

PROGRESS REPORT

(January 2008 – December 2008)



**EXTRABUDGETARY PROGRAMME
ON THE SAFETY OF NUCLEAR INSTALLATIONS
IN THE SOUTH EAST ASIA, PACIFIC AND FAR EAST COUNTRIES**



INTERNATIONAL ATOMIC ENERGY AGENCY

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International Atomic Energy Agency

Asian Nuclear Safety Network

**Extrabudgetary Programme (EBP) on the Safety of Nuclear Installations in the
South East Asia, Pacific and Far East Countries**

PROGRESS REPORT

EXECUTIVE SUMMARY

During 2008, the ANSN continued to develop with hubs in China, Japan and Republic of Korea and national centres in Indonesia, Malaysia, Philippines, Thailand and Vietnam. Australia, France, Germany, Japan, Republic of Korea and the USA provide in-kind and/or financial support to ANSN through the Extrabudgetary Programme on the Safety of Nuclear Installations in South East Asia, Pacific and Far East Countries (EBP-Asia).

In April 2008, a Strategy dialogue meeting was held in Vienna. Senior representatives of the ANSN participating countries discussed the development of the ANSN, its usefulness to date, and, most importantly, strategies for future enhancement of nuclear safety in the Asian region. In view of the rapid expansion of nuclear power programmes in Asia, additional cooperation and timely efforts to establish effective nuclear safety infrastructure will be required. In this regard the ANSN is an existing and powerful tool which could be utilized, at a more strategic level, to promote safety in the Region in developing a regional capacity building system.

The ANSN Steering Committee (SC), co-chaired by Malaysia and Japan, met in October 2008 in Malaysia. For the first time, in addition to its usual mandate to coordinate ANSN development in the direction given by the Strategy dialogue meeting, the SC discussed results of 2008 activities and agreed with the plan for 2009 activities according to a new mechanism through the Topical Groups based on a “network culture”. The SC requested the Secretariat to develop a long term vision for the ANSN in the 2020 time frame to be discussed and approved at the Strategy Dialogue meeting. This would provide guidance and increase effectiveness of the SC.

Based on Safety Conventions and IAEA Safety Standards, safety of each Asian country is reviewed using the Integrated Safety Evaluation (ISE) process embedded in the ANSN. That process includes self-assessment and peer discussion through the IT network and Topical Groups. The SC recognised, at this point in time, the ISE process as a good performance indicator system for evaluating the overall ANSN project.

The topical groups are more and more in the centre of the process with higher status and more resources. They contribute to the strategy of the ANSN in participating in the ISE process, proposing and implementing regional workshops and training courses and, identifying knowledge to upload in the IT network

A new topical group on Governmental and regulatory infrastructure was created in 2008 in order to enhance nuclear safety infrastructure to support new and expanding nuclear power programmes in the region. Future activities on siting and public awareness are under consideration.

The Agency's ANSN website improved in 2008 with the continuous upload of the material of past ANSN activities and the management of the ANSN. Work has started in 2008 to reinforce the security of the network and to update the software.

To increase the ANSN outreach, the bi-weekly ANSN Newsletter continues to be widely distributed worldwide. In 2008, a promotional meeting (Caravan) was conducted in Malaysia to present the ANSN to some 300 specialists of the scientific community of this country.

Increasing cooperation with the Forum of Nuclear Cooperation in Asia (FNCA) took place in 2008 with the participation of IAEA in a FNCA Panel meeting and the participation of an FNCA representative at the ANSN SC meeting. Good contacts are still in progress with the Association of Southeast Asian Nations (ASEAN) to look into the possibility of cooperation between ANSN and the nuclear energy safety sub-sector network of that organisation.

Table 1 *Number of activities in 2008*

ANSN Management	9
Regional	11
National	20
China	7
Indonesia	5
Malaysia	2
Philippines	1
Thailand	2
Vietnam	3
Total	40

INTRODUCTION

This report describes the activities implemented from January 2008 until December 2008.

More details about the results of activities described in this report are available in the main web site of the Asian Nuclear Safety Network (ANSN) at the following address: www.ansn.org.

Strategy and coordination

ANSN Nuclear Safety Strategy Dialogue Meeting

Vienna, Austria, 21 April 2008

The objective of this meeting was to discuss nuclear safety strategy issues within the framework of the Asian Nuclear Safety Network (ANSN). The initial development of the ANSN, its usefulness to date, and, most importantly, strategies for future enhancement of nuclear safety in the Asian region was discussed by senior officials from Australia, China, France, Indonesia, Japan, Korea, Malaysia, Philippines, Thailand, USA, and Vietnam. Representatives from Singapore and the Association of Southeast Asian Nations (ASEAN) attended as observers.



In view of the rapid expansion of nuclear power programmes in Asia, additional cooperation and timely efforts to establish effective nuclear safety infrastructure will be required. In this regard the ANSN is an existing and powerful tool which could be utilized, at a more strategic level, to promote safety in the Region. The main topics shared through various presentations and plenary discussion included capacity building, safety assessment capability and, emergency preparedness and response (EPR). During the concluding session, some directions for future

ANSN activities were agreed by the participants. The ANSN Education and Training Topical Group (TG) is expected to study an effective and efficient regional capacity building system for nuclear safety infrastructure, particularly safety regulation. Safety assessment capability is a key issue for ensuring safety of a nuclear installation before, during, and after its life. Therefore, it was suggested that the ANSN Safety Analysis TG develop and propose an appropriate mechanism to share and transfer safety assessment tools, maintain/improve quality of safety assessments, and educate and train staff. A new ANSN TG focusing on initial stages of nuclear safety infrastructure development will be created. Site evaluation could be a future topic for the ANSN. This new orientation of the ANSN will be conducted with other appropriate partnerships, institutions and initiatives including the ASEAN.

8th Steering Committee Meeting of the ANSN

Putrajaya, Malaysia, 20–23 October 2008

The Atomic Energy Licensing Board of Malaysia (AELB) hosted this 8th ANSN SC meeting. Twenty-six participants from ten participating countries and the IAEA attended the meeting. In addition, three observers from Singapore, FNCA and ASEAN were invited to participate. For the first time, a representative from the Department of Technical Cooperation of the IAEA also attended the meeting.

The SC approved the nomination of Raja Abdul Aziz Raja Adnan, Director General of AELB as Chairman of the ANSN SC and of Mr. Tsutomu Yokoyama, from Japan, as co-Chairman, who will ensure continuous follow-up of the SC activities. After some introductory presentations including those of the representatives of FNCA and ASEAN, national representatives reported their progress on

nuclear safety and proposed activities for 2009 in their respective countries. Active discussion and information exchange amongst the participants took place regarding the national activities for 2009. They will be selected and implemented according to a new mechanism through the Topical Groups (TGs) based on a “network culture”.



According to previous practice, the TG coordinators met separately to discuss topics of common interest and to review the proposed regional activities. The last part of the meeting was devoted to discussion and approval of the “Strategy and position paper on the future of the ANSN” proposed by the IAEA.

The SC recognised the Integrated Safety Evaluation (ISE) process as a good performance indicator system for evaluating the overall ANSN project. The creation of a Governmental and Regulatory Infrastructure Topical Group was confirmed. The SC was pleased to see recent developments in the ANSN public web site. The SC agreed in principle to reinforce the security of the IT network and to centralise more IT features.

Outreach Activities

Malaysian Asian Nuclear Safety Network Caravan

Putrajaya, Malaysia, 20 October 2008

In the morning of the first day of the SC meeting, a special event called the Malaysian Asian Nuclear Safety Network Caravan presented the ANSN to some 300 specialists of the scientific community of Malaysia. The event was organized by AELB in cooperation with the Ministry of Science Technology and Innovation (MOSTI). Haji Fadillah Bin Yusof, MOSTI deputy Minister welcomed the participants and launched the Malaysian ANSN web site.



There was an exhibition of posters describing the ANSN and a panel on National and Regional Nuclear Safety Infrastructure and the Role of ANSN chaired by Dr. Noramly Muslim chairman of AELB. A press conference also took place.

IAEA participation in the First Meeting of the ASEAN Nuclear Energy Safety Sub-Sector Network

Singapore, 22-23 January 2008

At the invitation of the Association of Southeast Asian Nations (ASEAN), two IAEA staff attended, as observers, the first meeting of the ASEAN Nuclear Energy Safety Sub-Sector Network (NES-SSN) from 22 to 23 January 2008 in Singapore.

The IAEA participants presented the Agency's programme on Nuclear Safety and Security, with particular emphasis on the Global Nuclear Safety and Security Regime and the Asian Nuclear Safety Network (ANSN).

The participation of the IAEA was appreciated and provided a good opportunity for mutual exchange of information and to explore a broader utilisation of the ANSN by ASEAN. Strengthening cooperation between ASEAN and

the IAEA in the area of nuclear safety is envisaged.

IAEA participation in the Second Meeting of the ASEAN Nuclear Energy Safety Sub-Sector Network

Singapore, 14-15 October 2008

More than thirty participants coming from eight of the ten ASEAN Member Countries attended the second meeting of NES-SSN, namely Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, and Thailand. Laos and Vietnam didn't participate. ASEAN Centre for Energy (ACE) whose Executive Director is seconded from Vietnam is the Secretary of the NES-SSN.

Participants spent almost one day for discussion that is whether Objective of NES-SSN includes "establishment of regional nuclear safety regime" proposed by Singapore. Indonesia strongly opposed it because the concept of "regional nuclear safety regime" is not clearly defined. Singapore could not answer to this basic question. At the end of the first day, the IAEA staff presented IAEA activities including the 2020 reports and the Asian Nuclear Safety Network (ANSN) and contributed the discussion about nuclear safety regime.

On the 2nd day, as they could not reach consensus on Objective, they agreed to stop the discussion on TOR and make a report to the SOME.

As the TOR and work plan were not finalised, possible cooperation between ASEAN and IAEA was not discussed. The chairman confirmed he would attend the Steering Committee of the ANSN as an observer.

There exist some regional framework including ASEAN, ASEAN+3 (China, Japan, Korea), APEC. ASEAN+3 is the best regional framework to support entrant countries in Asia because China, Japan, and Korea can provide financial and technical supports to them.

IAEA participation in the 2nd Study Panel for Cooperation in the Field of Nuclear Energy in Asia (FNCA meeting)

Tokyo, Japan, 1-2 September 2008

The objective of the meeting, hosted by the Cabinet Office Government of Japan (CAO) and

the Japan Atomic Energy Commission (JAEC), in cooperation with the Nuclear Safety Commission of Japan (NSC), was to discuss the development of the infrastructures for ensuring nuclear safety among senior officials and experts in charge of nuclear policy and nuclear safety regulation of nine member countries participating in the Forum for Nuclear Cooperation in Asia (FNCA), namely, Bangladesh, China, Indonesia, Japan, Korea, Malaysia, The Philippines, Thailand and Vietnam. An officer of the Department of Nuclear Safety and Security, IAEA, also participated in the meeting, chaired by Dr. Kunihisa Soda, Commissioner of NSC.

After country/IAEA presentations and round table discussion, it was stated that active exchange of information, good practices and lessons learned on the infrastructure development such as safety legal system, human resources and public acceptance should be conducted among FNCA countries through seminars and/or workshops.



Based on the recognition that international cooperation can contribute to effective and efficient development of the infrastructure for nuclear safety, it was suggested that it is necessary to promote coordination of FNCA with other international frameworks such as the ANSN and the nuclear energy safety sub-network of the Association of South East Asian Nations (ASEAN) to produce results more effectively.

16th Pacific Basin Nuclear Conference Aomori, Japan, 13-18 October 2008

The Pacific Basin Nuclear Conferences (PBNCs) were initiated originally as regional cooperative forums to advance peaceful uses of nuclear energy in the Pacific Basin region. The first meeting was held in 1976 In Hawaii, USA and they have been held about every two years, initially under the joint sponsorship of the American Nuclear Society (ANS) and the Pacific Basin nuclear energy society selected by the ANS to host each conference. The conferences have played an

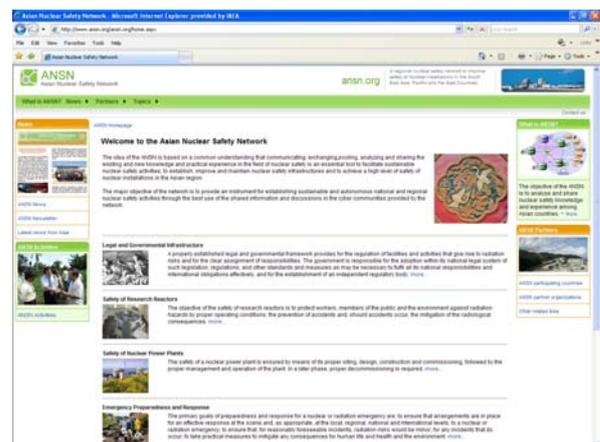
important role in providing a forum in which to share information relating to both research and development and to the implementation of nuclear technology in the Pacific Basin.

An IAEA representative participated in Keynote Session on “International Cooperation of Nuclear Technology and Application (Panel)” on 16 October. He presented the Asian Nuclear Safety Network (ANSN) including capacity building of nuclear safety and the programme management and activities of ANSN. The Session Chairman suggested it is needed to coordinate initiatives supporting new entrant countries of NPPs.

All the major vendors were present, as well several of the new entrant countries in the region. A strong interest was shown in the Agency documents supporting the entrant countries, and the activities the Agency do in providing training in nuclear safety.

ANSN web sites

During the period covered by this report, the major event was the publication of the new ANSN public site at the following address: <http://www.ansn.org/>. Compared to the previous one, it has been updated and additional information is available, including some basic documents covering the main topics of the ANSN. It is also more secure than the previous version and it is written in a more recent language (ASP.NET 2.0).



The next step, started at the end of 2008, is to “translate” the existing IAEA web site in ASP.NET 2.0 and to append it to the existing public site to create a unique ANSN site where anyone, according to his level of access, will be able to find the information he is looking for and, using this central site as a portal, could navigate through the national web sites of the ANSN.

The task of uploading all the material previously stored in the Asian Programme Management Database (APMD) was completed. All the activities from 1997 until 2008 have been uploaded, corresponding to about 350 events and more than 4 500 reports and PowerPoint presentations. The APMD is now discontinued.

ANSN Newsletter

The purpose of the newsletter is to provide a short and concise overview of the safety activities underway in the participating countries under the framework of the ANSN and to increase the outreach of the network.

The newsletter is published bi-weekly since March 2005 and widely distributed electronically to about 900 subscribers, mainly in Asia, and also in the supporting countries of the ANSN. In 2008, twenty-one issues have been published.

Other events

Member States have noted with appreciation the achievements and value of the ANSN during

Board of Governors meetings and the General Conference in 2008.

At the margins of the 52nd General Conference of the IAEA, Mr. Taniguchi, DDG-NS, had informal discussions with representatives of Japan, Indonesia, Malaysia, the Philippines, Singapore, Thailand, Vietnam and EC on various ANSN issues.

On 10 December 2008, the Republic of Korea hosted a working lunch in Vienna for the ANSN country ambassadors (China, Japan, Republic of Korea, Malaysia, the Philippines, Thailand, Vietnam and the European Commission).

Mr. Taniguchi briefed on the ANSN activities and the plan for the 2nd Strategy Dialogue meeting to be held in Seoul in April 2009 to discuss strategic and political issues in order to enhance regulatory capability regarding nuclear safety infrastructure in Asia with a view to the year 2020.

The European Commission confirmed its intention to propose to its Member States a 2 million euros contribution to the ANSN in 2009.

Singapore has officially joined the Asian Nuclear Safety Network in December 2008.

Regional Activities

Education and Training Topical Group

OBJECTIVE

1. To identify and share best practices for national training strategies
2. To identify training needs and specific training projects
3. To identify training material needs
4. To contribute to revise and continuously improve the training material available in the ANSN

4th Education & Training Topical Group Meeting

Bali, Indonesia, 12–13 November 2008

The main objectives of the 4th meeting of the Education & Training Topical Group (E&T TG) were: to exchange information, to revise the progress of the E&T TG work programme, to explore possibilities for further regional cooperation and, to discuss and approve the national and regional programmes of ANSN activities in the domain of E&T for 2009.



The first day of the meeting was devoted to clarifying the General competence Framework (GF) and actions to identify and share training documents in support of it. The development of the National Training Frameworks with specific needs was discussed in the light of the E&T TG strategy report produced in 2006. The coordinators of the TG reported on the conclusions of the recent Steering Committee (SC) meeting and the activities planned for 2009. The IAEA presented recent developments of training materials and upgraded web services for e-learning. DVDs

containing lectures on Management Systems (MS) and a workshop on MS focusing on safety culture were also introduced to the participants. All participating ANSN countries reported on the present status of their training activities.

On the second day of the meeting, the concept of the “Regional Training System”, put forward by IAEA Secretariat, was discussed. A revision of the Terms of Reference of the E&T TG was proposed in view of the extended mandate given by the SC and the “Regional Training System”. The proposal of activities for 2009 and how they fulfil the national request was then discussed, amended and approved.

The main conclusions of the meeting include: i) the reinforced use and keeping up-to-date of the Integrated Safety Evaluation (ISE) for a better coordination with the E&T TG work programme; ii) the need to have the E&T information of the ISE updated annually before March in order to prepare the work programme for E&T TG plenary meeting in October 2009; iii) the necessity for the E&T TG to address the issue of developing a policy and strategy for building up competence in the ANSN countries and involve decision makers; iv) the request to the countries to identify documents, training workshops available in English that have taken place during the year and to fill in the reference of these documents in the General training Framework.

Basic Professional Training course in Nuclear Safety

Daejon, Korea, 3-28 November 2008

The IAEA Basic Professional Training Course (BPTC) on nuclear safety is intended to provide a broad overview of safety concepts and their application to nuclear power plants and research reactors. A standard syllabus was developed and an e-learning version of the text book published on NSNI training web site. The nature and scope of the course are primarily oriented to junior professional recently involved in nuclear safety related activities. It is also appropriate for

specialised professionals who lack a broader overview of nuclear safety.

Given the interest of these materials for building up competence in the Asian region, there was an agreement between Korean Institute for Nuclear Safety (KINS) and the IAEA in order to hold the BPTC as a regional course within the Asian Nuclear Safety Network. As a result of this agreement KINS representatives and the IAEA prepared an adapted programme of the IAEA materials of the BPTC intended to be held in Korea with duration of a month in November 2008. In addition to the duration, the structure, training methods were also agreed and the Extra-budgetary programme assigned a devoted amount for two lecturers and for eleven participants from the Asian region.

The training course was attended by young engineers representing Malaysia, China, Thailand, Philippines, and Vietnam.

The IAEA Basic Professional Training Course provides a comprehensive introductory background on nuclear safety for NPPs based on the IAEA

safety standards and is an important tool for training with a view of future development of human resources.

In addition to the BPTC, the IAEA Regulatory Control course and IAEA materials, particularly the video lectures support the knowledge of the IAEA safety Standards and are an important tool for self study, sustainability and building up competence in Regulatory Bodies that envisage embarking in nuclear power.

KINS expertise and facilities have proved to be very useful and adequate basis for holding the course efficiently in the Asian region. Cooperation between KINS and the IAEA for holding the BPTC and extend it to the Regulatory Control course for the ANSN will be highly beneficial for further development of competence in nuclear safety based on the IAEA safety standards.

A condensed version of the IAEA-BPTC was successfully held in KINS for the ANSN countries and the implementation of the course was improved including work groups, and exams.

Safety Analysis Topical Group

OBJECTIVE

1. To provide a forum for the exchange of information and documentation
2. To maintain and improve the knowledge acquired during the TG activities

Meeting of the ANSN Safety Analysis Topical Group

Daejeon, Korea, 11–14 March 2008

A meeting of the ANSN Topical Group on Safety Analysis was held at the Korea Institute of Nuclear Safety (KINS) in Daejeon, Republic of Korea. Nine participants from China, Indonesia, Malaysia, the Philippines, Thailand and Vietnam, and two from KINS attended the meeting.



Several presentations on safety assessment results obtained from research reactors were given by the participants from China, Thailand, Indonesia and Malaysia. Special lectures on the design and safety analysis of the HANARO research reactor and on computer code verification and validation for research reactors were provided by KAERI and KINS, respectively. IAEA staff introduced the fundamentals of nuclear power plant design. Two groups were formed to work together on the completion of the RELAP5 input deck for the PUSPATI reactor in Malaysia. This was successfully accomplished and a transient calculation of the loss of flow was performed. Explanations were provided in connection with the modelling of critical flow with RELAP5 and the Marviken test for critical flow, after which the participants were required to perform a code assessment for comparison with the test results.

An exchange of information and experience in the area of safety analysis for research reactors has taken place continuously within the ANSN TG Hub. The discussion on the RELAP5 based safety assessment of the member countries' research reactors and the special lectures given at the ANSN TG meeting provided further insights on the way to perform safety analysis for research reactors and to ensure their safety.

Since Vietnam, Thailand and Indonesia have indicated plans to construct nuclear power plants in the future, it was agreed at the meeting that the activity of the ANSN TG would be extended to cover the safety analysis for nuclear power plants as well as research reactors. It was also agreed that the work of the TG on Safety Analysis would focus rather on the way to analyse the assessment results and to model the component/system than on the RELAP5 assessment itself.

During the meeting, the new ANSN strategy for the period of 2008–2009, with a special focus on ways to strengthen safety assessment capabilities (including the sharing of safety assessment tools), were introduced by the IAEA. All of the participants supported the proposal.

Training Course on Safety Assessment and Verification for Nuclear Reactors Daejeon, 14–18 July 2008

The purpose of this training course was to improve participants' understanding of comprehensive nuclear reactor safety assessments for research reactors and nuclear power plants, and the independent verification thereof. Nine participants from China, Indonesia, Malaysia, Thailand and Vietnam, and nine lecturers from the Korea Atomic Energy Research Institute (KAERI), the Korea Institute of Nuclear Safety and the Korea Power Engineering Company attended the meeting.



The course provided training on systematic procedures and methods, the process of completing a safety assessment from the initial design process, construction and operation to design modifications. They also provided instruction on the procedure for carrying out independent verification of reactor safety assessment.

During the course, lectures were given on design and operation of the NPPs; contents and format of the Safety Analysis Report; and the regulatory activities for review and inspection of NPPs. The thermal-hydraulic computer code, MARS (Multi-dimensional Analysis of Reactor Safety), developed by KAERI was introduced and all

participants were trained in how to develop input data, run the code and analyze the results.

Some participants will be selected and invited to become members of the ANSN Topical Group on Safety Analysis in 2009, thus providing them with an opportunity to contribute to the information exchange on safety analysis methods, using also, to this end, the on-line possibilities offered by the ANSN Web. Thus the activities of the ANSN will be extended from code assessment and application in safety analysis to a comprehensive discussion on safety analysis methods and current safety issues. The members of the ANSN Topical Group on Safety Analysis will cooperate in developing guidance on safety analysis methods as well as on the review procedure for safety analysis.

Operational Safety Topical Group

OBJECTIVE

1. To identify and share best practices for the safe siting, design, construction, operation (including ageing management), modification and decommissioning of nuclear power plants as well as to be a source of expertise in these matters
2. To promote the mutual exchange of information through ANSN and to foster the sharing of knowledge and experience on the safety of nuclear power plants
3. To promote the mutual cooperation between both operators and regulators of participating Member States in the safe operation of nuclear power plants

Third Meeting of the Operational Safety Topical Group of the ANSN

Tokyo, Japan, 8-11 December 2008

The meeting was hosted by the Japan Nuclear Energy Safety Organisation (JNES) and attended by sixteen participants from six ANSN countries (China, France, Indonesia, Japan, Malaysia and Vietnam) and two IAEA staff. After welcoming remarks by Mr. TORIIHARA Masatoshi, Vice-President of JNES, the current status of the ANSN including the results of the 8th Steering Committee meeting was presented, as well as the IAEA programme and policy to support countries launching nuclear power projects.

China, Indonesia, Malaysia and Vietnam introduced the status of existing and expanding nuclear power programmes and related potential safety issues in their respective countries. Japan made presentations on nuclear safety regulations in Japan and on operating experience analysis. France introduced the EDF experience in China.

The second part of the meeting was devoted to discussion on the programme of ANSN activities

for 2009 related to Operational Safety and other general topics related to the Group. Participants agreed on the importance of the OSTG in the framework of the new priority of the ANSN, namely to focus on the enhancement of the nuclear safety infrastructure for the countries recently involved in a nuclear power programme. The proposed programme of activities for 2009 will include regional workshops on Public Communication Programme Establishment and Management for NPP project, Commissioning Preparation and Management of NPPs and, Human Resource Management and Knowledge Transition for NPP project.



In addition to the meeting, a workshop on experience exchange for NPP construction including commissioning and handover to operation was held on the following days. Through presentations by IAEA, Japan and France, the workshop provided exchange of experience on how to create a smooth commissioning process taking into account overlapping activities, cooperation with suppliers and other support organisations, and involvement of operation staff into commissioning activities. It also provided a floor for discussion between participants.

Emergency Preparedness and Response Topical Group

OBJECTIVE

1. To identify and share best practices for national EPR strategies
2. To identify EPR needs and strategic EPR programme
3. To serve as a forum for information exchange
4. To plan and to provide EPR training courses
5. To assist to learn the EPR through national and international level exercises.

Workshop on Preparedness & Response for a Nuclear or Radiological Emergency and ANSN EPR Topical Group Meeting Bangkok, Thailand, 22-26 September 2008

The workshop on Requirements for Preparedness & Response for a Nuclear or Radiological Emergency was held in Bangkok, Thailand, in coordination with the Office of Atoms for Peace (OAP). Twenty one representatives from Australia, China, Indonesia, Japan, Malaysia, Philippines, Thailand and Vietnam, and IAEA staff participated in the meeting. Lectures (based mainly on the standard IAEA training modules on requirements for preparedness and response for a nuclear or radiological emergency) were delivered by IAEA staff and an expert from the Philippines. In addition to the lecturing each Member State was requested to present the results of the Integrated Safety Evaluation (ISE) of its country in the field of Emergency Preparedness and Response.



All presentations and lectures stimulated lots of discussion that enhanced the understanding of requirements for radiation emergency.

After the Workshop the 3rd meeting of the ANSN TG on Emergency Preparedness and Response (EPR) was held at the same venue as the workshop. All the activities carried out in Phase 1 were reviewed and country progress during the two years was reported. Based on the discussion

and analysis a Mid-term plan (2009-2011) for Phase II was developed. The plan will be presented by the TG Coordinator to the next Steering Committee meeting.

The TG recognized that significant progress in EPR was made in every participating country.

Workshop on Methods and Procedures for Nuclear or Radiological Emergency Response and Observation of an Exercise in an ANSN Member Country

Japan, 20–24 October 2008

The workshop, held in coordination with the Japan Atomic Energy Agency (JAEA), was intended to enhance the exchange of information and to strengthen the infrastructure of radiation emergency preparedness in ANSN Member States. It focused on emergency exercises and was carried out in conjunction with the observation of a national nuclear emergency exercise held in Fukushima NPP in Japan.

Twenty persons participated in the workshop including eight representatives from Indonesia, Malaysia, Philippines, Thailand and Vietnam, in addition to the lecturers and instructors – ten Japanese and one Korean.



IAEA staff gave lectures to the participants on various aspects of radiation emergency exercises. Japanese, Korean and Malaysian experts delivered lectures on experiences of recent exercises carried out in their respective countries. A staff member of the IAEA Incident Emergency Centre also presented the recent ConvEx-3 exercise, which was conducted in July 2008, using the video conference system between IAEA and JAEA. In addition to the lectures and presentations of each Member State on their recent progress in emergency preparedness and response, the participants also observed the national nuclear emergency exercise.

The presentations and lectures at the workshop stimulated many discussions that enhanced the understanding of the importance of an emergency exercise. Moreover, the observation of the large

scale emergency exercise was a unique way for the participants to understand the many aspects of conducting an exercise in their own countries.

Radioactive Waste Management Topical Group

OBJECTIVE

1. To identify and share best practices for safety of national radioactive waste management strategies
2. To establish usable support systems and database for safety of national radioactive waste management strategies
3. To assist to join and meet national obligations of the Joint Convention
4. To serve as a forum for information exchange and to provide training course

Training Course on Establishment of Limitation and Controls

Manila, Philippines, 28 July–1 August 2008

The purpose of this training course was to familiarize participants with international standards related to control of effluent discharges and associated environmental monitoring. The course, hosted by the Philippine Nuclear Research Institute (PNRI), was attended by thirteen participants from China, Indonesia, Malaysia, Philippines, Thailand and Vietnam.



IAEA staff and external experts delivered a series of lectures on specific topics including international standards in the area of control of discharges; sources of public exposures and exposure pathways; approaches for establishment of authorized release quantities; methods for dose assessments; methods for sensitivity and uncertainty analyses; practical experience in establishing regulatory discharges limitations and controls for research reactors; environmental monitoring programmes basis and analytical techniques for liquid/air monitoring.

The presentations were followed by group exercises on test cases in which participants experienced loading the test cases into the software provided by the lecturers and then undertaking assessment. The training course was

concluded with an examination on the subject matter presented during the course.

The training course was well received; the attendees participated actively, and the examination process illustrated that the majority of participants had grasped the concepts presented.

Practical training courses of this nature provide a good medium to give people a basic introduction and insight into international standards related to control of effluent discharges and associated environmental monitoring activities. In order to build on this type of training, participants suggested making use of the approaches presented in the training course for dealing with real situations; this could then be followed by an opportunity to review their experiences at a later stage.

Annual meeting of the ANSN Radioactive Waste Management Topical Group and Workshop on Licensing and Regulatory Control of Radioactive Waste Disposal Facilities and Activities

Melbourne 13–17 October 2008

The annual meeting of this topical group is held to review progress in regard to the existing work plan of the group and to create a work plan for future activities. The meeting, hosted by the Australian national regulatory authority ARPANSA at their laboratory in Melbourne, was attended by representatives from Indonesia, Malaysia, Vietnam, the Philippines and Thailand, together with two representatives from Japan and several representatives from Australia. A review of the group activities was presented by Mr Kihara, coordinator of the group and a presentation was given on the new database system for IAEA radioactive waste management safety standards. The IAEA representative proposed to make use of actual test cases for both predisposal and disposal, and if possible to link to the Safety Assessment Driving Radioactive Waste Management Solutions (SADRWMS) and PRISM inter comparison and harmonisation projects of the Agency. After general discussion it was agreed that a programme of work should be adopted which would include three regional events dealing with the subjects identified. It was also agreed that a follow up mission should take

place in Indonesia on the siting of the proposed near surface disposal facility.



In addition to the meeting, a workshop on “Licensing and Regulatory Control of Radioactive Waste Disposal Facilities” was held during the following days. The sessions covered, inter alia, developments on safety standards for radioactive waste management and disposal, the legal basis for regulatory control of nuclear and radiation related facilities, the safety assessment of disposal facilities, regulatory aspects of exemption, exclusion and clearance, and ANSN involvement in a SADRWMS test case to perform a safety-assessment of Thailand's waste facilities. A visit was also undertaken to the ARPANSA waste storage facility.

Safety Management of Research Reactors Topical Group

OBJECTIVE

1. To identify and share best practices for the safe design, construction, operation (including ageing management), modification and decommissioning of Research Reactors as well as to be a source of expertise in these matters
2. To promote the implementation of the Code of Conduct on the Safety of Research Reactors and the application of IAEA Safety Standards
3. To promote the mutual exchange of information through ANSN and to foster the sharing of knowledge and experience on the safety of research reactors
4. To promote the mutual cooperation between participating Member States in the safe operation of Research Reactors

Workshop on Periodic Safety Review of Research Reactors: Evaluation of the Operating Experience and Review of Safety Documents Hanoi, Vietnam, 14–18 July 2008

The main objective of the workshop was to provide practical information and guidance to research reactor specialists from the Asian countries on the periodic safety review of research reactors, in particular, on the evaluation of operating experience and review of safety documents. The meeting also provided a forum for the participants to discuss their national practices and exchange their experience on these subjects.



The workshop, hosted by the Vietnam Agency for Radiation and Nuclear Safety & Control (VARANSAC), was conducted by two IAEA staff

and two NRC experts. A total of nineteen participants from six Asian countries participated in the workshop.

Twenty-two presentations were made at the workshop, covering in particular the topics of IAEA Safety Standards and safety documents for the periodic safety review of research reactors, feedback from regional meetings on the Code of Conduct, safety requirements for the design and operation of research reactors, licensing process, periodic safety review, incident reporting system for research reactors, operating experience and sharing of lessons learned, country activities on the periodic safety review of research reactors. Two working groups were constituted, one representing the operators and the other representing the regulators. They discussed in particular the operating experiences and lessons learned, the current status of research reactor safety, and the performance of periodic safety review of research reactors in participating countries.

The lectures and the discussions during the workshop improved the understanding of participants on the scope and methodology of periodic safety review of research reactors. The workshop was also a good occasion for improving the exchange of operating experience and information on good practices related to safety assessment for research reactors.

Workshop on Safety of Research Reactor Decommissioning Activities: Project Planning, Management, Regulatory Review and Safety Assessment Manila, Philippines, 15-19 September 2008

The Research Reactor Decommissioning Demonstration Project (R²D²P) was initiated to provide lectures and “hands-on” training in a scheduled series of workshops. The first workshop was held in June 2006. This workshop on “Planning” was the fifth one. The purpose of the workshop was to provide information on planning for the decommissioning process, from shutdown to the defined decommissioning end state.

In addition to participants from the Philippines, the workshop was attended by fifteen experts (regulators and operators) from nine countries, including Indonesia, Malaysia and Vietnam. Four consultants from Germany, Spain, United

Kingdom and USA gave lectures during the workshop.



One of the main messages was that planning for decommissioning has to be carried out as early as possible, and ideally already in the design stage of a nuclear facility. The overall contents of such a plan were explained and cooperation among

countries was encouraged as well as requesting help and assistance from experts. The countries were reminded to prepare decommissioning plans, if they are not yet available. A few countries reported that they initiated such a work. At the end of the workshop, the progress of the Philippine research reactor (PRR-1) decommissioning project and, the plans and intended achievements in the near future were also discussed.

The workshop provided opportunities for promotion of use of the IAEA Safety Standards and for cooperation and networking among the participating countries to share their experience and to solve difficult issues related to research reactor decommissioning.

National Activities: China

Workshop on Safety Analyses for Symptom-based Emergency Operating Procedures

Shenzhen - Daya Bay NPP, 21–25 April 2008

The purpose of the workshop, organized with the China Guangdong Nuclear Power Holding, Co. Ltd. (CGNPC) and hosted by the China Nuclear Power Engineering Company Ltd. (CNPEC), was to present international experience and to exchange information with regard to development, validation and verification of symptom-based emergency operating procedures (EOPs) for modern nuclear power plants. Thirty-two participants from the CGNPC attended the workshop.



The first presentation on “Ling Ao II State-oriented EOPs Design Background and Implementation” was given by an Electricité de France adviser to CNPEC. An expert from the Korea Institute for Nuclear Safety (KINS) gave presentations on safety analysis for NPPs, including safety analysis specific to EOP Development; TMI-2 lessons learned; application of safety analysis to EOP development and validation; and, EOP analysis for BDBA accidents during shutdown operation and validation.

Another expert from Bohunice NPP, Slovakia, who was responsible for the development of plant specific EOPs at his plant, shared his experience through presentations on analytical support for EOPs development; experience gained in symptom-based EOPs development project at Bohunice NPP; symptom-based EOPs verification and validation; symptom-based EOP training, implementation and maintenance. In addition, he conducted a practical exercise on the use of EOPs for a selected accident scenario — spurious high pressure safety injection actuation. The exercise

involved all participants with a desk-top simulation.

Furthermore, two national presentations from CGPEC were given on “State Oriented Procedures (SOP) Computerized Operation Procedure Preparation” and “Management of Computerized Operation Procedure Preparation”.

The presentations at the workshop addressed the contents of the IAEA Safety Report Series #48 “Development and Review of Plant Specific Emergency Operating Procedures”.

Safety Management System for New Nuclear Power Plants – Workshop on Design Management

Shanghai, 8-10 April 2008

The workshop was opened by the President of Shanghai Nuclear Engineering Research and Design Institute who welcomed the experts and participants and stayed for the IAEA presentation. Twenty representatives from the Design Institute, their Headquarters organisation and the Chinese nuclear utilities attended the workshop. IAEA staff provided presentations on the current and future planned IAEA activities in relation to Design Management including the status of the relevant Safety Standards and the review services available. Experts also gave presentations on Design Management from a Regulatory, Vendor and Utility perspective.



The two Utility experts were from Duke Energy in the US. Duke is currently progressing the design and licensing process to build two AP-1000 units (Lee Project) and provided presentations on both the overall goals and objectives of the design and licensing process and also the more detailed arrangements for the Lee project.

The two Vendor experts from Toshiba Corporation gave presentations on the management of the organisational interfaces between the vendor and utility organisations in relation the design and also on some of the specific tools for managing the design basis information.

The Regulator expert was from Finland and gave an update on the progress with the construction of Okliluoto 3. This included the causes of the delays on the build project and how these related to the importance of completing the detailed design activities prior to construction.

The technical information exchanged during the workshop will be incorporated into the approach being taken in China for their substantial AP-1000 build programme and their plans to absorb the technical design information relating to AP-1000 technology. The build programme commences at Sanmen NPP with first pouring of structural concrete expected early 2009.

The opportunity was also taken to facilitate initial steps to share AP-1000 experiences internationally. One of the US experts at the workshop, an executive with Duke Energy, leads a group of representatives from the US utilities intending to build AP-1000s, which has been brought together to ensure commonality in the design and licensing approach for the AP-1000. This includes interfacing and agreeing with Westinghouse on the detailed design standards and arrangements. Discussions during the workshop with key representatives from the Chinese utilities, including the Vice President of the Sanmen Nuclear Power Company, provided the opportunity to facilitate further international co-operation in this area.

The presentations on specific approaches to design management and licensing during the workshop from a utility, vendor and regulator perspective, provided an excellent opportunity for the key practitioners to share approaches and incorporate best practices in the on-going design management and licensing arrangements.

Workshop on Site Acceptance Test (SAT) of Full-scope Simulators

Lianyungang, 14–16 January 2008

An IAEA workshop to discuss good practices in site acceptance testing of full-scope simulators was held at the Tianwan Nuclear Power Station (TNPS), Lianyungang, China. Twenty-five participants from China, representing seven nuclear power plants being operated or under construction, and three research, design and engineering support organizations, took part in this

workshop organized in cooperation with the IAEA and Jiangsu Nuclear Power Corporation. Four international experts from Germany, the Ukraine and the USA shared their experience. IAEA staff provided a comprehensive picture of the status and trends in the nuclear power sector and nuclear training.

Full-scope simulators are important tools to ensure safety of the NPPs through the training, qualification and authorization of the control room staff, training of other categories of personnel, and use for engineering purposes. Acceptance testing of full-scope simulators is a comprehensive activity requiring involvement on subject matters experts, training staff and simulator vendor personnel.



Acceptance testing should be supported by a solid management, verified and validated testing procedures, and software tools. The decision whether the simulator is Ready For Training (RFT) shall be taken only after quality performed acceptance testing of the simulator. The international experts (from KSG Simulator Centre, South-Ukraine NPP, FPL Energy Seabrook and GSE Systems) and participants from China presented and discussed the approaches, regulations, management practices, document control, and various tools employed for acceptance testing of full-scope simulators. Feedback received from the Chinese participants on the last day of the workshop showed that there were many strategic and specific takeaways from this workshop. After the three-day workshop, one IAEA expert assisted the TNPS training centre in preparing for the actual site acceptance testing of their full-scope simulator after its modernization.

Workshop on Configuration Management

Haiyang, 22–24 April 2008

The objective of the workshop was to improve the understanding of the close linkage between effective configuration management (CM), the completed (or updated) design basis

documentation (DBD), and safe operation of existing and new NPPs. It also provided information on the IAEA Engineering Safety Review Services on Configuration Management and related activities.

To choose and follow the approach of configuration management is important for the operation of NPPs and should start from the construction phase. It is of growing importance for NPPs that are embarking on a long term operation, perhaps up to 60 years. The availability of the design basis and design requirements over the whole plant life is also of great importance.



The workshop, hosted by the China Power Investment Group (CPI), was attended by forty-eight representatives from different Chinese Utilities (QNPC, CNNC, CGNPG, NPQJVC, TQNPC, SMNPC), Design Institutes (SNPTC, CAINI, CPCEC) and from the regulator, the National Nuclear Safety Administration of China. The workshop covered all the important aspects of configuration management, including the integration of CM principles and practices among all NPP functional areas. It introduced the concepts of CM Equilibrium, Equilibrium upsets and CM Equilibrium restoration. The workshop then used these concepts in the establishment of CM performance indicators, CM assessments, and CM Health Reporting. The significance of design basis information and margin management was stressed. Group exercises were conducted which reinforced the materials covered in the presentations. Active participation and the knowledge of participants and lecturers with the topic made the workshop very successful.

Workshop on Human Factors Management and Safety Culture Enhancement Haiyan, Zhejiang, 26–30 May 2008

The main objective of the workshop was to provide specific advice to Qinshan Nuclear Power Company (QNPC) on enhancing human error

prevention and at the same time to provide a more general platform for a national Chinese discussion about the characteristics and attributes of a strong safety culture. Therefore, it was considered necessary to draw special attention to the application of the new IAEA safety standards on management systems: the Safety Requirements on “The Management System for Facilities and Activities” (GS-R-3.) and the Safety Guide on “The Application of the Management System for Facilities and Activities”. Both documents are the basis for successful leadership and management for safety in nuclear power plants and offer an approach to establish and sustain a strong safety culture.



About twenty-five managers and specialists from QNPC and five other Chinese nuclear power plants took part in the workshop which was structured to incorporate both input and practical group work with tangible results. The invited experts delivered presentations on human factors and safety culture. Group work activities were mostly concentrated on enhancement and sustainability of safety culture in the Chinese utilities. In the area of human error prevention the approaches of Reason (1996) and Rasmussen (1983) were extensively discussed. The participants had the opportunity to discuss examples of man-machine interfaces based on human factors research. A series of practical exercises deepened the understanding of human factors and fostered a fruitful exchange of experience. The workshop also included information on the newly introduced IAEA review service: Safety Culture Assessment Review Team (SCART).

The Chinese specialists considered the area of safety culture important for their day-to-day work and were motivated to learn. The participants decided to use the content of the workshop in subsequent seminars to be organised in their respective nuclear power plants.

National Workshop on Application of IAEA Safety Standard GS-R-3: The Management System for Facilities and Activities Suzhou, 2–6 June 2008

The purpose of the workshop was to provide support to the National Nuclear Safety Authority (NNSA) of China – the regulatory body – for the revision of the Chinese quality assurance (QA) code HAF 003; and to enhance the understanding of IAEA GS-R-3 by the Chinese nuclear industry and regulatory body. Therefore, it was considered necessary to draw special attention to experience feedback on the application of IAEA GS-R-3, especially the integrated process approach, and the promotion of and support for a strong safety culture.



The workshop was attended by nineteen delegates representing regulatory authorities and operating organizations from several utilities. A series of presentations and discussions were held in plenary sessions. In addition, eight Chinese delegates provided the group with a presentation on the status of the current management system within their respective organizations.

Considering the fruitful exchanges between NNSA and the Chinese NPP representatives during the workshop, the creation and implementation of an advisory group to continue the work of revision of the Chinese QA code HAF 003, was fully supported by the IAEA. The results of working group sessions and of the plenary discussions will be used by NNSA as input for revising management system requirements in addition to IAEA safety standards and the current version of the Chinese QA Code HAF003.

The NNSA has started the revision of Chinese QA Code HAF003 in 2004. For this purpose, they adopted the framework of IAEA GS-R-3 as a basis for the revised code and followed a rigorous and open process in the management of this translation. In particular, the utilities were involved early on in the process. This approach used by the Chinese

regulatory body, supportive of IAEA GS-R-3, could be shared with other countries which plan to transit from quality assurance to the integrated management system (IMS) approach.

Workshop on operating experience of ECCS strainer blockage events Wuhan, China, 14–16 October 2008

The purpose of the workshop was to provide good practices in Member States to manage the emergency core cooling system (ECCS) strainer blockage issue on pressurized water reactors (PWR). The workshop was requested by the Research Institute of Nuclear Power Operation (RINPO). Thirty-one participants, mainly from RINPO, but also specialists from Qinshan NPP, Daya Bay NPP, Sanmen Nuclear Power Company, attended the workshop. The presentations were given by lecturers from the USA, Japan and IAEA staff.

The workshop was organized and structured on the basis of specific topics including outline of representative events (Barsebäck NPP), US-NRC's activities – including NUREG and Regulatory Guide –, current status of Japanese utilities and countermeasures for long term "Modification of ECCS strainer."



Each presentation was followed by discussion sessions. All participants actively participated in the discussions and showed high motivation for improvements of their own performance.

The workshop provided the latest information on current activities in the USA and Japan. Through the presentations and subsequent discussions during the workshop, the experts emphasized that for the evaluation of ECCS strainer modifications, Chinese participants could refer to the documents which were prepared by PWR utilities in the USA and US-NRC on the US-NRC website. The important point was to evaluate plants individually because it all depends on each plant's own conditions such as kind of debris (insulation), amount of debris, containment vessel design and pump flow rate.

National Activities: Indonesia

Expert Mission to review site evaluation activities for selecting a location for a radioactive waste disposal facility on Java Island

Serpong, Indonesia, 25–29 February 2008

An expert mission was carried out in order to review activities of the National Nuclear Energy Agency of Indonesia (BATAN) on site evaluation for selecting a location for a radioactive waste (RW) disposal facility on Java Island and the associated regulatory system.

Indonesia is seeking to develop a RW disposal programme in parallel with the introduction of a first nuclear power plant (NPP). The Nuclear Energy Regulatory Agency of Indonesia (BAPETEN), the regulatory authority, has requested BATAN to investigate technical specifications of a possible RW disposal facility on which future regulatory requirements are to be based. The mission was conducted through discussion with the counterpart at the Centre for Radioactive Waste Technology, BATAN and observations from a visit to one of the potential areas (Serpong).



Studies of geological, hydrological, tectonic and seismological properties on Java Island have been conducted by BATAN. These studies are taken as a part of the conceptual and planning stage of the site evaluation process, which is defined in the two IAEA Safety Standards as the first stage of the site evaluation process. Through the studies, BATAN have identified four areas (Serpong, Karimun Islands, Muria and Masalembu Islands) as potential areas to investigate in detail in the next stage of the site evaluation process. The studies are comprehensively conducted based on existing official data including characterization of

geological formation, distribution of epicentres, peak ground acceleration, volcanoes and precipitation, and the trend of sea levels covering practically all of Java Island. The country-specific natural phenomena such as volcanic activities, earthquake and high precipitation are addressed as well in the studies.

BATAN is attempting to make the very first step in setting up RW disposal programmes in which key national factors, such as the introduction of a first NPP and the establishment of regulations for RW and spent fuel management, are now ongoing. At this point, BATAN has successfully carried out comprehensive geological studies as a part of the site evaluation process for locating a RW disposal facility in accordance with the IAEA Safety Standards. To complete the site evaluation, supporting activities such as safety assessment and preparation of relevant parameters have to be carried out in parallel.

Strengthening Safety Culture through Improvement of Safety Management System and Key Performance Indicators

Serpong, Indonesia, 17-21 November 2008

The workshop was aimed at supporting the Indonesian research reactor operating organizations to develop, implement and assess safety culture. The expert team consisted of one IAEA staff, the Director of the Nuclear Safety Network Division of the Japan Nuclear Technology Institute (JANTI), and a consultant from the USA. The team conducted lectures, discussions and group work. About twenty managers and specialists from BATAN and one representative from the regulatory body, BAPETEN, attended the workshop.

The lectures covered a wide range of topics including general concepts of safety culture; safety culture as a key element of the management system; safety culture enhancement programme including indicators; safety culture assessment; and an action plan to strengthen safety culture. The participants from the different research reactors presented the safety culture activities developed within their organizations. In addition, practical exercises based on BATAN works on safety culture were conducted.

The participants' presentations associated with the practical exercises deepened the mutual understanding on what safety culture is and how to assess it. More specifically, this allowed the clarification of the safety culture concept and the place it occupies within the broader scope of nuclear safety. The programme included a short technical visit to the Sewabessy research reactor. This visit gave the group the opportunity to share a common experience which fostered fruitful exchanges and discussions at a more practical level.



The team of experts suggested the establishment and assignment of a safety culture committee as an essential step for strengthening BATAN's safety culture. The participants of the workshop benefited from lectures, discussions, and also exchange of information. Most of the BATAN research reactors organizations have already started several visible safety culture activities. This exchange of knowledge in the safety culture area, focused on research reactors, should be sustained at the national level and shared at the regional level.

Expert Mission on Radiation Protection Programme to BATAN

Serpong, Indonesia, 24-26 November 2008

The review of the radiation protection programme of the National Nuclear Energy Agency – locally called Badan Tenaga Atom Nasional (BATAN) – at the Serpong site and the evaluation of the follow-up actions from previous missions was conducted by an IAEA staff and one external expert from Argentina. After the opening session the experts provided three lectures to facilitate better understanding of the advices and recommendations being provided. To facilitate further discussions the counterpart provided a

presentation on Serpong's radiation protection programme arrangements in place.

Discussions, organised and chaired by the counterpart, formed an important part to analyse the radiation protection programme in place and the possibilities for improvements.

The 30 MW Siwabessy research reactor, the Radioisotope and Radio-Pharmaceutical Research Facility, and the Radioisotope and Radio-Pharmaceutical Installation (BATEK) were also visited. Finally the follow-up actions of earlier missions were discussed with the counterpart.



The attendants ranged from radiation protection technicians to some senior managers. The Agency team delivered lectures and provided ideas on how to implement a unified approach to the radiation protection issues but its successful implementation would need the full commitment of the facilities managers. In addition to the discussions shown in the mission schedule, others were informally held during the walk-downs in order to clarify the issues raised.

Assistance on further improvement of Safe Operation of the Kartini Reactor

Yogyakarta, Indonesia, 27-28 November 2008

The primary objective of the mission was to follow up on recommendations and suggestions made during the 2005 Integrated Safety Assessment of Research Reactor (INSARR) mission and to give recommendations for further improvements. The Kartini research reactor is a TRIGA Mark II type, open pool, light water moderated and cooled, operated at 100 kilowatt of thermal power. The reactor is operated during office hours. The initial criticality of Kartini research reactor was reached on 25 January 1979. The reactor has an operation license from the Regulatory Body (BAPETEN) valid until November 2010.

The mission was conducted by an IAEA staff and one expert from Argentina. After opening remarks by the head of the institute and some remarks on behalf of the team, the status of the follow-up

actions were presented by Kartini staff. As requested by the counterpart, four lectures were presented to the Kartini staff: IAEA safety standards for research reactors; integrated management systems for operating organisations; maintenance, periodic testing and inspections of research reactors; and, safety in the utilization and modification of research reactors.



The evaluation was conducted based on the INSARR mission report, a walk down of the Kartini reactor and discussions with the staff of the Kartini reactor. The implementation of the recommendations of the previous mission is being made gradually, but the team suggested additional work. Some good practices were also noted. The staff of the Kartini reactor showed great interest in the technical sessions and displayed enthusiasm, openness and a frank attitude during the discussions. The team also recognized the technical competency of the reactor operating staff and their actions to renew the I&C system.

Review of Radiation Protection Programme and Instrumentation & Control System for the Bandung research reactor Bandung, Indonesia, 1-3 December 2008

An IAEA expert mission to follow-up on the implementation of the recommendations of the Safety Review Mission on the Safety Analyses Report and the Core Bubbling and to review the radiation protection programme of the Triga 2000 Bandung Research Reactor of the National Nuclear

Energy Agency — locally called Badan Tenaga Atom Nasional (BATAN), was conducted by two IAEA staff members and one external expert from Argentina. After the opening session the reactor staff provided an overview of the implementation of the recommendations from previous missions and the radiation protection programme in place. In addition the IAEA team presented the current status of the IAEA Safety Standards, the IAEA standards regarding instrumentation and control systems and gave lectures regarding the implementation of a harmonized radiation protection programme and environmental monitoring.

The implementation of the recommendations of previous missions was discussed and assistance was given to facilitate the implementation of the remaining actions. The core bubbling phenomena and the investigations carried out by the reactor staff were discussed and advice was given for further investigation and completion of the analyses. The core bubbling phenomena has been observed since the upgrading of the reactor in 2000 and an increase in the phenomena has been observed since 2004.



The IAEA team reviewed the radiation protection programme based on the presentations given and a walk down to the reactor, liquid waste processing facility and radioisotope laboratory. Advice was also given for further improvement of the radiation protection programme at the site.

National Activities: Malaysia

Expert Mission on Implementation of the Research Reactor Operator Certification Programme

Selangor, Malaysia, 21–25 April 2008

The objective of the mission was to assist the Atomic Energy Licensing Board (AELB), the regulatory body of Malaysia, on the implementation of the research reactor certification and re-certification programme.

The main part of the mission was dedicated to the development of complete sets of questions (and their typical answers) for the written, operating, and walkthrough examinations for reactor operator's certification. These questions were developed to cover all the technical competencies required for the certification of the research reactor operators, including the needed theoretical background and the relevant concepts as well as the specific practical knowledge on the systems of the PUSPATI research reactor (which is the only research reactor in Malaysia), and their functions, layout, and operation of the reactor. These questions were developed in sufficient numbers for preparing several examinations.



A practical guidance on different aspects of the conduct of the certification examinations was provided, including demonstration of an example for the walkthrough examination. The mission discussed and provided recommendations for the revision of the AELB regulatory requirements for certification and recertification of the other operating positions. It also provided practical guidance, on the basis of the IAEA Safety Standards, on the regulatory inspection of the training and retraining programmes for research reactor operating personnel.

The AELB specialists appreciated the practical guidance provided on the subjects covered, and

AELB management indicated that the results of the mission will greatly contribute to the successful implementation of the regulatory requirements on the certification of research reactor operators.

Expert Mission on the Development of Research Reactor Inspector Certification Programme

Kuala Lumpur, 20–23 May 2008

The purpose of the mission was to help the Atomic Energy Licensing Board (AELB) to develop the certification programme in its regulatory framework; in particular to define the training and qualification requirements for its research reactor inspectors. The mission was conducted by a team of one IAEA staff member and one expert from the Korea Institute of Nuclear Safety (KINS).

About twenty participants coming from both the AELB and the operator attended the meeting. The IAEA team provided comprehensive presentations related to the mission topics: IAEA safety standards on regulatory inspection; training and qualification of inspectors in the regulatory body; safety regulation on research reactors in Korea; and the guide and plan for certification of nuclear regulatory inspectors in Korea. After the presentations, a thorough review and discussion of the draft documents prepared by the AELB were conducted, based on IAEA safety standards and practical experience from KINS.



There is one TRIGA-MARK II research reactor in operation in Malaysia. The AELB is to carry out regulatory inspections based on the established regulations. Development and implementation of the inspector certification programme will strengthen the regulatory framework within the

AELB, and furthermore, contribute towards improving the safety of its research reactor.

Establishing requirements for inspector certification including the training and qualification programme will be considered as one important step to develop an integrated inspection programme which extends its scope to other nuclear facilities such as nuclear power plants and nuclear fuel cycle facilities.

During the exit meeting, attended by the AELB Director General and all relevant AELB staff and

representatives from the operator, the results and the main conclusions were summarized. After a short discussion and some clarification, the mission recommendations were finalized and agreed to by the AELB counterparts and the IAEA team. Both the AELB staff and the representatives from the operator showed a very motivated and professional attitude prior and during the expert mission which contributed greatly to the success of the mission.

National Activities: Thailand

Expert Mission to review the Governmental and Regulatory Framework of Thailand for Nuclear Reactors Bangkok, 7–11 July 2008

The objective of the mission was to provide assistance to the Thailand Government's Office of Atoms for Peace (OAP) to review the governmental and regulatory framework, with a focus on the current status of the regulatory body and the licensing process for nuclear installations. The Thai objective is to better regulate their research reactor and to facilitate the introduction of a projected nuclear power programme.



General recommendations and suggestions derived from existing IAEA Safety Standards were proposed to help OAP move forward in their governmental and regulatory framework revision that includes: the clear designation of safety responsibility, enforcement actions regarding persons or organizations responsible for nuclear installations, and the establishment of a licensing process for nuclear installations that includes the obligations, roles and responsibilities of the regulatory body.

In addition, the financial aspects of the safety regulatory framework remain an important issue for countries embarking on nuclear power. This issue includes: funding for safety activities, liability for nuclear damages, decommissioning funds and regulatory taxes or fees to be charged to licensees or licence applicants for the regulatory process. The latter should enable regulatory authorities to be provided with proper funding. Mechanisms to levy these fees also need to be discussed and properly established with the national treasury at an early stage in the development of the regulatory framework;

detailed guidance should be considered for this issue.

Public involvement in the regulatory process was of great interest to the OAP because it reinforces the credibility of the regulatory body and enhances public confidence in the nuclear regulatory regime.

The responsibilities of newcomers to nuclear power were also discussed. An important message is that money cannot be a substitute for the ownership and commitments to safety and security. It was understood that these newcomers are buying a long-term cooperation package from responsible vendor countries.

Evaluation of the structure of the Thai Research Reactor TRR-1/M1 Bangkok, Thailand, 18-22 August 2008

The mission was performed at the Thailand Institute of Nuclear Technology (TINT) and conducted by two IAEA staff and two external experts from Argentina and Japan. Both the reactor operating staff from TINT and representatives from the Office of Atom for Peace (OAP), the regulatory authority of Thailand, participated in the mission.

The experts presented four lectures addressing the safety requirements for research reactors in relation to seismic events, the application of the graded approach for research reactors, the design of research reactors against external hazards, and the seismic design of nuclear facilities in Japan. Three presentations were also made by the counterparts on the current status of TRR-1/M1, the site characteristics and site data collection, and the ageing management programme for TRR-1/M1.



After a walk through the reactor facility, the rest of the time was devoted to review the available studies on site evaluation, the ageing management programme, the classification of structures, systems and components, the seismic evaluation of the reactor structures of TRR-1/M1, and to conduct a follow-up on the implementation of recommendations from the previous IAEA safety review mission. A work plan for updating the safety analysis report and the operating limits and conditions was established by the IAEA team and the operating staff.

Ageing management of structures, systems and components of research reactors is an important safety issue. Ageing management programmes have not been fully established for many research reactors in different Member States.

The lectures and the discussions during the mission improved the understanding of the participants on the approaches for the analyses of external hazards and seismic events for research reactors. The TRR-1/M1 reactor may provide a significant contribution to develop the technical and safety infrastructures needed for future nuclear projects in the country.

National Activities: Vietnam

Integrated Regulatory Review Service (IRRS) Information and Preparatory Mission

Hanoi, 20–23 April 2008

At the request of the Vietnam Agency for Radiation and Nuclear Safety and Control (VARANSAC), an Integrated Regulatory Review Service (IRRS) preparatory mission was conducted from 20 to 23 April 2008. The purpose was to discuss the following aspects of the future IRRS mission: clarification of the objectives, determination of the scope of the mission, sites and facilities to be visited, the self-assessment process, and the logistics and time of the mission.



After a thorough exchange of information and discussion between the IAEA team and the national counterparts, the scope of the mission was determined to cover: i) safety of research reactors covered by the Code of Conduct for the Safety of Research Reactors; ii) safety and security of radioactive sources covered by the Code of Conduct for the Safety and Security of Radioactive Sources; iii) emergency preparedness and response applied for: research reactors, industrial uses of ionizing radiation and transport; iv) occupational radiation exposure; v) education and training; vi) interface with other organization. It was agreed that the visits and observations will be organized in the Dalat Nuclear research institute (research reactor and isotope production unit); Ho Chi Minh City (irradiator centre and industrial facility); Hanoi (medical facility and technical support centre), with a view to directly observing regulatory activities and their effectiveness.

The review will draw directly from the results of the IAEA IRRT missions in 1999 and the RaSSIA mission 2006, making particular note of the progress made by VARANSAC regarding the findings of these two previous missions in

conjunction with the results from future self-assessments. Policy issues and regulatory challenges will be identified in order to be included within the senior regulators discussions during the mission. The self-assessment and its review process will contribute to continuing improvement of Vietnam's regulatory infrastructure for nuclear and radiation safety, and will serve as a reference for other countries with similar situations interested in future IRRS missions.

Expert Mission on Training Needs Assessment to Vietnam Atomic Energy Commission (VAEC)

Hanoi, Vietnam, 16-18 July 2008

The objective of the mission was to present the IAEA methodology for Systematic Training Needs Assessment (STNA) for research reactors and regulatory bodies as well as resources for training materials in nuclear safety available both at the IAEA and the Asian Nuclear Safety Network. The workshop included hands on training based on two case studies, one for a regulatory body and the other one for an operating organization of a research reactor. The mission took place in Hanoi, at the headquarters of VAEC and the audience included participants from VAEC, from the research reactor in Da Lat and the regulatory body (VARANS).



VAEC informed of their main activities, including a brief historical description of the Da Lat research reactor. It explained its links to MOST, MIT and VARANS and outlined VAEC's plans for human resources development and for implementing the project of a new nuclear plant. A discussion about the new law recently passed

and the role of the regulator within that law followed.

The IAEA team presented the main principles for systematic approach to training methodology and the relevant IAEA safety standards related to human resources and competency frameworks for regulatory bodies and research reactors as well as the role that ensuring competence play within the management systems of the organisation and nuclear safety. The case study for training in the

application of the IAEA software tool for STNA was presented and the participants split into two working groups, both of them comprising junior and senior personnel of regulatory body and research reactor.

Both VAEC and VARANSAC are now in the position to conduct a systematic training needs assessment based on their actual needs which will help in better utilization of their training effort and external support including IAEA resources.

CONTRIBUTIONS 2008

Country	Contributions
China	1 Information Technology expert
France	1 cost-free expert
Germany	1 cost-free expert
Japan	1 364 413 USD ¹
Republic of Korea	1 cost-free expert and hosting of training event
USA	125 000 USD

Australia, Indonesia, Philippines, Thailand and Vietnam hosted regional activities
A special mention to Malaysia which organised the 8th Steering Committee and the associated Caravan

¹ includes 2 cost-free experts from Japan

Regional Work Plan 2008

<i>No.</i>	<i>Title</i>	<i>Host Country</i>	<i>Responsible officer</i>	<i>Start date</i>	<i>Completion date</i>
8024	Coordination meeting with ASEAN	Singapore	Lemoine Philippe	22-01-2008	23-01-2008
8025	Coordination meeting with KINS and KAERI. Discussion on the further Korean contribution the ANSN and planning of BPTC	Korea	Taniguchi Tomihiro	22-01-2008	23-01-2008
8004	Consultation under ANSN to support registration of the Response Assistance Network (RANET) with MOFA, MEXT, METI and other related organizations	Japan	Fujimoto Kenzo	28-01-2008	01-02-2008
8007	Safety Analysis Topical Group	Korea	Lee Suk Ho	11-03-2008	14-03-2008
8009	Nuclear Safety Strategy Dialogue Meeting	Vienna HQ	Yamagata Hiroshi	21-04-2008	21-04-2008
8016	Training Course on Safety Assessment and Verification for Nuclear Reactors (III)	Korea	Lee Suk Ho	14-07-2008	18-07-2008
8023	Workshop on Periodic Safety Review: Evaluation of the Operating Experience and Review of Reactor Safety Documents	Vietnam	Abou Yehia Hassan	14-07-2008	18-07-2008
8013	Training Course on the Establishment of Limitations and Controls on Effluent Discharges and Associated Regulatory Review and Control	Philippines	Jova Sed Luis	28-07-2008	01-08-2008
8062	FNCA Panel Meeting on Nuclear Safety	Japan	Lemoine Philippe	01-09-2008	02-09-2008
8022	Workshop on Safety of Decommissioning activities: project management, regulatory control and assessment (combined with 08003)	Philippines	Abou Yehia Hassan	15-09-2008	19-09-2008
8011	Workshop on Requirements for Preparedness and Response for a Nuclear or Radiological Emergency (combined with 08010)	Thailand	Fujimoto Kenzo	22-09-2008	24-09-2008
8010	Emergency Preparedness and Response Topical Group (combined with 08011)	Thailand	Fujimoto Kenzo	25-09-2008	26-09-2008
8014	Workshop on the Licensing and Regulatory Control of Radioactive Waste Disposal Facilities and Activities, and Radioactive Waste Management Topical Group	Australia	Metcalf Philip	13-10-2008	17-10-2008
8063	ASEAN Nuclear Energy Safety Sub-Sector network Meeting	Singapore	Yamagata Hiroshi	14-10-2008	15-10-2008
8064	16th Pacific Basin Nuclear Conference	Japan	Yamagata Hiroshi	16-10-2008	17-10-2008
8012	Workshop on Methods and Procedures for Nuclear or Radiological Emergency Response and Observation of an Emergency Exercise in an ANSN Member Country	Japan	Fujimoto Kenzo	20-10-2008	24-10-2008
8051	8th ANSN Steering Committee	Malaysia	Lemoine Philippe	20-10-2008	23-10-2008

8019	Basic Professional Training Course on Nuclear Safety	Korea	Moracho Ramirez Maria	03-11-2008	07-11-2008
8018	Education and Training Topical Group and Workshop on the Systematic Training Needs Assessment Tool to define the National Training Frameworks	Indonesia	Moracho Ramirez Maria	11-11-2008	14-11-2008
8020	Workshop on Experience Exchange for Nuclear Power Plants under construction, including Commissioning and Hand over, and Operational Safety Topical Group	Japan	Renev Alexandre / Lemoine Philippe	08-12-2008	11-12-2008

National Work Plan 2008

<i>Country</i>	<i>No.</i>	<i>Title</i>	<i>Location</i>	<i>Responsible officer</i>	<i>Start date</i>	<i>Completion date</i>
China	8001	WS on Site Acceptance Testing (SAT) of Full-Scope Simulators and Support in Performing SAT.	Lianyungang	Kazenov Alexey	14-01-2008	16-01-2008
	8037	Safety Management System for New Nuclear Power Plants IV (Design Safety Requirements and Management)	Shanghai	Kearney Mark	08-04-2008	10-04-2008
	8031	National Workshop on Safety Analyses for Symptom Based Emergency Operating Procedures	Daya Bay	Dusic Milorad	21-04-2008	25-04-2008
	8006	Safety Management System for New NPPs I (Workshop and Preparatory Engineering Safety Review Service Expert Mission on Configuration Management / Configuration Management Workshop)	Haiyang NPP, Yantai	Toth Csilla	22-04-2008	24-04-2008
	8032	Improve Human Factor management in QNPC	Qinshan	Ignatov Marin	26-05-2008	30-05-2008
	8029	Application of IAEA Safety Standards GS-R-3 on Management Systems	Suzhou	Kerhoas Anne	02-06-2008	06-06-2008
	8033	Operating experience on ECCS strainer blockage events	Wuhan	Okamoto Takuo	14-10-2008	16-10-2008
Indonesia	8005	Mission on Siting for Radwaste Disposal in Java Island	Java Island	Bannai Toshihiro	25-02-2008	29-02-2008
	8042	Strengthen the Safety Culture through Improvement of Safety management System and Key Performance Indicator	Serpong	Kerhoas Anne	17-11-2008	21-11-2008
	8041	1. Development of Radiation Protection Program in BATAN Serpong, 2. Improvement of Safety management and operation of Kartini Research Reactor (Follow-up mission), 3. Review of radiation protection programme and instrumentation and control system for Bandung	Serpong, Kartini, Bandung	Boogaard Jeannot	24-11-2008	03-12-2008
Malaysia	8044	Implementation of reactor operator certification programme	Selangor	Shokr Amgad	21-04-2008	25-04-2008
	8045	Development of research reactor inspector certification programme	Kuala Lumpur	Guo Lingquan	20-05-2008	23-05-2008
Philippines	8003	Expert Mission on the regulatory aspect of decommissioning & review of the internal regulatory control programme of PNRI (combined with 08022)	Manila	Abou Yehia Hassan	15-09-2008	16-09-2008
Thailand	8049	Evaluation of New Nuclear Law and Related Ministerial Regulation	Bangkok	Calpena Stephane	07-07-2008	11-07-2008
	8047	Evaluation of the structure of Thai Research Reactor-1/ Modification 1 (TRR-1/M1)	Bangkok	Abou Yehia Hassan	18-08-2008	22-08-2008

Vietnam	8008	Expert Mission on International Regulatory Review Service - IRRS	Hanoi	Guo Lingquan	21-04-2008	23-04-2008
	8060	Meeting with Ministry and Regulatory Body	Hanoi	Taniguchi Tomihiro	19-06-2008	19-06-2008
	8050	Mission to assist the training needs assessment (TNA) on nuclear safety and review a draft national E&T framework on nuclear safety	Hanoi	Moracho Ramirez Maria	16-07-2008	18-07-2008