

# **PROGRESS REPORT**

(APRIL 2003 – OCTOBER 2003)

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

INTERNATIONAL ATOMIC ENERGY AGENCY

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

**PROGRESS REPORT**

November 2003

## **I. INTRODUCTION**

This report describes the activities implemented from April 2003 until October 2003 and those further planned for 2003. Activities implemented from October 2002 to March 2003 were presented earlier in the PROGRESS REPORT, EBP-ASIA-127, which was distributed to all participating countries at the end of May 2003.

## **II. ACTIVITIES IMPLEMENTED FROM APRIL 2003 TO OCTOBER 2003**

### **II.1. PROGRAMME MANAGEMENT**

#### **II.1.1. Database**

The new web version of the database (renamed APMD = Asian Programme Management Database) will be released in December.2003 to registered users. The new features are a complete new page design consistent with the Asian Nuclear Safety Network, a full text search and a direct link to the IAEA Technical Co-operation database TC-PRIDE. The APMD continues to present the basic information on activities supported by the extrabudgetary programme (titles, dates, venues, objectives, status, technical officers, outside experts, national counterparts, results,) as well as bilateral agreements, summary and mission reports, training material, Country Nuclear Safety Profiles (CNSPs) and Nuclear Safety Action Plans (NSAPs). It is continuously being updated.

#### **II.1.2. Preparatory Activities for ANSN Pilot Project**

##### *(i) Technical Meeting on Data Base Design for the ANSN Pilot Project*

A technical meeting was held at the IAEA in Vienna on May 26-30, 2003 to discuss the remaining ambiguities in the ANSN Database design and to coordinate the current development work that is being performed at the Argonne National Laboratory (ANL), USA, the IAEA, and at the Nuclear Power Engineering Corporation (NUPEC), Japan. Two staff from NUPEC, one staff from ANL and IAEA staff attended the meeting. The implementation of a few necessary improvements and capabilities has been discussed as well, resulting in a database design reference

document that will be the foundation of the ANSN pilot project implementation. The meeting report EBP-ASIA-128 was published in July 2003.

*(ii) ANSN Technical Consultation Meeting*

A technical consultation meeting was held at the IAEA in Vienna on July 7-11, 2003 to review information technology developments and to discuss the establishment of topical groups. Two staff from Korean Institute of Nuclear Safety, one staff from Argonne National Laboratory and IAEA staff attended the meeting. The meeting report EBP-ASIA-129 was published in August 2003.

### **II.1.3. Integrated Safety Evaluation (ISE)**

The ISE is a process for evaluating and promoting the application of the IAEA nuclear safety standards, with a view to strengthening national and global nuclear safety regimes. It was agreed at the Technical Meeting (TM) of November 2002 to develop an ISE for each recipient country.

The IAEA has initiated drafting of ISE reports according to the format and contents prescribed in the “Guidelines for ISE of Nuclear Installations” (EBP-ASIA 120) prepared by the Secretariat.

The ISE reports will be revised, and completed by each one of the respective countries. Each report will address the progress achieved in each country in the following topics:

- Legal and governmental framework for safety
- Safety of research reactors
- Education and training
- Nuclear power plant safety (China only)

A milestone implementation schedule was prepared by the IAEA and agreed at the Second ANSN Consultation Meeting March 2003.

Advisory Mission on ISE was carried out for each one of the respective countries except for China. The missions assisted each country to complete the ISE reports. A consultation meeting was held on October 2003 in Vienna to assist China in completing the report. Results of each activity are introduced in II.3.

The respective countries are invited to introduce ISE results at the TM on December 2003.

### **II.1.4. Education and Training**

Complementary to its training courses and workshops (about 60 in 2003), the IAEA is concentrating its efforts on assisting Member States to establish national sustainable education and training programmes that are in line with international safety standards. Essential elements of this effort are the identification of Member States needs, the development of model type training leading to train the trainers and the use of distance learning tools.

## **Identification of Member States Needs**

The Agency now offers a review and advisory service entitled “Education and Training Review Service for Nuclear Safety (ETRS)”. At the request of a Member State, this service will provide an evaluation of the State’s education and training programmes relevant to safety and advice on strengthening them. The first such missions were conducted during 2002 to Indonesia, Malaysia, Thailand and Vietnam and a similar activity was conducted in China under the format of a workshop. In 2003, based on the experience gained, new guidelines were created and the results of the 2002 missions were used as a basis for the preparation of the chapter on education and training of the Integrated Safety Evaluation.

## **Preparation of Standard Training Material**

Standard training material consisting of guidelines on the course organization and commented viewgraphs of the lectures were prepared for several technical areas of nuclear installation safety. The material prepared is in line with the guidance provided in the IAEA Nuclear Safety Standards. Moreover textbooks and workbooks were published for the Basic Professional Training Course and Regulatory Control of Nuclear Power Plants.

## **Distance Learning Material**

With the increased availability of personal computers, many workers have access to a computer in the workplace and this has stimulated the development of computer based training packages. At present training packages were created as hypertext modules and as multi-media material with video and Powerpoint presentations synchronized. Materials on fundamentals of nuclear engineering, basic knowledge on nuclear safety and more recently a series on the IAEA Nuclear Safety Standards were created. In total about 51 topics are available.

## **Training the Trainers**

A train-the-trainers course was organized at the Argonne National Laboratory in 2002. The four weeks course covered most of the topics important to the safety of nuclear power plants and research reactors and was based on the Standard Training and Distance Learning Materials. Following the train-the-trainers course some Member States organized and conducted on a national level training courses and workshops using the provided materials. Examples of those are the National Basic Professional Training Courses organized in Indonesia and Vietnam in 2003 and the Ageing Management for Research Reactors and the Core Calculations courses organized in Indonesia also in 2003.

## **II.1.5 Translation and Utilization of the Training Materials**

The participating countries who organize the national training activities can be supported to translate and distribute the relevant materials at the training activities.

The National Basic Professional Training Course on Nuclear Safety was implemented from 25 August to 05 September 2003 by BATAN, Indonesia. The ten IAEA Safety Standard Documents related to the course topics, from the safety

fundamentals to relevant TECDOC were translated into the national language by the trainers of both BATAN and BAPETEN and distributed to the course participants.

The translated materials in the format of electronic files will be stored on their web page and made available of downloading for further utilization.

## II.2. REGIONAL ACTIVITIES

Three regional activities which were originally planned to be implemented in 2003 were postponed to 2004.

- Regional Workshop on Preservation of Research Reactors in Shutdown State and Decommissioning
- Regional Training on the Implementation of the Code of Conduct on the Safety of Research Reactors
- Regional Workshop on Education and Training for Nuclear Safety

Therefore there have been no regional activities from April 2003 to October 2003.

## II.3. NATIONAL ACTIVITIES

### II.3.1. China

#### *(i) Preparation for Pre-OSART and OSART Training (Qinshan III)*

Date: 18 - 21 March 2003 (postponed from 2002)

Place: Qinshan III NPP and Beijing, China

Objective and results:

The objective of this mission was to provide information on OSART mission and to discuss their implementation, in order to improve understanding and to train national experts involved in the OSART programmes.

The preparatory meeting for the OSART mission to Qinshan Phase III NPP (TQNPC), China, was carried out from 18 to 21 March 2003. During this time a seminar on “OSART Techniques for Field Inspection” was also presented at the Qinshan site. The meetings with senior plant management, China National Nuclear Corporation (CNNC), the resident inspector and the NPP OSART counterparts, were conducted at the Qinshan Phase III plant site. The meetings with the China Atomic Energy Authority (CAEA) and the National Nuclear Safety Administration (NNSA) were conducted at their respective offices in Beijing. The seminar on “OSART Techniques for Field Inspection” was also conducted at the Qinshan Phase III plant site.

The following major agreements were made:

**Date of Mission:** The OSART mission will be conducted from 17 May to 3 June, 2004. Team training will take place at the training centre at the Qinshan Nuclear Power Co. (QNPC) site on the preceding weekend of 15 and 16 May 2004.

**Scope of Mission:** The plant and the regulator agreed that the scope of the mission be the standard eight review areas, with two reviewers in operations. The plant and regulator also expressed interest in separate reviews for the areas of safety culture and operating experience.

*(ii) Operation Assessment of Nuclear Power Plants*

Date: 8 - 12 September 2003

Place: Qinshan Training Centre, Zhejiang, China

Objective and results:

The objective of this mission was to conduct a Workshop on “Operational Assessment”. This workshop complemented other activities being conducted under TC National Project CPR9/030. The workshop was organized through the Research Institute for Nuclear Power Operations (RINPO) and hosted by Qinshan III NPP (TQNPC) at the joint Qinshan Training Centre.

The workshop was designed to sustain and reinforce the importance of operational assessment in enhancing operational safety and performance. At the request of the hosts, the workshop was specifically designed for potential team-leaders of their national peer review mission programme.

The workshop was attended by 18 participants from the Chinese nuclear power plants and support organisations. (Daya Bay NPP, Ling Ao NPP, Qinshan I NPP, Qinshan III NPP Tianwan NPP and RINPO) Two Agency staff members presented and facilitated the workshop.

The Workshop was structured into several sessions. At the end of each working day the workshop participants participated in a Team Meeting. Two of them were designated as the Team Management to lead the discussions, ensure that everyone had the opportunity to express their opinions and to set follow-up actions for the following day. Each day the team was set a different task, however, a workshop critique was also expected from this exercise.

Throughout the workshop, discussions were held; and information and examples provided to the RINPO representatives on how they could develop an assessment programme that met the particular needs of the Chinese industry. It was stressed that there was a need to consider and assess the applicability of the material and information provided against Chinese requirements and not just to replicate other programmes wholesale.

Overall the feedback from the participants was very positive. They were also satisfied with the way that the workshop had been conducted. Throughout the workshop there was a high level of participation and a high desire to develop a critical approach utilizing proven operational assessment techniques.

*(iii) Consultation Meeting on Progress Reports on the Contribution of the Extrabudgetary Programme for Strengthening the Safety of Nuclear Installations in China*

Date: 20 - 24 October 2003

Place: Vienna, Austria

Objective and results:

The objective of the meeting was to assist China in drafting the progress reports based on the results of workshops and expert missions carried out under the frame of EBP.

The draft report was completed during this meeting. The reports will then serve as a technical basis to focus future co-operation between the IAEA and various organizations in China.

### **II.3.2. Indonesia**

*(i) National Training Course on Ageing Management for Research Reactor (expert mission)*

Date: 14 - 22 July 2003

Place: PUSPIPTEK, Serpong, Indonesia

Objective and results:

The objective of this mission was to give a course of lecture on a research reactor ageing management. The course was conducted jointly between the Indonesian National Nuclear Energy Agency (BATAN) and the IAEA.

One external expert from the USDOE was requested to participate in the course as a technical expert and also to serve as the IAEA coordinator. Other technical experts included from the Australian Nuclear Science and Technology Organisation (ANSTO), the Japan Atomic Energy Research Institute (JAERI) and selected members of the BATAN organization. The three outside experts lectured on ageing management the week of 14-18 July and the BATAN experts discussed internal initiatives the following week, 21-22 July 2003.

External expert from USDOE presented information on the status of IAEA research reactor standards, with emphasis on those dealing with ageing management; gave a general overview of ageing phenomena and mechanisms along with means to prevent and mitigate ageing effects; discussed techniques to measure and assess ageing degradation; and presented the elements of an ageing management programme. External expert from JAERI discussed properties of insulation and lubricants while external expert from ANSTO discussed the various metals commonly used in research reactors and in particular welds; each then further discussed damage mechanisms, degradation assessment, damage prevention and ageing management in greater detail in their respective areas of specialization.

The 26 course participants represented the following groups:

- 13 Centre for the Development of Research Reactor Technology (Serpong reactor)

- 8 Centre for the Development of Nuclear Safety Technology (Serpong site)
- 2 Centre for the R&D of Nuclear Techniques (Bandung TRIGA reactor)
- 1 Centre for R&D of Advanced Technology (Yogyakarta TRIGA reactor)
- 2 Regulatory body, BAPETEN

Each of the three Indonesian research reactors is tasked with developing ageing management programmes in the near future. The course participants were very involved, realizing that they would have to apply the course material in the near future.

The course successfully fulfilled the nation's request of the EBP.

*(ii) National Workshop on Reactor Calculations for Burn-up Calculations and Safety Analysis for the TRIGA Reactor SAR Preparation*

Date: 15 - 29 July 2003

Place: Babarsari, Yogyakarta, Indonesia

Objective and results:

The workshop was organized jointly by the Research and Development Centre for Advanced Technology (BATAN) and the IAEA. Twenty participants from different organizations attended the workshop.

The local organizers from BATAN defined the scope and prepared the programme of the workshop after discussions with the IAEA Technical officer. Local lecturers assured part of the lectures. This procedure for the organization and conduction of the workshop followed the new strategy adopted by EBP aiming to establish sustainable national educational and training programmes in nuclear safety.

The first week of the workshop (from 14 to 18 July) was dedicated to reactor physics and the lecturers were Mr. Eduardo Villarino from Argentina and a local lecturer, Mr. Tagor. The second week (from 21 to 25 July) was dedicated to thermal-hydraulic and the lecturers were Ms. Alicia Doval from Argentina, Ms. Endiah from Indonesia and Mr. Bastos, NSNI/IAEA.

Prior to the course a CD-ROM with modules on reactor physics and thermal-hydraulics was distributed to the participants requesting them to go through the modules before the course started. This procedure was intended to provide common background information to the participants and concentrate the sessions on the most relevant topics.

The lectures provided by Ms. Doval and Mr. Bastos focused on theoretical aspects while Ms. Endiah organized practical sessions on numerical modelling of reactivity insertion accidents with the PARET code.

Apart from lecturing Mr. Bastos also assisted to develop the chapter of the Integrated Safety Evaluation report (ISE) for Indonesia.

The procedure adopted for the evaluation consisted on discussions with the counterparts centred on the progress in the implementation of the recommendations provided in two previously conducted safety missions and major areas of future work.



Review of documents and field activities to confirm compliance with the IAEA Safety Standards were not conducted.

The new procedure adopted for the organization of the workshop demonstrated to be successful. The local staff from BATAN prepared and conducted the workshop in an efficient manner, and the local lecturer for the second week, Ms. Endiah was knowledgeable and provided interesting practical sessions on the use of the PARET code.

There is an understanding by the local organizers of the workshop that the thermal-hydraulic module is an introduction to the subject and more specialized workshops should be conducted in the future, if possible with the same audience, covering more deeply topics such as natural circulation, numerical modelling and uncertainties.

*(iii) National Basic Professional Training (BPT) Course on Nuclear Safety*

Date: 25 August - 05 September 2003

Place: Jakarta, Indonesia

Objective and results:

A national training course was organized to train staff of BATAN and BAPETEN on nuclear safety. This training was designed for the purpose of enhancing their knowledge of nuclear safety. The workshop will help participants to develop the necessary skills and techniques in executing their tasks and in applying nuclear safety standards..

The Indonesian National BPT Course was the first such course to be conducted in the EBP-Asia participant countries since the “Train the Trainer” Course at Argonne in 2002. The BATAN Coordinator, Dr. G. Lokollo, and the BAPETEN Coordinator, Dr. K. Huda, attended that course. The training given at the “Train the Trainer” Course was put to good use in designing the Indonesian National BPT Course. A unique aspect of the course was that, except for one IAEA staff member, Indonesian lecturers presented the lectures in the national language, Bahasa Indonesia. Good use was made of national resources in organizing and presenting the course. Several IAEA Standards and other documents were translated by the Indonesian lecturers into Bahasa Indonesia for use in the Course, with Agency support.

There were 20 participants in the Course, 12 from the various Centres of BATAN and 8 from BAPETEN. All were young people, most having a Bachelor’s degree and a few year experience in the nuclear field.

As part of the course programme, an IAEA staff member delivered lectures on: 1) the IAEA’s safety publications, safety services, and current safety programmes; 2) the IAEA’s activities in research reactors; and 3) the Code of Conduct for the Safety of Research Reactors. Emphasis in the lectures was on the content and nature of the resources available from the IAEA to assist in improving and maintaining safety.

The National BPT Course was well organized, with an appropriate set of topics, and a good selection of participants. Giving the lectures in the local language is a step forward. Translation of key IAEA documents into the local language is also a step forward, and should be supported. BATAN and BAPETEN have a plan to give the

BPT Course annually for at least a few years. Indonesia should be encouraged to investigate expansion of the BPT Course to include other countries from the region for which the language barrier can be overcome.

*(iv) Follow-up of Pre-IRRT and Review Mission on Nuclear Legislation and Regulatory Control*

Date: 29 September - 03 October 2003

Place: Jakarta, Indonesia

Objective and results:

The objective of this mission was to review the regulatory activities in Indonesia for nuclear safety, in particular to review the progress made since the last IRRT mission, based on the recommendations and suggestions made at that time.

An IAEA team of three experts (one IAEA staff member and two external experts, Mr. John Waddington, former DG of the CNSC, Canada, and Mr. Don Macnab, ARPANSA, Australia) visited the Indonesian Nuclear Energy Control Board (Badan Pengawas Tenaga Nuklir, BAPETEN).

The discussions covered the same topic areas as in the last IRRT mission, i.e., legislative and governmental responsibilities; authority, responsibilities and functions of the regulatory body; organization of the regulatory body; authorization process; and development of regulations and guides. This mission used the Guidelines for International Regulatory Review Teams (IRRTs), IAEA Services Series No. 8, September 2002, to conduct the review and report the results.

This mission noted that most of the recommendations and suggestions made during the last mission have either not yet been addressed or have only been partially addressed. The last mission had identified priorities related to a strong, competent and well-resourced regulatory body with adequate staffing; to the further development of the legislative framework with high priority; and a comprehensive training programme considering both the present and any future needs for qualified personnel. These priorities are still valid. This mission found that the number of staff and funding at BAPETEN is about right for the current level of nuclear activity in Indonesia, but that the introduction of nuclear generated electric power and desalination would require additional very experienced staff.

*(v) Advisory Mission on ISE (Legal/Governmental Infrastructure and Education & Training)*

Date: 29 September - 03 October 2003

Place: Jakarta, Indonesia

Objective and results:

The objective of this mission was to assist Indonesia to complete the ISE report for the areas of legal and governmental infrastructure, and education and training in nuclear safety.

This Advisory Mission was based on the Guidelines for Integrated Safety Evaluation of Nuclear Installations, EBP-ASIA-120, February 2003. The ISE Report was completed using the results of the previous IRRT Mission in 1999, of this follow-up IRRT Mission, and of the Advisory Review Mission on Education and Training conducted in July 2002 (EBP-ASIA-106).

### **II.3.3. Malaysia**

#### *(i) Follow-up of Experts Mission to Review Organization of the AELB*

Date: 07 - 11 April 2003 (Postponed from 2002)

Place: Kuala Lumpur, Malaysia

Objective and results:

The objective of this mission was to assess and evaluate the progress of implementation of the recommendations and suggestions of the previous experts' mission

An IAEA team of two experts (one IAEA staff member and one external expert, Mr. John Waddington, former DG of the CNSC, Canada) visited the Atomic Energy Licensing Board (AELB) from 7-11 April 2003.

The team followed up of the expert mission conducted in November 1999 (Mission Report EBP-ASIA-32). The detail purpose was to review the progress made since the last mission and to exchange information and experience with respect to the regulation of nuclear safety in the same predetermined topic areas as in the last mission: legislative and governmental responsibilities; responsibilities and functions of the regulatory body; organization of the regulatory body; and development of regulations and guides. This expert mission used the Guidelines for International Regulatory Review Teams (IRRTs), IAEA Services Series No. 8, September 2002, to conduct the review and report the results.

The discussions covered the same topic areas as in the last expert mission, i.e., legislative and governmental responsibilities; responsibilities and functions of the regulatory body; organization of the regulatory body; and development of regulations and guides. In the first area, although progress has been made for specific activities, there are still deficiencies. The corresponding recommendation and suggestion of the last mission are consequently considered to be still open and need to be addressed. In the second area, it was noted that the recommendation of the last mission related to the issue of the operator having the prime responsibility for safety has not yet been clarified and is still open. In the other two areas, the team found that the issues raised by the last mission have been adequately addressed. In the last area, the team noted that in addition to the Malaysian regulations, the AELB intends to use the relevant IAEA safety standards for judging the adequacy of the submissions of the licensee.

*(ii) Advisory Mission on ISE (pilot)*

Date: 07 - 11 April 2003

Place: Kuala Lumpur, Malaysia

Objective and results:

The objective of this mission was to provide advises on implementing ISE. It was conducted in conjunction with (i).

An IAEA team of two experts (one IAEA staff member and one external expert, Mr. John Waddington, former DG of the CNSC, Canada) visited the Atomic Energy Licensing Board (AELB) from 7-11 April 2003.

The detail purpose was to assist Malaysia to complete the Integrated Safety Evaluation report for the areas of legal and governmental infrastructure, and education and training in nuclear safety. This advisory mission was based on the Draft Guidelines for Integrated Safety Evaluation of Nuclear Installations, February 2003. The ISE Report was completed using the results of the expert missions for the review of the legal and governmental infrastructure, and of the Advisory Review Mission on Education and Training conducted in May 2002 (Mission Report EBP-ASIA-94).

The ISE Report for Malaysia has now been completed for the areas of legal and governmental infrastructure, and education and training. This will be one of the inputs for the next Technical Meeting on EBP Asia in December 2003.

*(iii) Assist the AELB in the Evaluation of the Safety Analysis Report (SAR)*

Date: 11 - 12 August 2003 (Postponed from 2002)

Place: Kuala Lumpur, Malaysia

Objective and results:

The objective of this mission was to discuss the reasons for the delay in implementing the modifications of the SAR and identify whether additional assistance might be needed either by Malaysian Institute for Nuclear Technology (MINT) or Atomic Energy Licensing Board (AELB).

The mission also discussed and clarified issues for the completion by Malaysia of the Integrated Safety Evaluation (ISE) in the area of safety of research reactor, and performed a walkthrough the research reactor facility and held discussions with the Reactor Manager and other Operational staff and monitor the operational safety of the facility as requested by the General Conference.

The mission consisted one IAEA staff member. Meetings were held in their respective premises with MINT on 11 August 2003 and with AELB on 12 August 2003. In both cases authorities and professionals from both organizations participated.

The mission made in both cases presentations on the Code of Conduct, Special Project and Supply Agreement, the importance of the SAR, the General Conference Resolutions on the safety of research reactors, the responsibility of Operating Organizations and the completion of the Integrated Safety Evaluation. A walkthrough

to the reactor and discussions on safety issues with the Operating Personnel were held on 11 August 2003.

There were positive steps taken by both MINT and AELB, which may enhance the operational safety of the research reactor, such as the creation of the IRG; the possibility of oversight the reactor by AELB; the restructuring of the organization, the decision to Benchmark the reactor with other similar (mentioned: RA-6 –Argentina; Triga in Vienna – Austria; HOR in Delft-The Netherlands) and the establishment of a Quality System.

The reactor appeared to be kept in good condition with a very good house keeping. Owing to the safe design of the reactor and the competence of the operating personnel it was concluded that the reactor is being operated in a safe manner.

Notwithstanding the above assertions several recommendations were made.

### **II.3.4. Philippines**

#### *(i) Technical visit on the Current status of PRR-1*

Date: 14 - 15 August 2003 (Postponed from 2002)

Place: Manila, Philippines

Objective:

The objective of mission was to discuss the reasons for the delay in answering the letter sent to Philippines in April 2003 in relation to the future of the Philippines Research reactor (PRR-1).

The mission consisted one IAEA staff member. Meetings were held with Philippines Nuclear Research Institute (PNRI) authorities and staff.

The mission made presentations on the IAEA Safety Standards, the Code of Conduct on Safety of Research Reactors and relevant General Conference Resolutions.

As mentioned by the Acting Director of PNRI, the Institute is not in a position to clarify whether the PRR-1 will return to operation. PNRI will try its best to identify possible sources for funding. Meantime the reactor will remain in extended shutdown condition.

A walkthrough to the reactor was conducted during 14 August 2003.

At this time the PNRI is not able to define the future of the research reactor and the facility will remain in extended shutdown condition.

The IAEA is ready to provide assistance for establishing a Preliminary decommissioning programme for the PRR-1, to provide assistance for establishing a Management Systems Programme for the PNRI, and to assist the country to define a long-term programme including the identification of a facility that might be needed to replace the PRR-1.

Before providing assistance for the restoration of the reactor in any of its possible options (including the 100 kW option) the Government should provide the answer letter sent on April 2003 by the IAEA.

*(iii) Advisory Mission on ISE*

Date: 14 - 15 August 2003

Place: Manila, Philippines

Objective and results:

The objective of this mission was to discuss and clarify issues for the completion by Philippines of the Integrated Safety Evaluation (ISE).

The mission consisted one IAEA staff member. Meetings were held with Philippines Nuclear Research Institute (PNRI) authorities and staff.

The ISE was discussed and revised. The document will be completed by PNRI.

### **II.3.5. Thailand**

*(i) Assess Implementation of the Pre-IRRT Recommendation and Advisory Mission on ISE (Legal/Governmental Infrastructure and Education & Training)*

Date: 22 - 27 September 2003

Place: Bangkok, Thailand

Objective and results:

The objective of this mission was to assist Thailand in reviewing and completing the Integrated Safety Evaluation Report for the areas of legal and governmental infrastructure, and education and training in nuclear safety in Thailand.

An IAEA team of two experts (one IAEA staff member and one external expert, Mr. Alan Hall, National Nuclear Regulator, South Africa) visited the Office for Atom for Peace (OAP) in Bangkok.

This advisory mission was based on the Draft Guidelines for Integrated Safety Evaluation of Nuclear Installations, February 2003. The ISE Report was completed using the results of the IRRT mission held from 12 to 16 February 2001 and, of the Advisory Review Mission on Education and Training conducted in Bangkok, Thailand, from 8 to 12 July 2002 (Mission Report EBP-ASIA-103).

Each of the topical areas were reviewed and an evaluation of the progress achieved was performed. In the case of changes and/or improvements the ISE Report for Thailand was updated accordingly. Finally, representatives of OAP made a self-assessment on a four level scale, assigning a particular level to each of the topical areas to measure the actions/progress undertaken by the country. The outcomes of the mission, i.e. updates and self-assessment of the ISE report, were mutually agreed upon. The final ISE report now reflects the current achievements and challenges contributing to maintaining and continuously improving nuclear safety in Thailand. The final report is supposed to be used as an input for the next Technical Meeting on EBP Asia in December 2003.

*(ii) Review Mission on Safety Operation and Emergency Planning/Preparedness of TRR-1/M1*

Date: 05 -10 October 2003

Place: Bangkok, Thailand

Objective and results:

The objective of this mission was to complete the calculations and to recheck the completeness of the Safety Analysis Report (SAR) of TRR-1/M1, and to review the Emergency Plan of the reactor.

The Review was conducted following the Guidelines and methodology for the Integrated Safety Assessment for Research Reactors (INSARR).

The mission team was composed of three external experts and two staff members, Messrs. Carlos Perrin (Argentina – OO and MAINT), Matjaz Stepisnik (Slovenia – RP and EP), Marcus Voth (USA – SAR and OLC) and Mr. Paolo Contri (IAEA – EE and QA), Mr. Heriberto J. Boado Magan (IAEA – Team Leader).

In addition Mr. Minoru Ohkubo from the Japan Atomic Energy Research Institute (JAERI) attended as an observer.

The mission started with a detailed visit by all the team members to all related reactor facilities (walkthrough) and during the week were observed the weekly start up of the reactor and a shift turnover.

At the exit Meeting chaired by Mr. Sirichai KEINMEESUKE, OAEP and with the participation of all counterparts, team members and the Japanese observer, the team members presented the Safety Issues identified during the review.

It was stated that the safety of the facility can be upgraded easily without high costs but certainly with determination from the management

At the end of the meeting, the main counterpart for the mission expressed the decision of the local authorities to start the immediate implementation of the recommended measures to enhance the safety of the TRR-1/M1.

### **II.3.6. Vietnam**

*(i) WS on Research Reactor Safety Verification Inspection*

Date: 19 - 20 June 2003

Place: Hanoi, Vietnam

Objective and results:

The objective of this workshop were to train the regulators on safety inspection and to provide an overview on the IAEA activities in the field on research reactor safety.

Staff members of three organizations, namely the Vietnam Atomic Energy Commission, the Vietnam Radiation Protection and Nuclear Safety Authority and the Institute of Nuclear Science and Technique participated in the WS.

The Workshop was held by an external expert Mr. Hassan Abou Yehia (France) and an Agency staff member Mr. Tibor Hargitai.

The informal manner of the Workshop promoted discussion of important questions on the roles and responsibilities of the regulatory body and the operating organization. The participants received in electronic form the documents available for research reactors and also the draft of the documents presently under preparation.

*(ii) INSARR Mission to the Dalat Nuclear Research Reactor*

Date: 23 - 27 June 2003

Place: Dalat, Vietnam

Objective and results:

The main objective of the INSARR mission were to carry out a safety review of the research reactor and to conduct a follow-up to review the level of implementation of the recommendations provided in the previous INSARR and expert missions. An additional objective, common to all INSARR missions, is to exchange information and experience between the team members and the Operating Organisation.

The Dalat Nuclear Research Reactor is covered by Project and Supply Agreements INFCIRC/106 of January 1968 and INFCIRC/308 of December 1983, therefore, the IAEA, under the terms of reference of the INFCIRC/18/Rev.1, is entitled to examine its operational and radiological safety as an Agency assisted project.

The Agency provided three INSARR missions in 1985, 1989 and 1995 and recently three expert missions mainly focused on the safety analysis report and aging management have been delivered since 1999. A Pre-INSARR mission was conducted from 26-30 August 2002 to define the date and the scope of the presently reported review of the main INSARR mission.

The INSARR mission consisted of four external experts, Messrs. Hassan Abou Yehia (France), Gennady Kirsanov (Russia), Jánosy János Sebestyén (Hungary) and Nestor De Lorenzo (Argentina) and one IAEA staff member, Mr. Tibor Hargitai NSNI-ESS, who was the team leader for the INSARR mission.

On the first day of the INSARR Mission (Dalat) the team walked down the research reactor facility. During the walk-down the team visited the reactor control room, reactor hall and the electric power distribution room including the UPS system, the secondary pump room and cooling towers and the diesel generators. In general, the impression was good, but some observations regarding the housekeeping were reported to the counterpart. On the following two days team members discussed the pre-defined topics with the staff of the Nuclear Research Institute (NRI), Dalat. On Wednesday afternoon the latest version of the SAR was discussed. Thursday morning the team witnessed the start-up of the reactor including the pre-start-up tests. The exit meeting originally was planned for Friday morning but due to the change of the departure time of the daily flight going to Ho Chi Minh City it was held on Thursday afternoon.

The mission concluded that the DNRR is operated in a safe manner and recognized the positive attitude of the Institute management, the reactor manager and



his staff regarding nuclear safety and radiation protection as also stated in the previous missions. Notwithstanding, the mission made a number of recommendations to improve the level of operational safety, radiation protection and housekeeping in some areas. The reactor management had already planned fulfilment of most of the latter recommendations.

*(iii) Advisory Mission on ISE (Legal/Governmental Infrastructure and Education & Training)*

Date: 25 - 26 September 2003

Place: Hanoi, Vietnam

Objective:

The objective of this mission is to assist with the review and completion of the ISE Report in the areas of legal and governmental infrastructure and education and training.

One IAEA staff visited the Vietnam Atomic Energy Commission (VAEC) to conduct the mission.

This advisory mission was based on the Guidelines for Integrated Safety Evaluation of Nuclear Installations, EBP-ASIA-120, February 2003. The ISE Report was completed using the results of the IRRM Mission to Vietnam in 1999 (EBP-ASIA-16, May 1999), of the Expert Mission to Assist in Preparing a Draft Atomic Law and Relevant Documents (EBP-ASIA-92/IAEA-TCR-01013, March 2002) and of the Advisory Review Mission on Education and Training (EBP-ASIA-94, July 2002). Vietnam has not yet requested a follow-up IRRM mission.

The ISE Report for Vietnam was completed for the areas of legal and governmental infrastructure, and education and training. This will be one of the inputs for the next Technical Meeting on EBP Asia in December 2003.

### **III. WORK PROGRAMME FOR 2003 (NOVEMBER – DECEMBER 2003)**

#### **III.1. PROGRAMME MANAGEMENT**

##### **III.1.1. Technical Meeting**

The next TM will take place in Vienna on 8-11 December 2003. At the TM, a revised report on the EBP Strategy for 2004 and beyond will be submitted and discussed. The report will indicate the progress on the implementation of the work plan for 2003 including the ISEs, multimedia material on Education and Training and the ANSN pilot project.

## III.2. REGIONAL ACTIVITIES

### II.2.1. Regional Standard Safety Culture Workshop

Date: 10 - 14 November 2003

Place: Korea

Objective:

The objective of this workshop is to develop a common awareness of the area of Safety Culture and identify where further IAEA assistance can be provided to assist the member Countries to develop their own Safety Culture Enhancement Programmes

## III.3. NATIONAL ACTIVITIES

### III.3.1. China

*(i) Risk Analysis Report for Core Start-up without Neutron Source (Expert Mission)*

Date: 03 - 07 November 2003

Place: Tianwan NPP, Lianyungang, China

Objective:

The IAEA expert mission to TNPP, in September 2002 found a serious disagreement between TNPP and the Russian designer regarding the first reactor start-up without a neutron source and pointed out that Chinese and Russian side should resolve this disagreement as soon as possible. The Russian designer, following the suggestion, is carrying out the risk analysis of the core start-up without a neutron source. The IAEA is requested to review the analysis report.

*(ii) Workshop on Risk-informed Inspection Activities*

Date: 03 - 07 November 2003

Place: National Nuclear Safety Administration (NNSA), Beijing, China

Objective:

The objective of this mission is to give lectures for NNSA and TSO personnel on the concepts of risk-informed inspection and current developments of the concept in regulatory bodies. NNSA wants this knowledge to help them make correct decisions on inspection matters.

*(iii) WWER's Horizontal SG Tubing and Piping Examination Technology*

Date: 16 - 21 November 2003

Place: Research Institute of Nuclear Power Operation (RINPO), Wuhan, China

Objective:

The objective of this mission is to give lectures on examination requirements, practices, experience and technology of eddy current testing (ECT) for steam generator tubing and ultrasonic examination for primary circuit piping using composite material. Chinese participants are required to understand this technology and standards, and work out the PSI/ISI strategy for TNPP.

*(iv) International Peer Review of PSA (IPSART) for Qinshan Nuclear Power Plant (Review Mission)*

Date: 01 - 10 December 2003

Place: Qinshan I NPP, Zhejiang, China

Objective:

The objective of this mission is to carry out comprehensive IPSART review of the full-scale level 1 PSA in Qinshan phase-I NPP. The review items are; Selection and Quantification of Initiating Events (Internal Events); Event Tree Analysis; System Reliability Analysis; Human Reliability Analysis; Accident Sequence Qualification; Uncertainty Analysis and Sensitivity Analysis.

*(v) Emergency Operation Procedure for TNPP (Expert Mission)*

Date: 01 - 05 December 2003 (Postponed from 2002)

Place: Tianwan NPP, Lianyungang, China

Objective:

The objective of this mission is to review the TNPP emergency operation procedure and the management procedure for a serious accident (including beyond design basis accidents and emergency operation procedure). Exchange of experience in application of incident-oriented and symptom-oriented emergency procedures is also included in the scope of this mission.

*(vi) TNPP PSA Level 2 (Expert Mission)*

Date: 01 - 05 December 2003

Place: Tianwan NPP, Lianyungang, China

Objective:

The objective of this mission is to review the PSA level 2 methodology, the dominant containment failure sequences, their frequencies, and the radioactive source

term related to releases to the environment. The review will include the impact of not including a filtered containment ventilation system into the design.

### **III.3.2. Indonesia**

*(i) Follow-up of Seismic Safety Recommendations to the TRIGA II Bandung and Kartini Research Reactors*

Date: 03 - 07 November 2003

Place: Indonesia

Objective:

The objective of this mission is to implement a follow-up of the previous mission of 2002 in relation to the hazard assessment for external events.

*(ii) Radiological Consequences to the Environment during Normal Operation and Accident of RSG-GAS*

Date: 03 – 07 November 2003

Place: PUSPIPTEK, Serpong, Indonesia

Objective:

The objective of the activity is to obtain numerical data on the radiological consequences to the environment during normal and accident of RSG-GAS reactor and also to enhance capability of the Radiation Safety Group for assessment of radiological consequences to the environment during normal operation and accident conditions of BATAN's reactors (RSG-GAS reactor, Bandung reactor and Yogyakarta reactor). This assessment will be used for completing the SAR, especially the emergency planning and preparedness section.

### **III.3.3. Malaysia**

There are no work programmes scheduled in November and December 2003.

### **III.3.4. Philippines**

There are no work programmes scheduled in November and December 2003.

### **III.3.5. Thailand**

There are no work programmes scheduled in November and December 2003.

### **III.3.6. Vietnam**

There are no work programmes scheduled in November and December 2003.

#### IV. CONTRIBUTIONS 2003

<b>Country</b>	<b>Contributions</b>
China	1 cost free expert
France	1 cost-free expert
Germany	1 cost-free expert
Japan	1,381,481 US\$ (*)
Korea	in kind (**)
USA	100,000 US\$ 1 cost-free expert

\* includes 2 cost-free experts from Japan

\*\* hosting training events in Korea



## Work Programme for 2003

### IAEA Management

			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec
<b>Management - Co-ordination</b>														
Progress Report	Vienna	Sanada						4						
Final Report	Vienna	Sanada										15		
Strategy paper	Vienna	Lederman										15		
Technical Meeting	Vienna	Lederman												08--11
<b>Management - Country profile/action plan</b>														
Update CNSP/NSAP (continuing in 2004)	Vienna	Dubois												
<b>Management - Database</b>														
Database migration	Vienna	Lederman/Zrunek										15		
<b>Management-ISE</b>														
Preparation of guideline on ISE	Vienna	Lederman/Bastos	20--24											
<b>Management- Pilot Project-ANSN</b>														
Technical Group Meeting	Vienna	Lederman/Kimoto		03--05										
Consultation Meeting on the Asian Safety Network (ANSN)	Korea	Lederman			24--28									
Technical Meeting on data base design for the ANSN pilot project	Vienna	Lederman					26--30							
ANSN Technical Consultation Meeting	Vienna	Lederman							07--11					

## Work Programme for 2003

### Regional

			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec
<b>Training</b>														
Translation of the materials for training (continuing in 2004)	Vienna	Kimoto												
Complete textbook for the BPTC (in print)	Vienna	Bastos												
Distance learning modules on nuclear safety courses	Vienna	Bastos												
Regional Workshop on Protection Against Fire for Research Reactors	KAERI	Tezuka			10--14									
Regional Standard Safety Culture Workshop	Korea	Taylor/Kimoto											10--14	



## Work Programme for 2003

### China

			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec
<b>Expert missions</b>														
Management and Assessment of the Steam Generator Lifetime	Wuhan	Labbé												
Risk Analysis Report for Core Start-up without Neutron Source (TNPP)	Lianyungang	Niehaus											03--07	
TNPP PSA level 2	Lianyungang	Niehaus												01--05
Emergency Operation Procedure for TNPP	Lianyungang	Misak												01--05
<b>Safety Services</b>														
Preparatory Meeting for OSART and OSART training for Qinshan III	Zhejiang	Cook/Lipar			18--21									
IPSART Review of Qinshan Nuclear Power Plant	Qinshan-I NPP	Kouzmina												01--10
<b>Technical visits</b>														
Advisory Mission on ISE	Vienna	Lederman/Sanada										20--24		
<b>Training</b>														
Workshop of Ageing Management (Nuclear Installation)	Beijing	Saito												
Training for system engineers (Qinshan I)	Vandellos	Nichols	13--17											
Operation Assessment of Nuclear Power Plants	Qinshan-III	Nichols/Perramon									08--12			
Workshop on Risk-informed inspection activities	Beijing	Ranguelova											03--07	
VVER's Horizontal SG Tubing&Primary Composite Material Pipe Examination	Wuhan	Havel											16--21	

## Work Programme for 2003

### Indonesia

			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
<b>Expert missions</b>														
Follow-up of Pre-IRRT&Review Mission on Nuclear Legislation&Regulatory Control	Jakarta	Philip									29-	-3		
Follow-up of Seismic Safety Recommendations to the TRIGA II Bandung	Indonesia	Contri											03--07	
Radiological Consequences to the Environment during Normal Operation and	Serpong	Boado Magan											03--07	
<b>Technical visits</b>														
Advisory mission on ISE	Jakarta	Philip									29-	-3		
<b>Training</b>														
National Training Course on Ageing Management for Research Reactor (expert	Serpong	Bastos							14--22					
National WS on Reactor Calculations f.burn-up calculations & Safety Analysis f. TRIGA	Yogyakarta	Deitrich							15--29					
National Basic Professional Training Course on Nuclear Safety	Jakarta	Deitrich								25-	-5			

## Work Programme for 2003

### Malaysia

			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec
<b>Expert missions</b>														
Follow-up of Experts Mission to Review Organization of the AELB	Malaysia	Philip				07--11								
<b>Technical visits</b>														
Advisory mission on ISE (pilot)	Malaysia	Philip				07--11								
Technical visit on reviewing the status of SAR and monitoring the operation safety of	Malaysia	Boado Magan								11--12				

## Work Programme for 2003

### Philippines

			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec
<b>Expert missions</b>														
Establishing Strategic RR Utilization Plan (and Other Safety Issues)	Philippines	Boado Magan												
Feasibility Study to Safety Operation of RR in 100 kW Power	Philippines	Boado Magan												
<b>Technical visits</b>														
Advisory mission on ISE	Philippines	Boado Magan								14--15				
Technical visit on the Current status of PRR- 1	Philippines	Boado Magan								14--15				

## Work Programme for 2003

### Thailand

			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec
<b>Expert missions</b>														
Assess implementation of the Pre-IRRT Recommendaiton	Thailand	Giersch									22--26			
Review mission on Safety Operation of TRR-1/M1	Thailand	Boado Magan										06--10		
Emergency Planning and Preparedness of TRR-1/M1	Thailand	Boado Magan										06--10		
<b>Technical visits</b>														
Advisory mission on ISE	Thailand	Giersch									22--26			

## Work Programme for 2003

### Vietnam

			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
<b>Safety Services</b>														
INSARR mission	Dalat	Hargitai						23--27						
<b>Management-ISE</b>														
Advisory mission on ISE	Hanoi	Philip									25--26			
<b>Training</b>														
WS on research reactor safety verification inspection	Hanoi	Hargitai						19--20						