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PROGRESS REPORT

(OCTOBER 2002 – MARCH 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

May 2003

I. INTRODUCTION

This report describes the activities implemented from October 2002 until March 2003 and those further planned for 2003. Activities implemented from April 2002 to October 2002 were presented earlier in the PROGRESS REPORT, EBP-ASIA-110, which was distributed to all participating countries at the end of October 2002 and presented at the Technical Meeting held in November 2002.

II. ACTIVITIES IMPLEMENTED FROM OCTOBER 2002 TO MARCH 2003

II.1. PROGRAMME MANAGEMENT

II.1.1. Technical Meeting

A Technical Meeting (TM), formerly Advisory Group Meeting, was held from 18 to 20 November 2002 to review progress and future activities of the EBP. It was attended by 28 participants from 12 countries involved in the Programme. The TM expressed satisfaction with the results achieved and agreed on the work plan to be implemented in 2003. Results are contained in the report EBP-ASIA-114.

II.1.2. Database

The Internet-version of the EBP database was released to registered representatives in the participating countries. It presents information on each activity, including basic information on dates, venue, status, technical officers and national counterparts. In addition, the objective, results achieved, summary and full reports, the Country Nuclear Safety Profiles (CNSPs) and the Nuclear Safety Action Plans (NSAPs), are also displayed. Interrogation capabilities are available using various criteria: searching by country, by type of activities, by year. For training activities, the database contains the actual material presented by the lecturers. Information about other relevant IAEA Technical Co-operation projects, and bilateral agreements and projects related to the countries participating in the EBP can also be retrieved. The database is being updated continuously, including the activities related to the development of the Asian Nuclear Safety Network.

II.1.3. Preparatory Activities for ANSN Pilot Project

(i) Preparatory Meeting of ANSN

A Preparatory Meeting on the Asian Nuclear Safety Network (ANSN) was held on 21 November 2002 to discuss the concept and scope of the ANSN. It was attended by 33 participants from 13 countries. The participants expressed support for the establishment of the ANSN. Results are contained in the report EBP-ASIA-116.

(ii) Consultants Meeting on the Pilot Project for the ANSN

A Consultants Meeting on the Pilot Project for the ANSN was held from 3 to 5 February 2003 to co-ordinate the development of the portal sites in China, Germany, Japan, Korea, US and the IAEA. It was attended by 7 experts from 7 countries. The participants agreed on the structure of the database and developed the milestone implementation schedule. Results are contained in the report ANSN 06.

(iii) Second ANSN Consultation Meeting on the Implementation of Pilot Project on Education and Training

The Second ANSN Consultation Meeting on the Implementation of Pilot Project on Education and Training (E&T) was held from 24 to 26 March 2003 to review progress of the pilot project and to elicit views on ANSN scope of work for 2004 and beyond. It was attended by representatives from 13 countries. Substantial progress on hubs in China, Japan and Korea was demonstrated and welcomed by the participants. Participants also discussed the role of Hubs and National Centres and ANSN sustainability. The schedule for uploading E&T material onto the network and sharing of software development among hubs were agreed.

II.1.4. 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 TM of November 2002 (see II.1.1.) 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)[1]

A milestone implementation schedule was prepared by the IAEA and agreed at the Second ANSN Consultation Meeting March 2003. Further adjustments of the schedule will be made by the IAEA in consultation with each country, the objective being to complete all ISE Reports no later than October 2003 for the EBP technical meeting in December 2003.

II.1.5. Education and Training

Complementary to its training courses and workshops, the Nuclear Installation Safety Division concentrated its efforts on the development of background material to assist regional training centres on the implementation of their national training programmes in line with the Agency Safety Standards.

As part of this effort distance learning tools on basic safety concepts, reactor physics and thermal-hydraulics were revised and are available on the Agency web site. The first version of the modules was presented at the Regional Training Course on Train the Trainers in Nuclear Safety, ANL, USA in June 2002. The participants were provided with CD-ROMs of the modules and after an introductory session had the opportunity to experience them. Discussions were held on its usefulness and points for improvement. It was a common understanding that the modules prepared are very useful to support national trainers (although some improvements are still needed in some of the modules) and that other modules on specific topics of interest should be prepared. More recently a module on regulatory control of Nuclear Power Plants was started and a first version is foreseen to be available at the beginning of 2003.

Actions were taken to prepare standardized training material based on the experience available at NSNI in conducting training activities on safety related topics. This included preparation of a manual with the main guidelines for course preparation, a set of commented lectures and a compilation of reference material for selected topics where training activities have being conducted in the past. This material is available on CD-ROMs and there are provisions to include this material on the Agency web site in 2003. Topics where standardized training material is available are presented in a leaflet prepared to promote their use. Most of this material, in the preliminary version, was presented and distributed to the participants of the Regional Training Course on Train the Trainers in Nuclear Safety, ANL, USA in June 2002. Work is under way to publish the Basic Professional Training Course in Nuclear Safety in the IAEA training manual series and a self-study module in CD-ROM and internet option.

II.2. REGIONAL ACTIVITIES

II.2.1. Workshop on Safety Analysis Methodology and Computer Code Utilization (4)

Date: 21 October - 2 November 2002

[1] ISEs on nuclear power plant safety in China will be conducted based on the report presented in the framework of the Convention on Nuclear Safety.

Place: Daejeon, Korea

Objective and results:

The objective of the workshop was to prepare technical staff of regulatory bodies, technical support centres, and operators of research reactors and nuclear power plants (NPPs) to conduct safety assessments, particularly accident analysis using computer codes. The workshop was the last one in the series of Workshops on Safety Analysis methodology and Computer Code Utilization begun in February 2001.

The Korea Institute of Nuclear Safety hosted this workshop. As requested, a total of seventeen trainees from six recipient countries of the EBP participated in all four workshops.

The workshop program consisted of 27 modules (21 lectures and exercises in conducting safety analysis using the RELAP5 computer code). Instructors included two Agency staff members, Mr. Sok Chul Kim (NSNI-ESS) and Ms. Annick Carnino (NSNI, Director), two external lecturers, Mr. C. Allison from USA and Mr. Sang Shim from Canada, and eight Korean lecturers from KINS, Korea Atomic Energy Research Institute and Korea Power Engineering Company. The first week was dedicated to enhancing the trainee's practical knowledge and experience for accident analysis using computer code (RELAP5). The second week was focused on core thermal hydraulics and radiological consequence analysis including source term evaluation, with classroom lectures and computer code demonstrations. The participants held a poster workshop for demonstrating their case study results, and each trainee carried out transient analysis for their target facilities using RELAP5 computer code.

The target goal of the workshop was fully achieved by enhancing the technical capability of regulators and operators in safety analysis and dealing with RELAP5 computer code donated by USNRC. The participants' self performance appraisals and evaluations by lecturers show that the participants secured enough technical knowledge and experience to conduct safety analysis using RELAP5 computer code for their nuclear installations through the last four workshops.

II.2.2. Workshop on Protection Against Fire for Research Reactors

Date: 10 - 14 March 2003

Place: Daejeon, Korea

Objective and results:

The objective of the workshop was to train the personnel responsible for fire protection in order to enhance the safety of research reactors and nuclear facilities on the basis of IAEA safety standards and guides.

The IAEA team consisted of two external experts, Mr. H. Boll (IRSN, France) and Mr. Joong M. Yang (Lawrence Livermore National Laboratory, USA) and one Agency's staff member, Ms. H. Tezuka (NSNI).

Three speakers, two from Korea (KINS and KAERI) and one from Japan (JNC) were invited to introduce their country's fire experience and present lessons learned. Also, the IAEA experts introduced the practice and experience gained in France and USA.

The workshop was organised to provide the participants with the basic knowledge of fire protection for research reactors and nuclear facilities. Emphasis was placed on methods of prevention and suppression/mitigation of fire, such as transient combustible control, fire protection inspection through a research reactor site walk-down, fire emergency response procedure, and radiation protection during fire fighting.

During the mission the IAEA team gave lectures and practical training (transient combustible control and HANARO research reactor walk-down). A visit to the Emergency Response Centre in KINS was also conducted during the workshop.

There were 20 participants from Indonesia, Malaysia, Philippines, Thailand and Vietnam. They came from the regulatory bodies, research institutes and technical support organisations. The head of the fire brigade has also attended the workshop. Eight HANARO staff participated in all the sessions of the workshop.

This workshop was the first regional fire protection training for research reactors (RRs) and nuclear facilities. The participants recognised the importance of fire safety in RRs and appreciated this activity very much. As there are many other areas for training, the continuous IAEA assistance in this field is still needed to enhance fire safety in RRs and facilities as well as to enhance safety culture of the personnel.

II.3. NATIONAL ACTIVITIES

II.3.1. China

(i) Tianwan NPP General Commissioning Programme

Date: 7 - 11 October 2002

Place: Prague, Czech Republic

Objective and results:

The objective of this activity was to provide information on the commissioning programme for the Tianwan NPP (TNPP) based on the experience of Temelin NPP. The focus of the activity also included verification and validation (V&V) of digital I&C system during the commissioning.

The five experts of the IAEA agreed that there are no weaknesses in the TNPP commissioning programme. The support from the Russian and German contractors appear to be strong, focussed and knowledgeable. Nevertheless, the team stressed the need for the Chinese customer to be attentive to the distribution of responsibility during the different stages of the commissioning programme.

The team was separated into two groups. The general commissioning group reviewed the Quality Assurance programme, the PSAR Chapter 14, the commissioning programme for systems and components, a few procedures and the general documentation. The Chinese delegation was totally satisfied by the deep experience and the technical qualification of the experts involved in this workshop. Recommendations were made by the team to emphasize the following topics: the responsibility, the training programme, the emergency arrangement, the review and approval and the quality of the documentation. It was also emphasized the necessity of full engagements of the Chinese personnel from the beginning of commissioning works.

The I&C group reviewed the documentation sent by Siemens (Framatome ANP) in detail. The group made a few recommendations mainly regarding the relation between the Russian main designer and the Siemens I&C designer.

Good professional co-operation between Temelin personnel and the Chinese delegation was observed. Sixteen groups, consisting of a total of fifty two participants attended the workshop.

(ii) Workshop on Education and Training

Date: 14-18 October 2002

Place: Beijing, China

Objective and results:

A national level workshop on Education and Training was conducted at the Beijing Institute for Nuclear Engineering (BINE). The responsible organization for the workshop was the China Atomic Energy Authority (CAEA).

The objective of this workshop was to assist the participants of the Peoples Republic of China in performing a self-assessment of their development and maintenance of a sustainable and adequate education and training programme in nuclear safety consistent with IAEA safety standards and good international practices with due recognition to national conditions.

The IAEA team consisted of one IAEA staff member and six external experts from five countries, which were Argentina, Czech Republic, Germany, Japan (two experts) and Slovak Republic.

Discussions were held with selected management and staff of the CAEA and BINE organizations by the Agency Technical Officer (H. Eichenholz) throughout the

conduct of the workshop to ensure that the expectations of Chinese participants from the various organizations involved with nuclear safety were achieved.

During the workshop, the IAEA team members aided the workshop participants by being facilitators for conducting work group self-assessments in four focus areas: universities, research reactors, regulatory bodies and nuclear power plants

The workshop addressed self-assessment of competencies needed to ensure nuclear safety in the following four areas: basis and framework, competencies and training, adequacy of training, and continuous maintenance and improvement. At the completion of the workshop the Chinese work group leaders provided a presentation of their respective work group's self-assessment.

(iii) Workshop on Emergency Operation Procedures (EOP)

Date: 21-25 October 2002

Place: Qinshan II, China

Objective and results:

The objective of the workshop was to provide support to personnel involved in the operation of Qinshan Phase II NPP in making further improvements to their Emergency Operating Procedures (EOPs).

This workshop was hosted by Qinshan Phase II Nuclear Power Plant. One IAEA staff member, three invited experts from France, Hungary and the Netherlands, respectively, delivered lectures. About 25 participants attended the workshop; these consisted of operating, technical support and QA personnel of Qinshan II NPP, but representatives of Qinshan I and III were also present.

The general part of the workshop was based on the existing IAEA guidance document devoted to the development and review of EOPs. Important aspects of EOPs were described in several presentations, such as basic concepts and steps in the development and implementation of EOPs, overview of approaches adopted in different countries, analytical support, verification and validation, training of operating personnel, interface of EOPs with other NPP procedures and safety documentation, and the effect of a two-loop design on EOPs. During the specific part of the workshop, three different reference approaches were described in detail: the Westinghouse approach, the French approach, and the Framatome-ANP (Siemens) approach. Specific features of these reference approaches were demonstrated through a number of practical examples and exercises in the use of the EOPs.

The existing EOPs at Qinshan II, developed over a period of approximately three years, are of event based type; the plant personnel intend to improve them by converting them into symptom based procedures. The work was carried out mainly by the NPP personnel in close co-operation with the design organization and other Chinese engineering institutions. The procedures are being validated on the existing

full-scope simulator. A strong commitment to further improving these EOPs was expressed.

(iv) Tianwan NPP Level 1 PSA (follow-up)

Date: 21-25 October 2002

Place: St. Petersburg, Russia

Objective and results:

The objective of this mission was to review the revised level 1 internal event PSA report, in order to follow-up the previous review missions on PSA level 1 of TNPP implemented in 1999 and 2000.

The mission consisted of three external experts and one IAEA staff, seventeen Russian experts and one Chinese expert from the Jiangsu Nuclear Power Corporation. The review meeting found that much progress had been made in comparison to the status two years ago and that all issues had been addressed. The mission concluded that:

- With the reservations detailed in the mission report, the PSA is now in a status where it can provide important information for finalizing the design and, in particular, for developing operating/emergency operating procedures and simulator training programmes;
- No further follow-up review of the Level 1 PSA seems to be necessary;
- The level 2 PSA is not yet finalised, so the IPSART review originally planned for end of November 2002 needs to be rescheduled for next year;
- A review for the Low Power/Shutdown PSA, which was not within the requested scope, was requested as a separate mission or in combination with the Level 2 IPSART mission.

(v) Tianwan NPP Fire Risk Analysis (Fire Hazard Analysis)

Date: 28 October - 1 November 2002

Place: St. Petersburg, Russia

Objective and results:

The objective of this mission was to review the fire hazard analysis of Tianwan NPP (TNPP) and to advise Jiangsu Nuclear Power Corporation (JNPC) and the Russian counterpart (the technical counterpart) on the fire protection concerns based on the PSA Topical report and Final Safety Analysis Report (FSAR) for TNPP.

The IAEA team consisted of two outside experts, Messrs. F. Bonino from France and M. Boleman from Slovakia and one staff member, Ms. H. Tezuka (ESS-NSNI).

This mission consisted of two meetings: a plenary meeting, in which the Chinese, Russian and IAEA teams participated; and a subsequent IAEA internal meeting. The scope of this mission was discussed during the plenary meeting and the results of the discussion were reviewed during the IAEA internal meeting.

The review was done based on following two actions: (1) a review of Chapter 9.5.1 Fire Protection System of FSAR for TNPP, received in St. Petersburg during this mission, and of the TNPP Topic report – Probabilistic Analysis of Safety at Fires in NPP Rooms, received prior to this mission; and (2) extensive discussion with the technical counterparts.

The IAEA team produced a draft mission report that was discussed and handed to the Chinese and Russian counterparts on the last day of the mission.

It is understood that the fire PSA report is still in the preliminary stage because of lack of data, e.g. only 40% of cable trains was considered in the analysis. Therefore the review is focused on the methodology and clarification of the assumptions made for the analysis.

As a result of the review, the related questions were clarified and the IAEA team did not find any serious negative aspects. Several recommendations were provided for further consideration and future study. The Russian counterparts agreed with these recommendations.

(vi) Self-assessment of Operational Safety Management and Surveillance

Date: 11-15 November 2002

Place: Qinshan II, China

Objective and results:

The objective of the mission was to conduct a practical workshop to sustain and reinforce the importance of self-assessment of operational performance as a means of enhancing operational safety. The workshop was organised in conjunction with the Research Institute of Nuclear Power Operations (RINPO) and conducted at a conference centre near their offices in Wuhan, China. The workshop was attended by participants from Korea (one), India (three) and Pakistan (two), together with representatives of all NPPs in mainland China and members of the RINPO staff (in excess of 25 participants).

The workshop was conducted by two IAEA staff members, who were both very experienced in the techniques utilised by the IAEA OSART programme to assess operational safety of NPPs. The programme of the workshop was scheduled to explain the need to:

- Establish expectations (the required standards);
- Communicate those expectations;

- And ensure the implementation of those expectations (Self Assessment and Management Oversight).

Presentations were given on the relevant IAEA Nuclear Safety Standards, Management of Safety and the Self Assessment Process. These were supported by more detailed presentations on the OSART process utilised by the IAEA to develop issues. Practical exercises in observation and development of issues were conducted by visiting work in progress at a RINPO laboratory, and also utilising videos of Management Tours, and Maintenance of Pressure Switches and Motor Operated Valves. The utilisation of all four observation exercises allowed participants to develop common issues recognised in all scenarios, write issue statements and propose overall corrective actions.

Presentations were also given on Interviewing and Listening techniques and Management of Change.

All the international participants gave presentations on initiatives being carried out with regard to Self Assessment within their own utilities. This was supported by a presentation from RINPO on the proposed national peer review programme currently about to be implemented at all NPPs in mainland China. The first NPP to be reviewed will be Qinshan Phase II in November 2003.

(vii) OSART Follow-up for Ling Ao NPP

Date: 18-22 November 2002

Place: Ling Ao NPP, China

Objective and results:

The objective of this mission was to follow-up the Pre-OSART mission to Ling Ao implemented in August 2001. The unit 1 has been in operation since May 2002. Unit 2 was under commissioning out of the frame of the mission.

The team consisted of two reviewers from the IAEA, one representative from the Calder Hall NPP, UK and one from the Ringhals NPP, Sweden. Following the entrance meeting, which took place on Monday, 18th November, the team conducted the follow-up review, completed its initial report and presented its findings at an exit meeting on Friday, 22nd November. In addition to senior managers from Ling Ao Nuclear Power Company, senior managers from Guangdong Nuclear Power Joint Venture Company, including the Director General, attended the meeting

The team reviewed the status of the recommendations and suggestions identified during the Pre-OSART mission in August 2001. The areas reviewed were management, organization and administration; training and qualification; operations; maintenance; technical support; radiation protection; chemistry and emergency planning and preparedness. An exchange of technical experience also took place between the experts and plant counterparts on how the common goal of excellence in operational safety could be further pursued.

A statistical analysis of the status of the 33 recommendations and 11 suggestions identified in the Pre-OSART mission in August 2001 shows that 71% were resolved, 25% were making satisfactory progress, 2% (one issue) was making insufficient progress and one issue was withdrawn. The issues with satisfactory progress were not fully implemented due to their complexity or the need for long term action or their effectiveness has not been fully assessed.

(viii) Training for System Engineers

Date: 13-17 January 2003

Place: Vandellos, Spain

Objective and results:

The purpose of the mission was to facilitate and participate in the System Engineer Training Workshop for Qinshan Phase I NPP personnel. The workshop was conducted by Vandellos NPP, Spain.

Six members of the Qinshan I System Engineering Department attended the workshop, together with one IAEA staff member. The programme of the workshop was developed by Vandellos NPP and the content agreed by Qinshan I and the IAEA Technical Officer. The IAEA gave a short presentation at the commencement of the workshop on the history of the management enhancement programme at Qinshan I that had been supported by the IAEA TC Project CPR 009 and the desire of Qinshan I to replicate best practices in System Engineering. The IAEA Nuclear Safety Standards, plus other relevant TECDOCs and Reports were also presented to both the Qinshan I representatives and the Vandellos staff participating in the workshop. During the workshop the IAEA representative provided points of clarification between Qinshan I and Vandellos NPP staff as necessary:

Qinshan I personnel gave an overview of their Engineering Organisation and their plans to enhance their programmes. They also highlighted areas that were of particular interest to them on which they were seeking guidance.

Vandellos NPP personnel gave a series of presentations varying in detail and supported by presentational material and practical demonstrations.

The participants spent one day allocated to System Engineers on a one to one basis to allow them to follow a normal days activities of meetings, visits and routine work. This gave them the opportunity to see System Engineers at work and also ask detailed questions.

The programme was concluded with a comprehensive Question and Answer Session attended by System Engineers, the Head of System Engineering, the Engineering Manager and the Technical Director.

During the week's programme the participants also had the opportunity to meet and question the Production and Operations Managers of Vandellos and ASCO NPP's.

II.3.2. Indonesia

There have been no national activities from October 2002 to March 2003.

II.3.3. Malaysia

There have been no national activities from October 2002 to March 2003.

II.3.4. Philippines

There have been no national activities from October 2002 to March 2003.

II.3.5. Thailand

There have been no national activities from October 2002 to March 2003.

II.3.6. Viet Nam

There have been no national activities from October 2002 to March 2003.

III. WORK PROGRAMME FOR 2003 (APRIL – DECEMBER 2003)

III.1. PROGRAMME MANAGEMENT

III.1.1. Update CNSP/NSAP

Country Nuclear Safety Profiles (CNSP) and Nuclear Safety Action Plans (NSAP) are the basis of the EBP work plan and are periodically updated in line with the progress of the national nuclear developments, enhancements in nuclear safety, and results of the IAEA safety activities. Before the next TM, both CNSPs and NSAPs will be further updated, as needed, by mutual consultation between the countries and the Secretariat.

The latest version of the CNSPs and NSAPs is made available in the Database for the EBP Members.

III.1.2. 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

III.2.1. Regional Workshop on Preservation of Research Reactors in Shutdown State and Decommissioning

Date: 29 September – 03 October 2003
Place: JAERI, Japan
Objective:

To assist owners, operators and regulators of research reactors currently in an extended shutdown state and other persons involved in decision making for future facility use - either continue operations or permanently shutdown the facility for decommissioning. Assistance is to be provided through presentations on international standards and requirements for the resumption of operations at the research reactors or their decommissioning. In addition, the presentation of national case studies from developed countries will provide insight from experience gained in placing research reactors into safe storage, as well as carrying out the decommissioning process.

II.2.2. Regional Standard Safety Culture Workshop

Date: 10 – 14 November 2003
Place: Korea

Objective:

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.2.3 Regional Training on the Implementation of the Code of Conduct on the Safety of Research Reactors

Date: 4th quarter 2003, two weeks
Place: Argonne National Laboratory, USA
Objective:

To share best practices on the safety of research reactors in order to facilitate the implementation of the Code of Conduct on the Safety of Research Reactors in Member States.

III.2.4. Regional Workshop on Education and Training for Nuclear Safety

Date: To be determined (postponed from 2002)
Place: Tokyo, Japan
Objective:

The objective of this workshop is to exchange information on results of IAEA evaluations of nuclear safety education and training and specific needs of the countries in the region, and to explore means to enhance regional co-operation.

III.3. NATIONAL ACTIVITIES

III.3.1. China

(i) Emergency Operation Procedure for TNPP (Expert Mission)

Date: 25 – 29 August 2003 (Postponed from 2002)
Place: Russian Research Institute for Nuclear Power Plant Operation, Moscow
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.

(ii) Maintenance and Periodic Testing Program with ISI Program Review

Date: 08 – 12 September 2003
Place: Tianwan Nuclear Power Plant (TNPP), Lianyungang, China
Objective:

The objective of this mission is to give lectures for TNPP personnel on: the maintenance and periodic test management system in the NPP; maintenance programme, criteria and procedures; periodic testing programme, criteria and procedures; developing the maintenance plan; and developing a maintenance

programme on the basis of risk analysis. This mission also reviews the in-service inspection (ISI) programme for TNPP developed by Russian contractor.

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

Date: middle of September 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) Risk Analysis Report for Core Start-up without Neutron Source (Expert Mission)

Date: To be determined
Place: TNPP, 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.

(v) Operation Assessment of Nuclear Power Plants

Date: To be determined
Place: RINPO, Wuhan, China
Objective:

The objective of this mission is to train team leaders, assistant team leaders and assessors, and to provide the experience and technologies for the Operation Assessment Programme for NPPs in China.

(vi) Assess Implementation of IRRT Recommendation and Advisory Mission on ISE

Date: To be determined
Place: Beijing, China
Objective:

The objective of this mission is to assess implementation of recommendations made by the IRRT mission in October 2000, and to give advise to Chinese counterparts on drafting their ISE report, including discussion on avoiding any duplication of the national reports for the Convention on Nuclear Safety.

(vii) Pre-OSART Mission to TNPP

Date: 13-30 October 2003
Place: TNPP, Lianyungang, China

Objective:

The objective of this mission is to carry out a Pre-OSART for TNPP, encouraging development of their operational safety. The review areas will be the OSART standard: Management, Organisation and Administration; Training and Qualification; Operations; Maintenance; Technical Support; Radiation Protection; Chemistry; Emergency Planning and Preparedness. Commissioning activities will be integrated in the different review areas.

(viii) 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.

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

Date: 08 – 12 December 2003
Place: Qinshan I, 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 item 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.

(x) Workshop of Ageing Management (Nuclear Installation)

Date: second half of 2003
Place: NNSA, Beijing, China
Objective:

The objective of this workshop is to discuss regulation of ageing of NPPs and research reactors focused on the issues faced by NNSA.

(xi) Workshop of Quality Assurance (QA) of Regulatory Body

Date: second half of 2003
Place: NNSA, Beijing, China
Objective:

The objective of this mission is to inform the Chinese Regulatory Body (NNSA) on how to develop the QA programme for the regulatory body, through out the life-time of the nuclear facility: siting, construction, commissioning, operation and decommissioning; and how to implement the QA programme continuously, and effectively. Since NNSA is facing many regulatory challenges because of differing

types of reactors and the limited resources, it is necessary to fully and efficiently use available resources to do the surveillance and inspection work.

(xii) Management and Assessment of the Steam Generator Lifetime (Expert Mission)

Date: 4th Quarter of 2003
Place: RINPO, Wuhan, China
Objective:

The objective of this mission is to visit RINPO and participate a steam generator lifetime management seminar to give some suggestions and information about steam generator lifetime management strategy and techniques to specific NPP in China. RINPO has a long history in steam generator research, design and maintenance, and has accumulated enough experience. However, there are still some problems on steam generator operation and evaluation.

(xiii) Preparation for Pre-OSART and OSART Training (Qinshan III)

Date: To be determined (postponed from 2002)
Place: Qinshan III, Zhejiang, China
Objective:

The objectives of this mission are to become familiar with Pre-OSART and OSART missions, to understand objectives, review criteria of Pre-OSART and OSART missions and to give lessons learned from previous Pre-OSART and OSART missions.

(xiv) IPSART Review of the Data Bay NPP Level 1 PSA

Date: To be determined (postponed from 2002)
Place: Daya Bay NPP, Guandong, China
Objective:

The objective of this mission is to carry out a comprehensive IPSART review of the full-scale level 1 PSA in Daya Bay NPP.

(xv) TNPP PSA Level 2 (Expert Mission)

Date: waiting documentation
Place: TNPP, 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) National Training Course on Ageing Management for Research Reactor (expert mission)

Date: 14 – 22 July 2003

Place: PUSPIPTEK, Serpong, Indonesia
Objective:

The objective of this mission is to provide a national training course with the objective to provide the information and to develop ageing management, including also ageing assessment based on the IAEA recommendation and experience feedback in the world.

(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:

The objective of this workshop is to provide the basic knowledge and practical experience in neutronics and thermal-hydraulic analysis important for SAR preparation and for fuel burn-up evaluation. Participants will include about 20 Indonesian personnel from BATAN, BAPETEN, universities and other institutions. Instructors will include 2 – 3 Agency staff and outside experts, along with Indonesian experts.

(iii) National Basic Professional Training Course on Nuclear Safety

Date: 25 August – 05 September 2003
Place: Jakarta, Indonesia
Objective:

National training course is organized to train staff of BATAN and BAPETEN on nuclear safety. This training is designed for the purpose of enhancing their knowledge of nuclear safety. The workshop will help participants to develop necessary skills and techniques in executing their tasks and in applying nuclear safety standards. During the training, each participant will complete a basic assessment of nuclear safety.

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

Date: 29 September – 03 October 2003
Place: BAPETEN, Jakarta, Indonesia
Objective:

The objective of this mission is to review progress on the implementation of the recommendations formulated by the IAEA pre-IRRT conducted in 1999.

(v) Advisory Mission on ISE.

Date: 29 September – 03 October 2003
Place: Jakarta, Indonesia
Objective:

The objective of this mission is to provide a diagnostic of the overall safety situation in the country and to identify the areas where safety enhancements should be focused.

(vi) 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.

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

Date: To be determined. (about 1 month)
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

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

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

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

(ii) Advisory Mission on ISE (pilot)

Date: 07 - 11 April 2003
Place: Malaysia
Objective:

The objective of this mission is to provide a diagnostic of the overall safety situation in the country and to identify the areas where safety enhancements should be focused.

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

Date: June 2003 (Postponed from 2002)
Place: Malaysia

Objective:

The objective of this mission is to assist the AELB in the evaluation of the Safety Analysis Report (SAR) for the Triga Mark II Research Reactor.

III.3.4. Philippines

(i) Establishing Strategic RR Utilization Plan (and Other Safety Issues)

Date: To be determined. (Postponed from 2002)
Place: Philippines
Objective:

The objective of mission is to advise in the establishment of the Strategic Plans for Utilization for the Philippine Research Reactor (PRR-1) and conduct a seminar on Strategic Planning of Research Reactors.

(ii) Feasibility Study of Safety of Operation of RR at 100 kW Power

Date: To be determined.
Place: Philippines
Objective:

(iii) Advisory Mission on ISE

Date: To be determined.
Place: Philippines
Objective:

The objective of this mission is to provide a diagnostic of the overall safety situation in the country and to identify the areas where safety enhancements should be focused.

(iv) National Basic Professional Training Course on Nuclear Safety

Date: To be determined.
Place: Philippines
Objective:

The objective of this programme is to introduce the basic concepts of Nuclear Safety to the staff of operating organizations and regulatory bodies of the respective countries.

III.3.5. Thailand

(i) Review Mission on Safety Operation of TRR-1/M1

Date: 06 -10 October 2003
Place: Thailand

Objective:

Under the EBP, the first mission of updating the Safety Analysis Report (SAR) of TRR-1/M1 was carried out in 2002. Since there, the calculations have been finished. Therefore, the follow-up mission is required to evaluate the newly completed calculations and recheck the completeness of SAR.

(ii) Emergency Planning and Preparedness of TRR-1/M1

Date: 06 -10 October 2003 (Postponed from 2002)
Place: Thailand
Objective:

The objective of this mission is to review and assess the Emergency Planning and Preparedness of TRR-1/M1. An IAEA experts mission is needed to ensure that the contents of the Emergency Planning and Preparedness Program for TRR-1/M1 will be complete and correct according to IAEA recommendation and guidance.

(iii) Establish Ministerial Regulation on Safety of Research Reactor Operation

Date: To be determined. (Postponed from 2002)
Place: Thailand
Objective:

The objective of this mission is to advise and assist the NFRC staff to draft a ministerial regulation for safe operation of research reactor.

(iv) Assess Implementation of the Pre-IRRT Recommendation

Date: To be determined. (Postponed from 2002)
Place: Thailand

Objective:

The objective of this mission is to assess and evaluate the progress of implementation of the recommendations and suggestions of the previous expert mission

(v) Advisory Mission on ISE

Date: To be determined.
Place: Thailand
Objective:

The objective of this mission is to provide a diagnostic of the overall safety situation in the country and to identify the areas where safety enhancements should be focused.

III.3.6. Viet Nam

(i) WS on Research Reactor Safety Verification Inspection

Date: 19 - 20 June 2003
Place: Viet Nam
Objective:

The objective of this workshop is to teach VRPA personnel and the technical members of the ad-hoc Committee on Nuclear Safety to conduct the safety verification inspection for RR.

(ii) INSARR mission

Date: 23 - 27 June 2003
Place: Viet Nam
Objective:

The objective of the INSARR mission is to assess the safety of the research reactor by comparing its safety with the IAEA's safety standards, to find weak points and good practices and to provide advice on enhancing the safety of the facility.

(iii) Finalization of Dalat Research Reactor SAR

Date: October 2003 (Postponed from 2002)
Place: Viet Nam
Objective:

The objective of this mission is to review and finalize SAR to submit it to MOSTE.

(iv) Expert Mission on the Implementation of INSARR Recommendation

Date: October 2003
Place: Viet Nam
Objective:

The objective of the expert mission is to follow-up on the implementation of the INSARR recommendations and to provide advice on their fulfilment.

(v) Advisory Mission on ISE

Date: To be determined.
Place: Viet Nam
Objective:

The objective of this mission is to provide a diagnostic of the overall safety situation in the country and to identify the areas where safety enhancements should be focused.

(vi) National Basic Professional Training Course on Nuclear Safety (4th qtr)

Date: To be determined.
Place: Viet Nam
Objective:

The objective of this programme is to introduce the basic concepts of Nuclear Safety to the staff of operating organizations and regulatory bodies of the respective countries.

IV. CONTRIBUTIONS 2003

Country	**Contributions**
China	1 cost free expert
France	1 cost-free expert
Germany	1 cost-free expert
Japan	1,381,481 US$ (*)
Korea	in kind (**)
USA	monetary contribution to be determined
	1 cost-free expert

* includes 2 cost-free experts from Japan
** hosting training events in Korea

Work Programme for 2003
IAEA Management

Activity	Place	Responsible	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Management - Co-ordination														
Progress Report	Vienna	Sanada					xx--xx							
Final Report	Vienna	Sanada										xx--xx		
Strategy Paper	Vienna	Lederman										xx--xx		
Technical Meeting	Vienna	Lederman												08--11
Management - Country profile/action plan														
Update CNSP/NSAP	Vienna	Dubois										xx--xx		
Management - Database														
Database Migration	Vienna	Lederman/ Zrunek												
Management - ISE														
Preparation of Guideline on ISE	Vienna	Lederman/ Bastos	20--24											
Management - Pilot Project/ANSN														
Consultants Meeting	Vienna	Lederman/ Kimoto		03--05										
Second Consultation Meeting	Korea	Lederman			24--28									

Work Programme for 2003
Regional

Activity	Place	Responsible	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Training														
Distance learning modules on nuclear safety courses	Vienna	Bastos												
Complete textbook for the BPTC	Vienna	Bastos												
Translation of the materials for training	Vienna	Kimoto												
Regional Workshop on Protection Against Fire for Research Reactors	KAERI	Tezuka			10--14									
Regional WS on Preservation of Research Reactors in Shutdown State and Decommissioning	JAERI	Bastos/Kimoto									29-	-03		
Regional Standard Safety Culture Workshop	Korea	Taylor/Kimoto											10--14	
Implementation of the Code of Conduct on the Safety of Research Reactors	ANL	Bastos												xx--xx

Work Programme for 2003

Activity	Place	Responsible	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expert missions														
Assess Implementation of IRRT Recommendation and Advisory Mission on ISE	China	Lederman/ Giersch												
Risk Analysis Report for Core Start-up without Neutron Source (TNPP)	Lianyungang	Niehaus												
TNPP PSA level 2	China	Niehaus												
Management and Assessment of the Steam Generator Lifetime (4th qtr)	Wuhan	Labbé												
Emergency Operation Procedure for TNPP	Moscow	Misak								25--29				
Safety Services														
Preparation for Pre-OSART and OSART training (Qinshan III)	Zhejiang	Cook												
IPSART Review of the Daya Bay NPP Level 1 PSA	Daya Bay	Yllera												
Pre-OSART Mission to TNPP	Lianyungang	Hansson										13--30		
IPSART Review of Qinshan NPP (Phase I)	Zhejiang	Kouzmina												08--12
Training														
VVER's Horizontal SG Tubing and Piping Examination Technology (3rd qtr)	Wuhan	Havel									xx--xx			
Workshop on Quality Assurance (QA) of Regulatory Body (2nd half)	Beijing	Giersch												
Workshop of Ageing Management (Nuclear Installation)(2nd half)	Beijing	Kotyza												
Operation Assessment of Nuclear Power Plants	Wuhan	Nichols												
Training for system engineers (Qinshan I)	Vandellos	Nichols	13--17											
Maintenance and Periodic Testing Program with ISI Program Review	Lianyungang	Vaishnys									08--12			
Workshop on Risk-informed Inspection Activities	Beijing	Ranguelova											03--07	

Work Programme for 2003
Indonesia

Activity	Place	Responsible	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expert missions														
Radiological Consequences to the Environment during Normal Operation and Accident of RSG-GAS	Serpong	Boado M./ Perrotta												
Follow-up of Pre-IRRT&Review Mission on Nuclear Legislation&Regulatory Control	Jakarta	Philip									29-	-03		
Follow-up of Seismic Safety Recommendations to the TRIGA II Bandung and Kartini Research Reactors	Indonesia	Contri											03--07	
Technical visits														
Advisory mission on ISE	Jakarta	Philip									29-	-03		
Training														
National Training Course on Ageing Management for Research Reactor (expert mission)	Serpong	Bastos							14--22					
National WS on Reactor Calculations f.Burn-up Calculations & Safety Analysis f. TRIGA Reactor SAR Preparation	Yogyakarta	Deitrich							15--29					
National Basic Professional Training Course on Nuclear Safety	Jakarta	Bastos								25-	-05			

Work Programme for 2003
Malaysia

Activity	Place	Responsible	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expert missions														
Follow-up of Experts Mission to Review Organization of the AELB	Malaysia	Philip				07--11								
Assist the AELB in the Evaluation of the Safety Analysis Report (SAR)	Malaysia	Boado M./ Perrotta						xx--xx						
Technical visits														
Advisory mission on ISE (pilot)	Malaysia	Philip				07--11								

Work Programme for 2003
Philippines

Activity	Place	Responsible	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expert missions														
Establishing Strategic RR Utilization Plan (and Other Safety Issues)	Philippines	Boado Magan												
Feasibility Study of Safety of Operation of RR at 100 kW Power	Philippines	Boado Magan												
Technical visits														
Advisory mission on ISE	Philippines	Boado Magan												
Training														
National Basic Professional Training Course on Nuclear Safety	Philippines	Bastos												

Work Programme for 2003
Thailand

Activity	Place	Responsible	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expert missions														
Establish Ministerial Regulation on Safety of Research Reactor Operation	Thailand	Philip												
Assess Implementation of the Pre-IRRT Recommendaiton	Thailand	Giersch									xx--xx			
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		
Technical visits														
Advisory mission on ISE	Thailand	Giersch									xx--xx			

Work Programme for 2003
Viet Nam

Activity	Place	Responsible	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Expert missions														
Finalization of Dalat Research Reactor SAR	Viet Nam	Hargitai										xx--xx		
Expert Mission on the Implementation of INSARR Recommendation	Viet Nam	Hargitai										xx--xx		
Safety Services														
INSARR mission	Dalat	Hargitai						23--27						
Technical visits														
Advisory mission on ISE	Viet Nam	Bastos												
Training														
National Basic Professional Training Course on Nuclear Safety (4th qtr)	Viet Nam	Bastos												
WS on Research Reactor Safety Verification Inspection	Hanoi	Hargitai						19--20						