

OVERVIEW
OF THE EBP ACTIVITIES
SINCE APRIL 2000

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

International Atomic Energy Agency

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

OVERVIEW OF THE EBP ACTIVITIES SINCE APRIL 2000

I. INTRODUCTION

The last Advisory Group Meeting (AGM) for the EBP, which was held at the IAEA Headquarters in Vienna on October 18-20, 1999, reviewed the progress and activities planned for 2000 in the framework of the EBP. At the end of March 2000, the Secretariat prepared and sent to the representatives from countries participating in the EBP a Progress Report, which described the activities implemented from October 1999 until March 2000 and further activities planned for 2000.

This document describes the activities from April to September 2000 and the activities planned up to the end of 2000.

II. ACTIVITIES IMPLEMENTED FROM APRIL TO SEPTEMBER 2000

This section reviews the outline and results of the activities implemented after the Progress Report issued in March 2000.

II.1. PROGRAMME MANAGEMENT

II.1.1. Database

The database for the EBP activities has been expanded and currently includes for each activity, the objective, the results achieved, the associated reports, the planned activities, the Country Nuclear Safety Profile (CNSP), the Nuclear Safety Action Plan (NSAP), relevant IAEA TC projects, and bilateral agreements and projects. The database has been revised continuously and will be released twice a year to the countries involved in the EBP through a CD-ROM delivered with the Progress Report. The first CD-ROM was distributed to the Advisory Group Members in April 2000. A version of the database to provide access to registered users via internet is under development and will ultimately replace the CD-ROM.

II.2. REGIONAL ACTIVITIES

II.2.1. Training Workshop on Nuclear Power Plant Siting

Date: 3-14 April 2000

Place: Jakarta and Muria, Indonesia

Objective and results:

The objective of this workshop, which was hosted by the National Atomic Energy Agency (BATAN), Government of Indonesia, was to provide an overall treatment of issues related to nuclear power plant siting. This covered mainly aspects related to natural and man-induced external hazards, dispersion of radioactive effluents in the atmosphere and the hydrosphere, emergency preparedness feasibility considerations including the demographic conditions. A site study visit to Muria was included.

The workshop was attended by 24 engineers/professionals from six countries - China, Indonesia, Malaysia, Philippines, Thailand and Viet Nam - and ten lecturers including two staff from the IAEA and eight experts from outside.

The contents of lectures were considered very informative and comprehensive, and the participants were satisfied with the workshop. Some participants felt that two weeks was not sufficient for understanding deeply the issues related to NPP siting, which includes a large variety of topics. Discussion sessions were held daily to enhance the understanding of participants. The site visit to Muria was very useful for participants to obtain more practical training on NPP siting.

II.2.2. International Training Course on Regulatory Aspects and Safety Documentation of Research Reactors (organized under the TC Programme)

Date: 8-26 May 2000

Place: Argonne, USA

Objective and results:

The purpose of this course, which was organised by the IAEA in co-operation with the Government of USA, is to help regulatory staff members, designers and operators of research reactors in countries now operating research reactors, or which are in the process of installing new research reactors or licensing old reactors, to have a better understanding of international standards and requirements for research reactor safety and regulation, and to provide insight from experience gained in developed countries on the actual regulatory work. The EBP provided financial support to five professionals to attend the course from the countries participating in the EBP.

II.2.3. Video Tutorial on the Functions of the Regulatory Body

The objective of this task is to enhance basic nuclear safety knowledge of professional staff in the countries, and to facilitate their communication with IAEA experts teams. A video on legislative and regulatory infrastructure for the nuclear safety has been made and will be distributed to the representatives from countries participating in the EBP.

II.2.4. Tutorials on Reactor Neutronics and Thermal Hydraulics for Internet and CD-ROM Use

Training modules on reactor physics and thermal hydraulics have been prepared and are being updated for self study via internet or CD-ROMs. It includes exercises and solutions to facilitate the learning process.

The purpose of the tutorial modules is for training of junior professionals using the state of the art technology for distance learning.

II.3. NATIONAL ACTIVITIES

II.3.1. China

(i) Scientific Visit on Radiation Protection during Outage of NPP

Date: 17-28 April 2000

Place: Tokyo, Ohi and Kashiwazaki Kariwa, Japan

Objective and results:

The objective of this scientific visit, which was organized by the Government of Japan through Nuclear Power Engineering Corporation (NUPEC), was to improve technical capability of Chinese experts on the radiation protection during NPP outage through visiting facilities in Japan and discussion with Japanese experts. Funding was from the contribution of Japan to the EBP.

Four Chinese experts participated in the scientific visit. The programme included lectures on: control of radiation exposure dose; effect of activities on reduction of radiation exposure dose; examples on reduction of radiation exposure dose. The Chinese experts observed the maintenance work of Ohi unit-2 and also visited Kashiwazaki Kariwa NPPs. Question and answer were conducted actively between the experts based on their knowledge of the radiation protection, and the scientific visit was completed very successfully.

(ii) Workshop on Periodical Safety Review (PSR)

Date: 22-26 May 2000

Place: Qinshan, China

Objective and results:

The objective of this workshop was to support the Qinshan NPP capability to conduct the 1st Periodic Safety Review (PSR) in the near future.

The workshop was attended by 35 participants from Qinshan NPP and other organizations, including the regulatory body, technical support organizations and staff of Daya Bay NPP. The IAEA team presented the PSR methodology, the IAEA Safety Guide, and PSR practice and experience in other countries. The following topics have been also discussed:

- assessment of potential effect of radio frequency interference (RFI);
- non-destructive techniques for cable ageing assessment;
- ageing management of structures and components;
- which standards should be used for the analysis of structural and plant components and safety systems;
- equipment qualification;
- advice to regulator on PSR assessment phase.

The workshop clarified the requirements, scope and structure of a PSR and should improve the confidence of Qinshan NPP to carry out this task.

(iii) Workshop on Fire Safety

Date: 19-23 June 2000

Place: Qinshan, China

Objective and results:

The objective of this workshop was to enhance technical knowledge and safety culture of fire protection in NPPs.

There were 60 participants from the regulatory body, utilities, NPPs, and technical support organizations from China. The workshop was organised with the intention to provide the participants with the basic knowledge of fire protection in NPPs. The workshop also involved a plant walk-down for training on inspection of fire hazards. Emphasis was placed on prevention and suppression/mitigation of a fire such as: transient combustible control and inspection; fire protection inspection throughout plant walk-down; fire emergency response procedure; radiation protection during fire fighting.

The lectures and practical training conducted by the IAEA team were very much appreciated by all participants as an effective measures to improve NPP fire protection.

(iv) Workshop on Severe Accident Policy

Date: 26-30 June 2000

Place: Beijing, China

Objective and results:

The objective of this workshop was to assist the regulatory body to establish a severe accident policy and safety goals for both existing and future nuclear reactors and to strengthen the technical competence of the regulatory body in the area of severe accidents.

The workshop was attended by 31 participants from the regulatory body and other organizations including utilities, technical supporting organizations and universities in China. The workshop covered the following topics and a round table discussion was also held on open issues specified by the host institution:

- present and future regulatory activities in the area of severe accidents in China;
- overview of the IAEA activities in the area of severe accident analysis and accident management;
- consideration of severe accidents in the IAEA documents for existing and future nuclear reactors;
- safety goals related to severe accidents;
- methodology for review on accident management programme;
- overview of regulatory requirements related to severe accidents and their implementation in the design and operation of nuclear power plants in different countries;
- requirements related to and consideration of severe accidents in the design of the future European Pressurised Water Reactor (EPR)

(v) Technical Visit to China

Date: 26-30 June 2000

Place: Beijing, China

Objective and results:

The objective of this technical visit was to discuss future EBP activities including Programme Scope for Phase III and the detailed assistance based on the results of the questionnaires, which were previously sent to know the opinions of the country.

Meetings with the National Nuclear Safety Administration (NNSA), the China Atomic Energy Authority (CAEA), the China Institute of Atomic Energy (CIAE) and Jiangsu Nuclear Power Corporation (JNPC) were held respectively. The IAEA assistance implemented to date in the framework of the EBP was most welcome. Several new specific requests for the IAEA assistance on Tianwan NPP (TNPP) and China Experimental Fast Reactor (CEFR) were expressed from the respective organizations.

(vi) Experts' Mission to Peer Review the Assessment of the RPV PTS Analysis and Ageing Related Issues Justification for Tianwan NPP

Date: 26-30 June 2000

Place: Moscow, Russia

Objective and results:

The objective of this experts' mission was to exchange information and discuss the approaches taken by the plant designer/supplier to address issues related to reactor pressure vessel (RPV) pressurized thermal shock (PTS) analysis and ageing (such as irradiation embrittlement and thermal ageing monitoring and assessment) for Tianwan NPP.

Twenty-nine experts from Russia and China participated in the meeting along with the five IAEA experts. The meeting was held in Moscow, Russia in the offices of OKB Hidropress, the reactor designer. The peer review was carried out in 2 parallel groups on PTS analysis and material related issues, based on reports provided by Russian and Chinese organizations in advance, on the presentations made, and on discussions during the meeting.

All important aspects related to RPV integrity were addressed during the review. Regarding the PTS analysis performed by OKB Hidropress, experts concluded that the scope of the analysis, the deterministic tools and the probabilistic assessment of the RPV failure risk were adequate. Several conservative assumptions were used within the integrity assessment resulting in additional safety margins. Regarding material related issues, the information provided by OKB Hidropress (and its subcontractors) was comprehensive and the most important aspects were dealt with. The new surveillance programme design was very good. RPV integrity related aspects, where development of national expertise in China would be most beneficial, were suggested.

(vii) Experts' Mission to Peer Review the I&C Conceptual Design for Tianwan NPP

Date: 25-29 September 2000

Place: Erlangen, Germany

Objective and results:

The objective of this mission was to peer review the I&C conceptual design for Tianwan NPP. The objective and scope of the review were agreed during the preparatory mission held in Beijing, 28 February to 3 March.

The meeting was held at the Siemens office in Erlangen, Germany and it was attended by 30 - 40 experts from China, Russia, Germany and the IAEA. The agenda of the meeting focused on the safety issues and questions raised during the Chinese review of the I&C part of the preliminary safety analysis report (PSAR). Topics included: qualification of the systems and the components; reliability and availability of the Russian systems; redundancy of the systems; isolation of the main control room and the standby control room; humane - machine

interface; and PSAR licensing issues. The IAEA team found that the interfaces between the I&C design and the overall plant design are being given the required attention.

II.3.2. Indonesia

(i) Technical Visit to Indonesia

Date: 10 April 2000

Place: Jakarta, Indonesia

Objective and results:

The purpose of the technical visit was to discuss the future EBP activities for Indonesia including Programme Scope for Phase III and the detailed assistance based on the results of the questionnaires, which were previously sent to know the opinions of the country, and a proposed Nuclear Safety Action Plan (NSAP) for Indonesia.

The IAEA assistance, which has been implemented to date in the framework of the EBP, is very much appreciated, and also should focus on enhancing regulatory function by supporting regulatory body's activities to regulate existing research reactors, including review of SARs and inspection & enforcement. The NSAP, which was proposed based on the recommendations of the IRRT mission in 1999, the INSARR mission in 1998 and other reports related to nuclear safety issues, was generally agreed.

At the meeting, siting issues of nuclear power plants were also discussed. The IAEA assistance for enhancing the regulatory framework and independent technical capability to review nuclear power plant siting should be included in the NSAP.

(ii) Workshop on Nuclear Safety and Risk Assessment

Date: 1-5 May 2000

Place: Jakarta, Indonesia

Objective and results:

The objective of this workshop was to strengthen the technical competence of the regulatory body and to set up a nuclear safety and risk assessment programme, including probabilistic and deterministic methods.

The presentation by the mission covered the following main areas:

- present and future regulatory activities in Indonesia;
- activities of the IAEA activities in nuclear safety and risk assessment;
- review and assessment by the regulatory body;
- methodology for deterministic safety analysis;
- probabilistic safety analysis;
- decision making by the regulatory body;

- examples of safety assessment processes for nuclear power plants and for research reactors.

A round table discussion devoted to the establishment and organization of a safety assessment group at the regulatory body was also held.

(iii) Workshop on Integrated Inspection and Enforcement Programme

Date: 5-9 June 2000

Place: Jakarta, Indonesia

Objective and results:

The objective of this workshop was to assist the Nuclear Energy Control Board (BAPETEN) to enhance the technical capability of staff involved in the regulatory inspection and enforcement programme.

The workshop was attended by about 30 professionals from BAPETEN, and several managers attended sessions on specific topics. The presentation made by the IAEA experts covered the following main areas:

- inspection and enforcement by the regulatory body;
- scope of regulatory inspection (research reactors);
- scope of regulatory inspection (nuclear power plants);
- organization and planning of the inspection programme for construction and commissioning;
- regulatory inspection and methods of inspection for construction and commissioning;
- enforcement actions;
- training and qualification of inspectors;
- safety culture;
- practical exercise / workshop on communication with the public.

Intensive panel discussions were held every day on the subject areas of the lectures held during the day. The contents of the extensive lecture were considered very informative and comprehensive, and the participants underlined the needs for more training, emphasising specific practical inspection cases and inspection techniques.

(iv) Experts' Mission to Review Existing Reactor Safety Modifications (Triga Mark II)

Date: 21-25 August 2000

Place: Bandung, Indonesia

Objective and results:

The objective of this mission was to review the current safety status of a modification of a Triga Mark II in Bandung, which is operated by the Centre of Research and Development of Nuclear Techniques (CRDNT), the Directorate for Basic Research and Application of BATAN. The main objectives of the upgrade project were:

- to increase the reactor power from 1000 kW to 2000 kW;
- to upgrade the safety systems of the reactor;
- to provide additional in-core irradiation facilities capable to produce more amount of radioisotopes and to increase the potential use of the beam-tubes.

The reviewers made recommendations on several aspects of the upgrade project such as the reactor shielding and the seismic design of the modifications. In addition, other subjects to enhance the safety of the modified reactor were discussed with the counterparts of BATAN.

II.3.3. Malaysia

(i) Experts' Mission to Provide Guidance for the Preparation of Safety Analysis Report

Date: 26-30 June 2000

Place: Kuala Lumpur, Malaysia

Objective and results:

The objective of this mission was to provide advice and assistance to improve the safety analysis report (SAR) for a Triga Mark II Research Reactor in Malaysia.

The members of the mission gave presentations about the current programmes and trends for research reactor safety and safety analysis methodology. The mission reviewed the compliance of the current SAR with the IAEA SS 35-G1 through document review and discussion with local experts. The implementation status of the recommendations made by the INSARR mission in 1997 and the assumptions & methods for the safety analysis were reviewed. Detailed findings and recommendations to improve the SAR were addressed during the discussion.

II.3.4. Philippines

(i) Technical Visit to Philippines

Date: 3-4 July 2000

Place: Quezon City, Philippines

Objective and results:

The objective of this technical visit was to discuss future EBP activities including Programme Scope for Phase III and the detailed assistance based on the results of the questionnaires, which were previously sent to know the opinions of the country.

A meeting with the Philippine Nuclear Research Institute (PNRI) was held. During the meeting, a presentation of the EBP was provided by the IAEA staff and the situation of the Philippine Research Reactor (PRR-1) was described by the PNRI staff. Assistance for the PRR-1 and a pre-IRRT mission were requested for Phase III of the EBP.

II.3.5. Thailand

(i) Technical Visit to Thailand

Date: 5-6 July 2000

Place: Bangkok, Thailand

Objective and results:

The objective of this technical visit was to discuss future EBP activities including the Program Scope of Phase III and the detailed assistance based on the results of the questionnaires sent earlier to the country.

At the meeting, the IAEA staff was informed by the Office of Atomic Energy for Peace (OAEP) about the current situation of nuclear safety in Thailand including the safety examination of the Thai Research Reactor - 2 (TRR-2), and the situation of the regulatory body after the radiological accident in February 2000. Regarding the future activities under the EBP, acceptance of the pre-IRRT mission was confirmed. Strengthening the regulatory infrastructure is an important element of the EBP assistance for Phase III.

(ii) Radiological assessment review of the TRR-2 reactor at ONRC

Date: 21-25 August 2000

Place: Bangkok, Thailand

Objective and results:

The main purpose of this mission was to support the OAEP staff for conducting and reviewing the radiological consequence analysis for the ONRC research reactor. The mission reviewed the results of the radiological consequence analysis addressed in the PSAR and provided technical advice on the sensitivity calculation of the release mode and meteorological conditions into the radiological consequence analysis.

II.3.6. Viet Nam

(i) National Seminar on Research Reactor Safety

Date: 3-7 April 2000

Place: Hanoi, Viet Nam

Objective and results:

The objective of this seminar was to improve knowledge and the technical capability on research reactor safety for the staff of the regulatory body and operating group in Viet Nam.

The seminar was well attended by 21 participants from organizations including Viet Nam Radiation Protection and Nuclear Safety Authority (VRPA), which is taking the functions of the regulator of nuclear activities in Viet Nam. The seminar consisted of 21 lectures on the safety analysis report and operational safety of research reactors. At the end of each day, a discussion panel was arranged for in-depth discussion and clarification of the presented topics.

(ii) Scientific Visit to US

Date: 15-25 May 2000

Place: Washington, D.C., Argonne, U.S.

Objective and results:

The purpose of this scientific visit was to learn functions of well established regulatory body: functions of nuclear safety support institutes; safety culture and activities of vendors and owners in the U.S.

Four members of the Vietnamese Government visited NRC, DOE, NEI, Argonne National Laboratory, and related organizations, and discussed many of the legal, regulatory, political and procedural issues related to building a nuclear power program.

(iii) Experts' Mission on Review and Assessment of the SAR of the DRR

Date: 14-18 August 2000

Place: Dalat, Viet Nam

Objective and results:

The objective of this mission was to assist Dalat Research Reactor (DRR) Centre for upgrading the Safety Analysis Report (SAR) of DRR-1 with 500 kW thermal capacity. The mission reviewed Rev.2 SAR of DRR in terms of the compliance with the Agency Guide SS-35-G1 entitled "Safety Assessment of Research Reactors and Preparation of the Safety Analysis Reports".

It was understood that the SAR of DRR does not fully comply with the contents of the relevant Agency Guide because of insufficient financial and humane recourses. Safety significant issues related to safety design and operation of the facility are addressed in the report as practical as possible, and the quality of the SAR and performance of facility management had been well kept under the circumstances.

III. ACTIVITIES PLANNED IN 2000

This section describes the activities planned for 2000 (from October to December)

III.1. REGIONAL ACTIVITIES

III.1.1. Workshop on Prerequisites of Institutional Requirements for Deployment of Nuclear Power

Date: 2-3 November 2000

Place: Vienna

Objective and contents:

The objective of this workshop is to provide information based on approaches and the experience gained in other countries in building their nuclear safety infrastructure. The participants in the AGM, from 31 October to 1 November, are expected to attend the workshop.

The workshop will cover the following topics:

- infrastructure needs to support the launch of a nuclear power programme;
- organization and structure of the nuclear regulatory body;
- establishment of nuclear regulatory technical support programme;
- relationship between a regulatory body and operating organizations involved in a nuclear power plant project;
- relationship between a regulatory body and public;
- international co-operation for nuclear safety and regulatory activities.

III.1.2. Training Workshop on the Safety of Research Reactors (Operational Safety)

Date: 6-17 November 2000

Place: Tokai-mura, Japan

Objective and contents:

This regional training workshop, which will be organised by the IAEA in co-operation with the Government of Japan through the Japan Atomic Energy Institute (JAERI), is designed to provide training on operational safety for research reactor for personnel involved in safety regulation. The workshop will be open to 24 participants from the six countries.

The workshop will cover the following topics for research reactors:

- safety analysis;
- quality assurance program;
- maintenance and test program;
- preparation of operating procedure;
- simulation of operation;
- radiation protection;
- waste management.

III.2. NATIONAL ACTIVITIES

III.2.1. China

(i) IRRT Mission to the Regulatory Body

Date: 9-20 October 2000

Place: Beijing, China

Objective:

The objective of this IRRT mission is to review the effectiveness of the regulatory body and to exchange information and experience in the following areas:

- legislative and governmental responsibilities;
- authority, responsibilities and functions of the regulatory body;
- organization of the regulatory body;
- the authorisation process;
- review and assessment;
- inspection and enforcement;
- development of regulations and guides;
- emergency preparedness.

(ii) Workshop on PSA Applications

Date: 30 October - 3 November 2000

Place: Beijing, China

Objective:

The objective of this workshop is to provide comprehensive and detailed information on the perspectives for use of probabilistic safety assessment (PSA) applications and risk-informed regulations and inspections for NPPs safety enhancement. The workshop will provide an overview of possible PSA application, and attention will be paid to general PSA aspects such as PSA level, scope and level of detail, which have to be considered when planning/performing PSA applications.

(iii) Follow-up Mission on Level 1 PSA for Tianwan NPP

Date: 13-17 November 2000

Place: St. Petersburg, Russia

Objective:

The objective of this mission is to review the adequacy of assumptions, analysis methods, input data, the credibility of analysis outcomes, and implementation of IAEA's recommendations and comments raised by the Review Mission of November 1999.

(iv) Experts' Mission to Peer Review the Assessment of the RPV Strength and Fatigue Analysis for the Tianwan NPP

This mission was postponed to 2001 and might be included in the assistance related to licensing requirements for the reactor coolant system.

III.2.2. Thailand

(i) Pre-IRRT Mission for the OAEP

Date: 27 November - 1 December 2000

Place: Bangkok, Thailand

Objective:

The objective of the pre-IRRT mission in Thailand is to review the legal basis, organization, staffing, performance of basic regulatory activities (review and assessment, inspection and enforcement) and other selected areas of the regulatory body which is currently part of Office of Atomic Energy for Peace (OAEP). The basis for the review will be IAEA Safety Requirements for the area of governmental organization and good international practices. Recommendations and suggestions should assist in the enhancement of national regulatory infrastructure and function. The mission will be composed of four experts (two outside, two IAEA staff).

III.2.3. Viet Nam

(i) Workshop on Safety Assessment and Regulatory Control for Research Reactors

Date: 3-6 October 2000

Place: Hanoi, Viet Nam

Objective:

The objective of this workshop is to provide to the Vietnamese Regulatory authority staff comprehensive and detailed information on the practices and experience with the licensing and regulatory inspections of research reactors and relevant IAEA safety standards. The workshop will consist of presentations by the experts on selected topics and discussions focused on particular licensing and inspections activities for Dalat RR. The attendees to this workshop are expected to enhance their capabilities for safety inspection of the Dalat RR.

IV. CONTRIBUTIONS 2000

The following countries have provided cash and/or in-kind contributions.

Country	Contributions
Japan	1,381,000 US\$ (*)
Spain	10,000,000 ESP
USA	210,000 US\$ (**)
France	1 cost-free expert
Germany	1 cost free expert
Korea	1 expert (***)

* includes 2 cost-free experts from Japan.

** includes US\$ 30,000 allocated for a Seminar on Nuclear Liability.

*** supported by the EBP Funds.