety reassessments (completed or in progress), including the successful methods and approaches used in the safety reassessments of beyond design basis events, as well as areas in which difficulty was encountered or assistance is needed.

The IAEA officers delivered presentations on the IAEA safety standards and supporting publications, the IAEA guidance for safety reassessments and the methods and approaches for safety analysis. The

external experts provided two presentations on improving emergency preparedness measures for coping with and mitigation of accidents and total loss of electrical power in a large research reactor. Thereafter presentations on analysis of a loss-of-coolant accident in a large research reactor and analysis of damage to the core of a research reactor coupled with damage to the reactor confinement or containment followed. National presentations were delivered on the safety reassessments carried out in ANSN member countries, on safety assessments in progress or planned for the facilities in participants' countries, including the details of the analyses performed, on the identified safety enhancements and the status of implementation of the enhancements.

During the workshop, discussions on national practices regarding safety reassessments were also conducted. The participants were divided into three groups that each included individuals from operating organizations and regulatory bodies and represented a broad spectrum of the ANSN member countries. Within the framework of the guidance for safety reassessments, the relevant IAEA safety standards and the workshop presentations, the groups discussed and prepared presentations on safety reassessments and enhancements including national practices, challenges and suggestions for improvement.

The following conclusions and recommendations are based on the information provided by the participants:

- Discussions at this workshop indicated that there is a need for clarification and assistance in identifying beyond design basis initiating events for consideration in safety reassessments. In addition, clarification is needed in determining the appropriate analysis approach and degree of conservatism to be used for these events. Accordingly, it is recommended that the IAEA organize a workshop to facilitate exchange of experience and expertise in these matters.
- Lack of the necessary expertise and analytical tools has been identified by several Member States as a major difficulty in carrying out safety reassessment of research reactors. It is recommended that the ANSN member countries needing assistance in specific technical areas consult with the other ANSN members to determine whether assistance in acquiring the needed expertise and tools is available within the region. The IAEA can facilitate this consultation if necessary.
- Lack of regulatory requirements and guidance has been cited as a major difficulty in proceeding with safety reassessment of research reactors. Nevertheless, it is recommended that research reactor operating organizations proceed with safety reassessments following their best judgment, informal consultation with the regulatory body and the guidance of Safety Report No. 80, especially to identify the limitations of the research reactor when exposed to extreme external events.
- All Member States represented have performed, or plan to perform, safety reassessments of their research reactors. In many cases the reassessments led to identification of facility modifications, enhancements to EPR plans and revisions to regulatory requirements that could improve the safety of research reactors in the case of extreme external events. To ensure that reassessments are performed and identified improvements are implemented, it is recommended that Member States develop formal action plans with a schedule and identification of the responsible organizations and/or persons. It is recommended that the IAEA organize

an additional workshop for the ANSN member countries to report on any additional reassessments, the status of their action plans and the results of implementation of the identified improvements, and to receive peer review of the actions they have taken with respect to safety reassessments.

- The scope and methods of safety reassessment vary widely between Member States, with some considering nearly the entire range of extreme external events and others considering only a few. Methods used to identify safety improvements ranged from detailed computer models and analysis in some cases, to a 'walk-down' approach in others. With the publication of Safety Report No. 80, it is recommended that Member States re-evaluate the scope and methods of their safety reassessments to ensure that they are performed in a systematic and comprehensive manner, and if gaps are identified, to work with other Member States within the region to obtain, if needed, the necessary tools and expertise to close the gaps.

Topical Group on Siting

Regional Workshop on essential knowledge of site evaluation report for NPPs

Kuala Lumpur, Malaysia

26–30 August 2013

IAEA Technical Officer: Mr Hamid MAHMOOD
(International Seismic Safety Centre,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

In developing the infrastructure for a national nuclear power programme it is important to ensure that a proper legal and regulatory framework has been established. The regulatory framework covers the authorization/licensing process for an NPP. The operator is required to submit or make available to the regulatory body, in accordance with the applicable legal provisions and nuclear regulations, all the information described in the licensing process. This information should be presented in the form of a report, hereinafter referred to as a safety analysis report (SAR).



The countries from the region that are planning to develop nuclear power programmes need to pay close attention to the legal and regulatory framework in addition to other infrastructure aspects. The regulatory body should have the necessary technical capabilities to be able to review the preliminary safety analysis report (PSAR) and SAR and other supporting documents associated with the licensing process for a NPP. This involves developing adequate human resources and technical expertise to ensure that safety and security elements are properly implemented throughout all stages of the nuclear power programme, in accordance with national and international standards.

This workshop aimed to contribute to identifying the technical capabilities and skills in the field of site evaluation that are required, on the one hand, by the future operator of an NPP in order to develop the technical studies and documentation that will support the licence application, and, on the other, by the regulatory body and its TSOs in order to evaluate the PSAR/SAR and other supporting documents during the licensing process.

The purpose of the workshop was to share information and knowledge on the technique and skills for reviewing the SAR, especially the chapter on site evaluation. The main topics of the workshop included:

- Structure of the site evaluation section(s) of an SAR

- Site hazards
- Site suitability criteria (exclusion criteria)
- Detailed outcome of site evaluation
- Meteorological and hydrological hazards
- Seismic hazards
- Geotechnical hazards
- External human induced hazards
- Radiological dispersion taking into account population distribution
- Feasibility of implementation of an emergency plan

Key challenges related to inland sites and lessons learned

- Consideration of multiple hazards
- Review guidelines for the site evaluation report

The workshop consisted of presentations by IAEA staff and external experts as well as country presentations.

The presentations covered the structure of the site evaluation section(s) of an SAR, site hazards, site suitability criteria (exclusion criteria), detailed outcome of site evaluation, hazards relating to meteorology and hydrology, seismic and geotechnical hazards, external human induced hazards, radiological dispersion taking into account population distribution, the feasibility of implementation of an emergency plan and key challenges related to inland sites and lessons learned. In addition, the external experts presented several case studies. The representatives of the participating countries (Bangladesh, Indonesia, Japan, Malaysia, Philippines, Thailand, and Viet Nam) gave presentations on the status of siting aspects in their respective countries.

All planned activities for the workshop were successfully completed without any technical, logistical or administrative problems or delays.

The workshop covered all topics as outlined in the prospectus and several case studies were included. As the participants showed complete satisfaction during the concluding meeting, the objectives of the workshop were successfully achieved.

Annual Meeting of the Topical Group on Siting and Regional Workshop on Tsunami Hazard Assessment and Hydrology Related to Nuclear Power Plant Siting Activities and Requirements

Phuket, Thailand
4–8 November 2013

IAEA Technical Officers: Mr Sujit SAMADDAR and Mr Hamid MAHMOOD
(International Seismic Safety Centre,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

The site evaluation of an NPP comprises an evaluation of: the effects of possible external events (natural or human induced origin); characteristics of the site that could influence the transfer of released radioactive material to the environment; and the population density and population

distribution and other characteristics of the external zone that may affect the feasibility of implementing emergency measures. An NPP site has therefore to be evaluated against all natural and human induced hazards, and all details of the hazard assessments, including the design basis parameters, have to be provided in the SAR in the prescribed format. The general and specific requirements to carry out hazard assessments are established by the national regulators, and guidance documents are used to meet these requirements.



Tsunamis on coastal sites and the failure of upstream dams on river sites are some of the most significant external hazards. Sharing information and experience on flooding hazards with embarking countries is therefore essential so that such hazards are properly evaluated during the site assessment stage.

The purpose of the workshop was to share information and knowledge on the techniques and skills for carrying out flood hazard assessments, in particular with regard to tsunamis. It is important that safety standards, assessment methods and relevant criteria are well understood and that an appropriate site is selected and evaluated. The main topics of the workshop included:

- General and specific requirements
- Database requirements
- Tsunami sources
- Hazard assessments
- Characterization of loading effects
- Tsunami warning systems
- Case studies

Furthermore, the workshop was held jointly with the annual meeting of the STG, which discussed the outcome of 2013 activities and the work plan for 2014.

The workshop consisted of presentations by the IAEA staff and external experts, and country presentations. The presentations covered relevant IAEA safety standards; safety requirements and guidance on flooding aspects (*Site Evaluation for Nuclear Installations* (IAEA Safety Standards Series No. NS-R-3, Vienna, 2003) and *Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations* (IAEA Safety Standards Series No. SSG-18, Vienna, 2011), database requirements, tsunami sources and uncertainties, hazard assessments for coastal, river and estuary sites, tsunami warning systems, the evolution of design basis for tsunamis at Japanese (Fukushima Daiichi, Daini and Onagawa) NPPs, details of the 11 March 2011 tsunami, French regulations for flood hazard assessments in France, and dam break studies. Several case studies were included as recommended by the participants during the previous regional workshop in Malaysia.

The representatives of the participating countries (Bangladesh, Indonesia, Malaysia, Philippines, Thailand and Viet Nam) gave presentations on the current status of NPP activities and flooding studies in their respective countries.

The Phuket Disaster Prevention and Mitigation Office gave a presentation on the tsunami warning system in Phuket.

All planned activities for the workshop and the annual meeting were successfully completed without any technical, logistical or administrative problems or delays.

The workshop covered all topics as outlined in the prospectus and several case studies were included as recommended in the previous workshop. Since tsunami flooding is a major concern for Thailand, Malaysia, Indonesia, Philippines and Viet Nam, very useful discussions took place on the common tsunami sources in this region.

In conclusion, all participants agreed that these workshops were providing useful information and helping them to improve their understanding in the area of siting for NPPs. As such, the objectives of the workshop were successfully achieved.

National Activities

China

National Workshop on Preparing for Long Term Operation of Nuclear Power Plants and on Ageing Management Review

Haiyan, China

3–5 May 2013

IAEA Technical Officer: Mr Robert KRIVANEK
(Operational Safety Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

The National Workshop on Preparing for Long Term Operation of Nuclear Power Plants and on Ageing Management Review was organized in Haiyan, China, from 3 to 5 May 2013. Experts from Hungary, the Netherlands and the United States of America participated in this workshop along with national participants from China and IAEA representatives.

The objectives of the workshop were to:

- Improve awareness and provide information on the SALTO service offered by the IAEA;
- Provide presentations and discussions on lessons learned from preparing for LTO as well as from SALTO missions; and
- Identify terminology, references and approaches related to AMR, LTO preparation, AMP implementation, LCM, asset management implementation, and SALTO missions.

During the workshop, the IAEA officers delivered presentations on the IAEA's activities related to LTO and ageing management, covering, in particular, the following topics: IAEA safety standards that are relevant to LTO and ageing management; the SALTO methodology; and the IGALL Programme. Several presentations were also delivered during the workshop sessions which focused on national approaches to: (1) LTO preparation — scope of activities, planning, organizational structure to support ageing management and LTO, software support; (2) ageing management implementation and AMR; (3) TLAA revalidation for LTO — scope and methods of revalidation; and (4) LCM and asset management — terminology, references, approaches, models and introduction of relevant software. Discussions on lessons learned from SALTO missions — regarding their preparation, organization and conduct, as well as action plans adopted after such missions and follow-up — were held after the presentations.

Several recommendations pertaining to the TLAA methodology for life extension (with a focus on fatigue and buried pipelines); the TLAA methodology for life extension (with a focus on equipment qualification and concrete in nuclear facility buildings); and LCM methodology were drafted for future reference.

National Workshop on the Commissioning and Operation Management of Digital Instrumentation and Control Systems at Nuclear Power Plants

Haiyang, China
27–30 August 2013

IAEA Technical Officer: Mr Alexander DUCHAC
(Safety Assessment Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

This national workshop was held within the framework of the ANSN in Haiyang City, Shandong Province, China, from 27 to 30 August 2013. The event was organized as a cooperative effort of the IAEA, the Nuclear Power Institute of China (NPIC) and the China Power Investment Corporation (CPI). The primary workshop participants were staff members of the NPIC and the CPI. Twenty-four participants from the CPI, as well as from NPP sites that belong to the CPI, attended the workshop along with IAEA representatives and experts from the Westinghouse Electric Company and AREVA.



The CPI was a beneficiary of this workshop as it is currently involved in constructing six Westinghouse AP1000 reactor units at the Haiyang NPP site (with the option of adding two further units later on). When completed, this site will become one of the largest NPP sites in China. The site is located on the Yellow Sea coast, approximately 120 km east from Qingdao. The first two reactor units are close to completion, with commissioning envisaged to take place in 2014–2015. The AP1000 units are the first of their kind to be built in China. The AP1000 reactor design is equipped with a Westinghouse digital reactor control and protection system (RCPS).

Accordingly, this workshop focused on topics related to the hardware and software of digital I&C systems, with particular attention devoted to commissioning activities. The specific objectives of the workshop were to:

- Provide training on several topics related to digital I&C systems (with a focus on commissioning and operation);
- Enable participants to learn about the commissioning process for their NPPs;
- Discuss special topics of interest;
- Provide information on IAEA safety standards applicable to digital I&C, as well as on digital I&C security issues; and

- Provide information on relevant international activities to support digital I&C licensing and implementation.

The following IAEA publications and documents were referenced as the source of design requirements and guidance for the purposes of discussing commissioning and operation of digital I&C:

- “Design of Instrumentation and Control Systems in Nuclear Power Plants” (DS431) (draft safety standard)
- *Safety of Nuclear Power Plants: Commissioning and Operation* (IAEA Safety Standards Series No. SSR-2/2, Vienna, 2011)
- “Commissioning for Nuclear Power Plants” (DS446) (draft safety standard)
- *Core Knowledge on Instrumentation and Control Systems in Nuclear Power Plants* (IAEA Nuclear Energy Series No. NP-T-3.12, Vienna, 2011)

The following United States Nuclear Regulatory Commission (NRC) documents were taken as examples of criteria for the commissioning of digital I&C systems:

- Section 14.3.5 (“Instrumentation and Controls — Inspections, Tests, Analyses, and Acceptance Criteria”) in *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition* (NRC document NUREG-0800)
- *Initial Test Programs for Water-cooled Nuclear Power Plants* (NRC Regulatory Guide 1.68)

Applicable standards to digital I&C for nuclear power plants, issued by the Institute of Electrical and Electronics Engineers (IEEE) and the International Electrotechnical Commission (IEC), were also considered.

The workshop featured 13 presentations given by the IAEA representatives; a presentation on the CPI’s business organization and the construction and operation of NPPs; and a panel discussion to address specific topics of interest to CPI engineers.

The presentations by the IAEA team covered the following digital I&C related topics:

- Digital RCPS development process
- Testing during the design, factory acceptance tests and site acceptance tests
- Software verification and validation
- Guidance on the installation of the I&C cabinets and components in preparation for start-up testing
- Troubleshooting during the start-up testing (if things go wrong)
- How to improve I&C engineers’ troubleshooting skills
- Qualification of I&C equipment
- Lessons learned on:
 - Software commissioning (examples of software errors)
 - Early or premature failure of components due to lack of attention during installation

The expert from Westinghouse presented the company's commissioning experience with digital I&C, i.e. installation of I&C cabinets, troubleshooting of digital I&C and lessons learned during the commissioning. He focused on digital technology that will be installed at the Haiyang NPP. The expert from AREVA presented the company's experience with an RCPS refurbishment project that involved design, development, testing, implementation and commissioning of a TELEPERM XS based RCPS at the Paks NPP. The IAEA Technical Officer gave an overview of the IAEA guidance on LCM of digital I&C, related cybersecurity issues and equipment qualification for I&C equipment. In addition, the CPI arranged a site visit to the Haiyang construction site with two AP1000 reactors which are near to completion.

The commissioning of Unit 1 is expected to occur in 2014–2015. However, there are many pre-commissioning activities related to installation and testing of individual I&C components which will start soon. This workshop provided the CPI engineers with some important insights into design, testing, validation and commissioning of digital I&C systems, as well as with the opportunity to share their digital I&C experience with the IAEA team. A combination of theory and practice was used.

Thailand

National Workshop on Capacity Building IT Modules for ANSN Topical Group Members from Thailand

Bangkok, Thailand

25–27 June 2013

IAEA Technical Officer: Mr Sameer KUNJEER
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

The National Workshop on Capacity Building IT Modules for ANSN Topical Group Members from Thailand was organized in Bangkok, Thailand, from 25 to 27 June 2013.

The objectives for this national workshop were to:

- Brief and train the ANSN Topical Group coordinators regarding the various capacity building IT modules on the centralized ANSN website in order to foster more support for future ANSN activities from the perspective of the ANSN Vision 2020;
- Analyse future enhancements to the IT modules, based on the ANSN Topical Group coordinators' requirements;
- Discuss the full or partial integration of the capacity building IT modules into the national centre websites; and
- Discuss an approach to promote use of these modules among a wider audience within the ANSN member countries.

During the workshop, IAEA representatives delivered presentations on the following topics:

- Briefing on the centralized ANSN website as well as the national centre websites
- Exercise on the online nomination process and suggestions for future enhancements
- Webinar demonstration and discussions
- Pool of experts database and future enhancements
- e-Library proposal and further enhancements

In conclusion, several recommendations were gathered from the ANSN Topical Group members from Thailand as listed below:

- Topical Group members from the RWMTG expressed their concern over the speed of accessing documents/content from the centralized ANSN website. The IAEA officers clarified that with the implementation of the e-Library, for which the master server would be located in Asia, document access should become faster.
- The IAEA officers noted the necessity of informing potential participants about the delivery/submission of their candidature through the online

nomination system as soon as they have submitted their Nomination Form. This would avoid multiple clicks by the user on the “Apply Online” link.

- Topical Group members from the EPRTG suggested having a “Help” menu, in which the procedures/guidelines as well as frequently asked questions could be made available. The IAEA officers appreciated the suggestion and agreed to incorporate this feature in the centralized ANSN website.
- Topical Group members also mentioned the need for discussion forums on the national centre websites as well as the promotion of announcements of ANSN events which are open for nomination.
- The IAEA representatives confirmed that the IAEA would ensure that the recordings of previous online meetings/webinar sessions would be available on the centralized ANSN website, within the respective Topical Group pages.
- Topical Group members from the SMRRTG indicated that it would be desirable to have communication forums (such as mailing list groups) for discussion among the national Topical Group members.
- Topical Group members from the LMSTG suggested that the IAEA Technical Officer could provide briefings on the enhancements made to the centralized ANSN website (capacity building IT modules) during the annual meetings.
- Topical Group members also emphasized the necessity of closer cooperation with the national ITSG members, to disseminate procedures/guidelines on effective use of national centre websites.



Indonesia

Consultancy Meeting to Finalize Details of Content Management System Implementation for National Centre Websites and Workshop on Capacity Building IT modules for ANSN Topical Group Members from Indonesia

Yogyakarta, Indonesia

13–17 May 2013

IAEA Technical Officer: Mr Sameer KUNJEER
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

A Consultancy Meeting to Finalize Details of Content Management System Implementation for National Centre Websites and a Workshop on Capacity Building IT modules for ANSN Topical Group Members from Indonesia were held in Yogyakarta, Indonesia, from 13 to 17 May 2013.



The objectives for the consultancy meeting were to:

- Analyse the existing CMS and identify further enhancements;
- Discuss and identify elements of capacity building IT modules (already implemented on the centralized ANSN website) to be integrated in national centre websites via the CMS;
- Propose an approach for achieving the future integration of the capacity building IT modules via the CMS; and
- Finalize the timescales and resources for the identified potential approach.

During the consultancy meeting, the following topics were discussed:

- Data structure of the capacity building IT modules on the centralized ANSN website.
- Integration of specific features of the capacity building IT modules from the centralised ANSN website into the national centre websites via the CMS, such as:
 - Announcements of events open for nomination.

- Online meetings (webinar): interface to allow users from ANSN member countries to submit requests for online meetings (webinar sessions).
- Pool of experts: interface to allow users from ANSN member countries to seek advice/expertise from relevant experts, pertaining to their technical queries. Email notification would be sent to relevant experts as part of this process.

The ITSG members from Indonesia provided a briefing on the current status of the CMS, covering topics listed below:

- Current version of the CMS
- Underlying technologies such as PHP 5.3.x, MySQL, etc.
- Current implementation of the CMS in ANSN national centre websites (Indonesia, Malaysia and Thailand)

Indonesia also reported the existing server configuration and details of the CMS core module. The participants also noted and acknowledged the implementation of the e-Library in the CMS, based on the guidelines proposed and agreed by the ITSG.

The ITSG members from Japan reported proposals for enhancement of the implementation of CMS.

Japan briefed on the necessity of introducing SSL (Secure Sockets Layer) to ensure encryption of data transmitted over the network between ANSN national centre websites and the ANSN master server. It was agreed that this aspect was essential from the overall ANSN security perspective and would be taken into consideration when finalizing the installation and configuration of the ANSN master server.

Discussions were held on the user interface of the relevant elements of the capacity building IT modules. The IAEA officers proposed several layouts for all the interfaces. It was agreed that the CMS team from Indonesia would work closely with the IAEA to initially complete the necessary changes in the CMS to facilitate the announcement of ANSN events that are open for nomination on the national centre websites. The IAEA officers also briefed on the synchronization of necessary data from the centralized ANSN database server with the ANSN master server database hosted in Asia (supposed to be Microsoft SQL Server, but maybe it will be decided to change this if the initial prototype/proof of concept to be completed by the Indonesian CMS team is not successful).

In conclusion, the following action points were agreed upon by the participants in the consultancy meeting:

- The ITSG members from Indonesia would probe the feasibility of storing documents in binary format in the Microsoft SQL database through PHP procedural constructs.
- It was suggested that the thematic areas for classification in the current implementation of the e-Library in the CMS should be ignored. The IAEA would report back on this aspect, once the thematic areas had been finalized.
- The IAEA also recommended the guidelines for the versioning of CMS. It was suggested that the major and minor part of the version should be mapped to any major and minor changes in the CMS implementation and not to the year of implementation.

- The ITSG members from Indonesia would also consider whether the same version of CMS implementation would work successfully for ANSN member countries such as Malaysia and Viet Nam, which support the Windows platform. Indonesia would report back if there were any chances of functionality failures in code, because of lack of support of certain PHP WAMP (Windows Apache MySQL PHP) features/functions/procedural constructs on the Windows platform.
- The IAEA would be responsible for coordinating closely with the Indonesian CMS team for the creation of database scripts, in order to bring this synchronization into effect. Review of these mechanisms could be done after implementation of the initial proof of concept.

National Workshop on the Application of IAEA Methodology and Tools for the Safety Case and Safety Assessment for the Management of Predisposal Radioactive Waste Facilities: Part II

Densapar, Indonesia
9–13 September 2013

IAEA Technical Officer: Ms Monika KINKER
(Waste and Environmental Safety Section,
Division of Radiation, Transport and Waste Safety,
Department of Nuclear Safety and Security)

The purpose of the workshop was to assist Indonesia's nuclear operator (BATAN) and regulator (BAPETEN) in their work to strengthen capacities in the country for the demonstration of safety of predisposal facilities for management of radioactive waste, focusing on the work performed by the national counterparts since the October 2012 national workshop. The workshop was also expanded to include optimization of radiation protection in the control of occupational exposure.

Eighteen participants attended the workshop, representing BAPETEN and BATAN, along with a Technical Officer from the IAEA Waste and Environmental Safety Section and external experts from Sweden and France.

The focus of the workshop was to review work done by the Working Groups on Application Case and Regulatory Framework since October 2012 in applying the guidance contained in the General Safety Guide entitled *The Safety Case and Safety Assessment for the Predisposal Management of Radioactive Waste* (IAEA Safety Standards Series No. GSG-3, Vienna, 2013). In response to a request by the national counterpart, the workshop was expanded to include technical guidance on adapting *Optimization of Radiation Protection in the Control of Occupational Exposure* (Safety Reports Series No. 21, IAEA, Vienna, 2002).

The workshop included presentations on IAEA activities related to the safety case/safety assessment of predisposal RWM; optimization of occupational exposure and radiation protection; definition, role and documentation of the safety case; management of uncertainties (occupational exposure and safety assessment); topical issues related to use of the Safety Assessment Framework (SAFRAN) software tool by the application working group; and case studies related to the management of Category 3 radioactive sources. The working groups presented the work done since the 2012 workshop to update the safety case/safety assessment of the National Radioactive Waste Technology Center in Serpong, and on topical issues faced by the Working Group on Regulatory Framework.

Working group sessions were performed during the week to support further development of the safety assessment for the application case; to identify issues that need to be considered under the regulatory framework such as requirements pertaining to the safety case for predisposal RWM; to discuss implementation of Safety Reports Series No. 21 and use of the RADIOR software learning program for optimization of radiological protection; and to develop and discuss recommendations for work to be done by the working groups over the next 12 months.

As a result of discussions during the workshop, work plans were recommended and agreed by the application working group for continuing its work in developing (in consultation with the Working Group on Regulatory Framework) the application case performed by BATAN, including also a case study on a reflector that had been removed from the Bandung research reactor and will be transported to the National Radioactive Waste Technology Center in Serpong. The participants suggested that another national workshop be organized in September 2014 in Bandung to support the continued development of the safety case, including implementation of dose optimization, for RWM facilities and activities in the country.

The participants felt that the lectures and conduct of the workshop met the objectives, and that the lecturers provided excellent coverage of their assigned lecture topics and interacted effectively with participants during the exercises, in particular by sharing their experience in their technical areas of expertise. The participants were actively engaged in discussions and exercises.

Consultancy Meeting to Develop Nuclear Emergency Exercises for BATAN Facilities

Jakarta, Indonesia

23–27 September 2013

IAEA Technical Officers: Mr Jean-François LAFORTUNE
and Mr Muralidhar KRISHNAMACHARI
(Incident and Emergency Centre,
Department of Nuclear Safety and Security)

A Consultancy Meeting to Develop Nuclear Emergency Exercises for BATAN Facilities was organized in Jakarta, Indonesia, from 23 to 27 September 2013. Twenty-four participants from BATAN, BAPETEN and emergency services (municipal disaster response agencies, Ministry of Research and Technology, and Indonesian Army) attended the meeting along with IAEA representatives.



Based on the national regulations contained in BAPETEN Chairman Decree No. 1 (2010) and Government Regulation No. 54 (2012), every nuclear facility in Indonesia is required to conduct nuclear emergency exercises periodically. Recently, the emergency plan for BATAN in Serpong was

updated to ensure compliance with the national regulations and IAEA standards. To be consistent with the IAEA standards for nuclear emergency exercises, BATAN requested the ANSN/EPRTG to conduct a Workshop on Nuclear Emergency Exercise Preparation, Conduct and Evaluation for BATAN Facilities.

The workshop focused on the off-site consequences of a nuclear emergency. The objectives of the workshop were to enable participants to gain practical experience in the preparation, conduct and evaluation of nuclear emergencies, as well as confidence in controller, evaluator and player roles, and to build capacity among participants so that they can continue to successfully develop and conduct nuclear emergency exercises.

BATAN presented nuclear emergency exercise experiences at its facilities in Serpong and pointed out some inconsistencies with regard to the IAEA publication *Method for Developing Arrangements for Response to a Nuclear or Radiological Emergency* (Emergency Preparedness and Response Series EPR-METHOD 2003, IAEA, Vienna, 2003). The lecturers started with an overview of EPR exercises, explaining the objectives of the workshop and the target audiences. This was followed by discussion of the general concept of exercises. Half of the workshop consisted of a tabletop exercise covering all stages from preparation up to evaluation.

The lectures and tabletop exercises were delivered in such a way that all the participants could follow the concepts presented as far as possible. Lectures and exercise emphasized the benefit of an all-hazard approach to nuclear and radiological emergency preparedness, which builds on existing conventional emergency preparedness arrangements and provides an optimized and consistent approach to planning. The workshop enhanced the participants' capacity to develop nuclear emergency exercises in accordance with their expertise.

National Workshop on the Establishment and Implementation of Periodic Safety Review Programmes

Jakarta, Indonesia
2–6 December 2013

IAEA Technical Officers: Mr David SEARS
and Mr Deshraj Venkat H. RAO
(Research Reactor Safety Section,
Division of Nuclear Installation Safety,
Department of Nuclear Safety and Security)

A National Workshop on the Establishment and Implementation of Periodic Safety Review Programmes was organized in Jakarta, Indonesia, from 2 to 6 December 2013. Twenty participants from BAPETEN and BATAN attended the workshop along with IAEA representatives and experts from Australia.

The objective of the workshop was to provide the national participants with practical knowledge and information to establish and implement periodic safety reviews (PSRs) for research reactors. International practices for planning, organizing, and implementing PSRs for research reactors were presented and discussed. The workshop provided a forum for acquiring knowledge and sharing experiences and international practices to help BATAN and BAPETEN to build capacity for conducting the first PSR and associated regulatory review of a research reactor in Indonesia.



Indonesia has three research reactors, operated by BATAN and regulated by BAPETEN, the national regulatory body. All three of the reactors are approaching the end of their operating licence periods. In 2011, BAPETEN issued requirements stipulating that the operating organization should conduct PSRs of all operational aspects and activities of research reactors at least once every five years. BATAN is undertaking its first PSR of the RSG-GAS research reactor but it does not have formal processes with procedures for performing safety analysis or PSRs. The regulatory body has never reviewed a PSR report. Both BATAN and BAPETEN lack experience in performing and reviewing PSRs. Training is needed to enhance the effectiveness of both organizations in this area.

The topics that were covered during the workshop included:

- Overview of IAEA safety standards for review of research reactors, with a focus on PSR for research reactors;
- Safety reassessment for research reactors in the light of the Fukushima Daiichi accident;
- IAEA activities on the safety of research reactors;
- PSR of research reactors;
- National updates on the status of the Kartini, Bandung and RSG-GAS research reactors;
- Regulatory framework for PSR in Indonesia;
- Introduction to each of the 14 safety factors and global assessment for PSR (based on *Periodic Safety Review for Nuclear Power Plants* (IAEA Safety Standards Series No. SSG-25, Vienna, 2013);
- Assessment of the condition of structures, systems and components (SSCs) incorporating safety factors 1, 2, 3, 4, 7, 8 and 9;
- Application of a fault schedule to PSR of the OPAL Reactor deterministic safety case;
- Maintenance of safety related documentation and procedures for research reactors; and
- Practical example of PSR at ANSTO.

The working group activities were designed to provide practical examples of selected aspects of PSR. The exercises were focused on safety factors that the participants indicated were priorities for their research reactors, including safety factors 2 ("Actual conditions of SSCs important to safety"), 4 ("Ageing"), 5 ("Deterministic safety analysis") and 7 ("Hazard analysis").

The workshop concluded with a review of the working group presentations/reports and discussions by the participants on the overall conclusions and recommendations. The workshop helped the national organizations to better understand how to establish and conduct PSRs for different kinds of research reactors. Participants in the workshop expressed interest in learning in greater detail how to review each of the 14 safety factors and integrate these into a global assessment for a PSR.

Participants suggested that the IAEA should provide written guidance on performing PSR for research reactors, similar to the guidance provided in SSG-25 for NPPs, with appropriate use of the graded approach.

Philippines

Expert Mission to Discuss Enhancements to the National Centre Website of the Philippines

Manila, Philippines

2–3 December 2013

IAEA Technical Officer: Mr Sameer KUNJEER
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

An expert mission to discuss enhancements to the national centre website of the Philippines was conducted in Manila, Philippines, from 2 to 3 Dec 2013. Three PNRI staff as well as ITSG members from the Philippines and Indonesia, and an IAEA representative, participated in the mission.

The objectives for this expert mission were to:

- Analyse the existing Philippines ANSN national centre infrastructure and status of the national centre website;
- Discuss and identify enhancements to the national centre website from the perspective of the ANSN capacity building IT modules;
- Propose an approach to achieve the future integration of the capacity building IT modules into the Philippines national centre website; and
- Finalize the timescales and resources for the identified potential approach.

The current ANSN national centre website of the Philippines still uses the older version of the CMS. It was discussed and agreed to install and configure the latest version during this mission. The Philippines (through the PNRI) has adopted the use of open source technologies such as Linux, PHP, MySQL Server for implementation of its national centre website. The ANSN national centre website for the Philippines is hosted on a server within the PNRI, which is an Apache web server, located within the firewall.

The participants discussed content management in the national centre website. ITSG members from the Philippines stated that the documents pertaining to regulatory activities should not be uploaded to the Philippines ANSN national centre website, due to redundancy issues. The experts clarified that linking these documents through the national centre website would be a viable option. ITSG members from Philippines stressed furthermore that the security checks of the CMS code should also be conducted by CMS implementation team. Thereafter, the ANSN member countries could adopt this CMS for their respective national centre websites. ITSG members from the Philippines also briefed on the NKM platform implemented within the PNRI. It was also discussed if the Philippines ANSN national centre website could be incorporated within the NKM platform to streamline the process of uploading documents.

The experts also managed to install the latest version of the CMS for the Philippines national centre website. Configuration of the CMS would be completed by the Philippines ITSG members in close coordination with the CMS implementation team soon.

National Workshop on Capacity Building IT Modules for ANSN Topical Group Members from the Philippines

Manila, Philippines
4–6 December 2013

IAEA Technical Officer: Mr Sameer KUNJEER
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

The National Workshop on Capacity Building IT Modules for ANSN Topical Group Members from the Philippines was organized in Manila, Philippines, from 4 to 6 December 2013.

The objectives for this workshop were to:

- Brief and train the ANSN Topical Group coordinators on the various capacity building IT modules in the centralized ANSN website in order to foster more support for future ANSN activities from the perspective of the ANSN Vision 2020;
- Analyse future enhancements to the IT modules, based on the ANSN Topical Group coordinators' requirements;
- Discuss the full or partial integration of the capacity building IT modules into the national centre websites; and
- Discuss an approach to promote use of these modules among a wider audience within the ANSN member countries.

During the workshop, the IAEA Technical Officer delivered presentations on the following topics:

- Briefing on the centralized ANSN website as well as national centre websites
- Exercise on the registration process in the centralised ANSN website
- Exercise on the online nomination process and suggestions for future enhancements
- Webinar demonstration and discussions
- Pool of experts database and future enhancements
- e-Library proposal and further enhancements

The ITSG member from the Philippines gave a demonstration on the Philippines national centre website, in which the elements of local news, interface for document upload, etc. were highlighted. It was noted that the user registration process on the Philippines national centre website is no longer required, since all of the contents/documents pertaining to nuclear safety available on the national centre website are open to the general public. The Topical Group members also acknowledged the use of the CMS for maintaining consistent layout and structure for the implementation of national centre websites.

Some of the key recommendations from this workshop are listed below:

- The participants recommended incorporating a section containing "Best Practices" for benchmarking, etc. in the ANSN Topical Group pages. The IAEA officer pointed out that a somewhat similar section called "Reference Material" already exists in the ANSN Topical Group pages. This section

includes links to key IAEA reference material, pertaining to each technical area.

- The participants suggested including a calendar for all ANSN events on the home page of the centralized ANSN website. The IAEA officer appreciated this recommendation and agreed that it would be implemented soon.
- The Topical Group members from the Philippines also agreed to promote the Philippines national centre website by incorporating links to this website in all relevant outreach material produced by governmental departments, colleges and universities.
- The participants emphasized that the search feature in the centralized ANSN website should be more robust and user-friendly. The IAEA officer mentioned that a website-wide search feature was already under consideration and would be implemented in the centralized ANSN website soon.
- The Topical Group members also suggested that an additional folder to share relevant technical information (other than IAEA reference material), pertaining to ANSN thematic areas should be made available on the centralized ANSN website.
- The participants emphasized that the procedures as well as the format for sharing national documents pertaining to the ANSN activities and those which are supposed to be uploaded in the national centre website, should be finalized and shared with all Topical Group members. This would facilitate the sharing of documents with the respective ITSG members, with all corresponding metadata (attributes). The IAEA officer agreed that this task would be accomplished in close cooperation with the ITSG members and the CMS team.
- The participants also suggested that the use of the capacity building IT modules could be promoted by including it as an activity in the Topical Group work plans and evaluating it on the basis of some performance indicators. The IAEA officer appreciated this suggestion and agreed to discuss it further with the Topical Group coordinators.

Malaysia

Expert Mission to Upgrade the National Centre Website and Workshop on Capacity Building IT Modules for ANSN Topical Group Members from Malaysia

Kuala Lumpur, Malaysia

27–31 May 2013

IAEA Technical Officer: Mr Sameer KUNJEER
(Safety and Security Coordination Section,
Department of Nuclear Safety and Security)

An expert mission to upgrade the ANSN national centre website of Malaysia and a Workshop on Capacity Building IT Modules for ANSN Topical Group Members from Malaysia was organized at the AELB's headquarters in Kuala Lumpur, Malaysia, from 27 to 31 May 2013.



The objectives for this mission were to:

- Analyse the existing Malaysian ANSN national centre infrastructure and status of the national centre website;
- Discuss and identify enhancements to the national centre website from the perspective of the ANSN capacity building IT modules;
- Propose an approach to achieve the future integration of the capacity building IT modules into the Malaysian national centre website; and
- Finalize the timescales and resources for the identified approach.

During the mission, the following topics were presented and discussed:

- Briefing on the centralized ANSN website and demonstration of its key features
- Briefing on the Malaysian ANSN national centre website
- Discussions on expectations from the Malaysian national centre website
- Presentation of the CMS for national centre websites
- Briefing on the data structure of the capacity building IT modules on the centralised ANSN website

Malaysia has recently adopted the CMS implementation for ANSN using PHP 5.3.x, MySQL technologies on a Red Hat Linux platform. This implementation is done on a registered/licensed Linux platform to comply with the organizational IT security policies of the AELB, which in turn are derived/align to the national cybersecurity policies. Malaysia has also moved its web server with the current CMS implementation for the ANSN outside of the trusted zone and located it in a demilitarized/external zone in order to facilitate the configuration and installation of open source software such as Red Hat Linux. Currently the Malaysian national centre website encounters no critical IT issues (using the CMS), except for minor configuration errors. These errors have been reported to the Indonesian CMS team and relevant measures to resolve them will be undertaken.

It was also noted by the participants and the IAEA that the configuration and installation of open source software/tools on Microsoft technologies were prohibited at the AELB in order to comply with the national cybersecurity policies. The IAEA officer mentioned that the compliance of CMS implementation with the national cybersecurity policies was the responsibility of the respective ITSG members and hence they needed to coordinate closely with the CMS implementation team (from Indonesia) and the IAEA to resolve any potential conflicts with these policies.

It was also discussed and agreed that Malaysia would play a significant role in the testing of the existing CMS implementation (penetration testing) to ensure a secure platform for the national centre websites. Malaysian ITSG members can also act as key players for other types of functionality testing such as unit and integration testing of the CMS, before it is applied to other national centre websites. The IAEA encouraged the CMS team to probe any potential security vulnerability issues with the current implementation of the CMS, via penetration testing, etc. It was also proposed that after completion of the CMS (including the integration of the capacity building IT modules) a security audit could be conducted by external cybersecurity experts and, moreover, that a workshop to exchange experience should be organized to facilitate smooth implementation of the CMS among ANSN member countries in future.

The participants also noted and acknowledged the implementation of the e-Library in the CMS, based on the guidelines proposed and agreed by the ITSG. The taxonomy of this e-Library implementation has been simplified to store documents in the ANSN master server. Finally, Indonesia outlined the existing ANSN server infrastructure. The participants appreciated the ease of configuration provided by the CMS and expressed their willingness to provide appropriate feedback for the CMS implementation. The Malaysian ITSG members also agreed to work closely with the Indonesian CMS team in testing the current implementation.

An Excel sheet listing the data structure of the existing scheme in the centralized ANSN database server was presented. This sheet included only the necessary database fields, corresponding to each element of the capacity building IT module, which are essential for integration purposes. It was clarified that these data would be synchronized to the ANSN master server database via a push mechanism, and that the CMS would incorporate necessary procedural constructs to pull this data out and populate the user interface elements of the capacity building IT modules.

The participants also agreed that at the forthcoming ITSG meeting, ITSG members would be requested to compile and present their national as well as organizational cybersecurity policies in order to facilitate the identification of any potential security risks as well as standardization of the CMS platform from a security perspective. The IAEA officer stressed the need for close collaboration among the ITSG members to ensure successful implementation of the CMS in the near future.

Attachment

ANSN Work Programme 2014

TG / area / State	Name of activity	Country, venue	TO	PMO	Start date	End date
Mgt	First planning meeting with Chinese counterparts of the EBP Asia	China	L. Guo	L. Guo	23-01-2014	24-01-2014
ITSG	Consultancy meeting to adapt best practices in coding and cybersecurity for the implementation of the new CMS for the ANSN	Indonesia	K. Sameer	L. Guo	27-01-2014	31-01-2014
Mgt	First planning meeting with Korean regulatory body (NSSC)	Republic of Korea	L. Guo	L. Guo	17-02-2014	18-02-2014
Mgt	Coordination meeting with Hong Kong Observatory	China	L. Guo	L. Guo	20-02-2014	21-02-2014
Viet Nam	Expert Mission to Assist Viet Nam in Filing the Gaps in its Emergency Preparedness and Response Capabilities Identified by the Emergency Preparedness Review Mission	Viet Nam	M. Krishnamachari	B.K. Lim	03-03-2014	07-03-2014
ETTg	Regional Workshop on Systematic Approach to Training and on Developing a Training Action Plan to Fill the Gaps Identified Using the Guidelines for Systematic Assessment of Regulatory Competence Needs (SARCoN)	Indonesia	M.J. Moracho Ramirez / M.R. Zimmermann	B.K. Lim	24-03-2014	28-03-2014
OSTG	Regional Workshop on the Time-Limited Ageing Analysis Methodology for Life Extension, with a Focus on Equipment Qualification and Concrete in Nuclear Facility Buildings	China	A.V. Polyakov	B.K. Lim	24-03-2014	28-03-2014
RWMTG	Regional Workshop on Clearance of Decommissioning Waste: Part 2	Viet Nam	J.H. Rowat / E. Warnecke	J. Parlange	24-03-2014	28-03-2014
ETTg	Regional Workshop to Provide Basic Professional Training in Nuclear Safety	Republic of Korea	M.J. Moracho Ramirez	B.K. Lim	07-04-2014	18-04-2014
Viet Nam	National Workshop and Expert Mission on Site Evaluation for Research Reactors	Viet Nam	J. Haddad / H. Mahmood	B.K. Lim	15-04-2014	17-04-2014
China	National Workshop on Training in Root Cause Analysis for Nuclear Events	China	F. Jiang	L. Guo	22-04-2014	25-04-2014
Mgt	19th Meeting of the ANSN Steering Committee	Viet Nam	L. Guo	L. Guo	23-04-2014	25-04-2014

TG / area / State	Name of activity	Country, venue	TO	PMO	Start date	End date
SATG	Regional Workshop to Conduct a Review Exercise for the Preparation of Safety Analysis Reports for Nuclear Power Plants: Transient and Accident Analysis	Viet Nam	K. Manwoong	B.K. Lim	05-05-2014	09-05-2014
LMSTG	Regional Workshop on the Transition of Management Systems Already in Place for Radiation Practices at Nuclear Facilities from ISO 9000 to GS-R-3	Republic of Korea	A. Khatoon	L. Guo	12-05-2014	16-05-2014
GRITG	Regional Workshop on Regulatory Approaches Needed for the Deployment of a Country's First Nuclear Power Plant Project	Malaysia	R.A. Gibbs	M. Takahashi	19-05-2014	23-05-2014
Indonesia	National Workshop on Emergency Preparedness and Response for Off-Site Consequences	Indonesia	P. Zombori	B.K. Lim	02-06-2014	06-06-2014
ETTG	Regional Workshop on Special On-the-Job Training for Nuclear Newcomers	Republic of Korea	M.J. Moracho Ramirez	B.K. Lim	09-06-2014	13-06-2014
EPRTG	Regional Workshop on Long Term Issues Following a Nuclear or Radiological Emergency and Annual Meeting of the EPRTG	Malaysia	P. Zombori	Y. Chaari	09-06-2014	13-06-2014
China	Expert Mission on Risk Management, Risk Monitor Development and Risk-Informed Application in Nuclear Power Plants	China	A. Lyubarskiy	L. Guo	09-06-2014	13-06-2014
Indonesia	National Workshop on Performance Indicators of the Regulatory Body	Indonesia	J.R. Jubin	Y. Chaari	30-06-2014	04-07-2014
RWMTG	Regional Workshop on Predisposal — Waste Acceptance Criteria, Processing and Interim Storage	Viet Nam	G. Bruno / E. K. Howell.	J. Parlange	30-06-2014	04-07-2014
SATG	Regional Workshop on Safety Analysis Using RELAP5 and Annual Meeting of the SATG	Republic of Korea	K. Manwoong	L. Guo	30-06-2014	04-07-2014
OSTG	Regional Workshop on Analysis of Safety Significant Events in Asian Countries' Nuclear Power Plants Using Trend Analysis and Statistical Analysis Methods	China	J. Fuming	L. Guo	01-07-2014	04-07-2014
ETTG	Regional Workshop on Using the Education and Training Review Service (ETRES) for Self-Assessment and Filling the Gaps	Austria	M.J. Moracho Ramirez	L. Guo	07-07-2014	11-07-2014

TG / area / State	Name of activity	Country, venue	TO	PMO	Start date	End date
STG	Fifth Annual Meeting of the STG and Regional Workshop on Probabilistic Seismic Hazard Analysis and Surface Faulting Analysis for Nuclear Power Plant Sites	Austria	J. Haddad	L. Guo	15-07-2014	18-07-2014
SATG	Consultancy Meeting on Peer Review for Finalization of the Draft Technical Guidelines on the Evaluation of Fluid–Structure Interaction	USA	K. Manwoong	L. Guo	21-07-2014	24-07-2014
SATG	Webinar on Reactivity Insertion Accidents at Nuclear Power Plants and consultant service contract for the development of webinar lecture materials	Webinar	K. Manwoong	L. Guo	30-07-2014	31-07-2014
ETTG	Regional Workshop on the Instructor Training Programme	Japan	M.J. Moracho Ramírez	L. Guo	04-08-2014	08-08-2014
Management	2nd Planning Meeting with Korean Regulatory Body, NSSC	Republic of Korea	L. Guo	L. Guo	07-08-2014	08-08-2014
CTG and EPRTG	Workshop on Communication During Emergencies (Phase II)	Thailand	B. Nasim	Y. Chaari	18-08-2014	22-08-2014
Indonesia	National Workshop on Application of IAEA Methodology and Tools for the Safety Case and Safety Assessment of Dismantled Reactor Components at the Bandung Research Reactor	Indonesia	M. Kinker	Y. Chaari	25-08-2014	29-08-2014
Indonesia	National Tabletop Exercise on Emergency Response for a Radiological Accident in Countries with Coastal and Inland Waterways	Indonesia	P. Zombori	Y. Chaari	02-09-2014	04-09-2014
SATG	Consultancy Meeting to Finalize the Review Service Guidelines for Gap Finding Related to Safety Analysis Capabilities	Austria	K. Manwoong	L. Guo	02-09-2014	05-09-2014
SMRRTG	Second Annual Meeting of the Regional Advisory Safety Committee for Research Reactors in Asia and the Pacific (RASCAP)	Malaysia	D.V.H. Rao	J. Parlange	08-09-2014	12-09-2014
ETTG	Regional Workshop on Safety Review and Assessment by the Regulatory Body	Republic of Korea	U. Bezdeguemeli	L. Guo	15-09-2014	19-09-2014
CBMG	Consultancy Meeting on the Development of the Safety Assessment Guidance for ANSN	Austria	L/ Guo	L/ Guo	17-09-2017	19-09-2014
SATG	Expert Mission on Gap Finding Related to Safety Analysis Capabilities	Viet Nam	M. Kim	L. Guo	06-10-2014	10-10-2014

TG / area / State	Name of activity	Country, venue	TO	PMO	Start date	End date
CTG	Workshop for Senior Officials and CTG Members on Legal and Regulatory Requirements Concerning Communication and Annual Meeting of the CTG	Malaysia	J.R. Jubin	J. Parlange	07-10-2014	10-10-2014
OSTG	Regional Workshop on the Time-Limited Ageing Analysis Methodology for Life Extension, with a Focus on Fatigue and Buried Pipelines	China	R. Krivanek	L. Guo	14-10-2014	17-10-2014
ETTg	Annual Meeting of the ETTG	Austria	M.J. Moracho Ramírez	L. Guo	20-10-2014	24-10-2014
Indonesia	National Workshop on Radiation Emergency Medicine	Indonesia	E.D. Herrera Reyes	Y. Chaari	20-10-2014	23-10-2014
Philippines	National Workshop on Knowledge Management	Philippines	S. Mallick	J. Parlange	20-10-2014	24-10-2014
GRITG	Sixth Annual Meeting of the GRITG and Regional Workshop on the Legal and Regulatory Framework	USA	R.A. Gibbs	Y. Chaari	27-10-2014	31-10-2014
RWMTG	Regional Workshop on Field Data Acquisition and Data Processing for the Safety Case of Waste Disposal Facilities and Annual Meeting of the RWMTG	Philippines	W. Kennedy	J. Parlange	03-11-2014	07-11-2014
Malaysia	National Workshop on Knowledge Management	Malaysia	S. Mallick	Y. Chaari	04-11-2014	07-11-2014
LMSTG	Regional Workshop on Development of an Integrated Management System Model Based on GS-R-3 and GSR Part 2 and Third Annual Meeting of the LMSTG	Malaysia	A. Khatoon	L. Guo	17-11-2014	21-11-2014
CBMG	Second Meeting of the CBMG	Austria	L. Guo	L. Guo	17-11-2014	18-11-2014
Mgt	20th Meeting of the ANSN Steering Committee	Austria	L. Guo	L. Guo	19-11-2014	21-11-2014
IAEA	International Conference on Occupational Radiation Protection: Enhancing the Protection of Workers — Gaps, Challenges and Developments	Austria	J. Ma	L. Guo	01-12-2014	05-12-2014
SMRRTG	Regional Workshop on Systematic Fire Hazard Analysis at Research Reactors	USA	A. Shokr / D. Sears	J. Parlange	01-12-2014	05-12-2014
ETTg	Regional Workshop on Nuclear Safety Tailored for Regulators	Malaysia	U. Bezdeguemeli	L. Guo	01-12-2014	05-12-2014
ETTg	Regional Workshop on Outlining a National Strategy for Education and Training	Indonesia	M.J. Moracho Ramírez	L. Guo	TBD	TBD

TG / area / State	Name of activity	Country, venue	TO	PMO	Start date	End date
Viet Nam	National Workshop on an Effective National Emergency Response Centre for Radiological and Nuclear Emergencies	Viet Nam	R. Salinas	Y. Chaari	TBD	TBD
Philippines	National Workshop on Knowledge Management	Philippines	S. Mallick	J. Parlange	TBD	TBD
STG	Regional Workshop on Assessment of Geotechnical, Seismic and Hydrological Issues Related to Nuclear Power Plant Siting: Activities and Requirements	Bangladesh	J. Haddad	L. Guo	TBD	TBD
Thailand	National Workshop on Enhancing the Capability of Thai Radiological Assessors	Thailand	R. Salinas	J. Parlange	TBD	TBD
Viet Nam	National Workshop on Radioactive Waste Management for Rare Earth Mining, Milling and Processing Activities	Viet Nam	G. Bruno	Y. Chaari	TBD	TBD
ITSG	11th Meeting of the ITSG	Philippines	TBD	L. Guo	TBD	TBD
ITSG	Consultancy meeting to discuss the infrastructure of the ANSN master server for national centre websites as well as the necessary hosting arrangements	Republic of Korea (tentatively)	TBD	L. Guo	TBD	TBD
ITSG	Consultancy meeting to determine the feasibility of migration of the centralized ANSN website to a SharePoint platform	Austria	TBD	L. Guo	TBD	TBD
CBMG	Regional Workshop on CBMG Support Procedures to Promote Self-Assessment Based on SSG-16	Austria	TBD	Y. Chaari	TBD	TBD
ITSG	Consultancy meeting to draft the key performance indicators for the ANSN	Austria	TBD	L. Guo	TBD	TBD
Bangladesh	National Nuclear Emergency Response Exercise for the TRIGA Mark-II Research Reactor	Bangladesh	TBD	Y. Chaari	TBD	TBD
China	National Workshop on Analysis of Safety Significant Events in Asian Countries' Nuclear Power Plants Using Trend Analysis and Statistical Analysis Methods	China	TBD	L. Guo	TBD	TBD
China	National Workshop on Safety Margin Assessment for Nuclear Power Plants with Regard to Human Induced External Events	China	TBD	L. Guo	TBD	TBD

List of Abbreviations

AELB	Atomic Energy Licensing Board [Malaysia]
AMP	ageing management programme
AMR	ageing management review
ANNuR	Arab Network of Nuclear Regulators
ANSN	Asian Nuclear Safety Network
ANSTO	Australian Nuclear Science and Technology Organisation
ASEAN	Association of Southeast Asian Nations
ASEANTOM	ASEAN Network of Nuclear Regulatory Bodies on Atomic Energy
ASN	French Nuclear Safety Authority
BAPETEN	Nuclear Energy Regulatory Agency [Indonesia]
BATAN	National Nuclear Energy Agency
BEPU	best estimate plus uncertainty
BPTC	Basic Professional Training Course on Nuclear Safety [IAEA]
CB	capacity building
CBMG	Capacity Building Management Group [ANSN]
CMS	content management system
CNSC	Canadian Nuclear Safety Commission
CPI	China Power Investment Corporation
CTG	Topical Group on Communication and Consultation with Interested Parties [ANSN]
DSA	deterministic safety analysis
EBP Asia	Extrabudgetary Programme on the Safety of Nuclear Installations in South-East Asia, Pacific and Far East Countries [ANSN]
ENSTTI	European Nuclear Safety Training and Tutoring Institute
EPR	emergency preparedness and response
EPREG	Emergency Preparedness and Response Expert Group [IAEA]
EPREV	Emergency Preparedness Review [IAEA]
EPRTG	Topical Group on Emergency Preparedness and Response [ANSN]
E&T	education and training
ETRES	Education and Training Review Service [IAEA]
ETTg	Topical Group on Education and Training [ANSN]
EU	European Union
FNCA	Forum for Nuclear Cooperation in Asia
FNRBA	Forum of Nuclear Regulatory Bodies in Africa
FORO	Ibero-American Forum of Radiological and Nuclear Regulatory Agencies
FSI	fluid–structure interaction
GNSSN	Global Nuclear Safety and Security Network
GRITG	Topical Group on Governmental and Regulatory Infrastructure [ANSN]
GSAN	Global Safety Assessment Network [IAEA]
HRD	human resource development
IAEA	International Atomic Energy Agency
I&C	instrumentation and control
ICC-NRS	International Cooperation Centre for Nuclear and Radiation Safety
IEC	Incident and Emergency Centre [IAEA]
IGALL	International Generic Ageing Lessons Learned [IAEA]
INSS	International Nuclear Safety School [Republic of Korea]

IRIDM	integrated risk informed decision making
IRRS	Integrated Regulatory Review Service [IAEA]
ISE	Integrated System Evaluation [IAEA]
IT	information technology
ITSG	Information Technology Support Group [ANSN]
ITASS	Integrated Training and Accident Analysis System
JAEA	Japan Atomic Energy Agency
JNES	Japan Nuclear Energy Safety Organization
JSME	Japan Society of Mechanical Engineers
KEPCO	Korea Electric Power Corporation
KHNP	Korea Hydro & Nuclear Power Company
KINS	Korea Institute of Nuclear Safety
KM	knowledge management
KNF	KEPCO Nuclear Fuel Company [Republic of Korea]
LCM	life cycle management
LMSTG	Topical Group on Leadership and Management for Safety of the Regulatory Bodies [ANSN]
LTO	long term operation
Mgt	Management [ANSN]
NAA	neutron activation analysis
NCP	national contact point
Necsa	South African Nuclear Energy Corporation
NIRS	National Institute of Radiological Sciences [Japan]
NKM	nuclear knowledge management
NNRP	National Nuclear Regulatory Portal [GNSSN]
NNSA	National Nuclear Safety Administration [China]
NPIC	Nuclear Power Institute of China
NPP	nuclear power plant
NRA	Nuclear Regulation Authority [Japan]
NRC	United States Nuclear Regulatory Commission
NSSC	Nuclear Safety and Security Commission [Republic of Korea]
OAP	Office of Atoms for Peace [Thailand]
OLCs	operational limits and conditions
OSTG	Topical Group on Operational Safety [ANSN]
PMO	Project Management Officer [IAEA]
PNRI	Philippine Nuclear Research Institute
PreSA	Peer Review and Support Arrangement [ANSN]
PSA	probabilistic safety assessment
PSAR	preliminary safety analysis report
PSR	periodic safety review
QA	quality assurance
RANET	Response and Assistance Network [IAEA]
RCPS	reactor control and protection system
R&D	research and development
RELAP	Reactor Excursion and Leak Analysis Program
RINPO	Research Institute of Nuclear Power Operation [China]
RWM	radioactive waste management
RWMTG	Topical Group on Radioactive Waste Management [ANSN]
SALTO	Safety Aspects of Long Term Operation [IAEA]
SAR	safety analysis report

SARCoN	Guidelines for Systematic Assessment of Regulatory Competence Needs [IAEA]
SAT	systematic approach to training
SATG	Topical Group on Safety Analysis [ANSN]
SC	Steering Committee [ANSN]
SMRRTG	Topical Group on Safety Management of Research Reactors [SMRRTG]
SNSA	Slovenian Nuclear Safety Administration
SSCs	structures, systems and components
SSG-16	<i>Establishing the Safety Infrastructure for a Nuclear Power Programme</i> (IAEA Safety Standards Series No. SSG-16, Vienna, 2011)
STG	Topical Group on Siting [ANSN]
SYS–TH	system thermal–hydraulics
TC	technical cooperation
TECDOC	IAEA Technical Document
TEPCO	Tokyo Electric Power Company
TG	Topical Group [ANSN]
TLAA	time-limited ageing analysis
TO	Technical Officer
TSO	technical support organization
ÚJD SR	Nuclear Regulatory Authority of the Slovak Republic
VARANS	Vietnam Agency for Radiation and Nuclear Safety
Vinatom	Viet Nam Atomic Energy Institute
VVER	water cooled water moderated power reactor
WENRA	Western European Nuclear Regulators Association